SMARTEES: Deliverable 5.2 (Report)

Policy Recommendations for each cluster of case-studies

Insights from Policy Scenario Workshops

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Executive summary

This deliverable corresponds to the elaboration of policy recommendations and guidelines for the implementation and assessment of new local embedded low carbon policies.

The report presents the results of the policy scenario workshops implemented in five clusters of social innovations: (i) Holistic, shared, and persistent mobility planning (Zürich, Switzerland and Groningen, the Netherlands); (ii) Island renaissance based on renewable energy production (Samsø, Denmark and El Hierro, Spain); (iii) Energy efficiency in district regeneration (Malmö and Stockholm, Sweden); (iv) Urban mobility with superblocks (Vitoria-Gasteiz and Barcelona, Spain); and (v) Co-ordinated, tailored, and inclusive energy efficiency schemes for fighting fuel poverty (Aberdeen, United Kingdom and Timişoara, Romania).

The report is structured in four chapters and eight annexes. Chapter 1 introduces the main goals and tasks delivered in WP5 concerning the organization of the policy scenario workshops and the analysis and integration of the results in the Agent-Based Models (ABM). The methodology for the co-definition and refinement of policy scenarios is explained in chapter 2. Following, a cluster-case analysis is presented in chapter 3 corresponding to the results of the first and second policy scenario workshops conducted in each cluster of SI. This cluster analysis presents the best strategies promoting social acceptability and adoption of Social Innovations discussed in the multistakeholder deliberative workshops. Further, the results of testing alternative policies through ABM are presented in synthetic descriptive “boxes” illustrating the inputs from the scenario simulations.

Chapter 4 distils the main insights and lessons from the policy workshops and elaborates a series of policy recommendations for the implementation and assessment of local embedded energy social innovations. These recommendations will provide a supportive policy landscape for cities, islands and regions aiming to foster social acceptability and adoption of energy saving patterns of consumption and sustainable mobility. Finally, the annexes include the full reports from the policy scenario workshops conducted in the SMARTEES reference cities and islands as well as the methodological guidelines for the development of policy scenario workshops.

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ANNEXES

List of abbreviations

ABM	Agent-based model
PSW	Policy Scenario Workshop
SI	Social Innovation
WP	Work Package

1. Introduction

The SMARTEES project focuses on the human factor in energy transitions and aims to foster a deep understanding of the conditions and dynamics of successful energy transitions. It zooms in on cases of social innovations in energy transitions, which are conceptualized in SMARTEES "as processes of change in social relationships, interactions, and/or the sharing of knowledge that broadens/deepens the engagement of individual stakeholders with energy topics and leads to, or is based on, new environmentally sustainable ways of producing, managing and consuming energy to meet societal challenges" (Caiati et al, 2019).

Social innovations have the potential to creatively solve important social and environmental challenges while also contributing to high quality of life and wellbeing for many citizens (Avelino et al., 2020). Opposed to a strictly technological and technocratic understanding of the governance of energy transitions, socially innovative energy transitions place the emphasis on the importance of social factors as well as social changes needed to achieve a significant transformation of the current systems of energy production, distribution and consumption, and make it sustainable and replicable in different local contexts.

Understanding the social dynamics of such transformations, by identifying their development patterns and policy strategies and tools that lead to either social acceptance and adoption of new energy systems and practices, or to their rejection and polarization is of high value for those in charge of designing or managing such transitions and implementing policy strategies to foster a smooth transition. Furthermore, the democratic ideal is also that such transitions would be co-created by citizens or at least involve their active participation and collaboration, thus valorising their knowledge and competences, fostering citizen empowerment and the ideal of energy citizenship.

The empirical approach of SMARTEES has been to focus on clusters of successful cases of energy-related social innovations, to identify and extract the main lessons that should guide replication and governance of energy transitions in other local contexts. As part of this agenda, WP 5 zoomed in on the types of policy strategies and tools that 10 reference cases have implemented, analysing their immediate and long-term effects on dynamics of citizen participation, acceptability and resistance, as well as on the adoption of new practices and behaviours. Intrinsic in these cases is that although their duration varies, they have enough of a temporal history to allow for dynamic analyses of patterns of evolution and draw policy-relevant conclusions. The overall objective of WP 5 has been to synthesize the main policies and communication strategies employed by local promoters of energy-related social innovations, identify lessons learned by engaging in reflexive analysis on their consequences and define and test a series of alternative policy interventions in social simulations using agent-based models that could inform subsequent practice and replication.

Based on extensive empirical work and a joint policy workshop carried out in the first stages of the project, we defined a conceptual framework for the definition of locally embedded alternative policy

scenarios reported in Del 5.1, by identifying the relevant barriers and drivers influencing dynamics of acceptability or resistance, as well as citizen empowerment or disempowerment.

This theoretical framework served as the basis for the definition of a methodology to design and carry out multistakeholder deliberative workshops in which alternative policy interventions were defined, engaging SMARTEES researchers, modellers and policy actors, stakeholders and experts as described in the methodological guidelines for the definition of policy scenarios for each case study cluster (Annex 8).

Policy scenario workshops were organized by each case research partners in two stages. The first round of workshops was carried out in 2020. Stakeholders engaged in reflexive analysis and deliberation of the main policy strategies used and explored what they would do differently with the experience of hindsight or what alternative pathways would be interesting to explore in a simulated environment. The workshop results were then distilled into a series of alternative policy and communication scenarios to implement in the agent-based models created for each cluster. The first results of agent-based simulations were further presented and discussed in the second round of policy scenario workshops, which focused on the analysis and refinement of the energy policy scenarios to enhance their realism and relevance for each case cluster. Several policy scenarios were then finalized and implemented in the agent-based models, which simulated what would have happened if alternative policy routes had been taken. Detailed descriptions of the architecture of the agent-based models and of the technical implementation of alternative policy scenarios are provided in Del 7.3 and 7.4.

In the present deliverable, we focus on the outcomes of the two rounds of the multistakeholder deliberative policy scenario workshops and draw conclusions on the most promising policy and communication strategies to: a) foster social acceptability and diminish polarization of public opinion or resistance to transformative changes required by energy transitions to address the climate crisis; b) enhance citizen empowerment, understood as active participation in the shaping of socially innovative energy transitions; and c) provide policy-relevant knowledge on the foreseeable dynamics of socially innovative transitions in order to tailor governance strategies to particular social change stages and specific social dynamics. Policy scenario workshops provided rich knowledge on the social dynamics that influence the course of social innovations, with a particular focus on those that foster or hinder social acceptability of these innovations. They also shed light on the social mechanisms of contestation, resistance and conflict, the circumstances under which they occur and how such contestation can be resolved. Informed by psychological perspectives on the role of needs in dynamics of acceptance of, or resistance to, change and in opinion formation, particular emphasis has been placed in SMARTEES on defining alternative policy scenarios that address citizens´ needs, to anticipate resistance and contestation, and to increase public acceptability in future endeavours to promote energy-related social innovations cases.

Alternative policy scenarios implemented in the agent-based models and their outcomes are presented, facilitating a set of alternative policy interventions to experiment with in the implementation of future developments of the different energy social innovations. As a result, this

deliverable concludes with a final chapter of policy recommendations to foster the co-design and social acceptability of energy-related social innovations. These recommendations aim to support decision-making processes, also highlighting the best strategies to engage and empower citizens in energy local social innovations.

The report is structured as follows: Section 2 briefly describes the methodology adopted in the five case clusters and goes into a more detailed description of the specific objectives of the two rounds of policy workshops (for a more detailed description of methodological principles and strategies, please see Annex 8). Each empirical case has adapted the methodology to local conditions as described in each case report (Annexes 1 to 7). Section 3 presents the alternative policy scenarios defined and tested and extracts case specific conclusions regarding the conditions and dynamics that influence social acceptability and citizen empowerment. Section 4 concludes by comparing and contrasting the five clusters and underlines important lessons for future implementation and replication of these and other energy-related social innovations.

2. Methodology for the development of alternative policy scenarios with stakeholders

SMARTEES' policy scenario workshops were conceived as processes of knowledge co-production, reflexive analysis and decision-making regarding policy alternatives and counterfactual scenarios to foster energy-related social innovations. Policy scenario workshops have been organized in the five clusters of social innovations, involving both reference cases of each cluster:

- **Cluster 1: Holistic, shared, and persistent mobility planning**. This social innovation uses the mobility plan as a way to mobilize and coordinate many societal actors towards the common goal of a sustainable and efficient mobility system. The cities of Groningen (the Netherlands) and Zürich (Switzerland) are the reference cases involved in this activity.
- **Cluster 2: Island renaissance based on renewable energy production**. This social innovation centres around the mobilization of citizens and innovative partnerships to achieve energy independence through renewable and energy efficiency measures and, as a result revive island communities by creating sustainable island economies. The islands of Samsø (Denmark) and El Hierro (Spain) are the reference cases involved.
- **Cluster 3: Energy efficiency in district regeneration.** This social innovation triggers district regeneration through hard and soft measures, such as local energy production and energy efficiency measures, urban green spaces, transport system transition measures and citizen participation. The Swedish cities of Malmö and Stockholm are the reference cases of this cluster.
- **Cluster 4: Urban mobility with superblocks**. This social innovation is based on a radical transformation of urban design to foster low-carbon mobility and create high-quality public spaces for alternative social uses. The city is reorganised into superblocks, car-free areas that maximize public space for new social uses and keep road traffic outside of the superblocks´ inner streets. The Spanish cities of Vitoria-Gasteiz and Barcelona are the references cases analysed

- **Cluster 5: Co-ordinated, tailored, and inclusive energy efficiency schemes for fighting fuel poverty**. This social innovation is characterized by public authorities working in coordination with supply companies and civil society organisations to implement energy efficiency measures for residential buildings with the aim of fighting fuel poverty with a tailored and inclusive approach. The reference cases are Aberdeen (Scotland) and Timişoara (Romania).

Policy scenario workshops were prepared and delivered by each SMARTEES case responsible research partner, following the methodological guidelines elaborated for the definition of policy scenarios for each case study cluster. The first round of workshops was organized in Autumn 2020, while the second round of workshops was held in Spring 2021.

2.1. Multistakeholder deliberative approach

The policy scenario workshop adopted a multistakeholder deliberative format and served to discuss and develop alternative pathways to implement innovative policies aiming at gaining wide local support and social commitment (Dick, 2000; Gnaiger & Scroffenegger, 2003). Policy workshops guided participants in identifying the main elements characterizing the process of design and implementation of the energy-related social innovations in their city or island, as well as the alternative routes that would take based on the lessons learned.

Participants included SMARTEES case researchers and modellers, who introduced the main topics of discussion and facilitated the activities in the workshop. A diversity of policy actors, stakeholders and experts were invited to participate in the policy workshops, representing the following categories of stakeholders and seeking a sufficiently diverse range of social groups, positions, roles and opinions:

(a) Promoters, pioneers, supporters, and key persons involved in the development of the social innovation.

(b) Policy actors, who are (or who were in the past) directly involved with the implementation of the social innovation and the strategy to further develop it.

(c) Stakeholders and civil society actors, from both public and private institutions, with direct relation with the SI.

(d) External experts in the SI.

2.2. Objectives, and procedure of the first round of policy scenario workshops

In preparation for the first round of policy scenarios, case study researchers customized the methodological guidelines to their specific case and workshops' involved stakeholders. Moreover, the empirical knowledge acquired through previous research activities in SMARTEES on the social dynamics and policy strategies in each case was synthesized and examples were provided for each case to structure and guide stakeholder deliberation. Table 1 summarizes the dimensions identified as relevant in socially-innovative energy transition processes based on SMARTEES results:

Table 1. Relevant factors influencing social acceptability and citizen empowerment

DIMENSIONS RELEVANT FOR THE ACCEPTABILITY OF THE SOCIAL INNOVATION AND CITIZEN EMPOWERMENT			
Resistance to the energy-related social innovation	Internal resistance	Different visions (e.g., within the City Council) regarding the process of design and implementation of the SI.	
	Political resistance and conflict	Struggling with different political positions and motivations.	
	Citizen resistance	Fear of change	Natural resistance to lose perceived comforts (e.g., having a bus stop near to home) or "rights" (e.g., "the right to drive a car").
		Social groups with different interests and goals	Specific groups concerned about the impact of the SI or the potential negative impact on their economic activity.
		Backlash to perceived top-down decision-making	Top-down measures can produce strong contestation or the non-involvement in the social innovation, perceived as an "imposition" by the city council.
		Misunderstanding of the SI, lack of appropriate knowledge.	Innovations that require technical knowledge, training, or investment in technologies might require specific advising, consultation and training efforts focusing on empowering citizens in the adoption of energy saving measures.
		NIMBY manifestations	NIMBY ("not in my backyard") effect from citizens living close to new technological installations.
Existing (un) supporting local and social norms	Social norms	Social dynamics that foster (non)sustainable behaviours, due to the influence of specific social groups adopting a social innovation or related behaviours, or existing social norms that act as barriers for the SI.	
	Other relevant attitudes	Attitudes supporting intensive consumption patterns, money-saving motivations, or those related to the importance of social relationships.	
Lack of confidence	Lack of confidence of the beneficiaries regarding the usefulness and effectiveness of the energy projects. In the absence of successful references, uncertainty and novelty sometimes generate fear and unease.		
Place identity & place attachment	The affective connection with particular places and environments can either hinder or enhance the acceptability of energy-related social innovations.		
Low adoption of new energy behaviours	For social innovations to become accepted "as the new normal", mindsets, views and attitudes have to change. Having time to experience the benefits of the social innovation and get used to new practices and behaviours plays a key role here.		
(Lack of) satisfaction of needs	Taking key psychological needs into account and tailoring policy to these needs for different social groups might influence acceptability. Seven different types of needs were identified, which were further refined through analyses reported in Del 4.2, and through the tailoring of ABMs in each case: (a) the need for safety (b) autonomy (i.e., self-sufficiency) (c) the need for status (i.e., social prestige and recognition) (d) belonging (social cohesion of the community) (e) trust in the project and in institutional representatives (f) the need for recognition (as an environmentally sustainable and/or innovative place) (g) the need for competence in carrying out new behaviours.		

Concerns for the impact on local economy & jobs	The concerns of citizens related to their local economy and job development (or reduction) have an impact on acceptability.
Commitment of relevant social actors through the process	A strong motivation of the involved actors and promoters to persist and adapt to different (either anticipated or not) social concerns was identified as a key factor in the long-term success of an initiative.
Concern for quality of living conditions	The presence or absence of explicit concern and focus on improving citizens´ quality of life is an important factor, especially in those case involving vulnerable or discriminated social groups.

SMARTEES empirical research has also supported the identification of key policy and communication strategies and tools that promoters of energy-related social innovations use. These were also synthesized and used to structure discussions in the first round of workshops and to push reflexive analysis further towards the identification of alternatives. Table 2 presents this synthesis, further adapted by each case cluster.

The first round of policy scenario workshops had the following specific objectives:

- Refine the main lessons learned on each relevant dimension in the process of design and implementation of social innovations.
- Identify alternative policies and strategies of interest
- Identify foreseeable obstacles to alternative policy scenarios of interest and strategies overcome them.

The general structure of the first round of policy scenario workshops was built on three iterative phases:

1. Framing reflexive analysis. The case(s) researchers presented the social, institutional and political dynamics reflected in Table 1 and tailored to each case, as well as the main policy strategies used at particular moments in time.

2. Discussion on lessons learned from the pilot implementations of energy-related social innovations. Case(s) researchers guided the discussion asking participants (1) to refine lessons learned, (2) to zoom in on particularly promising alternative interventions, by reflecting on the question of what they would do differently (counterfactual scenario) and (3) reflect on other important factors that might influence social acceptability of an energy-related social innovation not already included in the table, i.e. what might have been missed from the analysis. During this phase, participants also identified the obstacles for the counterfactual scenarios discussed previously and discussed on possible solutions to overcome them.

3. Deliberation on the most interesting policy alternatives and counterfactual scenarios to be tested through social simulations. The basic structure and assumptions of the agent-based models were presented and opportunities and limitations to the implementation of alternative scenarios were discussed with stakeholders, focusing on choosing a set of most promising alternative yet realistic scenarios for testing.

Table 2. Lessons learned on policy and communication strategies and tools

Strategies fostering policy and stakeholder commitment	
Citizen commitment strategies (i.e., citizen pacts for the SI)	Formalized commitment strategies such as policy or citizens' 'pacts' signed between the local government and a diversity of stakeholders are effective in maintaining involvement of all relevant actors over time and through experienced difficulties.
Co-creation of the future (future-orientation, "what should be done further")	Concerns towards the future, and more specifically, working together to shape the desired future is a common orientation in all the SMARTEES cases.
Consultation of human resources with a high level of knowledge/ expertise	Human resource and expertise represented either as a barrier or a driver, a high level of technical and governance expertise is generally needed.
Creation of working groups / task forces with multiple stakeholders	Creation of permanent working groups of stakeholders, residents, and citizens, from the beginning, with sufficient space to express their suggestions and observations and adjust the plan to their real needs.
Informal, extended partnerships involving a wider set of actors	Consensus is built progressively, through negotiation and dialogue to overcome conflicts and resistance, and needs both formal and informal channels and contexts (e.g., Samsø´s "good energy cafés", informal meetings, creating an informal and relaxed space to create a common vision for their energy future).
Strategies enhancing citizen involvement and support	
Citizen empowerment strategies	Fostering the conditions for meaningful engagement in the shaping of the social innovation leads to higher acceptability, and a more satisfactory result for a diversity of social groups, including those that might be against the social innovation at the beginning of the process.
Citizen participation in decision-making (participatory strategies)	Citizen participation should be carefully designed and organized considering the most adequate time to involve both general public and specific groups of interest. The rules and mechanisms to participate in decision-making processes, and the commitment required from participants should be made explicit. Promoters might have to deal also with the reluctance of citizens to engage in decision-making processes. Approaches that foster active participation and citizen ownership of the process and outcome are more successful than technocratic or top-down policies.
Cultural mediation	In some cases, an explicit effort to relate the social innovation with particular cultural themes is needed.
Information and communication activities	Implementing – at an early stage – dissemination, communication and education strategies about the ambition, characteristics and changes entailed by the energy-related social innovation, such as educational programmes,

	environmental awareness campaigns, citizen forums, interviews, etc.
Strategies addressing education, awareness-raising and social norms	
Promoting awareness of the impacts of the social innovation on health, social wellbeing, and the environment	Enhancing environmental awareness as well as educating on the health and social impacts and implications of the social innovation.
Social and cultural norms	Using tools and strategies that target and make salient social norms that support the social innovation, such as those related to the environment or to quality of life and social wellbeing; or fostering social norms that encourage social participation to shape the social innovation.
Normative, infrastructural and technological measures	
Implementation of pilot projects (step by step implementation)	One strategy for gaining social support is to proceed gradually, step by step, avoiding changes that are too fast or too radical. Pilot and/or reversible interventions become effective strategies to demonstrate the positive impact of the social innovation and gain support for further replication, out-and up-scaling.
Infrastructural and technological policies or tools	Investments in public and private infrastructures and technologies, as well as the provision of technical guidelines and training.
Normative and regulatory tools	Promoting a new regulatory framework for a particular energy innovation, including push and pull measures, such as incentives, taxes or raising fees (e.g., for parking).
Providing resources to support implementation	Provide different resources such as expertise, time, or money. Financial resources could include tax benefits and economic measures that provide incentives for businesses and/or financial support for households (e.g., subsidies, grants, loans) to foster adoption of energy-related innovations and tackle energy inequality and poverty.

Adaptation to the situation created by the COVID-19 pandemic

The multistakeholder policy scenarios workshops were conducted in Autumn 2020 and Spring 2021. Although workshops were initially planned to be conducted face-to-face, due to COVID travel restrictions in Europe and social distance recommendations, we opted for virtual or hybrid formats. Table 3 and 4 present the modality and timing of each of the workshops, for both rounds (see Tables 3 and 4).

Table 3. Organization of the first phase of policy scenario workshops in five clusters of social innovation

Cluster/Case	Method	Format	Dates
Holistic Mobility (Groningen & Zürich)	Online	2 sessions-workshop (+participants' assisted homework between the sessions with supporting online tools about cases)	1st session 21 September 2020; 2nd session 24 September 2020
Island Renaissance (Samsø)	Mixed: Online version with island participants located together	1 session-workshop (4hours/session)	17 December 2020
Island Renaissance (El Hierro)	Mixed: Online version with island participants located together	2 sessions-workshop (4 hours/session)	1st session 19 October 2020; 2nd session 22 October 2020
District Regeneration (Stockholm & Malmö)	Online	1 session-workshop (3 hours) (+participants' assisted homework one week prior, and a "post-workshop-survey"	21 October 2020 (task on the 14 October and survey on the 28 October)
Superblocks (Vitoria-Gasteiz & Barcelona)	Mixed: Online version with city participants located together	3 sessions-workshop on 3 different days (4 hours/each session). Each city worked first separately in the first session, and both joined the last plenary session	1st session Barcelona: 1 October 2020 1st session Vitoria-Gasteiz: 5 October 2020 Joint session: 8 October 2020
Fuel Poverty (Aberdeen)	Online	1 session-workshop (one half-day)	9 October 2020
Fuel Poverty (Timisoara)	Online	1 session-workshop during (1 hours/session), (+participants' assisted homework previous to the workshop)	4 August, 2021

2.3. Objectives and procedure of the second round of policy scenario workshops

In a second stage, we focused on the analysis of the first simulated explorations of alternative scenarios. Specifically, the goals of the workshops were twofold: first, to present the simulated scenarios of the social innovation processes in each case/cluster of reference cases; and second, to refine these policy scenarios with the participants, to concrete a series of alternative policies that, based on the ABM simulations, foster broad social acceptability of energy sustainability policies.

Priority was given to the model reference cases and to those cases for which agent-based models were significantly advanced. The same participants engaged in the first workshop were invited to join the second workshop. Workshops were conducted in the months of April and May 2021. An online format was chosen due to Covid-19 restrictions. Table 5, below, describes the method, format and dates in which policy scenario workshops were organized in each cluster.

Table 4. Second round of policy scenario workshops in reference cases

Cluster/Case	Method (face-to-face/remote)	Format	Dates
Holistic Mobility (Groningen & Zürich)	Online	1 session-workshop (2.5 hours)	13 April 2021
Island Renaissance (Samsø)	Mixed: Online version with (few) island participants located together	1 session-workshop (2 hours)	27 May 2021
Island Renaissance (El Hierro)	Online	1 session workshop (3 hours)	6 May 2021
District Regeneration (Stockholm & Malmö)	Online	1 session workshop (2.5 hours)	13 April 2021
Superblocks (Vitoria-Gasteiz)	Online	1 session workshop (3 hours)	22 April 2021
Fuel Poverty (Aberdeen)	Online	1 session workshop (2.5 hours)	21 May 2021

2.4. Workshop data analysis

The SMARTEES policy scenario workshops were recorded using audio and/or video recording devices. These recordings were checked for accuracy by the research team.

To distil the main lessons learned and the counterfactual scenarios elaborated by the participants, a reporting template was used. Additional elaboration was necessary in some cases involving case researchers and agent-based modellers. This also included additional data analyses of, for example, the number of communication campaigns carried out by promoters, their content in terms of the psychological needs they targeted, as well as their population reach and impact (e.g., the number of publications on a particular topic and the number of readers of a particular communication medium). Examples of these analyses have been provided in Del 4.2 (Wilson et. al, 2021) and Del 7.4 (Bouman et. al, 2021). For this report, we focus on the presentation of the finalized tested scenarios and their implications for policy. The workshops were also documented in detail and a report per each reference case has been produced and compiled as an annex of this report (see Annexes 1 to 7). The results of the policy scenarios workshops were implemented through social simulation models (WP7), and their outcomes were discussed and refined (as reported in deliverable 7.4). Furthermore, the outcomes of the policy scenarios have been integrated in the SMARTEES policy-sandbox (WP8), that will support reflexive thinking and planning of policies to foster socially acceptable and inclusive energy innovations (see deliverable 8.2).

3. Fostering social acceptability and citizen empowerment of energy-related social innovations

This section presents the main results of the first and second round of multistakeholder deliberative policy scenarios developed in each cluster of energy-related social innovations in SMARTEES. An overview of each cluster is first presented, following by a synthesis of the main **factors – both barriers and drivers – affecting social acceptability and citizen empowerment identified in** the **multistakeholder deliberative workshops**. The alternative policy scenarios co-produced and implemented in the agent-based models are presented, and the results of a selection of alternative policy scenarios coproduced in the main reference case are illustrated in synthetic boxes. Finally, a series of **conclusions and policy recommendations** are distilled for each cluster.

3.1. First cluster: Holistic, shared and persistent mobility planning

3.1.1. Background

Cluster 1 "Holistic, shared and persistent mobility planning" refers to the case of Zürich and Groningen. Both cases are characterized by a very long life (around 40-45 years until today) and are both centred on mobility (based on high quality public transport and propagation of bikes and bike lanes; mainly the first in Zürich, mainly the latter in Groningen) with little interest on the main other sectors of energy consumption (e.g., housing, industry, etc.) or on energy production (increasing, however, recently). In both cases, the "starting point" is in the '70s of the 20th century (mobility strategy to speed up trams and buses in Zürich; design and launch of a new Traffic Circulation Plan/TCP in Groningen aimed at limiting the use of cars). In both cases, the main actor was (and still is) the Municipality. Both approaches were participative.

In Zürich, the implementation of the mobility strategy governance is rooted on a very strong system of direct democracy characterized by the celebration of various referenda (promoted either by public local authorities or by citizens) and traditional consultations of citizens at the local level). In general, the city of Zürich and all the other local planning authorities try to engage stakeholders and do engage them in formal and informal fora as much as they can. Before the final decisions are taken, normally, there is a formal request for comments where most of the formal actors get a chance to be involved.

In Groningen, there was an important evolution of the governance model of mobility. The organisation of city planning has changed completely because of the paradigm shift in the 1970's. Basically, the top-down approach by the technical planning experts has been changed towards a holistic planning process, where plans are being developed including many relevant sustainability dimensions such as well-being and involvement of the citizens, energy use and economic viability. Consequently, citizens and shopkeepers/ entrepreneurs are increasingly being involved in planning processes. At the beginning without important influences in the decision-making, later (especially

since the 1990s). Also influencing decisions thanks to more or less binding referenda and local consultations. An important tipping point in this evolution process was the referendum held in 1994 on the closing of Noorderplantsoen Park for through car traffic.

In both cases (Zürich and Groningen), big changes in citizens' mobility behaviour towards new much more pro-environmental behaviour are well documented. The big difference is that: (a) In Zürich the transition has been from cars to firstly public transports and, secondly, to bikes and walking, and (b) in Groningen the transition has been from cars, firstly to bikes and, secondly, to public transports and walking. This difference between Zürich and Groningen concerns all age groups (e.g., most young people in Groningen ride bike because it is convenient, while in Zürich they prefer public transport because of comfort and Wi-Fi availability) In both cases, the change in mobility behaviour change fits into a wider trend of behaving more environmentally friendly, e.g., separating waste, limiting water use, isolating housing, joining energy cooperation's and the like (mainly in the last years).

3.1.2. How to promote social acceptability and adoption of Social Innovations related to mobility

How to promote social acceptability and adoption of social innovation related to urban mobility was at the core of the Cluster 1 since the beginning of the SMARTEES project. Starting from a documentary analysis, enriched with interviews to key informants (policy makers, transport sector facilities, scientific community, enterprises, and citizens), barriers (or critical issues) and drivers (e.g., "strategies" for gaining social support and/or for overcoming critical issues) were identified, as summarized below. Critical issues were (and are) different in Zürich and Groningen (despite the similarity of the two cases).

In Zürich, the main critical issue appeared to be the management of a public sector composed of multiple actors, where frictions could develop between the interests of the local municipality and the wider cantonal level. More specifically, frictions could emerge between the entities within the Municipality of Zürich; between the canton and the municipality; between the City of Zürich and neighbouring municipalities; among politicians; etc. Therefore, "institutional complexity" is considered a barrier by most of the actors consulted in Zürich. This critical issue is often or almost always overcome thanks to continuous/permanent negotiation processes (sometimes informal0F[1]), which is possible given the often-excellent interpersonal relationships among some of the involved actors. Moreover, the complex consultation mechanism through referenda (and in a less extent through the other consultation) can provoke a slowing down of the decision-making processes, in the sense that often the implementation of a policy or even a specific activity (and use the already available relative funding) sometimes is stopped because of a referendum, which, in fact, "blocks"

[1] The enhancement of informal ties (and work) represents a driver for most of the actors consulted (« go beyond the formal level through frequent informal and, often, friendly contacts»).

an ongoing initiative until the outcome of the referendum in question1F[2]. This issue is inherent in the functioning of democracy in Switzerland and therefore remains**.**

In Groningen, the main critical issue was "at the beginning, in the '70s/'80s", the tendency to adopt a top-down approach that caused a lack of consensus among some relevant actors in the implementation of the Traffic Circulation Plan/TCP (shopkeepers, the police management, and a significant group of car drivers) and a lack of a real stakeholder involvement (in the '80s, 53% of businesses still regarded the TCP as negative also because the economic risks associated with the introduction of TCP had not been brought under control). Stakeholders and citizens were considered by the municipality as actors to be often, at best, simply informed and not really involved. Nevertheless, the TCP met a large consensus among the left-wing citizens (therefore a further critical issue may have been an excessive political polarization).

Later this approach changed, and since the '90 the top-down approach was first softened and then abandoned and replaced by a consultation process also entailing negotiations among diverse interests (e.g., car drivers and bike riders in the design of a tailor-made biking roundabout), as well as referenda (however, less frequent than in Zürich – the first was the Referendum on the closing of Noorderplantsoen Park for through car traffic). The "top-down" problem finally disappeared almost completely (see above). Considering what has been said so far, one gets the impression that the above-mentioned critical issues were (and are) managed, essentially, through a more or less permanent monitoring and assessment of the social, economic, and environmental context and through a trend towards an "open design" by modifying, where necessary, the actions to be implemented and the duration of the interventions.

Turning now to the "strategies" for gaining social support, in Zürich, the main ones can be summarized as follows.

a) Follow the traditional forms of "direct democracy" characterizing the governance system in Switzerland (ask citizens' opinion through referenda; allow people initiative referenda; frequent citizens consultation through Quartierkonferenzen in each of the 12 sub-areas of Zürich; and/or other local consultations on specific projects/measures (see above).

b) Proceed gradually, step by step, avoiding too fast and too big changes in a short time, avoiding almost always radical measures (such as impeding cars circulation in specific areas of the city or between the sectors of the city – as it has been done in Groningen).

c) Negotiate constantly with citizens or specific groups (e.g., the representatives of the main important business groups) on specific measures2F[3].

[2] However, there is a certain degree of ambivalence at this regard. "Direct democracy" is considered a weak barrier for most key actors (i.e., all people interviewed from Municipality of Zürich's departments involved in the case, Political parties, the VBZ - Zürich Transport Authority, the SBB-Federal railways, the Canton of Zürich, and other cities in the Canton of Zürich). Conversely, other actors (i.e., the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, the business community "City Vereinigung", shopkeepers of a street/ square, the car group "Touring club Switzerland", the bike group "ProVelo", 12 Quartierkonferenz/Quartiervereine, specific citizens' groups, and Zürich inhabitants), considered this factor as a facilitating one.

[3] "Propensity to negotiation" was also identified as a driver in varying degrees by most of the involved key actors in Zürich (i.e., the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport, the Department of Public Safety, the

d) Adopt targeted policies (e.g., with contact persons for mobility consultations in large companies).

e) Give priority to "pull" measures (such as intensive improvement of public transport or the set-up of bike lanes) over "push" measures, which have however been implemented, but with less emphasis (such as the increase of the parking price).

In Groningen, the initiators gained serious support in the elections (40% in 1974) and considered that as a mandate to implement the TCP. So, their thought was that they had to inform people (carefully, including a direct communication with the citizens) but not much more (the "top-down" approach mentioned above). However, after the launch of the TCP, the initiators realised the importance of going to the neighbourhoods, shopkeepers, and other stakeholders to discuss the plans in terms of the liveability of the city. Hence the overall vision was emphasised when local plans were under discussion. Different neighbourhoods were approached in different ways, depending on the culture, level of participation and cohesion of the people living there. Discussions took place on the street, either planned or spontaneous. Later the negotiation process was expanded with a more formal referendum, either of a binding or of an advisory type. The experiences with referenda were mixed, as the outcomes were not always in line with the planners' preferences3F[4]. The municipality has become very aware of the importance of co-creation and consultation, and depending on the type and complexity of projects, different types of citizen involvement are being used. Also, the provision of information has changed in the time, partly due to new digital formats and channels that are available nowadays.

The municipality has changed its interaction from hosting meetings of interested people in the town hall, towards actively going towards the neighbourhoods and finding specific ways to include the local communities in the planning process. Finally, social support was (and is) maintained thanks to the experience of the city as a pleasant, friendly, clean and accessible place. The inner city has developed into a welcoming and friendly place where people like to shop, walk, and visit restaurants and bars with a continuous flow of people walking and biking. The older neighbourhoods that have been restored are flourishing. Most of the old and relatively small houses have been renovated, and the neighbourhoods are thriving. Due to a strict parking regime the inhabitants are capable of parking their cars in their own neighbourhood, and city visitors from abroad are increasingly using the transfer at the outskirts of the city, where large carparks are available with cheap and fast public transport for coming in the inner city. Therefore, strategies to gain citizen support for the mobility strategy in Zürich and in Groningen appear now as mostly convergent.

We can add that the adopted strategies for getting social acceptability and adoption of Social Innovations related to mobility appear successful. In this regard, we can refer to two very similar

Presidential department, the Health Department, Political parties, the Energy Commission, the ZVV - Zürich Transport Authority, the SBB – Federal railways, the Canton of Zürich, large enterprises working in Zürich territory, the business community "City Vereinigung", shopkeepers of a street/ square, the car group "Touring club Switzerland", the bike group "ProVelo", Quartierkonferenz/ Quartiervereine, specific citizens' groups, and Zürich inhabitants).

[4] Therefore, it is not strange that, among the key-actors involved in the Groningen social Innovation case the « belief in democracy » was identified both as a strong barrier and as a driver.

surveys implemented as part of the SMARTEES project in late 2019-early 2020, focussed, respectively, on the two cases (mentioned above) related to Limmatquai in Zürich and the Noorderplantsoen in Groningen. We can observe an increasing acceptance of the closing for cars of the road and park for cars. In the Groningen case in the referendum 50.9% voted for a closure, whilst in the 2019 survey 94,5% of the respondents reported to be in favour of keeping the park closed for cars. For the Zürich case we observe a similar adaptation effect, where 59.5% initially voted in favour of a permanent closure, whereas in 2020 84.2% favour a car-free Limmatquai street. Also, we observe that the closer people live to the Noorderplantsoen or Limmatquai street, the more favourable they are about the closure. This indicates that having more direct negative experiences with car traffic serves as a motivation for closing the street/park for car traffic. In both cities, this trend was stronger among those with a higher educational level.

3.1.3. Results of the policy scenario workshops on how to promote social acceptability and adoption of Social Innovations

The first workshop

Two years after the Kick-off of the SMARTEES project, UG and K&I organized a first online participatory policy scenario workshop (September 2020) to reflect on lessons learned from the successful interventions that foster wide acceptability of the social innovations on mobility in both cities. The outcomes of the policy scenario workshop provided insights on the best strategies to overcome (possible) citizen resistance and increase public acceptability as well as supporting energy innovations by supporting citizen engagement in the design of energy policies.

General topic of the workshop in Groningen and Zürich was promoting person transport by a certain modality in the city(ies). Both Groningen and Zürich had successful cases of promoting biking and public transport, and discouraging car use in the past (e.g., the Noorderplantsoen case, the Limmatquai case, as well as further “indirect” measures, such as the increase of parking fees, the imposition of very low speed limits). We feel that those historical examples are important for cities beginning their transition. Yet, these examples have now become less relevant for policymakers in cities that have already achieved a lot over the past decades. For example, in Groningen there are attempts to restrict bike movement in the city centre (also in relation to Covid-19, to enable pedestrian social distancing). Meanwhile, Zürich is facing the challenge of “conflicting spaces” accommodating pedestrians, public transport, bikes, and cars. In this online policy scenario workshop, we broadened the topic to include new challenges the cities are now facing. Details on the workshop (participants, Agenda, presentations, etc.) are reported in Annex 1 to this deliverable.

During the first workshop, the participants were asked to discuss on barriers and drivers of a Social Innovation they had experience with. The key findings concerning the barriers for SI projects reported were:

- The opposition of particular groups of residents is usually expected. Overcoming this barrier is done by digital and physical participation programmes, involving neighbourhood associations, and providing feedback to the community.
- The opposition of a prominent organisation/institution is not always present, but can emerge unexpectedly, as in the case of an association for people with disabilities opposed a project for not being accessible for wheelchairs. Mediation and careful communication were used as a response.
- The opposition of other departments/politicians was mentioned as something that can be expected. Involving other departments and stakeholders at an early stage in the planning process is mentioned as a strategy to mitigate possible opposition and try to collaborate in planning processes.
- Uncertainty of the project outcome is often anticipated, but some events are not anticipated, COVID-19 being mentioned explicitly.
- Bureaucratic/organizational issues that hinder the implementation of the project are sometimes anticipated, and sometimes not. It is mentioned that large projects always take much time concerning organization, and sometimes unanticipated problems emerge, e.g., with the availability and usability of data related to privacy regulations.

Characteristics of the barriers, as well as the identified solutions for overcoming them, are reported in Table 5 below.

Table 5. Barriers of the social acceptability of the SI as noted by participants (cluster1)

Barriers	Did you encounter it in your project?	Was it anticipated?	How did you (try to) overcome it?
Particular groups of residents oppose the project	*Moderately, there is usually some opposition from shop owners and* car-owning/ minded residents	yes	Calculation model that shows in which areas are enough basement garages to compensate on-street parking, information letters and events
A prominent organization/ institution oppose the project	no	varying	Inform, consult, advise, co-production, participate in decision-making, and facilitate discussion and majority voting

Other departments/ politicians oppose the project	yes	Mostly yes	Integrate them since the beginning of the first ideas and involve in development
Uncertainty of the project outcome	no	yes	Discussions and updates
Bureaucratic/ organizational issues that hinder the implementation of the project	yes	no	A big project team is always slow working, but you can integrate all the technical issues, you will get an overall working and functional solution.

The key findings concerning the drivers for Social Innovation projects reported were (Table 6):

- Particular groups of residents supporting the project was mentioned once, but not specified.
- Prominent organization/institution sometimes support a project, which may be anticipated, but also may come as a surprise.
- Other departments/politicians are reported to support the project. Not much is said about how to stimulate that, except for clearly communicating the aims of a project.

Table 6. Drivers to increase the social acceptability of the si as noted by participants (cluster1)

Drivers	Did you encounter it in your project?	Was it anticipated?	How did you stimulate it?
Particular groups of residents support the project	Mostly yes	No	Clarity about the purpose of a participation project (elaborating something new, discussion existing plans or options,
A prominent organization/institution supports the project	yes	yes	Organize and address, steering committee and project teams. Informing supporting group and expert groups

Other departments/politicians support the project	Yes	Yes	Show the key advantages in every possibility

Based on these barriers and drivers, the following policies were identified, see table 7.

Table 7. Policies to increase the social acceptability of the SI

Policies and strategies for the implementation of social innovation	Main insights / lesson learned
Policy1: communication with citizens	Opposition against plans may be unavoidable, but a clear involvement of (opposing) citizens and transparency with respect to information sharing from the early start may avoid unnecessary polarisations to grow.
Policy2: involving organisations	Getting a good overview of possible relevant interest groups and organisations and informing them about the project may be important for both the development of the plan as for support.
Policy3: Involving other departments	Avoiding developing plans in relative isolation may prevent conflicts with the policies of other departments. A good communication strategy can be very helpful.

This first policy scenario workshop essentially confirmed what had already emerged from the document research and from the interviews with key persons; however, attributing greater emphasis to specific barriers, drivers and policies that could therefore be considered as the most current.

Considering all together the three policies mentioned in Table 8, we can consider that one of the main insights to foster successful Social Innovations in mobility (but not only) is the switch from a governance system based only on various kinds of partnership between different institutional stakeholders (e.g., the municipalities and their companies as well as other public authorities) to a model of extended partnership (sometimes formal, sometimes informal) involving a wider set of actors, such as NGOs, environmental movements, universities/schools, citizens groups, local businesses, cultural and sport centres, “common citizens”, etc. This shift is more or less quick and can meet hindrances. This shift does not only happen if a strong system of direct democracy is already in place.

Finally, the following Table 8 provides an overview of strategies for gaining social acceptability as discussed in the workshop.

Table 8. Synthesis table of the strategies for gaining social acceptability

RELEVANT DIMENSIONS	STRATEGIES FOR GAINING SOCIAL ACCEPTABILITY						
	Information, communication (SI)	Participation of policy actors and citizens in co-designing	Support changes in social norms	Pilot projects	Infrastructure & technologies	Environmental awareness (health, quality of life)	Environmental education (wide context)
Citizen resistance	X	X	X	X	X	X	X
Policy resistance		X		X			
Non supporting social norms			X			X	
Lack of confidence in the project				X			
Place identity/attachment			X	X			
Commitment of relevant actors							
Satisfaction of experiential needs			X				
Satisfaction of social/psychological needs (security, belongingness, relatedness, status, reputation)			X				
Satisfaction of need of acknowledgement			X		X		X
Values: autonomy, biospheric and social oriented				X			X
Awareness of economic impact							X

Results from the ABM's simulating alternative policy scenarios co-created in the policy scenario workshops

The second round of policy scenario workshops yielded three conceptual alternative scenarios. These scenarios were elaborated for the Groningen case, but were discussed, during the workshop, having in mind the Zürich case, that is, as we saw above very similar to the Groningen one (since the second workshop was attended by people both from Groningen and for Zürich).

The first scenario we discussed addressed how sensitive the simulated social dynamics are for unexpected events. The case we discussed as interesting was the event of an accident with a cyclist before the referendum, which would strengthen the safety motive of the people. The question is how sensitive the case is for such unexpected events. The second scenario type we discussed relates to the organisation of meetings to discuss the opening or closing of the park. We made a distinction between town hall meetings versus neighbourhood meetings. Meetings at the townhall require more effort to attend, and hence in a simulation this would mean that more involved people having more time are more likely to attend. This can be implemented as a bias of more educated, older people with a high involvement attending. The opinion dynamics generated in such a meeting may have an impact on the attitudes of these people, and after the meeting they may share their opinions with other people. The question is how such townhall meetings can affect the discussions/opinions in the wider city. Alternatively, meetings can also be organised in the neighbourhoods. It was discussed that although such a meeting would be more accessible for people, timing may also serve as a bias. Meetings scheduled during the day will result in an underrepresentation of working people, whereas meetings in the afternoon may result in an underrepresentation of (young) parents.

The third scenario relates to a communication strategy. For the Groningen case we specifically discussed the influence that shopkeepers can have on the discussion. Basically, shopkeepers were opposed to closing the park for car traffic. Because these shopkeepers are also advertising in local newspapers, these newspapers were biased in the sense that they reserved more space for the voice of the shopkeepers. In this scenario we would like to implement this influence by creating a city-wide influence of advertising against the closure of the park for cars. It is of interest to explore if such a media campaign is capable of making a serious change in the discussions taking place, and the outcome of the referendum. The last scenario we discussed was related to the composition of the population. Groningen is a student city, and as a consequence the population is younger and more educated than other comparable cities. As such it would be interesting to explore the scenario of "what if Groningen was a regular city". This can be done by changing the population characteristics and explore what the impact will be on the resulting social dynamics concerning the referendum.

In this deliverable, we selected the third scenario to demonstrate and implement in ABMs because it refers to a widely used policy option that interferes with the opinion dynamics in the community. Other scenarios and the development of ABM's are discussed in deliverable 7.4. In the following descriptive boxes, we demonstrate scenario 3 in two variations and the results from the agent-based model simulations:

1. Communication strategy: Local Media campaigns focused on affirmation of the benefits of having a car-free park.
2. Communication strategy local media campaigns held by shopkeepers supporting car-traffic in the park for shopping convenience.

ALTERNATIVE SCENARIO N.1

COMMUNICATION STRATEGY: LOCAL MEDIA CAMPAIGNS FOCUSED ON AFFIRMATION OF THE BENEFITS OF HAVING A CAR-FREE PARK

CASE STUDY: GRONNINGEN

FACTUAL SCENARIO

Groningen implemented the city's Traffic Circulation Plan in 1977. It focused on facilitating cyclists and pedestrians in the city, and de-intensifying car-use in the city via various interventions.

We specifically focus on the intervention case of the **closure of the Noorderplantsoen park for cars starting in 1993**. In this park, the traffic situation had become more problematic over the years.

In particular, sharing of the road by cars and cyclists turned out to be unsafe. The quality of the park decreased due to NOx, particulate matter, sound emissions, and lower safety, especially for playing children.

This situation brought the local population and policymakers together in **organizing a referendum on closing the park for car traffic.**

FACTS

Since the 1970's the city planning has focused on de-intensifying car-use in the city

As a test, the Noorderplantsoen park was closed for cars between 1993 and 1994

The municipality and citizen NGO's cooperated in organizing the referendum.

In October 1994, after a test closure of one year, the majority (50,9%) voted in favor of a permanent closure.

ALTERNATIVE POLICY SCENARIO

In reality, citizens NGO's, municipality and cyclists unions worked together on the referendum but had not actively advertised and reported in newspapers promoting citizens to vote pro closure. Given that the referendum results yielded a borderline majority vote, it is not unlikely that the outcome could have been different. It is of interest to **explore if such a media campaign is capable of making a serious change in voting behavior and the outcome of the referendum**.

Operationally the communication strategy can be implemented by **making the pro-closing beliefs of the agents more important** because we have no data on the precise susceptibility of different citizens of Groningen. We also include an **experiment on the timing of the campaign** in how close to the referendum date it is cast, in the beginning when the government announces the referendum, in the middle of the process, and right before the referendum.

RESULTS

Local media campaigns focused on the affirmation of the benefits of having a car-free park seem to **have a strong impact on the referendum results,** especially in reference to the original outcome of 50.9% in favor, when no affirmative campaigns were held. Figure 1 shows that **if an affirmative campaign is held at the onset of the process, the referendum yields a majority vote pro closure of the park for cars of 61.13%**.

Figure 1: affirmative campaign early in the process

Figure 2 shows that if an affirmative campaign is held in the middle onset of the process, the referendum yields a majority vote pro closure of the park for cars of 61.08%.

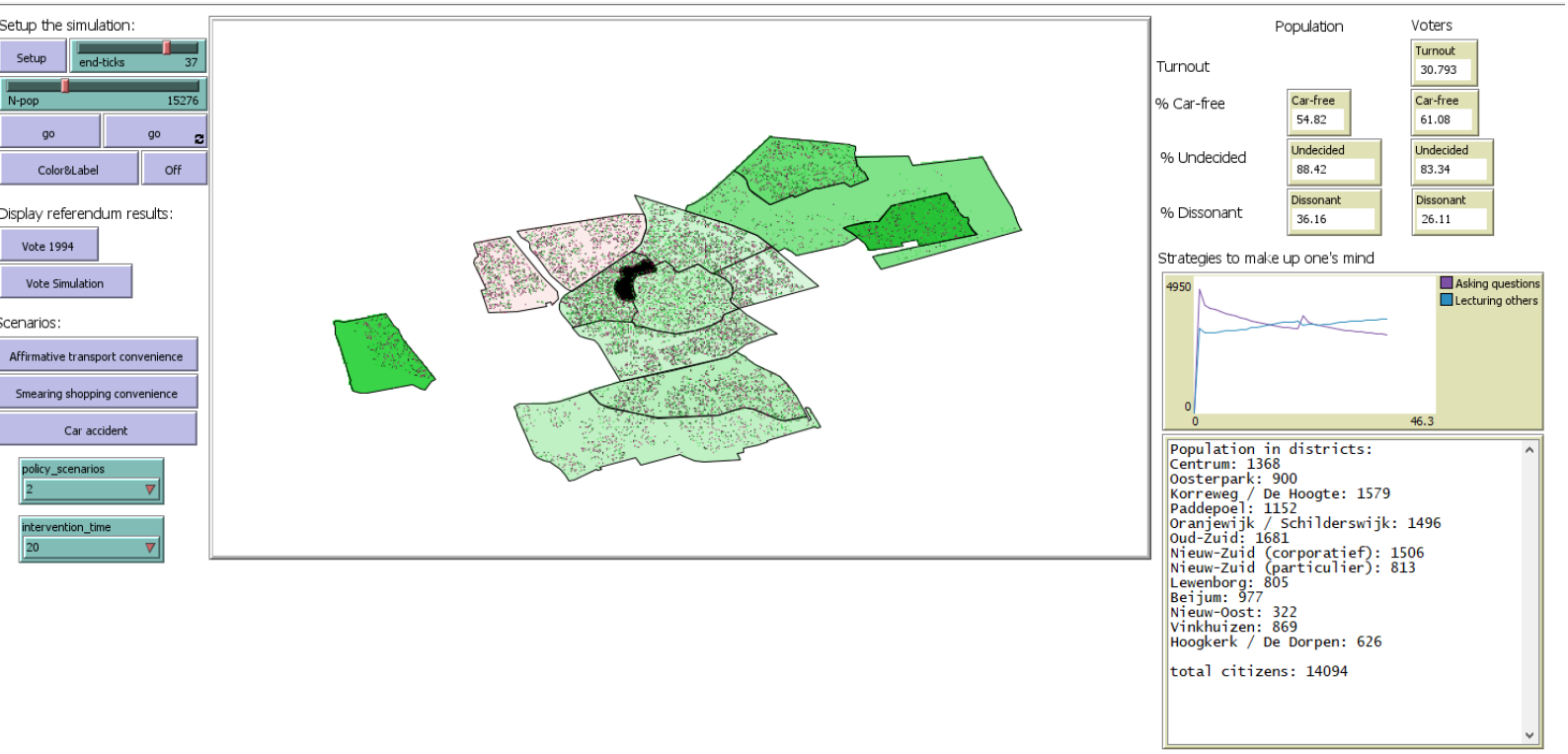


Figure 2: affirmative camplaign in the midst of the process

Figure 3 shows that if an affirmative campaign is held right before the referendum, the referendum yields a majority vote pro closure of the park for cars of 61.44%.

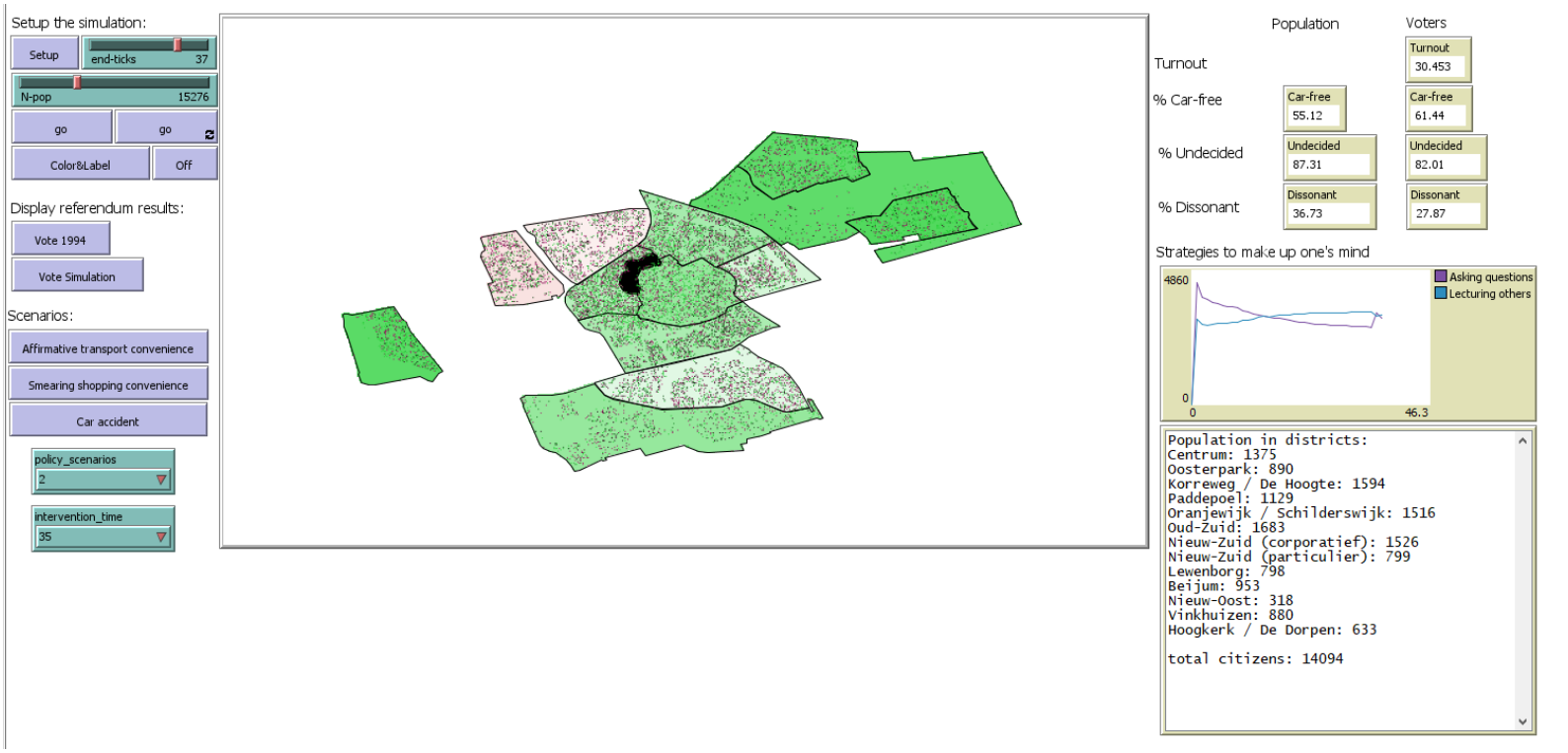


Figure 3: affirmative campaign right before the referendum

COMMUNICATION STRATEGY: LOCAL MEDIA CAMPAIGNS HELD BY SHOPKEEPERS SUPPORTING CAR-TRAFFIC AND SHOPPING CONVENIENCE

CASE STUDY: GRONNINGEN

FACTUAL SCENARIO

Groningen implemented the city's Traffic Circulation Plan in 1977. It focused on **facilitating cyclists and pedestrians in the city,** and de-intensifying car-use in the city via various interventions.

We specifically focus on the intervention case of the **closure of the Noorderplantsoen park for cars starting in 1993**. In this park, the traffic situation had become more problematic over the years (*see alternative scenario n°1*).

The local population and policymakers worked together in **organizing a referendum on closing the park for car traffic.** Although many actors and citizens recognized the potential benefits, **shopkeepers in the vicinity of the park were opposed.** This was because closing the park for car-traffic hampers customers' easy access in reaching shops with a car, and thereby possibly endangering shops sales volumes and jeopardizing their livelihood.

Shopkeepers organized minimal protest, conveying a negative message about the consequences of closing the park through traffic using the local newspapers.

In 1994, after a test closure of one year, a majority vote of 50.9% decided in favour of a permanent closure.

FACTS

Since the 1970's the city planning has focused on de-intensifying car-use in the city

Shopkeepers advertised by spreading negative messages in local newspapers

In October 1994, the referendum yielded a majority vote of 50.9% decided in favour of a permanent closure

ALTERNATIVE POLICY SCENARIO

This scenario relates to communication strategies of citizens and shopkeepers that are against closing the park for through closure. In reality, shopkeepers were advertising in local newspapers, however, but **there were no clear media campaigns held**.

In this scenario, we implement this influence by **creating a city-wide influence of advertising against the closure of the park for cars**. It is of interest to explore if such a **media campaign is capable of making a serious change in the discussions** taking place, and the outcome of the referendum.

We also take into account that the **timing of the campaign** in the period from announcing the referendum to the moment that the referendum takes place makes a difference in how pronounced the influence is of the campaign on the referendum result.

RESULTS

Implementation of the alternative scenario where shopkeepers hold "media campaigns" by advertising against the closure of the park for cars, seems to have an influence on the referendum results. These campaigns seem to have more impact closer to the referendum date. Figure 1 shows that when the campaigns are held early in the process, only 49.68% of the voters is pro keeping the park open for cars, whereas there is still a majority vote for closing the park for cars 50.65%.

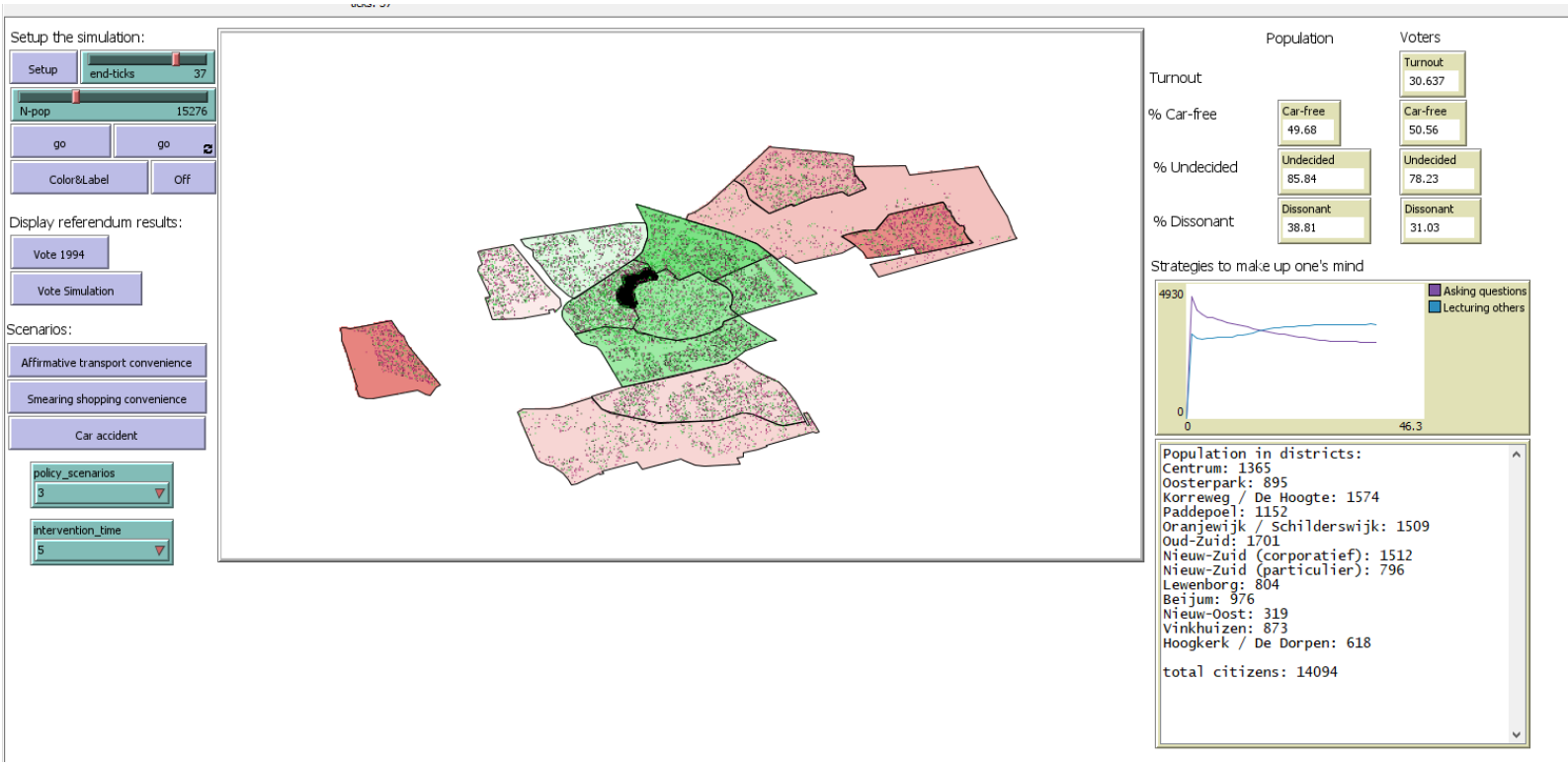


Figure 1: Campaigns held by shopkeepers supporting car-traffic in the beginning of the process

Figure 2 shows that when the campaigns are held in the middle of the process, a minority of 49.87% votes for keeping the park open for cars.

Figure 2: campaigns held by shopkeepers supporting car-traffic in the middle of the process

Figure 3 shows that when campaigns are held shortly before the referendum, a minority of 49.5% votes for keeping the park open for cars.

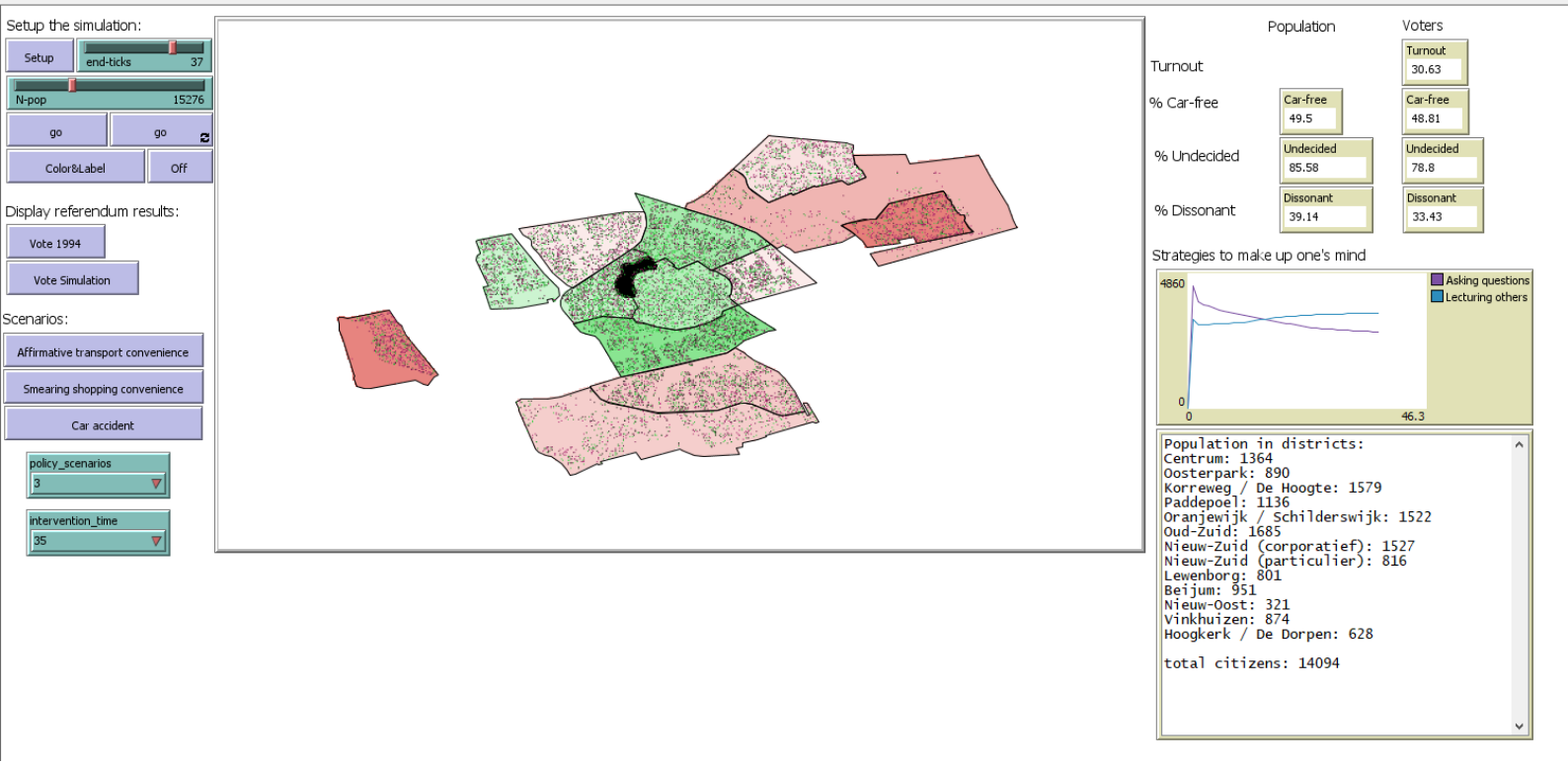


Figure 3: campaigns held by shopkeepers supporting car-traffic close to the referendum

3.1.4. Policy recommendations for the implementation and assessment of SI holistic mobility

Both the Groningen case as the Zürich case comprise several decades of consistent holistic policy towards developing a transportation system that seriously decreases the use of cars in the city centre. The policy is not just focusing on saving energy, or on improving air quality, but rather focusing on multiple dimensions of quality-of-life. As a result, in both cities the public space is of high quality, appreciated by the citizens.

Both specific cases, the closing of the Noorderplantsoen park for car traffic in Groningen, and the reduction of car traffic at Limatquai demonstrate successful changes that took place within the wider context of city developments. Had these projects been proposed without the historical policy context, it would have been imaginable that they had not been accepted by the population. Especially in the Groningen case, where there was a very small majority voting for closure of the park, it could have been a different outcome if the plan was not fitting within a consistent policy to reduce car use that was supported (but also disliked) by large numbers of citizens.

A key insight is that the satisfaction of the inhabitants with the developments is also a process of growth. This is exemplified by both cases. In Groningen, basically half of the citizens were in favour of banning cars from the park when the plans were unfolded, whereas now, more than 2 decades later, a huge majority of 95% of the people supports the idea of a car-free park. In Zürich, a majority vote of 59.5% decided in favour of a permanent closure in 1999. Apparently, in early 2020, the favourable persons are 84.2%.

As a generic reflection, we can say that people often adhere to the familiar situation they are used to, and proposed changes are often experienced of a disruption of the familiar current situation. Stated briefly: as a general principle, people do not like change. Only the people that are experiencing problems in the current conditions, or people that are aware of the significant improvements a plan would have on their quality of life will be proponents of a change.

Social innovation thus can be seen as an ongoing process of growth, and in a holistic mobility policy it appears that both a long-term vision on the mobility structure of the city and a step-by-step project-based policy where the local communities are actively playing a role in creating the conditions for a fruitful developmental process in cities.

Considering the more specific insights related to the cases we studied, a first barrier is the identification of groups of citizens that disagree with the plan because it has a negative impact on their lives. Especially in the development of plans it is essential to involve these citizens in the planning process, because adjustment of the plans to reduce possible negative impacts for these groups of citizens will (1) make the plan better in terms of contributing to the quality-of-life of all citizens, and (2) prevents the emergence of negative opinions and feelings towards the plan and the municipality, which may lead to polarized opinions in the community.

A next barrier reported is a prominent organization/institution opposing the project. This is a barrier that is reported to play a role in some cases. In the workshop, the participants indicated that they dealt with such opposing forces by seeking collaboration in the form of early information, consulting, advising, co-creation and participation in decision-making. This barrier relates to external parties, but it is also important to be sensitive to opposition from within the organisation, e.g., other departments. When for example environmental planning conflicts with traffic handling, the project planning can turn into a struggle between two (or more) departments within a municipal organisation. Especially in the context of holistic plans, it is important to have all departments being involved and at least informed about plans, and create sufficient opportunities for discussion and co-creation.

Important drivers of a social innovation that were mentioned refer to groups supporting the project, which can be fostered by being very clear about the purpose of a participation project. The more (positive) citizens are being involved in a project, and the more they experience that their input is being appreciated and being used, the more support there will be for developing plans.

The bottom line for policy in the context of social innovation is involving people in the plans from early on, and making sure that the heterogeneity in the citizen population is represented in the development of plans to make sure that the plan is contributing as much as possible to the wellbeing of all citizens, and that the citizens have the experience that their perspective is considered to be relevant, even if the ultimate implementation still has some negative outcomes for a subgroup of citizens. This “early on” includes being sensitive for the ideas that citizens have in improving their environment, and actively interacting with them to develop the future city. It is in such local democratic processes where the self-organised bottom-up processes happening in communities meet with the structure of procedures defining the organisations that are responsible for implementation. The smoother this interaction takes place, the more satisfactory the policy process and city developments will be.

3.2. Second cluster: Island renaissance based on renewable energy production

3.2.1. Background

Cluster 2 “Island renaissance based on renewable energy production” focuses on the mobilization of citizens and innovative partnerships set-up on an island to achieve energy independence through renewable and energy efficiency measures as means to overcome the factors that put the community itself in danger and revive island communities.

The case of Energy Island Samsø (Denmark) started in 1997 with an attitude critical to the dependence of the islands on energy supply from the mainland. This energy innovation consisted of the construction of four district heating plants along with wind turbines and a solar panel system. 100% of the island’s electricity currently comes from wind power, with surplus electricity exported to the mainland grid, and 75% of its heat comes from local solar power and biomass. The more interesting feature of Samsø relates to the bottom-up participatory approach adopted since the initial conception of the project. Citizens contributed to the design and implementation of the plan through a series of workshops that were organized by a core group of islanders that led the project and were able to convince the early opponents. The islanders are currently the owners of the Samsø Energy Supply Company (founded in 2007). Furthermore, the Samsø Energy Academy was founded. Further ongoing stages of the project concentrate on making Samsø fossil fuel-free by 2030. This entails several ongoing actions, including careful planning, arranging themed meetings, switching to fossil fuels-free transportation means, upgrading existing wind turbines, replacing oil furnaces with heat pumps, and advising residents and businesses about reducing their use of electricity and heat.

The island of El Hierro (Canary Islands, Spain) has launched the project “El Hierro 100% renewable energies” aiming at becoming a self-sufficient territory based on renewable sources, taking the advantage of the geographic characteristics of this volcanic island. This project has been mainly promoted by the island authority (the Cabildo de El Hierro). It started as a technological innovation in renewable energies which consisted of the construction of a Wind Pumped Hydro Power Station. A new energy company, “Gorona del Viento SA” was created as a public-private enterprise run by the island government. The ongoing plans for the expansion of the “El Hierro 100% renewable energies” project involve the empowerment of the citizen in the energy domain (becoming “prosumers”) as well as enhancing behavioural changes towards low-carbon mobility and the sustainable development of the island. For instance, an electric vehicle charging network has been deployed across the island to be used for free. The island government launched a pilot policy of subsidies for encouraging the adoption of renewable energies among residents and local enterprises: (a) renewable energy self-consumption installations in farms, vineyards and households; (b) purchasing of electric vehicles; (c) replacement of old household appliances.

Samsø and El Hierro are pioneer islands that become living examples of energy transitions to be replicated in other contexts. Both projects have received international recognition, from EU institutions and other islands in the world, like Japan, who visited them to learn more about their substantial achievements. While the projects are getting more mature, the policy scenario workshops conducted in SMARTEES in 2020 and 2021 are taking place at the same time as the promoters are defining the future plans for the

expansion of the projects, which have been studied in the different research activities conducted in SMARTEES (see Deliverables 5.1, 4.2 and 3.1).

3.2.2. How to promote social acceptability and adoption of Social Innovations related to renewable energy production

Introduction to the first round of policy scenarios in the islands cluster

The multistakeholder deliberative workshops in the second cluster of social innovations were developed as two separated workshops organized in the islands of Samsø and El Hierro. Specifically, the policy workshops carried out in Samsø focused on the relevant factors and conditions for the implementation of a transition project towards energy self-sufficiency based on renewable energies. These were grouped into four categories: (1) leadership and vision; (2) community participation; (3) economic sustainability; (4) ownership schemes; and (5) the institutional environment.

The workshop organized in El Hierro focused first on the discussion on the social and institutional dynamics that became relevant for the development and acceptability of the SI. Thus, the principal dimensions addressed in the workshop's discussions focused on (1) citizen resistance to renewable energy adoption; (2) contextual factors influencing social acceptability, such as lack of confidence in the effectiveness of the project, place identity/attachment dimensions; regulations and environmental awareness; (3) the satisfaction (or lack of) of citizen´s experiential and social needs and values (in specific, satisfaction of need of acknowledgement, need of belonging, social and biospheric values).

Details on the workshops (participants, Agenda, presentations, etc.) conducted in Samsø and El Hierro are reported in Annex 2 and Annex 3 of this deliverable.

3.3.2.1. Results of the policy scenario workshops on how to promote social acceptability and adoption of Social Innovations in Samsø

Policy strategies to gain social acceptability

Strategies implemented to foster social acceptability

In the SI of Samsø, specific drivers and strategies appeared to be successful in increasing social acceptability; these were already known from the previous stages of research in the project, i.e. desk research and the qualitative interviews (see D3.1. by Caiati et al., 2019), nevertheless, in the workshop, these were confirmed, and some further details emerged.

The initiative's success in gathering social acceptance was built through an “internal lobbying” action, as one of the workshop attendees called it, meaning with that lobbying for the vision of Samsø as a renewables island with all the economic actors and citizens of the island. It was an action guided by a group of community members who approached and involved in many meetings with all the main economic actors of the island and, in particular, those who were the backbone of Samsø’s society, like farmers and local businesses. These groups were made sensible to the economic opportunities that the project would create for an otherwise declining economy and decreasing population. Also, the municipality joined the project, but as pointed out in the workshop, this happened only when the then conservative mayor understood that the farmers and the main economic actors would support the project.

In this process, it was pivotal the role of an organisation such as the Energy and Environment Office, an NGO that was created to support the process and to promote participation involving citizens while appearing as independent and not tied to local political actors, which in itself promoted a sense of trust in the participation process. An energy company that looked at the financial and technical details of the project was also perceived as independent and trustworthy. This process was pervasive and aimed at reaching as many people as possible, open meetings were promoted where alternatives were discussed, and consensus on future actions was generated. At the same time, accountability was encouraged, keeping track of the process and producing minutes for every meeting.

Some additional strategic elements favoured the consensus-building process and, more generally, the SI. A masterplan that guided the process while leaving room for discussions and participatory co-creation and decision making was realised at the very start; this allowed to have a participatory process that was bounded by guiding principles and objectives, it provided a vision but also allowed citizens and stakeholders to discuss options to achieve the objectives and to mediate potential conflicts through the agreement of shared solution.

It was decided from the start that co-benefits should be sought after and that economic and environmental objectives should go hand in hand. This strategy was reflected by including local economic actors in the actions of the project. For example, plumbers, concerned with the district heating projects that they saw as a threat to their business of installing and maintaining oil-fired heating systems, were invited to work and profit from the district heating projects. Similarly, farmers were made sensible to the economic benefits of leasing their lands for renewable energy projects and selling biomass to district heating plants.

Community ownership co-operative schemes, whenever was feasible, were used to benefit as many individuals as possible from the new energy developments; this meant that many citizens accepted to be on the governing boards of the co-operatives, thereby strengthening participation and a sense of ownership of the project.

Another element that was determining in influencing acceptance was the supportive financial and institutional environment. The national government provided grants, while advantageous feed-in

tariffs were also in place. Further, the municipality guaranteed bank loans and the then local banking environment was defined as “progressive” and supportive, granting financing without requesting significant upfront capital of guarantees. These financial and institutional conditions created a favourable financial outlook for the project and made it easier to promote the SI as an excellent financial opportunity for everyone. Although these favourable circumstances are not to be regarded as a strategy to gain social acceptance in itself, they point to the importance of adopting a strategy in the design and implementation that might magnify the financial benefits for the stakeholders involved.

Alternative policy scenarios and potential strategies

The attendees didn’t mention alternative strategies that could have been used in the given conditions. The SI had proved itself very successful in gaining participation and consent by the vast majority of the population of the island, so there were no obvious shortcomings in the strategies adopted to facilitate social acceptance.

There was only an instance in which the process hadn’t been successful in building consent around a proposed district heating plant for the villages of Besser, Langemark, Torup and Østerby. A number of practical elements worked against this specific plan, relatively high costs of establishing a long network, the fact that several villagers had already invested in the biomass boilers, and further, as emerged in the workshop, a problem of trust towards an individual of the community that was considered to promote this project for personal advantage made some suspicious and unwilling to support it.

It was mentioned in the workshop that a strategy to address the problem of lack of trust would be to strengthen the role of a citizen-led organisation as leader of early-stage participation processes. This would make it more likely that the process is perceived as independent and free from influence by economic stakeholders. However, it was pointed out that this strategy had already been adopted in the vast majority of the projects carried out.

In conclusion, the lesson learnt from the case appeared to be that social acceptability can be promoted through an inclusive process of participation and co-creation that seeks to involve a large number of the residents and particularly key crucial stakeholders. This highly participatory process was used successfully on the island of Samsø. In particular, it ensured that the main economic and institutional actors were involved, beyond ordinary residents, that thereby granting the inclusion of those subjects capable of mobilizing their resources and fostering consent. Economic actors were brought on board, showing them the economic benefits of the project. In this respect, acceptability was based not only on meeting pro-environmental attitudes but, first and foremost, also on meeting economic needs, which appeared to be better served by joining the project than not.

Another element that appeared to play a positive role in both cases was the trust that the project proponents could inspire the island residents. In both cases, they were regarded as authoritative,

involving several levels of institutional governments (national and local) and subjects who were regarded to be independent of political and particular local interests.

While trust might be challenging to build, inclusive participation processes appeared to be best placed to achieve this result.

Insights to foster successful Social Innovations in energy transitions

Beyond social acceptability, other elements were considered to contribute to the success of social innovations in islands.

First and foremost, a sound economic plan sufficiently financed by public grants appeared to be a key element; this can be hardly surprising considering that island economies are often, like in the cases considered, struggling with economic sustainability and depopulation. This context would not be able to raise significant capital by themselves, even securing private financing by backing institutions is more challenging than for more affluent areas.

Secondly, but this ties closely to the earlier point, a collaborative and supportive institutional environment is necessary. Local and the central government and its agencies' willingness to engage along with local actors promoting the SIs is pivotal to the process' success.

Testing alternative policy scenarios through agent-based modelling

For the Samsø model at a later stage in the project it was decided to focus on the social innovation of joining a heat network, as Samsø´s successive projects involved the establishment of district heating plants. The local partner felt that such a model would be more useful for them than re-modelling the early stage of the development on the island. This model is about to be finalized while this deliverable is finished. Model scenario runs will be presented in the final version of Deliverable 7.4. As a consequence, there were only basic ideas of the model of the Samsø cases in time for the second round of policy scenario workshops conducted in May 2021. Therefore, we cannot share policy scenario runs for these cases in this deliverable and refer to the final update of Deliverable 7.4.

3.3.2.2. Results of the policy scenario workshops on how to promote social acceptability and adoption of Social Innovations in El Hierro

The first and second policy scenario workshop in El Hierro revolved around the topic of how to increase social acceptability towards the project "El Hierro 100% renewable energies" and enhance renewable energies adoption, such as solar panel installations and electric mobility options (e-bike, e-vehicle). Although investments in the wind-pumped hydropower plant and the creation of "Gorona del Viento" energy plant have been key developments in the last two decades, it has become clear to promoters that the residents' involvement and commitment to these objectives are

essential conditions to achieve the stated vision. As part of the preparations for the workshop, we developed a timeline of communication and policy strategies and their outcomes. This timeline was used to frame discussions about alternative policy scenarios and make decisions about the timeline of their implementation in the agent-based simulations:

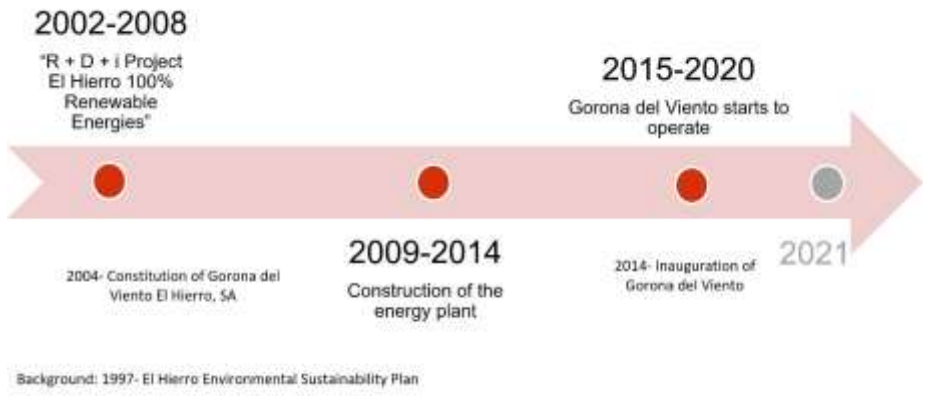


Figure 1. Timeline of the "El Hierro 100% renewable energies" project

Policy strategies to gain social acceptability

Workshop participants analysed the strategies they have used at different stages of implementation and extracted a series of lessons regarding their effectiveness in achieving social acceptability. These are grouped as:

(a) information and communication strategies to anticipate citizen resistance.

(b) actions to foster and strengthen local identity and pride as residents of a sustainable island.

(c) creation of new institutions to ensure public ownership of, and control over, the project.

(d) financial instruments supporting the individual and business adoption of renewable energy technologies.

(a) Information and communication strategies to anticipate citizen resistance. Communication and dissemination of the project "EL Hierro 100% Renewables" was organized through information campaigns that promoted, nationally and internationally, the image of the island as an innovative and sustainable place. The communication strategy implemented was rolled out in three phases:

- Phase 1. Kick off "El Hierro 100% Renewable Energies" project. Communication focused on the dissemination of the R&I project of Gorona del Viento that was funded by the EU. Regional national and international media covered the news produced by the project.
- Phase 2. Construction of "Gorona del Viento" Energy plant. Communication strategies focus on disseminating the benefits of the plant (e.g., job creation; tourism; media coverage brings tourism and scientific activity that benefits the island).

- Phase 3. Communication since Gorona del Viento starts functioning. Information provided through press releases, Web, and social media (Facebook, Twitter) about impact of Gorona del Viento and the milestones it has been achieving. The island receives international media attention and the project's reputation grows. Other communication actions involve the organization of “open days”, guided visits to the Gorona del Viento facilities; educational actions engaging young students on the island; dissemination of the project in the science museum and in the interpretation centre of the El Hierro biosphere reserve.

In conclusion, these communication strategies mainly addressed the needs for energy self-sufficiency, prestige and recognition. They also targeted an increase in the islanders ‘confidence in the effectiveness of the project and tackling increasing scepticism towards the project among a part of the population. However, considering the dimensions identified as relevant for the social acceptability of the SI, participants observed that communication strategies missed addressing significant experiential needs and values, such as the need for economic sustainability, the need for environmental quality, or making environmental values salient.

(b) Actions to foster and strengthen local identity and pride as residents of a sustainable island. According to the participants in the policy scenario workshops, the project “El Hierro 100% Renewable Island” and, in particular, the Gorona del Viento energy plant, contributed to the vision of the island as a pioneer in renewable energies, which is aligned with the existing local identity of El Hierro as a sustainable place to live and visit. Gorona del Viento has attracted international interest (visits of other islands, expert visits), which received intensive positive coverage from regional, national, and international media (printed and digital media, radio and television). Participants agreed that the fact that news about Gorona del Viento appear in the international press increases feelings of pride for most of the residents. However, they also mentioned that the project is more valued internationally than locally, where it has been questioned by the population. One expert participant mentions that “the islanders lack sufficient technical knowledge to assess the merit of having developed a plant with the characteristics of Gorona del Viento in such a short period of time. They are not aware of what it means to innovate, develop an idea from scratch, take a risk…” This illustrates a deficit-view of the public (Devine-Wright, 2007), which implications in the design of a rather top-down initial policy, that informed but did not significantly involve residents.

(c) Creation of new institutions to ensure public ownership of, and control over, the project. The public ownership of Gorona del Viento energy plant was mentioned as a key element for the social acceptability of the project. The islanders accepted the project because the energy plant is a public company mostly owned by the local authority of El Cabildo de El Hierro, and they felt “it is theirs”. According to the participants, if the project had a private and/or external origin, it would have fallen onto existing distrust and would have generated more resistance. However, other participants consider that the participation of a private energy supplier has become a barrier to acceptability, as citizens would have preferred that the propriety was 100% public (Gorona del Viento is currently owned by the local government with 66% of the shares, the private energy company owns 23% and the Canary Islands government (the regional government) with 11% of shares).

(d) Financial instruments supporting the individual and business adoption of renewable energy technologies. Renewable energy adoption has been fostered by the island authorities (Cabildo of El Hierro) for the last two years. The Cabildo of El Hierro approved a plan of subsidies in the period 2018-2020 to encourage farm and wine cellars owners to install solar panels in their exploitation. The local authority also approved subsidies for low-income residents to change their old home appliances (e.g., refrigerators) to energy-efficient ones. In terms of low-carbon mobility, El Hierro has installed a network of electric vehicle recharging points distributed across the main localities on the isle, which intends to meet the demand of existing electric vehicles on the island as well as to encourage tourists to choose this type of car. The island authorities opened a line of subsidies (up to €7.000) for residents and professionals to purchase an electric car. Although the number of people that applied for these aids is still limited, the representatives of the Cabildo expect that positive pilot experiences encourage other residents to apply. However, these financial instruments are covered by the benefits that the Cabildo receives from Gorona del Viento, which depend on the annual profits produced by the energy plant.

Insights to foster successful Social Innovations in energy transitions: co-production of alternative policies for the expansion of the project "El Hierro 100% Renewable Energies"

The second part of the first deliberative workshops in El Hierro focused on the elaboration of alternative policy scenarios to increase the public acceptability of the renewable energy policies within the island community. Thus, a series of alternative strategies were proposed by the participants, that are listed and described below:

- Targeted information and communication strategies addressing specific social needs and environmental values.
- Implementation of consumer awareness, decision-aid and empowerment measures.
- Educational programmes addressing energy literacy.
- Funding strategies for renewable infrastructures and technologies.
- Participatory approaches to increase citizen involvement in decision-making.

Information and communication strategies that address social needs and environmental values. Participants in the first round of policy scenarios have proposed some strategies oriented to the refinement of the communication and dissemination of the project, according to the following objectives:

i. Provide information that is transparent and adapted to the needs of different social groups aimed to reduce scepticism and increase citizens' confidence in the effectiveness of the policy.
i. Disseminate specific information that help residents to take ownership of the project ("Make it yours").

ii. Highlight the innovativeness of the project and the social and environmental outcomes achieved, while explaining that Gorona del Viento is part of a long-term plan to make El Hierro a self-sufficient and clean energy island.
iii. Foster environmental awareness through communication campaigns that appeal to emotions and socio-environmental values.
iv. Strengthen the existing social and political consensus. Reinforcing the message of the political consensus about Gorona del Viento, as an element to increase confidence in the project.

Consumer awareness, decision-aid and empowerment measures. Workshop participants stressed the need of implementing consumer awareness policies that foster the adoption of renewable energies technologies (e.g., photovoltaic solar panels) and energy-saving behaviours in households and business. The following strategies have been suggested:

i. Creation of a "renewable energies' office" in Gorona del Viento for advisory services on renewable energies.
i. Creation of an energy audits program that provide individuals with knowledge and tools to adopt well-informed decisions about their energy consumption, for example, explaining how to save on electricity bills and adjust supply to demand. Previous experiences on energy audits were so positive that it is considered a key strategy for achieving social acceptability.
ii. Provide successful examples of the extent to which renewable energy facilities contribute to reduce energy consumption: "spread the success stories of other neighbours in renewable energies, which also resulted in an economic benefit for the investor".

Address energy literacy through educational programmes in coordination with education institutions in the island. This strategy consists of increasing the collaboration with the educational institutions on the isle and establishing an energy literacy programme in schools and high schools. The educational programme would aim to increase students' understanding on the impact of energy consumption. Energy issues would be addressed through the local example of Gorona del Viento. A second strategy consisted of the organization of a series of events in El Hierro aiming at increasing citizen's knowledge and awareness about renewable energies. The organization of a "renewable energy fair" is proposed as these fairs usually constitute a relevant educational showcase that would contribute to continue strengthening the image of El Hierro as a sustainable island based on clean energies.

Financing strategies for renewable infrastructures and technologies. This strategy would consist of the implementation a well-funded subsidy program adapted to the needs of families that allows them to face an energy change without incurring debt. Furthermore, the profits of Gorona del Viento are suggested to be reinvested in two types of grants: (1) structural investments (solar panels in public buildings, hotels and households; enlargement of island's electric vehicle charging network), and (2) massive actions such as distribution of LED bulbs.

Participatory approaches. To increase social acceptability and adoption of renewable energies, and counteract the initial lack of resident involvement, participants in the policy scenario workshop propose to engage residents in the decision-making process concerning energy transition in the island or in the ownership of the project. For achieving this goal, the following policies were suggested:

i. Citizen consultations about the destination of the profits resulted from the exploitation of Gorona del Viento (decisions about the investments are taken by the island authorities. It is suggested to create formulas of participatory budgeting for involving residents in policy making).

i. Develop a mechanism for the purchase of shares of Gorona del Viento by El Hierro residents. As one of the participants suggested, the island citizens can be offered the opportunity to invest 1.000€ in shares, which would generate the feeling of belonging in citizenship while the plant would have alternative funding sources.

3.2.3. Results from the ABM's simulating alternative policy scenarios co-created in the policy scenario workshops delivered in El Hierro

The five alternative policy scenarios co-defined in the first round of workshops were further elaborated by the UDC team and integrated in the agent-based model created for El Hierro. The citizen response to the different alternative policies (in terms of acceptability of the SI) is determined by the results of the specific survey conducted by SMARTEES in El Hierro in 2020 to a representative sample of the population in the island. The survey gathered relevant data on citizens' trust in different institutions and relationships, as well as the importance they give to values and the satisfaction of social and psychological needs (e.g., prestige energy independence, participation, economic sustainability, environmental quality). The survey also addressed two specific questions: (1) to what extent citizens agreed with the El Hierro 100% renewable energies project, at the beginning of the project (2) In case of a public consultation on the expansion of project, what would the citizens' vote be today?

Responses to the survey show that a high number of citizens stated that they were undecided in their position with respect to their support for the expansion of the project (40%). Further, around 50% of population would support the expansion and 10% would vote against of the expansion of the SI. Survey responses to the hypothetical public consultancy were used to define the baseline scenario in the model (the baseline scenario represents the real development of the case). Moreover, the model was fed with the qualitative data gathered in the SMARTEES project (in-depth interviews, fieldtrips, policy scenario workshops). Desktop research was specifically done for the model, which consisted of discourse analysis of communication strategies carried out by key actors (promoters, supporters, opponents, and media) to inform, educate and engage the population in the SI, across the different stages of the project (according to the timeline). This content analysis focused on the experiential and psychological needs addressed in these communications, the rate of population reached, and their impact. As a result, the baseline scenario recreates the

communication processes of the different actors in the different stages of the project and presents the current level of public acceptability towards the expansion of the SI. Consequently, the model simulates changes in citizens' support towards the SI as a result of the implementation of the alternative policy scenarios developed in the workshops. The baseline scenario and first inputs from the agent-based simulations were presented and discussed in the second round of policy scenario workshops that were conducted in El Hierro in May 2021. The alternative scenarios were further refined in the workshop in order to accurately resemble the reality of the case.

Four alternative policy scenarios were further discussed and elaborated in a collaborative exercise between the SMARTEES researchers and the participants in the workshops.

The first alternative scenario consisted of the modification of the content and frequency of communication actions implemented at specific project development stages. As interviews and survey results in El Hierro show that economic sustainability of the island is a main concern for residents, workshop participants proposed a change in the content of the messages to place emphasis on for the economic benefits of the project. For example: "while you might not save on your electricity bill directly, you will benefit from other policies such as public grants or free (subsidized) energy for your electric vehicle". In consequence, the communications about the project could strengthen its positive impact as well as "do everything necessary so that the benefits of Gorona reach the population, that is the most effective policy in terms of public acceptability". A second option within this alternative scenario is to target an increase in people's environmental awareness, by focusing discursive content on the environmental benefits of the project.

This scenario was implemented in the agent-based model through the simulation of new communication strategies, launched by the promoters, addressing specific social and experiential needs. Thus, Scenario 1 consisted of a communication strategy developed in the period 2014-2020 (when the loss of citizen support for the project is identified). Two sub-scenarios were simulated: Scenario 1A addresses the dimension of economic sustainability and Scenario 1B addresses the needs for economic sustainability, prestige and environmental quality, the three most important needs for residents according to the research conducted in SMARTEES.

The second scenario developed a proposal made in the first workshop and focused on **promoting dissemination events on the island, such as a renewable energy fair**. According to the participants in the workshop, these fairs constitute a relevant showcase for the island and contribute to enhancing the reputation of El Hierro as a sustainable island, with an added economic benefit. Scenario 2 consists of testing the impact of a dissemination event (the "renewable energy fair") at the beginning of 2015, as a strategy to counteract the negative effect of a critical opinion piece published in the local newspaper, authored by two ex-engineers of Gorona del Viento in 2014. This scenario is implemented in the model through a communication campaign addressing the needs for prestige, economic sustainability, and environmental quality. Two sub-scenarios were developed: Scenario 2A implements the communication campaign only in 2015 while Scenario 2B tests the effect of maintaining the same policy for a duration of 3 years.

The third alternative scenario discussed in the workshop focused on the **involvement of citizens in the co-definition of the energy-related policies on the island.** This scenario addresses the need of citizens to participate and feel they have the capacity to influence the policies that affect to them. Participatory policies were formulated in the first round of policy workshops, and some participants pointed to the possibility to articulate innovative structures to engage citizens in decision-making, specifically enhancing citizenry participation in the island´s energy transition. One of the counterfactual scenarios relates to establish deliberative processes allowing residents to elicit and vote about the destination of part of the benefits gained by the exploitation of Gorona del Viento. This policy is aligned with the principles of the "Participatory Budgeting", a local social innovation that has been implemented in several municipalities on the Canary Islands, but previous experiences have not been noted in El Hierro. This policy was considered a promising instrument, but one of the participants pointed that the increasing bureaucratization of the public administration could frustrate and reduce its positive impact if the implementation of the most voted decisions suffers from delays and administrative issues.

Therefore, this scenario was implemented in the agent-based model through the simulation of a participatory strategy that consisted of face-to-face meetings organized by the local government with citizens. These participatory events were simulated in all census sections on the island, in different stages of the project, aiming at increasing citizens involvement in the co-definition of energy-related policies on the island. Scenario 3A tests the effects of this policy in four specific stages (2007 projects' kick-off; 2014, 2015 and 2018). Scenario 3B consists of the intensification of the participatory strategy at the beginning of the project, aiming to develop a shared vision on isle's energy transition, organizing face-to-face meetings since 2006 (lasting until 2021), monthly during the most significant stages, and every six months during the development of the SI.

The fourth policy scenario delivered in the policy workshops involved the **creation of a permanent participatory body for energy transitions**. A new policy alternative related to the previous one consists of the creation of a permanent participatory body which articulates the interlocution channels between the project and the social and economic actors on the island. Building on the successful experience of the El Hierro Biosphere Reserve, which counts on a permanent participatory body "which meets every month and counts with the participation of the island's associations. This new body could function as a deliberative tool for receiving feedback about the different projects and new policies to be implemented in the frame of the energy transition strategy.

After the workshop, the following scenarios were simulated through the agent-based model, as they were considered the most interesting for such simulations: *Scenario 1)* communication strategy addressing specific social and experiential needs; *Scenario 2)* increasing the island's prestige through a renewable energies event; and *Scenario 3)* enhancing citizen participation in the island's energy renewable policies.

ALTERNATIVE SCENARIO N.1

COMMUNICATION STRATEGY ADDRESSING SPECIFIC SOCIAL AND EXPERIENTIAL NEEDS

CASE STUDY: EL HIERRO

Picture: Gorona del Viento windmills @Carlos Teixidor Cadenas. Retrieved from https://commons.wikimedia.org/

FACTUAL SCENARIO

The "El Hierro 100% renewable energy island" project aims to become a sustainable island **substituting fossil fuel-based energy** with renewable energy sources. The project started 20 years ago and is currently **supported by a majority of the population**.

However, there is still a **skeptical or negative perception** among part of the population. They regret the lack of a direct impact on their economies, especially because they do not perceive the benefits of the investment in terms of reduction of the energy bill.

Participants in the policy scenario workshops pointed that the **discourse of the promoters might not be connected to islanders' preoccupations**, specifically, the dimension of economic sustainability.

FACTS

The **loss of citizen support** for the project is identified in the **period 2014-2020**, after the energy plants started functioning.

Communications were mainly oriented to the goal of achieving energy independence.

Other dimensions like **prestige, environmental quality,** and **economic sustainability** have less relevance in the promoters' discourse.

ALTERNATIVE POLICY SCENARIO

This first alternative scenario consisted of a new communication strategy from the promoters addressing the satisfaction of specific needs that citizens are more concerned about, for islanders easily to perceive the economic benefits of the project. Two different approaches have been simulated:

Scenario 1A is implemented in the model as a **new communication strategy** of **Gorona del Viento**, addressing the dimension of **economic sustainability** in the **period 2014-2020,** when the loss of citizen support for the project is identified. Gorona del Viento launches **6 communications per year** (1 every 2 months) while the **island council** endorses Gorona's discourse every time. The **local media** provides intensive coverage.

Scenario 1B reproduces the same strategy as scenario A but **addressing the needs for economic sustainability, prestige and environmental quality** (the three most important needs for residents according to survey data gathered in SMARTEES).

RESULTS

The model confirms the **efficacy of strategic communication policies addressing specific social and experiential needs** that are relevant for people. As Figure 1 shows, if the promoters address the need for economic sustainability, the support towards the energy project rises up to 64.68%, while in the baseline scenario the support was only 51.1% (the baseline scenario represents the real development of the case).

If the promoters address in their communications the **needs for economic sustainability, prestige and environmental quality**, the **support to the expansion of the renewable energies project increases up to 71.45%** (↑21,3), which is significant, compared to the baseline scenario, as Figure 1 shows.

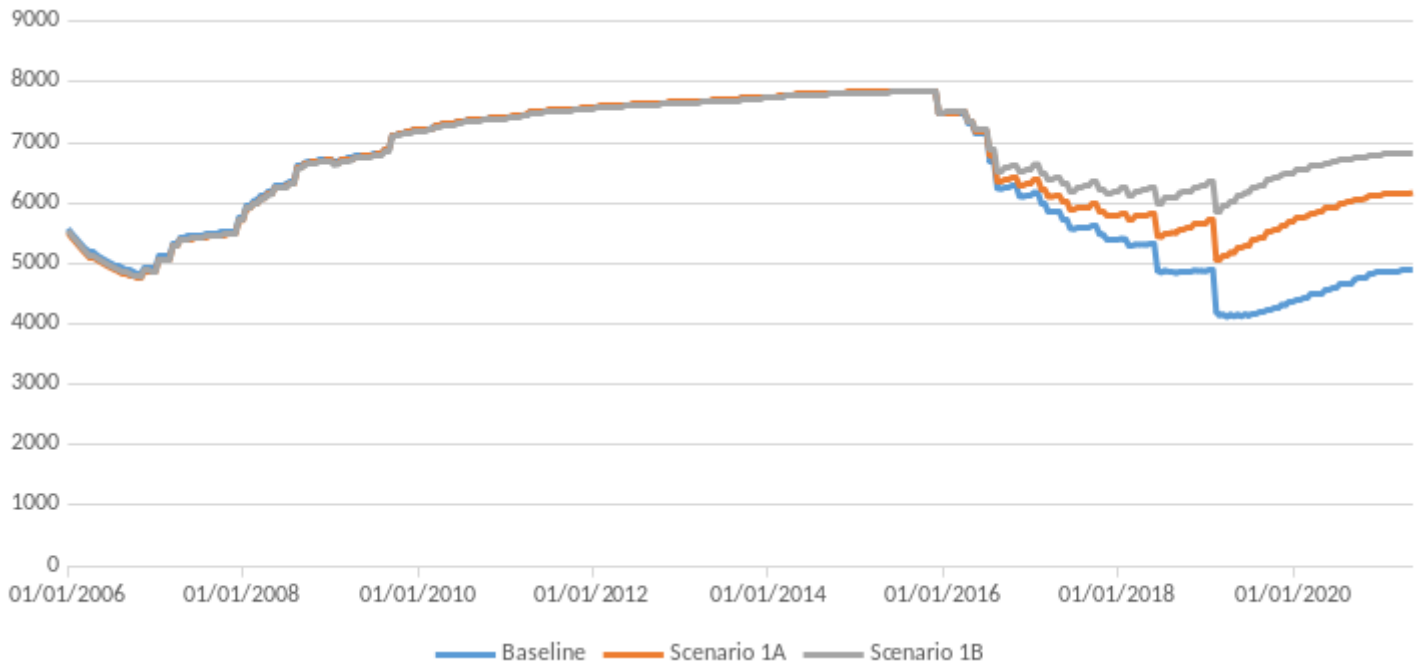


Figure 1. Number of citizens voting in favour of the ampliation of the project in scenario 1A and 1B, compared to the baseline scenario.

ALTERNATIVE SCENARIO N.2

INCREASING THE ISLAND'S PRESTIGE THROUGH A RENEWABLE ENERGIES EVENT

CASE STUDY: EL HIERRO

FACTUAL SCENARIO

In El Hierro, a new energy company, “Gorona del Viento SA” (2004) was created, which is a **public-private enterprise run by the island government** in partnership with the regional administration and a private energy company.

The inauguration of the wind pumped hydropower station was highlighted as a key achievement in the sustainable development strategy. However, a **critical opinion piece,** published in a local newspaper, authored by two ex-engineers of Gorona del Viento, caused a **large negative effect on islander´s attitudes towards the SI.**

ALTERNATIVE POLICY SCENARIO

This scenario consists of the promotion of a dissemination event on the island, a "renewable energy fair" at the beginning of 2015. According to the workshops' participants, these fairs are a relevant showcase for the island and would enhance the reputation of El Hierro as a sustainable island, with an added economic benefit.

This alternative policy -**Scenario 2A**- is implemented in the model by Gorona del Viento launching a communication campaign for 4 months (6 communications acts), addressing the needs for prestige, economic sustainability and environmental quality. The Cabildo and local media endorse both the campaign. This event triggers additional communications between residents over a period of 3 months.

Scenario 2B tests the effect of maintaining the same policy **for a duration of 3 years**.

RESULTS

Scenario 2 tests if negative opinions towards the energy renewable project can be modified by enhancing the satisfaction of the need for prestige. Thus, the model simulates the effect of one event that combines strategic communication from the promoters with additional communications between citizens for a short period of time.

The results show that **if this policy is implemented just once, the support project increases only 3,3%**. However, if the same **policy is developed for 3 years, the support** to the expansion of the renewable energies project **increases up to 69% (↑ 18).**

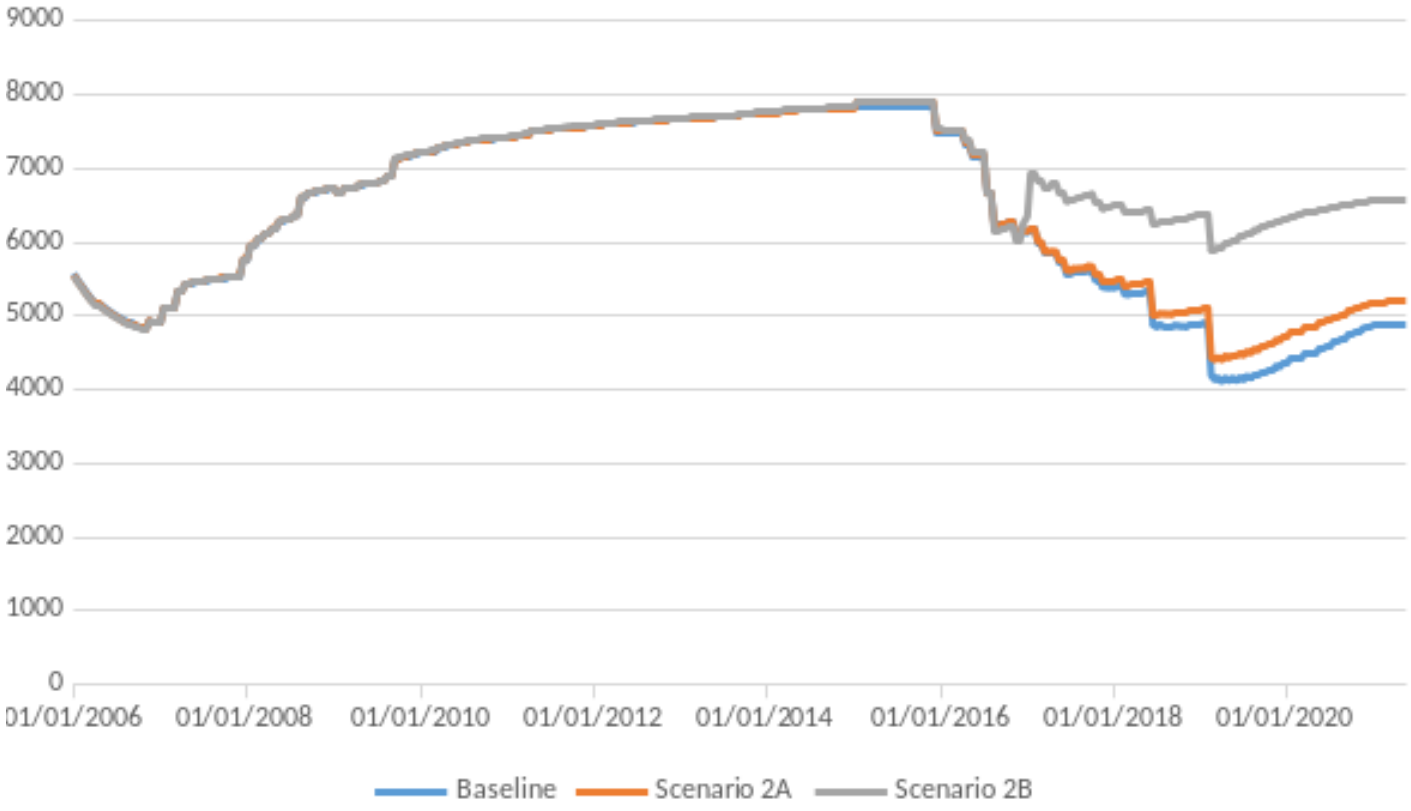


Figure 1. Number of citizens voting in favour of the ampliation of the project in scenario 2A and 2B, compared to the baseline scenario

ALTERNATIVE SCENARIO N.3

ENHACING CITIZENRY PARTICIPATION IN THE ISLAND'S ENERGY RENEWABLE POLICIES

CASE STUDY: EL HIERRO

FACTUAL SCENARIO

The "El Hierro 100% renewable energies" project has been mainly promoted by the island authority (the Cabildo de El Hierro). It started as a technological innovation in renewable energies which consisted of the construction of a wind pumped hydropower station.

The ongoing plans for the expansion of the "El Hierro 100% renewable energies" project involve the **empowerment of the citizen** in the energy domain, becoming ***prosumers.***

Behavioural changes towards **low-carbon mobility** are enhanced. An **electric vehicle charging network** has been deployed across the island to be used for free.

FACTS

50% of respondents to a **survey conducted in El Hierro** for the SMARTEES project would vote in favour of expanding "El Hierro 100% renewables energies" project.

10% of respondents would vote against the expansion of the energy project.

Almost **40% of islanders report being undecided.**

Picture: El Hierro @Manuel Pancorbo Castro. Retrieved from https://commons.wikimedia.org/

ALTERNATIVE POLICY SCENARIO

The 3rd alternative scenario focused on the involvement of citizens in the co-definition of the energy-related policies on the island.

Scenario 3A consists of organizing face-to-face meetings between the local government with citizens in all census sections on the island in 4 relevant stages: (a) 2007 projects' kick-off; (b) 2014 (Gorona's inauguration); (c) 2015 (Gorona starts functioning); (d) 2018 (Gorona shares profits). This policy tests the effect of a communication strategy launched by the Council that triggers additional communications between citizens.

Scenario 3B consists of the intensification of the participatory strategy at the beginning of the project, aiming to develop a shared vision on isle's energy transition, and the appropriation of the project by the citizens of El Hierro. Face-to-face meetings are organized since 2006 (lasting until 2021), monthly during the most significant stages, and every 6 months during the development of the SI. Participatory meetings are held in all census sections, collecting the opinion of the neighbours about the energy project.

RESULTS

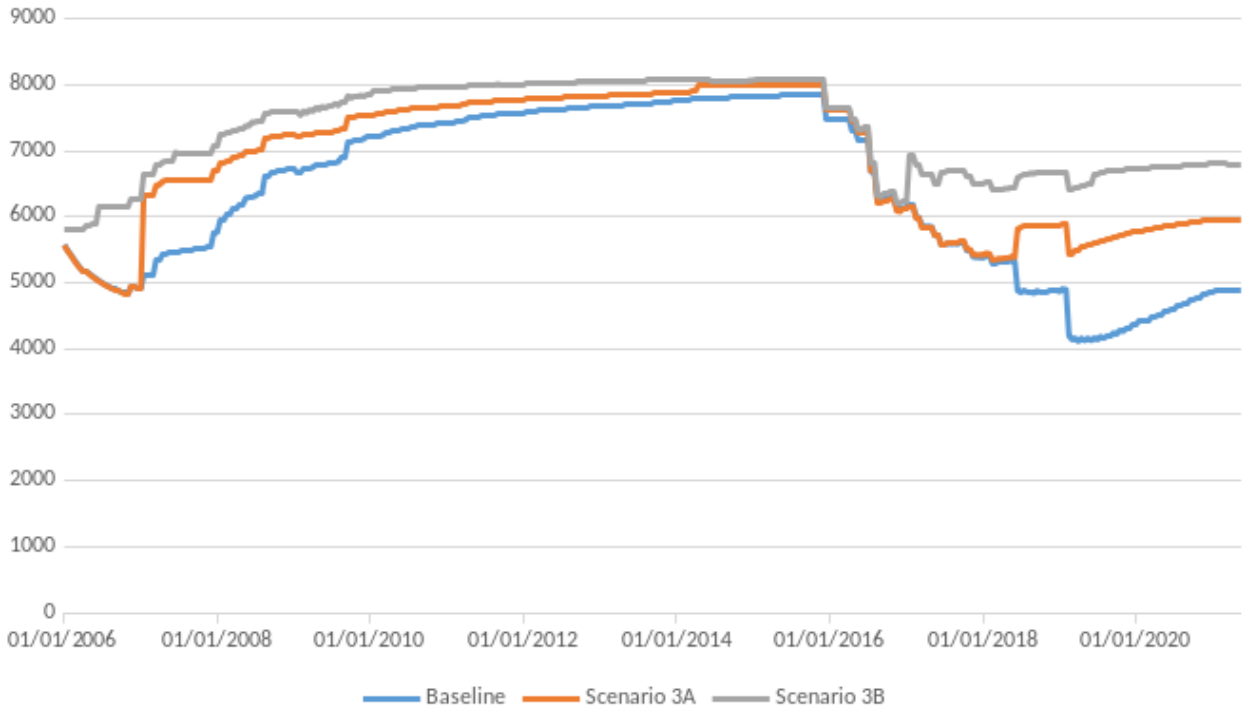


Figure 1. Number of citizens voting in favour of the ampliation of the project in scenario 3A and 3B, compared to the baseline scenario

This model shows that participatory **policies to empower citizens to participate and shape the project are very promising**. If the promoters organize participatory events involving a large number of residents, the support towards the energy project rises up to 62,4% (↑11,3). Furthermore, when participatory approaches are largely displayed and sustained over time, with different levels of intensity, the **support to the expansion of the renewable energies project increases up to 71.24% (↑21,1)**, compared to the baseline scenario, which represents the real development of the case. In both scenarios, the rate of citizens against the project (9%) does not change.

3.2.4. Policy recommendations for the implementation and assessment of energy transitions based on renewable energy production

Islands are often peculiar socio-economic environments with proud, tight-knit communities that are facing economic and demographic decline.

In this context, there is a significant potential for collaboration and mobilisation, particularly when citizens see a broader economic and environmental vision that might support the island's development for the years to come.

Public policies for financing the social innovations in islands are indispensable because of the limited resources that islands could otherwise mobilise to self-sustain the SIs. Policymakers need to consider that islands in most cases, are disadvantaged economies whose peripherical location and, in some cases, limited connection infrastructure contribute to sluggish or declining local economies and dwindling populations.

Secondly, the SIs should be led by subjects considered trustworthy and reputable; this might change from a context to another. In some countries, local authorities, national governments, major energy companies, research organisations might all be regarded as authoritative and trustworthy; in other countries, this might not be the case, and independent citizen-led organisations might be best placed for leading the project. Therefore, careful consideration should be given to which subjects are involved and should lead the partnership.

To maximise social acceptance and harvest the energies of economic actors and residents, a sound plan of participation, consultation and, to an extent, co-creation of the SI would be helpful, particularly when in place since the early stages of the project. If this for budgetary or other reasons does not happen, other social activities aiming at spreading information about the SI and its benefits should be put in place. A plan of participatory activities should be mindful of the social composition of the island, which might be changing. It was pointed in the workshops (i.e., Samsø's) that islands might be facing an ongoing shift from a more traditional socio-economic environment based on farming and other traditional activities towards a more composite society comprising new residents, like retirees, newcomers with migrant backgrounds, or young families seeking a rural location to escape city life. The new residents might have a less rooted place attachment and weaker social connections; they might prove to be less suited to be recruited by traditional means, might have some constraints to participation due to childcare and the absence of extended family on the island, and in some instances, they might be less sensitive towards long term projects. Therefore, participatory activities might need to use various means of recruitment, emphasising different arguments when targeting different social groups and should offer multiple ways to participate to be inclusive.

Notably, communication should be shaped to convey to citizens the relevance of the broader benefits that the project will deliver, i.e., economic and social benefits along with environmental goals. A common vision of the island's future sustainable development and economy outlined in a master plan would be a valuable element to communicate and guide the project development through different phases, allowing some degree of flexibility while establishing some firm objectives.

As the policy scenarios modelled in El Hierro show, alternative strategies that put the focus on the fulfilment of the different social, psychological and experiential needs are very promising, especially when they are displayed since the beginning of the project and are sustained across the project. The results of the first and second scenario demonstrate that dimensions related to economic development strongly influence public acceptance but not only, as gaining reputation and prestige appears to be a key factor for people to support the expansion of the energy project. Therefore, instead of developing a communication strategy focused on energy self-sufficiency, the promoters elaborate a coherent discourse stressing the fulfilment of the need for economic sustainability, reputation and environmental quality, the support towards the energy project increases in more than 20 points.

In El Hierro, the model is aimed to simulate the temporal evolution of citizens' opinion about the social innovation, addressing the question of to what extent the percentage[5] of citizens in favour of the expansion of “El Hierro 100% renewable energies” is altered based on the implementation of a specific alternative policy scenario. The third alternative scenario tested the impact of the participatory approaches, stimulating citizen's involvement in the co-definition of an initial common vision, as well as taking part on definition of plans for the project´s future development. The results of the model confirm that participatory policies addressing the need for citizens to participate and feel they have the capacity to influence the policies that affect them are extremely effective. Accordingly, when participatory approaches are largely displayed and sustained over time, with different levels of intensity, the support to the expansion of the renewable energies project rises with 21 points.

5 It should be noticed that, according to the survey conducted in 2020 in the frame of the SMARTEES project, a high number of citizens (51%) reported an undecided position regarding the expansion of the project while 42% would vote in favour of the expansion of the project

3.3. Third cluster: Energy efficiency in district regeneration

3.3.1. Background

Cluster 3 “Energy efficiency in district regeneration” triggers district regeneration through hard and soft measures, such as local energy production and energy efficiency measures, urban green spaces, transport system transition measures and citizen participation. The cities of Stockholm and Malmö are the reference cases of this cluster. In Stockholm, the case focused on a project to upgrade housing in the Järva area, to the north of the city, and this has formed the prime focus of modelling. The Sustainable Järva project ran from 2010-2014 and entailed the retrofitting of seven residential buildings originally constructed between 1965 and 1975 as part of Sweden’s ‘million homes programme’, with a view to achieving a 50% reduction in energy demand. Following this pilot, Svenska Bostäder has been commissioned to refurbish 5,200 apartments in the period to 2022 (Enarsson, n. d.). In Malmö, the Ekostaden Augustenborg programme, which started in 1998, has the aim of making the Augustenborg region of the city more socially, economically and environmentally sustainable, enabling residents to take a leading role in designing and implementing the project.

Three main types of intervention policies were identified in this cluster: (i) Infrastructure and technology upgrade measure; (ii) Normative and regulatory approaches, and (iii) Consumer awareness, decision aid and empowerment measures. Infrastructure and technology upgrade measures were the core of the interventions and were realised through improvements in energy efficiency, installations of renewables, green roofs, and improvements of the drainages systems on the relatively old (from the 50s, 60s and 70s) social housing apartment blocks. The improvements in Järvä also regarded mobility, i.e., cycling paths and biking facilities were laid out or upgraded. These upgrades were led by public institutions, the municipality and the public building companies but were discussed through participatory processes that involved the residents.

'Normative and regulatory approaches' regarded some specific features of the projects that provided residents with guidelines on how to improve their behaviours towards sustainable goals and for example in the case of Malmö regarded recycling, composting and growing organic food, while in Järvä involved citizens in projects aimed at taking up cycling among other sustainable behaviours. 'Consumer awareness, decision aid and empowerment measures' were deployed in both cases of Augustenborg Malmö and Stockholm Järvä, although with some differences. In the case of Malmö, a consultation process was held from the early stage of the project, and all the actions were agreed upon with the residents. In the case of Järvä instead, an initial process of consultation was missed, which led to protests by a large number of tenants fearing an increase in rental charges, this led to the creation of a large process of participation called 'Järvadialogen', which was developed by Svenska Bostäder in cooperation with the Swedish Union of tenants and the city of Stockholm and that consisted on a three-level process aimed at collecting the views of residents, presenting their views and showing what has been realised based on their views.

3.3.2. Results of the policy scenario workshops on how to promote social acceptability and adoption of Social Innovationsin the District Regeneration Cluster

In the first workshop, the SI's stakeholders of both Stockholm and Malmö engaged in a richer discussion regarding dimensions of Social Innovations and alternative policy scenarios in both cities. We aimed to combine the discussion over two SI initiatives – "Mainstreaming sustainability", primarily concerned with making piloted sustainable solutions for urban development the city standard, and SMARTEES, which among other objectives, aims to develop a policy sandbox toolkit for SIs' design, to facilitate replication of social innovations. The social innovations of the district regeneration cluster aim to induce environmentally and socially sustainable changes through measures such as local renewable energy generation, urban green spaces, transport system transition and citizen participation. The policy scenarios workshop investigated how different neighbourhoods responded to various initiatives, policies and strategies, and how other neighbourhoods might respond to and replicate these experiences adopting tested or new strategies.

The workshop's main focus was dedicated to 1) describe social innovations and their aims, 2) describe the barriers and drivers of the SIs, 3) describe alternative policy scenarios and strategies. Details on the policy scenario workshops (participants, agenda, presentations, content of discussions, etc.) are reported in Annex 4 to this deliverable.

Policy strategies to gain social acceptability

Social acceptability in district regeneration of relatively deprived neighbourhoods, like the cases of Järva, Stockholm, and Augustenborg, Malmö, appears to be tied to the suitability of the project to deliver co-benefits and the ability to involve residents in an inclusive process of co-creation.

These neighbourhoods, which are complex because of a significant presence of an ethnically mixed immigrant population and relatively higher deprivation levels compared with other neighbourhoods, need to see interventions that address economic and social needs along with environmental aims.

Tapping on these needs to foster social acceptability is more likely to happen when interventions delivering co-benefits are co-created or at least discussed and to an extent agreed with residents. This approach worked well since the start of the project in Augustenborg and, at a later stage, also in Järva, whose delay in conducting an inclusive consultation process led to significant protests. Further, for cultural reasons, the local government might not be necessarily trusted in this social context. Therefore, a process of active participation might be necessary to build trust towards the subjects leading the SI.

Cultural diversity will require further attention in dealing with communication and recruitment efforts for consultation and co-creation processes. The usual recruitment channels, i.e., letters, emails, announcements on notice boards, might not work. An active recruitment effort targeting

community organisations' representatives, if present, or at least individuals known to be well connected in the minority communities, is more likely to succeed.

Having on-the-ground resourceful individuals employed by the project, possibly having an immigrant cultural background, might help significantly to improve communication with and involvement of residents.

Insights to foster successful Social Innovations in energy transitions

Again, like for other types of SIs researched in this project, adequate financing of the SIs appeared to be very important. Deprived neighbourhoods would not be able to raise their own finances, and residents would be very concerned with any intervention that might generate additional costs for them. Finances should support the participation process, the interventions, and the long-term maintenance of achieved goals. The suspicion that rationales of tokenism and short-termism might inspire some interventions would generate negative responses.

A supportive institutional environment will be necessary to secure adequate financing through public finances and ensure that laws and regulations are well-engineered to support the aims of Sis. Law and regulations should ensure that the responsibilities of different authorities and departments are clear while, at the same time, a single overarching management of the project is in place. This issue emerged as a critical aspect in the workshops, where it was pointed that fragmentation of responsibilities may cause problems in communication and coordination among different subjects engaged in the SIs.

3.3.3. Results from the ABM's simulating alternative policy scenarios co-created in the policy scenario workshops delivered in Cluster 3

During the workshop, it was emphasised the importance of including policy scenarios in the model based on early-stage and co-creation participation processes as opposed to a hypothetical scenario presenting a limited participation process.

As in the first workshop, it was pointed out that early stage and highly involving participation, including co-creation features, would provide the best chances of fostering social acceptance. Therefore, scenarios based on early stage versus late consultation and no consultation and scenarios based on co-creation versus simple consultation could be accounted for in the model, compatibly with data requirements, to see how predicted social accepted might shift in the different participation scenarios.

The importance of having flexible designs for the SI was stressed, thereby allowing a process of co-creation during the participation process. However, it was also pointed out that this flexibility and room for co-creation and "negotiation" might come at the cost of having a larger budget covering some interventions requested by participants.

It was mentioned that the co-creation process should aim at meeting the needs of residents as much as possible through interventions focused on delivering co-benefits, something that already emerged in the first workshop. The process of participation and co-creation should be open enough to allow

essential needs, which might have been missed during the stage of the SI's design, to emerge and being accounted for. Some of the adjustments suggested by citizens might prove to be relatively low-cost, thereby even in a hypothetical situation of a limited budget, a co-creation approach to participation should not be avoided. Nevertheless, non-negotiable aspects might be necessary to achieve the aims of the SI. However, even in this case, it was pointed out that SIs including many interventions and aiming at delivering co-benefits are more likely to gain social acceptance because one single intervention might be disliked while several others might be seen favourably.

It was also discussed whether using a policy of compensations for undesired interventions could be helpful to ease acceptance. It was argued that both "negotiation" and "compensation" might be legally problematic and that, more generally, a co-creation participatory project could suffice in fostering social acceptance, while some could see compensation as an attempt at buying acceptance.

Holding a co-creation process with elements of negotiation for a SI on a neighbourhood level might present some challenges; for example, it was pointed out that such a process might involve several organisations and authorities with competences on different features of the neighbourhood, like the buildings, public spaces and green areas, or public transport. Therefore, it is essential to include all the relevant subjects in the process.

Further challenges might be present for SIs that include the construction of new residential buildings in a neighbourhood, which is quite common in a pattern of densification that is happening in many cities. In this case, it will not be possible to involve the future residents in a co-creation process, and the existing residents in the neighbourhood might be against the construction of new buildings in the area.

In terms of strategies to increase participation, few of them have been indicated as suitable to provide fruitful results, namely: incentives, using a mixed format with in-person meetings and online participation, and, particularly in ethnically mixed neighbourhoods, liaising with community organisations and formal and informal leaders.

Economic incentives have been used in Järva to increase participation rates through a lottery system, which awarded one month free of rent to the winner. These incentives, along with recruitment attempts carried out by resourceful engagement officers liaising directly with the formal and informal networks of the neighbourhoods, are necessary, particularly in those ethnically mixed communities that might not respond well to invitations delivered by traditional means, e.g., mail.

Ethnic diversity poses further challenges to a participation process because it might make some residents more sensitive to some messages instead of others and can change their perception of the trustworthiness of the leading actors involved. Being mindful of these differences and recruiting for the management of the participation process, cultural mediators or professionals with an understanding and experience of these challenges might be necessary. It has been suggested to include in the model, compatibly with data requirements, alternative scenarios based on a variety of

participation strategies tailored for the ethnic diversity of the resident population to explore how they might affect consultation recruitment efforts and social acceptance.

A mixed format of in-person meetings and online tools can offer a better chance at involving individuals from differing demographics in participatory activities, e.g., elderly, who might favour in-person meetings and young individuals and parents who might instead favour online engagement. Online participation could benefit from using both social media and bespoke participation online services, now available on the market.

Whenever possible, participation should display anticipated benefits from the interventions considered in the project; this worked in Järva, where Svenska Bostäder, the municipal building company, could show case a refurbished flat to residents. Clearly, this cannot be an option for many other types of interventions; nevertheless, showing pictures or videos from similar interventions that occurred elsewhere could help people familiarise themselves and develop a more favourable attitude towards the SI.

Further, strategies to minimise discomfort during the implementation of the interventions of the SI were considered beneficial to increase social acceptance. For example, in Järva, alternative accommodation was provided nearby when the flats were refurbished, and the costs for moving were covered.

It was discussed whether 'soft interventions', meaning those interventions that did not require changes in the built environment or similar major physical interventions, might help with facilitating social acceptance. For example, courses in cycling were given to women in Järva, which appeared to be well received. It was pointed out that they can contribute to a positive opinion about the whole SI project but cannot necessarily ease acceptance unless they tap into social needs perceived as significant. On the other hand, soft interventions should not replace resource-intensive interventions; otherwise, they might be perceived as a form of 'tokenism', i.e., symbolic actions, that do not address a need, in which case they would reduce acceptance.

The role of the media was also discussed and, given that media can influence the social acceptance of SIs, and how to handle media relations best. A successful SI would be able to sell itself in the media arena, thereby attracting positive media coverage; however, it was pointed out that some basic strategy in relating with local media might be helpful, particularly avoiding to call the attention of the media at the early stage of implementation of a SI is seen as beneficial, because an early stage is not showing positive results yet, and it could instead be a time in which concerns are voiced.

Insights from the model simulations conducted have explored the rate of renovation. Although renovated apartments have slightly higher rents, they also enable lower household energy use. Overall households in renovated apartments are slightly better off. If too much time is taken over the renovations, this leads to inequalities among residents, which, especially if those of similar ethnicity live nearby each other, is a potential source of indirect discrimination, and a possible cause of resentment by one community of another. More information on this study is available in D7.4 of the

project, however, the message for policymakers would be to think about timing, and the implications for different households of there being a significant gap between the first and last apartment renovation in an area.

3.3.4. Policy recommendations for the implementation and assessment of energy transitions based on district regeneration

The cases of district regeneration in SMARTEES are placed in ethnically mixed, relatively deprived neighbourhoods. These conditions are reflected in some of the following recommendations.

Policies of public financing of the SI are needed to cover not only core interventions but also early-stage and ongoing consultation and the long-term maintenance of the achieved objectives. Financing should also cover costs incurred by residents that might need to relocate temporarily to other locations. It would be unrealistic to expect social acceptance and participation by residents in a deprived area if these conditions were not met.

In these contexts, the consultation and co-creation process should be established as a policy requirement that is carried out at the start of every project, possibly recruiting individuals with experience in cultural mediation. Recruitment efforts targeting the involvement of residents in the consultation process should be mindful of the neighbourhood's cultural and social fabric, which might not respond to traditional ways of soliciting participation. In this case, direct contact with formal and informal leaders in the community is advisable. Specific efforts might also be needed for some vulnerable groups, particularly women and youths, which, in more traditional communities, might be less inclined to make their voice heard.

It is advisable to design all the interventions aiming to deliver co-benefits, environmental, social and economic, based on an analysis of the neighbourhood's needs carried out ahead and during the consultation with residents. While soft interventions, such as education and awareness campaigns, might be helpful, they should avoid replacing resource-intensive interventions that might be needed to address local primary needs; otherwise, they might appear as a form of tokenism undermining trust in the actors leading the SI.

Revising the local and regional policies and regulations to harmonise and streamline the design and implementation of social innovations is advisable. This would be useful to resolve conflicts of responsibility between different authorities and municipal departments, to facilitate communication across departments and finally, to ensure overarching management of the SI that can effectively communicate and involve citizens in a single consultation process on interventions that different departments and authorities might oversee.

3.4. Fourth cluster: Urban mobility with superblocks

3.4.1. Background

Cluster 4 “Urban mobility with superblocks” is based on an urban innovation (superblocks) that introduce low-carbon mobility following a participatory approach at the city and neighbourhood level. The city is reorganised into superblocks, car-free areas that maximize public space for new social uses and keep road traffic outside the neighbourhoods, redesigning the inner streets for use by pedestrians.

In Vitoria-Gasteiz, the Superblocks Model has been defined in the ‘Sustainable Mobility and Public Space Plan’ (2007) elaborated by the Council of Vitoria-Gasteiz, which establishes a hierarchical outline which conditions every public space intervention or road regulation (in accordance with the “superblocks” distribution). Several relevant actors and stakeholders were involved in this plan. First, local politicians and city stakeholders signed first the ‘Citizens' Pact for Sustainable Mobility’ (2007). A series of participatory meetings with residents and neighbourhood associations facilitated information and citizens’ participation in designing the new public transport system (2009). Simultaneously, traffic restrictions and new parking regulations were implemented in the central superblocks (2009-2012), despite the resistance and protest received from the retail sector and business allocated in the affected areas. To date, three superblocks (Central, Sancho El Sabio and Médico Tornay-Judimendi superblocks) are completed and actions have been implemented in 20 of the 77 superblocks scheduled in the Plan. five more interventions are planned to be implemented in the period 2021-2023.

In Barcelona, the superblocks’ aim is to re-organize mobility in small areas of the city – so-called superblocks – in which motorized traffic is restricted. Through the ‘Let’s fill the streets with life’ superblock programme (2016) Barcelona city is planned to be organised into 503 superblocks. The plan is being implemented by the Municipality of Barcelona. The city council promoters have developed a participatory process engaging a wide representation of residents and groups of interests in the area that co-designed the superblock “Action Plan” together for a period of almost 1 year. The superblocks programme has received social support in certain areas (e.g., Sant Antoni, Horta) but also high levels of contestation in others (e.g. Poblenou). To date, five superblocks have been fully or partially implemented (Sant Antoni, Poblenou, Horta, Hostafrancs, Les Corts) and participatory processes have been organized for the co-definition of three more superblocks. Barcelona's superblocks programme is taking a step ahead in 2021, aiming at the creation of a network of green areas in the Eixample district (Cerdà section), transforming the area in 21 green streets and 21 new squares.

Both Barcelona and Vitoria-Gasteiz have received international recognition for the development of this SI. El Poblenou's Superblock received an “special mention” at the 2018 European Prize for Urban Public Space. Vitoria-Gasteiz awarded the title of “European Green Capital” (2012) as well as the “UN Global Green City Award” (2019).

3.4.2. How to promote social acceptability and adoption of Social Innovations: Results of the policy scenario workshops in the Superblocks Cluster

Introduction to the first round of policy scenarios in superblocks case studies

The SMARTEES policy scenarios were developed as two multistakeholder deliberative workshops that joined a sample of nine local practitioners and stakeholders in the reflection and understanding how to promote social acceptability of urban mobility innovations based on superblocks scheme. Specifically, the policy workshops carried out in the two Vitoria-Gasteiz and Barcelona reference cases, focused first on the discussion on the main strategies developed in pilot superblocks and the more relevant dimensions affecting social acceptability of SIs. Drawing on the lessons learned from the pilot social innovations already implemented in both case studies, participants identified the most appropriate solutions and alternatives for the replication of superblocks in the city context. Finally, participants co-produced a series of alternative policy scenarios that serve as the basis for the design of future superblocks in each city.

In terms of the organization, the first round of political scenario workshops in the superblocks cluster consisted of a first deliberative session conducted separately in both reference cities, followed by a second joined session with Barcelona and Vitoria-Gasteiz, for joint reflection on the lessons learned and the co-designing of alternative routes for the replication of superblocks. This second session also included the presentation of the Agent-Based Model prepared specifically for the superblock cluster as well as an introduction to the SMARTEES Policy Sandbox Tool. Due to the COVID-19 situation, the workshops were conducted following a mixed formula: virtual workshops with the researchers and modellers connected online but with city participants located together and a few experts joining from home. Details on the workshop (participants, agenda, presentations, etc.) are reported in Annex 5 to this deliverable.

Policy strategies to gain social acceptability

The main topic of discussion on the policy scenario workshops in the Superblocks cluster was how to foster citizens´ acceptability towards the superblocks model as a sustainable strategy to improve environmental quality and wellbeing in neighbourhoods by promoting low carbon and active mobility patterns of behaviour. During the first phase of policy scenario workshops organized in the reference cities of Vitoria-Gasteiz and Barcelona a series of tools, measures, processes, and communicative strategies were elicited by the workshops participants as the main policies implemented so far to increase the social acceptability of superblocks. These strategies, described below, refer to: (a) Targeted information and communication strategies to anticipate citizen resistance and address satisfaction of experiential needs; (b) Citizen and stakeholder engagement in decision-making; (c) Pilot projects; and (d) Achieving political and social consensus.

(a) Targeted information and communication strategies to anticipate citizen resistance and address satisfaction of experiential needs

Participants in the policy scenario workshops stressed the importance of implementing – at an early stage – targeted communication and dissemination strategies about the ambition, the

characteristics, and the changes that the SI involves. In both Vitoria-Gasteiz and Barcelona, the performance of effective information and communication strategies targeting specific groups or adapted to different types of audiences has been critical to anticipate citizen resistance and to raise public awareness. Specifically, citizen contestation in superblocks relates to residents' fear of any kind of change that modifies the status quo. This concerns to the "natural resistance" to lose the perceived commodities (e.g., having a bus stop near to home) or assumed rights (e.g., "the right to drive a car", "the right to park in front of the house") that motivated the main resistance towards car circulation or parking restrictions in Barcelona and Vitoria-Gasteiz. According to Barcelona participants, while environmental discourse underlines the superblocks programme, this sustainability framework needs to be adapted or "translated" to the reality of the neighbourhood in order residents to comprehend and endorse the transformative discourses of the SI. Some lessons and insights have been pointed by the superblocks promoting teams in the policy scenarios:

- **Align the superblocks discourse with the needs of the neighbourhood**. Effective communication strategies should address resident's social and biospheric values as well as experiential and social needs, such as the need for safety or the need of increasing people's quality of life or improving environmental conditions in neighbourhoods: "Citizens must feel that their needs and demands are heard and, as far as possible, addressed" (Barcelona policy scenario workshop).

- **Align the discourse of superblocks with health goals.** In Barcelona, the publication of recent health studies and several media reports that establish a clear relationship between environmental conditions, quality of life, and health issues in the city, significantly increased citizen's awareness on the impact of environmental pollution on their health. The superblocks promoting team took advantage of this circumstance aligning superblock's discourse to the health issues that captured the attention of the public becoming a key element to raise the social acceptability of the program.

- **Address the concerns of different groups relating (to) the implementation of the superblocks in each neighbourhood.** When specific concerns are identified, thematic sessions are organized to provide concrete information (supported by empirical evidence and data), on the needs and worries of these groups. For example, the Barcelona superblocks team designed a model so that blind people could have a precise image of how the design of the superblocks, considering their needs. Such "informative pills" helped to reduce concern, anxiety and resistance.
- **Involve local stakeholders and social actors in the communication strategy**. These local agents can reach people that might elude the information provided by the city council. They can also present the goals and benefits of the project to/in the press/tv/radio providing new perspectives and insights that contribute to gain social acceptance. For example, Facebook surveys and communicative actions carried out by the *Collectivo Superilla Poblenou* are examples of involving citizens in the decisions about new infrastructures/urban furniture in the superblock area.
- **Gain mass media support**. Local and international media have played a key role in the dissemination of the goals of the superblocks programme, fostering social acceptability to the measure. In the case

of the Poblenou superblock (Barcelona), the national and international media were key allies in strengthening support and advocacy for the project. This contributed positively, not only to increase social acceptability, but also to satisfy the resident's psychological need for recognition and acknowledgement as an innovative neighbourhood. Vitoria-Gasteiz participants reported that local journalists supported the policy measures and contribute to the understanding of the benefits of the superblocks model. However, some participants pointed out that information to media need to be provided with caution so as published headlines might generate controversy and social contestation. Thus, residents and stakeholders need to be informed in advance and media should be informed once the measure has been discussed with the beneficiaries. As one of the participants stresses: "for concrete superblocks actions, it is better to start the discussion with the citizens in the neighbourhood first than to divulge the details through the media".

A substantial differentiation is made between the following two spheres: 1) the project/plan, which allows more scope for co-design, dissemination in the media is more convenient from the beginning; and 2) specific actions and interventions at the neighbourhood level. These allow less scope for co-design and dissemination in the media is more convenient when the action plan has been approved, and social acceptance has been reached in the neighbourhood.

(b) Citizen and stakeholder engagement in decision-making

Top-down measures can produce strong contestation or reluctance to support an innovative policy. As reported in Poblenou (Barcelona), where the participatory process started after the implementation of the pilot superblock, strong social contestation raised against a measure, which was perceived as an "imposition" by the city council, without being discussed in advance with the neighbourhood. Therefore, listening to the opinion of the neighbours and ask for their feedback is fundamental. In Vitoria-Gasteiz, participation has been structured through the Citizen's Forum for Sustainable Mobility. A series of workshops, presentations and conferences were developed to design a new mobility model for the city. This has been a paradigmatic model of participation that gathered a wide representation of various agents and stakeholders following a well-designed articulation of participation. The Forum served to build social and political consensus and different local media, social agents, political parties endorsed the model and the guiding principles of the plan.

Key lessons that draw from the pilot superblocks experiences are the following:

- **Establish strategic alliances with specific stakeholders and opinion leaders in the neighbourhood**. Some stakeholders play a key role in citizen participation processes. There are specific groups in the city or in the neighbourhood especially concerned about the impact of the SI. For example, the local/neighbourhood businesses, shopkeepers, the retail sector, etc., manifest preoccupation with the potential negative impact on their economic activity or changes in the type of economic activity in the area. These groups with different interests and goals need to be involved in the participatory processes. Specifically, the influence of merchants to reach neighbours and influence in public opinion is given as an example. Superblock's practitioners coincide that it is essential to establish alliances with these intermediaries and gain their support. Thus, direct and open channels of interlocution should be established between the citizens and the superblocks promoting team, who must therefore

be accessible "It is essential to maintain a fluid and continuous communication with neighbourhood and business associations motivated to improve the neighbourhood" (Vitoria-Gasteiz policy scenario workshop). Barcelona's superblock team learned to take advantage of existing opportunities for involving social actors in the project, reaching out to neighbourhood's social groups, local movements and participatory processes already created.

- **Structure public participation in different levels of engagement at the city or neighbourhood level.** In Barcelona, a stable core group of stakeholders, political and social agents was created to work together in the superblock project. The different steps done by the core group are communicated to a large group of citizens or residents, to inform them about the decisions adopted and the plans or measures adopted. Maintaining a high level of transparency prevents misinformation issues and increases trust in the promoting team. Vitoria-Gasteiz participants stress the importance of gathering the support and strategic alliances with the neighbourhood social leaders. Participation in the designing phase is approached as an exercise for gathering feedback from residents and social actors about the project.

- **Involve opponents** contributes to reduce resistance and contestation. Social innovations might face political resistance and conflict. Due to those superblocks are district-level projects that affect a series of municipal departments, they usually need the involvement of different policy decisors, who should be involved in the designing, and their considerations should be taken into account. As the promoters in Barcelona pointed out, involving critical voices from the very beginning in the deliberative sessions reduces opposition and, eventually, opponents turn in to supporters.

- **Build trust and confidence in the effectiveness of the SI.** Citizen and stakeholder engagement in the co-designing of the superblocks has been pointed also as an effective tool to address the satisfaction of social needs, such as the need for confidence in the effectiveness of the policy and the need for trust in the project's leaders (institutional representatives). A climate of trust, intimacy, transparency, and open communication must be generated, in which the participants feel comfortable, to foster participant's confidence in the leadership of the project. Barcelona's promoters highlight the importance of stability in the core group of participants [that the same people participate in the discussions] and continuity [organizing periodic meetings].

- **Dedicate time and resources** to participatory process allowing sufficient time for reflection, discussion, and maturation of proposals. Participants appreciate that the promoters dedicate time and effort to reach agreements and building consensus about the project. While time pressure is considered negative, participants need also to perceive that progress is being made and their contribution is meaningful.

- **Assess the level of social acceptability in every stage of the process**. Vitoria-Gasteiz participants stress that "each proposal in the plan needs to be contrasted with the opinion leaders of the neighbourhood. If there is not enough support, the policy must be suspended,

and do not move forward". **Evaluation and follow-up of the actions** must be carried out and outcomes should be shared with the participants in these processes.

Participants in policy scenarios report **difficulties to reach specific sectors of the population**. One of the promoters of Barcelona superblocks estimates that only 5% of the residents of a neighbourhood participate in the participatory processes, so most of the beneficiaries do not actually engage in public arena discussions. They also noted that opponents do not usually join open participatory processes but manifest their rejection informally and their social influence should be considered.

Promoters argue that alternative strategies must be carried on reaching to different groups with different social needs (e.g., students, young people, women), and specially **people not involved in local associations/organizations.** Some formulas have been articulated in Barcelona, for example, organizing sectorial meetings to discuss how the superblock will affect them or informative pills addressing local issues and specific public concerns.

(c) Pilot projects

The superblocks model had to deal with the lack of confidence of citizens regarding the effectiveness of this policy to reach environmental and mobility goals. Pilot projects have been formulated as a positive strategy to increase social acceptability towards superblock in Barcelona and Vitoria-Gasteiz as they allow people to experience the advantages of the social innovation. For example, superblocks increase the satisfaction of individual and social needs, like the need for safety (e.g., streets without car traffic are safer for children to play in) or the need for belonging (enhancing connectedness between neighbours, increasing social cohesion of the community).

Participants in the policy scenario workshops stress that "an early success story is needed to overcome resistance at both citizen and political level" (Barcelona policy scenario workshop). Vitoria-Gasteiz promoters highlight the importance of "choosing the place right where the pilot project is being launched and quickly executing it once it has been approved". Thus, the successful experience of the Superblock Sancho El Sabio generated confidence in the model. Pilot superblocks paved the way for the replication of the SI as allowed other neighbourhoods to perceive the benefits and request similar measures, as reported by the participants from both reference cases in the policy scenario workshop.
However, residents and beneficiaries might be suspicious regarding pilot interventions because they do not have references of other places in which the project is working well. To avoid citizens´ resistance to the pilot measures, some key elements need to be considered:

- **Flexibility and experimentation capability**. For superblocks not to be perceived as a top-down measure, citizens involved in participatory processes must be confident that they might change the project if they are not satisfied with the result. They should feel confident that they will be listened to in decisions such as specific measures, priorities, or timelines.

- The promoters should **be clear about the aspects of the program susceptible to be changed** and those that are not flexible (e.g., SI goals).

- To present the final objective of the superblock project and indicate that this objective will be achieved in different phases. Citizens must perceive that the pace of implementation of the pilot project (infrastructures, specific urban measures) is to be slow and basic needs for mobility or accessibility of private cars are not jeopardized.

(d) Achieving political and social consensus

Political consensus and social agreements are important elements for the success of the superblocks program. In the case of Vitoria-Gasteiz, political agreements constituted a "precondition" for shaping the sustainability mobility and public space plans. As a result of this, despite different political parties have run the city, the urban design strategy has remained. In different stages of the plan, despite high levels of social contestation, the consensus achieved among the different local parties was essential for approving the most controversial measures, such as the regulation of car-parking or restrictions to car mobility in the pilot superblock. In the case of Barcelona, political consensus at the district level is seen as essential in shaping the superblock program. Involving representatives of the different local parties in the participatory processes gains their support for the project and is considered an asset.

3.4.3. Insights to foster successful Social Innovations in energy transitions: definition of alternative policies for the implementation and replication of superblocks

Despite pilot superblocks in Vitoria-Gasteiz and Barcelona are considered successful experiences, the policy scenario workshops presented an opportunity for reflection on the challenges and difficulties experienced. Participants in policy workshops envisioned a set of alternative policies and measures that could have been adopted – or to be adopted in future replications – to enhance social acceptability for the model and larger adoption of zero-carbon patterns of mobility. In this section, the policy scenarios defined in the workshops with the two references cases are presented separately, so as the scenarios refer to the specific context of each city.

- **Alternative policy scenarios to foster social acceptability Vitoria-Gasteiz superblocks model**

Four alternative policy scenarios were defined for the further development of the **Vitoria-Gasteiz superblocks model.** The first of these scenarios address citizen's acceptability with a **communication campaign at the city level focused on Superblocks model.** Participants in the Vitoria-Gasteiz policy scenario workshops discussed the convenience of designing and developing an "**umbrella" communication campaign to explain the superblock model to the citizenship**. They found that many citizens are still not familiar with the superblock concept, despite a decade of implementation

in the city. They consider strategic "to explain the *concept of superblock* better through a campaign designed with a pedagogical component". One participant points out that policies and measures are often contested "because they are not understood by citizens". Therefore, an effort to **adapt the discourse to the different groups of population** must be done as well as to **address their specific needs**. Further, **IT tools** (e.g., mobile Apps) can be also used at the service of the project to inform residents and communicate with them. **Media** would play a key role in disseminating the general guidelines of superblocks. However, for concrete actions, it is better to start the discussion with the citizens in the neighbourhood first than to divulge the details through the media.

The second scenario focuses on **fostering green local identities**. Policy workshops´ participants pointed out that social acceptability towards superblocks can be also enhanced by positioning Vitoria-Gasteiz as a frontrunner city in environmental and energy transition. They highlighted that strengthening the "green identity" that the city has already gained (Vitoria-Gasteiz has been granted recognition as a "green city") might contribute to the wide adoption of low-carbon mobility behaviours in the city. Some communication strategies have been suggested to connect the superblocks discourse with the dimensions of "quality of life", "air quality", and "quality of the public space". The city can also adopt green labels such as "Eco-City", "City 8-80", "Cycling City", etc. to foster collective identities.

The third scenario consists of **rising citizens´ environmental awareness and competence in pro-environmental behaviour.** Launching a holistic environmental education program on sustainable mobility has been suggested that targets different groups of population. This policy should provide citizens not only with knowledge and specific information, but also allow them to modify their attitudes and favour a change in patterns of behaviour. **Sustainable mobility educative actions** should **address the need for competence in carrying out pro-environmental behaviours.**

The fourth scenario addresses the specific **need for safety, involving both infrastructure and normative measures.** Much emphasis has been **placed on safety issues.** Several participants in the policy scenarios emphasized that it is necessary to undertake interventions that contribute to making the pavements safer for pedestrians. **Pedestrians feel insecure** (especially children's) in some streets because scooters and bikes ride on the pavements. Specific **policies to control and regulate the traffic** of electric scooters and bicycles in the city are required. On the other hand, cyclist demand the **better maintenance and extension of cycling infrastructures** across the city for cyclist circulate without risk. A repertory of low-cost strategies for tactical urban planning is already available, specifically, traffic-calming measures, good signalling, and penalties for those who break the law.

- **Alternative policy scenarios to foster social acceptability of Barcelona´s superblocks programme**

The first alternative policy scenario for superblocks developed in Barcelona's policy workshops points to the development of an **extensive diagnosis of the neighbourhood's needs and demands that inform superblock's communication and participation strategies.** To anticipate citizen

contestation and reactions against the superblocks, SI practitioners recommend developing a diagnosis of the area affected by the new superblock, identifying the needs of the different groups of population living and/or working in the neighbourhood. This diagnosis would inform the communication of targeted strategies designed for the superblock project. This diagnosis should focus both on technical and social needs: "It is essential to identify the main problems and concerns in the neighbourhood and align the superblock preparatory activities (information, communication, participation, etc.) with the satisfaction of social needs and the solution of current problems". Thus, in the process of gaining social acceptability, it is necessary to cover the following phases: (1) The city council presents its proposal to a few people considered as references in the neighbourhood. If sufficient acceptability is achieved, it can proceed to the next phase; (2) The city council presents its proposal to the neighbourhood groups. If sufficient acceptability is achieved, it can proceed to the next phase; (3) The city council presents its proposal to the residents of the neighbourhood. If sufficient acceptability is achieved, it is possible to advance to the implementation phase in which infrastructural and tactical measures are adopted. Finally, a **good maintenance of the superblocks' infrastructures should be ensured.** This goal involves engaging other city council departments in the designing and maintenance of the superblocks' infrastructures in good conditions to avoid social contestation after the implementation of the measure. As pointed out by one of the participants in the policy scenarios, some critique arose in Barcelona due to the poor conservation of the gardens and other public furniture after the inauguration of Sant Antoni superblock. The good maintenance of the public space increases **people's place attachment and sense of pride.**

The second policy scenario developed in Barcelona addresses the **need for safety (infrastructure and normative measures).** Positive outcomes should be shared with the citizens in the new superblocks to reduce resistance as well as to anticipate potential negative effects. As one of the participants in the Barcelona's policy scenario workshops pointed out "there is already evidence for the effectiveness of superblocks in improving road safety. The 2019 data have shown that in the superblock areas there have been no traffic accidents. This is a good argument for increasing acceptability and weakens the opponents' speech".

Third policy scenario **addresses climate emergency goals.** Citizens are more aware of the need of improving air quality due to its harmful effects on health and increased their support to environmental policies. According to one of the participants in the policy workshops, the "environmental discourse" is largely endorsed by the politicians and most of the population. Although pilot superblocks are not sufficient to reduce the total amount of traffic, superblocks are presented as innovative solutions to face and adapt to global warming impacts and address the climate emergency.

The fourth scenario **tackles citizen's resistance with a communication strategy at both city and neighbourhood level.** Policy scenario workshop participants suggest the convenience of developing a coherent and permanent institutional strategy to provide information about the superblocks programme. Communication strategy should be organized by the City Council in the different phases of the project: Diagnosis phase, agreement on the action plan, and the process of implementation of the measures approved. Communication actions should reinforce the discourse by emphasizing the need to promote the health of the residents of the neighbourhood and to protect the school areas. It is suggested to

link the goals of the superblocks with previous school programs in the city. The concerns of different groups relating to the implementation of the superblock should be addressed in thematic meetings with neighbours ("Informative pills"). The use of social media (Facebook, Twitter, Instagram) should be enhanced to connect to residents, workers and visitors in the superblock.

The fifth scenario **addresses the satisfaction of need of belonging (social cohesion).** Infrastructural measures favour new uses of public space such as sports, children's playgrounds, urban gardens, etc. Pilot *s*uperblocks have contributed to reinforcing the **feeling of belonging** in some neighbourhoods, such as Poblenou. It is considered that this dimension, depending on the context, can exert a positive influence on social acceptability (superblocks are seen as an opportunity to improve the social cohesion of the neighbourhood).

3.4.4. Results from the ABM's simulating alternative policy scenarios co-created in the policy scenario workshops delivered in Vitoria-Gasteiz

The second round of policy scenarios workshops was conducted in the city of Vitoria-Gasteiz in April 2021. It was developed as a multistakeholder deliberative workshops that joined a sample of six local practitioners and stakeholders with UDC researchers and AMB modellers. The goals of the workshop were two-fold: first, to present the simulated scenarios of the social innovation processes elaborated for Vitoria-Gazteiz case and refine the alternative policy scenarios that can be implemented in the model, reflecting together on the simulations carried out and the possibilities of the models, aimed at increasing the social acceptability of the superblocks social innovation. In terms of the organization, the second round of political scenario workshops in the superblocks cluster consisted of only one deliberative session with the case of Vitoria-Gasteiz.

Concerning the content of the workshop, the UDC modelling team introduced how the ABM works and the different phases for the configuration of the model. The model aims to understand the citizen acceptance of superblocks and to study the expansion and replicability of the plan in other neighbourhoods in the city. The hypothesis of the model concerns the percentage of citizens that would be in favour and the percentage that would be against a (new) superblock, depending on the implementation of a set of different policy scenarios. The model will eventually represent changes in the intensity and the orientation of the communications. It will be able to simulate the outcomes of the implementation of a set of alternative policies and communication strategies from promoters, supporters, opponents, and local media (critical nodes), testing what would have happened in terms of citizens acceptability towards the project given different scenarios. The recreation of the communication processes of the different actors in the different stages of the project is fundamental for the model to correctly represent the history of the process of implementation of the superblocks and it was refined in the second workshop so that it resembles the reality as much as possible (see D4.2 for further information about how qualitative and quantitative data have been integrated in the model).

The second part of the policy scenario workshop consisted of a facilitated discussion focusing on the following topics: (1) the initial rate of citizen acceptability towards the SI; (2) an approximation of the list of tactics & triggers to the reality of the case; (3) current levels of social acceptability, (4) other factors conditioning the social acceptability of superblocks and, finally, (5) concretion of the

alternative policy scenarios to be tested in the model. The results of the discussion served refining the alternative policy scenarios to be implemented in the model. Five alternative policy scenarios were discussed in the second round of Vitoria-Gasteiz´s policy workshops as described below, although only a selection of them were further implemented in the agent-based model.

The first scenario concerns the development of a **comprehensive communication strategy of the promoters in the early stages of the project, aiming at citizens to become familiar with the superblocks model and its main features and goals**. Participants in the first policy scenario workshops discuss the convenience of designing and developing an "umbrella" communication campaign to explain the superblock model to the citizenship. This scenario was further discussed in the second round. Thus, an alternative communication campaign was proposed to be conducted in the first stages of the project, for citizens to become more familiar with the superblock model and increase their level of support. It was mentioned that an important effort was made in 2009, explaining that superblocks were the basis for the reformulation of the different mobility network. However, as the pilot Sancho El Sabio superblock was not implemented, the participants are not sure that the population was able to frame both policies as part of the same innovative urban strategy.

The second scenario consists of the **modification of the communication actions taken in specific stages when social conflict raised: changing the orientation of the discourse, addressing the satisfaction of specific needs that citizens are more interested or worried about**. This scenario addresses specific needs (comfort, wellbeing) that enhance the positive benefits of the superblocks model. It has been argued that when the two most relevant policies were simultaneously adopted (change in bus network and restrictions to surface parking in city centre), the communication campaign focused on the positive impact of these measures, in terms of articulating "a more comfortable and functional pedestrian and cycling network as well as a more attractive bus network". An umbrella communication strategy was launched in the media, bus advertisings, and more than a hundred volunteers informed about the changes in the bus lanes for a week. However, the communication concerning the changes in parking surface received less attention and local media informed more about the negative reactions of citizens and merchants than the positive aspects of the measure. This negative information could be counted by increasing communications or providing alternative messages specifically oriented to groups of the population directly affected by these measures.

The third scenario consists of the **involvement of large number of citizens and local actors in policy the co-definition of the mobility policies.** It has been argued that the sustainable mobility and public space plan was elaborated in a participatory process that mainly involved city council technicians, representatives of the local political parties, external experts (e.g., Salvador Rueda, the Barcelona Urban Ecology Agency) and representatives of the principal stakeholders, neighbourhood associations, ecologists and other relevant social groups in the city. However, participatory processes did not engage wider groups of citizens, who were merely informed about the plan. An alternative policy scenario would consist of "rethinking the participatory model" and articulate new formulas for citizens' participation at the neighbourhood scale. This scenario could be implemented in the model by testing the impact of the organization of face-to-face meetings with citizens in

specific neighbourhoods, enhancing communication among citizens: neighbours, friends and relatives.

The fifth alternative policy proposed by the participants in the workshops relates to **involving resident´s associations leading communication actions supporting low-carbon mobility policies in the neighbourhood.** This strategy involves the development of a campaign for supporting low-carbon mobility in the area and claiming a safer and healthier neighbourhood. The possibility of introducing this campaign in the model is discussed, but several issues were mentioned: first, the action would involve citizens from different neighbourhoods (the beneficiaries), which would involve having information about how many people in each neighbourhood would be affected. Second, the relationship between this action and the acceptability of superblocks in this context is not clear. It can be perceived as a very different measure from the superblock and the model only has inputs from data on the perception of superblocks.

The last alternative scenario formulated by the workshops' participants involves **moving forward, beyond 2020**, and testing what would happen if a communication strategy was implemented in a new superblock to be hypothetically defined in a new neighbourhood (instead of the superblocks already included in the model). The model could be used to see how citizens responds to different communication actions. Concerning this scenario, several issues have been raised by the modeller team. The first problem is that we do not have information about what is happening, about the inputs that citizens would receive, based on which their opinion would be modified. The model has real inputs until 2020, from then, we need to approximate them. For example, an unexpected event might happen that alters the starting point of the model. For example, a serious accident, which has not been foreseen in the model, would make the simulation invalid.

After the workshop, the following scenarios were modelled forward:

1. Modification of the initial level of acceptance of the superblock model.
2. Intensification of the communication strategy focused on the need for comfort.
3. Participatory approach to increase citizens´ support towards superblocks.
4. Environmental education strategy combining awareness-rising campaign and participatory approach.

In the following descriptive boxes, we illustrate the scenarios described above, explaining the main results from the agent-based model simulations.

MODIFICATION OF THE INITIAL LEVEL OF ACCEPTANCE OF THE SUPERBLOCKS MODEL

CASE STUDY: VITORIA-GASTEIZ

FACTUAL SCENARIO

The majority of the respondents to the survey conducted in Vitoria-Gasteiz for the SMARTEES project in 2020 reported a favourable initial position towards superblocks (see Figure 1). However, several policies implemented at the early stages of the project received strong opposition from certain groups of citizens (according to qualitative data gathered in SMARTEES).

In order to represent such citizen contestation in the Agent-Based Model (ABM), it was discussed with the SI promoters and experts to what extend reducing the initial level of support in the baseline scenario would be more accurate to reality.

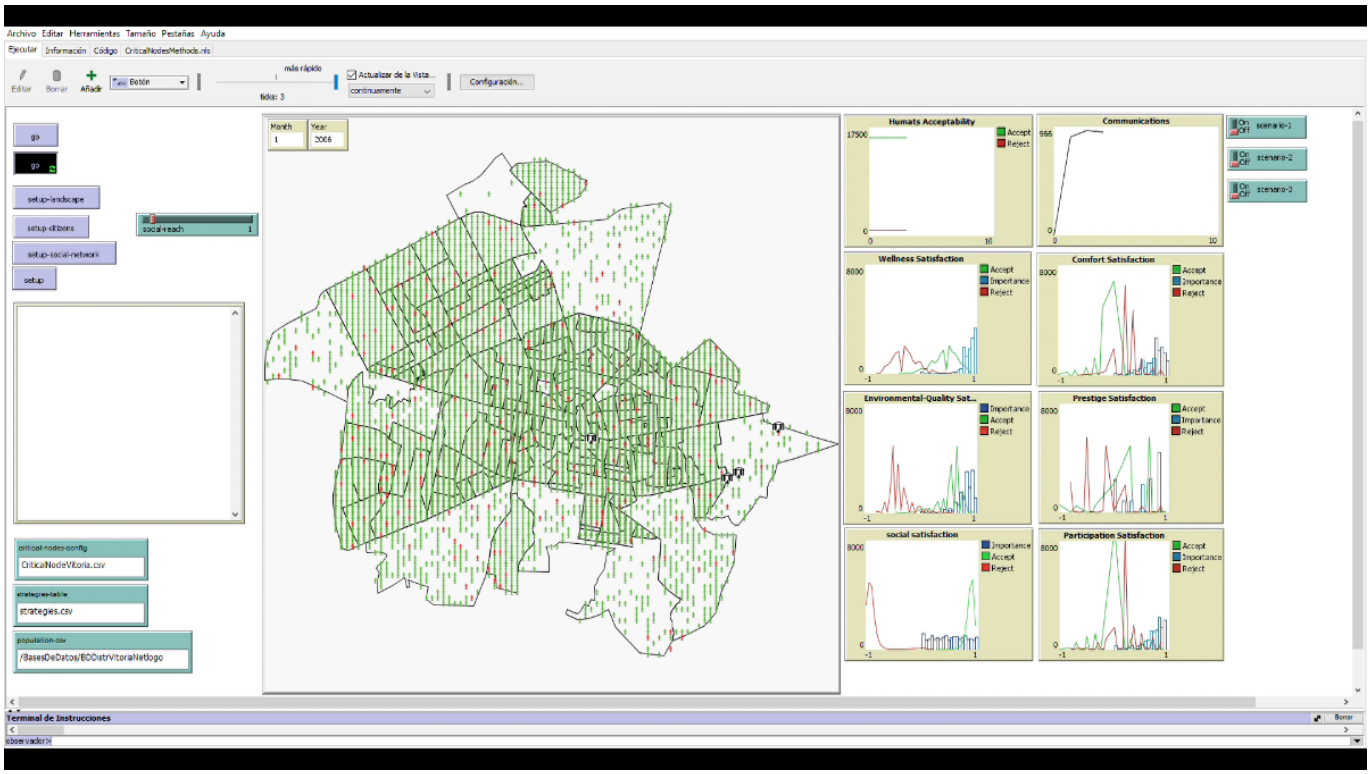


Figure 1. Representation o the initial level of acceptance according to the survey conducted in 2020. People in favour are presented in green. People against superblock are presented in red.

BASELINE SCENARIO

The **baseline scenario** aims to represent the real development of the case. It was presented and discussed in the policy scenario workshops organized in Vitoria-Gasteiz. Workshops participants confirmed the significant opposition due to changes in parking regulation and car restrictions policies in pilot superblocks. Moreover, they argued that **memory bias** might explain those positive responses concerning their initial support to the superblock model, given that the survey was carried out 14 years after the initial implementation. Survey responses contrast with reality in which, according to the participants of the workshop, at least 30% of the inhabitants appeared to be against the unpopular measures adopted in the frame of the superblocks policy.

To account for this, **the agent-based model for Vitoria-Gasteiz simulates citizen's initial support to the superblocks model with a lower rate of people endorsing the SI than the percentage reported in the survey** (see Figure 2). Thus, the baseline scenario presents **66,3% of the population in favour of the project** (green) and **33,7% of the population against the project** (red).

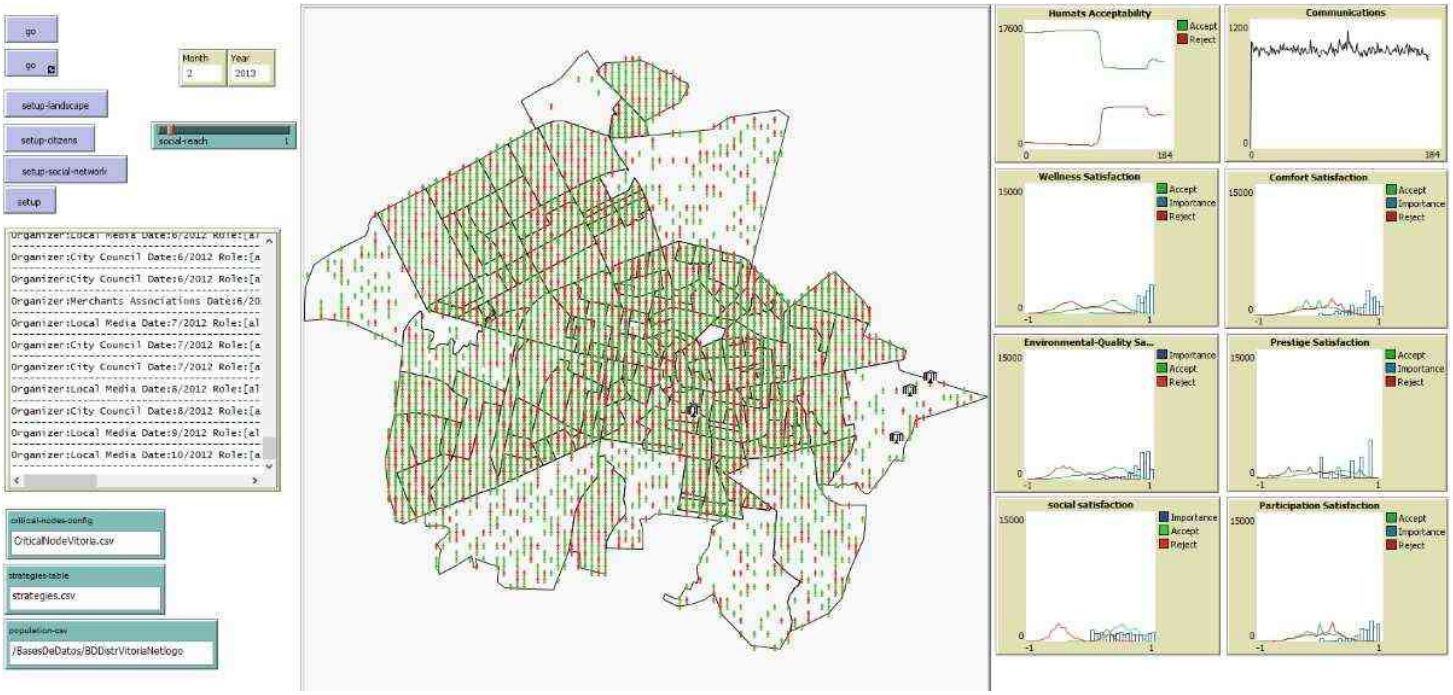


Figure 2: Baseline scenario representing a lower level of public acceptance towards the social innovation at the early stages of the project.

Survey data has been used to simulate the percentage of citizens that were in favour or were against the implementation of superblocks in the model. It corresponds to survey responses to a question about **citizens' support to the superblocks model at the beginning of the project** (more than a decade ago), as well as to specific questions related to the **perceived satisfaction of the need for wellness, comfort, environmental quality, prestige and participation**.

ALTERNATIVE SCENARIO N.1

INTENSIFICATION OF THE COMMUNICATION STRATEGY FOCUSED ON THE NEED FOR COMFORT

CASE STUDY: VITORIA-GASTEIZ

FACTUAL SCENARIO

In November 2009, a new parking policy was introduced in the city centre to dissuade using private cars. It increased the regulated area and multiplying by three the on-street parking prices. Residents should also pay for parking in the centre (while it was free before).

The measure was communicated by the City Council as a part of a strategy that put the focus on the benefits of sustainable mobility and the superblocks model.

The policy was very unpopular. The City Council had to deal with the strong resistance of the city centre residents and the retail sector: **33 residents' associations** (supported by the shopkeepers) gathered about **13,000 signatures** against the policy.

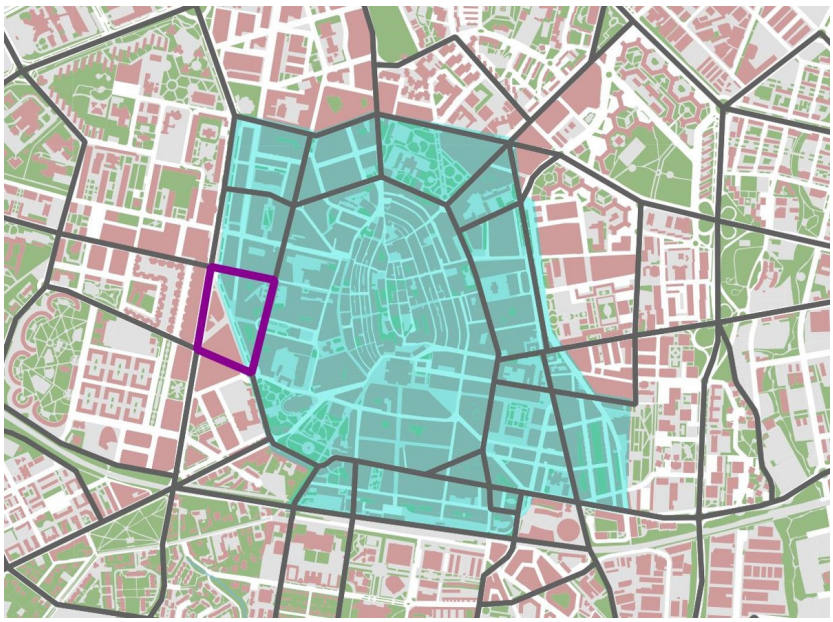


Figure 1: affected area of city centre by the new parking policy: expansion of the regulated parking area and increase (triple) in the price of surface parking (2009). In purple the pilot superblock Sancho El Sabio is indicated.

FACTS

In terms of communication, the City Council informed about the new policy from March 2008 to November 2009, in several press releases and announcements.

The City Council discourse focused on the benefits of the policy:

- Increasing resident's quality of life, (dimension affected: satisfaction of **need for wellbeing**).
- Enhancing air and urban space quality (dimension affected: the **need for environmental quality**).
- **Prestige** (being a reference city in sustainable mobility)

The local media mostly covered communications from the opponents (the residents' organizations) in that period.

Residents complained about the lack of participation in the decision on the increasing parking taxes.

ALTERNATIVE POLICY SCENARIO

SMARTEES
local social innovation

This scenario consists of the **implementation of a new communication strategy since the early stages of the project**, for citizens to become familiar with superblocks and anticipate residents' contestation. **Scenario 1a** includes communications from (a) the City Council, (2) the local associations, and (3) the press, **addressing the satisfaction of the need for comfort. Scenario 1b** tests the impact of **spontaneous meetings** among citizens discussing this policy.

Scenario 1A: New communication strategy from the city council to citizens addressing the need for comfort. This scenario is featured as follows:

a) Introducing **18 new communications** from the City Council to citizens addressing the satisfaction of the need for comfort, in order to anticipate the discontent of the residents that, for example, perceive that the policy restricts their "right" to park in their street for free. The campaign **starts at an early moment** (January 2007) and is sustained for **3 years and a half**. 100% of the population is estimated to be reached through direct communications with citizens as well as via mass media.

(b) Introducing **8 new communications from supporters** and 6 new communications from **local media** (in 2007 and 2009) endorsing the campaign.

(c) **Modifying trust rates** in the local media and residents' associations during a year and a half (from the beginning of 2009 to mid-2010), **depending on the importance of the need for comfort to citizens**. As a result of this strategy, trust rates in the city council increase while trust in local media and residents' associations decreases.

Scenario 1B reproduces the communication strategy described in Scenario 1a and introduces **additional communications between residents** simulating citizen discussions about the policy.

These **meetings** happen in three specific stages:

- **July 2006** (starting out of the project): Meetings in all census sections of the city.
- **June 2009** (new parking policy in central superblocks): Meetings in specific census sections (46 of 188) that are affected by the increase in the price of outdoor parking.
- **January 2012**: Meetings in all census sections of the city.

The main lesson to draw from **scenario 1A** relates to the **efficacy of designing specific campaigns addressing citizens' specific needs, such as the need for comfort** (Figure 1).

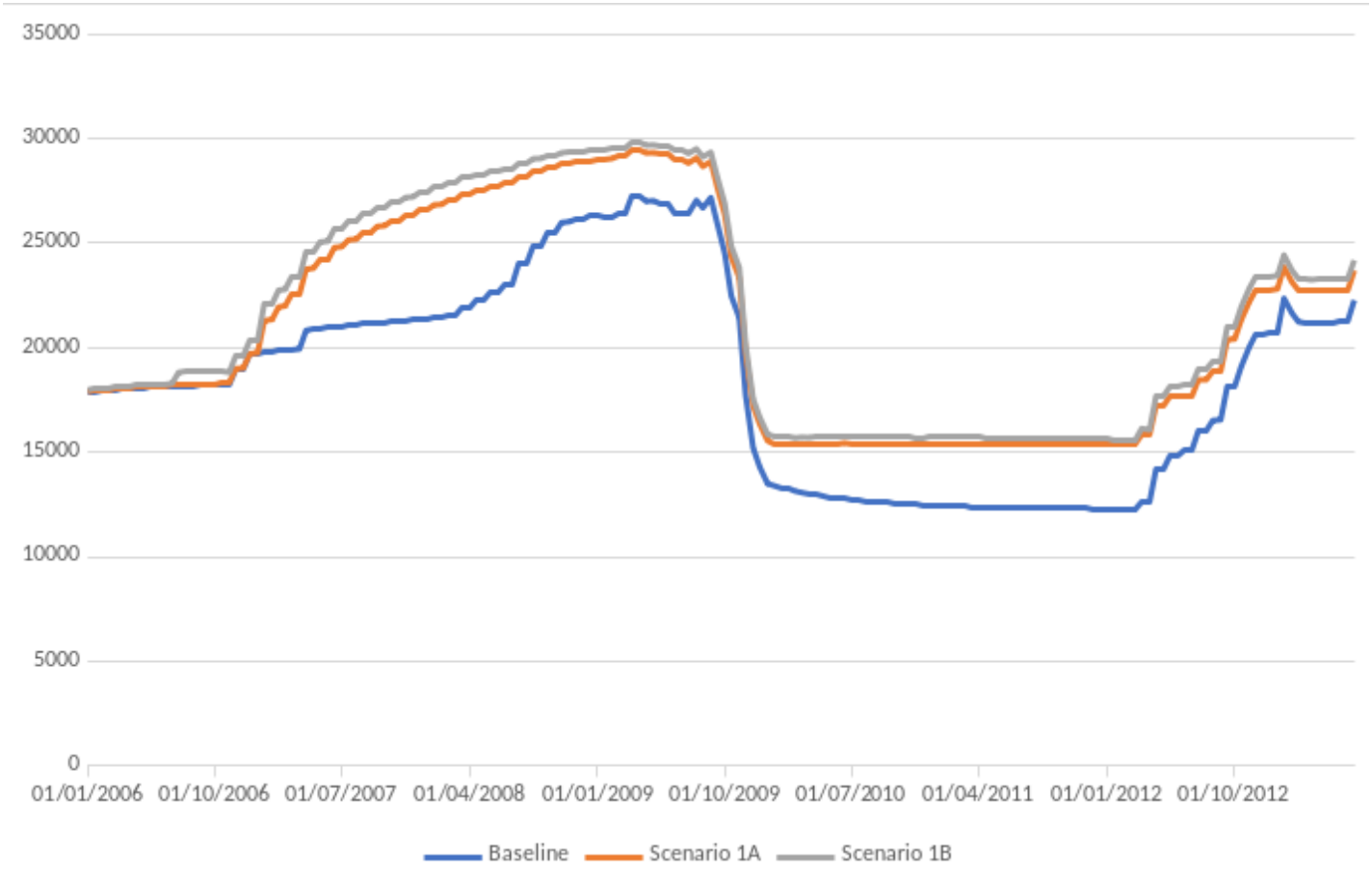


Figure 1: Number of citizens accepting the superblocks' SI in scenarios 1A and 1B, compared to the baseline scenario

The results also stress the importance of **increasing the scope of the campaigns** to reach a large number of inhabitants. **Anticipating contestation by starting the communications two years earlier** is also very effective.

Involving both local media and local associations (e.g., cyclists associations) who endorse the key messages, **raises the level of public acceptability to 70,6%** (↑4,3) since only 66.3% of the population voted in favour of the SI in the baseline scenario.

As scenario 1B shows, creating arenas for citizens to discuss superblocks is more effective than only launching a communication strategy. When **citizens have been involved in conversations about the measure, the social support towards the policy reaches up to 72%** (↑5,73).

PARTICIPATORY APPROACH TO INCREASE CITIZENS' SUPPORT TOWARDS SUPERBLOCKS

CASE STUDY: VITORIA-GASTEIZ

FACTUAL SCENARIO

The following groups participated in the formulation of **Vitoria-Gasteiz's Sustainable Mobility and Public Space Plan**:

- City council technicians
- Representatives of the local political parties
- External experts (e.g., Salvador Rueda, the Barcelona Urban Ecology Agency)
- Representatives of the principal neighborhood associations, cyclist's association, ecologists, and other relevant social and economic groups in the city.
- Representatives of the public and private transport sector
- External experts (e.g., Salvador Rueda, the Barcelona Urban Ecology Agency)

However, it was argued that wider groups of citizens were not involved, except for the participatory process concerning the new bus network in 2008-2009.

Thus, alternative policies would address inhabitants in the discussions on sustainable mobility policies and foster expontaneous communications among them concerning the superblocks model.

ALTERNATIVE POLICY SCENARIO

This alternative policy scenario consists of ***rethinking the participatory model,*** fostering citizens' meetings at the neighborhood scale in the co-definition of the mobility policies, across the different stages of the project.

Three variations of this scenario are presented, that attempt to answer the question: ***If people have spaces to communicate among themselves and discuss the new policy, would the acceptability of the superblocks project improve?***

Scenario 2A tests the effect of social networks functioning when people discuss a matter of interest. Thus, random expontaneous communications about superblocks are provoked within citizens' networks: neighbours, friends and relatives. 1 face-to-face meeting is arranged with the residents (at census section level) in three stages:

- July 2006: Meetings in all census sections of the city
- June 2009: Meetings in specific census sections (46 of 188) affected by the new parking policy in central superblocks.
- January 2012: Meetings in all census sections of the city

Scenario 2B reproduces meetings among residents as in scenario 2a. Besides, **we add 6 new communications from the local media** (supporting the policy) at the same period of time than conversations among citizens (within their social networks) occur.

Scenario 2C reproduces meetings among residents as in scenario 2a. Besides, **we add 6 new communications from the local associations** (supporting the policy) at the same period of time than conversations among citizens (within their social networks) occur.

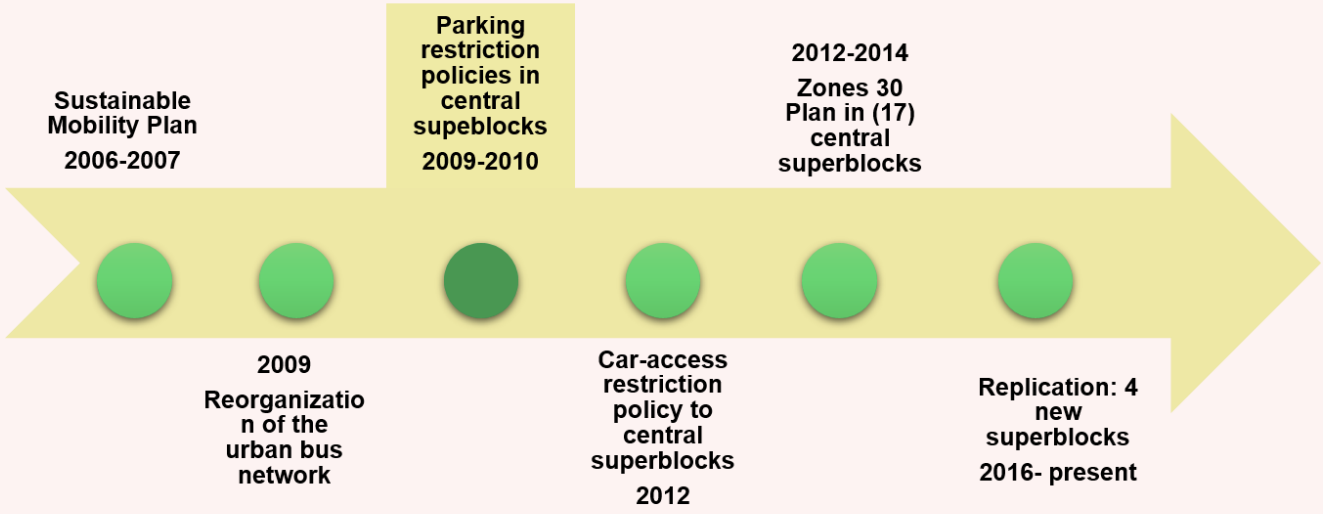


Figure 1: timeline with the main measures adopted in the process of implementation of the superblocks model in Vitoria-Gasteiz. In yellow, the unpopular parking policy is highlighted.

RESULTS

Scenario 2 tests if public acceptability increases by enhancing self-organized meetings among residents. These meetings are simulated in the model as random communications, within their social networks, for short periods of time (3 months), which occur in three relevant periods in the timeline.

However, as the figure below shows, **this strategy has a low impact as it only rises the rate of the population by 1.1% that would support the policy.** Thus, organizing only one meeting at three specific periods is not meaningful for the citizens (**scenario 2A**).

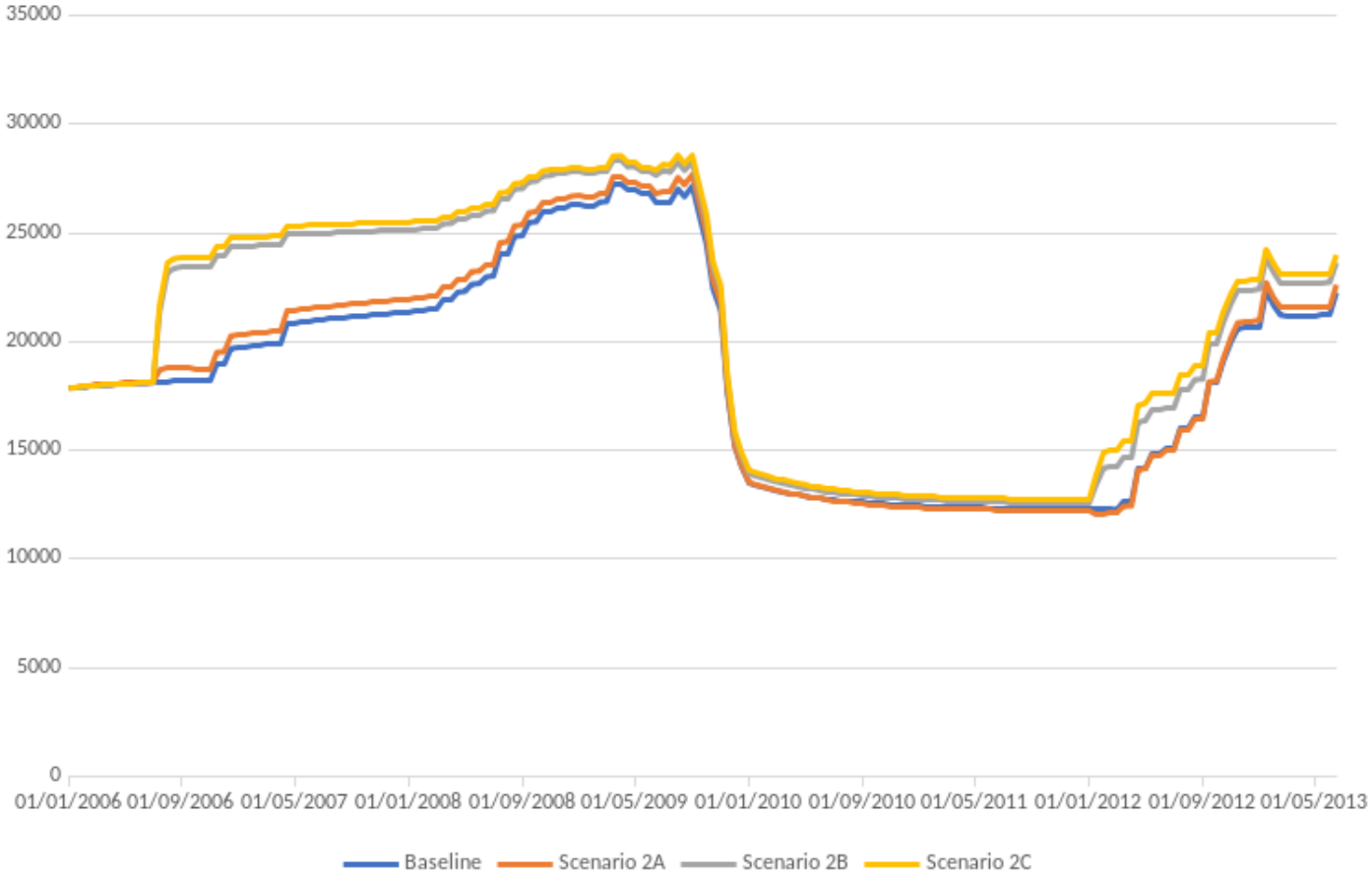


Figure 2: Number of citizens accepting the superblocks' SI in scenario 2, compared to the baseline scenario, as well as in combination with the involvement of local media or local associations

If citizen's random conversations are **influenced by the local media (scenario 2B)**, who talks positively towards the superblocks policy, the **support rises up to 70.45%** (↑4,15) of the population voting in favour of the SI.

Interestingly, **if conversations among citizens are combined with communications launched by the local associations (scenario 2C), the social support towards the policy reaches up to 71,52%** (↑5,22), which becomes a significant difference comparing to the base scenario.

ALTERNATIVE SCENARIO N.3

SMARTEES local social innovation

ENVIRONMENTAL EDUCATION COMBINING AWARENESS-RAISING STRATEGY AND PARTICIPATORY APPROACH

CASE STUDY: VITORIA-GASTEIZ

FACTUAL SCENARIO

Vitoria-Gazteiz City Council dedicated a large amount of effort and resources to the development of the sustainable mobility and public space plan.

Several **communication strategies** were **developed for a decade** to disseminate the **benefits of the superblock model** in different stages of the project.

However, it was argued that a wide **environmental education campaign addressing environmental awareness** was missing.

An awareness-raising campaing could thus contribute to increasing both the social acceptability towards superblocks and wider adoption of low carbon mobility patterns.

FACTS

In terms of communication, the City Council informed about **sustainable mobility and superblocks since 2006**, although the main communication strategy started in 2009.

Promoters' discourse focused on the dimensions of **environmental quality**, **wellbeing** (security, active mobility, road safety), and **improvement of comfort** (e.g. best public transport services).

The local media often endorsed the city's mobility policies, highlighting the benefits of superblocks while fostering the identity of Vitoria-Gasteiz as a "Green Capital".

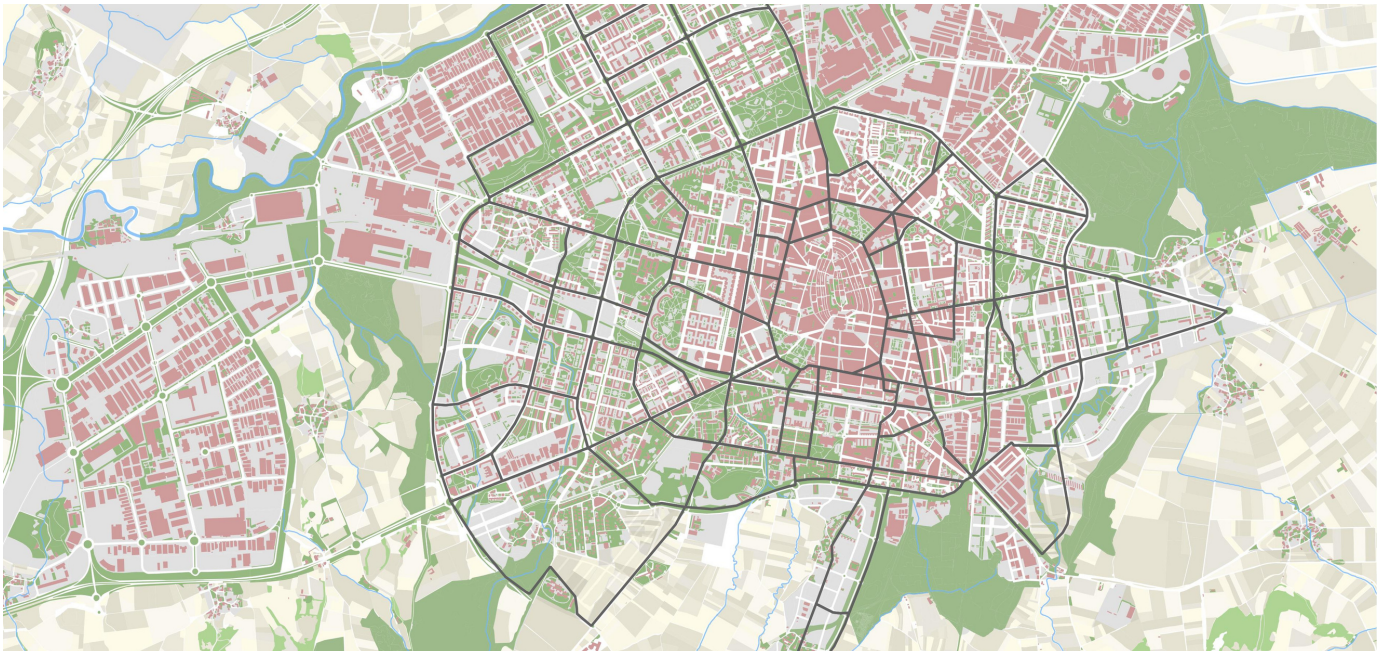


Figure 1: Superblocks scheme proposal as stated in the Sustainable Mobility and Public Space Plan (2008)

ALTERNATIVE POLICY SCENARIO

This alternative scenario consists of the development of an environmental education policy aiming at increasing residents' concern towards wellbeing and environmental quality. Two combinations of policies have been tested in the model. **Scenario 3A** combines an **environmental awarenesses campaign** with **random conversations** between citizens. **Scenario 3B involves also the press and local associations supporting the policy.**

Scenario 3A combines two different strategies:

(1) **Environmental awarenesses campaign** led by the City Council from January 2007 to June 2010, involving 42 communications in 3 years and a half (one per month). The communication strategy **addresses the importance of achieving a clean and healthy environment.** 100% of the population is estimated to be reached through direct communications with citizens as well as via mass media.

(2) **Self-organized meetings between residents in the same census sections,** fostering citizen debate on superblocks. These communications among citizens will happen in July 2006, June 2009 and January 2012 (*see scenario 2*).

Scenario 3B reproduces the previous one but adding new communications from **local actors supporting the environmental education campaign**. Thus, we added **6 new communications from the local media** (supporting the policy) and another **6 communications from local associations,** during the same period of time that conversations among citizens (and their social networks) occur.

Scenario 3 represents the effect of **citizen participatory actions** (organized as meetings among residents at the census section level) in combination with an **environmental awareness campaign.** In **scenario 3A, the level of social acceptability of superblocks reaches only up to 67.8%** (↑ 1,5%).

Scenario 3B becomes the most promising scenario as the rate of support towards the SI rises 9 points (↑ 9,41) in comparison to the base scenario, as a result of the combination between participatory approaches and awareness-raising strategies led by several actors: the city council and the local associations and supported by the local media (Figure 2).

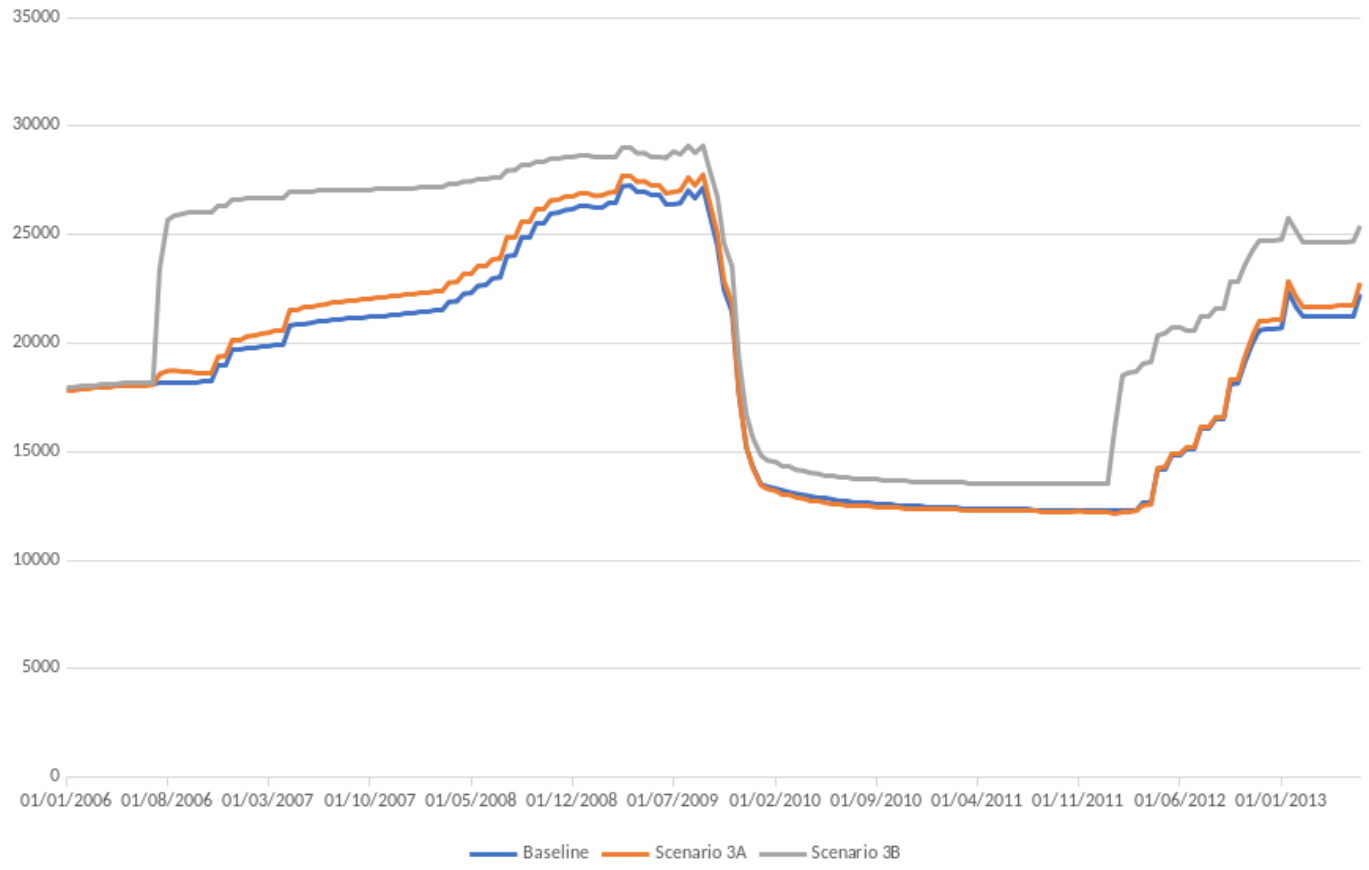


Figure 2: Number of citizens accepting the superblocks' SI in scenario 3, compared to the baseline scenario, as well as in combination with the involvement of local media and local associations

Interestingly, if the outcomes of the first and third scenarios are compared, it could be concluded that **environmental education strategies aiming at increasing environmental concern towards wellbeing and environmental quality appear to be more effective** (in terms of **increasing public support**) than targeted communication strategies addressing the satisfaction of specific needs.

This effect only occurs, however, when the communication strategy is presented **in combination with participatory approaches** and in **alliance with civic associations and the press** that **actively support** the campaign.

3.4.5. Policy recommendations for the implementation and assessment of energy transitions based on superblocks

The main insights drawn from the policy scenario workshops in the Superblocks cluster respond to the question of how to foster citizens´ acceptability towards superblocks. A series of alternative policies were elicited by the participants, who highlighted the importance of **developing – at an early stage – a well-planned information and communication strategies targeting different groups of citizens to anticipate citizen resistance**.

Public contestation in superblocks usually relates to residents' fear of any kind of change that modifies the status quo in parking facilities, public transport accessibility and road traffic inside superblocks. All of them concern to the satisfaction of experiential needs for comfort. Thus, citizens must feel that their needs and demands are heard and, as far as possible, addressed. In consequence, policy scenarios developed in the workshops consisted of the modification of the communication actions taken in specific stages when social conflict raised. Promoters' discourse would address the satisfaction of specific needs that citizens are more interested or worried about, (e.g., comfort, wellbeing, health, safety), emphasizing the positive benefits of the superblocks policy (e.g., enhancing the health and the road safe conditions for the residents of the neighbourhood). For example, in Barcelona, concerns of different groups relating to the implementation of the superblock are being addressed in thematic face-to-face meetings between the city promoters and the neighbours (so-called "informative pills"). The efficacy of designing specific campaigns addressing specific needs (the need for comfort) has been confirmed by the agent-based model. Thus, a relevant group of citizens is susceptible to be influenced by the policy and becomes more convinced that superblocks can support their need for comfort, despite the ongoing parking restrictions. However, for these strategies being successful, several features should be considered:

- First, the scope of the policy. The results from the agent-based model stress the importance of increasing the impact of the campaigns in terms of the rate of population addressed. Many inhabitants should be reached by these campaigns, and several formats should be used (by employing several sources of information, social media, etc).
- Anticipate to (expected) contestation and negative reaction towards the unpopular measure. Vitoria-Gasteiz´s model shows that the most effective policy is the one that started two years in advance, and sustains a coherent message strategy for four years, addressing specific needs.
- Involving different voices leading the communications increases the rate of social acceptability**,** according to the model. Vitoria-Gasteiz´ model shows that if local associations and local press endorse the city council's discourse, citizens' support to the policy rises.
- The most effective policies are those that **create arenas for citizens to discuss superblocks**. In terms of social acceptability, the model shows that Vitoria-Gasteiz inhabitants are more willing to vote in favour of the superblocks policy if they have been involved somehow in discussions about the measure.

A second successful strategy largely implemented in the superblocks cluster relates to the **involvement of citizens and local policy actors in the co-definition of the mobility policies**. Participatory approaches are fundamental in social innovations. Participatory processes across the

project have been designed and implemented so far in both Vitoria-Gasteiz and Barcelona. However, policy scenario workshops in Vitoria-Gasteiz point to the need of strengthening citizen´s involvement in the decision-making processes concerning the definition of superblocks plans. Alternative policy scenarios articulate new formulas for wider citizens' participation in each specific neighbourhood to fulfil people´s need for participation and being involved in the decisions that affect them. According to the survey conducted in Vitoria-Gasteiz, the need for participation is a significant factor that determines social support towards the policy. Such a participatory approach has been implemented in the model as self-organized meetings that occur in three relevant periods in the project. One lesson that was learned from the simulation model relates to the significant impact of participatory actions when these meetings are endorsed by the local associations and the local media, who talk positively about the superblocks policy. This happens because when a new policy is being implemented, residents frequently share their opinions with relatives, friends and neighbours and people they trust (especially if the new policy is incoherent with their own values and belief, as the theory of cognitive dissonance points out). Nevertheless, for participatory processes to effectively contribute to SI acceptability, they should be combined with communication strategies led by promoters, supporters, or stakeholders who people trust. Only in this case, according to the simulation model results, a significant change can be observed in people's willingness to endorse the SI.

A third type of alternative policy scenarios discussed in the workshops consists of **rising citizens´ awareness**, addressing climate emergency goals. This scenario has been modelled for Vitoria-Gasteiz simulating the impact of an environmental awareness campaign, aiming at increasing residents' concern towards wellbeing and environmental quality. Differently from the previous scenarios, the communication strategy from the city council addresses the importance of achieving a clean and healthy environment. Interestingly, the effect of a simple awareness raising campaign is small in terms of social acceptability towards the SI. However, if this awareness campaign is combined with citizen participatory actions (organized as meetings among residents at census section level), its efficacy rises significantly. This means that people apparently need an arena for discussing, validating, and consolidating these new insights triggered by the campaign. Furthermore, if the alternative policy scenario combines participatory approaches and awareness-raising strategies led by several actors (the city council and the local associations) and supported by the local media, the level of social acceptability increases up to 9.4%.

In conclusion, results from the superblocks simulation model suggest that of the three scenarios modelled **environmental education strategies** aiming at increasing environmental concern towards wellbeing and environmental quality **have a larger influence on citizens´ acceptability of superblocks**, specifically when they are presented in combination with participatory approaches and in alliance with civic associations and the press, who actively support the campaign with their communications. Citizens can be influenced to support the SI by communication strategies addressing both the satisfaction for specific needs (e.g., need for comfort, need for security, need for health, etc.) and environmental awareness. However, these approaches need to be launched at the

early stages of the project, and a coherent message across the different stages of the project should be sustained, by using several sources of information and reaching a wide audience. Finally, participatory processes need also to be supported by communication strategies led by the promoters, civic actors and local media who people trust.

3.5. Fifth cluster: Co-ordinated, tailored and inclusive energy efficiency schemes for fighting fuel poverty

3.5.1. Background

Cluster 5 "Co-ordinated, tailored, and inclusive energy efficiency schemes for fighting fuel poverty" includes the cases of Aberdeen and Timişoara. This social innovation is characterized by public authorities working in coordination with supply companies and civil society organisation in order to implement energy efficiency measures for houses and buildings with the aim of fighting fuel poverty with a tailored and inclusive approach.

As stated, the first reference case in this cluster is the city of Aberdeen (north-east of Scotland). This SI aims to tackle fuel poverty throughout the rollout of a district heating network across the city, which would result in substantial energy savings. The heat network has been developed over the past 15 years, addressing fuel poverty and improving the energy efficiency of the city's housing stock. Aberdeen is currently planning a new phase of heat network development in the neighbourhood of Torry. The key issues surrounding the evolution of thid SI relate to local energy production, household energy efficiency, fuel poverty and housing quality. The second reference case in the city of Timisoara, (Romania). Timisoara's SI is related to developing an action plan in order to reduce fossil energy use and decrease carbon intensity. The Timisoara project is still at an early stage (a live case-study). However, since the beginning, the main objectives proposed in the initiative are the reduction of energy consumption and greenhouse gas emissions, the use of renewable energy sources in the field of construction, and the use of renewable resources without medium and long-term storage associated with higher energy efficiency and low costs (lower prices for vulnerable consumer).

3.5.2. How to promote social acceptability and adoption of Social Innovations: Results of the policy scenario workshops in Aberdeen

The Aberdeen Policy Workshops included participants from Aberdeen City Council with responsibility for sustainability, energy and housing, Aberdeen Heat and Power, and Scarf (a fuel poverty social enterprise). The first workshop aimed to draw out ideas for increasing adoption of the heat network across the city in the next ten years.

To contextualise the discussion and to set the scene for considering policy scenarios for improving uptake of the heat network, we first asked participants to consider what trends might affect fuel poverty in Aberdeen over the next decade (to 2030). Participants mentioned a range of factors, many of which would result in increasing numbers of residents experiencing fuel poverty. They felt

that electricity and gas prices were likely to rise, and that incomes would probably not increase proportionately, resulting in higher proportions of residents' incomes being spent on fuel. Furthermore, changes in the way pensions are paid may mean that there are more people with private pensions in defined contribution schemes, who will be more vulnerable to fluctuations in the stock market and therefore to falling into fuel poverty in older age, which will be compounded by a projected increasing older population in the city. It was also felt that Covid-19 may lead to a long recession, resulting in higher rates of unemployment and lower incomes for many residents.

More broadly, participants felt that Covid-19 may have a long-term impact on lifestyles and working practices, with working from home becoming the norm for some of the working age population and more people having to give up work or reduce their working hours to take care of children. This would result in greater home heating costs as well as reduced incomes. More extreme weather patterns because of climate change may mean that homes have to be heated more and for longer, further contributing to fuel poverty.

One factor was mentioned that may reduce fuel poverty in the coming decade: namely, that national policies are likely to be introduced that will require privately rented properties to meet minimum energy efficiency standards, leading to better home insulation and improved heating systems throughout Aberdeen. This should mitigate the impacts of some of the foregoing factors to some extent. However, the overriding concern throughout the discussion was that more residents would end up in fuel poverty in the next ten years, and that the circumstances of those already in fuel poverty would become more difficult.

In the second part of the facilitated discussion, attention turned to what could be done to increase adoption of the heat network by 2030. Participants were encouraged to think beyond current planning, financial and technical constraints to develop scenarios that could really make a difference to energy and fuel poverty in the city.

To guide the discussion, participants were prompted to think about four "levers" for increasing uptake:

- Legislative levers: how could local, national and UK policy and legislation encourage uptake of the heat network?
- Infrastructural levers: what changes to physical aspects of the heat network might result in greater adoption?
- Financial levers: are there monetary incentives, for example for residents or property developers that could improve heat network adoption?
- Social levers: what might increase the acceptability or desirability of joining a heat network among the population of Aberdeen?

In terms of **legislative levers**, participants thought that it would soon be a statutory requirement for Aberdeen City Council to set a decarbonisation target that will apply to social housing and Council-owned assets, although the influence of the target was expected to be wider, spreading to privately owned properties in the city. Scotland-wide, requirements will start to come through for other

sectors, such as building, planning and transport, to enforce net zero targets, too. As the City Council is the planning authority, it can influence what happens in the new-build sector (this is considered in the new local development plan for 2022). However, planning policies tend to state that developers *should* do this or that, and developers often say it is not economically viable and adhere to the building regulations and no more. A return on capital of below 10%, for example, is considered not viable.

This led on to some discussion about whether the "shoulds" in planning policies could become "musts"; in other words, ought the optional aspects of compliance with energy policies to become mandatory, and what impact would this have on property development in the city? While enforcing compliance may seem to be a straightforward solution in theory, workshop participants warned that, in their experience, it may result in developers withdrawing from projects altogether due to the perceived non-viability of connecting to the heat network. An example was provided of two ongoing development projects in the city which, having been asked either to join the network or to create a local network, have opted to develop their own networks (specified by Aberdeen Heat and Power for future compatibility) since they could do so more cost effectively.

In terms of **infrastructural levers**, Aberdeen Heat and Power suggested that, theoretically, they could invest financial gains in extending the heat network to new areas of the city, connecting people as boilers fail. There was also some discussion about "anchor loads" - large buildings such as administrative offices, sports centres and hotels that can be used to connect the smaller buildings around them; if demand increased from these non-domestic customers, this could lead to an expansion of the network. It was also noted that, as smaller networks are connected, the resilience of the heat network improves because, if something goes wrong with a pipe in one part of the network, heat can be pushed round in another way; in other words, with expansion of the network comes increasing stability.

Financial levers were mentioned in the workshop and elaborated in a follow-up meeting with Scarf. Participants talked about the fact that people are most concerned about cost, reliability and disruption when deciding whether to join the heat network. One of the more radical scenarios suggested was giving everyone free energy, for example as an alternative to the money being put into furlough, a UK Government scheme introduced in early lockdown (spring 2020) to prevent people being made unemployed due to being unable to work or their employer being unable to pay them, by making contributions towards their wages. Fuel poverty is ultimately related to poverty, and this led to some suggestions directed at reducing poverty more broadly, for example introducing a new policy that nobody should pay more than 10% of their income on energy or putting a cap on rent so that other living expenses are more affordable.

In terms of **social levers**, participants focused on schemes to raise residents' knowledge and awareness of district heating specifically and of options for heating their homes more generally. Begun early enough, such interventions could prevent recurrence of fuel poverty in the future. This could be achieved through more funding – and more targeted funding – to the younger generation

to make them aware of heating costs and options when they move into halls of residence or buy their first home.

Having considered these four levers, discussion then focused on drawing out specific scenarios for increasing future uptake of the heat network to test using the agent-based model. This resulted in the following formalised scenarios for consideration by the modelling team, with a view to taking forward those that provide a range of scenarios for the second workshop, and that best demonstrate the potential of the agent-based model.

Legislative scenarios

Firmer encouragement by Aberdeen City Council for new private developments to join the heat network. This could be implemented through the city's Local Development Plan for 2022.

National (Scottish) decarbonisation legislation is introduced so that gas prices increase, with an impact on developers, homeowners, and landlords.

Infrastructural scenarios

1. Through its Local Development Plan, Aberdeen City Council makes it compulsory for anchor buildings to join the heat network, across the city or in targeted areas, from 2022.
2. Barriers to the rollout of the physical heat network, such as financial costs, roads, and planning restrictions, are removed. This is implemented through the Local Development Plan in 2022 and means that the network can be implemented immediately rather than gradually across the city. (This scenario was suggested in response to encouragement given to participants to think beyond existing constraints, so that more imaginative scenarios could be modelled).

Financial scenarios

1. Through its Local Heat and Energy Efficiency Strategy, the City Council places a cap on the cost of connecting to the heat network, making joining the network more attractive to homeowners and landlords.
2. National legislation is introduced to give free energy to all residents, effectively setting all energy prices to zero.
3. National legislation is introduced to cap the proportion of income spent on home heating at 10%.
4. Rent is capped so that nobody pays more than a proportion of his or her income on rent, effectively freeing up more income to spend on heating.

Social scenarios

1. New technologies arrive for individual homes (e.g., hydrogen boilers and fuel cells) or to increase the efficiency of the heat network, driving down the cost of energy.
2. SCARF introduces an awareness-raising strategy at schools, colleges and universities in the city so that young people have better knowledge about heating costs and their options.

Some – but not all – of these scenarios have been implemented in the agent-based model.

Insights to foster successful Social Innovations in energy transitions

In terms of insights into how successful social innovations in energy transitions can be fostered, several observations emerged from this workshop. First, it is helpful to identify the existing barriers to innovation so that they can be considered and tackled individually with a view to overcoming specific hurdles. For example, in the Aberdeen case, the barriers, broadly, are legislative, infrastructural, financial and social. This provides a framework for addressing "messy" challenges with multiple interdependent components.

Second, the policy "levers" to overcome barriers to social innovation in energy transitions span areas of local governance responsibility (e.g., energy, sustainability, housing and planning). Bringing together people from across these areas can help to identify which levers need to be pulled to address different barriers and unpack some of the complexity that may be involved in doing so, so that it is both understood by all the policy makers and can be represented in the model. In the Aberdeen case, Aberdeen Heat and Power and Scarf were critical to this process, providing first-hand knowledge of the practicalities of implementation and awareness of the lived experiences of those in fuel poverty and the scale of addressing the challenge.

Third, in the workshop we found it helpful to think about how the challenge can be addressed over a defined timeframe that is neither too short to accomplish real change, nor too distant for participants to imagine. For Aberdeen, we selected a ten-year period. This was questioned by participants, who initially found it difficult to consider how heat network uptake could be increased given current uncertainty around decarbonisation targets. There was also some hesitancy about the feasibility of achieving substantive change by 2030, given that it has taken nearly 18 years for the city's heat network to reach its current form. However, providing a time frame brought focus to the discussion and encouraged participants to be ambitious in considering what could be achieved in this period, thinking beyond the constraints that have typically hampered progress, since the goal of SMARTEES is, after all, to understand how such innovations can be better supported by policy.

Finally, Covid-19 has fundamentally changed the context in which social innovations take place. At the time of the first workshop (October 2020), participants speculated as to how Covid is changing the way people live and work, their priorities for the future, and how society functions. Ongoing monitoring is needed to ascertain the range and scale of the repercussions of the pandemic specifically, and it is an opportunity to understand how innovations can respond to sudden shocks more generally.

3.5.3. How to promote social acceptability and adoption of Social Innovations: Results of the policy scenario focus group in Timisoara

In Timisoara, the two policy scenario workshops took another form, those of one focus group, split into two phases: an individual reflexive phase and one group discussion phase (with small groups and plenary discussions). We should mention that the policy scenario alternative discussions were

postponed from the initially planned dates as a result of local elections in autumn 2020, including mayoral office. This election led to a number of significant changes (e.g., the power structure in the City Hall shifted from one major political party to another, new founded party), which further led to a phase of instability (with legal contestation of the election results) and uncertainty until things stabilized eventually and connections to relevant partners in the administration could be re-established.

The Timisoara policy focus group included participants from Timisoara City Hall, advisors for the Local City Council and the Mayor's office, representatives from West University of Timisoara, working on projects related to energy and social innovations, and the Intercommunity Development Association - Timisoara Growth Pole (an association responsible for attracting European funds and revitalizing the entire metropolitan area). In order for all participants to have a context for reflection and discussions for dealing with energy poverty in Timisoara, materials were created in Romanian language and distributed beforehand to all participants. This information was related to the SMARTEES project objectives and research activities, specific actions undertaken in the Timisoara SI, as well as the definitions and description for all the dimensions taken into consideration for the Timisoara SI acceptability and citizen empowerment (as identified under SMARTEES WP5).

During the focus group, several strategies to increase the large-scale acceptability emerged, which refer to the legislative/normative level, the informational level, the infrastructural level, and the technological level of policies or tools. It is of importance that participants made the distinction between social awareness/acceptability and buy-in. They felt that citizen acceptability can be increased via, for example, awareness campaigns, where people are introduced to the issues and their solutions, but to ensure the buy-in can be more complex. For citizens to not only accept, but also to change their behaviours towards new patterns of energy consumption, the solutions proposed from the municipality must be “thought through”, as well as to make improvements to present normative and regulatory tools, and to solve infrastructural and technological issues present for now. Thus, the municipality should first focus on solving pressing issues (e.g., the infrastructure network of the local heating company), then creating integrative strategies to be adopted by citizens.

Participants were exposed to all the tools, solutions, strategies and processes identified as relevant under WP5 efforts, being taken under consideration during both preparatory and discussions (plenary and small group work) phases, namely:

- Laws and regulations / normative and regulatory tools.
- Information and communication activities.
- Pilot projects (step by step implementation).
- Creation of working groups / task forces with multiple stakeholders.
- Infrastructural and technological policies or tools.

Laws and regulations / Normative and regulatory tools were identified by participants as one of the most important strategies for SI acceptability. This strategy came up as participants noticed a lack of a comprehensive, integrative top-down strategic plan with a longer time perspective. A larger umbrella was proposed, which could be called Green Energy Solutions for Timisoara, where the local heating company is at the core. This strategic plan should contain not only a clear description of objectives, but also clear solutions and actions to be made, in order for citizens to have a comprehensive understanding to make decisions on. Technical solutions, the costs, how they are covered, and what is the end bill for the consumer should be included in this strategic plan. Moreover, the strategy to change from association-based contracts with the local heating company to individual-based contracts (and metering) was discussed during the focus group. The issue with the present solution - the association -based contracts, is that for the local heating company is impossible to track how many individual users are, which are their individual heating needs are, and to make predictions related to future heating needs for Timisoara's citizens.

Information and communication activities were another strategy to ensure citizen's acceptability of the Timisoara SI. However, these awareness campaigns to inform citizens about the issues and their solutions should take place only after the technological, infrastructural, and normative barriers were addressed. Otherwise, if these barriers are not addressed, citizens can have the feeling that an unfinished solution is presented to them, with high expectations from citizens and not the City Hall. Thus, if citizens are expected to change their patterns of behaviour related to satisfying their heating needs, then the municipality and the local heating company should provide complete solutions which cover different needs and are adapted to different housing arrangements and household revenues (e.g., living in a house or in an apartment; premium, medium, small, or subsidised billing).

Pilot projects (step-by-step implementation) were also identified as an important strategy for citizen acceptability of the SI in the Timisoara case. Awareness and information campaigns can only go so far in making explicit both the gains and the losses from changing a behaviour related to energy consumption. Pilot projects have the major benefit that the solution proposed is tested by a small number of citizens in reality, thus being more tangible than an information campaign. If people see that the solution for fighting energy poverty is working for others, they will be more prone to embrace it.

Creation of working groups / task forces with multiple stakeholders refers to a newly introduced type of position in the City Hall: the neighbourhood managers. These new neighbourhood managers will have to liaise with residents, NGOs, and businesses in the neighbourhoods to identify all issues facing the community, including access to and efficacy of the heating. Because these managers are close to the citizen's realities of living, they should have the role of discussing energy related needs and grievances of the residents, and to liaise with the City Hall in order to offer solutions for it. Thus, the neighbourhood managers would act as a link between the citizens from different districts and the municipality. Moreover, the information campaigns conducted to ensure citizen acceptability and empowerment should involve neighbourhood managers, too, for creating and dissemination of information towards the local public.

Finally, **infrastructural and technological policies or tools** were identified as vital for social acceptability and adoption of social energy innovations in Timisoara. Two main issues were identified in relation to the existing infrastructure and technology in Timisoara, namely preparing the infrastructure of the city for a future use of electricity at a higher load (e.g., in the future, electric cars will be used more and more), and the rehabilitation of the old network and heating infrastructure. In relation to the future increase in energy consumption, specifically electric, the need to switch from fossil to clean energy was prompted, which should be integrated into the city planning to prepare Timisoara for new patterns of energy production and consumption (integrate structures for other types of energy such as wind or solar). This solution could take several forms of energy production and consumption, such as infrastructure for electric cars, solar energy captured in the same district where it is consumed, smart lightning with smart sensors installed on the lamp poles, or renewed technology for the local heating company. Regarding the rehabilitation of the old network and heating infrastructure, some ideas were discussed. A solution where only the rehabilitation of the old network (e.g., pipes) is the focus was deemed inefficient, multiple solutions being proposed. First, because a lot of heat is lost, leaking out from the buildings, the retrofit of old buildings was confirmed as one important step for ensuring a more efficient use of the energy produced. Related to this idea, another strategy was identified, namely, to certify all the buildings in Timisoara in terms of energy efficiency. This certification process should inform about heating needs and costs prognosis for each building, which should take place in the phase of project development. Another strategy related to the rehabilitation of the existing network and heating infrastructure was to extend the heat network in other areas of Timisoara. This latter strategy was found by the participants to be more of interest for the future, as for now, the local heating company is running on low power, which makes it a more pressing issue to find a solution to allow it to run at full capacity.

Based on these identified policies and tools for ensuring an increased acceptability of the SI by the citizens of Timisoara, several alternative policy scenarios were also proposed. Specifically, those alternatives were:

1) Top-down comprehensive, integrative strategies / strategic plans (from the City Hall) for longer periods of time (2030 in connection with the EU Green Deal initiative).
2) Embrace electricity as the new normal in preparing energy production and consumption at the district level.
3) A new role for neighbourhood managers (a new position just created in the City Hall).
4) Increasing the price for gas (increasing taxation/ raising taxes).
5) Fixed term contracts and individual consumer records.
6) Improve service quality.
7) Individual metering (how the district heating is paid in Timisoara).
8) Extending the heat network in the areas around Timisoara.

3.5.4. Results from the ABM's simulating alternative policy scenarios co-created in the policy scenario workshops delivered in Aberdeen

The second Aberdeen Policy Scenario Workshop had two main aims: first, to update participants regarding our progress with modelling the scenarios discussed at the first workshop; and then, to elicit their feedback on how the model could be improved. Participants in the first workshop were invited to attend the second workshop, along with SMARTEES researchers, which was delivered online (due to Covid-19 restrictions) in May 2021.

Concerning the content of the second round of policy workshops, the SMARTEES team reintroduced the agent-based model of Torry (ACHSIUM - Aberdeen City Heat Network Social Innovation Uptake Model), giving an update on progress made since the last workshop. Torry was used as the case to be modelled first because of planned extensions of the existing heat network and the advantage of it being a smaller population to work with whilst still being a meaningful spatial area. The sensitivity analysis was also introduced, and significant results from the sensitivity analysis were presented and explained. The presence of democratic decision-making households (as opposed to patriarchal or matriarchal decision-making) and a parameter called 'decision-bias were further discussed.

Concerning policy simulations work, of the ten potential scenarios developed during the first Aberdeen workshop, the following are being explored by the modelling team:

- Financial scenario 1: Through its Local Heat and Energy Efficiency Strategy, the City Council places a cap on the cost of connecting to the heat network, making joining the network more attractive to homeowners and landlords.
- Legislative scenario 2: National (Scottish) decarbonisation legislation is introduced so that gas prices increase, with an impact on developers, homeowners and landlords.
- Social scenario 1: New technologies arrive for individual homes (e.g., hydrogen boilers and fuel cells) or to increase the efficiency of the heat network, driving down the cost of energy.
- Social scenario 2: Scarf introduces an awareness-raising strategy at schools, colleges and universities in the city so that young people have better knowledge about heating costs and their options.

Legislative scenario 1 (firmer encouragement by Aberdeen City Council for new private developments to join the heat network) and infrastructural scenario 2 (barriers to the rollout of the physical heat network, such as financial costs, roads and planning restrictions, are removed) are also being considered. Additionally, the modellers are interested in exploring what would have happened if Aberdeen Heat and Power had been a for-profit organisation (Aberdeen Heat and Power was established by Aberdeen City Council in 2002 as a not-for-profit energy services company to deliver the heat network and is a critical element of the social innovation – therefore considering what could have been achieved in its absence may be a valuable exercise).

At the time of the workshop, the Aberdeen 'ACHSIUM' model was undergoing de-bugging and was presented to participants in its latest form, including a range of "switches" and "dials" for changing the parameters (Figure 2).

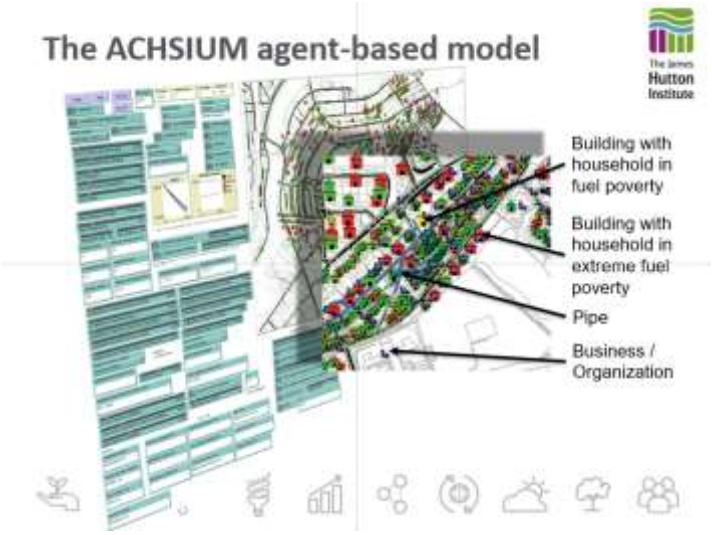


Figure 2. Slide presenting the 'ACHSIUM' model to participants in the second workshop

Preliminary results of financial scenario 1 (capping the cost of connecting to the heat network) were presented in the form of a pricing experiment, which looked for a tipping point of installation and ongoing costs for joining a heat network. Installation costs of £0-£6000 and cost per unit costs of 0p–22p per unit were explored. Results were presented as heat maps (see Figure 3) but currently showed no pattern – further work is needed to produce a meaningful output. However, the presentation was useful in demonstrating to the stakeholders the kinds of output a model such as this could show, and hence making clearer in their minds the capabilities of agent-based modelling.

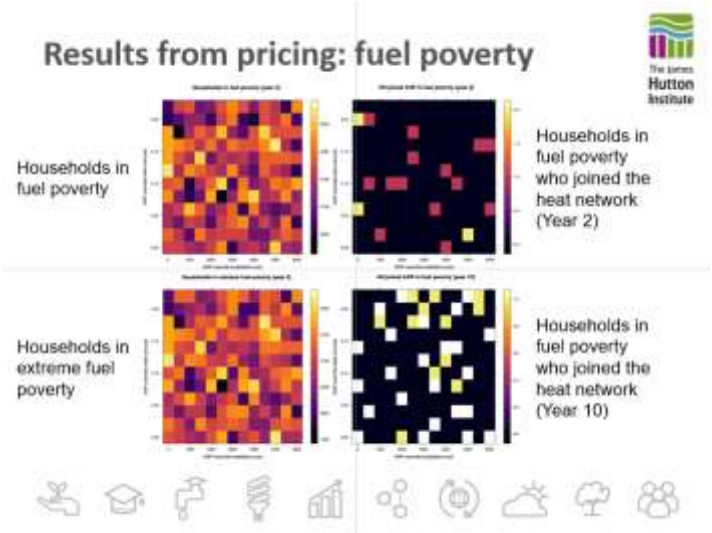


Figure 3. Heat maps showing results of pricing experiment, presented at the second workshop

Discussion following the presentation focused on clarifying aspects of heat network installation and fuel poverty that will enable the model to be refined. For example, the cost of connecting from the road to the entry point of a building is one that someone other than the resident may pay for, for example Aberdeen City Council, but the cost of connecting from the entry point to the property may need to be borne by the homeowner. In addition, the price per metre for installing pipe depends on where the pipe is being laid, with 'soft dig' areas such as grass verges being easier to dig up. The model may need to be adapted to look at where the ground is soft as this affects distribution routes and pricing. In city centres there are a lot of pipes and wires in every street that need to be moved out the way to install network pipes, so this in theory would make it cheaper in suburban areas with less concentrated wiring. Installation costs also depend on the density of blocks of flats.

Participants also provided feedback regarding the proposed scenarios being taken forward for analysis. In particular, regarding the arrival of new technologies, they clarified that the government is not keen on electric heating as an alternative to gas boilers in the future. Air source heat pumps and hydrogen are more efficient as they reduce the amount of investment that is required upstream.

There was also some discussion about the complexity of defining fuel poverty, which is currently defined in terms of the proportion of a household's income spent on heating the home. It is important to consider what people *would* spend to heat their homes adequately, as well as what they *do* spend, so that new technologies are equipped to address the challenge fully.

Subsequent to the workshop, the following scenarios were taken forward:

- Legislative scenario 2: National (Scottish) decarbonisation legislation is introduced so that gas prices increase, with an impact on developers, homeowners, and landlords. This was represented in the model by a ban on new gas installations, with gas prices rising thereafter.
- Social scenario 1: New technologies arrive for individual homes (e.g., hydrogen boilers and fuel cells) or to increase the efficiency of the heat network, driving down the cost of energy. To do this, a new technology was introduced into the agent-based model as a tariff with a high connection cost (to represent the installation of new equipment) and lower ongoing costs (to represent more favourable conditions for the technology).
- Social scenario 2: Scarf introduces an awareness-raising strategy in schools, colleges and universities in the city so that young people have better knowledge about heating costs and their options. For this scenario, awareness-raising campaigns were implemented in the model concurrently with street votes to make more favourable conditions for adoption. This is thought to have an impact on early adopters by informing them that the heat network will keep them warm, which has a ripple effect through their social network.

Details of these scenarios and how they were implemented are provided in Deliverable 7.4 (Report on scenario development and experiments for selected cases). Results suggest that legislative scenario 2 (decarbonisation) and social scenario 1 (arrival of new technology) have a similar influence on the rollout of the heat network and the number of households in fuel poverty, with new

technology being slightly better than decarbonisation for number of households in extreme fuel poverty. Generally, social scenario 2 (implementation of an awareness-raising strategy) had greater impact, with more heat network pipe laid, more households using the heat network, and fewer people in fuel poverty and in extreme fuel poverty.

In the following descriptive boxes, we illustrate three of the scenarios described above, explaining the main results from the agent-based model simulations.

ALTERNATIVE SCENARIO N.1

DECARBONISATION OF DOMESTIC HEATING

CASE STUDY: ABERDEEN

Picture: Aberdeen Harbour @Bruce McAdam. Retrieved from https://commons.wikimedia.org/

FACTUAL SCENARIO

Between 1970 and 2005, the percentage of **UK homes using central heating systems increased from 30% to 95%** as more and more domestic buildings were connected to the gas mains; the figure remains at 95% today (1).

Heating accounts for around a third of household greenhouse gas emissions. However, natural gas is relatively cheap, it is readily available in most towns and cities, and **the technology is familiar to citizens**.

Transitioning households away from gas and onto cleaner, greener ways of heating, such as the district heating scheme provided by the **Aberdeen Heat Network**, therefore poses a challenge.

FACTS

95% of homes in Aberdeen are connected to the gas network.

40% of UK CO2 emissions come from domestic households.

The average UK household generates 2,745kg of gas emissions from heating.

(1) Statista (2021) UK: heating methods survey. https://www.statista.com/statistics/426988/united-kingdom-uk-heating-methods/

ALTERNATIVE POLICY SCENARIO

To meet the Scottish Government's ambitious target of net zero carbon emissions by 2045, it is likely that new domestic gas boiler installations will soon be banned, lowering carbon emissions and fundamentally changing the way homes are heated across the country. **This alternative scenario models the impact of such legislation, with new gas boiler installations being banned in Aberdeen from 2020 and gas prices rising significantly thereafter**.

The scenario emerged from discussions with representatives from Aberdeen City Council, Aberdeen Heat and Power and Scarf during **policy workshops** and is considered credible although the date of implementation may differ in reality. Over time, **these measures are expected to increase demand for and uptake of the heat network by driving developers and home-owners to explore alternative heating solutions**.

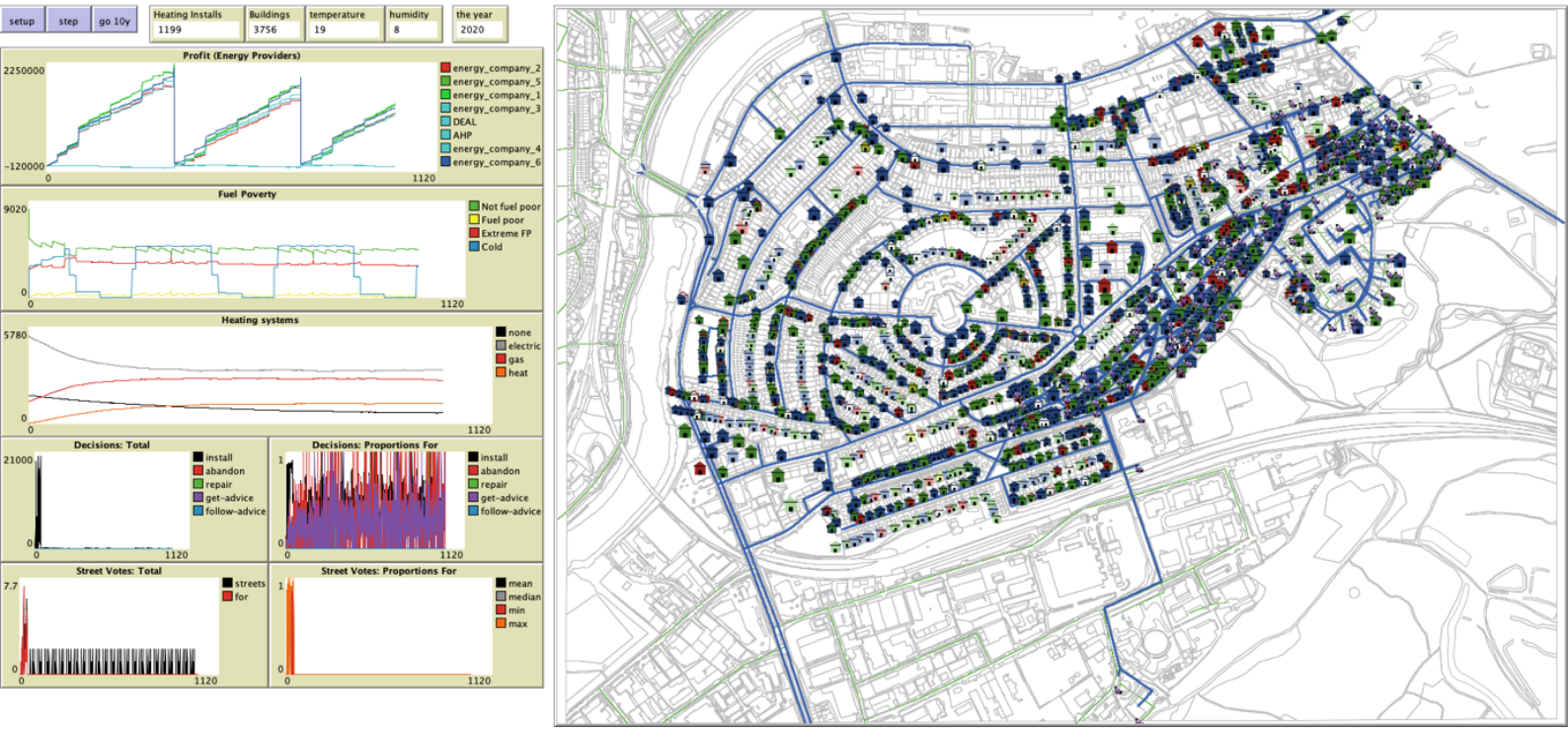


Figure 1. The ACHSIUM model featuring the Aberdeen case study.

RESULTS

Measures relating to decarbonisation of domestic heating – specifically **banning gas boiler installations and increasing gas prices – did not lead to many more heat network pipes** being laid in Aberdeen. This may be due to such measures being **insufficient** in themselves **to increase rollout of and demand for district heating** in the city, since both **access to and awareness of the network are low** outwith specific pockets where it has been developed to date. Such a policy may, however, be **more impactful if implemented in conjunction with** other initiatives such as an **awareness-raising campaign**.

ALTERNATIVE SCENARIO N.2

ARRIVAL OF NEW DOMESTIC HEATING TECHNOLOGIES

CASE STUDY: ABERDEEN

FACTUAL SCENARIO

Like most cities in the UK, Aberdeen is characterised by **limited options for domestic heating**, primarily gas (the most prolific) and electric. A small proportion of innovative households have opted for alternative, often **greener, sources of heating** in recent years.

It is against this relatively unchanging backdrop that the **Aberdeen Heat Network** has been rolled out thus far, representing **the only affordable low carbon alternative** available to many residents in the neighbourhoods in which it has been introduced.

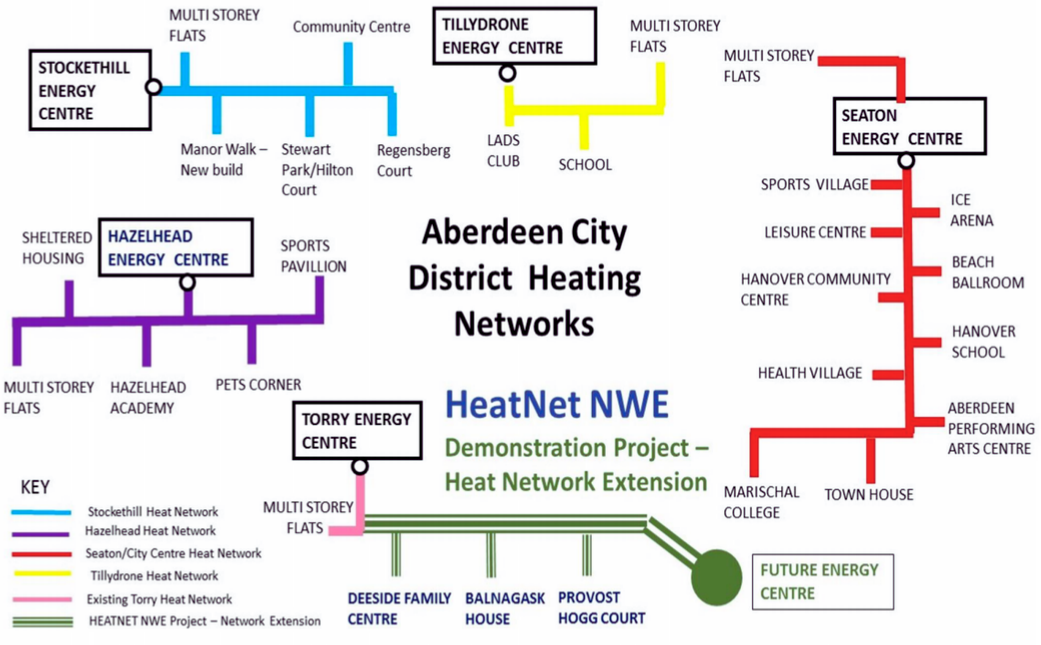
Availability of the heat network is dependent on the rollout of the physical infrastructure, which is fraught with challenges.

FACTS

The Aberdeen Heat Network is currently available in the neighbourhoods of **Stockethill, Hazlehead, Seaton, Tillydrone** and **Torry**.

There are currently over 830 heat networks in Scotland.

The Heat Networks (Scotland) Act (2021) legislates to support the growth of heat networks by improving standards and consumer confidence.



ALTERNATIVE POLICY SCENARIO

In this alternative scenario, new domestic heating technologies arrive on the market as a viable option for home-owners and developers. These might include hydrogen boilers, air source heat pumps or fuel cells, which become available to install in individual households in the near future, before the heat network is extended to all areas.

Although these technologies are in development, they are not yet readily or affordably available to most home-owners, so this currently represents a **"what if?" scenario** in which we explore what could happen should this transpire. It is represented in the agent-based model as **a new tariff starting in 2022 with low connection and ongoing costs, given that such technologies are likely to be associated with grants and incentives.**

RESULTS

Introduction of new domestic heating technologies has a slightly negative impact on demand for the Aberdeen Heat Network, represented in the model by the rollout of pipes and street-level demand through 'street votes'. Households comprising innovators and early adopters would install the new technology before the heat network becomes available in their area, at which point their incentive to invest in another new heating system will likely be low.

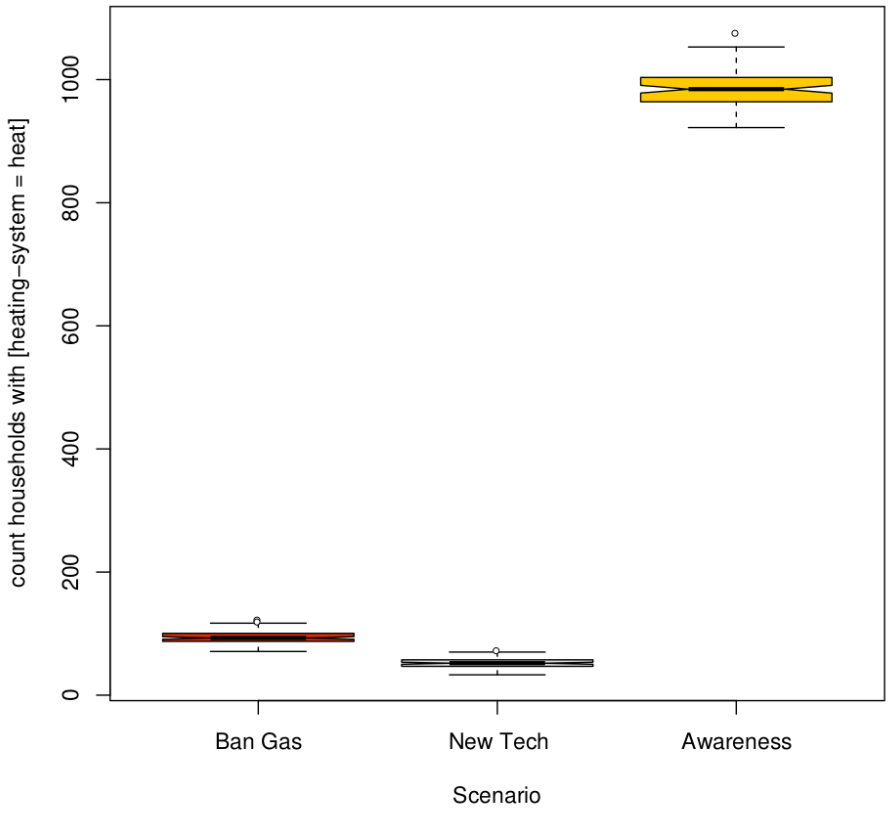


Figure 1. The introduction of new technologies results in slightly lower uptake of the heat network.

ALTERNATIVE SCENARIO N.3

AWARENESS-RAISING CAMPAIGN

CASE STUDY: ABERDEEN

FACTUAL SCENARIO

The Aberdeen Heat Network is underpinned by an innovative partnership between three organisations: **Aberdeen City Council**, **Aberdeen Heat and Power** (established by the Council as a **not-for-profit energy services company** to deliver the heat network) and **Scarf**, a **local charity** whose purpose is to deliver a range of sustainability and energy-related services and advice to householders, businesses and communities.

The partnership has enabled the network to expand from the **first development in Stockethill's multi-storey blocks in 2003-2005** to neighbourhoods across the city, most recently to **Torry** where an **energy-from-waste plant** processes non-recyclable waste to produce heat for one of the most deprived areas of Aberdeen.

FACTS

50% of respondents to a survey conducted in Aberdeen for the SMARTEES project reported being *somewhat likely*, *likely*, or *highly likely* to join a district heating scheme if it was available in their area.

Over 30% of respondents to the same survey placed a high level of trust in energy advice organisations such as Scarf.

Picture: Housing in Torry @Lizzie Retrieved from: https://www.geograph.org.uk/photo/11572

ALTERNATIVE POLICY SCENARIO

In this alternative policy scenario, Scarf runs an **awareness-raising campaign promoting energy efficiency and the Aberdeen Heat Network in schools, colleges and universities across the city**. The target population is **young people and younger adults** on the grounds that early interventions could prevent the recurrence of fuel poverty in the future. The idea for this scenario emerged from a workshop with key stakeholders in the Aberdeen case study. **In the agent-based model the scenario was implemented by predisposing early adopters to positive perceptions of the heat network's ability to keep them warm.**

RESULTS

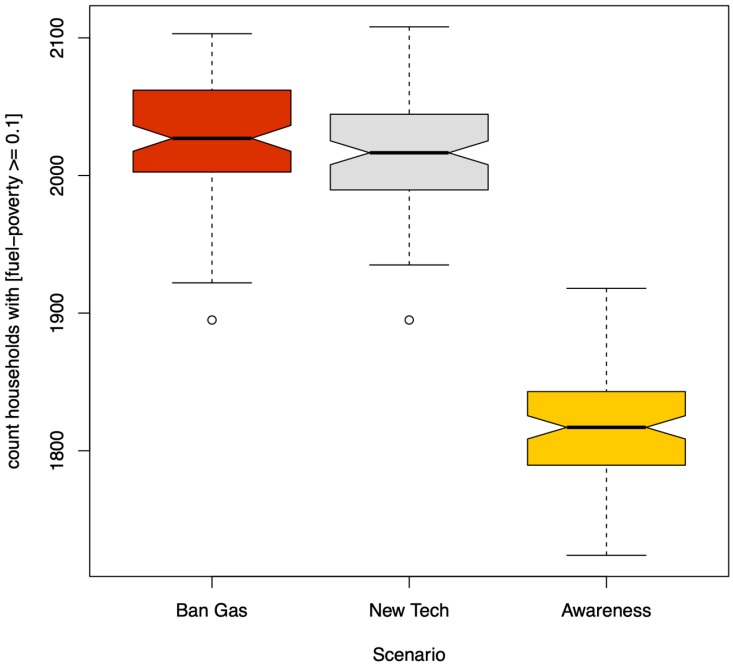


Figure 1. An awareness-raising campaign ultimately results in fewer households in fuel poverty.

Awareness-raising campaigns had a larger influence on adoption than other measures, such as banning new gas boilers and introducing new heating technologies.

The model showed that **an awareness-raising campaign could most quickly and effectively lead to higher street-level demand** ('street-votes'), more pipe being laid, more households being connected, and – critically – fewer residents in fuel poverty.

The campaign achieves this by convincing early adopters to join the network, which in turn makes their social network more likely to join, resulting in positive outcomes over the ten-year period of the scenario. Further analysis could be done with the model to understand how adoption spreads through the early adopters' networks to ensure those in or most at risk of fuel poverty are reached first.

To the same end, insights may also be gained from simulating an awareness campaign in a particular geographical area of the city (e.g., an area of multiple deprivation), or among a particular demographic group (e.g., older people living alone). These provisos notwithstanding, the **findings suggest that social levers can be a powerful mechanism for driving demand** and that **social networks are crucial in spreading uptake of the innovation**.

3.5.5. Policy recommendations for the implementation and assessment of energy transitions based on 1.1.energy efficiency schemes for fighting fuel poverty

Results from the Aberdeen model suggest that, of the scenarios tested, awareness-raising campaigns have a larger influence on heat network adoption than other measures, such as decarbonization or the introduction of new energy technologies. The model showed that an awareness-raising campaign could lead, most quickly and effectively, to more pipes being laid, more households being connected, and – critically – fewer residents in fuel poverty. The campaign achieves this by convincing early adopters to join the network, which in turn makes their social network more likely to join, resulting in positive outcomes over the ten-year period of the scenario.

While these findings align with Diffusion of Innovation Theory (Rogers, 1962), they assume a highly effective awareness-raising campaign, which would require considerable design effort in the "real world": not all campaigns will have the desired effect. In the model, the campaign is formalized as values in particular algorithms, and no insights are given as to *how* to raise awareness effectively.

Further analysis could be done with the model to understand how adoption spreads through the early adopters' networks: who is influenced first and where are they located, to ensure those in or most at risk of fuel poverty are reached first. To the same end, insights may also be gained from simulating an awareness campaign in a particular geographical area of the city (for example, an area of multiple deprivation), or among a particular demographic group (for example, older people living alone).

These provisos notwithstanding, the findings suggest that social levers can be a powerful mechanism for spreading uptake of the innovation. These findings will be shared with stakeholders at a subsequent meeting, in which we hope to generate further insights into their implications for policy.

Based on **Timisoara focus group discussions** on alternative policies and their subsequent drivers and barriers, several policy recommendations of best strategies to gain large scale adoption for the SI emerged, for several phases of project development. First, **the infrastructural and technological policies or tools should be made available**. The issues related to improving the quality of services in the energy domain with investments in rehabilitation of the old network and heating infrastructure should be a priority, in combination with the efforts towards retrofitting the old buildings. In this way, both local administration and citizens have lower costs for heating, energy consumption is more efficient and the issue of energy poverty is addressed. With energy losses being addressed and fixed, the existing infrastructure at the city level should be enhanced in order to respond to future energy needs (e.g., increased use of electric cars, integrating smart technology for energy consumption such as smart lightning). When these issues are addressed, then extending the heat network in the areas around Timisoara can be considered.

Second, **top-down comprehensive, integrative strategies (from the City Hall) for longer periods of time** (2030 in connection with the EU Green Deal initiative) can be devised. These strategies should offer a clear, comprehensive and consistent vision and actions to its partners and citizens, including

the costs for energy consumption. Moreover, neighbourhood managers could have an important role of facilitating communication between the City Hall and the citizens, playing a role in citizen empowerment. Also related to normative and regulatory tools, a change from association-based contracts to individual/household based contracts for heating services provided by the local heating company could be fruitful to both the producer and the consumer.

Third, **the need for pilot studies,** by selecting certain areas in Timisoara, following a previous evaluation phase, to test new technologies and their associated social component appeared to be urgently needed to increase the level of social acceptance. These pilot studies should consider not only the financial dimension, as is the current trend to emphasize the economic component (e.g., cost reduction), but also other dimensions to be highlighted, such as well-being or health issues.

Unlike in the Aberdeen case study where the awareness-raising campaigns for sustainable energy consumption have a greater influence on heat network adoption than other measures, the influencing factor in the Timisoara case study is the existence of an integrated strategy with an extended time dimension that the municipality has to provide and to monitor its implementation. To ensure the success of the action and a high degree of social acceptance of innovation in this field, it is essential that this strategy: (a) is the result of a co-creation process in which decision-makers together with citizens, energy providers, infrastructure departments, and technology departments engage, starting from understanding the real problems that people face, to design viable solutions (need-based approach); (b) is designed for at least one decade (future-based approach); (c) is clear and accessible, and progress easy to verify and monitor (indicator-based approach); (d) considers several dimensions and levels, of the neighbourhood, city, surrounding areas, etc. (multilevel-based approach), and (e) is transferable (transfer-based approach).

4. Conclusions on the best social innovation approaches to realizing local transitions to energy efficiency and sustainability

Local energy social innovations are not just focused on saving energy but on multiple dimensions of quality-of-life, wellbeing, and the satisfaction of a diversity of societal needs, in specific contexts when interventions affect large groups of the population or deprived communities. As described in each cluster's analysis, a series of barriers and impediments have been identified in most of the case studies. For instance, as both clusters on urban mobility highlight, when a new policy attempts to modify largely adopted social practices, resistance and contestation arise. People are usually reluctant to disruptions of the status quo. Thus, often, only the people who are experiencing problems in the current conditions, or people who are specially concerned regarding the significant issues that the new policy intends to face, will be promoters or supporters of the SI.

Second, top-down approaches frequently cause strong contestation, reluctance, or lack of consensus among some relevant actors in the implementation of the new energy policies. Most of the cases studied in this project present exemplary practices in public consultation, negotiation among diverse interests or even instances of direct democracy (e.g., referenda). However, these participatory approaches are often the result of policy learning processes that evolved from top-down measures to a paradigmatic model of participation that gathered a wide representation of various agents and stakeholders. Furthermore, in SMARTEES we studied a series of cases that deal with communities suffering for special situations of deprivation or isolation. For example, in the fuel poverty cluster, neighbourhoods face broad legislative, infrastructural, financial, and social barriers that constitute a challenging framework for SI to be displayed. Those barriers should be tackled with a view to overcoming specific hurdles.

The aim of this last chapter is to provide a series of insights and recommendations into how successful social innovations in energy transitions can be fostered. In this endeavour, we distilled the main insights on the most effective approaches to implement local social innovations in the energy domain, taking into consideration the barriers and limitations mentioned above. These insights draw from the inputs of the policy scenario workshops delivered and, specifically, from the results of the ABM's simulating alternative policy scenarios co-created in the policy scenario workshops, that modelled a series of alternative policy avenues that encourage wider adoption of energy-saving innovative solutions.

4.1. Insights from ABM's simulating alternative policy scenarios co-created in the policy scenario workshops

The first and second round of policy scenario workshops allowed room for discussing diverse alternative policy scenarios (most of them were not tested in the ABMs so far). The majority of

these scenarios focused on strategies enhancing citizen and stakeholder involvement in SI (e.g., targeted communication strategies, participatory approaches), followed by legislative and financial schemes encouraging SI adoption (e.g., pilot projects, legislations, financial measures). Environmental education, awareness-raising policies and the creation of new social norms and cultural norms were also elicited as strategies to gain SI acceptability. Table 9, below, presents an overview of the different strategies co-produced in the workshops and the relevant dimensions that these alternative policies address.

Table 9. Synthesis of strategies for gaining social acceptability and dimensions addressed in policy scenarios co-designed in the SMARTEES policy scenario workshops

	ALTERNATIVE POLICY SCENARIOS AIMING AT INCREASING SOCIAL ACCEPTABILITY							
RELEVANT DIMENSIONS	Targeted Information, communication (SI)	Participation of policy actors and citizens in SI co-designing	Support changes in social norms	Pilot projects	Infrastructure & technologies	Awareness-raising (health, quality of life)	Environmental education (wide context)	Legislative measures & financial schemes encouraging SI adoption
Citizen resistance	El Hierro Groningen	Malmö Stockholm Samsø		Vitoria-Gasteiz Barcelona	Aberdeen	Vitoria-Gasteiz Barcelona Aberdeen	El Hierro	Aberdeen Timisoara Samsø
Policy resistance		Groningen		Groningen				
Social norms			Groningen			Groningen	Vitoria-Gasteiz	
Lack of confidence in the project				Groningen Timisoara		Aberdeen		
Place identity/attachment	Vitoria-Gazteiz	Stockholm Samsø Stockholm	Groningen	Groningen			El Hierro	
Commitment of relevant actors		Vitoria-Gasteiz Barcelona Samsø						Samsø Stockholm Malmö

		Timisoara						
Satisfaction of experiential needs	Vitoria-Gasteiz Barcelona El Hierro		Groningen		Samsø	Aberdeen	Vitoria-Gasteiz Stockholm Malmö	Aberdeen Malmö Stockholm Samsø
Satisfaction of social/psychological needs (security, belongingness, relatedness, status, reputation)	El Hierro	Stockholm Samsø	Groningen					
Satisfaction of need of acknowledgement	Vitoria-Gasteiz Barcelona	Stockholm	Groningen		Groningen		Groningen	
Values: autonomy, biospheric and social oriented	Barcelona	Stockholm		Groningen	Samsø		Groningen	
Awareness of economic impact	Barcelona El Hierro	Samsø			Aberdeen Samsø		Groningen	
Facing economic issues (Fuel poverty)					Timisoara			Aberdeen Timisoara Malmö Stockholm

Six different policy approaches have been elaborated, modelled, and tested **through agent-based modelling** until the submission of this deliverable – more are finalized until the end of the project (see Table 10). Among them, **targeted communication strategies** have been co-defined in several clusters of social innovation, like the clusters of holistic mobility (cluster 1) and superblocks (cluster 4), as well as the island cluster (cluster 2). Different **participatory approaches** have been tested in cluster 1, 2, 3 and 4, while **awareness-raising campaigns** have been modelled in clusters 2, 4 and 5 (fuel poverty). Finally, in cluster 5 two specific policy scenarios addressing fuel poverty issues have been implemented that focus on legislative and technological changes: **prohibition of domestic gas installations** and **accessibility to new domestic heating technologies**.

Table 10. Types of alternative scenarios modelled in the five clusters of social innovation

Alternative policy scenarios	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Local media communication strategies focussed on affirmation of benefits of SI	X				
Targeted communication strategies addressing social and experiential needs		X		X	
Participatory approaches to increase citizens´ support towards SI		X		X	
Awareness raising campaigns		X		X	X
Legislative scenarios banning gas installations					X
New technologies for energy efficiency in households					X

Strategic communication approaches

Strategic communication approaches have been implemented in the ABM for the cases of Groningen, Vitoria-Gasteiz and El Hierro. In Groningen, communication strategy is modelled using local media aiming at testing the impact of creating a city-wide influence of advertising in favour of the closure of the park for cars. The campaign stresses the benefits of having a car-free park. In the case of Vitoria-Gasteiz, a targeted communication campaign is addressed by the City Council using different formats to reach wide audience. In the Vitoria-Gasteiz model, the strategy specifically addresses the satisfaction of the need for comfort, to anticipate residents' contestation towards new parking policies in superblocks.

In the El Hierro case study, two alternative strategies launched by the island council were tested, which consisted of a targeted communication addressing only the need for economic sustainability or oriented to fulfil the need for prestige, environmental quality, and economic sustainability. The model shows that these three dimensions are relevant for people to support the expansion of the energy project.

The results of the three models demonstrate that targeted campaigns can influence people's attitudes towards the SI, influencing their voting orientation in a hypothetical consultancy in favour or against the SIs. Interestingly, in the Groningen case the greater impact is obtained when the affirmative campaign is held right before the referendum. On the contrary, in Vitoria-Gasteiz and El

Hierro the most effective policies are implemented since the beginning of the project and are maintained across the project.

The efficacy of designing specific campaigns addressing citizen's social and experiential needs and emphasizing the positive benefits of the superblocks model (e.g., enhancing the health and the road safety conditions for the residents of the neighbourhood) has been confirmed by ABM. However, the results from the model stress the **importance of the scope of the policy**. Thus, a large audience should be reached for these campaigns to be effective. Besides, **involving different social actors** leading or supporting the campaign (local associations and local press) increases social acceptability.

Although economic dimensions and comfort become relevant for specific groups of population, **public acceptability relies also on the fulfilment of social needs like gaining prestige and reputation, increasing environmental quality or wellbeing**, and all of them should be addressed when a communication strategy is designed.

Participation of citizens, social and policy actors in the SI co-designing process

Alternative policy scenarios modelling the impact of participatory approaches have been tested in Vitoria-Gasteiz and El Hierro from different perspectives. In Vitoria-Gasteiz the model simulated the effect of social interaction fostering random communications among residents in a same area and their social networks (friends, family, neighbours) through creating arenas for exchange. Similarly, in El Hierro's model, a plan of participation, consultation and, to an extent, co-creation of a common vision of the island energy transition was simulated.

The results of the model confirm that **participatory policies** addressing the need for citizens to participate and feel they have the capacity to influence the policies that affect them **are extremely effective**. The opinion dynamics generated in such participatory events (e.g., meetings with residents) have an impact on the citizens' attitudes towards the SI. In El Hierro, participatory approaches are very promising, especially if this policy is displayed with large levels of intensity and sustained over time. Again, the model of Vitoria-Gasteiz stresses that participatory approaches are more effective in they are endorsed by the media, as well as other relevant local actors who people trust.

Awareness-raising policies

A third type of alternative policy scenarios implemented in Cluster 4 and 5 simulated the impact of environmental awareness strategies aiming to increase citizens knowledge about environmental or energy issues. In the Aberdeen case, awareness-raising campaigns are simulated by informing young people that the local heat network will keep them warm and tests its impact in terms of district heating adoption. In the case of Vitoria-Gasteiz, the campaign aims to increase residents' concern about wellbeing and environmental quality, addressing the importance of achieving a clean and healthy environment.

The results of the model in Aberdeen show that awareness-raising campaigns had a larger influence on SI adoption than the other tested interventions and can rapidly and effectively lead to higher

number of households connected to the local heat network by persuading younger households to join the network. However, single awareness-raising campaigns in Vitoria-Gasteiz show poor efficacy in the simulations. However, social acceptability rises significantly if this campaign is supported by local actors and is combined with participatory approaches. The findings suggest that social levers can be a powerful mechanism for driving social acceptability and that social networks are crucial in spreading uptake of the innovation.

Legislative scenarios banning gas installations

The Aberdeen case developed singular scenarios that put the focus on the expected future evolution of the energy market. A legislative scenario was implemented simulating the impact of the prohibition of gas boiler installations in households and increasing gas prices. The results of the model show that coercive measures do not lead to more adoption of heat network connections. Such measures seem to be insufficient in themselves with respect to the heat network, although it could be more effective if implemented in conjunction with other initiatives such as an awareness-raising campaign.

Technology upgrade for energy efficiency in households

This policy scenario was only implemented in the Aberdeen case, referring to accessibility to new technologies for energy efficiency in individual homes that would increase the efficiency of the heat network, driving down the cost of heating. The results show that this policy has a slightly negative impact on demand for the Aberdeen Heat Network because early-adopters would install the new technologies before the heat network becomes available in their area, which would decrease their interest to invest in another new heating system.

4.2. Best practices for the implementation of energy local social innovations. Insights from the multistakeholder deliberative workshops

Beyond the results of the policy scenarios modelled, the multistakeholder deliberative workshops organized in the frame of WP5, provided deep expert knowledge on best strategies to gain social acceptance of local social energy innovations. It appears that success of policy development in the context of social innovation relies on the capacity of SI promoters to actively engage citizens and specific groups affected in inclusive processes of co-creation or policy co-designing, since the beginning of the planning process. Consultation and co-creation processes become normative in deprived contexts and specific efforts might also be needed for vulnerable groups and communities which might be less inclined to make their voice heard, to make sure that their needs are fulfilled and anticipate negative reactions against the new policy.

Concerning best practices to develop participatory approaches, the following lessons have been reported by the participants in the policy scenario workshops:

- Urban mobility plans should structure public participation in different levels of engagement at the city or neighbourhood level. Further, involving opponents involving critical voices from the very beginning in the deliberative sessions reduces opposition and, eventually, opponents turn in-to supporters.

- Build trust and confidence in the effectiveness of the SI. A climate of trust, transparency and open communication must be generated, in which the participants feel comfortable, to foster participant's confidence in the leadership of the project.

- Dedicate time and resources to participatory process allowing sufficient time for reflection, discussion, and maturation of proposals. Participants appreciate that the promoters dedicate time and effort to reach agreements and building consensus about the project. While time pressure is considered negative, participants need also to perceive that progress is being made and their contribution is meaningful. The more (positive) citizens are being involved in a project, and the more they experience that their input is being appreciated and being used, the more support there will be for developing plans.

- Establish alliances with stakeholders and opinion leaders supporting the SI. Some stakeholders play a key role in citizen participation processes. They can help to reach people that might elude the information provided by the city council. They can also endorse the goals and benefits of the SI, contributing to gain social acceptance. Achieving political consensus and social agreements are important elements for the success of the SIs.

- Elaborate a good diagnosis for anticipating barriers to SI. It is helpful to identify the existing barriers and relevant social needs that need to be addressed. It is advisable to design all the interventions aiming to deliver co-benefits, environmental, social and economic, based on an analysis of the neighbourhood's needs carried out ahead and during the consultation with residents.

- Negotiate constantly with citizens or specific groups (e.g., the representatives of the main important business groups) on specific measures.

Participants in the policy scenario workshops stressed the importance of implementing – at an early stage– targeted communication and dissemination strategies about the ambition, the characteristics, and the changes that the SI involves. Policies addressing the satisfaction of needs for comfort have been already implemented in the ABM and as pointed in the previous section, the outcomes of ABM showed that social approaches are very promising. However, other needs have been pointed in the workshops as relevant for citizens to be addressed in targeted communication strategies. For example, the need for safety, involving both infrastructure and normative measures has been deeply discussed concerning urban mobility policies. Addressing the satisfaction of need of belonging and gaining social cohesion might contribute to increase public support to interventions that enhance public space in neighbourhoods. Addressing environmental values and connecting the goals of the SI

with climate emergency goals or health conditions might increase public support to environmental policies.

Adequate financing of the social innovations appeared to be very important, especially in deprived communities in which any intervention that might generate additional costs that people cannot afford will have problems to succeed. As the fuel poverty cluster shows, income is a relevant dimension for the adoption of district heating. Public policies for financing renewable energy production installations become indispensable in small, isolated, territories due to difficulties to mobilise sufficient resources.

The approach undertaken, which mixed multistakeholder deliberative workshops to co-create alternative policy scenarios, with agent-based simulations of these policies to test their effects on overall public acceptability, as well as adoption of different social innovations has provided a wealth of information on best strategies to foster acceptability in dynamic processes of implementation of energy-related social innovations. Such mixed approaches are a very promissing avenue for the exploration of alternatives and can be a useful participatory, deliberative decision-making tool in local contexts where energy transition objectives have been set. The SMARTEES project hopefuly provides a useful example of what can be achieved through such mixed approaches.

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ANNEXES

Annex 1: Report on Policy Scenario Workshops Cluster Holistic, Shared and Persistent Mobility Plan

Figure: map of the computer simulation of the Groningen case

Project Full Title	Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability	
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Deliverable	D5.2 Elaboration of Policy Recommendations for each cluster of case-studies. ANNEX 1. Report on Policy Scenario Deliberative Workshops: Cluster Holistic, shared and persistent mobility plan	
Delivery Date	31.08.2021	
Author(s)	Patrycja Antosz, Loes Bouman, Wander Jager (UG), Gabriele Quinti (J&I)	
Contributor(s)	Niklas Mischkowski (ICLEI)	
level:	Public (PU)	**X**
	Confidential, only for members of the consortium (CO)	

Keywords
Policy scenarios, energy local social innovation, energy transitions, social acceptability, social innovation adoption

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1. Case Study Background

Groningen

Groningen is an old, compact city originating from the third century with around 200.000 inhabitants, including a student population of around 60.000. Since the early 1970's the city planning has focused on facilitating cyclists and pedestrians in the city, and de-intensifying car-use in the city. Groningen tops three categories in a 2015 EU survey of the quality of life in 79 European cities (Flash Eurobarometer, 2016[6]), with 94% of the Groningers reporting to be (very) satisfied with the public space. Health service (95%) and education (89%) also scored very high in this survey. In terms of its total score, Groningen came in third place, behind Aalborg and Hamburg. Zurich, also a case study in the SMARTEES project, Oslo and Copenhagen were ex aequo with Groningen.

The visual quality of the city of Groningen is high. The combination of many old buildings and monuments with modern architecture such as the Groninger museum, Dot, together with lots of green areas and waterways provide a rich visual experience. The air quality of the city is rated as (very) good by 94% of the population (Flash Eurobarometer 2016). The acoustic quality of the city is generally high as well. 85% of the Groningen inhabitants are satisfied with the noise level (Flash Eurobarometer 2016). Due to the absence of a constant humming from car traffic the soundscape is open and provides references to special places, such as the carillon of the academy tower and the large bells of the Martini tower.

Due to the intensive use of cycling, emissions of CO2, NOx and fine particles from private transport are relatively low. Also, household emissions demonstrate a decreasing trend, partly due to intensified insulation of buildings (Stadsmonitor, 2015). The demographics of the city show a high number of young and highly educated people, which comes as no surprise with 60.000 students living in the city. Due to the many students and the relative low employment rate of the non-student population, the average income is one of the lowest in The Netherlands (Stadsmonitor 2015).

The Traffic Circulation Plan, implemented in 1977, was the start of the holistic traffic planning, and several developments and plans have followed in the years after. We specifically focussed on the case of the closure of the Noorderplantsoen park for cars starting in 1993. In this park, the traffic situation had become more problematic over the years. In particular, sharing of the road by cars and cyclists turned out to be unsafe. Moreover, quality of the park decreased due to NOx, small particles and sound emissions, and a lower safety, especially for playing children. The situation brought the local population and policy makers together in organising a referendum on closing the

[6] Sources: Flash Eurobarometer (2016). Quality of life in European Cities 2015. FLASH EUROBAROMETER 419. European Commission, Directorate-General for Regional and Urban Policy REGIO DG 02 – Communication. Luxembourg: Publications Office of the European Union, 2016

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Noorderplantsoen for car traffic. In October 1994, after a test closure of one year, a majority vote of 50.9% decided in favour of a permanent closure. Currently, about 95% of respondents of a questionnaire indicated to be in favour of keeping this park car free. Because of the interesting social dynamics in this case, and the fact this was the first ever advising referendum organised in the Netherlands, we focussed on modelling this case for the Groningen case study.

Zürich

The story of the Zürich Mobility Strategy goes back to the 1970s. Until the 1970s, public spaces in Zürich were designed primarily to handle automobiles (a "car-friendly city" as symbol of progress). In the 60s and 70s the city administration developed two different projects for underground solutions for short distance public transport. Both projects have been rejected in referendums. In fact, this vote against large investments in new technologies made clear that tax-payers wanted the existing surface public transport system working better and more efficiently instead of leaving surface to cars and adopt a two level (surface and underground) mobility system. In this regard, immediately after the second referendum (1973) a “people’s initiative” was launched for projects to speed up trams and buses. As a matter of fact, this initiative marked a discontinuity in the development of the city and gave the important impulse that a majority of the population expressly agreed to a policy aimed at improving urban space for people, with a residential area very attractive decreasing traffic congestion through an improvement of surface public mobility. It is upon this impulse that the Zürich Mobility Strategy is rooted.

Since the beginning the main actor was (and still is) the Municipality. Many other actors are involved, such as Canton, transport enterprises, business community, car groups, bike groups, Quartierkonferenzen (networks of local associations), “street communities”, scientific community. The governance of the mobility strategy is rooted on a very strong system of direct democracy characterized by the implementation of various referenda (promoted either by public local authorities or by citizens) and traditional consultations of citizens at the local level.

In general, the city of Zürich and all the other local planning authorities try to engage stakeholders and do engage them in formal and informal fora as much as they can. Before the final decisions are taken, there normally is a formal request for comments where most of the formal actors get a chance to be involved (e.g. the Quartierkonferenzen in each of the 12 sub-areas of Zürich are always asked formally to comment and cooperate with the local authorities). Some further features of this social initiative are: (a) Proceed gradually, step by step, avoiding too fast and too big changes in a short time, avoiding almost always radical measures. (b) Negotiate constantly with citizens or specific groups (e.g., the representatives of the main important business groups) on specific measures. (c) Adopt targeted policies (e.g., with contact persons for mobility consultations in large companies). (d) Give priority to “pull” measures (such as intensive improvement of public transport or the set-up of bike lanes) over “push” measures, which have however been implemented, but with less emphasis (such as the increase of the parking price).

Big changes in citizens' mobility behaviours towards new behaviours much more pro-environment were well documented (despite some resistances) until the Covid-19 restrictions, which entailed a strong reduction in the use of public services (now mitigated, but still persistent) and more bikes and walk); but also a "return to cars" that could represent a consolidated phenomenon in people behaviour.

2. First round of policy scenarios workshops

2.1. Methodology and objectives of the workshop

Two years into the project, we organized an online participatory policy scenario workshop to reflect on lessons learned from the successful interventions that foster wide acceptability of the social innovations on mobility in both cities. Considering the Covid-19 pandemic, we organized the workshop online, rather than face-to-face (as originally anticipated). The activities in the form of two 2-3 hours meetings a day were spread out over four days. The outcomes of the policy scenario workshop provided insights on the best strategies to overcome (possible) citizen resistance and increase public acceptability as well as supporting energy innovations by supporting citizen engagement in the design of energy policies.

Concerning the participants in the workshop, from the SMARTEES project five people were involved: UG case researchers Wander Jager, Patrycja Antosz and Gabriele Quinti, from J&I. Niklas Mischkowski and Elma Meskovic joined the workshop representing ICLEI. A total of 8 attendees represented the Zürich social innovation. These participants represented the municipality of Zürich, and other organizations involved in the development of holistic mobility policies. From Groningen, three people joined. They represented the municipality of Groningen and a participatory working group. The names of the participants are not reported in order to respect confidentiality and anonymity agreements.

General topic of the workshop in Groningen and Zurich was promoting citizen movement with a use of a certain modality in the city(ies). Both Groningen and Zurich had successful cases of promoting biking and public transport, and discouraging car mobility in the past (e.g., the Noorderplantsoen case, the Limmatquai case, as well as further "indirect" measures, such as the increase of parking prices, the imposition of very low speed limits). We feel that those historical examples are important for cities beginning their transition. Yet, have now become less relevant for policy-makers in cities that have already achieved a lot over the past decades. For example, in Groningen there are attempts to restrict bike movement in the city centre (also in relation to Covid-19, to enable pedestrian social distancing). Meanwhile, Zurich is facing the challenge of "conflicting spaces" accommodating pedestrians, public transport, bikes, and cars. In this online policy scenario workshop, we broadened the topic to include new challenges the cities are now facing.

2.2. Agenda

The workshop was organized in three parts. The first meeting took place on Monday, the 21st of September 2020. The first day started with the organizers presenting what has been done so far in SMARTEES and what needs to be done in the future. A discussion of successful interventions (i.e., the Noorderplantsoen case in Groningen, and the Limmatquai case in Zurich) followed and were focus of the day. The main theme was: if you were to do it again, how would you do it? Participants discussed factors relevant for social acceptability of policies/actions implemented (e.g., the role of citizen empowerment, availability of resources), and reflected on how policy interventions could be done differently/have already been done differently in each city. The second and third days were planned to be less time consuming for attendees. Each participant was given an online tool (see supplementary material 1) and worked individually on summing up the main reflections of the previous day - presenting the lessons learned from various policy interventions, and on possible alternatives, drivers and barriers of certain solutions. The online tool also allowed for discussions between participants during the third workshop day.

During the fourth day – Thursday, the 24th of September 2020, participants tried to create a recipe for success - discuss to what extent similar policy interventions can be implemented in other cities. If so, what is needed and what is to be avoided. Finally, we presented first simulations of the Groningen case model and asked for participants' feedback on a initial version of the SMARTEES policy sandbox tool (PST) - one of the major final output of the SMARTEES project.

Detailed agendas by day:

		Monday, 21st of September
14:00	14:05	Welcome to the meeting
14:05	14:15	Round table of who you are and what you do
14:15	14:25	Information about the SMARTEES project
14:25	14:35	Noorderplantsoen case
14:35	15:25	Cases that participants (have) work(ed) on
15:25	15:50	Drivers and barriers for project success
15:50	16:00	Reflection on drivers and barriers for project's success/failure

		Thursday, 24th of September
13:30	13:35	Welcome to the meeting
13:35	13:45	Round table of who you are and what you do
13:45	13:55	Summary of last meeting and plan for today
13:55	14:25	Reflections discussion
14:25	14:55	Presentation of the model and the sandobox tool
14:55	15:25	Feedback session
15:25	15:30	Next workshop

In supplementary material 1 a full description is provided of the original setup and considerations of the workshop

2.3. Results of the first round of policy scenario workshops

Introduction to the policy scenario workshops

In the workshops we had the following presentations:

1. **Wander's presentation(s) from day 1**

The introduction of the workshop started with a quick welcome, overview of the programme and short reminder on what the workshop was about. Because all the participants had been informed before about the topic and goals of the workshop, this could be done quickly. Following that, we had an introduction round where all participants in a few words could introduce themselves, the position that they had in their municipality, and projects they were working on.

Following the introduction, in the presentation first an overview was provided of the SMARTEES project and the different clusters involved in the project. Then we zoomed in on the Groningen case, first introducing the city of Groningen and the wider context of the Traffic Circulation Plan. Following that, the specific case of the Noorderplantsoen case was explained.

In supplementary material 2 you will find the slides as used during day 1 of the workshop presentation.

2. **Computer simulations in the service of decision-making presentation (supplementary material 2)**

Participants were introduced to general ideas for modeling Groningen and Zurich cases in SMARTEES, incl. the HUMAT socio-cognitive architecture that depicts cognitively motivated information exchange in social networks. Further, the model of the Noorderplantsoen case in Groningen was presented in relation to the history of the case. Following the model scheduling, calibration was described. Attendees got to know what sources of data were used, and in what way they aided in making the modelled case resemble the reality of the 1994 Groningen. Finally, a movie of the Groningen simulation was shown to the participants.

In supplementary material 3 you will find the slides as used during day 2 of the workshop presentation.

Best strategies to increase social acceptability of the SI

After the first round of the workshop, the participants of the workshops were asked to fill in a table on barriers and drivers of a SI they had experience with. Only two participants from Zürich actually filled in the table that we had shared with them as a Google doc.

The key findings concerning the barriers for SI projects they reported were:

- The opposition of particular group of residents is usually expected. Overcoming this barrier is done by digital and physical participation programmes, involving neighbourhood associations and providing feedback to the community.
- The opposition of a prominent organisation/institution is not always present, but can emerge unexpectedly, as in the case of an association for people with disabilities opposed a project for not being accessible for wheelchairs. Mediation and careful communication was used as a response.
- The opposition of other departments/politicians was mentioned as something that can be expected. Involving other departments and stakeholders at an early stage in the planning process is mentioned as a strategy to mitigate possible opposition and try to collaborate in planning processes.
- Uncertainty of the project outcome is often anticipated, but some events are not anticipated, COVID-19 being mentioned explicitly.
- Bureaucratic/organizational issues that hinder the implementation of the project are sometimes anticipated, and sometimes not. It is mentioned that large projects are always taking much time concerning organization, and sometimes unanticipated problems emerge, e.g. with the availability and usability of data related to privacy regulations.

The key findings concerning the drivers for SI projects they reported were:

- Particular groups of residents supporting the project was mentioned once, but not specified
- Prominent organization/institution sometimes support a project, which may be anticipated, but also may come as a surprise
- Other departments/politicians are reported to support the project. Not much is said about how to stimulate that, except for communicating clearly the aims of a project.

In supplementary material 4 the filled in homework tables are presented.

The tables below summarize how participants in the workshops have experienced both barriers and drivers in the social acceptability and developing process regarding designing and implementing the social innovations.

Table 1.a Barriers of the social acceptability of the SI as noted by participants

Barriers	**Did you encounter it in your project?**	**Was it anticipated?**	**How did you (try to) overcome it?**
Particular groups of residents oppose the project	50/50 (Opposition from shop owners, car-owning residents)	yes	calculation model that shows in which areas are enough basement garages to compensate on-street parking information letters and events
A prominent organization/ institution oppose the project	no	varying	Inform, consult, advise, co-production, participate in decision-making, and facilitate discussion and majority voting
Other departments/ politicians oppose the project	yes	Mostly yes	Integrate them since the beginning of the first ideas and involve in development
Uncertainty of the project outcome	no	yes	Discussions and updates
Bureaucratic/ organizational issues that hinder the implementation of the project	yes	no	A big project team is always slow-working but you can integrate all the technical issues, you'll get an overall working and functional solution.

Table 1.b Drivers to increase the social acceptability of the SI as noted by participants

Drivers	Did you encounter it in your project?	Was it anticipated?	How did you stimulate it?
Particular groups of residents support the project	Mostly yes	No	clarity about the purpose of a participation project (elaborating something new, discussion existing plans or options,
A prominent organization/institution supports the project	yes	yes	Organize and address, steering committee and project teams. Informing supporting group and expert groups

Other departments/politicians support the project	Yes	Yes	Show the key advantages in every possibility

Table 1.c Policies to increase the social acceptability of theSI

Policies and strategies for the implementation of social innovation	Main insights / lesson learned
Policy1: communication with citizens Dimension addressed:	Opposition against plans may be unavoidable, but a clear involvement of (opposing) citizens and transparency with respect to information sharing from the early start may avoid unnecessary polarisations to grow.
Policy2: involving organisations Dimension addressed:	Getting a good overview of possible relevant interest groups and organisations and informing them about the project may be important for both the development of the plan as for support.
Policy3: Involving other departments Dimension addressed:	Avoiding developing plans in relative isolation may prevent conflicts with the policies of other departments. A good communication strategy can be very helpful

Policy scenarios for the replication of the SI

Alternative scenarios:

The workshop discussion allowed us to formulate various possible counterfactual scenarios for the Groningen Noorderplantsoen case study, below summarized in table 3.

Table 2. Alternative policy scenarios for the replication of the SI

Alternative pathway/strategies	**Action plan/communicative actions for social engagement**
Closing the park for cars as a test	Park was not closed as a test: people do not have the experience o Experienced experiential satisfaction is the same as expected o Experienced experiential satisfaction is lower than expected (a negative surprise): - Safety for children - an accident happened - only simulated when the park is not closed for cars as an experiment Park is closed as a test:

	○ Experienced experiential satisfaction is the same as expected ○ Experienced experiential satisfaction is higher than expected (a positive surprise): - Shopping convenience - closing of the park for cars is more convenient than expected - only simulated when the park is closed for cars - Transport convenience - only when closing the park for cars (e.g. a rose to make the experience better) - Park activities - only simulated when park closed for cars (e.g. Noorderzon festival) ○ Experienced experiential satisfaction is lower than expected (a negative surprise) ○ Transport convenience - only when closing the park for cars
Mass media	○ Negative campaign - who is the media reaching – e.g., random 20% of the population; persuasiveness will follow a random distribution with a mean of mean persuasiveness of agents - shopping convenience low and transport convenience low. ○ Positive campaign: focused on park activities and environmental issues
Meetings organised by city hall	○ Meeting in a city hall early on, middle, and just before the vote only for the no experimental closure, When experimental closure - meeting only early on. To be discussed: what if the municipality is creating false expectations? ○ People with high motivation go - approx. 1% most motivated will participate motivation is the sum of all need importance or 1 core need that exceeds a given value ○ During the meeting participants: - High trust in municipality, no discussion: become more positive about permanent closure of the park for cars - expected satisfactions increase - top down approach - Low trust in municipality, no discussion: - people strengthen their original opinions without trusting the municipality - High trust in municipality + discussion (empowering): People has the opportunity to exchange information (participants are just provided with a platform) - Low trust in municipality + no discussion Meetings in ALL neighbourhoods early on, middle, and just before the vote

The following Table 3 provides an overview of strategies for gaining social acceptability as discussed in the workshop.

Table 3. Synthesis table of the strategies for gaining social acceptability

RELEVANT DIMENSIONS	STRATEGIES FOR GAINING SOCIAL ACCEPTABILITY						
	Information, communication (SI)	Participation of policy actors and citizens in co-desining	Support changes in social norms	Pilot projects	Infrastructure & technologies	Environmental awareness (health, quality of life)	Environmental education (wide context)
Citizen resistance							
Policy resistance		X		X			
Non supporting social norms			X			X	
Lack of confidence in the project				X			
Place identity/attachment			X	X			
Commitment of relevant actors							
Satisfaction of experiential needs			X				
Satisfaction of social/psychological needs (security, belongingness, relationess, status, reputation)			X				
Satisfaction of need of acknowledgement			X		X		X
Values: autonomy, biospheric and social oriented				X			X
Awareness of economic impact							X

Input for the ABM and the Policy Sandbox Tool

The discussions in the workshop culminated in the idea that for the Sandbox tool it would be practical to first have a menu where to find a simulated case that is resembling a situation where the user is interested in. For example, are we dealing with very visible behaviour or not, and is it a one-time decision (e.g., investing in a heat network) or does it require a lasting behavioural change (e.g. modality choice)? Having a selected case, it would be good to have several exemplary simulation runs available as narratives that support an informed discussion. Different policy scenarios can be envisaged here, in particular social policies such as informative strategies and discussion meetings.

3. Second round of policy scenario workshops

3.1. Methodology and objectives

In the second round of the workshop, we organized an online participatory policy scenario workshop to reflect on the policy scenarios that would be of interest to simulate and to incorporate in the sandbox tool. Considering the continuing Covid-19 pandemic, we organized the workshop online, rather than face-to-face (as originally anticipated).

The workshop was organised as a single meeting of 2,5 hours. This was done because in our experience having several online meetings with homework to do did not prove to be an involving format. The outcomes of the policy scenario workshop provided insights on the best strategies to overcome (possible) citizen resistance and increase public acceptability as well as supporting energy innovations by supporting citizen engagement in the design of energy policies.

Concerning the participants in the workshop, from the SMARTEES project five people were involved: UG case researchers Wander Jager and Loes Bouman, and Gabriele Quinti, from J&I. Niklas Mischkowski and Elma Meskovic joined the workshop representing ICLEI. A total of 7 attendees represented the Zürich social innovation. These participants represented the municipality of Zürich, and other organizations involved in the development of holistic mobility policies. From Groningen, one person joined representing the municipality of Groningen. Also, one representative of the municipality of Budapest (Cluster 1 follower case) and one mobility expert from Vienna joined the workshop.

General topic of the workshop in Groningen and Zurich was promoting citizen movement with a use of a certain modality in the city(ies), as in the first workshop. The shorter online setting of this second workshop was less demanding for the participants. However, it is obvious that such a short online workshop does not allow for the interactions and discussions of a 2 day physical workshop.

The presentations worked well, the sharing of the survey results of both the Zürich as the Groningen case were well received. The demonstration of the agent-based model of the Groningen case also

was clear for the participants, thus providing a basis for a discussion on possible scenarios of interest.

The discussion on policy scenarios did provide us with information on what was of interest to the policy makers. Hence despite the limitations of an online workshop we obtained some basic information that confirmed our ideas on what policy scenarios would be of interest to explore with the simulation model and to implement in the sandbox tool.

3.2. Agenda

Tuesday April 13th

15:00 15:05 Welcome to the meeting
15:05 15:15 Round table of who you are and what you do
15:15 15:25 SMARTEES project recap with focus on cluster 1, summary of last meeting and plan for today
15.25 15.40 Presentation Survey results Zurich
15.40 15.55 Presentation Survey results Groningen
15.55 16:20 Presentation of computer simulated policy scenario's
16.20 16.30 Questions and open discussion on survey and simulation results
16.30 16:55 Plenary discussions on key findings and scenario experiments (3 in total, 10 minutes for each)
16:55 17:15 Presentation Policy sand-box tool ICLEI
17:15 17:25 Discussion on sandbox tool and simulations on Ethics and responsible use
17:25 17:30 Future steps and wrapping it up

3.3. Results of the second round of policy scenario workshops

In this workshop we first presented the results of the surveys of Zürich and Groningen. In supplementary material 5 the presentation form Zürich can be found, and in supplementary material 6 the presentation of the data from Groningen.

Presentation of the Agent-Based Model (ABV)

The agent-based model has been presented as a demonstration of the capabilities of the simulation tool. In supplementary material 7 the slides can be found. After an introduction (recap) of the Noorderplantsoen case, first the different drivers on behaviour are being explained. It is made clear using examples of 2 different inhabitants how the motives can differ, and what implications this may have for choice behaviour (cognitive dissonance). It has been shown how the empirical data have been used to parameterise and artificial population of Groningen that reflects the inhabitants of

different neighbourhoods. First simulations are being demonstrated showing how the model is capable of representing the social processes taking place in the case of Groningen, as well as the motivation of different citizens to cast their vote and if that vote was in favour or not for closing the Noorderplantsoen park for car traffic.

Results of the workshop discussion on the alternative policy scenarios

First of all, it is important to realise this workshop has been organised online, and it was relatively short. Due to the continuing COVID pandemic we were forced to organise this workshop online, and having earlier experiences with online meetings we were well aware that a long meeting would not be appreciated. Because the short online setting does not allow for the interactions that originally had been envisaged for a two-day physical meeting, the results of this workshop are much more superficial than in case a physical workshop could have been organised.

Scenarios of interest discussed with the participantS

The first scenario we discussed addressed how sensitive the simulated social dynamics are for unexpected events. The case we discussed as interesting was the event of an accident with a cyclist before the referendum, which would strengthen the safety motive of the people. The question is how sensitive the case is for such unexpected events.

The second scenario type we discussed relates to the organisation of meetings to discuss the opening or closing of the park. We made a distinction between townhall meetings versus neighbourhood meetings. Meetings at the townhall require more effort to attend, and hence in a simulation this would mean that more involved people having more time are more likely to attend. This can be implemented as a bias of more educated, older people with a high involvement attending. The opinion dynamics generated in such a meeting may have an impact on the attitudes of these people, and after the meeting they may share their opinions with other people. The question is how such townhall meetings can affect the discussions/opinions in the wider city. Alternatively, also meetings can be organised in the neighbourhood. It was discussed that despite such a meeting would be more accessible for people, timing may also serve as a bias. Meetings scheduled during the day will result in an underrepresentation of working people, whereas meetings in the afternoon may result in an underrepresentation of (young) parents.

The third scenario relates to a communication strategy. For the Groningen case we specifically discussed the influence that shopkeepers can have on the discussion. Basically, shopkeepers were opposed to closing the park for car traffic. Because these shopkeepers are also advertising in local newspapers, these newspapers were biased in the sense that they reserved more space for the voice of the shopkeepers. In this scenario we would like to implement this influence by creating a city-wide influence of advertising against the closure of the park for cars. It is of interest to explore if

such a media campaign is capable of making a serious change in the discussions taking place, and the outcome of the referendum.

The last scenario we discussed related to the composition of the population. Groningen is a student city, and as a consequence the population is younger and more educated than other comparable cities. As such it would be interesting to explore the scenario of "what if Groningen was a regular city". This can be done by changing the population characteristics, and explore what the impact will be on the resulting social dynamics concerning the referendum.

Workshop discussion on the Policy Sandbox Tool

The Policy Sandbox Tool was presented by ICLEI as one of the ultimate outcomes of the project, explaining that it aims to capture the effects of social innovations on policy outcomes, to support local government in decisions concerning energy and mobility transitions, and to allow policy-makers to explore social dynamics. The tool needs to be user-friendly while being based on solid data, and to be usable for a wide range of European cities.

A presentation of the status quo was given and followed by a presentation from Urban Islands about the SMARTEES' exploitation plan and ideas for what can be offered to other cities beyond the life of the project. Ideas include the sandbox tool itself, a sandbox innovation workshop and an out-of-the-box bespoke service. Using prepared polls in zoom, the following questions were posed to participants:

Sandbox tool

1. Does the prototype sandbox tool give a better understanding of the case studies and what Agent Based Modelling may offer?
2. Would this be a useful demonstration for other practitioners in your organisation?
3. Would this be a useful demonstration for other policy makers in your organisation?

The response from participants was positive with regard to the first question, with 25% of respondents strongly agreeing that the tool gives a better understanding of the case studies and what Agent-Based Modelling may offer, and 75% agreeing.

When responding to whether the tool would be a useful demonstration for other practitioners, 60% of respondents agreed that the tool would be useful, while 40% were undecided / neutral.

When asked whether the tool would be a useful demonstration for other policy makers, however, the majority (75%) opinion was undecided / neutral while only 25% agreed that the demonstration would be useful.

Sandbox Innovation Workshop

1. Would a brainstorming workshop with SMARTEES partners focusing on a challenge in your city be useful?
2. Would you be willing to cover the costs for the delivery of such a workshop by SMARTEES partners? (approx. €2-5000)

Responses to the first of the two questions showed that 14% of respondents strongly agreed that a brainstorming workshop with SMARTEES partners focusing on a challenge would be useful, 43% agreed, and 43% were undecided / neutral.

When presented with the second question regarding whether they would be willing to cover the costs related to the delivery of such a workshop, 11% of respondents answered with a yes, 22% with a no, and 67% were not sure.

Out-of-the-box service

1. Do you think there is a potential market for a customised service to help cities with social innovation and energy transition?

2. What kind of services would be most relevant?
- Policy support
- Practice support
- Advisory support
- Peer mentoring
- Consultancy support
- Agent-based modelling support

When responding to the first question, the majority (56%) indicated that they do think that there is a potential market for a customised service to help cities with social innovation and energy transition, while 44% were undecided / neutral.

In relation to the second question and the services that would be most relevant, the responses generally showed an interest in all of the options except for peer mentoring. Respondents were able to select more than one answer in response to this question. More specifically, 56% selected policy support, 56% practice support, 44% advisory support, 33% consultancy support, and 44% agent-based modelling support.

A short discussion followed, with one question from a participating researcher, with an interest in the functioning of the ABM under new circumstances, such as the internet and social media. The city

participants, overall, had few questions related to the PST, even on direct request. However, a participant from Zurich stated that the PST would be of interest to learn about social dynamics, e.g. in the urban planning process. The participant cautioned, however, that it should be used only to learn about and not to influence public opinion. On the question posed by the modelling team, related to whether political parties might be interested in using a PST to strengthen political campaigns or programmes, the Zurich representative cautioned about the risk of manipulation and asked how this could be prevented in turn. A question that was left open in the end; community involvement was seen as a key criterion for an ethical use of an applied PST/ABM working process.

SUPLEMENTARY MATERIAL

1. Original setup of workshop

The first part of the workshop takes place in plenary, and is focused on welcoming the participants, explaining them about the programme and process plan of the workshop, explaining the wider settings and the aims of the workshop, presentation of SMARTEES project, presentation of the facilitator(s)/moderators, and the presentation of any materials the organiser considers helpful to frame the workshop.

During this phase, a short presentation of each participant will take place, covering the following aspects: who (name, education, position within the organisation), what and how (institution, aims, fields of interest, clients, etc.), and why (expectations from the workshop).

It is important to establish during this phase the rules of conduct and to be clear for participants what are their roles and tasks during this workshop. Moreover, the schedule will be presented and participants will be introduced to the materials used during the workshop.

During this phase, the organisers present the current state of affair (what was done so far and what is further needed to be done), present the participants the key questions which build the workshop and guide the process, and the specificities of the case-study. Case-responsible modellers also present in short the model they work with, and its necessities.

As both cities already replicated a similar social innovation later on, the context will represent **a possible replica of the SI at the city level (the SI is scaled-up to the entire city)**. The table with relevant dimensions/lesson learned for the case is presented and information related to each element is detailed by case responsible researchers. Also, the role of geographical location of interest groups will be discussed. The information given is related to the operationalization of the concepts used, what is considered of success and what lessons were learned for each dimension discussed. The objective of the phase is to define the context of discussions and to have a mutual understanding on the dimensions identified as relevant for the case. Moreover, participants are offered valuable information related to lessons learned and past success – they will discuss obstacles and the role of context in the success. In the context of lessons learned, participants will be able to share information about actual replicas of the social innovation (restricting car movements in other parts of the city), discuss how such implementations changed over time and what solutions/policy implementations proved to be most effective.

At the end of the meeting, a “homework” will be given to participants to execute over the next day.

Day 2: Individual work/small group session phase

The platform will support both individual work and group consultations, giving the decision to the participant to what extent to engage with other stakeholders. Platform will encourage participants

to share materials and contact each other. ICLEI's role in possibly letting us use their webinar infrastructure. Other tools, such google forms could be used, so that people could observe each others response.

During this phase, each participant works on what they learned and on possible alternatives regarding each dimension relevant for the case. For this, the participants are each provided with the table containing the relevant dimensions and have the task to: (1) identify lessons learned for each dimension – "What you already learned", and (2) identify alternative interventions for each dimension – "What would you do differently" (counterfactual scenario). For each counterfactual scenario a list of possible barriers as well as a list of possible drivers for SI acceptability is drawn by each work group. The goals is to identify the obstacles for the counterfactual scenarios discussed previously, and to find possible solutions to overcome them.

Day 3: The 2nd Plenary Session phase + debriefing and feedback.

One person, the moderator, summarizes the outputs from individuals and we all discuss that: Would lessons learned work in the other case and why? What are the barriers? How to overcome them? What are important features of context? During this phase, participants reflect on conclusions from the homework.

Modellers try to ask what would be suitable for a sandbox tool from the perspective of public administration and NGOs. What do participants want to learn from a model. Showing a initial version of the models and showing them online how we play with the models. At the end of the workshop there is a feedback round of the participants reflecting their impressions, feelings and perception. Challenge: keeping the language participant-friendly.

Future engagement: Sharing information about the project, engaging them in the project, sending them a summary, providing us with final feedback if they want to.

Other cluster-specific considerations

- Discussing how to manage different visions if there is more than one vision
- Not hiding that conflicts are an issue, but at the same time not making it a topic of the model
- Managing Budapest's interests – showing a long-term path of development, rather than focusing on current political will to implement certain solutions
- Being aware that only a small number of counter-factual scenarios will be implemented in agent-based models, but recognizing that a wider discussion is needed nonetheless

2. Slides used in the workshop part 1

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Groningen, the cycling city

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Groningen - Noorderplantsoen Case

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Groningen - Noorderplantsoen Case
Referendum 1994: 50.9% (!!) decided in favour of a permanent closure

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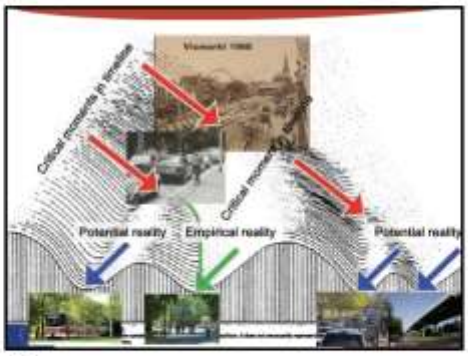
Potential reality
Empirical reality
Potential reality

10


Tipping points in social systems
Park open for cars
Heat net rejected
Park car free
Heat net adopted
failure
way-out
success

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Networks in Social Innovation

12

17/03/2021

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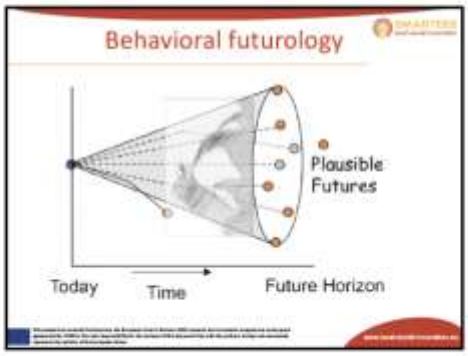

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3. Slides used in the workshop part 2

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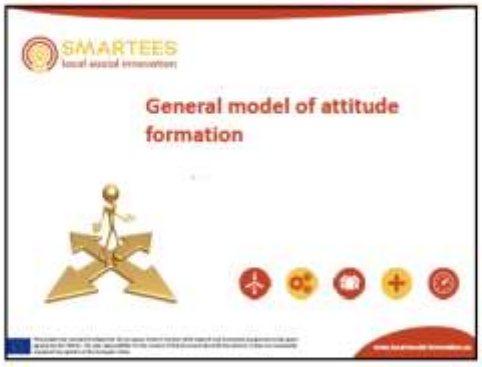

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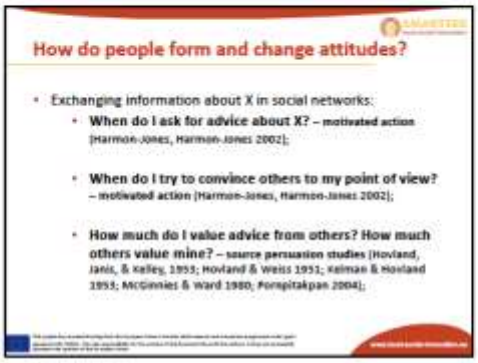

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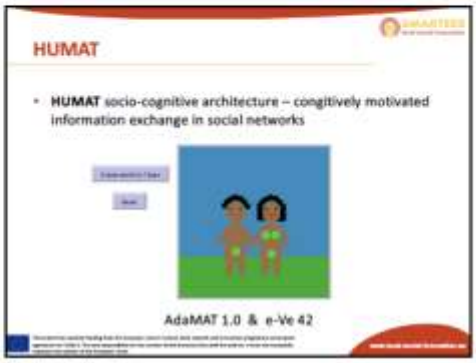

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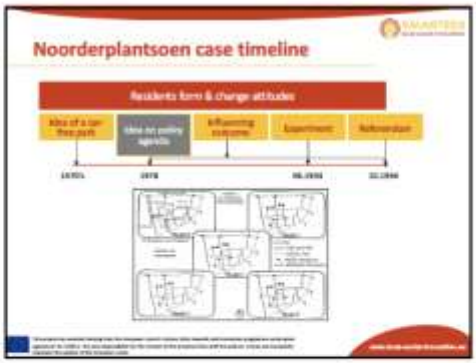

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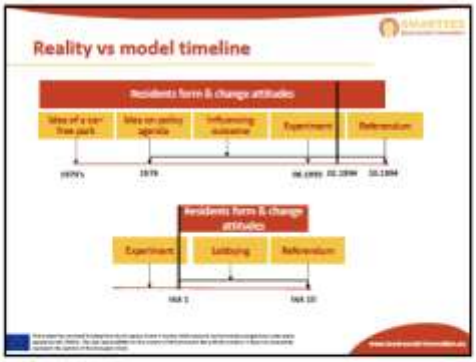

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17/03/2021

Collecting new data to fill the gaps

New data:
- Individual in-depth interviews
- Surveys
- Policy workshops

19

Noorderplantsoen model

1994 Groningen: 141 653 residents
Groningen model: 14 165 residents

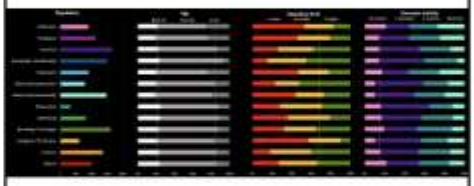
20

Geo-socio-demography

- 936 homogenous groups of agents comprising different fractions of the population,
- representative with respect to
  - age (3),
  - gender (2),
  - main economic activity (4) and
  - city district (12).

21

Geo-socio-demography



22

Social networks

- friends,
- co-workers,
- neighbours.

- vary in size between individuals;
- are limited in size;
- display high clustering i.e. friends tend to know one another.

23

Social networks

- movie of social network creation

24

17/03/2021

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4. Filled in homework tables

Project "Future vision for public transportation 2050"

Barrier	Did you encounter it in your project?	Was it anticipated?	How did you (try to) overcome it?
Particular groups of residents oppose the project	Not yet	Yes	Involvement of all Zurich's inhabitants in our participation programme - digitally (**www.vbz2050.ch**) and physically (Walk-Ins)
A prominent organization/institution oppose the project	No	A little bit	Information of the relevant commissions of Zurich's municipal council (= parliament)
Other departments/politicians oppose the project	Not so much	Kind of	Involve the subscriber (ZVV) and the civil engineering authority (TAZ) in our steering committee
Uncertainty of the project outcome	No	Not necessary	As it is, this uncertainty is part of the project and makes it exciting
Bureaucratic/organizational issues that hinder the implementation of the project	Maybe	Not really	It is a huge project organization with very many stakeholders to involve and a couple of unclear interfaces to other strategies - hopefully

			everything is set up well

Driver	Did you encounter it in your project?	Was it anticipated?	How did you stimulate it?
Particular groups of residents support the project	No	No	
A prominent organization/institution supports the project	Kind of	Yes	Steering committee and project team: ZVV, TAZ supporting group: AfV, DAV, AfS, STEZ expert group: OST, Kt. BS, SNZ
Other departments/politicians support the project	Maybe	Hopefully	TAZ is led by a different politician than VBZ, they can hopefully support our project together - later on, the finished strategy will be presented in our city council

Project "Pikmi" (www.pikmi.ch**)**

Barrier	Did you encounter it in your project?	Was it anticipated?	How did you (try to) overcome it?
Particular groups of residents oppose the project	Not yet	Yes	Participation events in Q1 2021 to discuss topics Involvement of the neighbourhood association Different possibilities for feedback
A prominent organization/institution oppose the project	Yes	Not enough	Associations for people with disabilities opposed the project for not being accessible for wheelchairs → mediation with some meetings to discuss the needs and solutions, presentations in a commission, careful communication
Other departments/politicians oppose the project	Yes	Yes	Hard discussion in the municipal council, mainly about disabilities and the business case (high costs) - we were prepared for discussion with arguments and were supported by our city council

Uncertainty of the project outcome	Yes	At the moment	This is part of the project, but during the beginning of the COVID-crisis, this was a much discussed topic - now we will consider this aspect in our evaluation concept to secure more profound results
Bureaucratic/organizational issues that hinder the implementation of the project	Yes	Too little	Privacy regulation of customer data, very difficult and exhausting problems…trying to solve all of them

Driver	Did you encounter it in your project?	Was it anticipated?	How did you stimulate it?
Particular groups of residents support the project	Not yet	Not yet	Our project will be known as soon as the operations start (November)
A prominent organization/institution supports the project	A little bit	Not really	By support of Mobility car-sharing, we had good arguments against taxi business
Other departments/politicians support the project	Yes	Yes	Our city council supported our project, fits his agenda

Project "unspecified"

Barrier	Did you encounter it in your project?	Was it anticipated?	How did you (try to) overcome it?
Particular groups of residents oppose the project	Yes	Yes	Informations in specific timeframes
A prominent organization/institution oppose the project	No	No	Work like a firefighter to bring down the fire
Other departments/politicians oppose the project	Yes	Yes	Integrate them since the beginning of the first ideas
Uncertainty of the project outcome	No	Yes	
Bureaucratic/organizational issues that hinder the implementation of the project	Yes	No	A big project team is always slow-working but you can integrate all the technical issues, you'll get an overall working and functional solution.

Driver	Did you encounter it in your project?	Was it anticipated?	How did you stimulate it?
Particular groups of residents support the project	Yes	No	Nothing until now; as I know
A prominent organization/institution supports the project	Yes	Yes	Be multiplicators and use they testimonials
Other departments/politicians support the project	Yes	Yes	Show the key advantages in every possibility

5. Slides data Zürich

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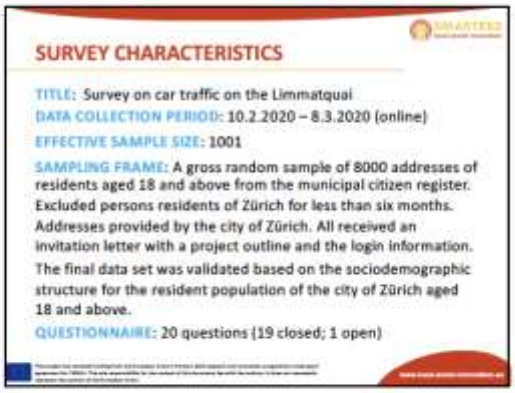

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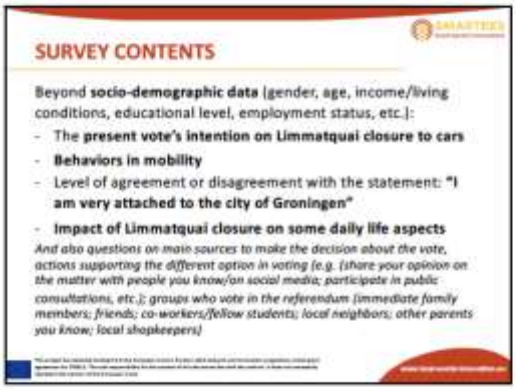

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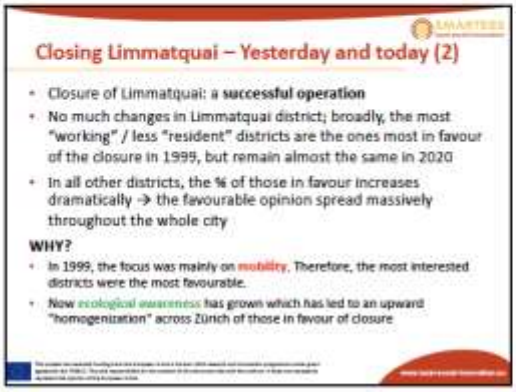

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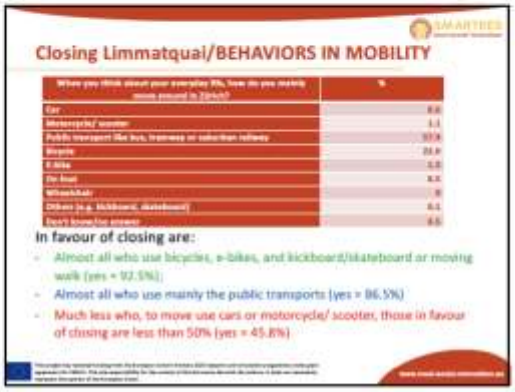

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Closing Limmatquai/ATTACHMENT TO ZÜRICH CITY
Agree completely or rather
Overall 90%
Among those that want to close: 92,4%
Among those against: 86,5%

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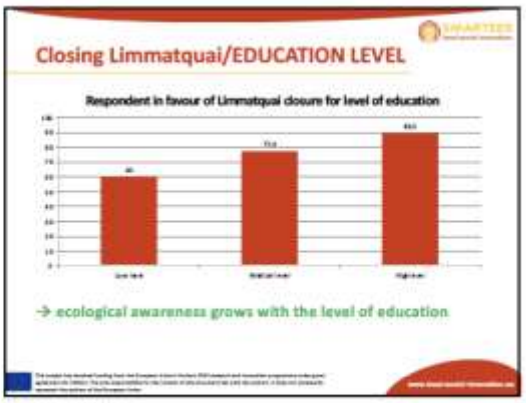
Closing Limmatquai/EDUCATION LEVEL
Respondent in favour of Limmatquai closure for level of education
→ ecological awareness grows with the level of education

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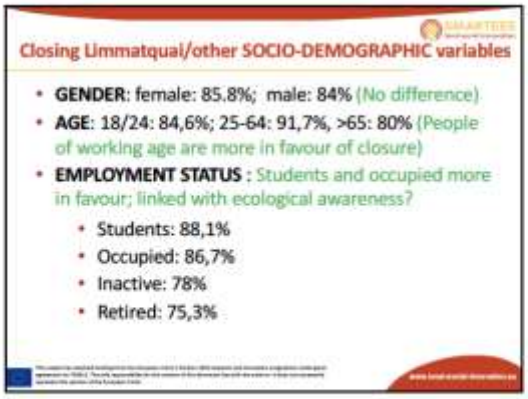
Closing Limmatquai/other SOCIO-DEMOGRAPHIC variables
GENDER: female: 85.8%; male: 84% (No difference)
AGE: 18/24: 84,6%; 25-64: 91,7%, >65: 80% (People of working age are more in favour of closure)
EMPLOYMENT STATUS : Students and occupied more in favour; linked with ecological awareness?
Students: 88,1%
Occupied: 86,7%
Inactive: 78%
Retired: 75,3%

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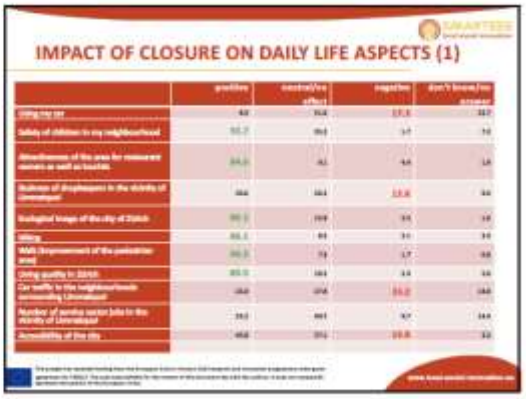
IMPACT OF CLOSURE ON DAILY LIFE ASPECTS (1)

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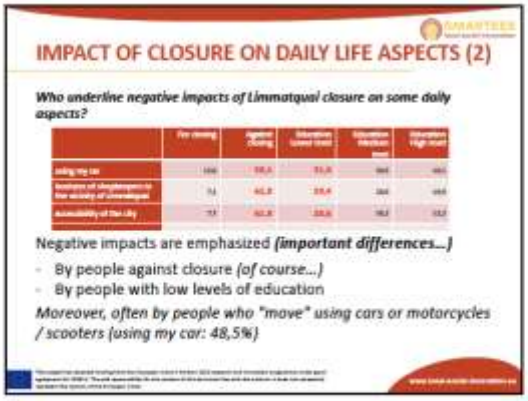
IMPACT OF CLOSURE ON DAILY LIFE ASPECTS (2)
Who underline negative impacts of Limmatquai closure on some daily aspects?
Negative impacts are emphasized (important differences…)
By people against closure (of course…)
By people with low levels of education
Moreover, often by people who "move" using cars or motorcycles / scooters (using my car: 48,5%)

11


IMPACTS CONSIDERED as MOST IMPORTANT for VOTE DECISION
Effects
%
Living quality in Zürich
76.6
Walk (improvement of the pedestrian area)
72.6
Biking
59.6
Ecological image of the city of Zürich
53.8
Safety of children in my neighbourhood
50.8
"Using my car", conversely, is considered important by 8% (concentrated among people who are against the closing of Limmatquai)

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6. Slides data Groningen

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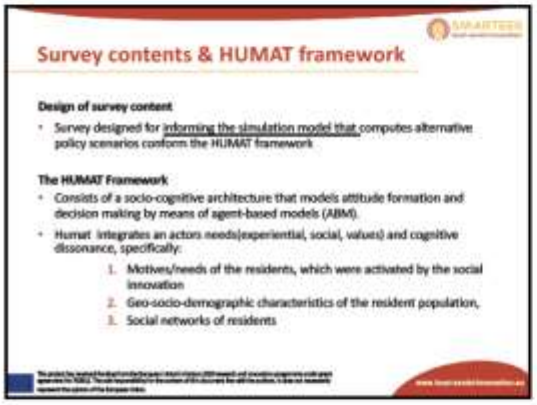

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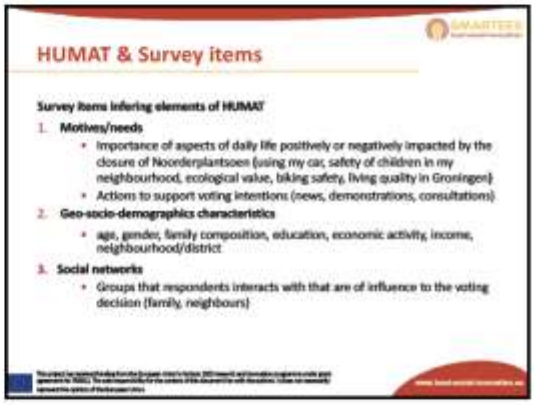

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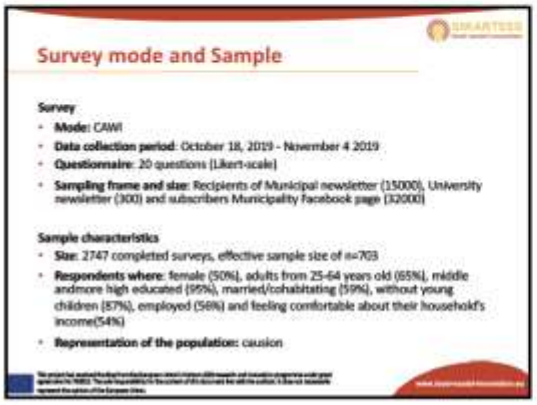

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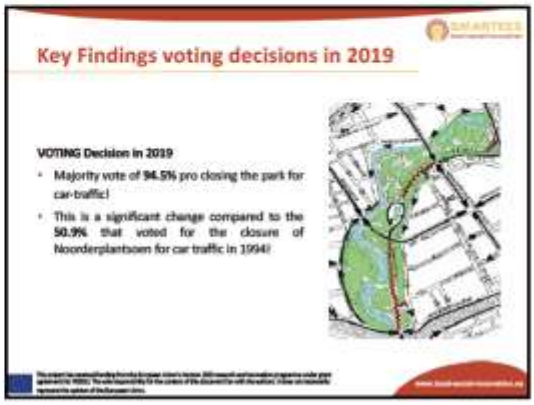

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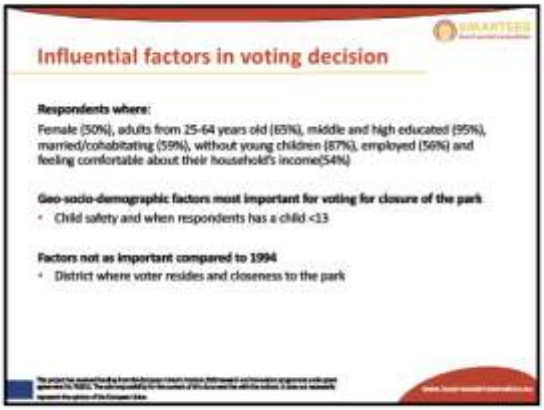
Influential factors in voting decision
Respondents where:
Female (50%), adults from 25-64 years old (65%), middle and high educated (95%), married/cohabitating (59%), without young children (87%), employed (56%) and feeling comfortable about their household's income(54%)
Geo-socio-demographic factors most important for voting for closure of the park
Child safety and when respondents has a child <13
Factors not as important compared to 1994
District where voter resides and closeness to the park

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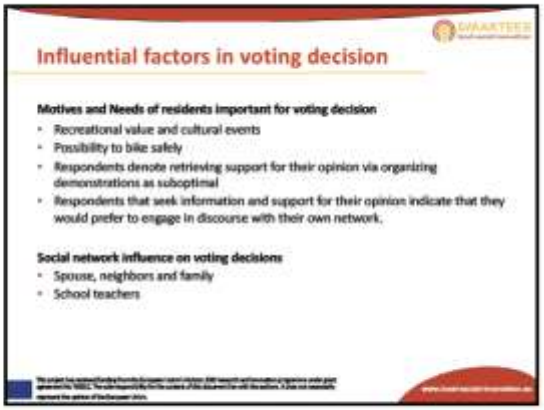
Influential factors in voting decision
Motives and Needs of residents important for voting decision
Recreational value and cultural events
Possibility to bike safely
Respondents denote retrieving support for their opinion via organizing demonstrations as suboptimal
Respondents that seek information and support for their opinion indicate that they would prefer to engage in discourse with their own network.
Social network influence on voting decisions
Spouse, neighbors and family
School teachers

8


Take home message and next step
What do we learn and where do we go from here?
Nowadays Noorderplantsoen is a recreational/social/ecological phenomenon important to citizens of Groningen
Only 25 years ago, slightly more than half of the voters felt as strongly
Is this a habituation effect?
What about counterfactual scenarios?

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Many Thanks for your attention!
Patrycja Antosz, Wander Jager, Loes Bouman
urbanisland

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7. Slides Simulation Groningen

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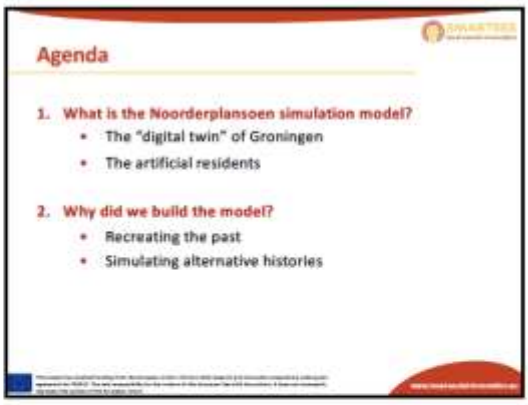

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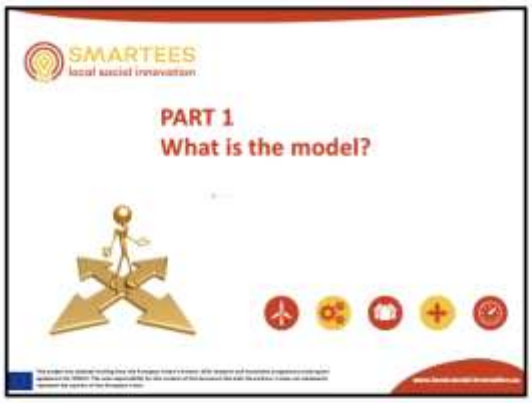

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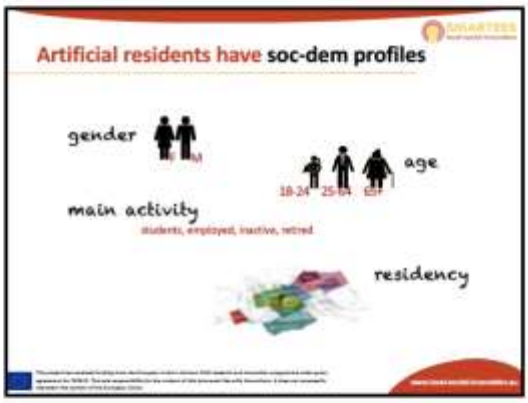

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6


What do they do?
Car-free?
Car-full?

7


How do they decide?
1. Which option has more pros?
2. Which option is more internally consistent?
3. Remove doubts
Decide

8


1. Which option has more pros?
Motives:
• kids' safety in the park
• shopping convenience
• transport convenience
• using the park for various activities
• caring for the environment
• belonging to a group of like-minded people

9


Gertjan – 21yo student living far away
Car-free?
Car-full?
kids safety
shopping
transport
activities
environment
belonging
N/A
N/A
10
-6

10


Anita – 33yo mum living next to the park
Car-free?
Car-full?
kids safety
shopping
transport
activities
environment
belonging
N/A
N/A
-3
-2

11


Anita – 33yo mum living next to the park
2. Which option is more internally consistent?
Car-free?
Car-full?
7/11 = 64%
6/10 = 60%

12

13

14

15

16

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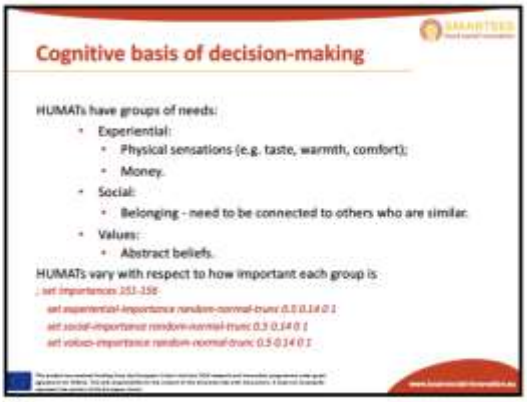

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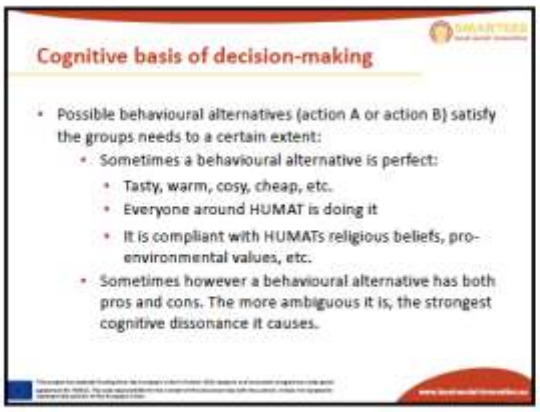

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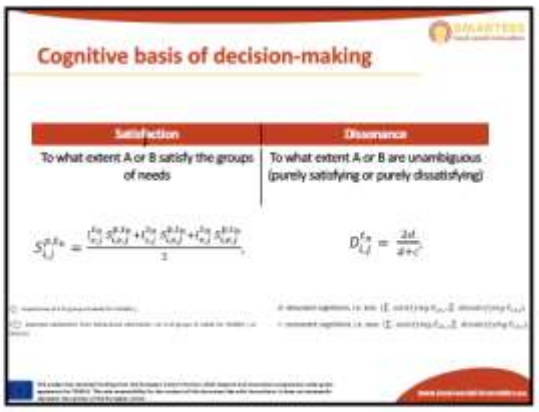

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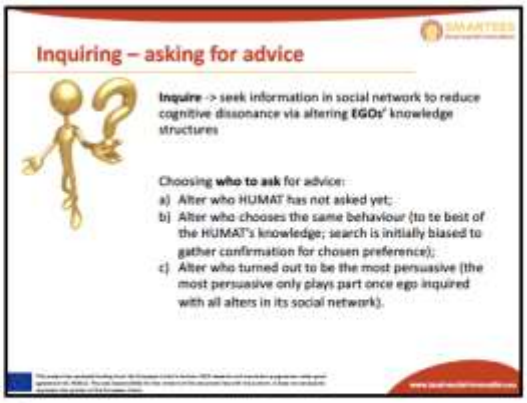

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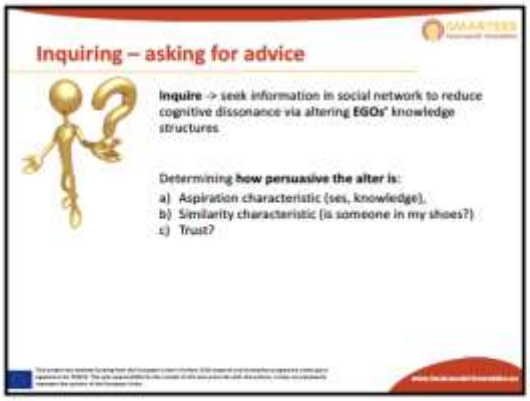

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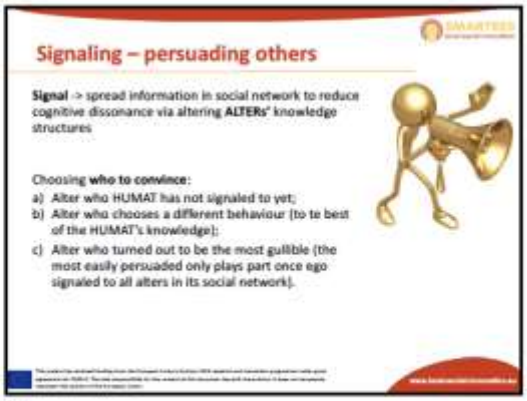

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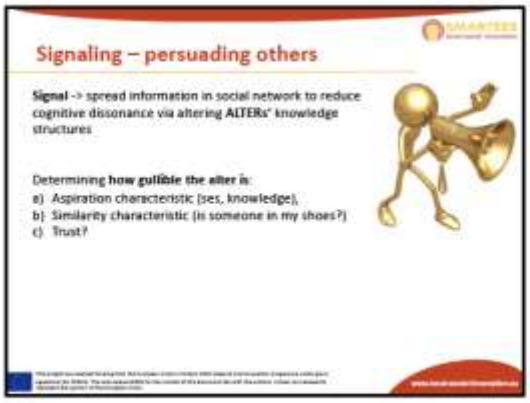

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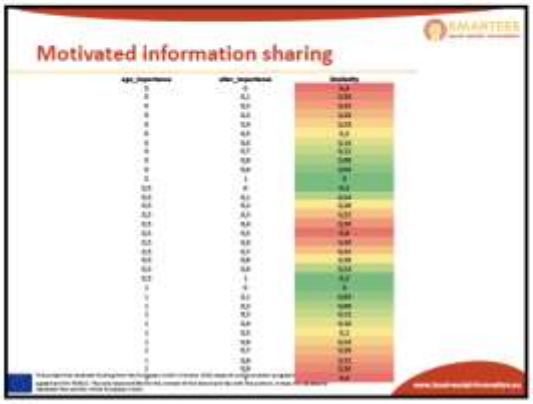

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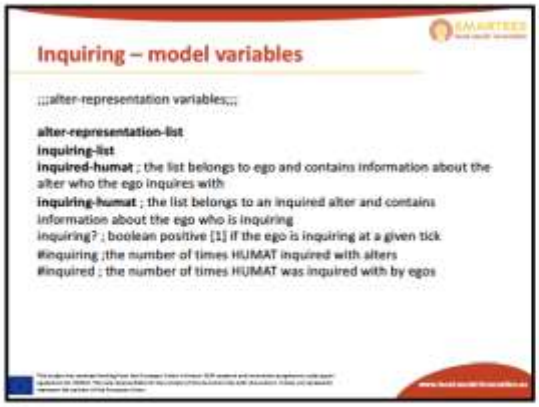

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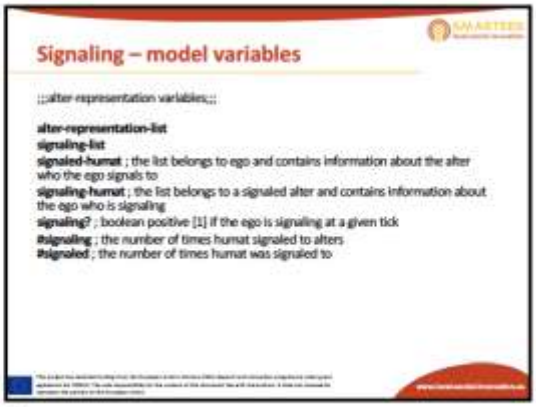

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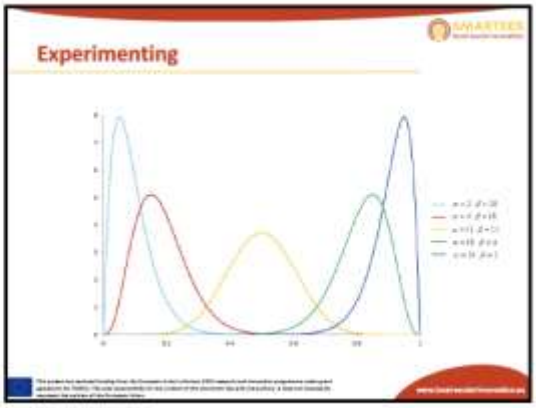

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8. Slides Sandbox Tool

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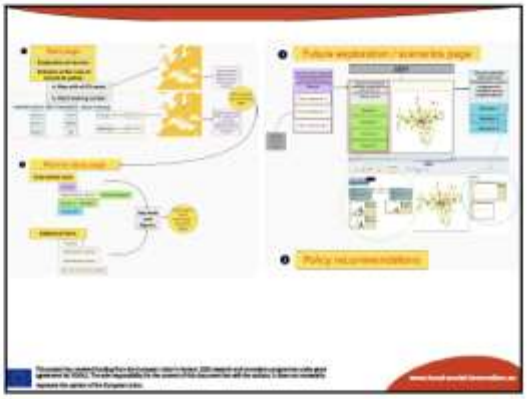

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6


1975 - Debating car traffic VS quality of life
1970
2020

7


1975
1970
2020

8


1975
1970
2020

9


1977: The original start of the traffic circulation plan
1970
2020

10


1977
1970
2020

11


1977
1970
2020

12

Annex 2: Report on Policy Scenario Workshops Cluster Island renaissance based on renewable energy production Samsø

Picture: Isle of Samsø

Project Full Title	Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability	
Project Acronym	SMARTEES	
Grant Agreement No.	763912	
Coordinator	Norwegian University of Science and Technology (NTNU)	
Project duration	May 2018 – April 2021 (36 months)	
Project website	**www.local-social-innovation.eu**	
Work Package	WP5 Policy Scenarios	
Deliverable	D5.2 Elaboration of Policy Recommendations for each cluster of case-studies. ANNEX 2. Report on Policy Scenario Deliberative Workshops: Cluster Island renaissance based on renewable energy production. Case: Samsø	
Delivery Date	31.08.2021	
Author(s)	Giuseppe Pellegrini Masini (NTNU)	
Contributor(s)		
level:	Public (PU)	**X**
	Confidential, only for members of the consortium (CO)	

Keywords
Policy scenarios, energy local social innovation, energy transitions, social acceptability, social innovation adoption

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1. Case Study Background

The case of Energy Island Samsø started in 1997 with an attitude critical to the dependence of the islands on energy supply from the mainland. Growing criticism of some aspects of the quality of life proposed by contemporary society and the idea of promoting a new relationship with the environment was prominent at the start of the project. This was connected with strong islander identities of the inhabitants, but also an economic threat of deteriorating job opportunities. The values of sustainability and respect for the environment were (and are) crucial and were already starting to develop before the project was implemented. At the same time, inhabitants were strongly identified with living on "their" island which was also connected to a specific way of handling obstacles. A participatory approach was adopted since the initial conception of the project. Despite citizens' involvement was limited at the beginning, the promoters aiming at involving citizens right from the start.

Citizens contributed to the design and implementation of the plan through a series of workshops. Initially, islanders opposed the plan, mostly due to their reluctance to have wind turbines along the coastline. However, as the owners of the Samsø Energy Supply Company, the islanders eventually benefited from the realisation of the project, and a shift in the public opinion occurred. Therefore, the project was implemented up to 2007. Furthermore, the Samsø Energy Academy was funded.

In Samsø, 4 district heating plants were built along with 11 onshore and 10 offshore wind turbines, and a 2500 m2 solar panel system; further, the use of biofuels by farmers has been promoted.

The 100% of the island's electricity currently comes from wind power, with surplus electricity exported to the mainland grid, and 75% of its heat comes from local solar power and biomass.

Renovation of 200 homes has increased efficiency and energy savings; and some passive buildings such as the Energy Academy have been built. Denmark's Renewable Energy Island Samsø is a role model (i.e., making Samsø's experiences applicable to other contexts in a simple form), a frontrunner and signpost for the energy transitions to come. The project has received intercontinental recognition from Japan to EU institutions, from the White House to Danish 'Climate Municipalities'.

Further ongoing stages of the project concentrate on making Samsø fossil fuel-free by 2030. This is called version 2.0 of Smasø's green transition and entails a number of ongoing actions, including careful planning, arranging themed meetings, upgrading existing wind turbines, replacing oil furnaces with heat pumps, and advising residents and businesses about reducing their use of electricity and heat. For this vision, seven objectives are outlined, including the ambitious objective 3, i.e. that fuel for transport on Samsø, and to and from the island, will be based on renewable energy.

2. First round of policy scenarios workshops

2.1 Methodology and objectives of the workshop

The first workshop was held online, due to the covid-19 ongoing pandemic, on the 17th of December 2020 in four hours between h 13,00 and 17,00. Concerning the participants in the workshop, from the SMARTEES project six people were involved: The facilitators were Giuseppe Pellegrini Masini and Erica Löfström, both researchers at NTNU Department of Psychology. Further SMARTEES researchers that attended the were Isabel Lema-Blanco, UDC, Wander Jager, UG, Niklas Mischkowski and Emlam Meskovic of ICLEI. The attendees were five practitioners working sustainability transitions in Samsø, representing the Samsø Energy Academy, the municipality of Samsø, Samsø Coop Offshore Wind and Samsø Energy and Environment office (NGO).

2.2 Agenda

Detailed agenda of the first phase of policy scenario workshops conducted in Samsø

Date Thursday 17/12/20

Time	Session content
13:00	Welcome Presentation of the participants *(10 minutes)* - SMARTEES Team (Giuseppe Pellegrini Masini, Erica Löfström, others) - Participants of Samsø Introduction to policy scenarios *(15 minutes)* - Presentation of the SMARTEES project, the objectives and the structure of the policy scenarios workshops (*5 minutes*) - Presentation of the relevant dimensions for the implementation of a transition project towards energy self-sufficiency based on renewable energies (*10 minutes)*
13:25	Lessons and learnings from the start-up of the Renewable Energy Island project *(60 minutes)* - Group reflection on the strategies implemented during the start-up of the Renewable Energy Island project. Lessons learned: advantages / disadvantages of each strategy. - Identification of alternative scenarios: What other alternative strategies existed? What would you have done differently?
14:25	Coffee break *(10 minutes)*

14:35	Presentation of the agent-based simulation model (University of Groningen) (15 minutes) - Joint reflection on the simulations to be carried out and the possibilities of expansion of the model. What strategies can be incorporated into the simulation model? (20 minutes)
15:10	Policy Sandbox Tool (ICLEI) presentation (15 minutes) -Reflection on how to design an interactive and effective tool to inspire the planning of innovations based on the Renewable Energy Island model. Questions and answers (15 minutes)
15,40	Coffee break (10 minutes)
15:50	Presentation of Søren Hermansen (Energy Academy): "The present and future of Samsø Renwable Energy Island" (10 minutes)
16: 00	Discussion of future scenarios of Samsø Renewable Energy Islands: what are the challenges, what are the drives and what are the barriers for the development of the project? How to foster social acceptability and community engagement? *(50 minutes)*
16:50	Conclusion and feedback *(10 minutes)*
17:00	End of session and workshop

2.3 Results of the first round of policy scenario workshops

2.3.1. Introduction to the policy scenario workshops

The workshop was introduced by a fifteen minutes presentation regarding:

- the SMARTEES project, the objectives and the structure of the policy scenarios workshops
- the relevant dimensions for the implementation of a transition project towards energy self-sufficiency based on renewable energies

The purpose of the workshop was designed outlining the following objectives:

- Jointly reflecting on lessons learned during all the phases of the SI
- Reflecting on social acceptability in Samsø
    - What actions did work
    - What actions didn't
    - What could have been done differently

- Discussing further data to be integrated into the SMARTEES agent-based model architecture.
- The future of the Samsø renewable energy island project

Some possible relevant dimensions for the discussion were introduced during the introductory presentation in order to prompt the attendees with some issues that could have had a significant impact on the SI development and success.

These were indicated in four groups of dimensions: 1 leadership and vision, 2 community participation, 3 economic sustainability, 4 ownership schemes, 5 the institutional environment (see table 1).

These dimensions didn't mean to be exhaustive but wished to stimulate attendees to think about all the relevant dimensions.

At the end of the introductory presentation and before starting the discussion, the attendees were prompted again to reflect and discuss:

- Samsø's residents involvement in decision-making processes
- How the step-by-step implementation of change worked
- If anything, what could have been done differently?
- What policies could make it easier?
- Anything else that could help to understand the successes (or shortcomings) of the SI in Samsø

Table 1 Potential dimensions and subdimension for the success of the SI introduced to stimulate a discussion

Leadership and vision	• A group of pioneers • Building a credible vision • Ability to mobilise energies • Effective communication
Community participation	• Building trust • Honest and transparent communication • Broad involvement • Understanding opposition and finding mediations • Empowerment through education

	• Harvesting pride, attachment, environmental eagerness
Economic sustainability	• Citizens, businesses and professionals need to see an economic opportunity • Savings/ Return on investment • Creation of jobs • Self-sufficiency • Sustainable business models: durability
Ownership schemes	• Shared/community ownership • Important for social acceptability • Necessary to deliver economic benefits
The institutional environment	• Grants/ Investments • Expertise • Trust • Banking system

2.3.4. Best strategies to increase social acceptability of the SI

Strategies implemented to foster social acceptability

In the SI of Samsø, specific drivers and strategies appeared to be clearly successful in increasing social acceptability, these were already known from the previous stages of research in the project, i.e. desk research and the qualitative interviews, nevertheless, in the workshop, these were confirmed, and some further details emerged.

The success of the initiative in gathering social acceptance was built through an "internal lobbying" action, as one of the attendees called it, meaning with that lobbying for the vision of Samsø as a renewables island with all the economic actors and citizens of the island. It was an action guided by a group of members of the community who approached and involved in many meetings all the main economic actors of the island and, in particular, those who were the backbone of Samsø's society, like farmers and local companies. These groups were made sensible to the economic opportunities that the project would create for an otherwise declining economy and decreasing population. Also, the municipality joined the project, but as was pointed in the workshop, this happened only when the then conservative mayor understood that the farmers and the main economic actors were going to support the project.

In this process, it was pivotal the role of an organisation such as the Energy and Environment Office, an NGO that was created to support the process and to promote participation involving citizens while appearing as independent and not tied to local political actors, which in itself promoted a sense of trust in the participation process. An energy company that looked at the financial and technical details of the project was also perceived as independent and trustworthy. This process was pervasive and aimed at reaching as many people as possible, open meetings were promoted where alternatives were discussed, and consensus on future actions was generated, while accountability was encouraged, keeping track of the process and producing minutes for every meeting.

Some further strategic elements favoured the consensus-building process and, more generally, the SI. A masterplan that guided the process while leaving room for discussions and participatory co-creation and decision making was realised at the very start; this allowed to have a participatory process that was bounded by guiding principles and objectives, it provided a vision but also allowed citizens and stakeholders to discuss options to achieve the objectives and to mediate potential conflicts through the agreement of shared solution.

It was decided from the start that co-benefits should be sought after and that economic and environmental objectives should go hand in hand. This was reflected by including local economic actors in the actions of the project. For example, plumbers, concerned with the district heating projects that they saw as a threat to their business of installing and maintaining oil-fired heating systems, were invited to work and profit from the district heating projects. Similarly, farmers were made sensible to the economic benefits deriving from leasing their lands for renewable energy projects and selling biomass to district heating plants.

Community ownership co-operative schemes, whenever was feasible, were used to benefit as many individuals as possible from the new energy developments. This also meant that many citizens accepted to be on the governing boards of the co-operatives, thereby strengthening participation and sense of ownership of the project.

Another element that was determining in influencing acceptance was the supportive financial and institutional environment. The national government provided grants, while advantageous feed-in tariffs were also in place. Further, the municipality guaranteed bank loans and the then local banking environment was defined as “progressive” and supportive, granting financing without requesting significant upfront capital of guarantees. All of these financial and institutional conditions created a favourable financial outlook for the project and made it easier to promote the SI as a good financial opportunity for everyone. Although these favourable circumstances are not to be regarded as a strategy to gain social acceptance in itself, they clearly point to the importance of adopting a strategy in the design and implementation that might magnify the financial benefits for the stakeholders involved.

Alternative policy scenarios and potential strategies

The attendees didn’t mention alternative strategies that could have been used in the given conditions. The SI had proved itself very successful in gaining participation and consent by the vast

majority of the population of the island, so there were no obvious shortcomings in the strategies adopted to facilitate social acceptance.

There was only an instance in which the process hadn't been successful in building consent around a proposed district heating plant for the villages of Besser, Langemark, Torup and Østerby. A number of practical elements worked against this specific plan, relatively high costs of establishing a long network, the fact that several villagers had already invested in the biomass boilers, and further, as emerged in the workshop, a problem of trust towards an individual of the community that was considered to promote this project for personal advantage made some suspicious and unwilling to support it.

It was mentioned in the workshop that a strategy to address the problem of lack of trust would be to strengthen the role of a citizen-led organisation as leader of early-stage participation processes. This would make it more likely that the process is being perceived as independent and free from influence by economic stakeholders. It was pointed out, though, that this strategy had already been adopted in the vast majority of the projects.

Table 1. Policies to increase the social acceptability of the SI

Policies and strategies for the implementation of social innovation	Main insights / lesson learned
Policy1: a wide process of participation and co-creation Dimension addressed: Citizens' participation and trust	Early-stage citizens' participation, open co-creative process involving many stakeholders: municipality, energy academy, farmers, local businesses, citizens
Policy2: Securing financial resources through multiple channels Dimension addressed: Financial resources	Securing good financial conditions to initiate, implement and sustain long-term the project aims through securing government grants, taking advantage of feed-in tariffs, seeking a supportive financial environment (local banking)
Policy3: Aiming at co-benefits Dimension addressed: Understanding needs and delivering co-benefits	The process was aiming at delivering co-benefits based on local needs: revitalising the economy, saving money, generating income while improving the environmental sustainability
Policy4: Planning for community ownership Dimension addressed: Ownership structure	Community ownership, whenever possible, it allowed a higher level of participation of citizens, wider distribution of economic benefits and creating a sense of ownership of the SI
Policy5: Creating a vision and a structured process of participation and co-creation Dimension addressed: Citizens' participation and leadership	A masterplan redacted and agreed with the municipality that guided the process from the start allowed focused participation and co-creation opportunities while giving structure to the process

Table 2. Policies to increase the social acceptability of the si

Policies for the implementation of SI	Alternative pathway/intervention identified
Policy1: Community engagement in district heating projects	Strengthening the role of a citizen-led organisation to guide the participation process

Dimension addressed: Participation and trust	

2.3.5. Policy scenarios for the replication of the SI

The project of Samsø has continued to evolve over the years, and it is now in a phase that is aiming to free the island from fossil fuels by 2030.

This current phase is presenting new challenges, which are due to a number of issues ranging from the nature of the interventions, the institutional and financial context and the changing social composition of the island.

It was mentioned in the workshop that the society of Samsø is changing in several ways. The farming community, the traditional backbone of society, is shrinking while at the same time newcomers have joined and are joining. Newcomers can be retirees interested in enjoying the environment of Samsø, or younger families with children, but in both cases, they don't have relatives or connections. Further, a significant number of newcomers are of different nationalities.

The changing society on the island is believed to pose new challenges in terms of participation in the SI's evolution. Incoming retirees often don't have a long term interest in the future of the local economy, particularly when they have not been part of the local society for long; therefore, they are less likely to participate and join some actions, while at the same time are conservative in relation to the features of the local environment and might resist some type of energy developments. Younger newcomers with families are instead similarly disconnected by the island society and therefore are harder to reach; further, they seem more difficult to involve in meetings, this is partly due to the fact that they don't have parents on the island that can help with sitting their children, but another reason is that they are similarly disconnected to an extent form the society of the island, and in a system of participation that in the past relied on informal communication and personal invitations, the newcomers are more difficult to reach. People from different nationalities might also have different cultures and might be less sensitive to the opportunity of participating.

More generally, it has been said during the workshop that a reason for the success of the SI on Samsø was a sense of pride and place attachment to the island. This is often stronger in those individuals who have lived longer on the island and that belong to families that have been established in Samsø for generations.

A possible strategy to attempt a greater involvement of difficult to reach subjects is considering alternative forms of communication, including virtual meetings and increased use of social networks both for communication and engagement. Finding also family-friendly times for meetings, such as the weekends when parents are free from working duties, is a possibility.

A further challenge that the Si is experiencing regards the changes in the financial and institutional environment. During the workshop, it has been pointed that the Danish national government is not favouring as much as it did in the past local community ownership, national policies seem to favour

large projects and thereby large companies, which might even be co-operatives but nevertheless, they have lost a grassroots and local connections with communities. Securing financing for the project appears more complicated; the local baking branches system doesn't offer the possibility of discussing financing anymore, dealings over financing happen with a higher level of banking management that is based on the mainland. Finally, banks require more guarantees and upfront capital to finance new projects, and the ability of the municipality to assist is also limited and ties by European and national laws regarding competition in markets that limit the space of action for local authorities.

It is difficult to find effective solutions to tackle these problems; broadly speaking, lobbying the national government, and fostering relations with the banking management is what is currently being done. Another strategy is seeking external investors; some appear interested in joining some project, although external investors might open a problem of governance of the energy developments, which would then be shared with the investors. In some cases, this has not been considered acceptable. For example, it was mentioned that a biogas plant that was planned has not yet been realised because it was not possible to raise the finances, however, an external company offered to build the plant, but this offer was turned down because the community felt that it would have lost control on the plant and the materials used for the biogas production.

While the first phase of the project was guided by the master plan approved by the national and the local government, a new guiding vision and plans have been outlined in a Climate Action Plan, which is now in need of a participation process to be thoroughly discussed with the citizens of Samsø. This, to an extent, is more difficult than in the past for a number of reasons. The solutions proposed are more ambitious and more complex, the projects are financially more demanding, and some of the actions might imply greater changes in the lives of islanders. This means that organising an effective participation process might involve a higher level of informed discussions, where often just the most educated and informed feel comfortable in participating. Further, the many options that the island is facing to become fossil-fuel free means that discussions can be much wider and disorienting for many citizens.

The higher complexity of the solutions considered and the wide range of technical options to choose from, is also matched by much higher availability of information than in the past. This has been pointed to as challenging in terms of participation because some individuals might brand themselves as experts and continually challenge the solutions proposed, often without prosing solid alternatives.

Possible strategies mentioned for tackling these issues consist in using a strategy of participation that, instead of focusing on involving everyone who agrees to participate in discussing the whole plan, would create specific thematic meetings regarding different actions, where a higher level of depth in the discussions could be achieved, and those citizens who are most interested are involved and asked to propose feasible alternatives if they have a critical stance.

Table 3. Policy scenarios for the replication of the SI

Present challenges	Strategies
Changing society in Samsø	Adapting participation times and formats to make it easier to participate for young families. Using new media but maintaining in presence meetings. Efforts to connect with newcomers are needed.
Unfavourable changes in the financial and institutional environment	Intensifying lobbying with national institutions. Fostering relations with financial institutions on the mainland. Opening to external investors while maintaining control on the governance.
Complexity of solutions required to achieve a fossil-fuel-free island increases challenges in the participation process	Rethinking the process of participation. Instead of a single large process, creating several participatory paths regarding specific actions with smaller groups to generate in-depth informed debates

2.3.6 Input for the ABM and the Policy Sandbox Tool

The workshop has strengthened the awareness of the modelling team about several variables that are being considered for inclusion in the model. Demographic variables like age, education, length of residence might influence participation, engagement and thereby social acceptance. The importance of a supportive institutional and financial environment is also an element whose relevance was emphasized for consideration of further parameters in the Agent Based Modelling for the Samsø case. Finally, the participants highlighted their interest in co-developing the Policy Sandbox Tool.

3. Second round of policy scenario workshops

3.1 Methodology and objectives

Objectives

The objectives of the second phase of multi-stakeholder deliberative workshops in Samsø were two-fold: first, to present the simulated scenarios of the social innovation processes elaborated for Samsø case and refine the alternative policy scenarios that can be implemented in the model and second, to present the Policy Sandbox and to get feedback about its features and perceived usability.

Specific objectives

- Present the alternative scenarios simulated through techniques of agent modelling (ABM) aimed at increasing the social acceptability of SI's interventions in Samsø

- Refine those political scenarios with the participants in the workshop so that they are as close as possible to the local reality

- Reflect together on the simulations carried out and the possibilities of the model

- Present the "Policy Sandbox Tool", an open digital platform that will integrate simulated scenarios (ABM) and will serve to showcase how, in selected SMARTEES cases, different policies approaches result in different results in the development of the social innovations.

Attendees

The second round of deliberative workshop was facilitated by were Giuseppe Pellegrini Masini and Erica Löfström, both researchers at NTNU Department of Psychology. Further SMARTEES researchers that attended the were Isabel Lema-Blanco, UDC, Wander Jager, UG, Niklas Mischkowski and Elma Meskovic of ICLEI. The practitioners were four practitioners working sustainability transitions in Samsø, representing the Samsø Energy Academy and the municipality of Samsø

Format

The workshop adopted an online format due to the Covid-19 restrictions on meeting in person during the pandemic. All the participants connected to the online video conferencing platform Zoom licensed to the Norwegian University of Science and Technology. The workshop lasted two hours.

3.2. Agenda

The workshop was held on the 27th of May 2021, between 13,00h and 15,00h and had the following agenda:

13:00

Welcome
Presentation of the participants
Introduction to the second round of policy scenarios
Presentation of the results of the first round of policy scenarios and introduction to the workshop

13:20

Presentation of the Agent-Based Model
Questions and clarifications
Refinement of policy strategies
Joint reflection on the simulations carried out and the possibilities of the model

14:35

SMARTEES Policy Sandbox Tool presentation and poll

15,00

Conclusions
End of the workshop

3.3 Results of the second round of policy scenario workshops

The workshop was introduced through a presentation that stated the following objectives:

- Presenting the simulated scenarios of the social innovation processes.
- Refining the Agent-Based Model developed with the participating promoters and stakeholders.
- Discussing the different alternative policy scenarios, which can be tested in the agent-based model, focused on gaining broader social acceptability of sustainable energy policies.

A summary of the strategies adopted, barriers and drivers and present and future challenges of the SI discussed in the first workshop were recalled.

Attendees were then prompted with a list of possible alternative policy strategies that could be employed to increase social acceptance:

- Which types of consultation events and timing? E.g. Meetings, surveys, requests of feedbacks
- Types of participation. What decisional power for the layman? How?
- Ownership and governance
- Communication strategies. Early-stage, ongoing, how?
- Meeting the needs of citizens. What process for mapping needs and accounting for them in design/implementation?
- Compensating for undesirable outcomes. How?
- Delivering tangible benefits. E.g. generating savings or creating new facilities.

Further, attendees were prompted about a brief list of topics relevant to reflect on alternative strategies for increasing the overall success of the SI

- Funding: what strategies can be used to overcome the challenge of financing the SI?
- Resources: what human resources and institutional resources are needed?
- Management: what management arrangements would support the most the SI?

Presentation of the Agent-Based Model

The presentation of the agent-based model focused on what a model is, and how it could serve the design of SIs and their related policies. It exemplified its application showcasing the SMARTEES case

of the city of Groningen. Finally, it discussed the details of the ongoing model development for Samsø and pointed at its key variables.

Results of the workshop discussion on the alternative policy scenarios presented in the model

The discussion brought up a number of issues that might influence consideration of the inclusion in the model of alternative policy scenarios.

It was pointed out that the national institutional and policy framework is important, especially in the long term, because it influences the financial feasibility and economic sustainability of the SI directly, and therefore it should be somehow accounted for in the model

Trust in the participation and co-creation processes of the SI was considered very important. It was pointed out the relevance of the perceived impartiality of the organisation leading the participation process. If a subject leading a process is seen to gain potential advantage from it, this can undermine trust. The episode of the missed opportunity to realise the district heating plant in Besser, Langemark, Torup and Østerby was recalled as an example of mistrust contributing to the failure of a specific project.

It was also discussed how the success of one initial action could lead to enabling replication of the same actions within the SI, a positive cascade effect that builds on positive perceptions and competencies generated by the earlier successful actions, and whether this could be reflected in the structure of the model concerning district heating cases.

It was mentioned that careful consideration should be given to age, length of residency and family circumstances of citizens, which affects their needs and place attachment. Newcomers, retirees, young individuals might have different levels of interest in long term projects and varying levels of ability to commit to participatory processes. Some young people might see themselves moving to the mainland soon, while retirees might not be interested in long term projects that require investments or that could compromise the amenities of their local environment. Finally, young families might have limitations in their ability to engage, and newcomers might have less of a place attachment and, therefore, less of a willingness to invest time and resources.

The inclusion of young people in the participatory process is seen as particularly challenging due to the changes in the island's social structure and a decline of the farming community. A strategy used in the past to invite directly through phone calls or by word what could be seen as civil society leaders, i.e. individuals who had prominent roles in some established professions or social groups, might exclude the younger generation who are less embedded in established social networks structures. For that reason, the energy academy is considering new forms of participation involving social media and online platforms, which could be more far-reaching with the younger population and could also provide an opportunity for polling participants or even for voting some project proposals.

The importance of also engaging on social media is seen as an opportunity to defuse criticisms and to engage constructively critical subjects that nowadays use social media more than other means to voice their critique and, in doing so, influence the political debate on the island.

It was also pointed out that local political and national debates and competition between rival political factions might influence social acceptance, particularly in the period preceding elections when political confrontation is heightened.

Finally, it was underlined the importance of giving relevance in the model to economic and financial circumstances. In this respect, it was confirmed that the SI had great success and consensus because it was also seen as an economic opportunity for a society relatively deprived due to being an island economy. This clearly affected and also affects the financing of the projects because it implies a limited capacity of autonomous investing, it requires a higher reliance on public grants, in bank financing and in seeking external investors. All of this in turn, can lower social acceptance, especially when the direct investment of households is perceived as too high or when a financial commitment of the municipality is seen as risky.

3.4. Workshop discussion on the Policy Sandbox Tool

The policy sandbox tool was presented in its current development. Attendees were provided with a web link to the current version of the tool and asked to take approximately ten minutes to go through the tool on their own. Before going through the tool, participants were given hints related to what kinds of things to look out for (e.g. whether the instructions were clear, the design looked appealing, etc.), to act as a guide and to thereby also draw useful feedback regarding the tool. Following the ten-minute exercise, participants were asked to answer a number of polls during the meeting that inquired about their user experience, the suitability of the tool to provide a better understanding of the cases, the potential usefulness of the tool for practitioners within the attendees' organisations, and potential marketability of the tool.

Some participants had to leave the meeting prior to the conclusion of the session due to other meetings and others had technical difficulties when it came to accessing the polls. Unfortunately, this meant that the number of poll responses received were limited to the responses of only one of the participants. Nonetheless, the feedback that was received was much appreciated and helpful.

Questions concerning user experience

For the first two statements, a scale response was used and the participant was asked to indicate whether they strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree.

1. I managed to navigate well my way through the PST. The respondent strongly agreed with this statement.

2. The current design is appealing to me. The participant agreed with this statement.
3. If any, which points did you find unclear or confusing?
    a. Instructions / Guidelines on the top of the page
    b. Moving through the timeline
    c. Moving through the info boxes (context, actors…)
    d. Quality of maps, images, and text
    e. Choosing scenarios in the exploration section
    f. Other

For the third point, namely the question related to what the participant found unclear or confusing, the respondent selected the quality of maps, images, and text. This may be due to the fact that the case study that was looked at when testing the tool was that of Aberdeen as that was the most advanced case and the first that was ready to be added in the tool.

Sandbox tool

For the three questions below, a scale response was used and the participant was asked to indicate whether they strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree.

1. Does the prototype sandbox tool give a better understanding of the case studies and what Agent-Based Modelling may offer? The respondent strongly agreed that the tool gives a better understanding of both the case studies and agent-based modelling.

2. Would this be a useful demonstration for other practitioners in your organisation? The participant agreed that the tool would be useful for other practitioners.

3. Would this be a useful demonstration for other policy makers in your organisation? The respondent agreed that the tool would be useful for policy makers.

Sandbox Innovation Workshop

For the two questions below, a scale response was used, and the participant was asked to indicate whether they strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree.

1. Would a brainstorming workshop with SMARTEES partners focusing on a challenge in your city be useful? The participant agreed that a brainstorming workshop would be useful.

2. Would you be willing to cover the costs for the delivery of such a workshop by SMARTEES partners? (approx. €2-5000). The participant indicated that they were not sure whether it would be possible to cover the costs of such a workshop.

Out-of-the-box service

For the first question below, a scale response was used and the participant was asked to indicate whether they strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree.

1. Do you think there is a potential market for a customised service to help cities with social innovation and energy transition? The participant agreed that there is a potential market for a customized service.

2. What kind of services would be most relevant?

- Policy support
- Practice support
- Advisory support
- Peer mentoring
- Consultancy support
- Agent-based modelling support

The respondent selected practice support, advisory support, and agent-based modelling support to be the most relevant.

Annex 3: Report on Policy Scenario Workshops Cluster Island renaissance based on renewable energy production

El Hierro

Picture: El Hierro 100% Renewable Energies project

Project Full Title	Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability	
Project Acronym	SMARTEES	
Grant Agreement No.	763912	
Coordinator	Norwegian University of Science and Technology (NTNU)	
Project duration	May 2018 – April 2021 (36 months)	
Project website	**www.local-social-innovation.eu**	
Work Package	WP5 Policy Scenarios	
Deliverable	D5.2 Elaboration of Policy Recommendations for each cluster of case-studies. ANNEX 3. Report on Policy Scenario Deliberative Workshops: Cluster Island renaissance based on renewable energy production. Case: El Hierro	
Delivery Date	31.08.2021	
Author(s)	Isabel Lema Blanco, Adina Dumitru (UDC)	
Contributor(s)		
level:	Public (PU)	**X**
	Confidential, only for members of the consortium (CO)	

Keywords
Policy scenarios, energy local social innovation, energy transitions, social acceptability, social innovation adoption

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1. Case Study Background

"El Hierro 100% renewable energies" is the energy project launched by El Hierro Island (Canary Islands) pursuing the sustainable development of the island based on the production and management of renewable energy (Sustainable Development Plan, 1997). This project, promoted by the local authority (the Cabildo de El Hierro), started as a technological innovation in renewable energies aiming at becoming a self-sufficient territory based on renewable sources, taking the advantage of the geographic characteristics of this volcanic island. El Hierro developed a Wind Pumped Hydro Power Station (inaugurated in 2015). It consists of five wind turbines capable of producing 11.5 megawatts of wind power to supply electricity for approximately 11,000 residents, an additional number of tourists, and three water desalination facilities.

A new energy company, "Gorona del Viento SA" was founded in 2004, which is a public-private enterprise owned by the island government with the partnership of the regional government, the Technological Institute of the Canary Islands (ITC) and the private energy company operating on the isle (Endesa). The project guarantees the electricity and water self-sufficiency on the island, reducing the vulnerability of the islanders as well as decreasing the reduction of CO2 emissions from fossil energies. El Hierro achieved in 2018 the milestone of supplying the 97% of energy demand by renewable sources during the month of July. Further, the support from the islanders have increased due to the plant has become a key element in the economic development of the isle, attracting sustainable and scientific tourism and gaining international reputation.

Aiming at being 100% self-sufficient, the island launched a series of policies for encouraging the adoption of renewable energies among citizens and visitors. For instance, an electric vehicle charging network has been deployed across the island to be used for free. Also, the Council launched a pilot policy of subsidies for (1) renewable energy self-consumption installations in farms and homes; (2) purchasing of electric vehicles (cars and bikes); (3) renovation of old household appliances. Gorona del Viento.

Plans for the expansion of the "El Hierro 100% renewable energies" project involve the empowerment of the citizen in the energy domain (becoming "prosumers") as well as enhancing behavioural changes towards low-carbon mobility and the sustainable development of the island. While the project is getting more mature, the policy scenario workshops conducted in SMARTEES in 2020 and 2021 are taking place at the same time as the promoters are defining the plans for the expansion of the project, which have been studied in the different research activities conducted in SMARTEES (see Deliverable 5.1, Deliverable 4.2 and Deliverable 3.1).

2. First round of policy scenarios workshops

2.1 Methodology, participants and objectives of the workshop

The policy scenario workshops aimed to promote joint reflection, between promoters and policy and social actors, about the best alternatives for the implementation of renewable energy policies with a high degree of public acceptability, which will serve to support informed decision-making on social innovations.

Specific objectives:

1. 1.Expert participants will reflect together on the experiences and lessons learned during the implementation of “El Hierro 100% Renewable Energies” project (pilot experiences, tools, solutions, strategies, processes).
2. 2. To identify the most relevant dimensions (barriers and facilitators) for the social acceptability of “El Hierro 100% Renewables” project and of the energy policies to be promoted on the island.
3. 3. To identify the most appropriate solutions and alternatives for the implementation of new energy policies that deepen the objective of energy self-sufficiency on the island (hypothetical scenario).
4. 4. To Co-produce a series of alternative policy scenarios that serve as the basis for the design of energy sustainability policies that enjoy broad social acceptability, based on the empirical knowledge obtained in the project.

Concerning the participants, the workshop was organized and facilitated by Isabel Lema Blanco, Susana Pablo Hernando and Adina Dumitru. Giuseppe Pellegrini Massini (NTNU) also participated as expert in energy innovations. The Agent-Based Model was presented by Bertha Guijarro Berdiñas and Noelia Sánchez Maroño. The Policy Sandbox Tool was presented by Elma Moskovic (ICLEI).

The policy scenario workshop was held in the headquarters of Gorona del Viento and counted with 9 expert participants representing the island Government (Cabildo de El Hierro), the energy company Gorona del Viento, one SI pioneer, local policy actors. Several external participants joined also the workshops, such as experts from the Canary Island Technological Institute (ITC) and representatives of the economic and educational sector on the island.

2.2 Agenda

The policy scenario workshop was divided in two sessions, held in El Hierro on the 19th and 22nd of October 2020. The UDC team facilitated the two sessions.

Policy scenario Agenda for El Hierro case

SESSION 1: INTRODUCTION TO POLICY SCENARIOS AND REFLECTION ON LESSONS LEARNED OCTOBER 19TH 2020	
16.00	Welcome to the workshop
16.20	Introduction of the first round of policy scenarios - Presentation of the SMARTEES project, the objectives and the structure of the policy scenarios workshops (5 minutes) - Presentation of the relevant dimensions for the implementation of a transition project towards energy self-sufficiency based on renewable energies (15 minutes)
16.30	Lessons learned from "El Hierro 100% Renewable Energies" project Group discussion on the strategies implemented in "El Hierro 100% Renewable Energies" project. - Lessons learned: advantages / disadvantages of each strategy. - Identification of alternative policy scenarios: What other alternative strategies do exist? What would you do differently? As a result of the discussion, the participants will make a list of scenarios in order of importance.
17.30	Coffee break
18.00	Alternative policy scenarios for implementation of a transition project towards energy self-sufficiency based on renewable energies - Presentation of the context for the expansion of the project "El Hierro 100% Renewable Energies" (10 minutes) - Group discussion: barriers, facilitators and strategies to gain social acceptability (80 minutes) Considering the selected context and the alternative strategies proposed in the previous discussion, the objective of this activity will be: - Identify potential obstacles to the implementation of alternative scenarios. What strategies are necessary to overcome these barriers? - Next steps to be taken for the expansion of the "El Hierro 100% Renewable" project, how would this translate into implementation strategies to gain social

	acceptability? As a result of the discussion, the participants will draw up a list of potential barriers and possible facilitators of innovation and define the implementation strategies (policy scenarios).
18.00	Conclusion

SESSION 2 - DISCUSSION OF THE RESULTS AND PRESENTATION OF THE MODELLING OF AGENTS OCTOBER 22ND 2020	
16.00	Welcome to the second session of the policy scenarios workshop
16.20	Alternative policy scenarios for the social acceptability of the energy transition project - Brief introduction of the work developed in session 1 of the workshop (UDC) - Group discussion of the relevant dimensions for social acceptability Presentation of the agent-based simulation model - Questions
17.30	Coffee break
17.45	Policy Sandbox Tool presentation (ICLEI) Discussion about the integration of the workshop results in the agent-based simulation model and its relationship with the Policy Sandbox Tool - Joint reflection on the simulations to be carried out and the possibilities of expansion of the model. What strategies can be incorporated into the simulation model? - Reflection on how to design an interactive and effective tool to inspire the planning of innovations.
19.00	Conclusion and further steps

2.3 Results of the first round of policy scenario workshops

2.3.1 Introduction to the policy scenario workshops

The policy scenario workshop in El Hierro started with a brief introduction from the UDC team regarding the general aims of the SMARTEES project and the specific objectives of the policy scenario workshops, followed with a longer presentation of the main outcomes from the empirical

research conducted in the SMARTEES project, specifically in El Hierro case study. This presentation conceptualized, first, social innovation and social acceptability in the SMARTEES project, following with the analysis of the relevant dimensions for the social acceptability of renewable energies. Third, the main lessons learned from the implementation of social innovations were briefly presented, which paved the way for starting the discussions on the barriers and drivers for the implementation of energy transition projects based on renewable energies (group discussion 1).

The promoters from El Hierro (Santiago González) presented the (future) master plan for the expansion of "El Hierro 100% renewable Energies" that focused on the following three aspects.

1) Increase the energy capacity through a diversification of renewable energy sources.
2) Energy consumption decrease.
3) Renewable energy self-consumption on households, farms, public buildings and enterprises.

This presentation was followed by the group discussion 2 on the barriers, drivers and strategies to increase social acceptability towards renewable energies.

Principal dimensions addressed in the deliberative sessions of the workshop

The principal dimensions addressed in the presentations and the discussions were:

1) Resistance: citizen resistance

2) Relevant contextual factors: (non-supporting) social/local norms; lack of confidence in the effectiveness of the project, place identity/attachment dimensions; norms and regulations; environmental awareness.

3) Satisfaction of experiential and social needs and values (in specific, satisfaction of need of acknowledgement, need of belonging, social and biospheric values)

2.3.2 Best strategies to increase social acceptability of the SI

Following a participatory and interactive methodology, a diversity of participants reflected jointly on the experiences and lessons learned during the implementation of "El Hierro 100% renewables" project. They discussed the most relevant dimensions (barriers and facilitators) as well as suggested alternatives measures and communication strategies to increase citizens' acceptability of the project. This section of the report will summarize the outcomes of the group discussions.

Table A. List of strategies to gain social acceptability implemented in El Hierro

Strategies (tools, measures, processes, communicative actions) to increase the social acceptability	Main insights
INFORMATION/COMMUNICATION STRATEGIES Dimensions addressed: - citizen resistance - Confidence in the effectiveness of the project - need for recognition and acknowledgement as an innovative island	• Initial communication of the project "EL Hierro 100% Renewables". Direct communication with the islanders and through the press regional and national (when I still don't know construction had begun on the plant). These information campaigns have been key to building the identity of the island promoting, nationally and internationally, the image of the island as an innovative and sustainable place. Concerning the information within the island, the communication it is done directly between promoters and citizens. Due to the small size of the island, citizens know the counsellors personally. • Communication when construction of the Gorona del Viento plant begins. Communication strategies focus on disseminating the benefits of the plant (e.g. job creation; tourism; media coverage brings tourism and scientific activity that benefits the island). • Communication when Gorona starts working. Press releases to publicize the event regionally and nationally. The island receives international media attention and the project's reputation grows. • Current communication strategies: information through press releases, Web and social media (FB, TW) about impact of Gorona del Viento and the milestones it has been achieving. The benefits of the plant have helped to mitigate public scepticism about the project and increase its social acceptance. Other direct communication strategies with the population that have an impact on social acceptability are: 1)

	Open day 2) Visits to the Gorona del Viento facilities 3) dissemination of the project in the science museum, or in the "interpretation centre of the biosphere reserve".
ENVIRONMENTAL AWARENESS AND CONCERN (about social innovation and in a broad dimension) Dimensions addressed: - citizen resistance - experiential needs and values - Support changes in social and cultural norms - Citizens' environmental concern (relationship between environmental quality-health-quality of life)	• Environmental education campaigns in the educational centres of the island (on different topics associated with sustainability) on an ongoing basis. These educational measures contributed to increase environmental awareness of the students as well as their families. • The school population has been the main target audience for educational actions (They estimate that there are 1800 people enrolled in El Hierro).
PILOT PROJECT THAT HAS WON INTERNATIONAL RECOGNITION Dimensions addressed - (Lack of) Confidence in the effectiveness of the model - Identity / attachment to the place (roots) - Citizen resistance	• Gorona del Viento is a technological innovation that has attracted international interest (visits of other islands, expert visits) and that has had a very high media impact. The fact that a story about Gorona del Viento appears in the international press is a source of pride for most of the residents. • However, it is suggested that the project it is more valued internationally than locally, where it has been most questioned. An expert mentions that the islanders lack sufficient technical knowledge to assess the merit of having developed a plant with the characteristics of Gorona del Viento in such a short period of time. They are not aware of what it means to innovate, develop an idea from scratch, take a risk"
CREATE NEW ENTITIES THAT MAINTAIN THE PUBLIC PROPERTY OF	• Public ownership of the project led by the Cabildo de El Hierro. The fact that the project

THE PROJECT Dimensions addressed - Identity / attachment to the place (roots) - Commitment of relevant social / policy actors to the project - Values: autonomy, biospheric or socially oriented values	was public has been key for its social acceptance. The citizens accepted the project because they felt "it was theirs" because it was a public company. If the project had a private and external origin, there would have been more resistance since it would have been perceived as that people came from outside to profit from their territory. Endesa's participation has become a barrier to acceptability, as citizens would have preferred that the financing was 100% public. • Good coordination between the Cabildo de El Hierro and Gorona del Viento to achieve common objectives.
FINANCIAL INSTRUMENTS AND SUBSIDIES Dimensions addressed - Support changes in social norms and cultural - Resistance	• Public grants for photovoltaic installations and for the purchase of electric cars, which have a positive impact on the family economy. • Subsidies allowed the educational population on the island carrying on international training activities.

Table B. Identification of alternative policy scenarios and strategies to gain social acceptability

Priority	ALTERNATIVE POLICY SCENARIOS	
1	FINANCING STRATEGIES FOR RENEWABLE INFRASTRUCTURES AND TECHNOLOGIES	- Subsidy program adapted to the needs of families that allows facing an energy change without incurring in debt. The profits of Gorona del Viento could be reinvested in two types of lines of grants: ◦ Structural investments (solar panels, refrigerators) ◦ Massive actions: distribution of LED bulbs
2	ADVICE AND SUPPORT	- Creation of an office in Gorona del Viento for advice on renewable energies. - Energy audits program to explain how to save on electricity bills and adjust supply to demand. This strategy allows reaching the groups that have not yet been reached, making

		house-to-house visits to make an audit. The previous experiences of people who have benefited from an audit it is so positive that it is considered a key strategy for achieving acceptability. - Facilitate the management of grants or aid for investment in renewable energy. - Actions demonstrating how renewable energy facilities contribute to savings in energy consumption, resulting in an economic benefit. - Spread the success stories of other territories in renewable energies.
3	INFORMATION / COMMUNICATION STRATEGIES Dimensions addressed: - social needs and values - place identity / attachment - Confidence in the effectiveness of the policy - Awareness on the economic impact of the measure	- Ecological communication and awareness strategies that appeal to emotions and values, socio-environmental. - To make an informative effort to explain that Gorona del Viento is just one part of a larger project to be implemented over a long period of time. - Introducing a transversal perspective of the communication and take advantage of every occasion (ex. female day) to explain the innovation and his social and environmental impact. - Reinforcing the message of the political consensus about Gorona del Viento, as an element to increase confidence in the project. - Transparency and information adapted to the needs of different social groups. - Increase the reputation of El Hierro as an innovative island in sustainability and renewable energy.
4	EDUCATION (ENERGY LITERACY) Dimensions addressed: - Environmental awareness - place identity /	- Educational programs that turn students into “ambassadors” of the renewable energy project. - Educational programs that address real learning situations and are contextualized on the island. - Associate lessons’ contents with complementary material on sustainability and energy, highlighting the experience of El Hierro.

	attachment	
5	CITIZEN PARTICIPATION IN DECISION-MAKING Dimensions addressed: - citizen resistance - place identity / attachment	- Design a mechanism for the purchase of shares by citizens. In the previous phases of the project, this would not have been possible. The large component of risk and insecurity associated with innovation meant that citizens did not bet on this project. Now, perhaps it was more feasible because a basic trust has already been built. - Citizen consultations about the destination of Gorona profits - Coordination with other participatory mechanisms: body of participation in the Biosphere Reserve

2.3.3 Policy scenarios for the replication of the SI

The second part of the first round of policy scenario workshops focused on the expansion plans for El Hierro 100% renewable energies" project. The promoters introduced the future strategy for the development of the project, which pursues to involve citizens in adoption of renewable technologies in their homes and enterprises. This phase is presenting new challenges, that were analysed in the workshop. Besides, a series of strategies were suggested to be able to overcome potential barriers, as well as take advantage of existing drivers that favour sustainable energies' adoption. Discussions revolved also around the best strategies to increase public acceptability to the project.

The main outcomes from these debates are listed in table C and D below.

Table C. Potential obstacles and facilitators in the expansion of "El Hierro 100% Renewable Energies" project

BARRIERS	DRIVERS
Economic difficulties that hinder investments in renewable energy. One strategy would be to have an ambitious grant program and demonstrate how these measures contribute to savings. It should improve the processing of grants, reducing administrative deadlines or facilitating the submission of applications.	Successful pilot experiences that can be adapted to this project. For example, we worked with groups of citizens to explain to them how to save on electricity bills and adjust supply to demand. If these experiences are launched in a period in which there are subsidies, the benefits are reinforced. One possible strategy would be to develop an information policy with a follow-up component and adaptation to each individual case.

Scepticism and mistrust regarding the politicians that make it difficult for the message to get through to citizens. Take care of the communication style. As a strategy to solve this barrier, transparency in communication by promoters is essential. For example, it is appreciated that Gorona del Viento publishes their accounts on the website. Communication campaigns must awaken emotions, be more creative, using a wide range of resources to awaken those emotions (art, humour ...).	Political consensus, regardless of the political party in government. One strategy would be to value this political consensus and try to decouple the project from politics and to link it exclusively to the institutions.

Table D. Strategies to be implemented to gain social acceptability towards the expansion of the project:

INFORMATION	• Refine communication strategies with a double objective: (i) transmit specific information that reduces scepticism and (ii) help citizens take ownership of the project ("Make it yours"). • Value the component innovation (R + D + i) of the project. • Associate the project "El Hierro 100% Renewables" to Gorona del Viento. • Strengthening the existing social and political consensus. Remark this as an example of another way of doing politics and institutional collaboration.
EDUCATION AND DISSEMINATION STRATEGIES	• Design and develop educational and environmental awareness strategies that introduce the component of accompaniment, advice and monitoring. • Promote dissemination events on the island, such as a renewable energy fair. These fairs constitute a relevant educational showcase and would contribute to continue strengthening the image of El Hierro.
STRATEGIES ORIENTED TO NEEDS	• Implement a well-fund subsidy program adapted to the needs of families that allows them to face an energy change without incurring debt.

'SATISFACTION	
PARTICIPATION AND CITIZENS 'ENGAGEMENT	• Design economic participation actions in the project (acquisition of shares). For example, the citizen can be offered the opportunity to invest 1000 euros in shares. They would have alternative funding sources, which would generate the feeling of belonging in citizenship. There are also risks, such as external companies enter the shareholding. This risk could be mitigated by placing conditions or restrictions on the acquisition of these shares.

2.3.4 Input for the ABM and the Policy Sandbox Tool

Concerning the policy sandbox tool, the workshop participants were interested in knowing the accessibility of the tool as well as the availability to which any user from an island or city could consult it on the internet. It is clarified that there will indeed be an online version of the tool, but that it is not yet available because the prototype version is being worked on. Regarding the parameters contemplated in the tool, it is commented that the number will range between 5 and 10, an issue that has been valued by the participants, who point out that there is a range of factors that affect the acceptability of a social innovation, and that it would not be convenient to reduce it to two or three dimensions.

Regarding the ABM, the discussion revolved around the data that will be used to feed and calibrate the model. Two types of data sources are mentioned: (i) data to describe the case, what has happened (sociodemographic data; perception surveys carried out in El Hierro; other data: interviews, documentation, press); (ii) data to introduce alternative policy scenarios.

Concerning the questions that the model will answer, it is pointed out that a model has to be simple because if too much complexity is introduced it is no longer a useful instrument. These questions must be associated with communicative acts and supported by data. One of the advantages of ABM is that it is not based on algorithms or formulas. This methodology is very suitable for exploring emerging behaviours and does not perceive change as a linear or proportional process; rather it may be the result of a butterfly effect.

Participants observe that the combination of a series of strategies is more effective in achieving the success of a policy than a single isolated action. That the model can represent the combined effect of several strategies in the model will be very positive and useful for policymakers.

In terms of the relevant strategies, the subsidy policy plays a determining role in social acceptability. He wonders about the possibility of representing this strategy in the model, although it is not a communicative act. The need to reflect more in depth on this point is pointed out. It is pointed out

that the fact that it is not known whether the people who have responded to the survey implemented in El Hierro have received, or not, the subsidy makes it difficult to represent this strategy in the model. The Cabildo could provide the data (anonymized) related to the number of the beneficiaries in 2018 and 2019 (specifically, number of grant beneficiaries and amount).

3. Second round of policy scenario workshops

3.1 Methodology, objectives and participants

The second round of policy scenario workshops in El Hierro was delivered as one only session, conducted in May 2021. The workshop adopted an online format, due to the Covid-19 restrictions on meeting in person during the pandemic, and all participants connected to an online video conferencing platform (Zoom). The objectives of the second phase of multi-stakeholder deliberative workshops in El Hierro were two-fold: first, to present the simulated scenarios of the social innovation processes elaborated for El Hierro case and discuss among participants about to what extent the model already developed represents the storyline and the reality of the project; and second, to refine the alternative policy scenarios that can be implemented in the model aiming at fostering broad social acceptability of the project "El Hierro 100_% Renewable Energies".

Attendees

All the attendees in the first round were invited to participate in the second round, contacted by email or telephone. Attached to the invitation, we sent the report (in Spanish) with the outcomes of the first round of the policy scenarios conducted in El Hierro in October 2020.

The workshop was organized and facilitated by Isabel Lema Blanco and Adina Dumitru. The Agent-Based Model was presented by Alejandro Arias Rodríguez. A total of seven participants joined the workshops who represented the island Government (Cabildo de El Hierro), the energy company Gorona del Viento, one SI pioneer, one expert from the Canary Island Technological Institute (ITC) and representatives of the educational sector.

3.2 Agenda

The workshop was held on the 6th of May 2021, between 16:00h and 18:30h and had the following agenda:

SECOND ROUND OF POLICY SCENARIO WORKSHOPS: ALTERNATIVE POLICY SCENARIO REFINEMENT MAY 6TH 2021	
16.00	Welcome to the workshop
16.15	Introduction of the second round of policy scenarios.
16.30	Presentation of the model
17.00	Facilitated participant discussion on the policy scenarios modelled
18.00	Conclusion and further steps

3.3 Results of the second round of policy scenario workshops

3.3.1. Introduction of the second round of policy scenarios: recap of the 1st round of policy scenarios and presentation of the methodology for the definition of alternative scenarios

The goals of the workshop were introduced by the UDC Team in a presentation that started with a recap of the work done in the two sessions of the first round of policy scenarios conducted in El Hierro, namely the discussions on lessons learned from the implementation of the SI, the identification of the main barriers and drivers, as well as the definition of alternative policies for increasing the social acceptability towards "El Hierro 100% renewable energies" project. Based on these alternative policy scenarios, we explained the methodology followed to elaborate the policy scenarios modelled. First, a timeline was created with different milestones, stages in the storyline of the case, indicating the triggers and tactics in terms of communication actions conducted by the relevant actors (critical nodes) to inform, educate and engage the population in the social innovation.

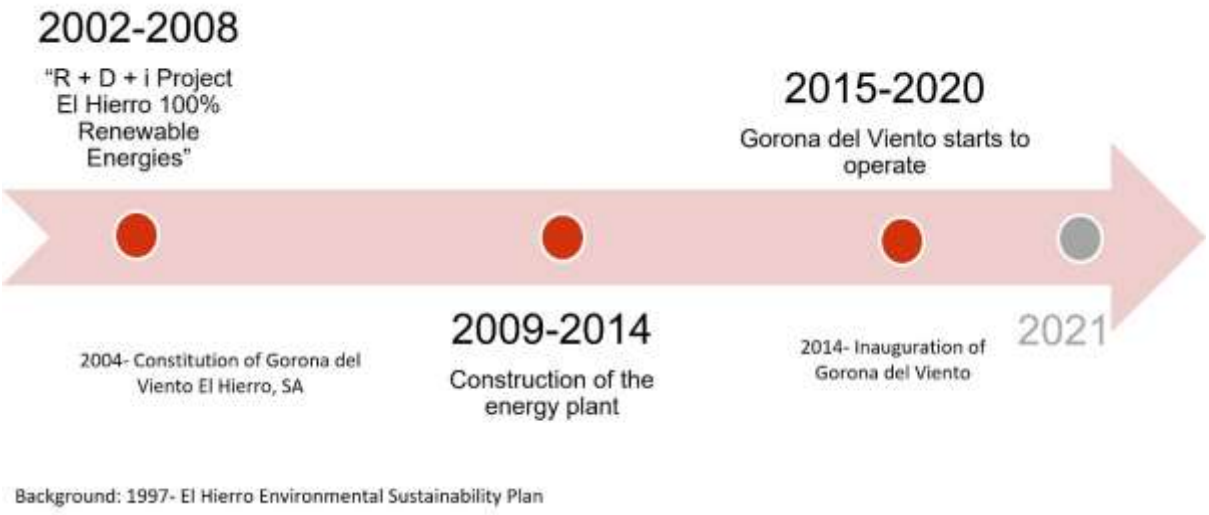

Figure 1. Timeline of the project "El Hierro 100% Renewable energies", with the identification of the different stages implemented in the model

Thus, the model has been fed by qualitative and quantitative data gathered in different research activities in the SMARTEES project. For instance, in-depth interviews, field trips and workshops in El Hierro, and the outcomes of the first round of policy scenarios were rich qualitative data to define the timeline of the project and feed the model. Further, document analysis was done specifically for the ABM which consisted of the discourse analysis of communications done by different relevant actors (promoters, supporters, opponents and media) involved in the development of the project.

More than 250 documents, including press releases, dissemination brochures and news published in local and regional media were analysed identifying the main dimensions and social and experiential needs addressing by each act of communication. Thus, the model integrates all these data to represent the reality of the project. We explained also the current limitations of the desktop analysis, in terms of existing gaps of information concerning communications from opponents and supporters, or the lack of access to (online) media sources in the first stage of the project.

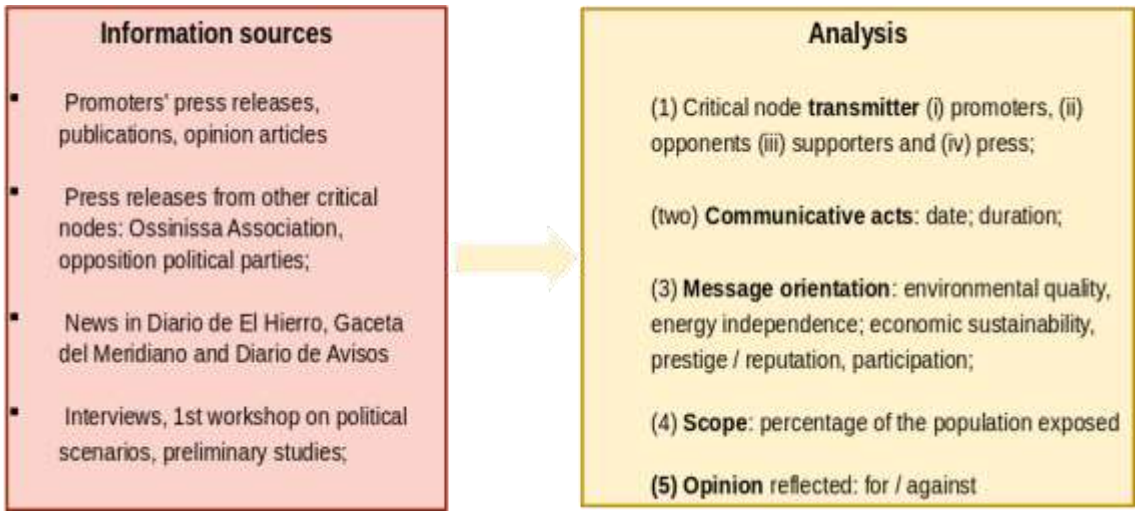

Figure 2. Presentation of the methodology: document analysis of the communicative acts in El Hierro.

CONSTRUCTION AND IMPLEMENTATION: GORONA DEL VIENTO EXECUTION WORKS Period 2009-2014								
TRIGGER	**Critical node**	**Communicative act**	**Duration**	**Frequency**	**Communication orientation**	**Scope**	**Media impact**	**Opinion**
1/29/2009	Press	Brussels wants to know if the project 'El Hierro 100% Renewables' complies with the directives " on environmental impact assessment "	1 day	1 day	Environmental quality (100%), Participation (100%) (information and transparency)	Half	Published in El Hierro newspaper	Against
09/3/2009	Cabildo of El Hierro	The European Energy Commissioner, Andris Piebalgs, visited El Hierro to learn about the 100% Renewable Energies project	1 day	1 day	Environmental quality (100%), Prestige (100%), Energy independence (100%)	high	Published in various media by the participation of the EC and the Canarian government in the activity	In favor
09/29/2009	Cabildo of El Hierro	El Hierro Hydroelectric Power Plant: twelve months of intense and fruitful work (article by Tomás Padrón in a local magazine)	1 day	1 day	Prestige (100%), Environmental quality (100%), Energy independence (100%)	Under	Only local magazine and blog readers	In favor

Figure 3. Presentation of the methodology: example of a table with triggers and tactics identified in the second stage of the project “El Hierro 100% Renewable Energies”.

Discussion

This presentation followed by a discussion with the participant that focused on the identification of relevant milestones in the history of the case that should be included in the model because these significant events contributed to the acknowledgement of the project or had direct impact on the acceptability (or not acceptability) of the project among the citizenship. For instance, receiving the visit from the former Spanish Government President, Rodríguez Zapatero, or from relevant European Commissioners were relevant facts that contributed to to succeed of the project. Further, important milestones were mentioned that negatively affected the perception of the project. For example, several articles published in local and scientific media criticizing Gorona del Viento performance had a negative impact on its social acceptability. Several “influencers” have been pointed out to play a key role in communications in favour or against the project.

According to one of the participants, the inauguration of Gorona del Viento (27.06.2014) had both positive and negative impact. As expected, some of the residents and specifically the tourist sector on the island acknowledged that the project was positive for the island, bringing more visitants and gaining national and international reputation. However, an opinion article published in the local newspaper seems to have had a lot of repercussion among the local population. The article, entitled “Central Hidroeólica de El Hierro: A critical vision”, was signed by two ex-engineers from Gorona del Viento, who highlight the Gorona project but were also critical concerning the “propaganda” of politicians, who created large expectations but with no scientific rigour.

Therefore, residents realized that “El Hierro 100% renewable energies" was a successful slogan but that "could never be a feasible reality due to the technical limitations". This critical event was pointed out to be included as a specific trigger in the model, and these two engineers can be considered influencers who have negatively influenced the acceptance of the project. Further, the total cost of the construction of the energy plan -around 82 million €- was largely criticised by a sector of population. Due to the estimations of the investment were around 65 million €, the

increase in the cost was negatively perceived by the island population, who questioned if the outcomes of the energy plant would justify this large investment.

A second relevant milestone that was not covered by the local press relates to a scientific article published in 2019 in the magazine "Renewable energy". This journal article analyses the cost of KW/h in El Hierro due to the performance of Gorona del Viento. This critical paper gained the attention of the Spanish specialized digital press, which advanced headlines such as "electricity costs more than double on the island of El Hierro". According to two participants, this article did harm the public image of Gorona for a short period of time and a public statement from the president of the island government was needed to confront these negative opinions. As a result of the discussions in the workshops, the timeline of the project in the model is being refined.

3.3.2. Presentation of the Agent-Based Model

The UDC modelling team introduced how the ABM works and the different phases for the configuration of the model. As the model aims to understand the citizen acceptance of the energy policy already implemented in El Hierro and study the expansion and replicability of the project, the hypothesis of the model concerns to the percentage of citizens that would be in favour and what percentage would be against the expansion of the project "100% renewable energies", depending on the implementation of a set of different policy scenarios.

Second, the basic functioning model is based on the definition of relevant actors (namely, critical nodes) in El Hierro, for instance, the island government, Gorona del Viento energy plant, citizens, local associations, local media and political opposition. The third phase is establishing the relations between the critical nodes and the population (namely, humats), as well as between citizens (e.g., friends, neighbours). The 4th phase consisted of the definition of the citizen response to the different communication acts from the critical nodes. This behaviour is determined by the results of the specific survey conducted by SMARTEES in El Hierro in 2020 that gathered relevant data on citizen's trust on different institutions and relationships, as well as the importance they give to values and the satisfaction of social and psychological needs (e.g., prestige and recognition, energy independence, participation, economic sustainability, environmental quality). The 5th stage consisted of the transference of the results of the questionnaire to the model according to the representation of the population, based on the official census data in El Hierro and the results of the representative sample of population participating in the survey.

An important point in the presentation of the model concerns to the recreation of the communication processes of the different actors in the different stages of the project in order. The model should be refined so that it resembles the reality as much as possible. Thus, two simulations of the initial level of acceptance were presented changing from green (in favour of the project) to red (against the project) according to their responses in the survey to the following questions: (1) We ask you to remember the period when you first learned about the 100% renewable Iron project. To what extent did you agree with the project? (2) If tomorrow there was a public consultation on the expansion of El Hierro 100% renewable energies project, what would you vote, yes or not?

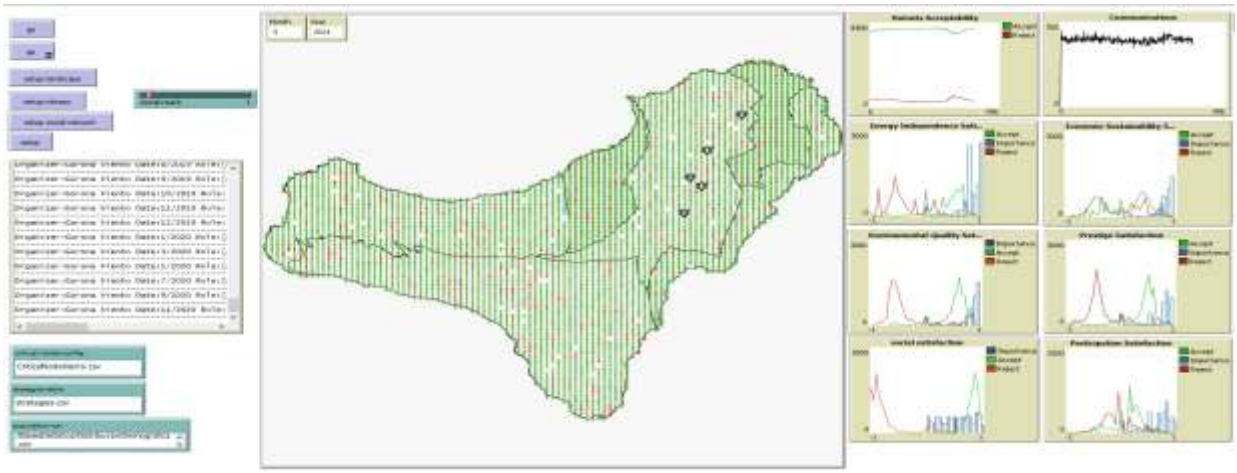

Figure 4. Scenario 1 representing the real level of public acceptance towards the social innovation at early stages of the project, accordingly to the responses to the questionnaire.

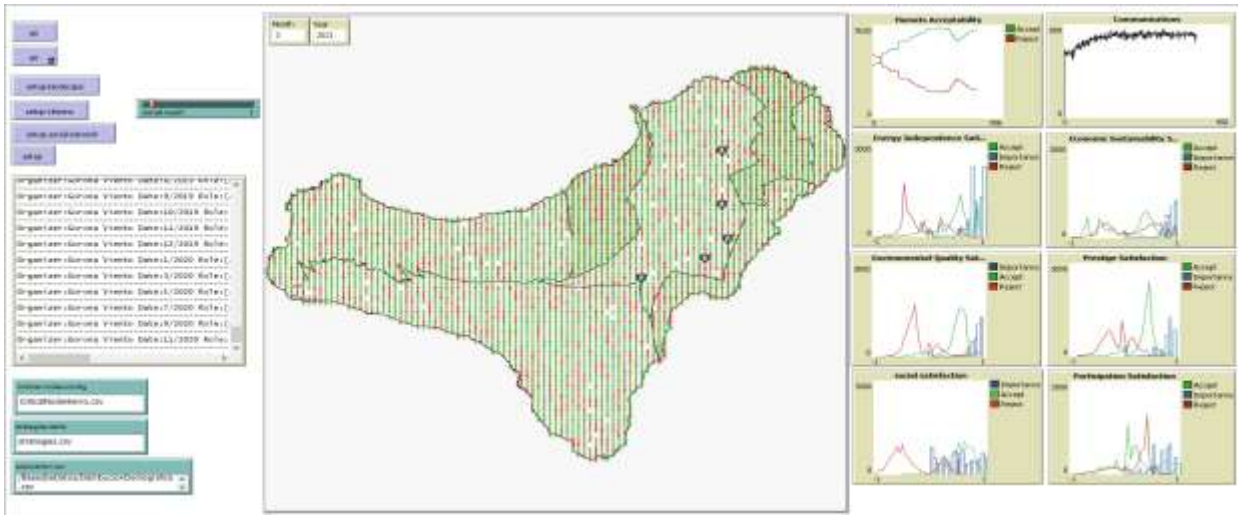

Figure 5. Scenario 2 representing a lower level of public acceptance towards the social innovation at early stages of the project

The model will eventually represent changes in the intensity and the orientation of the communications. It will be able to simulate the outcomes of the implementation of a set of alternative policies and communication strategies from promoters, supporters, opponents and local media (critical nodes), testing what would be to happen, in terms of citizens acceptability towards the project, given different scenarios.

Four alternative scenarios were presented to be further discussed with the participants:

i. Modification in the strategy of critical nodes introducing new communications to the citizens or changing the orientation of the discourse, addressing the satisfaction of specific needs that citizens are more interested or worried about.

ii. Organization of face-to-face meetings with citizens in specific localities (census sections)

iii. Involvement of new critical nodes for testing the effect of "influencers» on public opinion

3.3.3. Workshop discussion on the alternative policy scenarios presented in the model

The second round of policy scenario workshops dedicated a 45-minute facilitated discussion focusing on two questions: (1) the initial rate of citizen acceptability towards the SI; (2) the alternative policy scenarios to be tested in the model.

As explained above, as important issue in the model in regard to the representation of the social dynamics on the island as realistic as possible, the discussion focused first on the initial acceptance level of the project "El Hierro 100% Renewable Energies". There is a **consensus among the participants regarding the high level of initial acceptance of the project.** In general, the project created *good feelings* among residents. However, they perceived a progressive decrease in the level of acceptance overtime. A number of reasons were mentioned: first, people of El Hierro were initially disappointed, because of a misinterpretation of the project and people thought that their electricity bill would be lowered. Most of the population still regrets that they do not perceive a direct benefit from the project and, as consequence, a sector of the population thinks that the project was a failure. Second, the level of communication and interlocution with citizens increased and decreased during the different stages in the development of Gorona del Viento, depending on the promoters need from the support of the citizens. For example, when the project obtained financial resources and started out, the level of interlocution between the policymakers with the citizens decreased. It is argued that whether interlocution with citizens is lower, the level of support would consequently decrease too. However, other participants disagree with this opinion, so as the press department of Gorona del Viento has promptly informed of all the steps and actions that have been carried out.

Concerning the **current level of support for the expansion of the project** and the results of the survey advanced in the presentations, some participants argue that the question about the expansion of the project could be not correctly understood by the respondents. The ambiguity of the question, as well as the lack of energy literacy among the population, would be the cause of the large number of people who hesitates about their answer (about 51%), "because this is a very broad concept". Other participants reflect on the 42% that would vote in favour of the expansion, which is coherent with the increasing awareness of the energy project, as a result of communication, dissemination activities conducted by Gorona del Viento as well as the direct contact with the population. Other factors that determine the acceptability of Gorona del Viento were also

mentioned. Most participants insist that the main factor influencing acceptability is the fact that they perceive now that they can be benefited by the energy plant: “One way to counteract the negative aspect of not receiving a reduction in the bill is for them to perceive that the Council reverts the benefits of Gorona on the island and its inhabitants”. The beneficiaries of these grants can become key actors for the dissemination of the project.

Concerning topic 2 -alternative policy scenarios to be tested on the model- the **first scenario - “introducing new communications to the citizens or changing the orientation of the discourse”**- was largely discussed. As one of the main concerns in El Hierro is the economic sustainability of the island, the participants proposed a change in the orientation of the messages for citizens easily to perceive the economic benefits of the project. For example: "you may not save on your electricity bill, but you will benefit from other policies such as public grants or free energy for your electric vehicle". In consequence, the communications about the project could strengthen its positive impact as well as “do everything necessary so that the benefits of Gorona reach the population, that is the most effective policy in terms of public acceptability”. It has been argued that one alternative policy could be oriented to strengthen the energy mobility in the island. The project does not involve only renewable energy production but also the use of clean energy in different domains. However, the energy mobility issue was not tackled at the beginning of the project. However, other expert considers that people would have been discouraged by the characteristics of the electric vehicles ten years ago “this strategy would have not worked well, but it does now because now the electric car is more competitive”.

In terms of the implementation of the first alternative scenario in the ABM, it would be of interest to test if changes in the orientation of the communications from the Council and Gorona del Viento and see to what extent the perception of population changes. Modification in the strategy of critical nodes introducing new communications to the citizens or changing the orientation of the discourse, addressing the satisfaction of specific needs that citizens are more interested or worried about: e.g. economic sustainability. A second option within this alternative scenario would be increasing people’s environmental awareness, focusing the communication on the environmental quality dimension.

The **second scenario -organization of face-to-face meetings with citizens in specific localities (census sections)**- addresses the need for citizens to participate and feel they have the capacity to influence the policies that affect to them. Participatory policies were formulated in the first round of policy workshops, and some participants pointed to the possibility to articulate innovative structures for engaging citizens in decision-making. One of the counterfactual scenarios relates to establish deliberative processes allowing residents to elicit and vote about the destination of part of the benefits gained by the exploitation of Gorona del Viento. This policy is aligned with the principles of the “Participatory Budgeting”, a local social innovation that has been implemented in several municipalities on the Canary Islands, but previous experiences have not been noted in El Hierro. This policy has been considered a promising instrument, but one of the participants points that the

increasing bureaucratization of the public administration could frustrate its positive impact if the implementation of the most voted decisions suffers from delays and administrative issues.

A new policy alternative related to the previous one consists on the creation of a permanent participatory body which articulates the interlocution channels between the project and the social and economic actors on the island. Building on the successful experience of the El Hierro Biosphere Reserve, which counts on a permanent participatory body "which meets every month and counts with the participation of the island's associations, for example, there is a representative of the neighbourhood associations. A representative of the schools. From the farmers and the tourist part". This new body could function as a deliberative tool for receiving feedback about the different projects and new policies to be implemented in the frame of the energy transition strategy.

Concerning the original proposal from the UDC team, which consisted of organizing meeting with residents in specific sections, one of the participants points to the fact that this alternative was not implemented in the past because the policy-decisors were reluctant to explain to a large degree of detail the operative of the project, at least until the first objectives were achieved.

The **third scenario -Involvement of new critical nodes for testing the effect of "influencers» on public opinion-** addresses trust issues that citizens might have concerning the project. Perhaps this was the scenario that appears to be lesser appealing for the participants because it was difficult for them to identifying a stage in the past in which this strategy could have been effective. Thus, there is not one person on the island who is able to act as an influencer. Besides, one of the participants points that this strategy worked well in the past. For example, Juan Verde, a well-known Canarian expert and Secretary for relations with the European Union in the Barack Obama's administration, highlighted El Hierro's renewable energy project in several media interviews and in a conference given in a Canarian University. It was also noted that the influencer must be someone "from outside" due to receiving acknowledgement from an external voice is more powerful because people trust him or she (more than if the "influencer" is an islander).

Annex 4: Report on Policy Scenario Workshops Cluster District Regeneration Stockholm and Malmö

Project Full Title	Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability	
Project Acronym	SMARTEES	
Grant Agreement No.	763912	
Coordinator	Norwegian University of Science and Technology (NTNU)	
Project duration	May 2018 – April 2021 (36 months)	
Project website	**www.local-social-innovation.eu**	
Work Package	WP5 Policy Scenarios	
Deliverable	D5.2 Elaboration of Policy Recommendations for each cluster of case-studies. ANNEX 4. Report on Policy Scenario Deliberative Workshops: Cluster District Regeneration.	
Delivery Date	31.08.2021	
Author(s)	Giuseppe Pellegrini Masini (NTNU)	
Contributor(s)		
level:	Public (PU)	**X**
	Confidential, only for members of the consortium (CO)	

Keywords
Policy scenarios, energy local social innovation, energy transitions, social acceptability, social innovation adoption

This document has been prepared in the framework of the European project SMARTEES – Social Innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912.

1. Case Study Background

This cluster presents several interventions aimed at delivering district regeneration through a public-private-citizenship partnership. Infrastructural, technological and participatory policies have been applied in both cases aimed at making the neighbourhoods more sustainable through energy efficiency improvements, behavioural change and in the case of Malmö, interventions aimed at preventing local flooding.

Three main types of intervention policies were identified: I. Infrastructure and technology upgrade measure, II Normative and regulatory approaches, III Consumer awareness, decision aid and empowerment measures.

'Infrastructure and technology upgrade measures' were the core of the interventions and were realised through improvements in energy efficiency, installations of renewables, green roofs and improvements of the drainages systems on the relatively old (from the 50s, 60s and 70s) social housing apartment blocks. The improvements in Järva also regarded mobility, i.e. cycling paths and biking facilities were laid out or upgraded. These upgrades were led by public institutions, the municipality and the public building companies but were discussed through participatory processes that involved the residents.

'Normative and regulatory approaches' regarded some specific features of the projects that provided residents with guidelines on how to improve their behaviours towards sustainable goals and for example in the case of Malmö regarded recycling, composting and growing organic food, while in Järva involved citizens in projects aimed at taking up cycling among other sustainable behaviours.

'Consumer awareness, decision aid and empowerment measures' were deployed in both cases of Augustenborg Malmö and Stockholm Järva, although with some differences. In the case of Malmö, a consultation process was held from the early stage of the project, and all the actions were agreed upon with the residents. In the case of Järva instead, an initial process of consultation was missed, which led to protests by a large number of tenants fearing an increase in rental charges, this led to the creation of a large process of participation called 'Järvadialogen', which was developed by Svenska Bostäder in cooperation with the Swedish Union of tenants and the city of Stockholm and that consisted on a three-level process aimed at collecting the views of residents, presenting their views and showing what has been realised based on their views.

2. First round of policy scenarios workshops

2.1 Methodology, objectives of the workshop and participants

The first workshop was held online, due to the covid-19 ongoing pandemic, on the 21st of October 2020. The workshops consisted of a one 3-hour session, in combination with a "pre-workshop-task" one week prior, and a "post-workshop-survey" (task on the 14th and survey on the 28th).

In the workshop, we aimed to combine two SI initiatives – "Mainstreaming sustainability", primarily concerned with making piloted sustainable solutions for urban development the city standard, and SMARTEES, which among other objectives, aims to develop a policy sandbox tool-kit for SIs' design, to facilitate replication of social innovations. The Social Innovations of this SMARTEES' cluster aim to induce changes in the fields of district regeneration through measures such as local energy generation, urban green spaces, transport system transition and citizen participation. The policy scenarios workshop investigated how different neighbourhoods responded to various initiatives, policies and strategies, and how other neighbourhoods might respond to and replicate these experiences.

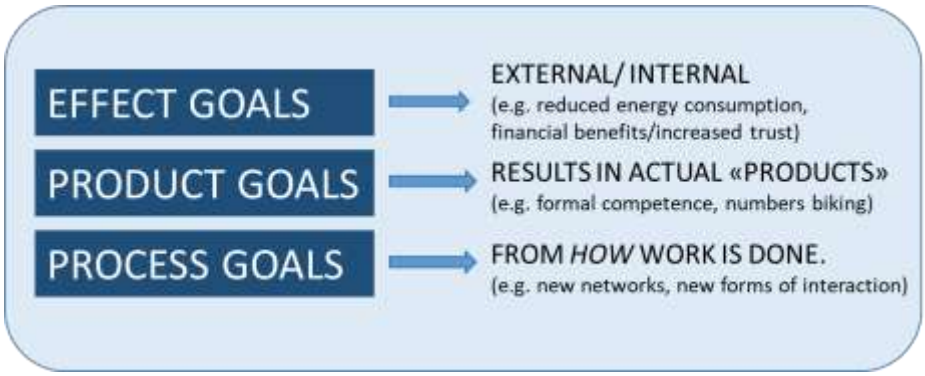

Figure 1 Workshop method for evaluating Social Innovations

The main aims of the workshop were defined as:

1. to define social innovation and its intention
2. describe barriers and drivers
3. describe alternative choices and outcomes.

The workshop was facilitated were Jens Røyrvik and Berit Therese Nilsen, both researchers at NTNU Samfunnsforskning, at the time, they acted as SMARTEES case researchers for both the cases of Malmö and Stockholm. Four more SMARTEES researchers attended the workshop Giuseppe Pellegrini Masini, NTNU, and Andrea Scalco, David Hales, Gary Polhill, from the James Hutton Institute modellers working on the agent-based model for both cities. The attendees were twelve

practitioners and experts working in urban sustainability, representing Stockholms stad, the KTH Royal Institute of Technology, IVL Swedish Environmental Research Institute. Also, Trevor Graham, director of Urbanisland, partner of the SMARTEES project contributed to the workshop, representing Augustenborg Malmö´s social innovation.

2.2 Agenda

Detailed agenda of the first phase of policy scenario workshops conducted in cluster 3

One week before the workshop	**Pre-Workshop-task.** Send out presentations: 1. Of Mainstreaming Sustainability and SMARTEES, where are the overlapping challenges and initiatives 2. Of SMARTEES Agent-Based Model (ABM) concept and Mainstreaming Sustainability method and model 3. Social Value Creation Analysis (SVA) – a working process in Stockholm 4. Of one Social Innovation (district regeneration) in each city. 5. Task for the participants: list and describe barriers, drivers and other factors in choosing, implementing and getting results of the Social Innovation.
13:00-13:45	**Introduction to policy scenarios, (common)** Welcome - Presentation objectives and structure of the workshop (Jens Røyrvik) Presentation of participants, 15 min Presentation of SMARTEES and ABM concept, 15 min (Berit Theresa Nilsen and Andrea Scalco) Presentation of Mainstreaming sustainability and method and model, 15 min (Lisa Enarsson, City of Stockholm, Matilda Landén, IVL and Berit Balkfors, KTH)
13:45-14:30	**Dimensions and scenarios - group session (case specific)** Presentation Malmö SI, Sustainable return on Investment, Trevor Graham 15 min Presentation Stockholm SI: the SVA process, Jennie Argerich 15 min Group: identify, discuss and select relevant dimensions for the actual SI. Group: identify, discuss and select contextual elements relevant for replicability of the case
14:30-15:00	**Break**
15:00-16:15	**Policy input - group session (case-specific) Group:** Present most relevant dimensions. Discuss relevance for the past and the future. Present relevant contextual elements. Discuss relevance for the past and the future. Construct and discuss different scenario outcomes (better and worse). Round of questions and suggestions from the participants regarding important factors for SI acceptability **End of the session**

2.3 Results of the first round of policy scenario workshops

2.3.1 Introduction to the policy scenario workshops

The first workshop presentation, named "Presentation of SMARTEES and ABM concept", delivered an overview of the project and of the then state of development of the ABM model. The project and the ABM models were presented orally, but short written descriptions were delivered by email in advance of the workshop and are included here:

> *SMARTEES is a project about understanding citizens' response to various energy transition innovations, and focus on behaviour related to neighbourhood change and energy as one aspect in that. This assumes a multidisciplinary understanding of social systems and inclusiveness. Robustness in policymaking depends on basing decisions on empirically grounded knowledge, which require participation from people with the right kind of experience and knowledge, using the right methodological tools. SMARTEES integrates theories and methodologies of social innovation and what is labelled agent-based modelling (ABM) in an unprecedented data collection and integration in five case clusters. Stockholm and Malmö are parts of the "district regeneration" cluster of successful innovation transfer.*
>
> *In this policy scenario workshop, we will analyse existing and future policies energy innovation scenarios, particularly focusing on neighbourhoods. We will involve a sample of key actors in developing a set of local-embedded policy scenarios. This process is suited to define alternative, complementary and/or refined policy interventions to replicate and upscale social innovations in the energy domain as well as supporting related social innovations in energy transitions. The outcomes of the policy scenario workshop will identify strategies to overcome citizen resistance and increase public acceptability of energy innovations by supporting citizen engagement in the design of local energy policies and energy innovations' interventions.*
>
> *SMARTEES agent-based models (ABMs) can be described as virtual representations of living cities. In this ABM, we will model Stockholm (and later Malmo) neighbourhoods by replicating their dwellings and their residents. The ABM will also include a virtual representation of housing companies and citizens associations since they play a crucial role in promoting social innovations. The role of the municipality and trigger of social innovations will be impersonated by the final users (i.e. researchers and policymakers).*
>
> *Dwellings are described by their location and energy efficiency. Residents representation is far more complex: each one is characterised by socio-demographic attributes, a certain pro-environmental attitude, a set of energy-related behaviours, and aspects related to the acceptance of social innovations.*

Over time buildings become outdated, suffer environmental conditions, lose energy efficiency, and so they require maintenance and renovation. The municipality supported by the housing companies and citizen associations can propose hard and soft social innovations to improve buildings energy efficiency and gain citizens' acceptance of these measures. However, the success of each intervention will depend on residents' characteristics and behaviours. The ABM will provide an estimation of the potential success of each intervention and the likely impact for different outcomes (e.g. buildings energy efficiency, citizens' quality of life, social cohesion).

The second presentation of "Mainstreaming sustainability (Hållbarhet blir standard) and method and model", was described in writing as follows:

The aim of the Mainsteaming sustainability project is to develop a governance process where successful sustainability solutions from pilot projects concerning buildings (energy), mobility and outdoor environment are up-scaled and implemented in cities in both existing and newly built areas. So sustainable innovative solutions that are developed in new projects will be established to upgrade a climate-neutral and sustainable society for all. In addition, positive synergies are strengthened, and negative side effects are avoided through a holistic approach and cross-organisational collaboration in urban development.

The objectives are:

-to develop an analysis method for identifying sustainable solutions with a potential to be standard in the city.

- to identify and validate a number of sustainable solutions during the project that can be carried forward during and after the end of the project and that have the potential to become standard.

- to develop a collaboration model for cross-sectoral societal development that facilitates implementation and standardisation of the process for sustainable solutions through effective actor collaboration as a tool for accelerating the transition to sustainable and climate-neutral cities.

- to test the collaboration model and analysis method and implement successful solutions in selected areas in Stockholm, Gothenburg, Malmö and municipalities in the Mälardalen region.

- to implement the analysis method and collaboration model in the governance process, so it works as a tool to continuously accelerate the transition to climate-neutral cities.

Further presentations regarded the projects: "Social Innovation Stockholm: Socialt värdeskapande analys (SVA), Social Value creation Analysis" and the sister project "Social Innovation Malmö: Sustainable returns from investments – overview", whose descriptions are reported here:

Social Innovation Stockholm

City of Stockholm has developed a model for creating social values in the city development process (Model for SVA). The model is about analysing a city's and a district's social challenges and, with the help of our ongoing city development projects, setting effect goals and project goals for improved social sustainability.

Social Innovation Malmö

"Sustainable Return on Investment" (HAI) is a process prototype for highlighting and evaluating social and environmental benefits linked to investments in urban development. The goal is to promote a process that supports a common and coordinated value creation in urban development where actors act together towards a goal, and make decisions that benefit the common goal. By making direct and indirect social and environmental values visible in economic terms, conditions are created for discussing the value of the project as a whole.

HAI takes its starting point in Social Return on Investment (SROI), which is found in a Swedish equivalent through the "value creation chain". SROI is an internationally recognised method that offers a clear structure for addressing the complexity of sustainability in urban development projects. The method has been further developed by the initiative's British partner, RealWorth, under the name SuROI (Sustainable Return on Investment).

HAI has been developed through value calculations in four Swedish case studies in Malmö (RoCent, Botildenborg and Heleneholm) and Lund (Källby). These cases have been in various stages of urban development: from in-depth overview plans, through detailed plans and detailed design, to the evaluation of implemented initiatives.

With experience from these cases, an HAI process has been developed and refined. This process includes a value calculation based on the SuROI method. HAI is based on proxy values in a number of thematic effect areas such as -

• Employment: e.g. economic effect of an unemployed person getting a job.

• Education and skills development: e.g. the value of an unemployed person gaining professional qualifications.

• Health: e.g. savings in healthcare due to increased exercise.

• Security: e.g. average cost of car thefts.

• Well-being: e.g. value of increased contact with neighbours.

The HAI process developed through the project can be considered to have been developed into a pre-commercial pilot stage. There are plans for further development of the project results in a semi-commercial phase before the final launch of the product/service.

2.3.2 Best strategies to increase social acceptability of the SI

Strategies implemented to foster social acceptability

A task for participants was carried out in order to identify drivers, barriers, formal, collective and individual factors at stake, whose understanding could clarify the nature of alternative policy scenarios (figure 1).

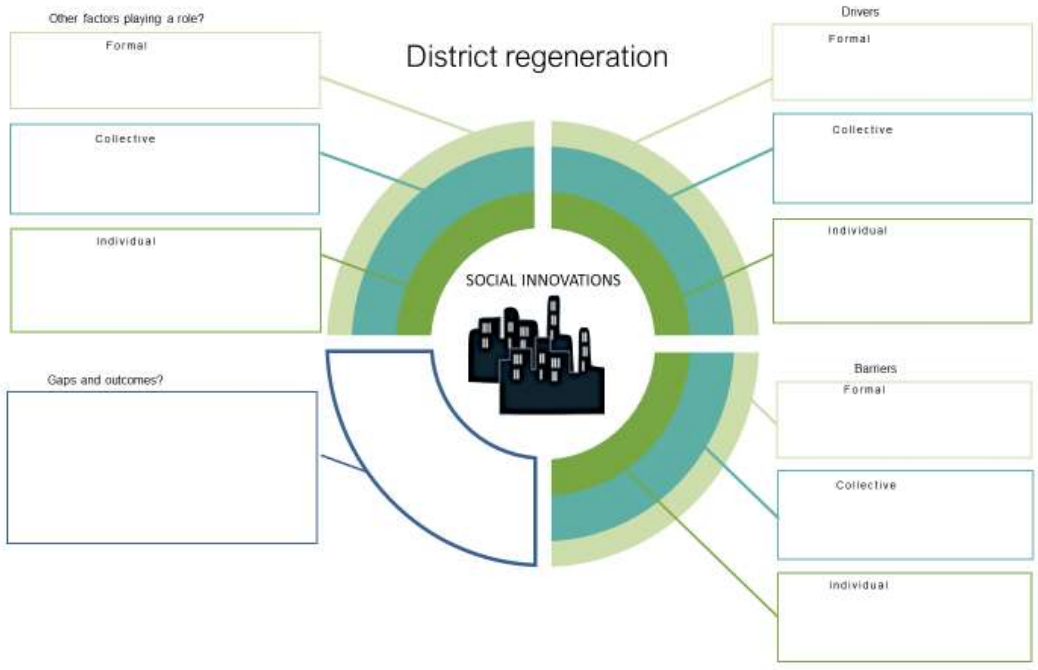

Figure 2 Task for the Stockholm and Malmö first workshop participants

In both the cases of Stockholm and Malmö, the primary strategy for increase the acceptability of the project was to create participatory processes; nevertheless, this happened in substantially different ways in the two cases.

In the case of Malmö, participation happened from an early stage. All actions were agreed with the residents, and the actions were aimed at meeting the needs of residents. This process included regular meetings, community workshops, and informal gatherings at sports and cultural events (Caiati et al., 2019); this achieved the result of almost avoiding any opposition.

In the case of Stockholm, instead, participation was not initially contemplated, and the renovation plans were communicated by letters delivered to the tenants; this led to protests of residents, who felt threatened in their right to occupy the buildings and were concerned that higher rents might be imposed on them. The protests prompted Svenska Bostäder (the public housing company) and, in particular, the municipality of Stockholm to change their approach. The municipality started the so-

called Järvadialogen (Järva dialogue), a three-stage process of participation of residents aimed at involving citizens in a co-creation process that accounted for their needs.

The stages of the process were described as follows (Caiati et al. 2019, p.87):

i. Collecting residents` views and suggestions

ii. Present the collected views

iii. Present what has been made based on these suggestions and views and what is being planned for the future

Meetings of residents of each unit with architects and building managers were also arranged before the renovations were carried out to allow residents to make comments and discuss options.

In Järva, specific actions aimed at including vulnerable and marginalised groups were carried out too. Specifically, immigrant women were targeted through a network that was built to collect their views. Women were also involved in cycling courses, and a bicycle facility was created to allow them and other residents to increase their cycling. Further, study groups and courses related to environmental sustainability and cleaning and maintenance of the neighbourhood were organised with the support of external organisations invited.

Alternative policy scenarios and potential strategies

The following drivers (and barriers) were identified as present across the several social innovations considered during the workshop in both the cities of Malmö and Stockholm:

i. Sufficient finances to initiate, implement and sustain long term the aims of the project

ii. Sufficient human resources to engage with all the phases of the SI

iii. Trust, across departments between different departments of the leading organisation, between different subjects of the partnership and between the leading actors and the citizens

iv. Early-stage citizens' participation

v. Co-creation type of participation

vi. City laws, regulations and strategies. They might make it challenging to identify the responsible subjects and therefore increase the organisational complexity. They might deliver a fragmentation of design, management and implementation

vii. Collective agreement among the people working in the different city departments involved in the SI design and implementation. Different departments often have different agendas and different "languages"

viii. Streamlining the SI design makes implementation and reproduction higher

ix. Acceptance by the politicians

x. Flexibility and aiming at delivering co-benefits. In particular, the environmental and social aims must be in tune

xi. Embeddedness in the city's strategy and contextual action

xii. Structured and efficient project management

xiii. A strategy for long term project maintenance of the achieved goals

xiv. Compensatory measures to address undesired outcomes, i.e. disutilities produced by the SI

Not all the above barriers and drivers are directly relevant to increasing social acceptance, although they are all relevant for the success of social innovations.

From the discussion, it appeared that in order to increase social acceptance, some specific drivers would need to be put in motion. On the resource side, funding and human resources would need to be sufficient to deliver meaningful actions and allow a substantial engagement from an early stage and throughout all the project's phases of the project.

Participation appears to be the most significant element that could facilitate building trust, which is a driver that should be fostered as much as possible between different departments of the leading organisations and in the relations with citizens.

This ties to the consideration, put forward in the workshop, that internal regulations and overarching city and national laws, which define in detail the responsibilities of different departments and organisations engaged in social innovations, are needed to avoid conflicts of responsibility and fragmentation in the management of the SI; this, in turn, could deliver a better consideration and planning of participatory processes and the communication strategy targeting residents.

Indirect positive effects on the social acceptance of the project could also be expected from streamlining the design and implementation of SIs. A SIs' design and implementation method that is routinely adopted in the municipality and partnering organisations would effectively eliminate the risk of avoiding early-stage participation actions if they were to be established as a standard feature of any SI.

The consensus of the political side of the administration would be helpful, primarily as an internal driver within the organisation, for smooth planning and delivery. Nevertheless, it can be speculated that a lack of support or disagreement with SIs' action from local politicians might increase the chances of a broader problem of social acceptance. Criticism delivered through the media by politicians might influence citizens' perception of the worthiness of the project.

Delivering co-benefits is another strategy that needs to be emphasised. Residents are not often favourable to sustainable interventions only, particularly in neighbourhoods challenged by more pressing issues of low income, unemployment, and safety. In these cases, it is necessary to plan for actions that deliver both environmental and socio-economic benefits for the residents to increase their acceptance.

A flexible approach in designing the interventions, if possible, is also preferable; binding residents to a limited set of choices increases the possibility of feeling forced between choosing among few options that might not meet the favour of residents.

Having a long-term strategy to maintain the achieved goals of interventions is also necessary in order to prevent future complaints, and in the worst cases, protests by the residents. The lack of a logn-term strategy to sustain the aims of the SI might lead to a reversal of the achieved objectives and thereby might undermine the trust in the SI and its leading organisations. This is not likely to affect initial acceptance much, although some citizens could question from the start whether an action is sustainable over time.

Finally, compensatory interventions might be considered to ease the acceptance of environmental measures that are negatively appraised by citizens. For example, reducing car mobility or car spaces in some neighbourhoods might lead to protests. Nevertheless, these interventions could become more acceptable if, contextually, citizens are offered new services and facilities, for example, a community hall, or a new green area, bike paths or any other intervention that could be seen as desirable.

Table 1. Policies to increase the social acceptability of the SI

Policies and strategies for the implementation of social innovation	Main insights / lesson learned
Policy 1: Participation and co-creation Dimensions addressed: Trust, inclusion, participation	The aim of the participation was co-creation and not merely consultation. This happened in both cases but with an important difference: in the case, of Augustenborg, Malmö, it happened since the early stage of development of the SI, while for Järva, Stockholm, it happened at a later stage after that substantial protests had erupted, thereby underlining the importance of having participation and co-creation since an early stage.

Table 2. Policies to increase the social acceptability of the SI

Policies for the implementation of si	Alternative pathway/intervention identified	main envisioned obstacles
Policy1: Adequate resources Dimensions addressed: Trust, inclusion, participation	Adequate funding and human resources to carry out a meaningful participatory process	Securing adequate resources can be challenging without a resourceful and supportive institutional environment. In these cases, the neighbourhoods are deprived and have very limited possibilities to contribute to investment schemes
Policy2: Regulations for participation Dimensions addressed: Trust, inclusion, participation	Regulations that would make participation mandatory and that define responsibilities across actors	No envisioned obstacles aside from adequate funding to implement regulated participation processes
Policy3: Streamlining the design/implementation Dimensions addressed: Management, organisation, participation, trust	Streamlining the design and the implementation of the SI would avoid oversights in the design and implementation of the whole SI that could diminish social acceptance	No major obstacle envisaged, but reduced flexibility in the design of the SI might be an issue
Policy4: Consultation with politicians Dimensions addressed: Consensus building, trust	Seeking consensus of the political side of the city government, might help to avoid public criticism susceptible to diminish social acceptance	Easy to do with majority parties, harder with opposition parties that might be unwilling to be involved or that might exploit the opportunity to voice their criticism publicly
Policy5: Delivering co-benefits Dimensions addressed: social acceptance, social inclusion	Delivering co-benefits to residents that include socio-economic benefits appears more successful in increasing social acceptance than focusing on environmental benefits only, and it can be useful to address social inclusion.	It might require larger budgets than social interventions based on environmental goals only
Policy6: Long-term strategy	Having a long-term strategy to	It will require larger budgets

Dimensions addressed: social acceptance, trust	maintain the achieved goals of SI's interventions is necessary to avoiding reversal and thereby	
Policy7: Compensatory actions Dimensions addressed: social acceptance	Compensatory interventions might be employed to ease the acceptance of environmental measures that are unpopular. It might be implemented through the delivery of amenities that compensate possible pro-environmental actions (e.g. reducing car parking spaces)	It might require larger budgets, and it might be problematic from a legal point of view. It might be perceived as an attempt at "buying" the acceptance by some community members.

2.3.3 Policy scenarios for the replication of the SI

The main challenges faced for replicating the SI are related to the barriers and drivers discussed in section 2.4.2. Nevertheless, it is worth recalling and elaborating here on some of the main barriers discussed.

It was discussed that the city government departments might be affected by a "silos mentality", i.e. the reluctance to share information and collaborate across departments of the same organisations where conflicts of responsibility might erupt. Thereby increasing and improving the level and quality of communication across city government departments should be considered valuable and necessary. This could be considered an action whose benefits transcend the design and implementation of SIs, but that certainly could be part of streamlining the SI process, which was pointed out as a beneficial action for replicating the Sis.

A further critical issue that regards the replication of the SIs was considered the fact that they are interventions based on neighbourhoods or anyway small areas of a large city might arise a conflict of responsibility between the different local authorities that might have competencies over the area and, as earlier pointed, between different departments of the same organisation. In both cases, improving internal and external regulations that deal with neighbourhood scales and sustainable energy SIs would be needed to reduce these conflicts and facilitate replicability.

Funding is a key aspect that has been discussed towards ensuring replicability of the SIs, particularly because SIs might be conceived as pilot projects without ensuring funding availability for replication or even maintenance of the project. Sustainable energy social innovations would benefit from a

wider strategic allocation of financial resources capable of ensuring replicability of successful pilot projects and of sustaining the achieved aims in the long term.

A further challenge that has been discussed is the process of urban densification that is ongoing in many European cities. This in itself could favour sustainable solutions while, at the same time, it creates some unpopular choices that might reduce the perceived amenity and comfort of an area and, therefore, social acceptance of some interventions that might further aggravate negative perceptions. For example, sustainable mobility policies might affect car parking and car traffic in a neighbourhood with a negative compounding effect generated by the challenges of densification, and at the same time, densification might prevent some compensatory actions from being implemented, for example, increasing green areas.

Table 3. Policy scenarios for the replication of the SI

Alternative strategies	Action plan
Strengthening cross-departmental communication	Increasing the quantity and quality of communication and knowledge sharing between departments of the city government
Improving internal and external regulations	Improving regulations that might prevent conflicts of responsibility within and between organisations and authorities
Funding strategies for replicability	Avoiding pilot only financing strategies, embedding pilots in wider strategies for financing SIs' replicability in time

2.3.4 Input for the ABM and the Policy Sandbox Tool

The workshop has strengthened the awareness of the modelling team about several variables that are being considered for inclusion in the model. Demographic variables like age, education, length of residence might influence participation, engagement and thereby social acceptance. The importance of a supportive institutional and financial environment is also an element whose relevance was emphasised for consideration of further parameters in the Agent Based Modelling for the district regeneration cluster cases. Finally, the participants highlighted their interest in co-developing the Policy Sandbox Tool.

3. Second round of policy scenario workshops

3.1 Methodology and objectives

Objectives

The objectives of the second phase of multi-stakeholder deliberative workshops in the District Regeneration cluster were two-fold: first, to present the simulated scenarios of the social innovation processes elaborated for the cases and refine the alternative policy scenarios that can be implemented in the model and second, to present the Policy Sandbox Tool and to get feedback about its features and perceived usability.

Specific objectives

- Present the alternative scenarios simulated through techniques of agent modelling (ABM) aimed at increasing the social acceptability of SI's interventions in the district regeneration cluster cases.

- Refine those political scenarios with the participants in the workshop so that they are as close as possible to the local reality.

- Reflect together on the simulations carried out and the possibilities of the model

- Present the "Policy Sandbox Tool", an open digital platform that will integrate simulated scenarios (ABM) and will serve to showcase how, in selected SMARTEES cases, different policies approaches result in different results in the development of the social innovations.

Attendees

The second round of deliberative workshop was facilitated by were Giuseppe Pellegrini Masini and Erica Löfström, both researchers at NTNU Department of Psychology. Further SMARTEES researchers that attended were Gary Polhill, UG, Niklas Mischkowski and Elma Meskovic of ICLEI. Also, Trevor Graham, director of Urbanisland, partner of the SMARTEES project, contributed as discussant to the workshop. The attendees were four practitioners working sustainability transitions in Stockholm and Malmö, representing KTH Royal Institute of Technology and Stockholms stads.

Format

The workshop adopted an online format due to the Covid-19 restrictions on meeting in person during the pandemic. All the participants connected to the online video conferencing platform Zoom licensed to the Norwegian University of Science and Technology. The workshop lasted two hours.

3.2 Agenda

The workshop was held on the 26th of May 2021, between 15,00h and 17,00h and had the following agenda:

15:00

Welcome

Presentation of the participants

Introduction to the second round of policy scenarios

Presentation of the results of the first round of policy scenarios and introduction to the workshop.

15:15

Presentation of the Agent-Based Model

Questions and clarifications

Refinement of policy strategies

Joint reflection on the simulations carried out and the possibilities of the model

16,15 Break

16:25

SMARTEES Policy Sandbox Tool presentation

16:55

Conclusions

3.3 Results of the second round of policy scenario workshops

The workshop was introduced through a presentation that stated the following objectives:

- Presenting the simulated scenarios of the social innovation processes.
- Refining the Agent-Based Model developed with the participating promoters and stakeholders.
- Discussing the different alternative policy scenarios, which can be tested in the agent-based model, focused on gaining broader social acceptability of sustainable energy policies.

A summary of the strategies adopted, barriers and drivers and present and future challenges of the SI discussed in the first workshop were recalled.

Attendees were then prompted with a list of possible alternative policy strategies that could be employed to increase social acceptance:

- Which types of consultation events and timing? E.g. Meetings, surveys, requests of feedbacks
- Types of participation. What decisional power for the layman? How?
- Ownership and governance
- Communication strategies. Early-stage, ongoing, how?
- Meeting the needs of citizens. What process for mapping needs and accounting for them in design/implementation?
- Compensating for undesirable outcomes. How?
- Delivering tangible benefits. E.g. generating savings or creating new facilities.

Further, attendees were prompted about a brief list of topics relevant to reflect on alternative strategies for increasing the overall success of the SI

- Funding: what strategies can be used to overcome the challenge of financing the SI?
- Resources: what human resources and institutional resources are needed?
- Management: what management arrangements would support the most the SI?

Presentation of the Agent-Based Model

The presentation of the "Wolverine" agent-based model focused on what a model is and how it could serve the design of SIs and their related policies. The history of the model design for the district regeneration cluster was illustrated. Finally, the presentation discussed the details of the ongoing model development and pointed at its key variables.

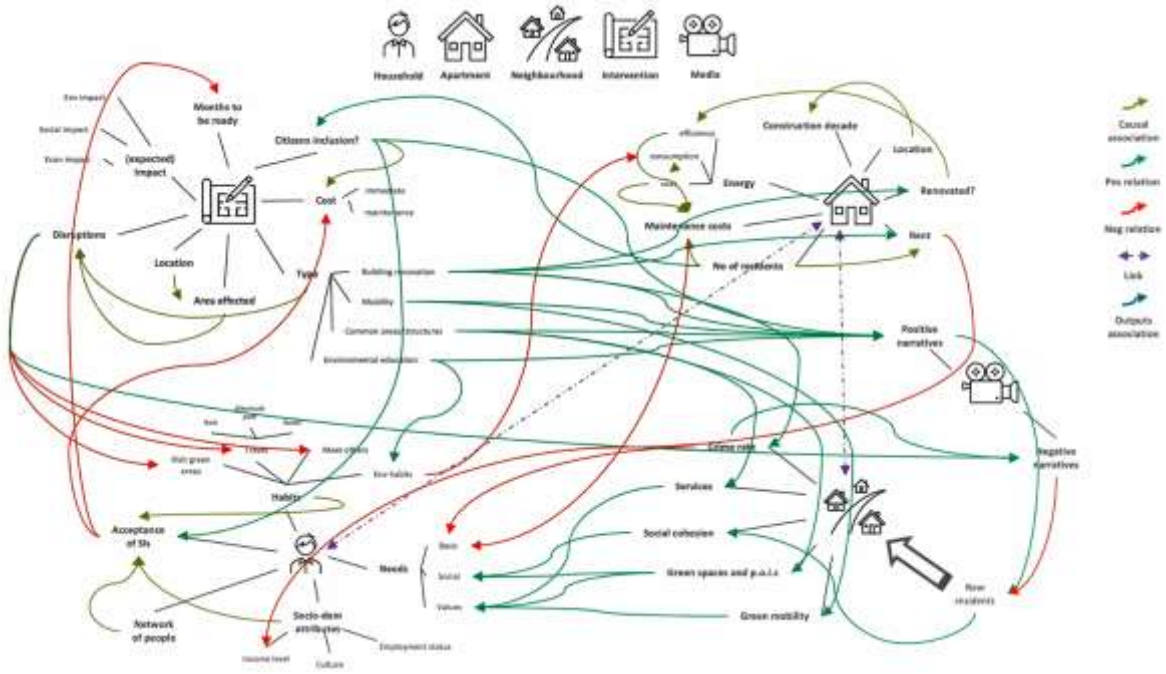

Figure 2 Visual representation of the relations between actors and variables in the model

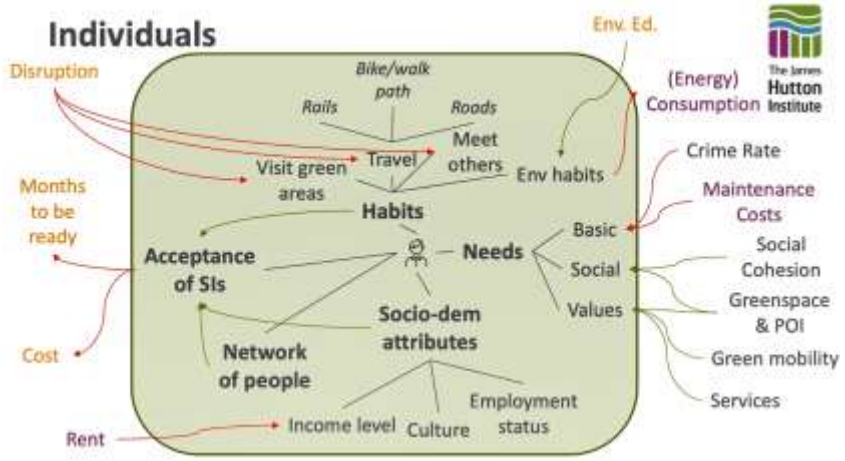

Figure 3 Visual representation of the relations between individuals and variables influencing their decision-making in the "Wolverine" model

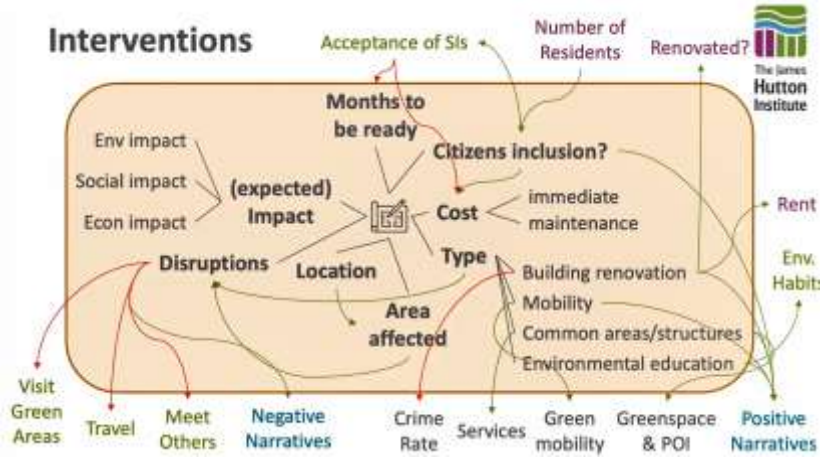

Figure 4 Interventions represented in the model

Results of the workshop discussion on the alternative policy scenarios presented in the model

During the workshop, it was emphasised the importance of including in the model policy scenarios based on early-stage and co-creation participation processes as opposed to a hypothetical scenario presenting a limited participation process.

As in the first workshop, it was pointed out that early stage and highly involving participation, including co-creation features, would provide the best chances of success in fostering social acceptance.

It was stressed the importance of having flexible designs for the SI, thereby allowing a process of co-creation during the participation process. However, it was also pointed out that this flexibility and room for co-creation and "negotiation" might come at the cost of having a larger budget that can cover the inclusion of some interventions requested by participants.

It was mentioned that the co-creation process should aim at meeting the needs of local residents as much as possible through interventions focused on delivering co-benefits, something that already emerged in the first workshop. The process of participation and co-creation should be open enough to allow important needs, which might have been missed during the stage of the SI's design, to emerge and being accounted for. Some of the adjustments suggested by citizens might actually prove to be relatively low-cost, thereby even in a hypothetical situation of a limited budget, a co-creation approach to participation should not be avoided. Nevertheless, non-negotiable aspects might be necessary to achieve the aims of the SI, but even in this case, it was pointed out that SIs including many interventions and aiming at delivering co-benefits are more likely to gain social acceptance because one single intervention might be disliked while several others might be seen favourably.

It was also discussed whether using a policy of compensations of undesired interventions could be useful to ease acceptance. It was argued that both “negotiation” and “compensation” might be legally problematic and that, more generally, a co-creation participatory project could anyway suffice in fostering social acceptance, while compensation could be seen by some as an attempt at buying acceptance.

Holding a co-creation process with elements of negotiation for a SI on a neighbourhood might present some challenges; for example, it was pointed out that such a process might involve several organisations and authorities with competencies on different features of the neighbourhood, like the buildings, public spaces and green areas or public transport. Therefore it is important to include all the relevant subjects in the process.

Further challenges might be present for those SIs that include the construction of new residential buildings in a neighbourhood, an instance this that is quite common in a pattern of densification that is investing many cities. In this case, it won’t be possible to involve the future residents in a co-creation process, and the existing residents in the neighbourhood might actually be against the construction of new buildings in the area.

In terms of strategies to increase participation, few of them have been indicated as suitable to provide fruitful results, namely: incentives, using a mixed format with in-person meeting and online participation, and, particularly in ethnically mixed neighbourhoods, liaising with community organisations and formal and informal leaders.

Economic incentives have been used in Järva to increase participation rates through a lottery system, which awarded one month free of rent to the winner. This, along with recruitment attempts carried out by resourceful engagement officers liaising directly with the formal and informal networks of the neighbourhoods, are necessary, particularly in those ethnically mixed communities that might not respond well to invitations delivered by traditional means e.g. mail.

A mixed format of in-person meetings and online tools can offer a better chance at involving in participatory activities individuals from differing demographics, e.g. elderly, who might favour in-person meetings and young individuals and parents who might instead favour online engagement. Online participation could benefit from the use of both social media and bespoke participation online services, now available on the market.

Whenever possible, participation should display anticipated benefits from the interventions considered in the project. This worked in Järva, where Svenska Bostäder, the municipal building company, could showcase a refurbished flat to residents. Clearly, this cannot be an option for many other types of interventions; nevertheless, showing pictures or videos from similar interventions that occurred elsewhere could help people to familiarise themselves and develop a more favourable attitude towards the SI.

Further, strategies to minimise discomfort during the implementation of the interventions of the SI were considered useful to increase social acceptance. For example, in Järva, alternative

accommodation was provided nearby when the flats were refurbished, and the costs for moving was covered.

It was discussed whether 'soft interventions', meaning those interventions that did not require changes in the built environment or similar major interventions, might help with facilitating social acceptance. For example, courses in cycling were given to women in Järva, which appeared to be well received. It was pointed out that they can contribute to a positive feeling about the whole SI project but cannot necessarily ease acceptance unless they tap into social needs perceived as significant. On the other hand, soft interventions should not replace resource-intensive interventions; otherwise, they might be perceived as a form of 'tokenism', i.e. symbolic cations, that do not address a need, in which case they would reduce acceptance.

It was also discussed the role of the media and, given that media can influence the social acceptance of SIs, and how to handle media relations best. A successful SI would be able to sell itself in the media arena, thereby attracting positive media coverage; however, it was pointed out that some basic strategy in relating with local media might be helpful, particularly avoiding to call the attention of the media at the early stage of implementation of a SI is seen as beneficial, because an early stage is not showing positive results yet, and it could instead be a time in which concerns are voiced.

3.4 Workshop discussion on the Policy Sandbox Tool

The policy sandbox tool was presented in its current development. Attendees were provided with a web link to the current version of the tool and asked to take approximately ten minutes to go through the tool on their own. Before going through the tool, participants were given hints related to what kinds of things to look out for (e.g. whether the instructions were clear, the design looked appealing, etc.), to act as a guide and to thereby also draw useful feedback regarding the tool. Following the ten-minute exercise, participants were asked to answer a number of polls during the meeting that inquired about their user experience, the suitability of the tool to provide a better understanding of the cases, the potential usefulness of the tool for practitioners within the attendees' organisations, and potential marketability of the tool.

Two respondents reacted to the poll. The following questions and responses appeared:

Questions concerning user experience

For the first two statements, a scale response was used and the participants were asked to indicate whether they strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree.

1. I managed to navigate well my way through the PST.
2. The current design is appealing to me.
3. If any, which points did you find unclear or confusing?

a. Instructions / Guidelines on the top of the page

b. Moving through the timeline

c. Moving through the info boxes (context, actors…)

d. Quality of maps, images, and text

e. Choosing scenarios in the exploration section

f. Other

For question 1, both participants agreed. Question 2 was answered once with "neither agree nor disagree" and once with "strongly agree". For question 3, the first participants responded that "Instructions / Guidelines on top of the page" and "Choosing scenarios in the exploration section" were unclear, the second participant chose the option "other". This feedback was not surprising given the state of the PST prototype without any concrete ABM model inputs available.

Sandbox tool

For the three questions below, a scale response was used and the participant was asked to indicate whether they strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree.

1. Does the prototype sandbox tool give a better understanding of the case studies and what Agent-Based Modelling may offer?
2. Would this be a useful demonstration for other practitioners in your organisation?
3. Would this be a useful demonstration for other policy makers in your organisation?

The respondents both neither agreed nor disagreed on that the tool gives a better understanding of both the case studies and agent-based modelling. Questions 2 and 3 were once both answered with disagreement and once both answered with agreement.

Sandbox Innovation Workshop

For the two questions below, a scale response was used and the participant was asked to indicate whether they strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree.

1. Would a brainstorming workshop with SMARTEES partners focusing on a challenge in your city be useful?
2. Would you be willing to cover the costs for the delivery of such a workshop by SMARTEES partners? (approx. €2-5000).

The participants agreed and strongly agreed respectively in that a brainstorming workshop would be useful, but answered "no" or "not sure" to the willingness to pay.

Out-of-the-box service

For the first question below, a scale response was used and the participant was asked to indicate whether they strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree.

1. Do you think there is a potential market for a customised service to help cities with social innovation and energy transition?
2. What kind of services would be most relevant?

a. Policy support

b. Practice support

c. Advisory support

d. Peer mentoring

e. Consultancy support

f. Agent-based modelling support

Both respondents answered to neither agree or disagree on question 1. One respondent agreed on question 1 whereas one answered to neither agree or disagree. Both respondents selected consultancy support and agent-based modelling support to be the most relevant; one also listed policy support, practice support, advisory support.

Annex 5: Report on Policy Scenario Workshops Cluster Urban Mobility with Superblocks

Vitoria-Gasteiz and Barcelona

Project Full Title	Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability	
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Deliverable	D5.2 Elaboration of Policy Recommendations for each cluster of case-studies. ANNEX 5. Report on Policy Scenario Deliberative Workshops: Cluster Urban Mobility with Superblocks.	
Delivery Date	31.08.2021	
Author(s)	Isabel Lema Blanco and Adina Dumitru University of A Coruña	
Contributor(s)		
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Keywords
Policy scenarios, energy local social innovation, energy transitions, social acceptability, social innovation adoption

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1. Case Study Background

This social innovation is based on an urban innovation (superblocks) that introduce low-carbon mobility practices through the reorganization of urban space, which minimizes the use of motorized modes of transportation. The city is reorganized into superblocks, car-free areas designed to maximize public space and keep private cars and public transport outside the neighbourhoods, redesigning the inner streets for use by pedestrians.

1.1. Vitoria-Gazteiz

In Vitoria-Gasteiz, the Superblocks Model has been defined in the 'Sustainable Mobility and Public Space Plan' (2007) elaborated by the Council of Vitoria-Gasteiz, which establishes a hierarchical outline which conditions every public space intervention or road regulation (in accordance with the "superblocks" distribution). The overall goal is to implement the superblock model at the whole city level. Thus, the Plan organizes urban mobility through a network of main roads along which all private and public motorized vehicles (cars, bus, tram, taxi) circulate while traffic is discouraged in the inner streets of each superblocks through vehicle access restrictions and traffic-calming measures. The actions in the three complete superblocks were more integral in terms of the reformation and pedestrianization of streets and squares. Since 2008 financial crisis, more economic solutions ("tactical urbanism") were put forward which did not entail the complete reformation of the street, but more than fifty streets benefited from traffic-calming measures and new cycling lanes.

Several relevant actors and stakeholders were involved in the Sustainable Mobility and Public Space Plan' at different stages. Local politicians and city stakeholders signed first the 'Citizens' Pact for Sustainable Mobility' (2007). A series of participatory meetings with residents and neighbourhood associations facilitate information and citizens' participation in the designing of the new public transport system (2009). Simultaneously, traffic restrictions and new parking regulations were implemented in the central superblocks (2009-2012), despite the resistance and protest received from the retail sector and business allocated in the affected areas. The political consensus guaranteed that the superblock's plan was implemented and sustained over time. Citizen participation was articulated through the 'Sustainable Mobility Forum', a deliberative body in which the different mobility policies are presented and discussed, receiving feedback from local associations, citizen's platforms and individuals that join the Forum.

To date, three superblocks (Central, Sancho el Sabio and Médico Tornay-Judimendi superblocks) have been completed and actions have been implemented in 20 of the 77 superblocks scheduled in the Plan. Five more interventions are planned to be implemented in the period 2021-2023 (in Zabalgana neighbourhood). The evaluation and assessment of the plan reports the positive impact of mobility policies on the environmental quality of the city due to the relevant decrease in the use of the private cars and the increase in sustainable transportation inside the city (public transport, bicycle, walking). Besides, superblocks have become calm areas for spare, shopping or sports and

population claim the extension of the plan to new areas of the city. Vitoria-Gasteiz awarded the title of “European Green Capital” (2012) as well as the “UN Global Green City Award” (2019). The Plan for Sustainable Mobility and Public Space was rated “Best Practice” by Un-Habitat.

1.2. Barcelona

Superblocks introduce low-carbon mobility practices as well as allow (new) social uses of the free-car public space. The goal is to re-organize mobility in small areas of the city – so-called superblocks – in which motorized traffic is restricted. The challenge when implementing superblocks, is to maintain the conditions for transversal mobility while the inner streets are calmed and are dedicated to new uses such as sports, children’s playgrounds, new green areas etc., increasing residents’ quality of life and social cohesion. Through the Urban Mobility Plan, Barcelona city is planned to be organised into 503 superblocks, as approved in the ‘Let’s fill the streets with life’ superblock programme (2016). The plan is being implemented by the Municipality of Barcelona, which formed a technical secretariat (promoter) to lead the programme, receiving also technical support from other municipal areas. Other actors involved are: a) supra-municipal public administrations, b) district (political) councils, c) local politicians and d) neighbourhood stakeholders, residents’ associations, specific groups of interests, district NGOs and third-sector entities (local politicians and stakeholders act as both supporters or opponents to the superblocks programme). Superblocks in Barcelona have received social support and social acceptance in certain areas (e.g. Sant Antoni, Horta) but also high levels of protests and contestation in others (e.g. pilot superblock in Poblenou) that have been reduced overtime. Social contestation was motivated by the lack of information and lack of social participation before starting the urban interventions. Changes in the pilot project were made after, following the suggestions of residents and the citizens´ associations in the area. In the following superblocks, the city council promoters implemented a participatory process engaging a wide representation of residents and groups of interests in the area that co-designed the superblock “Action Plan” together for a period of almost 1 year. The Action Plan is also introduced in advanced to the affected population and suggestions from residents and stakeholders are included.

To date, five superblocks have been fully or partially implemented so far (Sant Antoni, Poblenou, Horta, Hostafrancs, Les Corts) and participatory processes have been organized for the co-definition of three more superblocks (Girona, Les Corts, and Sant Gervassi). Barcelona's superblocks programme is taking a step ahead in 2021, aiming at the creation of a network of green areas where pedestrians have priority. This new vision will be first applied in the Eixample district (Cerdà section), transforming the area in 21 green streets and 21 new squares. The Eixample will gain a total of 33.4 hectares of new pedestrian areas and 6.6 hectares of urban green areas in the current densest district in the city, which suffers of the most pollution and noise. The outcomes of the superblocks programme have been assessed in three pilot interventions, measuring positive outcomes in the following dimensions: improvement of environmental and public space conditions, increase in green

areas, enhancement of social activity and social interaction in the neighbourhood. El Poblenou's Superblock received an “special mention” at the 2018 European Prize for Urban Public Space.

2. First round of policy scenarios workshops

2.1 Methodology, objectives of the workshop and participants

The policy scenario workshops in the superblocks cluster focused on the design of innovative urban policies on sustainable mobility that serve as the basis for the replication of the superblocks model in both cities of Barcelona and Vitoria-Gasteiz, supported by the empirical data obtained in the SMARTEES project. The first round of policy scenarios aimed at promoting joint reflection, between promoters and political and social actors (stakeholders), about the best alternatives for the implementation of low-carbon mobility policies that will serve to support informed decision-making on social innovations.

Specific objectives:

1. Expert participants will reflect together on the experiences and lessons learned during the implementation of the superblock program (pilot experiences, tools, solutions, strategies, processes).
2. Identify the most relevant dimensions (barriers and facilitators) for the social acceptability of superblocks.
3. Identify the most appropriate solutions and alternatives for the replication of superblocks in the context of the city (hypothetical scenario).
4. Co-produce a series of alternative policy scenarios that serve as the basis for the design of future superblocks in each city, based on the empirical knowledge obtained in the project.

Description of the format and methodology

Due to the COVID-19 situation, the workshops were conducted by a mixed formula: virtual workshops with the researchers connected online (using ZOOM platform) but with city participants located together and a few experts joining from home. The workshops were video recording and notes about the main topics of discussion were taken during the sessions by the UDC team.

The first round of political scenario workshops will consist of a combination of:

(1) One deliberative session with each city, where the most relevant dimensions for the implementation of future superblocks will be discussed.

(2) One final joining session with the cities of Barcelona and Vitoria-Gasteiz, for joint reflection on the relevant dimensions, the main lessons learned in both cities and the alternative routes for the design of new superblocks.

(2) Presentations made by researchers from the Universidade da Coruña (UDC) -adapted to the cases- about the main results obtained in the studies carried out at SMARTEES in the superblock cluster.

(4) Presentation of the agent model prepared by the team of modellers (UDC)

(5) Presentation of the Policy Sandbox Tool prepared by ICLEI.

Participants

The workshop was organized and moderated by Isabel Lema Blanco, Adina Dumitru and Susana Pablo Hernando. Besides, UDC modellers Amparo Alonso Betanzos, Bertha Guijarro Berdiñas, Alejandro Rodríguez Arias and Noelia Sánchez Maroño also joined the workshop.

The first session was held in the city of Barcelona and counted with 8 expert participants representing the municipality of Barcelona (promoters), policymakers (representatives in Districts of L'Eixample and Sant Martí), and representatives of social groups like the neighbourhood association Colectivo Superilla Poblenou-CSP9. While the SMARTEES researchers joined online, participants from Barcelona met together in the same plenary room.

The second session was held in the city of Vitoria-Gasteiz and counted with 9 attendees representing the Vitoria-Gasteiz City Council, the city Center of Environmental Studies (promoters), the pedestrians' association "Camina Gasteiz", the neighbourhood association "Ensanche XIX" and the cyclists' association "Gasteizko Bizikleteroak". While the SMARTEES researchers joined online, Vitoria-Gasteiz met together in the same room.

The third session joined together attendees from both Vitoria-Gasteiz and Barcelona together using the virtual conference software Zoom. The Agent-Based Model was presented by Bertha Guijarro Berdiñas and Noelia Sánchez Maroño. The Policy Sandbox Tool was presented by Sara de Maio (ICLEI). Seven participants from Barcelona and seven from Vitoria-Gasteiz attended the meeting representing the municipality of Barcelona and Vitoria-Gasteiz (local promoters), policymakers (Barcelona district councils), and representatives of following local associations: the neighbourhood association Colectivo Superilla Poblenou-CSP9 in Barcelona; the neighbourhood association "Ensanche XIX", the pedestrians' association "Camina Gasteiz" and the cyclists' association "Gasteizko Bizikleteroak" in Vitoria-Gasteiz.

2.2 Agenda

Detailed agendas of the first phase of policy scenario workshops conducted in cluster 4

The policy scenario workshops were organized in two different sessions. The first session was conducted separately in Vitoria-Gazteiz and Barcelona. The second session was conducted simultaneously to facilitate the participants in both cities to engage in joint discussions and interchange experiences and lessons about the implementation of superblocks in their respective contexts.

SESSIONS 1 & 2

INTRODUCTION TO POLICY SCENARIOS AND REFLECTION ON LESSONS LEARNED

Location: Vitoria-Gazteiz/Barcelona (these sessions were conducted separately in both cities)

9:30	Welcome to the workshop
10:10	**Introduction of the first round of policy scenarios** - Presentation of the SMARTEES project, the objectives and the structure of the policy scenarios workshops - Presentation of the relevant dimensions for the implementation of superblocks
11:10	**Lessons learned from superblocks** - Group reflection on the strategies implemented during the launch of the superblocks in the city. Lessons learned: advantages / disadvantages of each strategy. - Identification of alternative policy scenarios: What other alternative strategies exist? What would you do differently? As a result of the discussion, the participants will develop a list of scenarios in order of importance.
11:40	Coffee break
13:10	**Alternative policy scenarios for the implementation of a new superblock.** - Presentation of the context for the replication of a superblock **Group reflection: barriers, facilitators and strategies to implement a new superblock** Considering the context selected for the replication of a superblock and considering the alternative strategies proposed in the previous discussion, the objective of this activity will be: 1. Identify potential obstacles to the implementation of alternative scenarios. What strategies are necessary to overcome these barriers? 2. Next steps to take for the new superblock: How would this translate into implementation strategies? As a result of the discussion, the participants will draw up a list of potential barriers and possible facilitators of innovation and define implementation strategies (policy scenarios).
13:20	Conclusion

SESSION 2 - DISCUSSION OF THE RESULTS AND PRESENTATION OF THE MODELLING OF AGENTS

Plenary session to be held with the simultaneous participation of Vitoria-Gasteiz and Barcelona through a videoconference system

16:00	Welcome to the second session of the policy scenarios workshop
16:10	**Alternative policy scenarios for the social acceptability of superblocks** Presentation of the results of the discussions held in session 1. Discussion of the results with the representatives of both cities. **Presentation of the agent-based model for superblocks** Presentation of the policy scenarios for the replication of the new superblocks. Questions about the model.
17:50	Coffee break
18:10	**Policy Sandbox Tool presentation** **Joint discussion about the integration of the workshop results into the agent-based simulation model and its relationship with the policy sandbox tool** Joint reflection on the simulations to be carried out and the possibilities of expansion of the model. What strategies can be incorporated into the simulation model? Reflection on how to design an interactive and effective tool to inspire the planning of innovations based on the superblock model. What do Policy Sandbox Tool participants want to learn?
19:00	Conclusion and further steps

2.3 Results of the first round of policy scenario workshops

2.3.1 Introduction to the policy scenario workshops

The individual sessions held in each city started with a short introduction from the UDC team regarding the general aims of the SMARTEES project and the specific objectives of the policy scenario workshops, followed with a longer presentation of the main outcomes from the empirical research conducted in the SMARTEES project, specifically in the cluster of urban mobility with superblocks. This presentation conceptualized, first, social innovation and social acceptability in the SMARTEES project, following with the analysis of the relevant dimensions for the social acceptability of superblocks. Third, the main lessons learned from the implementation of social innovations were briefly presented, which paved the way for starting the discussions on the barriers and drivers for the implementation of the superblocks in the city (group discussion 1).

The promoters from Vitoria-Gazteiz and Barcelona presented a future (hypothetical) replication of one superblock in a new area of the city, which serves as basis for the group discussion 2 on the barriers, drivers and strategies to implement a new superblock.

Principal dimensions addressed in the deliberative sessions of the workshop

The principal dimensions addressed in the presentations and the discussions were:

1. Resistance: citizen and policy resistance
2. Relevant contextual factors: (non-supporting) social/local norms; lack of confidence in the project, place identity/attachment dimensions; commitment of relevant actors
3. Satisfaction of experiential and social needs and values (in specific, satisfaction of need of acknowledgement and need of trust in the leaders of the project)

2.3.2 Best strategies and alternative policy scenarios to increase social acceptability of superblocks: Results from deliberative workshop discussions in Barcelona

Following a participatory and interactive methodology, a diversity of participants reflected jointly on the experiences and lessons learned during the implementation of the superblocks program in the city, discussed the most relevant dimensions (barriers and facilitators) as well as suggested alternatives measures and communication strategies to increase citizens' acceptability of the superblocks model. This section of the report will summarize the outcomes of the first group discussion in each case study.

Table A. A. List of strategies to gain social acceptability implemented in Barcelona

Policies and strategies for the implementation of social innovation	Main insights / lesson learned
INFORMATION/COMMUNICATION STRATEGIES Dimensions addressed: citizen resistance - need for recognition and acknowledgement as an innovative neighbourhood	• Formulation of a sustainability discourse that connects to the experiential and social needs and values of the population. New discourses and frames in regard to the need of increasing people's quality of life have been widely adopted by political and social groups of the city. The superblocks model links with this sustainability framework but needs to be "translated" to the reality of the neighbourhood and citizens involved. A combination of different communicative actions using different channels need to be used. • Effective communication involves "a listening attitude". Citizens must feel that their needs and demands are heard and, as far as possible, addressed. It is necessary to align the speech with the needs of the neighbourhood, making technical language comprehensive to general audiences. • Take advantage of the existing opportunities for disseminating the project: neighbourhood' social groups, movements and participatory processes already created (e.g. Sant Antoni marketplace) • "INFORMATIVE PILLS". A successful strategy that they have used to address the concerns of different groups relating (to) the implementation of the superblocks in one neighbourhood: When they identified in general meetings with neighbours that certain groups expressed specific concerns, they organized thematic meetings with them to provide specific information and address their concerns. These specific sessions focused exclusively on the needs and worries of these groups helped to relax them and reduce resistance. These informative/educational pills were supported by evidence and data as well as specific resources to

	complex and technical messages can be understood by citizens. For example, they designed a model so that the blind people could have a precise image of how the design of the superblocks was being considered, considering their needs. • Media -local and international- play a key role in the dissemination of the goals of the project (during the designing and implementation phases) as well as in building social acceptability to the measure (once the measure has been implemented and impact has been observed). In Barcelona, in the case of Poblenou, the [national and international] media were key allies in strengthening support and advocacy for the project. This contributed positively, not only to increase social acceptability, but also to satisfy the resident's psychological need for recognition and acknowledgement as an innovative neighbourhood.
INCREASE CITIZENS' ENVIRONMENTAL AWARENESS AND CONCERN Dimensions addressed: citizen resistance - experiential needs and values	Communication strategy aligning the discourse of superblocks with the dimension of health (relationship between environmental quality-health-quality of life). The publication of a 2011 ISI Global report establishing a clear connection between environmental quality and quality of life and health was a turning point and gave a boost to the acceptability of the project. The introduction of health aspects in the discourse is key to increasing the acceptability of the program.
CITIZEN PARTICIPATION IN DECISION-MAKING Dimensions addressed: citizen and political resistance social needs and values place identity/attachment Confidence in the effectiveness of the policy - Confidence in the leaders of the	• Creating a stable core group of stakeholders, political and social agents to work together in the superblock project. Symmetry between technicians and citizens must be promoted. Some stakeholders play a key role in citizen participation processes. Specifically, the influence of merchants to reach neighbours is given as an example. It is essential to try to establish alliances with these intermediaries and win their support. • Confidence in the leadership of the project: A climate of trust, intimacy and open communication must be generated, in which the participants feel comfortable. Hence, the importance of stability [that participate the same people in the discussions] and

project	continuity [periodic meetings]. • Caring time and pressure. Handling time and deadlines with caution. People must perceive that progress is being made without haste. Time pressure is perceived as negative. Change requires time for reflection, discussion, and maturation of proposals. • Evaluation and follow-up of the actions must be carried out and outcomes should be shared with the participants in these processes.
PILOT PROJECTS Dimensions addressed: citizen and political resistance place identity/attachment Confidence in the effectiveness of the policy - experiential and social needs and values	• An early success story is needed to overcome resistance at multiple levels [citizen, political…]. • To present the final objective of the project and indicate that this objective will be achieved in different phases. Citizens have to perceive that the pace of implementation of pilot projects - specific urban actions - has to be slow so that it is not perceived as an imposition. • Flexibility and experimentation capability. For the project being not perceived as an imposition, participants in citizen participation processes must be confident that they might change the project if they are not satisfied with the result and being listened in decisions such as specific measures, priorities, timeline. However, this can be perceived as negative whether citizens see that all their effort can be easily dismantled. The promoters are clear about the aspects of the program susceptible to be changed and those that are not flexible [e.g.goals]. • Superblocks have contributed to reinforcing the feeling of belonging in some neighbourhoods, such as Poblenou. It is considered that this dimension, depending on the context, can exert a positive influence on social acceptability [“see the program as an opportunity to improve the neighbourhood”] or negative [“perceive the program as a threat and an intrusion”].

Table B. Identification of alternative policy scenarios and strategies to gain social acceptability in Barcelona

LTERNATIVE POLICY SCENARIOS	
CITIZEN PARTICIPATION IN DECISION-MAKING Dimensions addressed: - citizen and political resistance - place identity/attachment - Confidence in the effectiveness of the policy - Awareness on the economic impact of the measure	1. Citizens- engagement. It is estimated that 5% of the residents of a neighbourhood participate in the participatory processes. Alternative strategies must be carried on reaching to different groups with different social needs, e.g. students, young people, women. 2. Involve opponents from the very beginning contributes to reduce resistance and contestation. Participants also noted that opponents do not usually join open participatory processes. Other strategies must be designed to reach to not only the people involved in the local associations (e.g. organizing sectorial meetings to discuss how the superblock will affect them).
INFORMATION/COMMUNICATION STRATEGIES Dimensions addressed: - social needs and values - place identity/attachment - Confidence in the effectiveness of the policy - experiential and social needs and values - Awareness on the economic impact of the measure	• Media strategy. Permanent and coherent institutional strategy by the City Council to provide information about the program also through the media. • Communication must be organized in the different phases of the project: kick-off; diagnosis; action plan; implementation of each measure. • Involve local stakeholders and social actors in the communication strategy. These local agents can reach people that might elude the information provided by the city council. They can also present the goals and benefits of the project to/in the press/tv/radio providing new perspectives and insights that contribute to gain social acceptance. • Use social media (FB, TW, IN) to connect to residents, visitors. Surveys and communicative actions carried out by the CSP9 are examples of involving citizens in the decisions about new

	infrastructures/urban furniture in the superblock area. • Take advantage of successful pilot projects. Positive effects (using empirical data) from evaluation processes should be shared with the participants in the new superblocks to reduce resistance as well as to anticipate potential negative effects. • Evidence for the effectiveness of superblocks in improving road safety. The 2019 data have shown that in the superblock areas there have been no traffic accidents. This is a good argument for increasing acceptability and weaken opponents' speech.
INFRASTRUCTURE	Maintenance of the new areas in good conditions, involving other areas of the city council in this endeavour to avoid social contestation after the implementation of the measure 1. Infrastructural measures that favour the "new normal" (e.g. new uses of public space such as urban gardening)

The main challenges faced for replicating the SI are related to the obstacles located at both neighbourhood and city level, as listed below.

Table C. Potential obstacles and facilitators in the development of the replication of a superblock in Barcelona

BARRIERS	DRIVERS
Gentrification issues that might cause residents' concern and resistance to new improvements in the area.	Social groups / promoters linked to the City Council already existing. Potential support from extraordinarily strong social movements in this district (example, strength of the feminist movement in the neighbourhood).

Public transport issues that the superblock might affect and need to be solved in advance.	Security protocol for the prevention of terrorist attacks has forced the city council to impede the access of the cars to some streets close to the Cathedral. This situation might help residents to experiment the benefits of the superblocks in terms of increasing public space and pedestrianization of streets, reduce of traffic noise and pollution, etc.
Infrastructural barriers: for gaining more public space for the residents, an old building needs to be removed and residents need to be allocated in other houses.	Public awareness and social demand for the improvement of the area. Neighbours are aware that it is necessary to improve air quality [serious and recognized pollution problems in the neighbourhood] due to its harmful effects on health.
High impact of the tourism-based activities in the area might cause a negative reaction from the residents regarding who will be the main beneficiaries of the project: the neighbours or the tourists. Polarization within the neighbourhood both at the neighbourhood level: 3. Neighbours for and neighbours against. 4. Merchants [tourism-based trade] and traders against	Presence of many schools in the neighbourhood that claim for a more safety and clean area. Previous educational campaigns to improve the neighbourhood, air quality, mobility, reducing the levels of air pollution and noise.
It is considered a complex district in which different political parties are represented. Therefore, it will be necessary to build robust leadership.	A “win-win solution”. Superblocks are an opportunity to reconcile the interests of both neighbours and tourists.
Lawsuit from the neighbourhood association ["opponents"] 5. Neighbours do not reject the program itself or the interventions it entails 6. But it is expected that they will take advantage of the situation to try to raise entrenched and unresolved conflicts with the City Council and that, and therefore, they will offer resistance	COVID-19- Take advantage of the context of opportunities. The need to guarantee social distance near the school to prevent infections by coronavirus have led to actions being undertaken in 15 days that in other contexts would have taken months ... Specifically, more than 100 parking spaces have been eliminated. Given the healthcare context, this intervention has not been questioned and has been accepted.
COVID-19- Alteration of the order of priorities. Due to the serious social and economic	The “discourse go change” has already been won [unlike in the first superblocks] and there is political support from the mayor's office. There is a

problems that the pandemic has brought, the development of the superblock program is not currently considered a priority.	connection between the obligation to face the challenge of the climate emergency and the need to display the superblock program to face this threat.
Limited financial resources. The development of the superblocks program requires the investment of economic resources for the different actions. However, the current City Council's economic situation does not allow undertaking large investments. This will force them to have to propose "perennial" tactical urban planning solutions.	Evidence for the effectiveness of superblocks in other areas such as San Antoni, which is also a very populated district of the city. Also, data show that in the superblock areas traffic accidents are very low, which is a social issue to be tackled in the city (this links to the need of safety as a relevant dimension that superblocks can fulfil).
COVID-19 threatens the tourism model and, therefore, the possibility of involving the private foundation *Cathedral Sagrada Familia* to partially fund the urban intervention.	

Policy scenarios for the replication of the SI

Finally, several strategies to be implemented in the new superblock have been suggested by the participants, as listed below.

Table D. Policy scenarios for the replication of the SI: Strategies to be implemented to gain social acceptability

PARTICIPATION AND CITIZENS' ENGAGEMENT	• Involving different departments of the City Council in the co-designing of the measure. For example, it is mentioned that the Urban Planning Department must be present. • Need of leadership from the District administration. • In the process of gaining social acceptability, it is necessary to cover or overcome a series of phases: ◦ The city council presents its proposal to a few people considered as references in the neighbourhood. If sufficient acceptability is

	achieved, it can proceed to the next phase. ◦ The city council presents its proposal to the neighbourhood groups. If sufficient acceptability is achieved, it can proceed to the next phase. ◦ The city council presents its proposal to the residents of the neighbourhood. If sufficient acceptability is achieved, it is possible to advance to the next phase. ◦ The city council presents its proposal in the District council.
EDUCATION AND DISSEMINATION STRATEGIES	• Reinforce the discourse by emphasizing the need to promote the health of the residents of the neighbourhood and to protect the school areas. Link the goals of the superblocks with previous school programs. • Improve the communication strategy leaded by the promoters. Phases in which it is necessary to apply this strategy: ▪ Diagnosis phase ▪ Agreement on the action plan ▪ Implementation of the measures approved • "Informative pills". Address the concerns of different groups relating (to) the implementation of the superblock in thematic meetings with neighbours.
STRATEGIES ORIENTED TO NEEDS' SATISFACTION	• Preparing a good diagnosis of the neighbourhood. This diagnosis should focus both on technical and social needs. It is essential to identify the main problems and concerns in the neighbourhood and align the superblock preparatory activities (information, communication, participation etc) with the satisfaction of social needs and the solution of current problems.
PARTICIPATION AND CITIZENS' ENGAGEMENT	• Involving different departments of the City Council in the co-designing of the measure. For example, it is mentioned that the Urban Planning Department must be present. • Need of leadership from the District administration. • In the process of gaining social acceptability, it is necessary to cover or overcome a series of phases: ◦ The city council presents its proposal to a few people considered

	as references in the neighbourhood. If sufficient acceptability is achieved, it can proceed to the next phase. ◦ The city council presents its proposal to the neighbourhood groups. If sufficient acceptability is achieved, it can proceed to the next phase. ◦ The city council presents its proposal to the residents of the neighbourhood. If sufficient acceptability is achieved, it is possible to advance to the next phase. ◦ The city council presents its proposal to the District council.

2.3.3 Best strategies and alternative policy scenarios to increase social acceptability of superblocks: Results from deliberative workshop discussions in Vitoria-Gasteiz

Following the same strategy as in Barcelona, this section compiled the outcomes of the group discussions in Vitoria-Gasteiz.

Table A. A. List of strategies to gain social acceptability implemented in Vitoria-Gasteiz

STRATEGIES (TOOLS, MEASURES, PROCESSES, COMMUNICATIVE ACTIONS) TO INCREASE THE SOCIAL ACCEPTABILITY OF THE SUPERBLOCK	MAIN INSIGHTS
INFORMATION/COMMUNICATION STRATEGIES Dimensions addressed: - citizen resistance - satisfaction of experiential needs	• Social acceptability often depends on the ability of the promoters to disseminate the program at the neighbourhood level and listen to the opinion of the neighbours about the program. It is essential to maintain a fluid and continuous relationship with neighbourhood and business associations motivated to improve the neighbourhood. Citizens - through the different representation structures - can communicate with the people who are in charge of the design of their city. Promoters must therefore be accessible.

	• Gaining support from media is a key strategy due to the influence of local media in public opinion and awareness on social issues. Participants reported that many journalists believe in the benefits of the superblocks model and helped to spread and support it. However, despite the complicity of some journalists, some newspapers have published headlines aimed at generating controversy and social contestation.
POLITICAL CONSENSUS	• **Political consensus and social agreements** are important factors in the success of the programme, becoming a "precondition" for launching the mobility policy. This political consensus is the outcome of a prior effort and is seen as essential in shaping the superblock program. As a result of this, despite different political parties have run the city, the urban design strategy has remained. • In different stages of the program, when social contestation might jeopardize the sustainable mobility policy, the political consensus was essential for approving the most controversial measures, such as the regulation of car-parking or restrictions to car mobility in the pilot superblock.
ENVIRONMENTAL AWARENESS Dimensions addressed: - citizen resistance - experiential needs and values - place identity/attachment	• **The city model.** Vitoria-Gasteiz City Council has implemented a series of innovative policies in the past decades aiming at social inclusiveness, nature conservation, cultural development that favour the adoption of innovative solutions to current problems such as mobility and climate change. The existence of the centre for environmental studies (CEA) is a clear example of local advanced policies fostering sustainability. • Environmental education and awareness-raising might pave the way for the social agreement on the sustainable mobility plan. •

CITIZEN PARTICIPATION IN DECISION-MAKING Dimensions addressed: - citizen and political resistance - social needs and values - Confidence in the effectiveness of the policy - Confidence in the leaders of the project	• Participation has been structured through the "SUSTAINABLE MOBILITY FORUM". A series of workshops, presentations and conferences were developed to design a new mobility model for the city. This has been a paradigmatic model of participation that gathered a wide representation of various agents and social groups following an adequate format (well-designed articulation and instrumentation of participation). • The Forum could build a social and political consensus, which received support from opinion leaders. Different local media, social agents, political parties endorsed the model and the guiding principles of the plan.
PILOT PROJECTS Dimensions addressed: - citizen and political resistance - place identity/attachment - Confidence in the effectiveness of the policy - experiential and social needs and values	• Importance of choose right a pilot project and quickly executing one once it has been approved. The successful experience of the *superblock Central* has generated confidence in the model. The pilot superblock has allowed other neighbourhoods to perceive the benefits and request similar measures.

Table B. Identification of alternative policy scenarios and strategies to gain social acceptability

ALTERNATIVE POLICY SCENARIOS	
NORMATIVE AND REGULATORY STRATEGIES Dimensions addressed: - Confidence in the effectiveness of the policy - Awareness on the economic	• Developing specific norms to control and regulate the traffic of electric scooters and bicycles in the city and guarantee since safety is compromised (especially children's). Pedestrians feel insecure in some streets in superblocks because scooters and bikes ride on the pavements. • The national traffic regulatory framework does not suit very well to the changes in mobility patterns that Vitoria-Gasteiz wants to promote. Experimentation

impact of the measure	and innovation are restricted by law. In this sense, they suggest taking reference to the French normative model and trying to adapt it to the Spanish context.
EDUCATION AND ENVIRONMENTAL AWARENESS ACTIONS Dimensions addressed: - social needs and values - place identity/attachment - Confidence in the effectiveness of the policy - experiential and social needs and values	• Launching an environmental education program on sustainable mobility (the actions that have been carried out have not been previously planned but have been done taking advantage of other programmed actions with other objectives, such as the mobility week). • Design policies that not only provide citizens with knowledge and specific information), but also allow them to modify their attitudes and favour a change in patterns of behaviour. • Communication campaign at the city level. Design and develop an "umbrella" communication campaign to explain the superblock model to all the citizens of Vitoria-Gasteiz.
BUILD THE "GREEN" IDENTITY Dimensions addressed - place identity/attachment - New social norms	• Reinforce and enlarge the "green" identity that the city has already gained ("green city") linking this with the dimensions of "quality of life", "air quality", "quality of the public space" and adopting green labels such as "eco-city", "City 8-80" etc.
CITIZEN PARTICIPATION AT THE NEIGHBOURHOOD LEVEL Dimensions addressed: - citizen resistance - experiential needs and values - Awareness on the economic impact of the measure	• Improve the public participation at the neighbourhood level and evaluation of the level of social acceptability. Each proposal in the plan needs to be contrasted with the opinion leaders of the neighbourhood. If there is not enough support, the policy has to be suspended (not to move forward). In this sense, participants point out that there is no specific indicator that allows measuring and evaluating the degree of support that exists at the neighbourhood.
TECHNOLOGIES AND INNOVATION IN THE MOBILITY SECTOR	• IT tools (e.g. mobile Apps) can be used at the service of the project to inform residents and communicate with them.

Vitoria-Gasteiz plans to design a new superblock in Coronación neighbourhood, close to the old town. Participants in the policy scenario workshop discussed on the main characteristics of this area in terms of the demography (Predominance of the population with ages between 50 – 65 years) and socio-economic conditions.

Table C. Potential obstacles and facilitators in the development of the replication of a superblock in Vitoria-Gasteiz

BARRIERS	DRIVERS
Deficit of parking spaces / Mismatch between supply (low) and demand (high) of parking spaces	The situation generated by COVID-19 legitimizes somehow measures for pedestrianization of streets (“citizens feel safer outdoors than indoors”).
Limited and scarce financial resources. It is necessary to opt for "super low cost" strategies	COVID-19 allowed the enlargement of the cycling network (albeit in a “shabby” way) with no contestation. Citizens understand that it is essential that the cycling network reaches the industrial areas.
Specific vulnerable social groups in the area with different needs	Crises have often contributed to major urban transformations such as 2008 financial crisis (funding the pilot superblock in the city).
A certain "relaxation" or "accommodation" is perceived. The use of private vehicles has increased, and the use of public transport has decreased. Some causes are pointed out to explain this behaviour: The use of the car can be considered as a way of supporting the automotive industry so important in Vitoria-Gasteiz and so affected by the economic crisis derived from the pandemic. The car is perceived as the safest means of transport to avoid COVID-19 Although the superblocks program has been successful, much emphasis is placed on the safety problems derived from the circulation of the bicycle, the scooter ... One of the participants emphasized that it is necessary to undertake interventions that contribute to making the pavements "liveable".	Large experience in European projects that allowed Vitoria-Gasteiz to experiment with different measures and policies, evaluation and measurement as well as technological advances that can be implemented in the new superblocks (e.g. cargo bikes have been mentioned as an example of new policies in the city).

Policy scenarios for the replication of the SI

Finally, several strategies to be implemented in the new superblock have been suggested by the participants, as listed below.

Table D. Policy scenarios for the replication of the SI: Strategies to be implemented to gain social acceptability

PARTICIPATION AND CITIZENS' ENGAGEMENT	• Find support and alliances in the neighbourhood: The role of the interlocutors ("champions") is highlighted. • It is also noted that it is key to win the complicity of the restaurant, shops and retail sector • Generating an empowerment process through cooperation in a project with a common goal. • Expectations management through participatory processes: • It is pointed out that at this moment it does not make sense to propose a co-creation process because the model is already defined. • They consider it more pertinent to approach participation with the interlocutors of the neighbourhood as an exercise in contrast ("how do you see the model?"), searching for complicity and in managing expectations. • Participatory processes must always be open to all citizens. •
EDUCATION AND DISSEMINATION STRATEGIES	• Combine communication, educational and participatory strategies to generate positive attitudes towards the superblocks project. Neighbours will support the policy if they feel that the project is theirs, that it belongs to them. • Communication campaign: It is necessary to clarify the concept of superblock through the design of different campaigns raised with a pedagogical component. • The media can play a key role in transmitting the general guidelines of an exciting project from the start. But for concrete actions it is better to start the discussion with the citizens in the neighbourhood first than to divulge the details through the media. Again, the differentiation is made between the two plans: the project / plan [more scope for co-design, more convenience for dissemination in the media from the beginning] and specific actions and interventions [less scope for co-design, less

	convenience for dissemination in the media from the beginning].
STRATEGIES ORIENTED TO NEEDS' SATISFACTION	• Promote the simultaneous development of a favourable social and economic fabric within the neighbourhood (which can come from associations). • Consider the needs of different segments of the population (children, youth) in the design of the superblock: For example, it is suggested to use the road as a play space (for example, paint them so that it is possible to play traditional games), as a sports' area ... • When designing superblocks, it is also important to learn from the experiences developed in other countries. For example, an initiative in Canada is mentioned in which it is the neighbours themselves who are in charge of cultivating the green areas. • One participant points out that policies and measures are often answered "only because they are not understood by citizens". Therefore, an effort to adapt the discourse to each group must be done to contemplate the specific needs.
FOSTERING NEW IDENTITIES	• Another need that can be satisfied through design is to want to be different or to develop distinguishing identity marks.
INFRAESTRUCTURES	• A repertory of low-cost strategies for tactical urban planning is available, specifically, traffic-calming. Good signalling.

2.3.4 Input for the ABM and the Policy Sandbox Tool

The discussion on the model focused on the data required to feed the model. Although the model uses available sociodemographic datasets (to describe the population of the simulation environment) as well as qualitative data collected through semi-structured in-depth interviews and document analysis (e.g. Press) data on citizens' perceptions is being collected through questionnaires. These data make it possible to identify the needs of citizens, assess their degree of acceptability of the superblock program and define social networks. For a more accurate adaptation of the ABM to each city case, more quantitative and qualitative data is needed that allow describing the relationships between critical nodes [formal organized structures] and the communicative actions from the critical notes to citizens concerning the superblock project. These strategies need to be specified: [i] target population, [ii] frequency, [iii] impact.

Participants from Barcelona stressed the importance of representing the different phases in the model: 1) Phase 1. The relationships between the entities and grassroots movements that communicate with the critical nodes. It is a very long preliminary phase that forces the relationship between critical nodes to be incorporated into the model and, therefore, to collect more data in this regard. 2) Phase 2. Critical nodes communicate the project to citizens. In phase 1 the press becomes a relevant actor. The modeller team argued that it is their intention to distinguish different stages of the project.

It is suggested that agents be modelled separately or establishing relationships between actors (e.g. the city council that communicates with the neighbourhood association). The modeller team argued that it would be possible and relatively easy. However, in the current model the critical nodes are not communicating with each other, only with the citizens. This has been a decision taken upon data available. A balance needs to be made in terms of the information available to feed the model. It would not be exceedingly difficult to model the communication between the critical nodes, the difficult thing is to obtain the data with which to feed the model.

Participants ask about the usability of the model in new superblocks considering that data has been obtained for the current superblocks (To what extent does this model help us extrapolate results to new superblocks?). The model is useful for studying how social acceptability varies with the combination of different communication strategies and these alternatives scenarios will provide insights for future implementations.

Concerning the presentation of the policy sandbox tool, participants suggest that it would be extremely interested if the tool offers a compilation of measures and indicators that are relevant for social innovation. For example, parking policies are fundamental parameters (e.g. cost of parking; provision of parking). Participants say that it would be more useful for cities to have a tool that, after introducing a series of parameters, offered them “a tailored suit”, indicating the policy they have to design to achieve acceptability. This comment opens a discussion among cities about the need to adapt each policy to the needs and particularities of each context in which a specific program is to be implemented..

3. Second round of policy scenario workshops in Vitoria-Gasteiz

3.1 Methodology and objectives

Objectives

The objectives of the second phase of multi-stakeholder deliberative workshops in Vitoria-Gasteiz were two-fold: first, to present the simulated scenarios of the social innovation processes elaborated for Vitoria-Gazteiz case and refine the alternative policy scenarios that can be implemented in the model and second, to present the Policy Sandbox Tool for Vitoria-Gazteiz.

Specific objectives

- Present the alternative scenarios simulated through techniques of agent modelling (ABM) aimed at increasing the social acceptability of superblocks in Vitoria-Gasteiz

- Refine those political scenarios with the participants in the workshop, so that they are as close as possible to the local reality.

- Reflect together on the simulations carried out and the possibilities of the model

- Present the “Policy Sandbox Tool”, an open digital platform that will integrate simulated scenarios (ABM) and will serve to inspire the planning of superblocks taking as a reference the city of Vitoria-Gasteiz

Format

The workshop adopted an online format, due to the Covid-19 restrictions on meeting in person during the pandemic and all participants connected to an online video conferencing platform (Zoom).

Participants

The second round of policy scenario workshops was organized in the city of Vitoria-Gasteiz. All the attendees in the first round of policy scenarios were invited to participate in the second round, contacted by email or telephone. Attached to the invitation we sent the report (in Spanish) with the outcomes of the first round of the policy scenarios conducted in the Superblocks Cluster (October 2020). The workshop was facilitated by Adina Dumitru and Isabel Lema Blanco (UDC). Alejandro Rodríguez (UDC) presented the ABM model. The Policy Sandbox Tool was introduced by Niklas Mischkowski (ICLEI). A total of six participants from Vitoria-Gasteiz joined the workshops which represented the Vitoria-Gasteiz City Council, the Center for Environmental Studies, the pedestrians’ association "Camina Gasteiz" and the University of the Basque Country (expert).

3.2Agenda

The second policy workshop took place on the afternoon of 22nd April 2021 with the following agenda:

Policy scenario Agenda for Vitoria-Gazteiz

16.30	Welcome to the workshop
16.45	Introduction of the second round of policy scenarios.
17.00	Presentation of the model for Vitoria-Gasteiz
17.30	Facilitated participant discussion on the policy scenarios modelled
18.30	Presentation of the Policy Sandbox Tool and discussion
19.00	Conclusion and further steps

3.3 Results of the second round of policy scenario workshops

3.4.1. Introduction of the second round of policy scenarios

The goals of the workshop were introduced by the UDC Team in a presentation that started with a recap of the work done in the two sessions of the first round of policy scenarios conducted in Vitoria-Gasteiz, namely the discussions on lessons learned from the implementation of the SI, the identification of the key factors for social acceptability in the superblock cluster, as well as the definition of alternative policies for increasing the social acceptability of the Superblocks plan. The four alternative scenarios co-defined in the first round were briefly described:

> (1) Address citizen acceptability with a city-level communication campaign focused on the Superblocks model; (2) Communication strategy on sustainable mobility policies aimed at increasing the environmental identity of citizenship
>
> (3) Strategy environmental education aimed at different population groups, providing not only specific knowledge and information, but also aimed at modifying their mobility attitudes and behaviours.
>
> (4) Address the need for safety. Undertake interventions that help make roads and sidewalks safer for pedestrians and cyclists.

Based on these alternative policy scenarios, we explained the objectives for the second round of policy scenarios.

3.4.2. Presentation of the Agent-Based Model

The UDC modelling team introduced how the ABM works and the different phases for the configuration of the model. As the model aims to understand the citizen acceptance of the superblocks model and study the expansion and replicability of the plan in other neighbourhoods in the city, the hypothesis of the model concerns to the percentage of citizens that would be in favour and what percentage would be against a (new) superblock, depending on the implementation of a set of different policy scenarios.

Second, the basic functioning model is based on the definition of relevant actors (namely, critical nodes) in Vitoria-Gasteiz, for instance, the City Council, citizens, local associations, local press and merchants' associations. The third phase is establishing the relations between the critical nodes and the population (namely, humats), as well as between citizens (e.g., friends, neighbours). The 4th phase consisted of the definition of the citizen response to the different communication acts from the critical nodes. This behaviour is determined by the results of the specific survey conducted by SMARTEES in Vitoria-Gazteiz in 2020 that gathered relevant data on citizen's trust on different institutions and relationships, as well as the importance they give to several conditions (e.g., air quality, parking space) and the satisfaction of social and psychological needs (e.g., wellbeing, environmental quality, comfort, prestige and recognition). The 5th stage consisted of the transference of the results of the questionnaire to the model according to the representation of the population, based on the official census data and the results of the representative sample of population participating in the survey (856 questionnaires were completed). The 6th phase relates to the recreation of the process of implementation of the superblock model in Vitoria-Gazteiz.

The methodology followed to elaborate the policy scenarios modelled was explained. First, a timeline was created differencing six different stages, which became relevant milestones in the storyline of the case (see table below).

TIMELINE SUPERBLOCKS VITORIA-GASTEIZ		
Stage 1	2006-2007	Elaboration of the Sustainability Mobility and Urban Space Plan. Social and political agreement settled by the Citizens' Pact for sustainable mobility.
Stage 2	2008-2009	Reorganization of the urban bus network
Stage 3	2009-2010	Pedestrianization measures and new regulation of surface parking (2009) and creation of the Pilot superblock: Sancho el Sabio (2010)
Stage 4	2012	Car-access restriction policy to central superblocks. Communication campaign and penalty policies.

Stage 5	2012-2014	Changes on the philosophy of the superblock scheme: tactical urbanism and traffic pacification measures in inner streets. "Zones 30 Plan" Traffic calming in 45 inner streets of 17 superblocks in central superblocks
Stage 6	2012-2014	Changes on the philosophy of the superblock scheme: tactical urbanism and traffic pacification measures in inner streets. "Zones 30 Plan" Traffic calming in 45 inner streets of 17 superblocks in central superblocks
Stage 5	2016- present	Replication of the superblock model in different neighbourhoods (Médico Tornay's superblock, Superblock in the Memorial Centre for the Victims of Terrorism, Santa Bárbara Square, and Superblock in Coronación:Tenerías Street).

Following, a table of triggers and tactics was created in which the main communication actions from the different critical nodes were listed (see figure below).

Critical node	Trigger	Tactic	Duration	Frequency	Discourse orientation	Audience	Coverage	Opinion
Neighborhood associations	09/2009	Manifestation of a critical position through the local press	2 months	Once a month	Comfort	Half	Yes (2 news)	Against

Primary Critical Node	Opinion	Start date	End date	Frequency	Scope	Secondary Critical Node	Speech focus
Other Associations	Against	09/2009	10/2009	1	0.2	Local Press	Comfort

Figure1. Phase 6: recreation of the process. Example of a table with triggers and tactics identified in the second stage of the project "El Hierro 100% Renewable Energies".

This table has been fed by qualitative and quantitative data gathered in different research activities in the SMARTEES project. For instance, in-depth interviews, fieldtrips to Vitoria-Gasteiz and the outcomes of the first round of policy scenarios were rich qualitative data to define the timeline of the project and feed the model. Further, document analysis was done specifically for the ABM which consisted of the discourse analysis of communications done by different relevant actors (promoters, supporters, opponents and media) involved in the development of the project. 250 documents approx. were analysed, including press releases, dissemination brochures and news published in local and regional media identifying the main dimensions and social and experiential needs addressing by each act of communication.

The recreation of the communication processes of the different actors in the different stages of the project are fundamental for the model to correctly represent the history of the process of implementation of the superblocks and this should be refined so that it resembles the reality as

much as possible. Two simulations of the initial level of acceptance were presented changing from green (in favour of the project) to red (against the project) according to their responses in the survey to specific questions about their support to the superblocks model at the beginning of the project, a decade ago (see figure below).

Figure 2. Scenario 1 representing the real level of public acceptance towards the social innovation at early stages of the project, accordingly to the responses to the survey. Green: in favour to the superblock. Red: against the superblock.

The model will eventually represent changes in the intensity and the orientation of the communications. It will be able to simulate the outcomes of the implementation of a set of alternative policies and communication strategies from promoters, supporters, opponents and local media (critical nodes), testing what would be happened, in terms of citizens acceptability towards the project, given different scenarios.

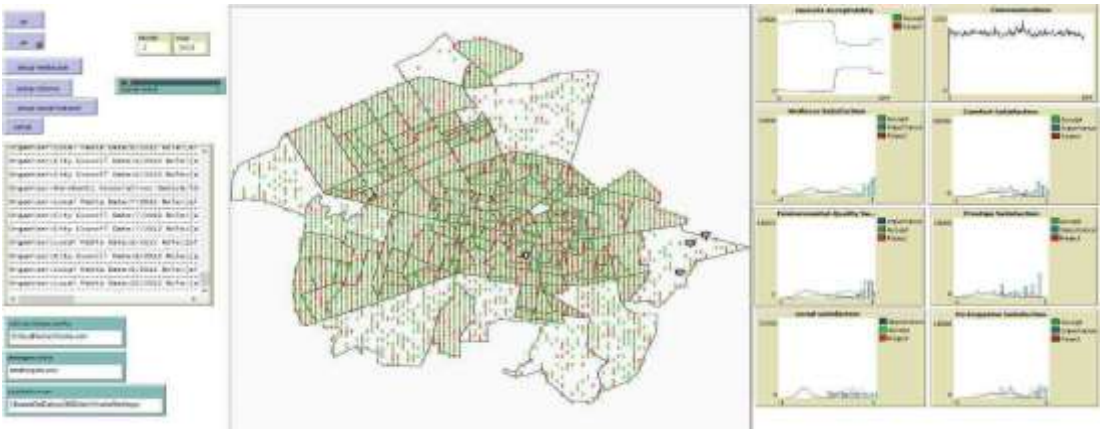

Figure 3. Scenario 2 representing a lower level of public acceptance towards the social innovation at early stages of the project.

Five alternative scenarios were presented to be further discussed with the participants:

1. Modification in the strategy of critical nodes (a) introducing new communications to the citizens; (b) modifying the duration of the existing ones; or/and (c) changing the orientation of the discourse, addressing the satisfaction of specific needs that citizens are more interested or worried about.
2. Implementation of a communication/education campaign to increase the importance of a specific need.
3. Organization of face-to-face meetings with citizens in specific neighbourhoods (census sections)
4. Communications focused on specific groups of the population.
5. Involvement of new critical nodes to test the effect of new "influencers» on public opinion.

3.4.3. Workshop discussion on the alternative policy scenarios presented in the model

The second round of policy scenario workshops dedicated a 1 hour of facilitated discussion focusing on the following topics: (1) the initial rate of citizen acceptability towards the SI; (2) The approximation of the list of tactics & triggers to the reality of the case; (3) current levels of social acceptability, (4) other factors conditioning the social acceptability of superblocks and, finally, (5) concretion of the alternative policy scenarios to be tested in the model.

(1) the initial rate of citizen acceptability towards the superblock model.

According to the responses to the survey conducted in Vitoria-Gasteiz in 2020, most of the citizens report an initial favourable position concerning the superblocks. However, the empirical work done in SMARTEES shows that several policies adopted by the City Council received strong opposition from certain groups of population. The participants in the second round of policy scenarios confirmed that there was a conflict and significant opposition due to changes in parking regulation and car restrictions policies in the pilot and central superblocks. Thus, even though the implementation of these measures was accompanied by an *ad hoc* communication campaign, a significant number of neighbourhood associations created a citizens' platform against the policy and collected a significant number of signatures (about 20.000 signatures). Second, other participants suggest that memory bias and sample bias could be factors that explain the positive responses in the survey. They think that citizenry has accepted the superblock model because it has become popular and a "successful product". However, they confirm the idea that initial support was lower than expressed in the questionnaire.

(2) Accurate relation of tactics & triggers in the project's timeline.

As explained above, one important issue in the model regards to the accurate relation of relevant milestones, tactics and triggers to be included in the model. Thus, the limitations of the model were explained and potential information gaps in the timeline were discussed. In conclusion, the

qualitative data gathered in the different research activities conducted in SMARTEES (in-depth interviews, fieldtrips, deliberative workshops), together with the discourse analysis of local press allowed to have an accurate picture of the main milestones and communication actions of the City Council in the period 2006-2020. One of the main inputs from the desktop analysis relates to the low visibility of the opponents in the local press media. For example, newspapers covered the opposition of merchants' associations and neighbourhood associations at the beginning of the process. However, only few instances of contestation have been reflected in media until now. According to one of the participants in the workshop, since a certain consensus had been reached with the Citizen Pact for Sustainable Mobility, which obtained the support of political groups and had the press as an ally, the opposite positions were little represented in the media discourse: “if there were voices against, they had very little speaker”.

(3) Current levels of social acceptability and endorsement

The rate of current citizens’ support towards the superblock model was also discussed. Several participants in the workshop mentioned that a large part of the population still does not understand in what superblocks consist of. Thus, it is possible that some measures such as the changes in the bus network are widely endorsed by the citizens while other policies that restrict car traffic or parking do not. According to several promoters, the concept of the superblock is not widespread, and the regular citizen does not share a holistic vision of the model and there is not much information about it. However, the UDC team argues that the survey has asked separately about each of the measures that the superblocks model involves (not about superblocks in general). For example, the average acceptability of the pedestrianization measures is higher than those related to changes in the parking policies. However, statistical analyses show that people group these measures in a single model, so there would be a generalized understanding that all these measures correspond to the superblock model.

(4) Other factors conditioning the social acceptability of superblocks

Concerning the current level of support for the expansion of the project, in accordance to the results of the survey advanced in the presentations, some participants argue that the communication strategies might not be the unique reason for having achieved a great level of support towards the superblock model. Two main factors are mentioned as significant motivations for support. First, the international recognition of Vitoria as European Green Capital certainly fostered a favourable opinion as sustainable mobility policies were highlighted by the media as one of the main reasons to be awarded. Thus, the survey confirms that the external recognition and international reputation of Vitoria-Gasteiz as a green city has considerable impact on the acceptability of different public space policies.

Second, social acceptability depends on the quality of the new public spaces created in the superblocks. According to some participants, acceptability depends a lot on whether the

transformation of the space has been ambitious and high-quality spaces for social uses have been created. For example, very unpopular measures related to the elimination of parking spaces are accepted whether the residents perceive that the measures will substantially improve the quality of these spaces, that was the case of the pilot superblock in Sancho El Sabio, Avenida Gasteiz, Plaza Green Capital, etc: “an example could be the remodelling of Gasteiz Avenue where there is a terrible loss of parking spaces but, on the contrary, there is a very high quality public space with broad sidewalks, with a landscaped area, with a naturalized river, with the tram that integrates very well in the urban design, then nobody in the public arena can at least raise their hand to say that they miss that other urban setting.

However, “in other interventions that involve removing parking spaces but with tactical urban planning measures, with less return on the quality of space, the acceptability is much lower”. Another participant links the acceptability with the quality of the project and if comfort and security conditions have been improved: “acceptability depends on the quality of the project and what it contributes to citizens. If it gives us comfort, more security and more peace of mind, or if it gives us the opposite”.

(5) Concretion of the alternative policy scenarios to be tested in the model

Concerning the alternative policy scenarios to be tested on the model, the **first scenario “modification in the strategy of the critical nodes”** was discussed in terms of if an alternative communication campaign to be conducted in the first stages of the project, for citizens to become more familiar with the superblock model and increase their level of support. It was mentioned that an important effort was made to communicate the model during the year 2009, explaining that superblocks were the basis for the reformulation of the different mobility network. This was explained in the media as well as in the Sustainability Mobility Forum, the participatory body that functions as a permanent deliberative space that engages political and social groups of interests, stakeholders and citizens. When the change of the bus network was implemented, an umbrella campaign was carried out that tried to make explicit that a new model of public space and mobility was being designed aiming at gaining more space for people. However, as the pilot Sancho El Sabio superblock was not implemented, the participants are not sure that population was able to frame both policies as part of a common innovative urban strategy.

Related to this, a **second alternative policy scenario could focus on addressing specific needs**, e.g., comfort, that enhance the positive benefits of the superblocks model. It has been argued that when the two most relevant policies were simultaneously adopted (change in bus network and restrictions to surface parking in city centre), the communication campaign focused on the positive impact of these measures, in terms of articulating “a more comfortable and functional pedestrian and cycling networks as well as a more attractive bus network”. An umbrella communication strategy was launched in media, bus announces, and more than a hundred volunteers informed about the changes in the bus lanes for a week. However, the communication concerning the changes in parking

surface received less attention and local media informed more about the negative reactions of citizens and merchants than the positive aspects of the measure. This negative information could be counted by increasing communications or providing alternative **messages specifically oriented to groups of population directly affected by these measures**.

A third alternative scenario consists of the **involvement of large number of citizens and local actors in policy the co-definition of the mobility policies**. It has been argued that a "top-down" approach was followed in the definition of the sustainable mobility and public space plan. The sustainable mobility plan was “built from above, promoted by technicians and a group of people that was not representative of the city. A conceptual model was designed, which got the support of the political groups and that was endorsed by opinion leaders, the press in general, and other important influencers in the city”. One participant considers that top-down approaches still exist in Vitoria and that transformative policies such as the extension of the tram, are decided by political instances "citizens are informed, and they are allowed to give their opinion, but the decision has been made".

There is also the perception that people accept the new measures "because they have no choice" and because although opposition to a measure can exist (for example, against the electric bus), in the end the opinion of the citizen is not considered. Further, existing participatory structures, such as the Sustainability Mobility Forum, do not work very well because only interest groups are involved. An alternative policy scenario would consist of “rethinking the participatory model” and articulate new formulas for citizens’ participation at the neighbourhood scale. The next superblocks are pointed out as “a tremendous opportunity for people to participate and to design not if there is going to be a superblock, but how they want it”. This scenario corresponds could be implemented in the model by testing the impact of the organization of face-to-face meetings with citizens in specific neighbourhoods, enhancing communication among humats (neighbours, friends, family).

A fourth alternative scenario formulated by the workshops’ participants involves moving forward, beyond 2020, and test what would happen if a communication strategy were implemented in a new superblock to be hypothetically defined in a new neighbourhood (instead of the superblocks already included in the model). If a superblock is made, for example, in Zabalgana, it would be necessary to define the characteristics that the action would have and then implement it in the model. Modelling a new superblock with the data we have in the model, would require defining specific communicative actions to be made not only by the city council, but also involving media, supporters and opponents.

The model could be used to see how citizens responds to different communication actions and what happens in these different campaigns. If the communication actions to be implemented were known, they could be implemented in the model and see what happens, that is, if these communication strategies lead to an increase in acceptability or not. Concerning this scenario, several issues have been raised by the modeller team. The first problem is that we do not have information about what is happening, about the inputs that citizens would receive, based on which their opinion would be modified. The model has real inputs until 2020, from then, we need to figure out them. It would be an exercise of imagination. For example, an unexpected event might happen

that alter the starting point of the model. For example, a serious accident, which has not been foreseen in the model, would make no valid the simulation. Finally, the model has assumptions that are defined by the characteristics of the initial superblock. It would be necessary to discuss to what extent the level of acceptance, for example, is exportable to that new superblock.

The last scenario proposed by the participants relates to a communication action that one neighbourhood association (in Zabalgana´s neighbourhood) aims to launch which consists of recognition campaign for people who go to work in the nearby polygon by bicycle, giving them discount vouchers in shops in the neighbourhood. The possibility of introducing this campaign in the model is discussed, but the following drawbacks are mentioned: first, the action would involve citizens from different neighbourhoods (the beneficiaries), which would involve having information about how many people in each neighbourhood would be affected. Second, the relationship between this action and the acceptability of superblocks in this context is not clear. It can be perceived as a quite different measure from the superblock and the model only has inputs from data on the perception of superblocks. This is not really a *what-if scenario* but something different and this feature is not trivial.

3.4 Workshop discussion on the Policy Sandbox Tool

The ICLEI team presented the Policy Sandbox Tool for the Vitoria-Gazteiz case. First, an introduction to the functioning and the interface of the SMARTEES policy sandbox tool was made, showing how this online tool looks like at this stage, as the following picture illustrates:

Figure 4. Policy Sandbox Tool prototype.

Second, the storyline for Vitoria-Gazteiz was introduced (see figure 5 below). This identified several phases and milestones since the starting out of the superblock's social innovation until the present. Each section includes a brief introduction to the contextual conditions, the actors who were involved

in and the description of the policy measures adopted in each phase. There is also an explanation of the main features of the social innovation as well as the outcomes and impact measured. The final exploration section allows users to simulate the outcomes of changing different parameters during the implementation of different policies in the history of the case. The specific parameters and policy simulations will consist of on a simplification of the alternative policy scenarios co-designed in the deliberative policy scenario workshops as well as the refinement of these scenarios implemented in the Agent Based Modelling.

Figure 5: Policy Sandbox Tool: case Vitoria-Gasteiz. Example of the storyboard.

It was explained that the PST tries to synthesize all the research carried out in SMARTEES for the identification of those social dynamics that have had a relevant role in social acceptability. The ABM models try to reproduce the social dynamics in Vitoria-Gasteiz in a simple way. The simulated policy scenarios show “what-if scenarios”, for example, if the communication strategies developed focus on different needs and different social groups. The model allows identifying which parameters are worth modifying, given their impact on social acceptability. The alternative policy scenarios aim at showing if the acceptability is higher or lower, depening on the variables changed. For example, there are dynamics of resistance, citizen concerns and needs that are common in a superblock implementation. This know-how can be interesting for anyone who wants to implement a superblock in other cities.

The workshop concluded with a presentation about the SMARTEES‘ exploitation plan and ideas for what can be offered to other cities beyond the life of the project. Ideas include the sandbox tool itself, a sandbox innovation workshop and an out-of-the-box customized service. A poll was

launched on these options. Due to errors in the execution of the polls, a survey was send out as a follow up to the meeting. The following options and questions were answered by 5 respondents:

Option 1: Sandbox tool

1. Does the prototype sandbox tool give a better understanding of the case studies and what Agent Based Modelling may offer?
2. Would this be a useful demonstration for other practitioners in your organisation?
3. Would this be a useful demonstration for other policy makers in your organisation?

Respondents answered as follows: Both for question 1 and 2, 100% were undecided / neutral. For question 3, 20% agreed for the PST to be useful whereas the remaining 80% were undecided / neutral.

Option 2: Sandbox Innovation Workshop

1. Would a brainstorming workshop with SMARTEES partners focusing on a challenge in your city be useful?
2. Would you be willing to cover the costs for the delivery of such a workshop by SMARTEES partners? (approx. €2-5000)

For Option 2, question 1 was answered by 40% with agreement, 40% undecided / neutral, and 20% disagreed on the usefullness of the option. For question 2, 60% said no, they would not pay the costs anticipated, and 40% were not sure.

Option 3: Out-of-the-box service

1. Do you think there is a potential market for a customised service to help cities with social innovation and energy transition?
2. What kind of services would be most relevant?

- Policy support
- Practice support
- Advisory support
- Peer mentoring
- Consultancy support
- Agent-based modelling support

With regard to question 1, 20% strongly agreed for a potential demand in the service to exist, 40% agreed, and 40% were undecided / neutral.

For the second question, respondents were informed that they could select multiple options. When enquired about what kinds of services would be most relevant, 0% chose policy support as well as 0% for ABM modelling support. In contrast, 40% chose practice support, 20% chose advisory support, 20% chose peer mentoring, and again 20% chose consultancy support.

Annex 6: Report on Policy Scenario Workshops Cluster Fighting energy poverty through energy efficiency Aberdeen

Project Full Title	Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability	
Project Acronym	SMARTEES	
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Coordinator	Norwegian University of Science and Technology (NTNU)	
Project duration	May 2018 – April 2021 (36 months)	
Project website	**www.local-social-innovation.eu**	
Work Package	WP5 Policy Scenarios	
Deliverable	D5.2 Elaboration of Policy Recommendations for each cluster of case-studies. ANNEX 6. Report on Policy Scenario Deliberative Workshops: Cluster Fighting energy poverty through energy efficiency. Case: Aberdeen	
Delivery Date	31.08.2021	
Author(s)	Ruth Wilson, Phoebe Somervail, Gary Polhill, Doug Salt, Kathryn Colley, Tony Craig (JH)	
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level:	Public (PU)	**X**
	Confidential, only for members of the consortium (CO)	

Keywords
Policy scenarios, energy local social innovation, energy transitions, social acceptability, social innovation adoption

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1. Case Study Background

This case study focuses on the city of Aberdeen in the north-east of Scotland. Although badged as the 'Oil Capital of Europe' and generally affluent, the city contains significant pockets of social deprivation and fuel poverty, which have been exacerbated following the decline of North Sea oil in recent years.

Aberdeen City Council has an ambition to eradicate fuel poverty, key to which is the rollout of a district heating network across the city, which would result in substantial energy savings. The Aberdeen case study focuses on the development of the district heating network, which is not a common source of domestic heating in the UK and faces a range of barriers to successful rollout.

The network was originally conceived as a response to concerns about fuel poverty amongst tenants in high rise social housing blocks relying on inefficient electric heating systems. Energy advisors working for SCARF, an Aberdeen-based social enterprise that aims to eradicate fuel poverty, found that many of the council-owned flats and houses they visited were cold and damp. Aberdeen City Council recognised that providing affordable warmth in these properties would help to ameliorate not only the economic deprivation of social housing tenants but also the deterioration of the housing stock due to damp, and the health problems of tenants exacerbated by a cold and damp living environment.

The continued development of the heat network over the past 15+ years has been driven by the complementary objectives of addressing fuel poverty and improving the energy efficiency of the city's housing stock. The key issues surrounding the evolution of Aberdeen's heat network relate to local energy production, household energy efficiency, fuel poverty and housing quality.

This is a 'live' case in that the case study research is taking place at the same time as the planning of a new phase of heat network development in the neighbourhood of Torry.

2. First round of policy scenarios workshops

2.1 Methodology, objectives and participants of the workshop

The goals of the first Aberdeen Policy Workshop were two-fold: first, to facilitate creative discussion among participants about how adoption of the heat network could be increased across Aberdeen; and second, to consider how we might use the case's Agent Based Model to explore the efficacy of their ideas. These discussions informed the development of policy scenarios to be taken forward in the model.

Workshop participants were identified in collaboration with Aberdeen City Council and were selected based on their professional role in relation to the heat network (details in section 4, below). On 15 September 2020, they were sent an email outlining the project in simple terms, inviting them to attend the workshop and asking them to complete a doodle poll with their availability. This was followed by on 18 September with a calendar invitation for the afternoon of 9 October. Before the workshop, an application was made to the James Hutton Institute's Research Ethics Committee, outlining the workshop structure and content and requesting ethical approval. The format of the workshop was also discussed with Aberdeen City Council, who advised that council participants, at least, had limited availability as a result of the combined effects of public sector funding cuts and staffing shortages and redeployments as a consequence of Covid-19. With this in mind, the first workshop was designed to take place in a single afternoon rather than over several sessions.

Members of the SMARTEES team attended the policy workshop in the following capacities:

Name	Role
Gary Polhill	Presenter
Doug Salt	Presenter
Ruth Wilson	Facilitator
Tony Craig	Facilitator

Workshop participants came from Aberdeen Heat and Power, SCARF (fuel poverty social enterprise) and divisions of Aberdeen City Council concerned with different aspects of the heat network (e.g. sustainability, energy and housing). Names and roles are not provided as this would contravene the confidentiality promised in the workshop consent form.

Given the restrictions on meeting in person during the pandemic, the workshop took place online using WebEx videoconferencing software. Instructions for joining the meeting and a consent form were included in the calendar invitation, and participants were asked to join a few minutes beforehand to ensure the technology functioned fully for everyone. Additionally, a brief introduction to WebEx functionality was provided at the start of the workshop. To minimise the risk of technical problems and to maximise accessibility for all participants, the whole workshop was conducted as a

group meeting; break-out and whiteboard functionality were considered during planning but in the end not used due to the potential for introducing complications and excluding some participants.

2.2 Agenda

The first policy workshop took place on the afternoon of 9 October 2020 with the following agenda. Note that, this being a live case study, the focus was on drawing out ideas for future replication of the SI (increased uptake of the heat network).

Policy Scenarios for the Aberdeen Heat Network – Workshop 1
13.30 Welcome to the workshop
13.35 Round table introductions
13.45 Presentation of the model
14.10 Goals of the workshop
14.25 Break
14.35 Facilitated participant discussion

- What trends could affect fuel poverty/thermal comfort in Aberdeen over the next 10 years? What could be the consequences of these trends?
- What could participant organisations do differently in the future to increase uptake of district heating? Consider:
    - Financial levers
    - Lifestyle/social levers
    - Infrastructural levers
    - Legislative levers

15.20 Formalisation of policy scenarios
15.50 Next steps
16.00 Close

2.3 Results of the first round of policy scenario workshops

2.3.1 Introduction to the policy scenario workshops

Presentation: Agent Based Models and ACHSIUM

Following a welcome from Ruth and round-table introductions, the workshop opened with a presentation from Doug in which he outlined the origins of Agent Based Modelling, explaining it as an approach to computer simulation that can represent differences between people and their interactions, which form a multi-layered network. He introduced ACHSIUM as a way of exploring scenarios for district heating adoption in Aberdeen City and showed how the model uses a map of

the Torry area to represent buildings and the households and businesses that occupy them, and the network of district heating pipes that run between them. He outlined the kinds of agents in the model (e.g. households, businesses, energy providers, advisory and financial agencies) and explained that each agent makes decisions based on its "episodic memory" of experiences and the influence of its advice network. The model represents changes in weather, life stages, financial situations, household composition, etc., and calculates what will happen in terms of heat network rollout, given different scenarios.

Doug then gave a demonstration of the model showing a simulation of buildings in Torry changing from red (in fuel poverty) to green (not in fuel poverty) according to whether they join the heat network, and explained how different policies can be tried out using the model.

Presentation: Goals of the workshop

Gary presented the goals of the workshop, namely to discuss what can be done to increase adoption of the heat network, and how the model might be used to explore that. Gary explained that the model's user interface has "switches" and "dials" that can be used to adjust elements of the model that make people more or less likely to join the heat network, e.g. cost of joining, and that the workshop participants' contributions would inform those. He emphasised the opportunity to use the model to "think the unthinkable" in terms of policy scenarios.

Discussion (replication of the SI)

Following a 10-minute break, the workshop reconvened for a 45-minute facilitated discussion focusing on two questions:

1. What trends might affect fuel poverty in Aberdeen over the next 10 years?
2. What could be done to increase adoption of the heat network in the next 10 years? Levers could be financial, social, infrastructural, legislative...

There was some initial discussion about the suitability of the 10-year framing of the questions, given that it had taken 18 years for the heat network to reach its current form, and that decarbonisation targets are currently unknown. The facilitators explained that this was to allow participants to think beyond current constraints while keeping a timeframe that was possible to imagine.

With respect to question 1 (trends that could affect fuel poverty in Aberdeen over the next 10 years), the following factors were mentioned:

- Rising prices of electricity and gas. It was felt to be unlikely that incomes would increase to match, which will push more people into fuel poverty.
- Covid may lead to a recession, resulting in lower pay for many residents.
- More extreme weather could increase fuel poverty due to having to heat homes more or for longer (also possible that cooling may be needed).
- Demographic changes, e.g. unemployment and an increasing older population.

- Changing lifestyles and work practices, e.g. more people working from home, resulting in increased home heating costs, and more people having to give up work for childcare, resulting in reduced income.
- Changes in the way pensions are paid, with more people with private pensions in defined contribution schemes and therefore more vulnerable to changes in the stock market.
- Change of use of buildings in city centres - some commercial properties might change into domestic properties.
- It is likely that new policies will be introduced requiring rented properties to meet energy efficiency standards, which should reduce fuel poverty.

The discussion around question 2 (what can be done to increase adoption of the heat network?) is outlined in the next section.

2.3.2 Best strategies to increase social acceptability of the SI

Regarding question 2 (what can be done to increase adoption of the heat network?), discussion focused on legislative, infrastructural, financial and social levers. In terms of **legislative levers**, participants felt that it would soon be a statutory requirement for Aberdeen City Council to set a decarbonisation target that will apply to social housing and Council-owned assets, although the influence of the target was expected to be wider. Scotland-wide, requirements will start to come through for other sectors, such as building, planning and transport, to enforce net zero targets too. As the City Council is the planning authority, it can influence what happens in the new-build sector (this is considered in the new local development plan for 2022). However, planning policies tend to state that developers *should* do this or that, and developers often say it's not economically viable and adhere to the building regulations and no more. A return on capital of below 10%, for example, is considered not viable.

This led on to some discussion about whether the "shoulds" in planning policies could be come "wills". Participants felt that it was difficult to be prescriptive around the viability of connecting to a heat network, when it may actually not be viable for developers. Two current developments have been asked either to join the network or to create a local network and have developed their own networks (specified by Aberdeen Heat and Power for future compatibility).

In terms of **infrastructural levers**, Aberdeen Heat and Power suggested that, theoretically, they could invest financial gains in extending the heat network to new areas of the city, connecting people as boilers fail. There was also some discussion about "anchor loads" - large buildings such as administrative offices, sports centres and hotels that can be used to connect the smaller buildings around them; if demand increased from these non-domestic customers, this could lead to an expansion of the network. It was also noted that, as smaller networks are connected, the resilience

of the heat network improves because if something goes wrong with a pipe in one part of the network, heat can be pushed round in another way; in other words, with expansion of the network comes increasing reliability.

Financial levers were mentioned in the workshop and elaborated in a follow-up meeting with SCARF. Participants talked about the fact that people are most concerned about cost, reliability and disruption when deciding whether to join the heat network. One of the more radical scenarios suggested was giving everyone free energy, for example as an alternative to the money being put into furlough. Fuel poverty is ultimately related to poverty, and this led to some suggestions directed at reducing poverty more broadly, for example introducing a new policy that nobody should pay more than 10% of their income on energy, or putting a cap on rent so that other living expenses are reduced.

In terms of **social levers**, participants focused on schemes to raise residents' knowledge and awareness of district heating specifically and of options for heating their homes more generally. Begun early enough, such interventions could prevent recurrence of fuel poverty in the future. This could be achieved through more funding – and more targeted funding – to the younger generation to make them aware of heating costs and options when they move into halls of residence or buy their first home.

2.3.3 Policy scenarios for the replication of the SI

In the final part of the workshop, participants and facilitators formalised the foregoing discussion into a set of policy scenarios for increasing future uptake of the heat network. Scenarios were set out in a table, specifying *what* the strategy was, *where* it would be directed, *when* it would take place, *who* would be involved and *how* it would be implemented; additional scenarios were added later based on a review of the discussion. The full range of scenarios – some more radical than others – is outlined in Table 1.

Table 1. Policy scenarios for the replication of the SI

Dimension	Strategy	Where	When	Who	How
Legislative	Firmer encouragement for new private developments to join/add heat network	Aberdeen City	2022	Private developers Home buyers AHP	Through the Local Development Plan
Legislative	Decarbonisation comes into effect (i.e. no more cheap gas)	National	Model various years and see what difference it	Developers Home owners Landlords AHP	National legislation

			makes		
Legislative	Oblige anchor buildings to connect to the network	Aberdeen City or targeted areas	2022	Businesses	Through the Local Development Plan
Infrastructural	All barriers to physical rollout of the heat network are removed (costs, roads, planning)	Aberdeen City	2021	Private developers AHP	Through the Local Development Plan
Financial	Cap on cost of connection, e.g. no more than £8000	Aberdeen City or targeted areas	2021	Home owners Landlords	Local Heat and Energy Efficiency Strategy (LHEES)
Financial	Give everyone free energy	National	2021	Tenants Home owners Businesses	National legislation
Financial	Cap of 10% of income to be spent on fuel	National	2022	Tenants Home owners	National legislation
Financial	Cap on rent	National	2021	Tenants	National legislation
Social	Arrival of new technologies: a) For individual homes, e.g. hydrogen boilers, fuel cells b) That make the heat network more efficient, driving down the cost of energy	Global	2025 (midway)	Developers Home owners Landlords Tenants AHP	Research & innovation
Social	Awareness raising among young people of heating costs and options	Aberdeen City	2021	Students School pupils SCARF	SCARF engagement strategy

Table 2. Synthesis table of the strategies (used in the past and in future scenarios) for gaining social acceptability

RELEVANT DIMENSIONS	STRATEGIES FOR GAINING SOCIAL ACCEPTABILITY						
	Information, communication (SI)	Participation of policy actors and citizens in co-designing	Support changes in social norms	Pilot projects	Infrastructure & technologies	Environmental awareness (health, quality of life)	Environmental education (wide context)
Citizen resistance	Past, Future	Past, Future		Past		Past, Future	Past, Future
Policy resistance		Past, Future		Past	Past		
Non supporting social norms	Past, Future		Past, Future				
Lack of confidence in the project	Past, Future	Past		Past			
Place identity/attachment		Past				Past, Future	Past, Future
Commitment of relevant actors	Past, Future	Past, Future		Past	Past, Future		Past, Future
Satisfaction of experiential needs				Past, Future			
Satisfaction of social/psychological needs (security, belongingness, relationess, status,			Past, Future				

reputation)							
Satisfaction of need of acknowledgement							
Values: autonomy, biospheric and social oriented				Past			
Awareness of economic impact	Past, Future			Past, Future			

2.3.4 Input for the ABM and the Policy Sandbox Tool

A subset of the policy scenarios suggested at the first workshop will be taken forward for modelling in the ABM and presentation at the second workshop. Table 3 shows which ones could readily be translated into "switches and dials" for the model, and the final column describes how this would be achieved. The Aberdeen case study team will further refine this list to identify those that will a) best demonstrate the potential of the ABM, b) provide a range of scenarios for the second workshop, and c) generate helpful feedback for the ongoing development of the ABM.

Table 3. Policy scenarios being taken forward

Dimension	Strategy	Where	When	Who	How	In the Model
Legislative	Firmer encouragement for new private developments to join/add heat network	Aberdeen City	2022	Private developers Home buyers AHP	Through the Local Development Plan	Increased probability new developments join
Legislative	Decarbonisation comes into effect (i.e. no more cheap gas)	National	Model various years and see what difference it makes	Developers Home owners Landlords AHP	National legislation	Scenarios featuring increased gas prices
Infrastructural	Oblige anchor buildings to connect to the network	Aberdeen City or targeted areas	2022	Businesses	Through the Local Development Plan	(Difficult to simulate – requires identification of

						anchor buildings in GIS data; knock-on effects of them connecting not clear in terms of impact on other agents)
Infrastructural	All barriers to physical rollout of the heat network are removed (costs, roads, planning)	Aberdeen City	2022	Private developers AHP	Through the Local Development Plan	Heat network implemented immediately rather than gradually
Financial	Cap on cost of connection, e.g. no more than £8000	Aberdeen City or targeted areas	2021	Home owners Landlords	Local Heat and Energy Efficiency Strategy (LHEES)	Amend connection pricing rules accordingly
Financial	Give everyone free energy	National	2021	Tenants Home owners Businesses	National legislation	All energy prices set to zero
Financial	Cap of 10% of income to be spent on home heating	National	2022	Tenants Home owners	National legislation	Amend energy billing rules accordingly
Financial	Cap on rent	National	2021	Tenants	National legislation	Amend rent billing rules accordingly
Social	Arrival of new technologies: a) For individual homes, e.g. hydrogen boilers, fuel cells b) That make the heat network more efficient, driving down the cost of energy	Global	2025 (midway)	Developers Home owners Landlords Tenants AHP	Research & innovation	(a) Add new heating technology options for households to consider; (b) Amend heat network ongoing connection pricing rules accordingly
Social	Awareness	Aberdeen	2021	Students	SCARF	Add cases

	raising among young people of heating costs and options	City		School pupils SCARF	engagement strategy	corresponding to new awareness to relevant agents' case bases.

3. Second round of policy scenario workshops

3.1 Methodology, objectives and participants

The second Aberdeen Policy Scenario Workshop had two main aims: first, to update participants regarding our progress with modelling the scenarios discussed at the first workshop; and second, to elicit their feedback on how the model could be improved. Additionally, ICLEI and Urbanisland representatives sought feedback on the usability of the policy sandbox tool and exploitation plans for the project more generally.

Participants in the first workshop were invited to attend the second workshop, along with SMARTEES representatives from ICLEI and Urbanisland, to discuss the policy sandbox tool and the SMARTEES exploitation plan respectively. On 4 May 2021 they were sent an email asking them to complete a doodle poll with their availability. This was followed on 11 May 2021 with a calendar invitation for the afternoon of 21 May 2021.

Although lockdown restrictions had eased in Aberdeen by the time of the second workshop, Scottish Government advice remained to work from home wherever possible. Therefore, like the first workshop, the second workshop took place online using WebEx videoconferencing software. This time, we assumed basic knowledge among the participants of how to use the software and did not include an instructive element. Again, to minimise the risk of technical problems and to maximise accessibility for all participants, the whole workshop was conducted as a group meeting and did not include break-out group or whiteboard functionality. The second workshop took place during a single 2.5-hour session to minimise the burden on participants.

The ethical approval provided by the James Hutton Institute's Research Ethics Committee before the first workshop also applied to the second workshop. Likewise, consent forms signed by the participants at the time of the first workshop also covered the second workshop; participants were given an opportunity to withdraw at the start of the second workshop, but none did.

Successful aspects of the workshop included an engaging presentation from Gary, setting out some of the practicalities of implementing an agent-based model and showing the considerable progress made to date. The participant discussion was also very helpful and covered aspects of implementing the heat network, in particular the cost of different parts of the implementation, that will allow the

team to fine-tune the model. We were also pointed towards sources of data that can be used in the model, for example from the Department of Business, Energy and Industrial Strategy at the UK Government. Participants appeared to be engaged throughout and seemed keen to meet again informally over the summer. Less successfully, the polls, which had been prepared in advance in WebEx and tested, would not launch when needed during the session on the policy sandbox tool. Niklas and Trevor improvised by asking participants to indicate using their hands/fingers and the chat box their responses to the questions, which a) made it difficult to record responses, and b) meant that responses were not anonymous. In future, we would do further testing with WebEx polls in a "live" situation to ensure they worked, and would have a back-up option on hand in case of technical issues.

Participants

Members of the SMARTEES team attended the policy workshop in the following capacities:

Name	**Role**
Gary Polhill	Presenter
Ruth Wilson	Presenter
Doug Salt	Facilitator
Phoebe Somervail	Observer

In addition, the following members of the wider SMARTEES project team were present:

Name	**Role**
Niklas Mischkowski, ICLEI	Presenter/facilitator
Elma Meskovic, ICLEI	Facilitator
Trevor Graham, Urbanisland	Presenter/facilitator

Workshop participants came from Aberdeen Heat and Power and divisions of Aberdeen City Council concerned with different aspects of the heat network (e.g. sustainability, energy and housing). Names and roles are not provided as this would contravene the confidentiality promised in the workshop consent form. At this second workshop, representatives from SCARF (fuel poverty social enterprise) were not available to attend.

3.2 Agenda

The second policy workshop took place on the afternoon of 21 May 2021 with the following agenda.

Policy Scenarios for the Aberdeen Heat Network – Workshop 2

13.00 Welcome back and recap
13.10 Presentation of modelling results so far, and work needed
Discussion
13.55 Break
14.05 Presentation of policy sandbox tool

14.50 Future steps
15.00 Close

3.3 Results of the second round of policy scenario workshops

Presentation of the Agent-Based Model

Participants were welcomed to the workshop by Ruth and new faces were introduced, since ICLEI and Urbanisland representatives had not been present at the first workshop. Ruth recapped on the first policy scenario workshop and reminded participants of the financial, legislative, social, and technological scenarios that were developed.

Gary presented slides reintroducing the agent-based model of Torry (ACHSIUM). He explained that Torry was used instead of Aberdeen to begin with because of planned extensions of the existing heat network and the advantage of it being a smaller population to work with whilst still being a meaningful spatial area. He described agent-based modelling as, in some ways, a never-ending process. Gary then went into detail of how the model is able to represent various buildings, businesses and individual households, and how the agents' behaviours are 'mapped'. Household decisions about whether to join the heat network given the opportunity to do so are critical to the model. The houses are colour-coded in the model dependent on their level of fuel poverty. The ability to represent the heat pipe being laid in the model was also presented; in theory this can be laid anywhere in the model but, as we know, this is not applicable to real-world scenarios.

Gary then gave an update on progress since the last workshop. The modellers have reviewed their code (e.g. running sensitivity analysis) and run the first few experiments, which demonstrated that there is still quite a bit of work to do on the model before we can say "this is right" (results presented later in the workshop). There has also been progress in gathering more data for the model. Currently the modellers are in the process of expanding from Torry to the whole of Aberdeen to allow exploration of scenarios that only make sense to run in a city-wide context. Gary explained that, with every run of the model, the modellers' confidence in it grows as it can be checked and adapted. The results presented in this workshop are preliminary and the focus is on the model's capability rather than the specific results – so far only a maximum of 28 houses are joining the network in the model. A screen grab of the current status of the Aberdeen model (pre-simulation example) was shown so participants could see how it would look on a larger scale than Torry.

Gary introduced sensitivity analysis, describing what it is and why it is important to have some idea about how the parameters ('traditional' and ontological), switches, and dials affect the key outcomes of the model that we are interested in (e.g., the amount of pipe laid, no. of connected households, no. of people in fuel poverty after the model is run). Significant results from the sensitivity analysis were presented and explained. Gary further discussed the presence of democratic decision-making households (as opposed to patriarchal or matriarchal decision-making)

and a parameter called 'decision-bias'. Decision bias is needed in order for the model to work: there needs to be a bias toward joining the network.

Results of the workshop discussion on the alternative policy scenarios presented in the model

Gary explained that, of the scenarios emerging from the first workshop, we are looking to explore those relating to decarbonisation, connection price caps and technological innovation. Other scenarios being explored include legislation enforcing use of heat networks, and the removal of all barriers to rollout. Additionally, he is interested in exploring what would have happened if Aberdeen Heat and Power had been a for-profit organisation, which could speak to the social innovation focus of the SMARTEES project.

Gary presented the preliminary results of a pricing scenario experiment, which looked for a tipping point of installation and ongoing costs for joining a heat network. Installation costs of £0-£6000 and cost per unit costs of 0p–22p per unit were explored. Results were presented as heat maps but currently show no pattern - further work is needed to produce a meaningful output.

Discussion following the presentation focused on clarifying aspects of heat network installation and fuel poverty that will enable the model to be refined. For example, the cost of connecting from the road to the entry point of a building is one that someone other than the resident may pay for, for example Aberdeen City Council, but the cost of connecting from the entry point to the property may need to be borne by the homeowner. Also, the price per metre for installing pipe depends on where the pipe is being laid, with 'soft dig' areas such as grass verges being easier to dig up. The model may need to be adapted to look at where the ground is soft as this affects distribution routes and pricing. In city centres there are a lot of pipes and wires in every street that need moved out the way to install, so this in theory would make it cheaper in suburban areas with less concentrated wiring. Installation costs also depend on the density of blocks of flats.

Participants clarified that the government is not keen on electric heating as an alternative to gas boilers in the future. Air source heat pumps and hydrogen are more efficient as they reduce the amount of investment that is required upstream.

There was also some discussion about the complexity of defining fuel poverty, which is currently defined in terms of the proportion of a household's income spent on heating the home. It is important to consider what people *would* spend to heat their homes adequately, as well as what they *do* spend, so that new technologies are equipped to address the challenge fully.

3.4 Workshop discussion on the Policy Sandbox Tool

Niklas presented the policy sandbox tool as one of the ultimate outcomes of the project, explaining that it aims to capture the effects of social innovations on policy outcomes, to support local government in decisions concerning energy and mobility transitions, and to allow policy-makers to explore social dynamics. The tool needs to be user-friendly while being based on solid data, and to be usable for a wide range of European cities.

He then shared a link to the prototype sandbox tool and gave participants ten minutes to work their way through it, following details of the Aberdeen cluster. Polls had been prepared using WebEx functionality for people to provide feedback on their experience, but the technology did not work on the day. Rather, a 'show of fingers' response scale was used (1 (superb) - 5 (horrible)) for the following questions:

1. How well did you manage to navigate your way through the PST? Scale 1-5
2. How appealing is the current design to you? Scale 1-5
3. If any, which points did you find unclear or confusing? Participants were asked to respond using the chat feature in WebEx.
    a. Instructions / Guidelines on the top of the page
    b. Moving through the timeline
    c. Moving through the info boxes (context, actors…)
    d. Quality of maps, images, and text
    e. Choosing scenarios in the exploration section
    f. Other

The majority of respondents found it quite easy to navigate through the policy sandbox tool. More specifically, 71% of respondents stated that they managed to navigate the tool superbly, 14% well, and 14% undecided / neutral.

When it came to the question about the design of the policy sandbox tool, 29% of respondents found the tool design to be superb, while 71% found it attractive. None of the respondents indicated a neutral or negative impression linked to the design of the tool.

Participants provided helpful feedback concerning whether they found any aspect of the tool unclear or confusing and, if so, which. Some positive feedback was collected, with one respondent highlighting that nothing was unclear and another that it was easy to move through the timeline. Other feedback that was collected proved to be helpful in understanding what could be improved when updating some of the elements of the tool, and the suggestions were integrated in the updated version of the tool. One of the respondents, for example, commented that the five

symbols/icons above the introductory map with the case study cities were not clear, while another respondent expressed that the home page could have been clearer in expressing that a user would need to click on the city in the map. The comments highlighted the importance of including guidelines / instructions on the different pages of the online tool that more clearly specified the steps to be followed. Another respondent mentioned that the tabs at the top of the tool page were a bit distracting and made it initially less clear how to navigate the tool. One of the participants also mentioned that moving through the information boxes (e.g. context, actors) was unclear or confusing, suggesting that it was not immediately possible to notice the different boxes. Another respondent further commented that it was not clear what to select in the exploration section, but this will change as more policy scenarios become available.

Finally, Niklas gave a quick overview of what the exploration page on the sandbox tool should encompass by the time it is finished, additionally a summary page.

The workshop concluded with a presentation from Trevor about the SMARTEES exploitation plan and ideas for what can be offered to other cities beyond the life of the project. Ideas include the sandbox tool itself, a sandbox innovation workshop and an out-of-the-box bespoke service. He posed the following questions to participants, who responded to each question with thumbs up or thumbs down, or by leaving a message in the chat:

Sandbox tool

1. Does the prototype sandbox tool give a better understanding of the case studies and what Agent Based Modelling may offer?

2. Would this be a useful demonstration for other practitioners in your organisation?

3. Would this be a useful demonstration for other policy makers in your organisation?

Respondents had an overall positive impression when asked whether the sandbox tool gives a better understanding of the case studies and agent-based model. Of the respondents, 80% stated that the tool did provide a better understanding of both aspects to some extent, while 20% thought the tool led to a better understanding of the case studies but not so much about what agent-based modelling may offer.

When asked whether the tool would be a useful demonstration for other practitioners and policy makers, 66% of respondents thought that it could be useful for other practitioners, while 100% of respondents thought it could be useful for policy makers.

Sandbox Innovation Workshop

1. Would a brainstorming workshop with SMARTEES partners focusing on a challenge in your city be useful?

2. Would you be willing to cover the costs for the delivery of such a workshop by SMARTEES partners? (approx. €2-5000)

The responses received for the first question – a Likert scale question (1 (strongly agree) - 5 (strongly disagree)) – showed that a brainstorming workshop with SMARTEES partners focusing on a challenge would be useful, with 100% of respondents indicating that they agreed.

When asked about whether they would be willing to cover the costs for the delivery of such a workshop, one respondent indicated that they were not sure whether there was enough budget available while the other respondents indicated that they would not be willing or that it would not be feasible to cover the costs.

Out-of-the-box service

1. Do you think there is a potential market for a customised service to help cities with social innovation and energy transition?

2. What kind of services would be most relevant?

- Policy support
- Practice support
- Advisory support
- Peer mentoring
- Consultancy support
- Agent-based modelling support

With regard to the first question, 40% of respondents strongly agreed that there is a potential market for a customized service, 40% were undecided / neutral, and one strongly disagreed. The respondent who strongly disagreed elaborated in explaining that they thought that a more proven track record was required in the sense of proving the accuracy of models before people would consider to buy into such a tool.

For the second question, respondents were informed that they could select multiple options. When enquired about what kinds of services would be most relevant, 20% of respondents selected policy support, 20% practice support, 60% advisory support, 80% peer mentoring, and 60% agent-based modelling support.

In the discussion that followed, one participant talked about how, in their experience with the SMARTEES project, agent-based modelling is beneficial for understanding the complexities and sensitivities around what people need rather than purely for focusing on economic and practical questions. Essentially, ABM can help to make the business case and to test out scenarios when investing multi-millions in regeneration.

One suggestion was to produce a version of the tool that costs very little, pricing up if the client required further depth. It needs to be affordable for a mass market so that it can be slid into a feasibility report. Organisations are used to paying for feasibility studies and could potentially cover the cost of something more reasonable than the costs outlined in Trevor's slide.

Gary discussed the fact that ABM might need to be something that can be done more rapidly in various different contexts and further research is needed to determine the possibility of this. Currently the costs are too high to make it feasible to create tailored solutions and the field is not advanced enough to have the resources to build something 'on the fly' (thrown together) to make that happen. However, knowing there is demand is a good incentive to proceed in that research direction and as a basis for follow-on bids.

Ruth concluded the workshop by mentioning that SMARTEES ends in October 2021 and asked participants to get in touch if they have thoughts regarding any further scenarios that they would like to see modelled or other areas where they think ABM could be applied. Gary commented that it would be helpful to meet informally over the summer to discuss further progress, and a representative from AHP mentioned that the week of 17th August may be suitable as there is a board meeting and they would be in the local area. Ruth thanked everyone for their input and the meeting was concluded.

Annex 7: Report on Policy Scenario Workshops Cluster Fighting energy poverty through energy efficiency Timișoara

Picture from shuttlechoice.ro

Project Full Title	Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability	
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1. Case Study Background

Timișoara case study revolves around the growing issue of energy poverty and vulnerability, focusing on a live project led by the Municipality of Timișoara, which aims to alleviate fuel poverty in the area, through an integrated program offering individualized household support to access energy efficiency improvements. In doing so, an action plan has been developed in Timisoara in order to reduce its fossil energy use and decrease carbon intensity (the Sustainable Energy Action Plan 2014-2020 for Timisoara7). At the same time, as energy costs are a challenge for a significant proportion of the city's inhabitants, it is necessary to combine energy transitions with measures addressing the fuel poverty (SMARTEES DoA).

In the field of energy-efficient buildings and districts, Timişoara Municipality has identified three major goals: (1) renovation work to transform existing buildings into energy-efficient buildings, (2) energy-efficient districts, and (3) neutral or energy-positive new buildings. Through thermal rehabilitation, the city aims to reduce the beneficiaries' costs by increasing the energy performance of buildings while reducing the annual heating costs by approximately 60% (https://local-social-innovation.eu/energy-efficiency-against-fuel-poverty/#c161). To this end, local public administration offers tax breaks and exemptions, for example, to apartment owners performing rehabilitation and thermal insulation work on their expense (for a period of seven years), owners who renovate the façade of their buildings (for a period of five years), or to property owners who replace the classical heating systems with renewable energy ones by installing solar panels, heating pumps, and individual micro-heating units running on bio-mass8.

The municipality also supports citizens' initiatives. Owners of apartments and buildings in the residential sector, private businesses, and large industrial customers are other important actors who influence energy consumption in Timişoara9. We should specify some details related to Colterm, as it is an entity highly related to Timisoara SI and energy production and distribution. COLTERM SA Timişoara was established in 2004 by Local Council Decision, through the reorganization of two companies: TERMOCET 2002, manager of power plants and the primary district heating network and CALOR, manager of the secondary network, thermal points and neighbourhood power plants. Being subordinated to the Timişoara Local Council, COLTERM SA has as object of activity the production, transport, distribution and supply of thermal energy; production and sale / supply of electricity;

7 Source: https://www.dmmt.ro/uploads/files/Planul%20de%20Actiune%20pentru%20Energia%20Durabila%20a%20Municipiului%20Timisoara%2020142020%20reevaluat%20in%202014%20aprobat%20prin%20HCL%20nr%20550%20din%2011%20Noiembrie%202014.pdf

8 Source: https://esmap.org/sites/esmap.org/files/DocumentLibrary/TRACE_Romania_TIMISOARA_Optimized.pdf

9 https://local-social-innovation.eu/energy-efficiency-against-fuel-poverty/#c161

operation, maintenance, repair and development of thermal networks and installations in thermal points and power plants etc.

It must be underlined that in Timisoara, energy poverty is not mainly a problem related to the adequate physical access to clean and modern energy; it is rather an issue of financial affordability and energy efficiency. Energy poverty/vulnerability therefore describes a condition wherein households cannot get or afford an adequate level of energy services. (Deliverable 3.1)

2. First round of policy scenarios workshops

2.1. Methodology, objectives and participants of the workshop

In Timisoara, the two workshops were thought as one focus group discussion with the following goals: (1) to guide and promote reflection on alternative interventions that would foster wide acceptability of the social innovation in the field of energy in Timisoara case and, (2) to provide input for simulations.

In order to reach our aims, this focus group was split into two phases. The first one was an individual reflexive phase, based on identifying potential counterfactual scenarios which are nothing more than possible policy alternatives on dimensions and lessons learned so far. This phase was already done by participants, as a preparatory, remaining to present each other's ideas and to circulate reflections during the focus group meeting, in order to deepen the first individual phase, benefiting from the contribution brought by the new meanings developed through the group discussion.

The second phase consisted of a group discussion and reflection on obstacles for the counterfactual scenarios, as well as solutions and actions needed. Specifically, during this phase, for each counterfactual scenario, a list of possible barriers as well as a list of possible drivers for social innovation acceptability were drawn by each work the group. As a conclusion, each work group presented a summary of the discussion.

The participants, representatives from the City Hall were identified in collaboration with Mayor's office, selected based on their professional role in relation to the heat network and strategic city planning. Participants from academia were selected based on their knowledge and involvement in various projects related to energy production or consumption, and based on taking an active role in the relationship between academia and the city as well.

The workshop was facilitated by the SMARTEES team members had the following roles during the focus group:

Name	Affiliation	Role
Patricia Albulescu	West University of Timisoara	Presenter & Facilitator
Doug Salt	The James Hutton Institute	Presenter & Facilitator
Dana Țurcan	West University of Timisoara	Technical support & Facilitator

Concerning the focus group participants, a total of 5 people engaged, two represented the promoter- Municipality of Timisoara- and three were experts from academia. During the focus group, the participants were split into two small groups. In one group, a modeller and a facilitator were present, as well as one WUT representative and one City Hall representative. In the other group, one facilitator, one WUT representative and one City Hall representative were present.

Affiliation	Role
West University of Timisoara	Lecturer at Geography Department, with research on topics such as GIS in social geography, Social innovation and its spatial effects, Social and solidarity economy (NGOs) and local development, etc.
West University of Timisoara	Professor at Faculty of Physics, teaching classes such as Classical Mechanics, Heat Transfer, Computational methods in transport phenomena, and Crystal growth processes
West University of Timisoara / Intercommunity Development Association – Timisoara Growth Pole	Associate Professor at Faculty of Economics and Business Administration. Areas of scientific interest: international accounting, ways to finance investments through non-reimbursable funds, educational entrepreneurship. Managing Director at Intercommunity Development Association – Timisoara Growth Pole, whose purposes are related to the cooperation between the member administrative-territorial units, for the joint realization of some development projects of zonal or regional interest, or of the joint provision of some public services.
City Hall	Timisoara Mayor's personal advisor on digitalization and Smart city.

City Hall	Advisor for the Local City Council. Specialties: Residential Architecture and Health Programs

The names of the participants are not provided as this would contravene the confidentiality promised during the focus group: “The focus group is audio and video recorded to be transcribed later, and data will be treated in order to guarantee the privacy and the anonymity of the participants, according to the law in force in the EU, as well as according to the general guidelines for psychological research activities. In no case the identity of the participants will be made public within scientific publications or conference presentations. Nonetheless, there is the need for your consent to use the knowledge produced during this focus group. If you consent, please just state your name and say I consent.”.

The focus group took place exclusively online using Google Meet software. Access to the meeting and details, such as the link, date and hour, duration, were included into an e-mail sent to participants beforehand. Break-out rooms were created before the meeting and used for small group discussions, setting a timer for the participants to be aware of the time remaining for this phase. When the breakout rooms time was up, the software prompted participants to the main room. The duration of the focus group was established after a short discussion with the participants where they expressed their availability for it. Because most of the participants were available for one hour and a half maximum, we established this time-frame for the online discussion.

With the time and format restrictions in mind, we designed only one policy scenario workshop to take place in a single afternoon, for one hour and a half rather than over two separate sessions, breaking the objectives into two phases. The individual work phase was thus designed to take place before the online meeting as a preparatory stage, following group and plenary discussions to take place during the online meeting.

For the individual reflexive phase, materials were created and sent via e-mail to all focus group participants with specific instructions on what and how to capture each participant’s perspectives and knowledge. One material created was in Romanian language, with the following sections: SMARTEES project description (1 page; at the end, we included a link to SMARTEES website), the description of the social innovation in Timisoara with specific actions taken until now (1 page), focus group objectives and a general description of it including the past activities and steps taken so far in SMARTEES project in order to identify main lessons learned and dimensions of relevance for Timisoara case study (1 page), and a description of the policy scenarios dimensions of relevance for this case and the focus group (4 pages). Alongside with this material, two excel tables were sent, one of them including all dimensions established in SMARTEES WP5 in preparation for policy scenario workshops, highlighting the ones of interest for Timisoara case study and filled in the cells with the description of the context of applying the solution, the other table including only the dimensions of relevance for Timisoara case study, being the work document to be filled in with participant’s perspective. The results of this individual work was the starting point of the focus group and the

discussions on alternative policy scenarios identified during the individual phase. Information about the focus group methodology and guidelines followed during the alternative policy scenarios focus group can be found in Appendix 1.

2.2. Agenda

The focus group combining both first and second policy scenario workshops took place on the of 4th of August 2021, in the afternoon. Because the Timisoara SI (similarly to Aberdeen), is a live case study, at the core of this focus group was the idea of alternative scenarios for replication purposes (scaling up).

Preparatory Phase (e-mail based phase before 4th of august)

Individual work – lessons learned and identification of policy alternatives for each relevant dimension of the SI

Participants are provided with handouts with the table with relevant dimensions/lesson learned for the case

Participants fill in the tables and create counterfactual scenarios on dimensions and lessons learned and sent it back to organizers before the online meeting

Tasks

1. Identify main lessons learned on each relevant dimension in the process of design and implementation of social innovations and indicate in which phase of the SI each lesson was relevant (e.g. tools, solutions, strategies, processes used) (identify only those lessons that have not been reported in the previous work conducted in the SMARTEES project)

2. Identify the alternative: what would you do differently on dimensions identified as relevant for acceptability of SI and citizen empowerment – counterfactual scenarios

3. Reflect on and report other important factors for SI acceptability not already included in the table

4th of august Agenda

13:00 Warm-up phase (20 minutes)

Welcome

Participants are presenting themselves

Presentation of ABM model

Informations about the objectives, duration of the focus group & good practice for this session

13:20 Plenary session 1 – FAMILIARIZATION WITH EACH OTHER'S WORK ON THE DIMENSIONS/LESSONS LEARNED FOR THE SOCIAL INNOVATION (35 min)

Participants are presenting their input based on preparatory stage – their perspective on the dimensions and lessons learned for the social innovation in Timisoara

ABM feedback: Case-responsible modeller also offers feedback on the work done to ensure that alternatives can be simulated in the model

13:55 Group session – BARRIERS AND ALTERNATIVE POLICIES/STRATEGIES (20 min)

There are 2 groups created, each consisting of 3 participants (as diverse as can be created).

Main questions:

1. Identify the obstacles you are likely to encounter and how to overcome them (Which strategies are needed?)
2. Next planned policy steps: How would this translate into implementation strategies?

Considering the context already chosen for the replicability of the case, each group discusses the obstacles for the counterfactual scenarios, as well as solutions and actions needed.

For each counterfactual scenario a list of possible barriers as well as a list of possible drivers for SI acceptability is drawn by each work group.

14:15 Plenary session 2 – DISCUSSIONS OF IDENTIFIED ALTERNATIVE STRATEGIES OR POLICIES & NEXT STEPS (35 min)

Presentation and explanations of the groups discussions and solutions (10 minutes/ group; 2 groups of 3 people)

Discussions of identified alternative strategies or policies & next steps (10 minutes)

Modeller: discussions on the ABM model and what is of interest for participants to be modelled for Timisoara case (5 minutes)

14:50 Debriefing and feedback (20 minutes)

Conclusion about the work done during the workshop

Next steps

Feedback from the participants

2.3 Results of the first round of policy scenario workshops

2.3.1. Introduction to the policy scenario workshops

Summary of the presentations

The focus group started with a warm welcome message from one of the WUT researchers, followed by the consent from participants for recoding the session and presenting the SMARTEES team members present in the online meeting. A very short presentation of SMARTEES project and goals followed, explaining that it is a transdisciplinary research project funded by the EU aiming to support the energy transition and improve policy design by developing alternative and robust policy pathways that foster citizen inclusion and take local peculiarities into account.

During this short presentation, it was also explained that the results from the examination of the five types of energy- and mobility-related local social innovation in ten front-runner cities and islands across Europe will feed into the development of a policy sandbox tool, which based on a comprehensive modelling approach, will help forecast the effects of policy measures and social innovation in similar local contexts. After this presentation, a round-table introductions followed, aiming for the participants to start to get to know each other, as well as for accustoming them to freely express themselves in this context.

The WUT researcher then continued with what the Timisoara SI is as well as its goals (i.e., renovation work to transform existing buildings into energy-efficient buildings, creating energy-efficient districts, and building neutral or energy-positive new buildings), and made the transition to the presentation of the ABM model. Thus, the presentation held by the modeller followed, explaining the role of the ABM model in SMARTEES project, making parallels with the Aberdeen model, and then displayed the Timisoara HOTNESS agent-based model. A short discussion on the operationalization of energy poverty in Romania/Timisoara, and specifically the lack of, followed. Then, the modeller presented the two main variables of interest in Timisoara case study, namely energy poverty, linked to district heating and trust in the local authorities. As a result, the citizens are moving away from district heating to household-based gas heating installations.

The modeller also explained that he built a trust feedback mechanism into the model. Then, the modeller proceeded to link these two variables with the way individuals tend to make decisions related to energy consumption based on their social networks (neighbourhood, family, social media, mainstream media, energy providers). The modeller also presented the significant results from the sensitivity runs of the Aberdeen model, as well as the experiments run with this model and their results (e.g., pricing and the effect on fuel poverty, awareness raising, technological innovation, decarbonisation). Moreover, the modeller suggested some additional experiments which could be run into the Timisoara model, of scientific interest, such as social innovation (i.e., what if Colterm was not for profit), or independent information source (i.e., what happens if in Timisoara is an advisory body).

The modeller presented the data which is needed for the model, namely demographic data and scenarios, as well as future steps, explaining that the models created under SMARTEES will go beyond the end of the project, as district heating is gaining a lot of attention and interest. Also, the modeller expressed his intention to keep the collaboration going also after October 2021 when the project is completed. The modeller's presentation concluded with a slide with SMARTEES research partners from James Hutton Institute contact details, prompting participants to get in contact with them for thoughts or questions.

Then, short presentations of the objectives and structure of policy scenario focus group, with instructions for the development of the next phases as well as good practices for the session were presented ("there are no right or wrong answers. The aim of us, the researchers, and the research itself is only to gather everyone's opinions and beliefs, and not technical knowledge on the topic. Second, this is a collective and creative work; therefore, no judgement, in the way all of us can tell, without fear, all that comes to mind"). With the agreement on good practices for the session, the phase of presentations was concluded.

Principal dimensions addressed in the deliberative sessions of the workshop

Relevant dimensions for the implementation of the SI taken into consideration for discussions during the workshop:

RESISTANCE	Internal resistance (and conflict)
	Political resistance (and conflict)
	Citizen resistance (and conflict)
AWARENESS & CONFIDENCE	Lack of confidence in the use/effectiveness of the SI (trust issues)
	Concern for quality of living conditions
	Concerns for the impact on local economy & jobs
COMMITMENT	Commitment of relevant social actors through the process
CONTEXTUAL FACTORS (BARRIERS/DRIVERS)	Existing (non)-supporting local and social norms
	Low adoption of new energy behaviours
SATISFACTION OF NEEDS	The need for trust in the project and in institutional representatives

Regarding the lessons learned, participants were exposed to all the tools, solutions, strategies and processes identified as relevant under WP5 efforts, being taken under consideration during both preparatory and discussions (plenary and small group work) phases, namely:

- information and communication activities,
- citizen participation in decision-making (participatory strategies, individual and collective citizen empowerment strategies (strategies to support behavioral and community adoption of the innovation)
- social and cultural norms (using environmental-related norm-targeting interventions to support acceptability of the innovation)
- social and cultural norms (tools or strategies targeting social and cultural norms regarding participation)
- pilot projects (step by step implementation)
- consultation of human resources with a high level of knowledge/expertise,
- laws and regulations (normative and regulatory tools)
- environmental awareness / awareness of the impact of the SI on the health and quality of life
- creation of working groups / task forces with multiple stakeholders
- citizen commitment strategies (i.e., citizen pacts for the SI)
- larger public deliberation and consultation strategies
- providing resources (human, financial etc.) to support SI implementation
- co-creation of the future, informal extended partnerships involving a wider set of actors
- cultural mediation
- infrastructural and technological policies or tools.

All these dimensions were thus reviewed by participants, highlighting the most important ones, in their opinion, for Timisoara SI.

2.3.2 Best strategies to increase social acceptability of the SI

Stemming from individual work phase and online discussions phase, some best strategies to increase social acceptability of the SI emerged, which could be grouped into legislative/normative, informational, infrastructural, and technological level policies or tools. Namely, the participants identified as most important policies and tools for Timisoara SI acceptability:

- Laws and regulations / Normative and regulatory tools
- Information and communication activities
- Pilot projects (step by step implementation)
- Creation of working groups / task forces with multiple stakeholders
- Infrastructural and technological policies or tools

List of alternative policy scenarios and potential strategies

During small group discussions, several alternative (counterfactual) scenarios were developed, as a response to the question "What could be done differently". We will further summarise what was reflected during these sessions in both groups.

In the working group 1, the following three scenarios were identified:

1) Top-down comprehensive, integrative strategies / strategic plan (from the City Hall) on longer periods of time (2030 in connection with the EU Green Deal initiative).

During the discussions, it transpired the issue of buy-in versus awareness. Before addressing the community and raising awareness ("before the awareness stage"), we need to show clarity and consistency in what is going to happen, as specifically as possible. It was suggested that the group working on Colterm issue ("saving Colterm", or how to "get even, not profitable") maybe should have a larger umbrella which could be called Green Energy Solution for Timisoara, where Colterm is at the core. When all is thought of, and a clear strategic plan is devised "up to the consumer's door" (including technical solutions, costs, who bears the costs, what is the end bill to the customer), then this can be presented to the public to raise awareness and create buy-in from energy consumers. For consumers, several billing options could be devised, such as premium, medium, small, subsidised, depending on the household revenue for which the end-bill is issued. The idea of multiple scenarios is not excluded, by taking into account various dimensions, for example, considering not only the poor-rich dimension (depending on income and the percentage of wages invested in energy consumption), but also other dimensions, such as the blocks area versus the houses area.

- Barriers: funding, lack of green energy alternatives beside Colterm
- Dimensions addressed by this alternative: citizen resistance and conflict, lack of confidence in the use/effectiveness of the SI, satisfying the need for trust in the project and in institutional representatives, existing non-supporting local and social norms

2) Embrace electricity as the new normal in preparing energy production and consumption at district level

The integration of several other types of clean energy was also discussed here, mainly related to the "future orientation". Specifically, concerns were raised as the city of Timisoara is not currently taking action in preparing the infrastructure of the city for the use of electric cars (the electric grid needs to be assessed and prepared for more divers consumers such as cars). Because we can only expect that the need for clean electricity to be on the rise/on more demand, the need to switch from fossil to clean energy should be integrated into the city planning to prepare Timisoara for new patterns of energy production and consumption (integrate structures for other types of energy such as wind or solar). This solution could take several forms of energy production, such as infrastructure for electric cars, solar energy captured in the same district where is consumed, smart lightning with smart

sensors installed on the polls to capture data about the district, renewed technology in Colterm to be distributing in one such district.

- Barriers: could not be identified
- Drivers: existing technology which can be replicated (i.e., we can look at other cities how they are doing this and just adapt it to local context)
- Dimensions addressed by this alternative: low adoption of new energy behaviours, concerns for the impact on local economy & jobs, citizen resistance and conflict

3) A new role for neighbourhood managers (a new position just created in the City Hall)

To better understand this solution, we have to mention that recently (during July 2021) in Timisoara a new organizational chart for the City Hall was devised. Specifically, Timisoara City Hall is working on creating a service that will deal with neighbourhood management. Each neighbourhood will have appointed a manager, appointed from among municipal officials, who will be responsible for liaising with residents, NGOs and businesses in the neighbourhood to identify all issues facing the community. The positions appear in the new organizational chart of the City Hall, from which, however, other functions disappear, 10 of them being management positions (https://www.primariatm.ro/2021/06/11/primarul-timisoarei-dominic-fritz-a-prezentat-noua-organigrama-a-institutiei). Expectations are high from Timisoara residents for this new position for neighbourhood manager. The new mayor of Timisoara, Dominic Fritz, declared publicly that he seeks to set up these positions for neighbourhood managers in an attempt to bring the citizens closer to the administration, in order to collect in real time residents' complaints and to implement solutions to address the local issues. The participants in his group agreed that neighbourhood managers are the perfect alternative solution for increasing acceptability of the SI and citizen empowerment, being the closest to the people's realities of living.

- Barriers: could not be identified
- Drivers: the new organizational chart of the City Hall with these new positions of neighbourhood managers
- Dimensions addressed by this alternative: citizen resistance and conflict, low adoption of new energy behaviours, concerns for the impact on local economy & jobs, lack of confidence in the use/effectiveness of the SI, satisfying the need for trust in the project and in institutional representatives

The working group 2 came up with different alternative strategies, namely:

1) Increasing the price for gas (increasing taxation/ raising taxes)

The idea of increasing the price for gas emerged during this groups' discussion as a solution of "saving Colterm". This local heating company is in debt, having significant financial burdens which no

viable solution was found for now. Increasing taxation was, latter on during discussions, found as not a good solution for the end client (individuals).

- Barriers: increasing costs for the client, which is the most important factor for the local heating company
- Drivers: none identified
- Dimensions addressed by this alternative: (increased) citizen resistance and conflict

2) Fixed term contracts and individual consumer records

Another alternative strategy introduced during the discussion in this work group was that the public administration to make it more difficult for users to break out from the contract with the district heating provider, Colterm. It was discussed also the issue of Colterm not having a clear overview of its users, as at the moment, Colterm has contracts with tenants' associations, not individuals. Thus, if 10 individuals do not report that they have declined the contract, Colterm does not know that they lost these 10 consumers.

- Barriers: frustrating citizens, lack of trust, lack of confidence in the local administration
- Drivers: by law, new buildings cannot get the construction permit without being connected to the district heating network or another solution at the building level (not permitted the apartment buildings where each apartment has an individual heating solution)
- Dimensions addressed by this alternative: negative effect on trust in the project and in institutional representatives

3) Improve service quality

This strategy came up as a solution to the issue of energy loss, because a lot of heat is lost, it just leaks out from the buildings. Thus, creating and giving certifications for all the buildings in the city in terms of energy efficiency (i.e., A to G) could be something to be done in the first phase of project development. The insulation of the buildings already included into the Timisoara SI obviously increases the energy efficiency of the buildings, interacting with the prices for the consumers (reducing costs), the revenue of Colterm, etc. It must be noted that the Romanian Energy Regulatory Authority (ANRE) already prepares energy certificates for buildings, including Timisoara area.

- Barriers: price of green energy ("green energy is not cheap"), Colterm is running currently on low power ("today, if we would have to serve all the clients [in the city], we could not be able to deliver the heat for all").
- Drivers: existing certification institution
- Dimensions addressed by this alternative: concern for the quality of living conditions, commitment of the social actors through the process

4) Individual metering (how the district heating is paid in Timisoara)

The main issue discussed here revolved around the reality that in the future, only the district heating remains sustainable, as individual gas installations (preferred in Timisoara by consumers) will be prohibited at some point in time. This issue is clearly related to individuals breaking contract with Colterm, and Colterm's issues related to estimating their number of clients. Thus, the solution found by this work group was to create individual contracts and metering in order for Colterm to have a clear picture of how many clients it has, what are the individual heating needs, and to be able to make predictions and scenarios related to energy use patterns and related costs. One of the participants stated that they would want to have a pilot project to see how this is received by the energy consumers. The modeller declared that he could include this into the model for Timisoara case, and scale the pilot project to the whole city.

- Barriers: price of green energy ("green energy is not cheap")
- Drivers: could not be identified
- Dimensions addressed by this alternative: lack of confidence in the use/effectiveness of the SI, citizen resistance and conflict, satisfying the need for trust in the project and in institutional representatives

5) Extending the heat network in the areas around Timisoara (e.g., Giroc)

The idea of extending the district heating network to other areas near Timisoara, which are now considered as suburbs of the city emerged. This strategy could be something to think for the future, because for now, the main issue is of rehabilitation of the existing, old network and heating infrastructure.

- Barriers: concerns related to the existing network
- Drivers: expanding the heating services and implicitly the jobs
- Dimensions addressed by this alternative: concern for quality of living conditions

Table 1. Policies to increase the social acceptability of the SI

Policies and strategies for the implementation of social innovation	**Main insights / lesson learned**
Dimension addressed: Citizen resistance and conflict, Lack of confidence in the use/effectiveness of the SI, Commitment of relevant social actors through the process, Satisfying the need for trust in the project and in institutional representatives	Laws and regulations / Normative and regulatory tools For gaining trust from citizens, in the first place, a comprehensive, integrative strategic plan must be created for Timisoara

Dimension addressed: Citizen resistance and conflict, Lack of confidence in the use/effectiveness of the SI, Commitment of relevant social actors through the process, Satisfying the need for trust in the project and in institutional representatives	Information and communication activities Specific, targeted awareness campaigns must be developed to answer citizen's needs
Dimension addressed: Internal resistance, Political resistance, Citizen resistance, Lack of confidence	Pilot projects (step by step implementation) Changing from individual gas installations back to local heating company will be tried in a pilot project
Dimension addressed: Citizen resistance, Lack of confidence, Commitment of relevant social actors through the process, Concern for quality of living conditions, Satisfying the need for trust	Creation of working groups The role of neighbourhood managers in liaising the relationship between citizens and city administration.
Dimension addressed: Concerns for the impact on local economy & jobs, Low adoption of new energy behaviours, Concern for quality of living conditions	Infrastructural tools Rehabilitation of the current heating network infrastructure
Dimension addressed: Low adoption of new energy behaviours	Technological policies or tools Using smart technology for collecting data on and improving energy consumption

List of strategies (e.g. information/communication; citizen participation; environmental awareness, etc.) to gain social acceptability developed in the process of design and implementation of the social innovation. Adapt this table according to the objectives of the workshop

Table 2. Policies to increase the social acceptability of the SI

Alternative pathway/intervention identified	**Main envisioned obstacles**	**Main envisioned drivers**
Top-down comprehensive, integrative strategies / strategic plan (from the City Hall) on longer periods of time	funding lack of green energy alternatives beside Colterm	external funds (e.g., from EU) could be attained other energy sources can be secured
Embrace electricity as the new normal in preparing energy production and consumption at district level	could not be identified	existing technology which can be replicated
A new role for neighbourhood managers	could not be identified	the new organizational chart of the City Hall with these new

		positions of neighbourhood managers
Increasing the price for gas	increasing costs for the client, which is the most important factor for the local heating company	could not be identified
Fixed term contracts	frustrating citizens lack of trust lack of confidence in the local administration	existing laws and regulations
Improve service quality	high price of green energy Colterm running on low power	existing certification institution
Individual metering	price of green energy ("green energy is not cheap")	could not be identified
Extending the heat network in the areas around Timisoara	concerns related to the existing network	expanding the heating services

List of alternative policy scenarios and potential strategies to gain social acceptability. Adapt this table according to the outcomes of the workshop.

Table 3. Synthesis table of the strategies for gaining social acceptability

RELEVANT DIMENSIONS	**STRATEGIES FOR GAINING SOCIAL ACCEPTABILITY**						
	Information, communication (SI)	Participation of policy actors and citizens in co-designing	Support changes in social norms	Pilot projects	Infrastructure & technologies	Environmental awareness (health, quality of life)	Environmental education (wide context)
Internal resistance	Past/Future	Future		Future		Past/Future	Past/Future
Citizen resistance	Future			Future	Future		
Policy resistance		Past/Future		Past/Future	Past/Future		Past/Future
Non supporting social norms	Past/Future	Future					

Lack of confidence in the project	Past/Future	Future		Future		Future	
Low adoption of new energy behaviours	Past/Future			Future		Past/Future	Past/Future
Concerns for the impact on local economy & jobs				Future			
Commitment of relevant social actors through the process	Past/Future	Future		Future			
Concern for quality of living conditions		Future		Future	Past/Future		
Satisfying the need for trust in the project and in institutional representatives	Past/Future	Future	Future	Future		Past/Future	Past/Future

2.3.3 Input for the ABM and the Policy Sandbox Tool

During the focus group discussions, the modeller identified the *service quality* variable which could be included into the Timisoara model, and currently lacking. He suggested that in the model, this variable could be parametrized and see how this affects profitability versus investment. Another variable of interest for participants to be modelled was creating targeted, *small scale awareness campaigns*. Through the model, it could boost the energy efficiency of buildings, at random, and see how this affects costs for individuals, for Colterm and for the local administration.

Individual metering pilot test was also of interest for modelling, as it came up during the focus group discussions.

Supplementary material: Focus group methodology

At this point, we will highlight the role of focus groups in qualitative research and will discuss how to conduct a focus group, from the selection of the sample to the organizing details.

Background information for the focus group methodology

Focus groups:

- are social situations where people discuss issues concerning their own experience.
- are research tools focused on collecting information, points of view, beliefs, values, opinions and meanings attributed to a specific object of interest.
- target the quality of the information collected rather than the quantity.
- start from the assumption that for some issues, and especially subtle ones, people do not know how they feel and they first need to listen to others in a relaxed setting to be able to thoughtfully give their answers to a set of questions.
- is based on an interactive development of ideas.

When designing a focus group, some aspects need to be accounted for (Cohen & Crabtree, 2006):

- Standardization of questions. Focus groups can vary in the extent to which they follow a structured protocol or permit discussion to emerge.
- The number of focus groups conducted or sampling will depend on the segmentation or different stratifications (e.g. age, sex, socioeconomic status, health status) that the researcher identifies as important to the research topic.
- About the number of participants per group, the rule of thumb has been 6-10 relatively homogeneous strangers.
- The level of moderator involvement can vary from high to low degree of control exercised during focus groups (e.g. extent to which structured questions are asked and group dynamics are actively managed).

Selection and recruitment of participants

When selecting the participants to a focus group, we need to take into account:

- the selection of participants needs to correspond to the information we want to obtain;
- any of the differences that might be the source of conflict or impede the meaningful participation of some members (when it is not predictable, the moderator's role is to be attentive to indicators of discomfort and to make sure that the discussion is as comfortable as possible);

- that although it is recommended to have strangers in the focus group, in some cases, it may be almost impossible (e.g., the participants in the focus group are colleagues in City Hall or West University of Timisoara, albeit in other departments and roles); therefore, decisions should rely on the basic criterion of whether a particular group of participants can comfortably discuss the topic in ways that are useful to the researcher (Morgan, 1997).

When selecting participants for a focus group, it is recommended to take into consideration the heterogeneity and homogeneity of the group. A very high level of homogeneity is not necessarily positive, as a sufficient variety of opinions is important to stimulate a good level of discussion. At the same time, it is important that we make sure that people hold a reasonable capacity for expressing their ideas and opinions, as previous research has shown this ensures that quality information is obtained.

Duration of focus groups

The ideal duration of time for a focus group session can be set from **60 to 90 minutes** (a maximum of 120 minutes should be respected). This duration can be considered as the most productive to gather data from participants, because beyond this time a lack of productive collection of information can arise as a result of participants' saturation.

Organizing and managing the focus group

Focus groups are group discussions about a specific topic, preliminarily defined on the basis of research aims. Participants are invited to join in the discussion, expressing their point of view, with the coordination and stimulation of a non-directive moderator, who has the role of ensuring that all members have the possibility to speak in a manner that is free from critiques and formal evaluations, and that all points of interest are covered in an exhaustive way. To do so, the moderator uses a guideline, a list of topics to be discussed, in the sequence that is judged appropriate for this particular group.

The focus group will be audio and/or video recorded to be transcribed later, and data will be treated in order to guarantee the privacy and the anonymity of the participants, according to the law in force in the EU and in each participating country, as well as according to the general guidelines for psychological research activities. In no case the identity of the participants will be made public within scientific publications or conference presentations.

Some basic recommendations for the moderator of the focus group are:

(a) to introduce each point to be discussed and give an opportunity to all the members to treat it;

(b) participants should discuss with each other and not with the moderator and the assistant(s);

(c) the moderator should not participate in the discussion, and should refrain from expressing opinions or personal evaluations, or (dis)agreement with the participants. The moderator must be neutral.

Some basic recommendations for the assistant(s) are reported below:

(a) do not participate in the discussion, but make sure that everyone participates (if necessary pointing out to the moderator those that are not participating enough, and/or those who tend to speak too long);

(b) take note of everything that is said (all the utterances related to the topic from the participants).

Annex 8: Methodological guidelines for the definition of alternative policy scenarios for socially innovative energy transitions

Picture: SMARTEES workshop in Samsø

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Methodological guidelines for the definition of alternative policy scenarios for socially innovative energy transitions

The context

In SMARTEES project, a series of tasks and actions were designed towards creating a comprehensive future policy scenario framework, suited to define alternative, complementary and/or refined policy interventions to replicate and upscale social innovations in the energy domain as well as support related social innovations in energy transitions. These related tasks are presented in short, below.

Task 5.4. Exploration of future policy scenarios through multi-stakeholders deliberative workshops This task establishes scenario logics, tests policy alternatives and identifies tipping points to co-produce a set of dynamic simulations of policy implementations for each case study involved. Policy scenarios will be co-created through iterative phases engaging policy and local actors in reflexive-thinking activities with SMARTEES researchers. SMARTEES researchers will provide a formally represented model for each case-study policy scenarios, considering the interactions among actors and networks within it and with its context.

Sub-Task 5.4.1: Preparation of the Future Workshops, which will involve a sample of key actors – concerning each case study cluster/initiative (reference cases and following cases) – in foreseen deliberative processes that co-create realistic pathways for realizing and developing energy transitions. This task involves the elaboration of the methodological guidelines for the definition of policy scenarios for each case study cluster. Methodological guidelines will describe the method for conducting the deliberative process with policy and local actors. Each research team involved in this WP will adapt the guidelines to each case study to develop a set of local-embedded policy-scenarios.

Sub-Task 5.4.2: Multistakeholder deliberative workshops – first phase. Implementation of the first phase of the multistakeholder participatory workshops for each local case study involved in this WP. The processes must be documented and a report per each workshop- will be produced. In total, two workshop rounds will be devised and organised, as follows: (a) one round focused on strategies to ensure the acceptability of the social innovations in energy transition, and (b) getting back with the participants from the first round, the next one is focused on modelling results based on the first round of workshops, and strategy refinement. The two rounds will be organised first with main SMARTEES reference cases, and later with the follower cases too.

Objectives

The present document contains the methodological guidelines to inform the preparation and development of participatory workshops in each case study cluster, and responds to WP5 objective: "furthering social acceptability of the changes that the energy transition implies (co-shaping the future)."

Therefore, the objectives of the workshops are to guide and promote reflection on alternative interventions that would foster wide acceptability of the social innovations in energy transitions in each SMARTEES case, and to provide input for simulations.

More specifically, the workshops will:

a) in each case study, jointly reflect on lessons learned;

b) based on factors identified as relevant for social acceptability of the SI (dimensions), find alternative interventions for replication purposes of innovation implementation;

c) provide data to be integrated into the SMARTEES ABM architecture.

The policy scenario workshops are conceived in the SMARTEES project as processes of knowledge co-production, reflexive thinking and decision-making regarding the possible policy alternatives, or counterfactual scenarios towards social energy innovations and the potential negative policy effects. The outcomes of the policy scenario workshops (WP5.task 5.4 and 5.5) will provide insights on the best strategies to overcome citizen resistance and increase public acceptability as well as supporting energy innovations by supporting citizen engagement in the design of energy policies, either in form of strategies, or counterfactual scenarios.

Policy alternatives, or counterfactual scenarios will then be integrated in social simulation models (WP7), and their outcomes will be assessed. Furthermore, the conceptual framework will also be integrated as a tool within the SMARTEES policy-sandbox (WP8), to support reflexive thinking and planning of policies to foster socially acceptable and inclusive energy innovations.

The following goals for the policy scenario workshops have been defined:

- To develop a common policy scenario methodology to be adapted to the context of each reference and premium follower cases (task 5.3).
- To organize and conduct a first round of multi-stakeholders deliberative workshops in the five clusters of social energy innovation involving a range of relevant stakeholders for developing policy scenarios based on the aims, characteristics and challenges of each social energy innovation (task 5.4).
- To analyse the results of the policy workshops and feed them into WP7 and WP8, followed by an integration of inputs (task 5.5.).
- To develop a 2nd round of policy scenarios and implementation of the multi-stakeholders deliberative workshops (Task 5.6).

- To report and summarize results of the workshops and make a cross-case evaluation (Sub-Task 5.6.2) contributing to the elaboration of policy recommendations for each case-study cluster (input for task 5.7) and provide input for Task 7.5 (input is "Contribution to experimentation with simulated scenarios in selected cases").
- To integrate the outcomes of the workshops within the SMARTEES policy-sandbox (WP8).

In sum, the goal of the first stage is focused on strategies to ensure the acceptability of the social innovations in energy transition, while the goal of the second stage is focused on modelling results and strategy refinement.

Previous reflexive activities we build on

A series of steps were taken so far in SMARTEES project in order to identify lessons learned and alternative interventions related to socially innovative energy initiatives, such as a series of systematic interviews with promoters of different SI's in each SMARTEES case (see Deliverable 3.1), and identification of actors and network structures involved in the SI for each case and drivers and barriers related to SI for each case (see Deliverable 6.1). Also, a 'Policy Scenario Workshop' was organized during the SMARTEES Annual General Assembly (25-27th June 2019), envisioning strategies for energy urban transitions' with the participation of representatives of 9 cities/islands. The Policy Scenario Workshop aimed to develop a policy scenario framework that identifies the lessons learned regarding the most important factors acting as barriers and drivers to acceptability of particular social innovations for energy transitions, a series of alternatives for future, effective replication of these innovations in the city, and key policy levers for supporting socially innovative energy transitions. Moreover, for each case a questionnaire was developed and distributed, with the aim to understand how people make decisions about energy efficiency.

In sum, a lot of steps were already taken in each reference case-study, to inform these rounds of workshops. Therefore, the workshops on alternative policy scenarios for socially innovative energy transitions build on the knowledge previously gathered and focus on ensuring the broad acceptability of the social innovation (SI).

Key factors identified as relevant for the acceptability of the social innovation

A series of dimensions were previously identified at policy and intervention levels in relation to acceptability of the social innovation. More specifically, barriers, drivers and needs were identified during the structured interviews conducted in each case, and can be found in Deliverable 5.1 *Theoretical framework for definition of locally-embedded future policy scenarios* and in Deliverable 6.1. *Report on social innovation drivers, barriers, actors and network structures.*

In each case-study, a series of steps, strategies and tool were used to ensure that the SI is transformed from an idea to a reality. We build upon these lessons learned in order to find

alternative pathways, or counterfactual scenarios where different strategies are used for mitigating the barriers encountered, to develop the drivers facilitating the SI, or to fulfil the needs at societal level during the workshops.

Therefore, for the workshops, a series of factors are considered relevant for the acceptability of the social innovation. Of interest is the interplay between drivers, barriers and needs (from now on referred to as dimensions, relevant for acceptability of SI and citizen empowerment) and lessons already known, drawn from the experience of each case of reference in form of tools, solutions, strategies and processes used to gain SI acceptability.

The **dimensions** identified as relevant for the acceptability of the social innovation and citizen empowerment derive from the analysis of drivers, barriers and needs, as follows:

(1) Resistance to the social innovation can take many forms, and can be at the level of any actor group involved in the SI

a) Internal resistance – within the driving organization (e.g. city council): different visions regarding the process of design and implementation of the SI. Internal or institutional resistances have been reported by the practitioners in different social energy innovations. In the superblock clusters, both Barcelona and Vitoria-Gasteiz pioneers and promoters mention that, at the beginning, they had to deal with the strong reluctance of other municipal departments to implement certain measures, because they had a different vision of the mobility and needs of the city.

a) Political resistance and conflict. Due to most of the social innovations are city-level projects, they usually need the support or involvement of different political institutions, such as the city council or the island government. This involves also struggling with different political positions and motivations.

a) Citizen resistance can manifest as: fear of change, social groups with different interests and goals, backlash to perceived top-down decision-making, misunderstanding of the SI, lack of appropriate knowledge or NYMBY (where applicable)

Citizen resistance: fear of change. Several interviewees mention that people seem to feel "always" fear of any kind of change that modifies the status quo: "people are often resistant to change even regarding projects that improve their quality of life". This relates to the natural resistance to lose the perceived commodities (e.g. having a bus stop near to home) or assumed rights (e.g. "the right to drive a car") that motivate the main protests against car circulation and parking restrictions in the holistic mobility and superblocks clusters.

Citizen resistance: social groups with different interests and goals. There are also specific groups that are concerned about the impact of the SI. The shopkeepers (who leaded the main protests against the Groningen mobility plan and the Vitoria-Gasteiz superblocks model), the local/neighbourhood businesses, the retail sector, etc., manifest preoccupation with the potential negative impact on their economic activity. Others are concerned about changes in the type of economic activity inside the area (for example, closing the traditional retail activity and opening more bars and terraces in

the streets affected by the project), as one interviewee mentions regarding the Sant Antoni Superblock (Barcelona). In the Zürich case, contestation came from people living in rural areas of the Canton of Zürich having different priorities (e.g. a large use of the car) as well as from few sectors of the business community in the City of Zürich who fight for a better access to their shops or to their working places.

Citizen resistance: backlash to perceived top-down decision-making. A few of the cases illustrate that top-down measures can produce strong contestation or the non-involvement in the social innovation. As reported in the negative experience in Poblenou (Barcelona), where the participatory process started after the implementation of the pilot intervention, the social contestation raised against a measure that was perceived as an "imposition" by the city council, without being discussed with the neighbourhood. According to one of the interviewees in Barcelona, the Poblenou experience served them to implement changes in the superblocks participatory approach, avoiding "top-down" effective interventions.

Citizen resistance: misunderstanding of the SI, lack of appropriate knowledge. As several cases demonstrate, providing information and targeting communication is not sufficient for people to engage in social innovations. Innovations that require technical knowledge, training or investment in technologies (e.g. solar panels, smart-meter use) might require specific advising, consultation and training efforts focusing on empowering citizens in the adoption of energy saving measures. On the island of Samsø, a training project has been promoted in relation to circular economy and sustainable farming practices, the efforts encompass talks, demonstrations and support to the implementation of new systems and practices among farmers. In Vitoria-Gasteiz, the Centre of Environmental Studies in collaboration with local cyclists' associations has promoted bicycling courses for students and adult people to increase their competences for safer cycling on streets and interurban roads. On the contrary, the lack of educational and training programmes in Barcelona has been reported by one of the interviewees as a significant barrier to the wider adoption of cycling as the main mode of transportation in the city.

Citizen resistance: NYMBY (where applicable). Whether the social innovation involves, for example, the construction of an energy facility or a transport station, this might create a NIMBY ("not in my backyard") effect from citizens living nearby to the new installation. This has been reported in the Samsø case. As one interviewee explains, the main contestation and resistance arise against the establishment of the biogas plant. The issue has triggered debate and resistance by many who do not want to have a biogas plan nearby due to the potential increase of traffic in the area and the worsening of the quality of the air.

(2) Existing non-supporting local and social norms

The influence of social norms (Cialdini, 2003, Cialdini & Goldstein, 2004; Nyborg et al 2016) in promoting energy saving conducts have been largely studied in a variety of domains and contexts such as bicycling (Sherwin, Chatterjee & Jain, 2014), public transport use (Zhang et al, 2016), and electric vehicle purchasing (Hiseliu & Rosqvist, 2016). Muñoz López & Rondinella (2016) found social

influence dynamics that foster sustainable mobility patterns in Vitoria-Gasteiz, due to specific social groups starting to travel by bike, like almost all of the representatives of the political groups travel by bike, the major of the city and journalists suggesting that this might have been one of the key explanatory factors of the success of the bike in the city (ibid pp.51). Moreover, a sustainable or pro-environmental behavior can be influenced not only by specific personal norms, but also by attitudes unrelated to the environment directly, such as those related to consumer products, saving money or other resources, luxury, waste, or the importance of social relationships (Stern, 2000).

(3) Lack of confidence in the use/effectiveness of the SI

Trust issues, such as the lack of confidence in the efficacy of the social innovation have an impact on the acceptability of the SI. As the fuel poverty cluster shows, social energy innovations have to deal with the lack of confidence of the beneficiaries regarding the effectiveness of the energy projects. Being involved in a pilot experience creates negative feelings from the potential beneficiaries, because they do not have references of other places in which the project is working well. For instance, Aberdeen Heat and Power company experienced most resistance to the heat network with the first set of residents to have the installed, so as they showed great reluctant to install a new technology that they had not previous references that it really works. The Timisoara case-study shows the peculiarity of the lack of trust in local-based initiatives. Residents are not confident on investments that are not the result of attracting external funds, preferably international.

(5) Low adoption of new energy behaviours

For social innovations to become a new social norm, in other words, to become accepted “as the new normal”, several conditions have to occur, being closely related to changes in mindsets, views and attitudes. An important aspect in this regard is time, in the sense that these phenomena are observed mainly in those social innovations that are more matured now, and that had time for people to observe the benefits of the energy transition and adopt new behavioural patterns at the individual and collective level.

(6) (Lack of) Satisfaction of needs

In the endeavours of identifying those dimensions important to consider in ensuring citizen acceptability and identifying alternatives, it is important to take also into consideration how the changes in behaviours and actions (SI-relevant interaction patterns and SI-relevant behaviours) are formed, making here reference to HUMAT model. Each behaviour alternative has a level of needs satisfaction, which in turn, is influenced by socio-demographic characteristics. Thus, ensuring a level of satisfaction on related needs (experiential, social, and values), influence the actions, which can be related to social innovation interaction patterns and behaviours.

As stated in the HUMAT model, we distinguish between three categories of needs. The experiential needs refer broadly to comfort and costs. Social needs are referring to belongingness (Baumeister, Leary 1995), relatedness (Deci, Ryan 2000), social safety, or social status. Values refer to autonomy, biosphere and societal goals.

(a) the need for safety

(b) the need for autonomy (i.e., self-sufficiency)

(c) the need for status (i.e., social prestige and recognition)

(d) the need for belonging (social cohesion of the community)

(e) the need for trust in the project and in institutional representatives

(f) the need for recognition (as an environmentally sustainable and/or innovative place)

(g) the need for competence in carrying out new behaviors

(7) Place identity & place attachment

The growth of human societies, development of technological advances, globalization, increased mobility, and encroaching environmental problems (Scannell and Gifford, 2010) threaten the person–place relationships. Altman and Low (1992) described place attachment as an affective link between individuals and their environments. Given these changes, and the identity and attachment being linked to individual affect, represents a dimension which could hinder or enhance the acceptability of the innovation. For example, in the cases of Samsø and El Hierro, as the inhabitants were strongly identified with living on "their" islands, it represented a factor to build upon public/private/citizens alliances. In Samsø case, the governance configuration, although intrinsically connected with the project, is founded on the conception of the islanders of Samsø as a strong 'tribe' provided with traditional wisdom and a strong sense of the significance of the place considered as a decisive element that brings people closer to their own place.

(8) Concerns for the impact on local economy & jobs

The concerns of citizens related to their local economy and job development (or reduction) could have an impact on wide acceptability of the SI. For example, in the case of Samsø, the main interactions happening in the early stage of the SI had as central hub some active citizens whose concern about the declining state of the local economy moved them to seek new economic opportunities compatible with the local economy. This activity sparked an interest in renewable energy and the activists leased with municipality and state officers to secure information, grants and assistance to process applications and setting up a community organization. Also, in the case of El Hierro, the project had a positive impact on the economy of the isle, which enhanced resident's support to the SI.

(9) Commitment of relevant social actors through the process

A strong motivation of the involved actors or initiators to work on solutions for sustainable energy or related goals was identified as a key factor to starting an initiative and to keep pushing the development (Ooms et al, 2017).

(10) Concern for quality of living conditions

The concern for the quality of living conditions was identified as a factor which could hinder or ameliorate the acceptability of the SI especially in those cases related to “energy efficiency in district regeneration” or focused on “energy efficiency schemes for fighting fuel poverty”. Specifically, putting in place a durable infrastructure that can change the living conditions of those who have been living with fuel poverty in Aberdeen, as well as having a strong understanding of the social conditions that tend to accompany/lead to fuel poverty, was identified as drivers for Aberdeen stakeholders. Also, people's concern for a sustainable lifestyle, for green technological solutions and for increasing the quality of living conditions were considered drivers that facilitate social innovation in Malmö and Stockholm.

Based on the analysis of the answers of the actors, using the methodology for task 6.1 objectives’ accomplishment, we conclude that the most relevant obstacle, regardless of the type of cluster, refers to ***people's perception that the costs of implementing innovative solutions are greater than the perceived personal or social benefits***.

The perceived costs have different meanings, from the personal costs of time and effort, of narrowing the personal comfort zone to the material costs (the lack of financial resources) of implementing innovative solutions and up to the cost related to the difficulties with developing an innovative solution due to a lack of trust in the administration. On the other hand, the economic, personal and social benefits of implementing social innovation are perceived as being removed over time (resistance to the delayed reward).

In every case-study, several **strategies, policies or tools** were thought of and used to ensure the delivery of the SI. These strategies had an impact on the acceptability of the SI, even if the intended purpose, or the objective of the strategy was not directly targeted this outcome. Thus, during the workshops we will have the opportunity to evaluate if different strategies or alternative interventions could influence the dimensions of interest identified as important for the acceptability of the SI, starting from what was already done.

Enclosed into SMARTEES Deliverable 5.1, a number of strategies were identified and proposed, related to: dissemination, communication and education strategies, advising, consultation and training strategies, community active involvement in decision-making (participatory strategies), empowerment of local communities, evaluation and assessment of the public acceptance of the social innovation, and empowerment of promoters and social actors involved in the social innovation. These strategies will be discussed during the workshop, reflecting on what was done so far (in terms of strategies used), identifying what alternative strategies are out there (evidence-based), and which alternatives are expected to satisfy the needs of the community (more appropriate considering the contextual factors, resources available and expected outcome).

The lessons learned taken into consideration for the workshops are as follows:

(1) <u>Information and communication activities</u>

Promoters and civil society actors participating in social energy innovations stress the importance of implementing – at an early stage – dissemination, communication and education strategies about the ambition, the characteristics and the changes that the social energy innovation involve. Information provision can be fostered by different strategies and measures, such as educational programmes, environmental awareness campaigns, citizen forums, interviews, etc. The case of Samsø, Vitoria-Gasteiz, Barcelona or Stockholm show that strategic performance of effective information and communication campaigns targeting specific groups or adapted to different types of audiences, is critical in order to inform citizens of the benefits of the innovation and increase public awareness concerning several social and environmental issues.

(2) Citizen participation in decision-making (participatory strategies)

Beyond information and communication, citizen engagement strategies (from the early stages of the project) seem to become normative in social innovations. Public participation should be carefully designed and organized considering the most adequate time to involve both general public and specific groups of interest; the rules and mechanisms to participate in decision-making processes, and the commitment required from participants. The principal factors affecting public engagement in SI relate to the perception of social innovations as impositions (when communication has failed among the promoters and citizens) or if such energy policies are not aligned with citizen's preoccupations or interests. Promoters might have to deal also with the reluctance of citizens to engage in decision-making processes, as they perceived they have not the capacity or knowledge to be involved. Thus, participatory and bottom-up approaches become more successful than technocratic or top-down policies.

(3) Citizen empowerment strategies: individual and collective (strategies to support behavioral and community adoption of the innovation)

Fostering local entrepreneurship and citizen's active engagement in energy innovation might involve changes in the existing institutions (e.g. policy bodies, legislation), the creation of new organizations as well as the establishment of new kind of relationships and partnerships between different types of actors (e.g. public-private-citizen partnerships). Empowering citizens in energy innovations involves an institutional change shifting from traditional "top-down policies" to new cooperative or participatory approaches in decision-making, empowering engaging citizens – as well as other private and market actors – in policy co-design.

(4) Social and cultural norms

(a) using environmental-related norm-targeting interventions to support acceptability of the innovation

(b) tools or strategies targeting social and cultural norms regarding participation

The creation of new social norms entails a collective change in people's worldviews, mindsets and attitudes towards an environmental or societal issue. As observed in Barcelona, citizens involved in superblocks are more concerned now about the impact of environmental pollution on their health or

on their children's cognitive development, as the promoters provided scientific evidence for the impact of air pollution in the city of Barcelona.

(5) Pilot projects (step by step implementation)

Because any changes are usually accompanied by some resistance to the proposed change, bigger changes usually are harder to handle. One of the strategies used in Zurich and Groningen for gaining social support was to proceed gradually, step by step, avoiding too fast and too big changes in a short time, avoiding almost always radical measures (such as impeding cars circulations in specific areas of the city or between the sectors of the city – as it has been done in Groningen). Pilot interventions become effective strategies to demonstrate the positive impact of the social innovation and gain support for further replication and up-scaling.

(6) Consultation of human resources with a high level of knowledge/expertise

In all cases, human resource and expertise represented either a barrier or a driver, as in any such SI, a high level of expertise is also needed. In Samsø, for example, one of the strategies used for gaining social support is represented by the capitalization on the experience (and lessons learned) through the set-up of the Samsø Energy Academy. In the same vein, El Hierro case, described as the result of three decades of studies, design, engineering development and a complex operation in a location affected by its insularity, a lot of innovative knowledge has been produced and is now shared within the scientific community. Gorona del Viento has become a tourist destination for visitors interested in nature as well as "for scientific tourism", which could be experts from the fields of renewable energy, students, responsibles from institutions dealing with energy issues, and the many people who travel to the island just due to the interest generated by this project.

(7) Laws and regulations / Normative and regulatory tools

This category refers to legal instruments and regulations that create the regulatory framework for a particular energy innovation, including instruments such as obligations schemes, taxes or penalization measures.

What is interesting is that, on the one hand, laws and regulations are generally perceived as an obstacle when there is considered to be restrictive for the innovative nature of the solution. On the other hand, regulations are considered as facilitators of social innovation when innovation comes as a solution to a particular problem or deficiency (eg: fuel poverty).

(8) Environmental awareness / awareness of the impact of the SI on the health and quality of life

Low awareness of citizens around energy issues and low interest in energy for the general public may influence the implementation of such energy initiatives negatively (Ooms et al, 2017). Therefore, a strategy to ensure the acceptability of the SI could revolve around the idea of making individuals aware of the environmental issues, and how the SI can have a positive impact on the health and quality of life of tits beneficiaries. In Barcelona and in Vitoria-Gasteiz, for example, ecological values and environmental awareness were remarkable motivations to launch the

Superblocks Programme, influenced by the citizens being more and more concerned with the effects of environmental pollution on their health and quality of life.

(9) Creation of working groups / task forces with multiple stakeholders

Creation of permanent working groups among different stakeholders was a specific citizen empowerment policy used in SMARTEES cases too. For example, in the case of Malmö, residents and citizens were deeply involved since the beginning in the co-design of the social innovation, also through permanent working groups among promoters and residents, giving them the possibility to express their suggestions and observations in order to have the possibility to adjust and modify the plan.

(10) Citizen commitment strategies (i.e., citizen pacts for the SI)

The adherence of citizens to norms and regulations, as well as their support for the SI was also ensured through commitment strategies such as 'Citizens' Pact for Sustainable Mobility' (2007) in Vitoria-Gasteiz, or the "Barcelona Mobility Pact" signed by the City Council and a diversity of stakeholders and local actors such as mobility-linked associations, companies, institutions, and public bodies to launch mobility initiatives and reaching consensus on improving the sustainable and safety mobility.

(11) Larger public deliberation and consultation strategies

Such strategies were used across all SMARTEES cases in order to communicate SI relevant information to larger groups, or to reach consensus on various related issues. Zürich, for example, benefitted from traditional tools of referenda promoted by local institutions and inhabitants by which citizens voted for or against different measures to be adopted for improving the mobility in the city. The Groningen case is another successful example of the use of voting tools to involve citizens in decision-making. Both examples constitute successful experiences of citizen empowerment and involvement that might inspire future developments of consultation processes for energy transition policies.

(12) Providing resources (human, financial etc) to support SI implementation

As for any project to be developed from inception to provision of benefits, different resources must be put in place, such as expertise, time, or money. The financial resources could include tax benefits and economic measures that provide incentives for business and/or financial support for households (e.g. subsidies, grants, loans) to foster innovation in the energy domain and tackle energy inequality and poverty.

(13) Co-creation of the future (future-orientation, "what should be done further")

Concerns towards the future, and more specifically, working together in order to shape the desired future is a common orientation in all the SMARTEES cases. In Samsø, for example, the co-creation of the future had a positive and transforming power, as the stakeholders have become part of the development and are involved in the continuous debate about what should be done further. The

municipality, the local farmers, and to a large degree, all the islanders have become part of the process. Overall, the project has gone from engaging the initial few enthusiasts to a movement that involves almost all actors on the island, i.e. individuals, businesses and professionals.

(14) Informal, extended partnerships involving a wider set of actors

Progressive character of the consensus building through negotiation and dialogue to overcome conflicts and resistance, means also bringing together multiple stakeholders, which can have an informal way of communicating. One such example comes from Samsø, with "Café Good Energy", informal meetings having the purpose of creating an open space for discovering the Samsø citizens common vision for energy.

(15) Cultural mediation

To be acceptable, a new idea must have meaning to the potential acceptors and have some relationship to their previous experience. The more the innovative solution is consistent with the way people think and reason, with significant themes or patterns in that people's culture, the more the innovative solution is valued, and hence adopted. As Hansis pointed out (1996), individuals in a given cultural setting will make their decision to accept, reject, or ignore an innovation on the basis of their image and impression of the new product, a decision which will be guided by the beliefs held by themselves and those around them. Thus it is probable that there are cross-cultural differences in environmental cognition which influence innovation and acceptance behavior.

(16) Infrastructural and technological policies or tools

These types of measures focus on investments in public and private infrastructures and technologies, as well as the provision of technical guidelines and training. A combination of infrastructural and technological policies, regulatory measures and high levels of citizen involvement have been implemented in both Malmö and Stockholm, such as the obligation for the inhabitants of the new building "Greenhouse Augustenborg" to plant organic food (Malmö).

The relevant dimensions to be addressed in the workshop

Within the workshop, both general and specific dimensions will be addressed. By *general dimension* we understand a common feature of the clusters, whereas by a *specific dimension* we understand a particularity of the cluster. It is necessary to emphasize that sometimes within the same cluster there are differences between case studies.

As general dimensions captured, we propose:

1. citizens's involvement in decision-making processes

2. step-by-step implementation of change by piloting projects

These general dimensions also act as general working framework of each workshop.

Cluster 1. Holistic, shared and persistent mobility planning

- Zürich
- Groningen

1. Inducing change in the mobility area accepted by people by satisfying their need for safety

2. Permanent consultation of and negotiation with citizens

3. Consultation of human resources with a high level of knowledge and skills

Cluster 2. Island renaissance based on renewable energy production

- Samsø
- El Hierro

1. Place identity (with emphasis on potential of tourism) & place attachment

2. Developing local economy and local job opportunities

3. The need for autonomy in the energy domain (energy self-sufficient territories)

NOTE:

However, apart from the common elements, the differences between the case studies in this cluster should be noted. The main difference between Samso and El Hierro is situated at the level of the involvement of the social actors and of the consultation process with the islanders. Thus, in Samso, there is a high level of commitment of all social actors since the beginning of the projects aiming at social innovation and in all their phases (design, co-creation, implementation), while in the case of El Hierro, we are talking about an absence of laws and regulations that stimulate the active involvement of citizens.

Cluster 3. Energy efficiency in district regeneration

- Malmö /Augustenborg
- Stockholm/Järva

1. Satisfying need for status by improving the image of low – status neighborhood

2. Concern for quality of living conditions

3. Cultural mediation & social cohesion of the community (the need for belonging)

Cluster 4. Urban mobility with superblocks

- Vitoria-Gasteiz
- Barcelona

In our opinion, the dimensions that can be implemented in the workshop within WP5 and which are based on the specificity of Cluster 4 (Urban Mobility with Superblocks) are:

1. Knowledge and experience in negotiation and lobbying activities (need for competence)

2. The need to be recognized as an environmentally sustainable place

3. Involving the political actors in urban mobility discourse

Cluster 5. Coordinated, tailored and inclusive energy efficiency schemes for fighting fuel poverty

- Aberdeen
- Timisoara

1. To protect the vulnerable groups

2. De-centralizing power and decisions in energy domain

3. Regaining the confidence of people in the administrative structures (need for trust)

As noted above, each cluster incorporates a central need of the people that, once satisfied, can stimulate a goal-oriented behavior, which is, accepting social innovation in a particular domain.

Thus:

Cluster 1: need for safety

Cluster 2: need for identity/belonging

Cluster 3: need for status

Cluster 4:

Cluster 5: need for trust

If we start from this premise, then the activities projected in the workshop will follow the activation of this behavior, and the argumentation will be concentrated around the two general dimensions, namely the stimulation of the involvement of all the relevant actors in the decision-making process and the step-by-step policy of change.

Description of methods used

The workshop will be structured as a deliberative workshop, and it will support participants in identifying the main elements characterizing the process of design and implementation of socially

innovative energy solutions, and apply the lessons learned from successful interventions and process characteristics to new implementations of the social innovation.

A deliberative workshop, in its generic format, represents a qualitative approach where throughout collaborative processes researchers as well as participants work intensively upon an issue or a question of interest, through the use of moderated discussions, individual reflexive work and joint problem-solving.

Usually, such methods are unfolding during one single day, with groups of 8 to 16 participants, facilitated by more than one moderator (facilitator). Deliberative workshops also involve a series of discussion activities, using different groupings, techniques and contexts, requiring hands-on practical involvement, special materials or facilitators. These workshops are also flexible, as it is possible to vary the composition of the workshop depending upon the size of the participant groups, divide tasks throughout the day's deliberation and divide larger groups up where necessary. Because such workshops are unfolding during an entire day, it allows moderators or facilitators to challenge the positions of participants as the day progresses, for example by introducing different types of information throughout the session, or by allowing time for presentations and plenary question-and-answer sessions.

In sum, deliberative workshops are allowing participants to not just state their preferences amongst a set of externally defined options, but to reflect on the core issues and creatively problem-solve to find suitable solutions. Deliberative workshops also allow broader development of attitudes and values over through interactive dialogue, being possible to see whether and how these can change and what arguments and information have had the greatest impact.

Questions

Although the objective is to develop alternative routes for the design and implementation of the social innovation, we will support participants in contextualizing the scenario by thinking about a future replication of the social innovation in a particular location (e.g. neighbourhood) or by focusing on a city-wide replication.

We can use (some of) the following questions in order to address the issue of social acceptability of innovative solutions:

(1) What is the social context in which the innovative solution is developed? The socio-demographic characteristics of the affected population?

(2) What are some of the elements of the larger context that should be taken into account when planning the process of innovation design?

(3) What are the main costs and benefits of business as usual versus the socially-innovative solution?

Taking all of the above into consideration, the workshop is built around the following questions:

1. Identify main lessons learned on each relevant dimension in the process of design and implementation of social innovations
2. Identify the alternative: What would you do differently on (dimensions identified above);
3. Identify the obstacles you are likely to encounter and how to overcome them
4. Next planned policy steps: how would this translate into implementation strategies?

Phases in developing, preparing and running the workshops

The goal of the first stage workshops is focused on strategies to ensure the acceptability of the social innovations in energy transition, while the goal of the second stage is focused on modelling results and strategy refinement.

Therefore, two rounds of workshops will be developed and organised, as follows:

<table>
<tr><td colspan="5">STAGE 1 WORKSHOPS (July-September 2020) with main reference cases and should invite supporting cases</td></tr>
<tr><td>Stage</td><td>Activities</td><td>How / guidelines</td><td>Responsible</td><td>When</td></tr>
<tr><td rowspan="3">Preparatory stage</td><td rowspan="2">Adaptation of the guidelines to the case study</td><td rowspan="2">Steps:
1. Decide on the most appropriate mode of delivery for the workshops (face to face, online, mixed face to face/online)
2. Provide the dimensions and lessons learned filled in table for the case
3. Based on relevant stakeholders for the case and modality, adapt the workshop agenda</td><td rowspan="2">case-responsible researchers and modelers</td><td>1st draft of workshop & agenda: 15th of June</td></tr>
<tr><td>1st round of discussions and finalizing the agenda: week 22nd-26th of June</td></tr>
<tr><td>Identification of participants: policy actors, promoters/ pioneers and experts</td><td>Refer to the section “stakeholder mobilisation” in this guidebook</td><td>case-responsible researchers, consults with city council</td><td></td></tr>
<tr><td></td><td>Stakeholder mobilisation</td><td>Personal contacts</td><td>each research team</td><td></td></tr>
</table>

	Practical workshop organisation: location hire, program, facilitation, catering and supporting arrangements		case study partner, research team as support	
	Practical organisation: documentation and presentations		case-responsible researchers and modelers	
Workshop development	Welcome, introduction of participants			
	Presentation of the SMARTEES project and introduction to the workshop			
	Scenarios development			
	Final discussion and evaluation			
Processing results	Evaluation			
	Report of input from policy scenario workshop			
	Further development of policy scenarios			
	Feed relevant results into WP7 & WP8			

STAGE 2 WORKSHOPS (April-June 2021) with main reference cases and should invite supporting cases				
Stage	Activities	How / guidelines	Responsible	When
Preparatory stage				
Workshop				

development				
Processing results				

* The present document will be updated with the structure and agenda for the 2nd round of workshops, aimed at strategy refinement and focused on modelling results based on the first round of workshops.

As a series of workshops for premium follower cities will be organised, this document will be updated with information regarding the structure of these workshops too.

Preparatory phase

In preparation for the workshop, several steps may be needed to be taken, referring to dimensions relevant for each case study, which are the lessons learned already in each case, adaptation of the guidelines to the specificities of the case and method of delivery (face to face, partly face to face & partly remote, or entirely online/remote), identification of participants, strategies to mobilize stakeholders, and other practical workshop organization details.

Adaptation of the guidelines to the case study

As a first step, case-responsible researchers and modelers work together to identify the dimensions relevant for the case and what lessons were already learned (which strategies, tools, solutions, strategies, and processes were used) to ensure the acceptability of the SI. From all proposed dimensions, a shorter, case-specific list is thus drawn. This tool is then used in the workshop as a basis for discussion and in identifying alternative interventions for replication purposes of the SI.

Identification of participants: policy actors, promoters/ pioneers and experts

To the workshops we invite key actors from each case study cluster/initiative, more specifically, representatives of energy sustainability initiatives, social promoters and innovators from each case study.

In order to have a better overview of the social context in each case study and to link these to SI acceptability related to energy, we invite following categories of population, making sure to involve policy makers and civil society actors from both public and private institutions:

1) promoters/pioneers,

2) policy actors (those directly involved with the implementation of the social innovation and the strategy to further develop it),

3) case-responsible modellers, and

4) experts.

Number of participants: between 8 to 16 participants per group.

If in your case study more than 16 key actors are involved or decide that more than 16 people can bring important knowledge, then multiple group discussions should take place simultaneously as part of a single deliberative workshop, in order to involve all the identified actors. Multiple group discussions could take place simultaneously as part of a single deliberative workshop too.

Stakeholder mobilization

A first list of participants needs to be drafted. Case-responsible researchers, with the help of representatives of the city council in SMARTEES have to identify who was involved as promoter, who is/will be involved in the new strategy development and future implementation, and experts relevant for the dimensions identified above (such as policy communication experts). Each role must be covered (promoters/pioneers, policy actors, case-responsible modellers and experts), making sure both representatives from policy makers and civil society actors are present to the workshops.

Moreover, as Task 5.1. included an actor analysis for each case study, it can be taken into account too.

Participants are recruited because of particular roles they occupy in policy making and beneficiaries of the SI.

Who should be involved

It is necessary to invite at least one representative from all the key actors involved in each case study previously identified (see SMARTEES: Deliverable 6.1), actors identified in the process of qualitative research phase in each case study and anyone with any kind of interest in – or influence on – the SI.

The participants can be engaged in to through personal contacts (by telephone or in person), or meeting them in advance, informing them about the aims of the workshop and the SMARTEES project (if the case). If interested about their participation and topic at hand, materials such the invitation to the workshop, drafted program and other useful information can be sent via e-mail. For this task, each case-study responsible research teams are in charge; they need to communicate with case-relevant contacts in order to make sure that the aims and objectives of the workshops are clearly understood (important in identification of most relevant participants to the workshops).

Another issue to consider during the recruitment of participants for the workshop is the participants' dropout rate, which can be rather high; the recommendation is that for ensuring a number of 16 participants, at least 20 participants must firmly confirm their participation (Gnaiger & Schroffenegger, 2003, INTERACTS project).

Practical workshop organization: location hire, program, facilitation, catering and supporting arrangements

TBD

Outline of the workshop

Some general considerations to keep in mind organizing these workshops in each case study:

- Ensure that all participants to the workshop are clear about their role, and how the process will work.
- Because experts will be invited to take part in the discussions, brief them beforehand so they clearly understand their role; in SMARTEES project, the research partners are considered the experts, as well as technical people in the City Council with a particular expertise, or experts relevant for any dimensions taken under consideration (e.g., policy communication experts), so on and so forth.
- Time allocated to participants' discussions is maximised.
- Provide a safe environment in which participants can express themselves freely.
- Make sure to provide enough time for everyone to share their views, and recognise the value of expertise from all participants not just the 'experts'.
- Ensure the discussions are carefully recorded.
- Be flexible both in timing and in having to change a process as it is running in case it takes an unexpected direction or unanticipated conflict arises.
- Keep the participants informed after the event, by providing a summary of the views presented in the workshop and recognise and clarify how the participant's input throughout the workshop has made a difference.
- Create a feedback form for the workshop; the review and evaluation of the workshop is useful for assessing what has been achieved and improve further similar initiatives.

Time Frame

Depending of the method employed for delivering the workshop (face to face, partly face to face & partly remote, or entirely online/remote) and specificities of the case, each workshop round is scheduled to last at minimum one single day, or can be divided across multiple days.

Both the workshop protocol and the mock-up agenda (Appendix 3) are provided as an example of 1 day workshop delivery. It is recommended to be adapted to the specificities of each case and can be broken into multiple days, as needed.

Workshop protocol

The workshop process and phases are created based on the work of Dick (2000) and the work carried out by Gnaiger and Schroffenegger (2003, INTERACTS project) on scenario workshop toolkit.

The workshop is built on the following phases:

1. Introductory phase

The first part of the workshop takes place in plenary, and is focused on welcoming the participants, explaining them about the programme and process plan of the workshop, explaining the wider settings and the aims of the workshop, presentation of SMARTEES project, presentation of the facilitator(s)/moderators, and the presentation of any materials the organiser considers helpful to frame the workshop.

During this phase, a short presentation of each participant is also in order, covering the following aspects: who (name, education, position within the organisation), what and how (institution, aims, fields of interest, clients, etc.), and why (expectations from the workshop).

It is important to establish during this phase the rules of conduct and to be clear for participants what are their roles and tasks during this workshop.

During this phase, the organisers present the current state of affair (what was done so far and what is further needed to be done), present the participants the key questions which build the workshop and guide the process, and the specificities of the case-study.

Case-responsible modellers also present in short the model they work with, its necessities and boundaries.

After this introductory phase is exhausted, a short comfort break is in order.

2. The 1st Plenary phase

As a first step, the participants decide together with case-responsible researchers and modellers, the context of the day's discussions, based on participants' interests and relevance for the case. The context represents here (a) a possible replica of the SI at the city level (the SI is scaled-up to the entire city), or (b) a possible replica of the SI in a new case (replication of the innovation implementation).

If a choice cannot be made between up-scaling or reproducing the SI, two separate groups can be created to work in parallel on both contexts.

During this phase, the table with relevant dimensions/lesson learned for the case is presented and information related to each element is detailed by case responsible researchers. The information given is related to the operationalization of the concepts used, what is considered of success and what lessons were learned for each dimension discussed.

The objective of the phase is to define the context of discussions and to have a mutual understanding on the dimensions identified as relevant for the case. Moreover, participants are offered valuable information related to lessons learned and past success.

3. Individual work phase

During this phase, each participant works individually and without any discussions on what they learned and on possible alternatives regarding each dimension relevant for the case. For this, the participants are each provided with the table containing the relevant dimensions and have the task to: (1) identify lessons learned for each dimension – "What you already learned", (2) identify alternative interventions for each dimension – "What would you do differently" (counterfactual scenario) and (3) reflect on and report other important factors for SI acceptability not already included in the table – "What is missing".

After this phase is complete, a short comfort break can be offered to the participants.

4. Small groups session phase

A minimum participation of four persons per group is recommended. The maximum participation per group should be limited to eight persons to give the individual participants a chance to discuss and bring forwards ones view.

In respect to the time provision of this phase, around one and a half hour of discussion time is recommended to have.

During this phase, participants produce a list of information arranged in order of importance, based on the work done under the previous phase on what was already learned, what can be done differently (counterfactual scenario) and what is missing.

After this phase is complete, a short comfort break can be offered to the participants.

5. The 2nd Plenary Session phase

During this phase, presentation of the results of each group takes place. The group work is presented by on spokesperson each and is compared with each other. This way, participants can learn to understand the ideas, fears and wishes of other participating groups and identify common ground and conflicting issues. The discussion stimulates mutual understanding. Individual motives, backgrounds, intentions become visible and decisions are made transparent and comprehensible. By having these results in an aggregated manner, makes it easier for the participants to have a more nuanced picture of what would be the most important elements from each group.

Case-responsible modellers also offer feedback during this phase in order to make sure that is discussed can be simulated into the model.

6. The 2nd Small group session phase

The goal of this second round of small group session is to identify the obstacles for the counterfactual scenarios discussed previously, and to find possible solutions to overcome them.

Therefore, for each counterfactual scenario a list of possible barriers as well as a list of possible drivers for SI acceptability is drawn by each work group.

7. The 3rd Plenary Session phase

This phase encompass two steps: presentation of the results of each small group and discussions related to next steps and actions.

During this phase, the small groups are reporting back with their work and disseminate their conclusions to the other participants. Based on the results of the small groups a plan is developed for the implementation of the results, i.e. what each participant or participating group can contribute to the realisation of the scenarios. This last step opens up perspectives for concerted action, shows practicable ways for implementation and can go as far as developing a strategic action plan.

During this phase, after the discussion is finished related to the next steps and actions, a short discussion related to the ABM model follows. More specifically, participants take the opportunity to discuss with case modellers what they consider to be of value (in what they are interested to see modelled) to be modelled for their case. The modellers have the role to manage expectations and to jointly reflect with the participants the possibilities of model expansion.

8. Debriefing and feedback phase

One way of organising these workshops is to assign time and give instructions to participants to develop an actual action plan, pointing out responsibilities of the different actors. Other way to end this workshop is to gather from participants several suggestions on how to translate the alternatives into implementation strategies, taking into consideration the identified barriers, but without pointing out responsibilities.

At the end of the workshop there is a feedback round of the participants reflecting their impressions, feelings and perception. This way a first glance on the immediate effect of the workshop on the participants is possible.

9. Informal drinks – face to face only

In sum, the workshops will be developed around the following elements:

- setting ground rules of conduct,
- introduction to the topic and purpose of the event, managing expectations related to the ABM model
- discussion of initial positions related to energy sustainability and wide acceptance of such initiatives,
- hearing/reading and consideration of evidence (description of current initiatives per case, policy decisions around them, etc.),

- debate (discuss, in small groups as well as in plenary about main lessons learned, alternatives, barriers and drivers for the alternative scenarios and next steps), and
- reaching a conclusion.

Medium

Due to current restrictions for flights and large group meetings, the workshops can be held either **face-to-face** if possible, or **online** (video-conferencing). The case-responsible researcher, as the person more in tune with case related situation, is to decide if the workshops will be organized face to face or online, or in a mixed format (partly face to face & partly remote).

An in-between solution is to organize the workshop in such a way in which the participants are meeting face to face, whereas the case-responsible researcher could intervene remote, via online video-conferencing application.

Roles

Case-responsible researchers' role is to oversee the coordination, planning, organizing and proper development of the workshop. More specifically, the case-responsible researcher is responsible for:

- adapting the present guidebook to the specificities to its case and medium (face to face, online, or partly face to face & partly remote),
- to fill in the dimensions and lessons learned table, adapted for the case
- to establish the final dimensions to be discussed and where finding alternative interventions could be of importance/value for the case
- to create the lists with participants needed for the workshop
- to create the materials needed for stakeholder mobilization, such as invitations to the workshop, program, workshop presentations and other useful information as the participants are aware of the workshop purpose, topic, and their role during the workshop
- to contact the participants and invite them to the workshop
- to create the final list of participants and participants tables to be signed and dated at arrival
- to find and book the venue, catering and other organizing needs (e.g., creating the materials needed for the workshop such as handouts, badges, etc.)
- make sure the discussions during the workshops are recorded
- adapt/translate, send and collect the feedback form to participants after the workshop

- to keep the participants informed after the event, by providing a summary of the views presented in the workshop and recognise and clarify how the participant's input throughout the workshop has made a difference
- to fill in the workshop report
- to coordinate with WP leaders responsible for this task

Case-responsible modeler(s) have the role to collaborate with the case-responsible researcher in adapting the present guidebook to the specificities to its case and medium (face to face, online, or partly face to face & partly remote), to fill in the dimensions and lessons learned table adapted for the case, to establish the final dimensions to be discussed and where finding alternative interventions could be of importance/value for the case. Also during the preparatory stage, the molders, together with the case-responsible researchers, discuss proper ways of recording the workshops and ways of gathering data during the workshop as they can be later used and integrated in the models. During the workshop, case-responsible modellers:

- present in short the model they work with, and its necessities to the participants in the introductory phase
- offer feedback during the plenary session phases in order to make sure that all what was discussed can be simulated into the model
- identify what is of interest for participants to be included in the model and manage expectations

Moderator/facilitator's role is to coordinate the development of the workshop, to use the methods and tools aforementioned in the present guidebook and to apply them in order to reach the objectives of the workshops, and to be mindful of, as well to manage, group dynamics. More specifically, it is the moderator or facilitator role to be engaged in all the phases of the workshop, to manage participants' expectation, and to guide participants throughout the workshop in order to reach the goals of the workshop.

It is the responsibility of moderator(s) to maintain the flow of the proceedings and to keep everyone on time and on track, requiring a firm but diplomatic presence. The moderator should be flexible, unbiased, empathetic, a good listener and enthusiastic. The moderator(s) should develop rapport with the participants, be respectful and communicate in a clear, friendly demeanour. The moderator(s) needs to keep the group on the subject at hand and encourage and provide space for less vocal members to express their ideas.

Co-moderators 'role is to assist the moderator/facilitator, making sure that the participants are supplied with all materials needed, to keep track of time, or anything else as needed. If necessary, the co-moderator is to facilitate the group processes too.

Materials/Resources needed

1.Moderator/facilitator for the workshop. To conduct a deliberative workshop with eight to sixteen participants it is sufficient to have one **moderator** and one **co-moderator** who in principal is **responsible for making sure that the participants are supplied with all materials needed and furthermore for facilitating the group processes** when needed. The moderator has to be very flexible and he has to have skills in guiding the participants without being too pushy (Gnaiger & Schroffenegger, 2003). It is recommended to have a facilitator or moderator who is familiar with the concept deliberative workshops or is experienced in moderating similar workshops that are characterised by a high level of group dynamics.

2.Work materials: tables (be mindful of the first table, which needs some pre-workshop adaptation), feedback form (printed), presentations in digital form, etc.

3. Venue: choose an informal setting where possible.

4. Catering: breakfast and lunch, drinks (for the celebration of finishing the workshops), coffee and tea, plenty of water.

5. Post-its, flipchart pages, markers, scotch tape.

6. Laptop and projector.

7.ADD IF THE CASE

These resources are to be adapted also to the mode of delivery (face to face, online, or partly face to face & partly remote).

Workshop data analysis

All discussions are recorded using audio and/or video recording devices. These recordings then are transcribed, checked for accuracy by the research team and then anonymized to remove names and any other identifying features of the discussions.

Costs

The costs for planning and organizing a deliberative workshop are usually medium to low, including the following:

- an incentive (such as a small payment) is also sometimes offered to citizens for their time,
- venue hire, catering and supporting arrangements.

If the workshop is delivered online, some of the costs can be eliminated, such as venue hire or catering. If a mixed mode is chosen, then be mindful of the number of participants meeting face to face and their needs.

Time-costs:

TBD

Appendix 1 – Workshop Report Outline

SMARTEES Multistakeholder deliberative workshops

Round 1 **2**

Date:

Contents

1. Attendance

ADD ATTENDANCE LIST (NAMES + ROLES)

ADD FACILITATORS/MODERATORS + CO-MODERATORS

2. Description and background

ADD OBJECTIVES OF THE WORKSHOP, SHORT DESCRIPTION OF THE CASE, ETC.

3. Summary of the introductory session

ADD A BRIEF SUMMARY OF PRESENTATIONS HELD

4. Results from work groups

ADD RESULTS IN FORM OF TEXT, PICTURES, ETC.

5. Feedback from participants

ADD FEEDBACK FORM WITH THE RESPONSES IN AN AGGREGATED MANNER

Report compiled by: ADD NAME OF THE AUTHORS OF THIS REPORT

Appendix 2 – Feedback form – aggregated*

Questions	Responses								
Did the workshop meet your expectations?									
Please comment on content									
Please comment on process									
What was left out?									
What should be improved next time?									
How were the facilitators?									
What should be improved in facilitation/ What facilitators should improve?									

*To be filled in by case-responsible researchers and annexed to the Workshop Report for each workshop/case

** If the feedback is gathered online, this information can be translated into a Google Forms or other survey/data gathering applications.*

Appendix 3 – Mock-up workshop agenda for entirely face to face meeting

8:45 am	**Arrival** Breakfast, coffee and tea
9:00 am	**Introduction** Welcome – presentation of workshop moderators and SMARTEES project (5 minutes)

	Presentation of the workshop programme and structure (10 minutes) Presentation of the participants (25 minutes) Presentation of the present situation (the so called zero scenario) (10 minutes) Presentation of ABM model and expectation management (10 minutes)
10:00 am	**Break**
10:10 am	**Plenary session 1** Participants are familiarised with the dimensions/lessons learned for their case Participants choose the context for the replicability of the case (scale-up, replication)
11:10 am	**Individual work** Participants are provided with handouts with the table with relevant dimensions/lesson learned for the case, pointing out the main questions to ask and what steps to take (*refer to the tables to be filled in*) Participants fill in the tables and create their own "scenario" on dimensions and lessons learned Main questions: 1. Identify main lessons learned on each relevant dimension in the process of design and implementation of social innovations 2. Identify the alternative: What would you do differently on (dimensions identified in preparatory phase) 3. Reflect on and report other important factors for SI acceptability not already included in the table
12:10 pm	**Group session 1** Discussions of counterfactual scenarios and lessons learned in small groups Participants provide a list of counterfactual scenarios arranged in order of importance
1:25 pm	**Lunch**
2:25 pm	**Plenary session 2** Participants present the results of each group Case-responsible modellers also offer feedback on the work done
3:25 pm	**Group session 2** Each group discusses the obstacles for the counterfactual scenarios discussed previously, as well as solutions and actions needed. Main questions: 1. Identify the obstacles you are likely to encounter and how to overcome them 2. Next planned policy steps: how would this translate into implementation strategies?
5 pm	**Break**
5:10 pm	**Plenary session 3** Presentation and explanations of the groups discussions and solutions (10 minutes/ group, in total 40 minutes)

	Discussions of identified alternative strategies or policies (40 minutes) Discussions on the ABM model and what is of interest for participants to be modelled for their case Co-moderator, moderator or case-responsible researchers are present in each interest group discussion/chat in order to facilitate the discussions and to mediate group dynamics. Case responsible modellers manage expectations related to the model and possibilities.
6:30 pm	Debriefing and feedback
7 pm	Informal drinks

Appendix 3b – Mock-up workshop agenda for entirely online meeting

9:00 am	**Introduction** Welcome – presentation of workshop moderators and SMARTEES project (5 minutes) Presentation of the workshop programme and structure (10 minutes) Presentation of the participants (25 minutes) Presentation of the present situation (10 minutes) Presentation of ABM model and expectation management (10 minutes) Facilitator(s) offer instructions for the next phase
10:00 am	**Break**
10:10 am	**Plenary session 1** Participants are familiarised with the dimensions/lessons learned for their case Participants choose the context for the replicability of the case (scale-up, replication)
11:10 am	**Individual work** Participants are provided via e-mail with handouts, pointing out the main questions to ask and what steps to take (*refer to the tables to be filled in*) Participants fill in the tables with their lessons learned and create their own counterfactual scenario. All the materials worked by the participants are sent via e-mail back to the facilitator(s). Interest groups are formed with the help of the moderator/facilitator, instructions for the next phase are provided, as well as the link to private/group discussions. The facilitator(s) make sure to keep records of all the phases' outputs (raw). Main questions: 1. Identify main lessons learned on each relevant dimension in the process of design and implementation of social innovations 2. Identify the alternative: What would you do differently on (dimensions identified in preparatory phase) 3. Reflect on and report other important factors for SI acceptability not already

	included in the table
12:10 pm	**Group session 1** Discussions of counterfactual scenarios and lessons learned in small groups Participants provide a list of scenarios arranged in order of importance Co-moderator, moderator and case-responsible researchers are present in each group discussion/chat in order to facilitate the discussions and to mediate group dynamics.
1:25 pm	**Lunch break**
2:25 pm	**Plenary session 2** Participants present the results of each group (45 minutes) Case-responsible modellers also offer feedback on the work done (15 minutes)
3:25 pm	**Group session 2** Each group discusses the obstacles for the counterfactual scenarios discussed previously, as well as solutions and actions needed. Main questions: 1. Identify the obstacles you are likely to encounter and how to overcome them 2. Next planned policy steps: how would this translate into implementation strategies?
5 pm	**Break**
5:10 pm	**Plenary session 3** Presentation and explanations of the groups discussions and solutions (10 minutes/ group, in total 40 minutes) Discussions of identified alternative strategies or policies (40 minutes) Discussions on the ABM model and what is of interest for participants to be modelled for their case Co-moderator, moderator or case-responsible researchers are present in each interest group discussion/chat in order to facilitate the discussions and to mediate group dynamics. Case responsible modellers manage expectations related to the model and possibilities.
6:30 pm	Debriefing and feedback **The facilitator(s) present the work done during the day, emphasise the roles of the participants, presents what will be further done with the work, and talks about how the participants can receive a report of the workshop. The facilitator(s) also gather the feedback the participants have for the workshop.*

Appendix 4 – materials to be used during the workshop / in preparation for

Table – TO BE ADAPTED BY EACH RESEARCH TEAM IN PREPARATION FOR THE WORKSHOP

	LESSONS LEARNED (tools, solutions, strategies and processes used)																
Dimensions relevant for acceptability of SI and citizen empowerment (barriers, drivers and needs)	Information and communication activities	Citizen participation in decision-making (participatory strategies)	Citizen empowerment strategies: individual and collective (strategies to support behavioral and community adoption of the innovation)	Social and cultural norms (using environmental-related norm-targeting interventions to support acceptability of the innovation)	Social and cultural norms (tools or strategies targeting social and cultural norms regarding participation)	Pilot projects (step by step implementation)	Consultation of human resources with a high level of knowledge/expertise	Laws and regulations / Normative and regulatory tools	Environmental awareness / awareness of the impact of the SI or the health and quality of life	Creation of working groups / task forces with multiple stakeholders	Citizen commitment strategies (i.e., citizen pacts for the SI)	Larger public deliberation and consultation strategies	Providing resources (human, financial etc) to support SI implementation	Co-creation of the future (future-orientation, "what should be done further")	Informal, extended partnerships involving a wider set of actors	Cultural mediation	Infrastructural and technological policies or tools
Internal resistance –within the driving organization or association (e.g. city council): different visions regarding the process of design and implementation of the SI																	
Political resistance and conflict																	
Citizen resistance and conflict																	
Existing non-supporting local and social norms																	
Lack of confidence in the use/effectiveness of the SI																	
Low adoption of new energy behaviours																	
(Lack of Satisfaction of the need for safety																	
Place identity & place attachment																	
Concerns for the impact on local economy & jobs																	
Satisfaction of the need for autonomy (i.e., self-sufficiency)																	
Commitment of relevant social actors through the process																	
Satisfying the need for status (i.e., social prestige and recognition)																	
Concern for quality of living conditions																	
Satisfying the need for belonging (social cohesion of the community)																	
Satisfying the need for trust in the project and in institutional representatives																	
Satisfying the need for recognition (as an environmentally sustainable and/or innovative place)																	
Satisfying the need for competence in carrying out new behaviors																	

ALTERNATIVE PATHWAY IDENTIFICATION

LESSON LEARNED	ALTERNATIVE PATHWAY/INTERVENTION IDENTIFIED	MAIN ENVISIONED OBSTACLES

How do the new policy interventions respect or come into conflict with different needs?

ALTERNATIVE INTERVENTION	NEEDS		
	EXPERIENTIAL: COST AND COMFORT (i.e, quality of living conditions, need for competence, need for autonomy)	SOCIAL (need for safety, need for status, need for belonging, place identity & place attachment, need for trust in the project and in institutional representatives, need for recognition)	VALUES

This table can be used to identify if the intervention proposed is influencing each need, and can serve as a basis for counterfactual scenario development.

Appendix 5 – Summary of drivers and barriers identified in Del.6.1

Cluster 1 – "Holistic, Shared and Persistent Mobility Planning" (Zürich and Groningen)

➢ General environmental predisposition was identified as a driver for social innovation (for most actors). Hence, the acceptance of the elements of social innovation can be facilitated by activating this predisposition / attitude.

In Zürich case, the attitudinal factors acting as drivers are related to propensity to negotiation, perceived benefits of action, attitudes related to riders and pedestrians safety, renewal of bus fleet (issues regarding hydrogen against fossil, Wi-Fi availability), promotion of electric cars, technology innovation as a support for the energy transition, or improving trains for reducing emission and enhancing quality, mobility perceived as a public-space problem. Responses varied greatly, for some actors a driver for others barrierer when considering the attitudes towards creating a car-friendly city.

➢ Behaviour-specific norms and beliefs were more actor-specific, with great variability between them. Any action aimed at stimulating social innovation in cluster 1 (by activating the set of beliefs), should be carefully customized and should take into account the specific beliefs of very different groups / actors.

➢ The benefits that act as drivers for social innovations in cluster 1 (i.e., improved cycling infrastructure, environmental quality etc.) are valued higher by most actors than the costs (time, effort, etc.) acting as barriers. In Groningen, perceived benefits of action are both drivers and barriers in terms of time, effort, motivation, fear of losing cus-tomers, or decreased employment (shopkeepers), but act as drivers when related to improvement of the cycling infrastructure, the environmental quality and utility of the park, PR benefits, benefits for cyclists, in particular for their safety.

➢ In Zürich case, institutional complexity, as a factor related to capabilities and resources, is seen as a barrier, but manageable due to negotiation, human resources quality, and informal ties; enhancement of informal ties (and work) represents a driver

➢ Information about the innovative actions is considered either a drive or is not relevant.

➢ In Zürich case, time is irrelevant for most actors, and a barrier for some (business sector), formulated as "more time needed for the SI", or "the SI is time consuming and a loss of time"

➢ Financial resources are perceived as a drive for social innovations; if they exist, they make it possible to induce the element of innovation in this domain substantially.

➢ Human resources (perceived as a driver by most actors) are closely related to knowledge and skills, the latter acting either as drivers or barriers. Therefore, human resources have no special significance as a drive for innovations unless they are associated with a high level of knowledge and skills.

➢ Material costs: barrier to the implementation of social innovation.

➢ Laws and regulations as contextual factors are perceived rather as barriers for social innovations than drivers, with at least one exception, namely for Zürich city residents who consider laws and regulations as a drive.

➢ Social norms and expectations: drivers

➢ Supporting policies represent an inconsistent element for innovation in the city transport domain because, although generally perceived as a driver, it is of varying strength for different actors.

➢ Direct democracy was identified in Zürichas a weak barrier for most actors in the public authority sphere (e.g., departments of Municipality, transport authorities, the Canton, other cities in the Canton), but a drivers for others, being related to an incentive for action (e.g., business actors, citizens)

➢ Habits and routines: irrelevant to the social innovation process. Both in Zürich and Groningen, are considered a weak barrier which involves a certain degree of resistance to change

<u>Cluster 2 – Island renaissance based on renewable energy production (Samsø and El Hierro)</u>

➢ The pro-environmental attitude, general concern of people towards the environment, climate change and pollution is perceived as a driver of social innovation;

➢ The set of people's beliefs is perceived as a driver for social innovation in the energy domain. The central belief that has the potential to stimulate the social innovation is related to the concern for the economic development of the island and for the rational use of its natural resources in order to protect the islands. It is not just about protecting natural resources, but also residents, in order to find solutions to reduce the phenomena of depopulation of the is-land and to increase social inclusion (in the case of Samsø) or to reduce the feeling of isolation (in the case of El Hierro).

➢ The perceived benefits of social innovations are generally related to economic factors, to opportunities for investment, generation of jobs and the development of new infrastructure. Regarding the costs perceived as barriers, the cost of the innovation is the main barrier (in El Hierro) while creating divisions within the community is also a concern (in Samsø); further some economic actors refer to the absence of communication infrastructure between the island and the mainland, which could decrease the attractiveness of the new sustainable tourist destination created on the island (in El Hierro).

➢ Literacy and social status are not relevant as facilitating or inhibiting factors of social innovation for this cluster. One exception are farmers (in Samsø) for which we notice an association between high status and political involvement. On the other hand, limited financial resources represent a barrier to social innovation in this field. The time resource overall is perceived either as irrelevant or as a barrier to social innovation, as it is a long process involving a great deal of planning and processing of legal requirements.

➢ For El Hierro, laws and regulations are considered mostly a barrier due to changes in national legislation, while in Samsø's case, they are considered both a drive (in terms of supporting national policies) and a barrier (restrictive landscape protection regulations and time-consuming

bureaucracy).

➢ Media, as contextual factor, is perceived in a positive way, a stimulating factor for the social innovations that are generally covered in favourable terms.

➢ Habits and routines are either irrelevant or perceived as a barrier to social innovation.

Cluster 3 – "Energy efficiency in district regeneration" (Malmö and Stockholm)

➢ The environmental predisposition that includes pro-environmental values reinforced by the motivation of the people to improve the image of low-status neighbourhoods acts as a driver.

➢ On the one hand, in the early phase of development of the SIs, the lack of trust of residents towards the administration and towards the union of tenants was a barrier for innovative solution in cluster 3. On the other hand, people's concern for a sustainable lifestyle, for green technological solutions and for increasing the quality of living conditions are drivers that facilitate social innovation in this cluster. A set of beliefs have the power to facilitate or diminish the penetration of social innovation: need for safety, belief in the usefulness and importance of a continual process of consultation with the neighbourhood, the problem of social inclusion or the cohesion of the community.

➢ In terms of benefits and costs, the drivers of social innovation are related to safety and to the quality of buildings and houses, to lower costs of energy, but also to the benefits of a communication and collaboration process that will facilitate social cohesion. In the case of tenants, the perceived costs of innovative solutions along with people's fear of losing the current homes and being relocated outside the community represent obstacles to innovation.

➢ Regarding the capabilities and resources needed for the implementation of social innovation, social status and time resources are generally not relevant factors, but for some actors like citizens, they act as drivers. Financial resources are drivers in general, and knowledge and skills required are perceived as drivers and as obstacles too (for example, limited skills to communicate in a foreign language). Another resource perceived as relevant in the social innovation process and which has the value of driver is social awareness of projects' managers because it is considered that this resource stimulates the initiative of decision-makers. The closer connection between the departments of the local administration represents another resource due to its facilitating role in the process of social innovation.

➢ Laws and regulations are perceived mostly as a driver within this cluster. Media represents a contextual driving factor because of its potential to promote changes and to reinforce the process positively. Habits and routines do not seem to play a significant role, being a minor barrier for social innovation.

Cluster 4 – "Urban mobility with superblocks" (Vitoria-Gasteiz and Barcelona)

➢ Pro-environmental attitudes act as a driver for social innovation, being related to experience in developing environmental projects, to environmental awareness and collaboration towards

enhancing the quality of life in the city. Pro-environmental values are learned from direct experience. The belief of the social actors that they can be competent partners in the debates about urban mobility and that they can achieve results increasing the well-being of the people and strengthen the environmental identity of the city, acts as a powerful driver for social innovation.

➢ Other attitudes that support social innovation are related to the willingness of the actors to engage in discussions about the mobility in the city, to the preservation of traditions, to the concern for climate change and air quality. Also, the perception that the quality of the urban space is important for the safety of the citizens and for their well-being is an essential drive for social innovation. The lack of financial and human resources has been pointed out as a barrier to social innovation, whereas time is a barrier because engaging in participatory processes is rather time-consuming.

➢ Knowledge, especially interdisciplinary, is perceived as a driver as this is needed in order to understand how to apply social innovation, as well as to perceive its usefulness. Changes at the level of social norms is a drive that facilitates social innovation, especially since the green solutions, such as cycling, are embraced by an increasing number of people, such as youths, public employees or even policymakers. Also, knowledge and experience in negotiation and lobbying activities that seek to influence policies in this area are necessary and important for social innovation.

➢ Supportive policies are very important not only for the beginning of the implementation of social innovation but also for the behavioural change that is intrinsically associated with so-cial innovation. Sometimes, the regional/metropolitan context, not just the local one, becomes a factor that may or may not facilitate social innovation in the urban mobility domain (driver). Habits are generally of limited relevance, and may act rather as a barrier when undesirable behaviours are considered.

<u>Cluster 5 - “Coordinated, tailored and inclusive energy efficiency schemes for fighting fuel poverty” (Aberdeen and Timisoara)</u>

➢ The environmental predisposition is perceived as a driver, including values that support an attitude of concern for the comfort, the health of the people and for the public good.

➢ People’s expertise and technical capacity to create a sustainable infrastructure and to balance social response to fuel poverty needs are important for social innovation. Particularly noticeable in this cluster is an understanding that the problem of energy poverty is not only a local one, but an issue that is related to the social conditions that tend to accompany or lead to fuel poverty. From this perspective, the rules regarding communication and collaboration strongly influence the behaviour and receptivity of the people towards innovative solutions.

➢ Costs, as barriers to social innovation, are represented by the difficulty of persuading potential beneficiaries of the benefits of social innovation. Material costs are a strong barrier, partly because the energy prices charged are competing with the existing gas provision and partly because of the substantial cost of investments in building upgrades and energy generation infrastructure. Other perceived costs are related to the difficulties with developing an innovative solution due to a lack of trust in the administration. Barriers are also related to the fluctuation of human resources, to the frequent legislative changes in the field of energy poverty and to the rapid pace of tech-nology

development (Timisoara). The benefits of implementing innovative solutions are enhanced if the potential beneficiary perceives the promoters of these solutions as being prestigious, trustworthy and socially involved.

➢ When financial burdens are covered by external sources without any impact for people, and when the social dialogue and consultation with citizens is continuous, financial resources act as drives. Time is perceived as a barrier to social innovation, especially in the sense of time pressure and overload, given the small number of people involved in the initiatives against energy poverty.

➢ Regulations created by local authorities seem to facilitate social innovations in the fuel poverty field (Aberdeen) and act as drivers. However, regarding social norms and expectations, these act as barriers, being related to the difficulty of overcoming histories of distrust and to people's expectation that implementing the innovative solution is a bureaucratic process. Communicating with potential beneficiaries and working closely with community leaders (as habits) make the social innovative solution easier to accept.

Appendix 6 – Operationalization of concepts

Social innovation in energy transition is defined in SMARTEES project as a process of change in social relationships, interactions, configurations, and/or the sharing of knowledge leading to, or based on, new environmentally sustainable ways of producing, managing, and consuming energy that meet social challenges/problems" (Caiati, Marta & Quinti 2019). Existing theories of social innovations point to two levels, on which social innovations can manifest themselves i.e. cognitive and behavioural. SMARTEES ABM architecture was designed to represent both dimensions of social innovations, the cognitive (i.e. framing, knowing) and the behavioural (i.e. doing, organising).

Policy scenarios in SMARTEES are described as specific public intervention implementations. Policy scenarios link closely with the perception of uncertainty and complexity. Developing policy is a complicated balancing act between developing consistent plans for attaining a certain desired future on the one hand, and, on the other hand, being adaptive to changing circumstances. This task may require adjustment of goals and ambitions.

Acceptability refers to two interconnected components: (a) determining how well an intervention or a change will be received by the target population, and (b) the extent to which the new intervention or its components might meet the needs of the target population and societal setting (Ayala & Elder, 2011). For ensuring a wide acceptability of the social innovation, it is important to focus both on the factors which drive the social innovation and those which hinders it. More specifically, acting on to improve those dimensions conducive of acceptability and diminish those which hinder the acceptability of the social innovation is at the centre of the issue and offer insights related to next steps to be taken and approaches.

Citizen empowerment is seen both as a psychological sense of control and ownership over decision-making, and a process by which citizens take the driving seat of the social innovation. Citizen

empowerment is understood here as a collective sense of working for their own well-being and improvement of conditions.

HUMAT model was developed as a basic architecture for constructing artificial populations, in which agent cognitions, decision-making and social interactions are based on social scientific theory. Real world social dynamics, such as social innovations, opinion dynamics and behavioural transitions (e.g. Nyborg et al. 2016) involve the behaviour and communication of many different individuals connected in social networks. These individuals make decisions on their behaviours on the basis of their interests, share information with others, and are susceptible to norms. Interactions between individuals result in a diffusion of new behaviours, formation of opposite opinion groups, and emergence of tipping points giving dominance to particular norms. The initiation of agent activity starts with the needs being satisfied (or not) by different behavioural alternatives. For modelling purposes in HUMAT, we distinguish between three categories of needs: (1) experiential needs (e), which, among others, refer to comfort and costs, (2) social needs (s), referring to belongingness (Baumeister, Leary 1995), relatedness (Deci, Ryan 2000; i.e. to feel close and accepted with important others and with important groups of others), social safety, social status, and (3) values (v), referring to autonomy, biosphere and societal goals. This distinction introduces a possibility of trade-offs between different need groups, which may result in the experience of cognitive dissonances impacting agent's information processing and chosen actions. Moreover, the distinction allows for variance in satisfaction-depletion dynamics of different need categories, which may be relatively fast for experiential needs, and slower for social needs and values.

Updated guidelines for the second round of policy scenario workshops

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The present document contains an update of the methodological guidelines that inform the preparation and development of the **second round of the participatory workshops** in each case study cluster, responding to WP5 objective: "furthering social acceptability of the changes that the energy transition implies (co-shaping the future").

1. Contextualization

In the SMARTEES project, a series of research activities were designed towards creating a comprehensive future policy scenario framework, suited to define alternative, complementary and/or refined policy interventions to replicate and upscale social innovations in the energy domain as well as support related social innovations in energy transitions. These research activities were integrated in:

- **Task 5.4.** "Exploration of future policy scenarios through multi-stakeholders deliberative workshops" (see "Methodological guidelines for the definition of alternative policy scenarios for socially innovative energy transitions").
- **Task 5.5.** "Integration of inputs from participatory workshops and elaboration of realistic policy scenarios to be tested by Agent-based Modelling techniques".
- **Task 5.6.** "Refinement phase: Analysis of energy future scenarios and transforming them into strategic interventions".

Task 5.6: Refinement phase: Analysis of energy future scenarios and transforming them into strategic interventions

In this task, SMARTEES researchers will present the integration of the knowledge co-produced in the previous activities, attending to the contextual conditions, which operate as drivers and barriers, and present a concrete desirable energy intervention – or combination of some of them – for a selection of case studies. Policy scenarios will be presented and discussed in a second round of deliberation with the case studies.

Policy scenarios will be refined with policy-actors and will serve to the definition and implementation of new energy policies in the context of each local case study. In this task, SMARTEES will engage a sample of citizens, consumers, social and business actors, including social innovators to discuss forthcoming energy policy implementation. Citizen participation will make these innovative policies more apt to address long-term challenges, anticipating resistances and contestation.

Task 5.6 is divided into the following sub-tasks:

Sub-Task 5.6.1: Preparation and execution of the Workshop, which will involve a sample of key actors – concerning each case-study cluster.

Sub-Task 5.6.2: Second phase of multi-stakeholder deliberative workshops for each local case-study involved in this WP. The processes must be documented and a report per each workshop will be produced (M5.2).

2. Objectives of the second round of the Multi-staheholder deliberative workshops

The goal of the refinement phase of the policy scenarios is focused on modelling results (ABM) and strategy refinement to ensure a high degree of public acceptability of the social innovations, which will serve to support informed decision-making on energy transitions (input for Deliverable 5.2 and 5.3).

Specific objectives:

- *To present the simulated scenarios of the social innovation processes in each case/cluster of reference cases.*
- *To refine the policy scenarios with policy-actors in order to create a series of* alternative strategies that, based on the realistic simulations of the SI processes in each reference case, foster broad social acceptability of energy sustainability policies (input for task 7.5). For doing this, a sample of promoters, stakeholders, citizens, social and business actors, and experts (including social innovators) will be engaged in discussions on best strategies for energy policy implementation (Sub-Tasks 5.6.1 and 5.6.2).
- *To report and summarize results of the workshops and make a cross-case evaluation (Sub-Task 5.6.2) contributing to the elaboration of policy recommendations for each case-study cluster (input for task 5.7)*
- *To integrate the outcomes of the workshops within the SMARTEES policy-sandbox (WP8).*

Preparation of the multi-stakeholder deliberative workshops

- The second phase of the policy workshops follows the structure and methods described in the "methodological guidelines for the definition of alternative policy scenarios for socially innovative energy transitions".
- Case researchers should adapt the guidelines to their specific cases and decide if the second round of policy scenarios will be organized joining the two reference cities involved in the cluster or separately.
- The main outcomes of this refinement phase will be integrated as part of the section 4 of the deliverable 5.2.
- A report should be prepared for each policy scenario workshop (this report will be included in deliverable 5.2).

The following table summarises and updates the main activities to be conducted regarding the preparation, development and results processing of the second round of policy workshops.

PHASE 2: MULTI-STAKEHOLDER DELIBERATIVE WORKSHOPS WITH REFERENCE CASES				
Stage	Activities	How / guidelines	Responsible	When
Preparatory stage	Stakeholder mobilisation	Invite the participants involved in the first round of policy workshops. Decide the convenience of involving new participants (eg. social innovators, experts, policy and social actors)	Case-responsible researchers, case-responsible researchers, consult with city council	February-March 2021
	Practical workshop organisation: Agenda, facilitation, videorecording, other supporting arrangements (e.g. location, catering)	Decide the most appropriate mode of delivery for the workshops (face to face, online, mixed face to face/online)	Case-responsible researchers	
	Practical organisation: documentation, presentations, note-taking,		Case-responsible researchers and modellers	
Workshop development	Welcome, introduction of participants			March-April 2021
	Introduction to the second round of policy scenarios workshops	- Presentation of the outcomes of the first round of policy scenarios - Presentation of the objectives of the second round of policy scenario	Case-responsible researchers, modellers and PST developers	

		workshops		
	Scenarios refinement	Presentation of the simulated scenarios of the SI processes Refinement of the policy scenarios (joint discussion with the participants)	Modeller team	
	Policy Sandbox Tool[1]	Presentation of the Policy Sandbox Tool Discussion on the interactive tool	PST developers	
Processing results	Input for Deliverable 5.2 Section 4 "Policy scenarios implemented and main results of the Agent-Based Models"	Outputs of the second round of policy scenario workshops conducted in each cluster of SI, testing alternative policies in five domains of energy local innovations.	The AMB team responsible for each cluster should integrate the main results of the ABM in the reference cases (UG, JH, UDC).	15th May 2021
	Report of input from policy scenario workshop	Report template	Case-responsible researchers	1st June 2021

Draft agenda

Case study researchers should adapt the following draft agenda to their specific cases in conversation with the Agent based modellers.

Time	Content of the workshop
9:00	Welcome Introduction of the participants (10 minutes) Introduction to the second round of policy scenarios (10 minutes) - Presentation of the outcomes of the first round of policy scenarios - Presentation of the objectives of the second round of policy scenarios
09:20	Presentation of the agent-based simulations (50 minutes) - Questions and clarifications (10 minutes) Strategy refinement: Joint reflection on the simulations carried out and the possibilities of the model (60 minutes)
11:20	Coffee break *(20 minutes)*
11:45	Presentation of the Policy Sandbox Tool (15 minutes) - Discussion (15 minutes)
12:15	Conclusion and feedback *(10 minutes)*
12:30	End of workshop