

SMARTeES: Deliverable 6.1 (Report)

D6.1 Report on social innovation drivers, barriers, actors and network structures

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Executive summary

The main objectives of Deliverable 6.1 are to identify all relevant actors and their social networks, as well as to highlight the drivers of and the barriers to social innovations analysed in all case clusters in SMARTEES. This is done with a two-fold intention: On the one hand, input is given for the Agent-Based Models constructed in WP7, simulating the dynamic development of a significant aspect of each social innovation. On the other hand, a more generic perspective on barriers and drivers for social energy innovation is taken to explore, how processes of social energy innovation can be fostered with respect to specific types of actors and their networks.

Based on the analysis performed at the level of each cluster and at the level of each actor involved, we concluded with a list of observations that could be the starting point for formulating recommendations on policies related to social innovations:

A general pro-environmental predisposition is perceived as an important driver of social innovations in the energy sector for the vast majority of actors in all cases. This means that no matter which type of actor in a social energy innovation process people are (e.g., NGO, administration, citizen, business), it is likely that more environmentally engaged people from these actor classes are more likely to drive social innovation processes. For this reason, it is recommended that social innovation policies that are interested in making the social innovations easier for people to accept, take advantage of the pro-environmental attitude of people, refer to environmental issues when initiating the social innovation process, liaise with societal groups with strong environmental engagement, or to develop environmental engagement before introducing innovative solutions.

Policy Recommendation 1: Build on existing environmental engagement or include a strategy to increase it, since almost all key actors across all cases name environmental engagement as a key driving force.

When it comes to alternative mobility solutions, there are a set of beliefs acting as drivers and that guide the behaviour of people in general, regarding the association between these solutions, their recreational value, and the well-being and safety of those who choose an alternative green mobility. This means that co-benefits of a green mobility transition for health, safety, and well-being need to be highlighted. A common risk is that business actors manifest some resistance in accepting greener alternatives of mobility because they see in this a threat for their own business. Often this resistance can be very strong in the beginning but is overcome later in the process. From this perspective, it is recommended that policies intending to stimulate social innovations in this field should aim at changing the conservative perceptions of business owners. Furthermore, implementing mobility changes as trials with an option to go back if not success is reached (in both cases studied connected to referenda) are a good way of addressing initial skepticism.

Policy Recommendation 2: Especially in mobility related social innovations, there often is initial resistance of groups that fear for their businesses. Include such groups early on and open for trial periods of the changes to the mobility system.

Trust in the abilities and good intention of stakeholders and decision-makers is a relevant factor for the acceptability of social innovations which most often involve a change in people's mind-set and behavioural routines. In general, the participatory processes, the partnership and the permanent consultation facilitate and strengthen trust. However, when it comes to the fuel poverty domain and the regeneration of districts / spaces, the process of permanent public debate and consultation with citizens and with the beneficiaries of social innovations become crucial in order to increase the acceptance of innovative solutions. This means that the inclusion and empowerment of citizens – especially citizens with limited access to public debates is of key importance and strategies should be developed and implemented from the start.

Policy Recommendation 3: Trust between actors is a key value in social innovation processes. Plan inclusion strategies for real participation of disadvantaged societal actors.

Social status, in general, is not perceived as a factor that significantly influences the social innovation, neither in the sense of facilitating nor in the sense of inhibiting this phenomenon, apart from citizens in the fuel poverty and neighbourhood renovation domains, where low social status of some key actors can be an important barrier preventing success. Thus, success of social innovation policies in the district regeneration and in the fight against energy poverty depends on the extent to which the decision makers understand that these two issues are strongly linked to the individuals' position in a social hierarchy and to the perceived importance of their own place in society (i.e., social status). This again underlines the importance of targeted empowerment strategies for these actors.

Policy Recommendation 4: In some social innovation processes, low social status of important actor groups may become a barrier. Develop strategies for empowering these groups and enable them to participate on their terms.

In terms of knowledge and skills, they generally act as drivers, in the sense that their existence supports and facilitates the penetration of innovative solutions, and lack of these is an obstacle, especially when considering relational and communication skills, such as group communication, ability to negotiate or language skills. It is recommended that social innovation policies capitalize both on domain-specific knowledge, and transversal competencies of those who design and implement these solutions. Furthermore, planning a strategy to provide necessary knowledge and skills to importance actors who do not possess it, is recommended.

Policy Recommendation 5: Knowledge and skills can be both an asset and a barrier in social innovation processes. Appreciate and capitalize on local knowledge of key actors, but be attentive to provide knowledge and skills, where lack of them hinders key actors from participating.

When it comes to the problem of the acceptance of a social innovation in order to develop communities that face problematic issues such as social exclusion or low community cohesion, it is recommended that public discourse and policies explicitly highlight the potential of the innovative solution to solve

these problematic issues even if the innovation has not been designed for this purpose. Again, highlighting co-benefits with a real meaning for the local society is an important key to success.

Policy Recommendation 6: Not always the environmental or energy related benefit of social energy innovations is what is most important for the local community. Be attentive for how the social innovation creates co-benefits for example in lifting the image of a challenged neighbourhood.

Laws and regulations act in some cases as barriers, while they represent a driver of social innovation in other cases. When they act as barriers, this is mainly because of procedural ambiguities or frequent changes in national legislation that endanger the ownership and management of the social innovation. When they act as drivers, this is mainly because they have an incremental value, they generate a framework for interventions, and they are perceived as working in favour of people.

Policy Recommendation 7: Regulations and laws can be a powerful driver or barrier of social innovations. Remove ambiguities and uncertainties in regulations, create room for experimental solutions, and design policies that amplify the output of social innovations.

Generally, the media plays a facilitating role in social innovation because of its potential to promote changes and to reinforce positively the process of social innovation. Based on this outcome, to consolidate a close, collaborative relationship between the promoters of social innovation policies and the media is important in all phases of the social innovation process. However, sometimes media also create a barrier by amplifying oppositional positions or resistance.

Policy Recommendation 8: Social innovations are often attractive stories for media to tell. Develop a media strategy and invite media partners actively into social innovation processes.

For almost all clusters, habits and routines are irrelevant or act as barriers to social innovation, being linked with peoples' resistance to change. However, there is also a risk that the social innovation itself, accepted and shared by the community, will become a routine with non-reflexive elements. From this perspective, it is recommended that policies promote social innovations as flexible structures and not as routines that exclude critical thinking and the possibility of optimizing or even changing the innovative solution when it is outdated or not adapted to the dynamics of the new social reality.

Policy Recommendation 9: Habits and routines are barriers to innovation. Create habit breaking events and arenas (e.g., a neighbourhood festival, but also temporal blockage of habitually used streets have been shown to deactivate routine thinking). Be aware to not fall into the trap to make the social innovation itself routine.

List of abbreviations

Abbreviation	Full word
SI	Social Innovation
TSI	Transformative Social Innovation
MLP	Multi-level perspective
DoW	Description of Work
VBN	Value-Belief-Norm
NAT	Norm-activation Theory
B&W	Burgemeester & Wethouders
DsenV	Dienst Stadsontwikkeling en Volkshuisvesting)
ENFB	Echte Nederlandse Fietzersbond
PR	Public Relations
MKB	Malmö Kommunala Bostads
NGO	Non-Profit Organization
UPA	Urban Planning Administration
SUT	Swedish Union of Tenants
SW	Swedish
AEU	Agencia de Ecologia Urbana de Barcelona
CEA	Environmental Studies Centre
TUVISA	Municipal department in Vitoria-Gasteiz
RACC	Foundation in Barcelona
DEAL	District Energy Aberdeen Limited
OFGEM	Governmental Organization in Aberdeen
AHP	Aberdeen Heat and Power
ROSENC	Romanian Sustainable Energy Cluster
UPT	Technical University of Timisoara

Introduction

The main objectives of Deliverable 6.1. are to identify all relevant actors and their social networks (Task 6.1.), as well as to highlight the drivers of and the barriers to social innovations analysed in all case clusters (Task 6.2.). We reiterate that ten referent cases selected for the empirical analysis of the dynamics of social innovation have been grouped in five clusters in SMARTeES:

- Cluster 1: Holistic, shared and persistent mobility planning (Zürich and Groningen)
- Cluster 2: Island renaissance based on renewable energy production (Samsø and El Hierro)
- Cluster 3: Energy efficiency in district regeneration (Malmö /Augustenborg and Stockholm/Järva)
- Cluster 4: Urban mobility with superblocks (Vitoria-Gasteiz and Barcelona)
- Cluster 5: Coordinated, tailored and inclusive energy efficiency schemes for fighting fuel poverty (Aberdeen and Timisoara)

In order to understand the complex structure of agent-type specific drivers and barriers, the present deliverable uses the theoretical and empirical information from different work-packages and offers a structured input for other work-packages. Specifically, the deliverable 6.1. is developed in accordance with WP2, which provided the theoretical framework, WP3 that provided information about profiles of the different types of social innovation, and WP5 that highlighted the results of scientific literature review on key factors acting as drivers of and barrier to the adoption of sustainable energy behaviours. Therefore, the Deliverable 6.1. utilizes these sources of information for identification of actors and their networks and for the analysis of relevant drivers and barriers and offers a structured input for the agent-based modelling in WP7.

Deliverable 6.1. is structured in three sections:

Section 1 outlines a theoretical framework of social innovations and categories of drivers and barriers affecting social innovations' actors, which includes a general definition of social innovation, pathways towards a theoretical framework of social energy innovations, a brief presentation of a theoretical model that underpins the selection of categories of drivers and barriers, and a definition of each driver and barrier type.

Section 2 aims to identify the actors, their networks structures and their implications regarding drivers and barriers for each case. This section uses and interprets the inputs from other partners. The maps of cases and the templates for identifying actors in each case were used. The analysis of actors and their relationships forms the framework for the analysis of drivers and barriers towards social innovation in all case clusters. The second section includes, for each cluster a short description of the cluster, the number and list of actors for each case, the set of barriers and drivers in a discursive and in a synthetic way (tables), the description of the networks' structures (relations between actors), and an essential description of networks' dynamics (maps).

Section 3 presents the main conclusions on drivers and barriers for social innovation discussed within each cluster.

Section 1

Theoretical framework of SIs and categories of barriers and drivers affecting SI actors

1.1 Definition of SIs

For the sake of clarity and discussion of the following section 1.2, we recall here the current working definition¹ of social innovation adopted by the SMARTEES project:

“Social innovation is a process 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.”

The definition sets aside energy SIs that are researched in this project from other types of SIs that have been investigated in other projects with inevitable implications for the definition of a theoretical framework of SIs that would suit the research aims of the SMARTEES project.

1.2 Towards a theoretical framework of energy social innovations

Social innovations have attracted considerable attention in recent years with comprehensive reviews of SIs spanning along several years or even decades (BEPA, 2014; Moulaert et al., 2017). The complexity, diversity of nature, diversity of proposed definitions and diverse historical and institutional contexts of SIs are compounded by a misuse of the SI label pointed by Moulaert et al. (2013, p. 13).

This makes it more difficult to trace broad theoretical frameworks of social innovations in the literature that are not tailored on sector-specific and contextualised cases but instead are common (see e.g. Bekkers et al., 2013).

One of the few traceable comprehensive theories of social innovations that appear worthy of note is outlined by Haxeltine et al. (2017). Haxeltine et al. advocate for a relational theoretical approach that is grounded in empirical research in an iterative process of conceptual identification and testing. A relational theoretical approach signifies, in the words of Haxeltine et al. (2017, p. 6), that: “As articulated in relational approaches, agency in TSI is more accurately understood as distributed across ‘webs’ or ‘networks’ of social and material relations.” And further: “We therefore approach social innovation (SI) as a process of introducing new social relations, involving the spread of new knowledge and new practices.” (Haxeltine et al., 2017, p. 6). This theoretical perspective appears to be consistent with the research perspective of the SMARTEES, which emphasizes the importance of social networks, and with its chosen definition of SI (section 1.1).

¹ Working definition as updated based on the feedback session from the SMARTEES GA in A Coruna.

Haxeltine et al. (2017) present their framework (fig.1) as a combination of four clusters of relational processes: a) relations in SI initiatives, b) relations in network formation, c) relations in institutional change, d) relations in the socio-material context.

The first, relations in SI initiatives, accounts for the formation of relations within the SI initiatives and refers to a group of subjects who come together pulled by the dissatisfaction regarding a current state of affairs regarding a specific societal area of activities. These subjects would forge relations in response to this dissatisfaction and aim at establishing an alternative set of activities seeking to replace the current ones being based on new, different, or alternative values. This interaction between individuals at the core of the SI would be reinforced by their common attempt at changing current institutional settings through the pursuit of shared goals and resulting in a process of empowerment (Table 1).

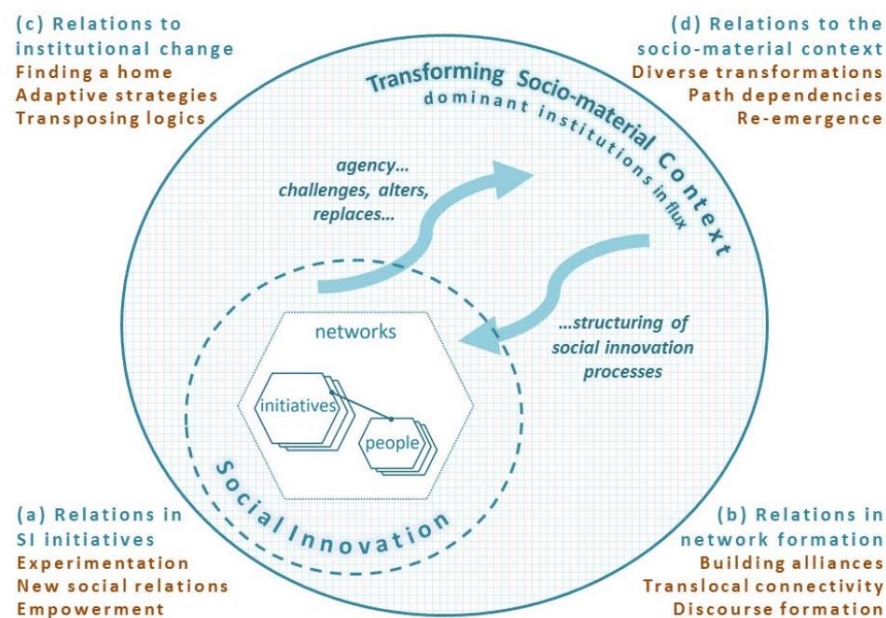


Figure 1 "A transformative social innovation process and its interlinked dynamics" (Haxeltine et al. 2017, p.9)

Relations in network formation instead refers to the forging of networks which are necessary for the SI initiators to sustain the process of SI. Networks are de facto alliances that help the initiators to overcome lack of resources. But networks are not only created locally, particularly when social initiatives try to replicate successful models borrowed by other experiences in other countries, but networks can also become transnational. Within these SI networks, new narratives and discourses that challenge established institutional settings are generated reinforced and developed, thereby leading to a critical mass that is more apt at challenging established narratives of economic development usually upheld by neoliberal thinking. The third element of this framework (Haxeltine et al., 2017) refers to relations to institutional change, which affirms that SIs tend to find equilibrium within the institutional context, promoting institutional change while accepting and befitting from institutional recognition through a dialectic relational exchange that might lead to institutional hybrid arrangements. The fourth and final area of processes composing this theoretical framework of SIs regards relations to the socio-material context.

These relations attain the interplay between SIs and socio-material context surrounding them. SIs attempt to replace established institutionalised socioeconomic relations but inevitably absorb from the context and occasionally reproduce at least some of the established socioeconomic relations that belong to the context. This in itself is not a negative aspect of SIs as long as it reinforces SIs and allows them to bring change to specific contextual relations that are the main target of the SIs' actions.

Table 1 Twelve propositions for a SI theoretical framework (Haxeltine et al. 2017)

SI relational processes	Propositions
a) Relations in SI initiatives	<p>1) "SI initiatives provide spaces in which new or alternative values can be promoted and aligned with new knowledge and practices—in a process of reflexive experimentation that supports both members' motivations and moves towards collective 'success' and 'impact'." (Haxeltine et al., 2017, p. 10)</p> <p>2) "Manifesting new/alternative interpersonal relations is one pivotal way in which SI actors are able to create the right conditions to challenge, alter, or replace dominant institutions." (Haxeltine et al., 2017, p. 11)</p> <p>3) "People are empowered to persist in their efforts towards institutional change, to the extent that basic needs for relatedness, autonomy, and competence are satisfied, while at the same time experiencing an increased sense of impact, meaning, and resilience." (Haxeltine et al., 2017, p. 11)</p>
b) Relations in network formation	<p>4) "The transformative impacts of SI initiatives depend greatly on the changing tensions within and stability of the action field(s) that they operate in." (Haxeltine et al., 2017, p. 12)</p> <p>5) "Transnational networks are crucially empowering local SI initiatives." (Haxeltine et al., 2017, p. 13)</p> <p>6) "Discourse formation and its mediation through communication infrastructures crucially enhances the reach of SI network formation." (Haxeltine et al., 2017, p. 14)</p>
c) Relations to institutional change	<p>7) "SI initiatives need to find an institutional home in order to access vital resources; this often entails a balancing against the desire for independence from (critiqued) dominant institutions." (Haxeltine et al., 2017, p. 15)</p> <p>8) "SI initiatives employ a diverse range of strategies for bringing about institutional change; they must proactively adapt these strategies in response to changing circumstances, while navigating contestations with dominant institutions, and maintaining their original vision." (Haxeltine et al., 2017, p. 15)</p> <p>9) "One way in which SI initiatives engage with dominant institutions is by reconsidering the broader institutional logics in which those institutions are embedded; they do this by 'travelling' across different institutional logics, and by reinventing, recombining and transposing specific elements." (Haxeltine et al., 2017, p. 16)</p>
d) Relations to the sociomaterial context	<p>10) "The rise of SI initiatives and the particular transformative ambitions conveyed by them are strongly shaped by the historical development of the wider sociomaterial context." (Haxeltine et al., 2017, p. 17)</p> <p>11) "SI initiatives are only innovative against the background of an evolving sociomaterial context. Activities of innovating and invention present but one historical appearance of TSI, next to other less conspicuously innovative activities of re-invention, advocacy, and contextual adoption." (Haxeltine et al., 2017, p. 17)</p> <p>12) "Diversity is an integral element of TSI processes, reflecting the historical diversity of the people involved in them, who strive for diverse institutional forms that fit with their differing values, future visions, and present circumstances." (Haxeltine et al., 2017, p. 18)</p>

1.3 The multilevel perspective of Social Innovations

Specific theories of energy social innovations (e.g. Hölsgens et al., 2018; Sung and Park, 2018) are developed often with reference to multi-level perspective (MLP) based frameworks (Geels, 2005; Geels and Schot, 2010).

MLP (Geels and Schot, 2010) is built within theoretical constructs of sociotechnical systems. Sociotechnical systems are conceived (Geels, 2004, p. 900) as “encompassing production, diffusion and use of technologies” and are regulated by three types of rules: cognitive, regulative and normative. They are resulting from the interaction of human actors configured into social groups, these groups create networks, and their members share agendas, perceptions and norms.

Scholars (Geels, 2005, 2004; Geels and Schot, 2010) maintain that changing socio-technical landscapes create tensions in socio-technical regimes, and these allow for niches to develop in which new socio-technical practices can develop. The niches develop through “...three internal processes a) the building of social networks that carry, nurture and develop novelties; b) heterogeneous learning processes to improve performance and build a working socio-technical configuration; c) articulation of expectations and visions to guide learning processes and attract attention and funding” (Geels and Schot, 2010, pp. 22–23).

Niches serve as social experiments in which innovative technologies are tested through new socio-economic supported by individuals and groups organized in networks and coalitions who can often benefit from public or private funding aimed at experimenting with new solutions.

If the niche innovations are successful in proving their efficacy and sustainability (environmental, social and economic), they tend to be long term institutionalized arrangements that establish networks with similar successful innovations, in this phase or level we would witness a “patchwork” of different socio-technical regimes competing, in an evolutionary perspective, to succeed and grow. Whether the new socio-technical practices would prevail in the long term over the traditional ones, this would result in a permanent change resulting in a new socio-technical landscape (figure 2).

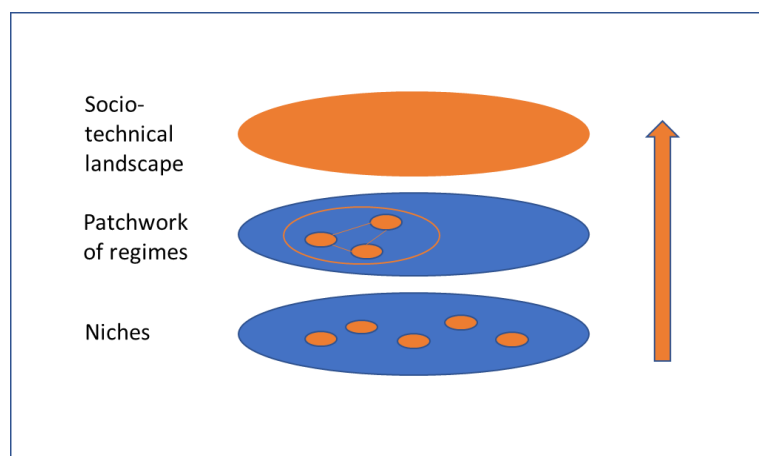


Figure 2 Multilevel perspective of socio-technical innovation (based on Geels 2002, 2004)

1.4 Integrating micro and macro levels towards a comprehensive theory of energy SIs

While the MLP and the relational framework of SIs presented in the previous sections are useful in understanding how SI develop in social and institutional contexts, their limit could be in the lack of a focus on a microlevel of decisions and actions that regard individuals engaging as single actors or within groups and organizations in SIs.

This level has already been discussed in the deliverable D7.1 (Antosz et al., 2018, pp. 9–12), where the CONSUMAT model (Jager, 2000) has been described (figure 3).

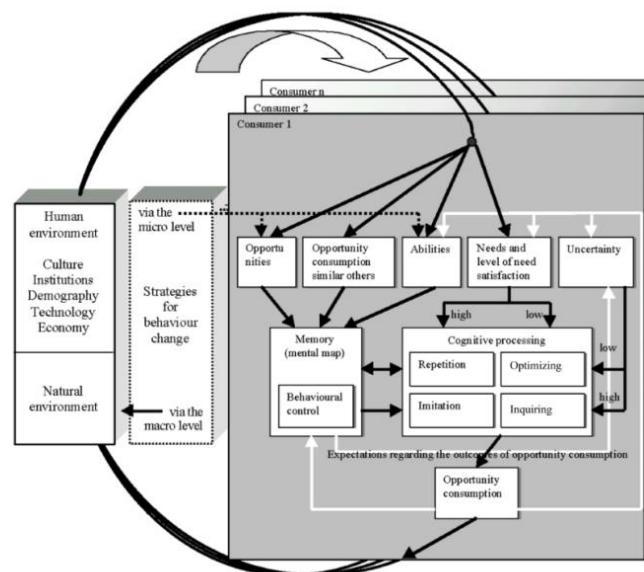


Figure 3 Overview of the CONSUMAT framework (Antosz et al. 2018, p.10)

The CONSUMAT model holds that three behaviour-driving forces interact 1) existence/sustenance, 2) social belonging and status, and 3) personal preferences (beliefs, attitudes). It has been proposed that different individuals might act under the influence of different motivational driving forces, which might be salient due to contextual circumstances (Lindenberg and Steg, 2007). Further, it was proposed (Pellegrini-Masini, 2007) that motivational drivers with regards to environmentally significant behaviours might shift in relation to an individuals' levels of satisfaction of needs, conceived in a hierarchy of motivations (Maslow, 1987), this motivational theory, albeit contested (Wahba and Bridwell, 1976), has received affirmative reconsideration and empirical validation in recent years (Oishi et al., 1999; Sheldon et al., 2001; Taormina and Gao, 2013).

Clearly, individuals may act in relation to SIs not only independently but, as often is the case, as part of organizations or groups; therefore their subjective motivations might be overridden by the motivations created by the goals of their organizations, but this might not be the case when organizations do not hold strict rules of conduct or values that would address the appraisal of an environmental issue (Hemingway and MacLagan, 2004; Pellegrini-Masini and Leishman, 2011).

The CONSUMAT model holds that individuals would act under the three driving forces whilst using defined cognitive strategies (Antosz et al., 2018, p. 11):

- 1. Low uncertainty and high satisfaction prompt agents to engage in repetition, which is the script-based mechanism driving habitual behaviour.*
- 2. High uncertainty and high satisfaction results in imitation, which is e.g. an important driver of fashion dynamics.*
- 3. When satisfaction is low, the agents are more motivated to invest effort in improving their situation. Hence when they are certain but dissatisfied, they will engage in deliberation - an assessment of available options implemented as expected utility maximization.*
- 4. Low satisfaction and high uncertainty results in inquiring, where the behaviour of comparable/similar others is evaluated and copied if it increases expected satisfaction.*

While thinking of SIs development in niches, we could hypothesise that individuals would act using cognitive strategies 3 or 4, seeking new solutions for satisfying their individual and collective needs. At the same time, while waging different options through “deliberation” or “inquiry” they will be likely to evaluate different courses of potential action under the influence of resources or perceived costs and benefits often determined by contextual variables. It was pointed out that attitudes, resources (including personal capabilities) and contextual variables influence environmentally significant behaviours (Stern, 2000).

Specifically, holding resources, such as finances, time, knowledge and others, could alter perceptions of costs and benefits of different options of courses of actions and therefore contribute to influencing the ultimate choice to engage in an action, both for individuals and organisations (Diekmann and Preisendörfer, 2003; Pellegrini-Masini and Leishman, 2011).

Inevitably, contextual variables themselves concur in shaping the perception of costs and benefits of specific actions for individuals (Corraliza and Berenguer, 2000; Pellegrini-Masini, 2007; Perlaviciute and Steg, 2014) and organisations (Bansal, 2005; Bowen, 2002; Leishman et al., 2012; Pellegrini-Masini and Leishman, 2011). Contextual variables could be immaterial like policies and regulations but could also include material circumstances influencing a specific (local or national) economy, such as climatic conditions, relative scarcity or presence of natural resources, the density of population, location of energy sources and related energy infrastructure etc.

At niche level, the decision of SI actors, individuals or organizations, could therefore be represented as developing from A, motivations to act related to the level of satisfaction of the actor’s needs, B inquiry and deliberation in relation to different courses of action based on the relative perception of costs and

benefits of such actions, influenced by C attitudes, contextual variables and actor's resources leading to D decisional outcome (figure 4)

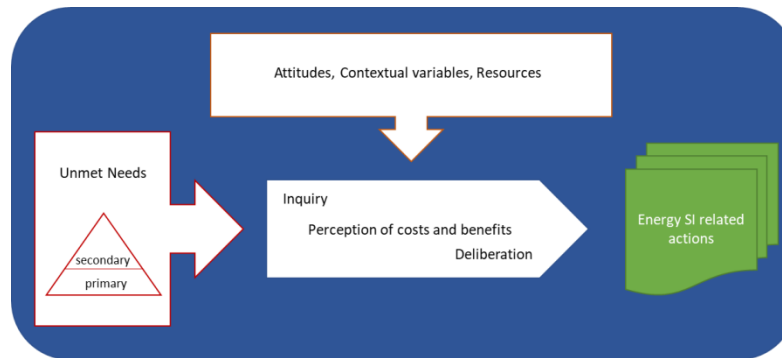


Figure 4 Groups of variables affecting the action of Energy SI actors

1.5 Drivers and barriers of SIs

While it already could appear apparent from our argument, it is worth specifying that in the theoretical perspective that we have chosen drivers and barriers of SIs are those variables that we have mentioned in the group C of variables influencing the perception of costs and benefits regarding the options of action that actors face. As we have written, these could be divided in attitudinal, contextual and resource variables therefore recalling the classification used by Stern (2000).

In accordance of SMART EES' aims, to provide "a significant advance in the comprehension of the human dimension of energy transitions through social innovations, specifically on a set of behaviours that influence energy consumption patterns and, therefore, defining effective strategies of collective intervention to tackle energy issues at local and wider scales" (SMART EES DoW), several barriers and drivers were extracted from relevant literature reviews and latter from the experience of each case of energy innovation. We can make a distinction between factors that can function in a positive way as drivers, and in a negative way as barriers, which can thus either hinder or facilitate social innovations in the energy sector. A strong driver is a powerful stimulating factor, while the generic driver is more common, and non-specific. A recent literature review on main barriers and drivers to concentrated solar power in the European Union (del Río, Peñasco, & Mir-Artigues, 2018) refers to techno-economic factors (such as high technological dynamism, technological competition or development in niches), policy factors and social acceptability when discussing drivers for this type of innovation, and refers to techno-economic factors (such as limited resource potentials, high or uncertain costs, or access to credit to finance investments), legal and administrative barriers, policy factors, and social opposition when considering the barriers.

The **political and normative context** can either hinder or support successful implementation of social innovation projects, whereas legal frameworks and policy instruments can facilitate community energy projects to merge and mainstream (Elle et al, 2015; Hewitt, 2019). Analysing the drivers and bottlenecks for renewable energy technology projects in Bangladesh, the following main barriers were identified: knowledge and skills (for example, awareness of renewable energy in public, industry, utility, and finan-

cial institutions), fit of the technology within the local implementation context (projects that have a technology-push character, which means technology is pushed onto the market without explicitly taking market demand into consideration, appear to be not successful), involvement of relevant stakeholders (important aspects here are explicit demand articulation and involvement of local entrepreneurs, end users, and local investors), market and financial mechanisms, and policies and procedures (Mondal, Kamp, Pachova, 2010).

Because many of the SI in the European Energy Community adopt public-private partnerships schemes, combined with a certain degree of **involvement of citizens' groups in decision-making** (Hewitt, 2019), 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). In this context, the active engagement of citizens in the public arena becomes an important positive factor (Moulaert, 2017). In order to engage and empower citizens, it is important to design adequate framework conditions (Haxeltine et al, 2016) and to establish participatory approaches which engage citizens in decision-making processes from early stages of the initiative (Perlaviciute et al, 2018; Schuitema & Bergstad, 2012).

SI processes require also the need of forging new types of relationships with political, market and social actors with **different motivations and goals** (Pel et al, 2017). 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). In the face of such changes, and the need to keep all the actors involved in the SI motivated and engaged, the concepts of empowerment and disempowerment become important factors in facilitating or hindering such initiatives. Haxeltine and colleagues (2016) conceptualize (dis)empowerment as the process through which human actors (individuals and groups) gain the capacity and willingness to mobilise resources to achieve their goals:

“People are empowered to persist in their efforts towards institutional change, to the extent that basic needs for relatedness, autonomy, and competence are satisfied, while at the same time experiencing an increased sense of impact, meaning, and resilience” (Haxeltine et al, 2017, pp.11).

In line with the SMARTEES empirical framework, which aims to analyse a series of European cases of energy innovation clustered in five domains, corresponding to specific kinds of social innovation in relation to the Energy transition towards low-carbon societies, ten reference cases (two reference cities or islands per cluster) have been selected for the empirical analysis of the social innovation dimensions under study. For each cluster and each case in particular, the drivers and barriers were identified and described below in relation to actors' attitudes, capabilities and resources, contextual factors, and related to habits and routines.

In order to have a common framework for identifying own barriers and drivers in each SI case, we proposed four main categories and their subsequent elements to capture each SI case particularities. The main four categories are comprised of attitudinal factors, capabilities and resources, contextual factors and habit and routine. These four categories are based on a value-belief-norm (VBN) theory (Stern, 2000), which explains how different components are influencing environmentally significant behaviour, and also the interactions between these components. Attitudinal factors are considered to best predict individual pro-environmental behaviours when those behaviours are not constrained by the context or

personal capabilities. If the targeted or desired behaviours are considered expensive or difficult by the individual, then the context or the personal capabilities and resources have the best predictive value for the said behaviour.

The **attitudinal factors** regarding social innovation captured here are related to norms, beliefs and values. More specifically, we capture here individual general environmentalist predisposition, behaviour (specific norms and beliefs), attitudes unrelated to the environment directly if the case, and perceived costs and benefits of action.

In general, attitudes represent “relatively enduring organization of beliefs, feelings, and behavioural tendencies towards socially significant objects, groups, events or symbols” (Hogg & Vaughan 2005), meaning that attitudes are the basis for future action (behaviour). In the case of social innovation, attitudes are therefore important in predicting specific pro-environmental or sustainability behaviours of the actors involved. Attitudes thus guide future behavior, more so when they are easy to recall (accessible) and stable over time (Glasman & Albarracín, 2006). Both direct experience and personal involvement induce individuals to think about their attitudes, which create the perfect conditions for these attitudes to be accessible for individuals, and to direct the future behavior (Petty, Haugtvedt, & Smith, 1995). But the way attitudes influence the action or behavior is just one of the components of attitudes. Schiffman and Kanuk (2004) suggest that attitudes are constructed around three components: (1) a cognitive component (beliefs); (2) an affective component (feelings); and (3) a conative component (behavior) (Cognitive-Affective-Conative Model). More specifically, the affective component represents the emotional response (i.e., liking or disliking) towards an attitude object, or in other words, the feelings and emotions linked to an attitude object. The cognitive component refers to the thoughts and beliefs an individual has about an attitude object, representing the evaluation of the entity that constitutes an individual's opinion (belief/disbelief) about the object.

The general predisposition to act with pro-environmental intent can influence all behaviours an individual considers to be environmentally important, but on the other hand, the role of these predispositions can vary greatly with the behavior, the actor, and the context.

Behavior-specific norms refer to specific personal moral norms, attitudes toward acts and behavior specific beliefs about the difficulty of taking certain actions or about their consequences for the self, others, or the environment. Personal norms and the predisposition to act in a certain way towards protecting the environment can be influenced by external factors or information that shapes the said beliefs, such as findings in environmental science (about consequences), publicity and commentary about those findings, and the actual and perceived openness of the political system to public influence (which may affect perceptions of personal responsibility) (Stern, 2000).

The personal norms in this context are nothing more than “expectations that people hold for themselves” (Schwartz, 1973), consisting of feelings of moral obligation or duty (Schwartz, 1970, 1975, 1977), which can be activated in order to behave in a pro-environmental manner. These personal norms are learned and modified through social interaction. According to Schwartz’s Norm-activation Theory (NAT), the process of norm activation consists of four situational factors or activators (i.e., awareness of need, situational responsibility, efficacy and ability) and two personality trait activators (i.e., awareness of consequences and denial of responsibility). In other words, personal norms provide guidance on how to act sustainably or pro-environmentally in specific situations only if they are activated (if individuals are

aware of conditions that entail adverse consequences for others and feel capable for averting these consequences) (Olbrich, Quaas, & Baumgärtner, 2011). However, the activation of personal norms is not sufficient for individuals to engage in pro-social behavior, because they can be neutralized by denying the consequences of an individual's actions on others or by denying the responsibility to take action (Harland et al., 2007). 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).

Perceived costs and benefits of action represent other social-psychological factors that influence the behaviour of an individual.

Personal **capabilities and resources** can play a significant role in the performance of environmentally relevant behaviour, because performing any behaviour requires finite tangible and intangible resources (Margetts & Kashima, 2016). It was found that even a temporary change in resources is associated with a change in environmentally significant behaviour (Fujii & Kitamura, 2003). Resources can be divided into two broad categories: economic and socio-emotional resources (Cropanzano & Mitchell, 2005). Because an economic resource, such as money, can be exchanged with most other resources it is perceived as being not very personal, whereas a socio-emotional resource, such as giving time, is more personal and signals particularistic relationship between the giver and the receiver (Foa & Foa, 1974, 1980). The capabilities and resources included here are knowledge and skills required for particular actions (e.g., the skills of a movement organizer for activism, mechanical knowledge for energy-conserving home repairs), the availability of time to act, and general capabilities and resources such as literacy, money, and social status and power (Stern, 2000).

Literacy is essential in helping us make sense of the world we are a part of, and is broadly considered as the ability to read and write. For now, there is no consensus of what exactly environmental literacy is, or one single, universal definition for this concept. Roth (1992) described environmental literacy as the outcome of a number of interplaying attributes: knowledge of ecological concepts, environmental issues and environmental action strategies; cognitive skills for analysing environmental problems and skills in the use of environmental action strategies; and the individual's 'affects' (values, environmental sensitivity, environmental attitudes, locus of control). Thus, an environmentally literate individual possesses the values, attitudes and skills that enable conversion of knowledge into action (Yavetz, Goldman, & Pe'er, 2009).

Social status was defined as "a person's relative position in a social hierarchy" (Swencionis & Fiske, 2018) and was related to the "respect, admiration, and importance in the eyes of others" one individual gets (Gregg, Mahadevan, & Sedikides, 2018).

Financial resources represent those material resources having the potential to support the development of ideas, actions and projects.

Time is an asset form which benefit is produced. Time may be one of the most precious resources, as it expires every day.

Knowledge is a body of information (factual or procedural knowledge), gathered by individuals through either formal or informal (television, newspapers, family, friends, etc.) education.

Skill refers to the ability of using that information and applying it in a context. Similarly, environmental knowledge can be defined as one's ability to identify a number of symbols, concepts and behaviour patterns related to environmental protection (Laroche et al., 2001). Research shows that a deeper knowledge of environmental issues and how to solve them increases the likelihood of individuals taking action to protect the environment (Vicente-Molina, Fernández-Sáinz, & Izagirre-Olaizola, 2013; Mobley et al., 2010). Any project or any endeavour can be accomplished only with the support, effort and expertise of the *human resources* involved in.

Therefore, all these personal capabilities and resources are important for directing behaviour, more so when considering pro-environmental behaviour as goal-directed and resource-enabled.

The next category comprises of external or **contextual factors**. According to Stern (2000), this category includes interpersonal influences (e.g., persuasion, modeling); community expectations; advertising; government regulations; other legal and institutional factors (e.g., contract restrictions on occupants of rental housing); *material costs and rewards*; the physical difficulty of specific actions; capabilities and constraints provided by technology and the built environment (e.g., building design, availability of bicycle paths, solar energy technology); the availability of public policies to support behaviour (e.g., curb side recycling programs); and various features of the broad social, economic, and political context (e.g., the price of oil, the sensitivity of government to public and interest group pressures, interest rates in financial markets). It is worth mentioning that each individual can perceive these external factors in a different manner, because these factors can be linked to different attitudes and beliefs. In other words, a contextual factor, such as the price of a product can be seen both as a driver and as a barrier as it could be linked to a positive attribute (higher quality, organic, etc.), or perceived as an economic barrier (Stern, 2000).

Laws, regulations and supportive policies, translated in economic incentives or favourable regulations, for example, can facilitate technological innovation, investment, knowledge building, networking activities and the strengthening of social innovations in the energy sector (Elle et al, 2015; Ooms et al, 2017).

Habits are both habits of doing (behaviours, actions, occupations), and habits of thought (tendencies to think in certain ways), which are performed repeatedly, relatively automatically, and with little variation, whereas **routines** are regular, more or less unvarying procedures, customary, prescribed, or habitual, as of business or daily life (Clark, 2000). Habits and routines are closely related to social innovation aims, in the sense that any social innovation is accompanied with changes at the level of social relationships and the 'playing rules' between the involved stakeholders (Bekkers, Tummers, & Voorberg, 2013). Through changes, social innovation challenges existing personal habits and routines of all the individuals involved. Moreover, changes in behaviours often require breaking old habits and become established by creating new ones (Dahlstrand & Biel, 1997).

At the same time, a disruption in personal habits and routines cannot be taken lightly, because a disruption in a person's everyday "elemental" routines can have a profound effect on the person's overall social integration, as well as on the person's sense of who he or she is in the world (Clark, 2000). Not only the consequences of changing habits and routines represent a challenge, but also the intrinsic character-

istic of habits, as being persistent. Breaking a habit or a routine is not impossible, though, as they do interact with time, agency, and context (Clark, 2000). Habits and routines are valuable for social innovations in particular and creative endeavours in general, as they encompass important advantages at personal level: (a) increase skill in action or thought as they enable an individual to focus more on the elaboration and less on the given action or thought, (b) requiring low effort levels in thought or action they reduce fatigue and new learning could be superimposed, (c) free attention for the unpredictable, and (d) enable a person to exercise functions without having to recall and attend to specific elements of a given practice (Young, 1988).

Section 2

Identification of actors and network structures, and implications regarding barriers and drivers for each case

This section refers to the identification of the main actors and their networks. An actor can be an individual / entity, a group, an organization, a community, a department or an interest group association. The actor network contains the actors and the relationships between them.

Researchers responsible for each case worked closely with each actor in identifying the key entities and the relationships between them, providing detailed information captured in Annex 1. For most of the actors, researchers identified and provided information about drivers and barriers related to SI for each case, which can be found within the present section. All this information is useful to highlight the implications of factors which could impact environmentally significant behaviours, and implicitly each of the SI case researched. The section ends with a series of conclusions related to drivers and barriers, from a cross-sectional perspective.

2.1. Cluster a) Holistic, shared and persistent mobility planning

Holistic, shared and persistent mobility planning social innovation (SI) is using the mobility plan as a way of mobilizing and coordinating many societal actors (different branches of local authorities, citizens, constructors, transport companies, etc.) towards the common goal of a more sustainable and efficient city transport system. Two cases are encompassing this SI: Zürich, from Switzerland and Groningen, from the Netherlands.

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.

2.1.1 Zürich

In Zürich SI case, twenty-two key actors are involved, being grouped into seven broad categories, namely:

- (1) Municipality of Zürich with seven of its departments (the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport, the Department of Public Safety, the Presidential department, the Health Department, Political parties, and the Energy Commission of the Municipality of Zürich);
- (2) The scientific community (the Institute for Transport Planning and Systems of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich);

- (3) Transport enterprises (the Zürich Transport Authority - ZVV, the Federal railways - SBB, car-sharing enterprises, and Bike-sharing enterprises);
- (4) Canton of Zürich (the Building Department, and the Department for Economic Affairs);
- (5) Other cities in the Canton of Zürich;
- (6) Business (large enterprises such as UBS, Crédit Suisse, or Google working in the Zürich territory, business community “City Vereinigung”, and shopkeepers of a specific street or square where a project will be implemented); and
- (7) Citizenship (the car group “Touring club Switzerland”, the bike group “ProVelo”, the 12 Quartierkonferenz/ Quartiersvereine, specific citizens’ groups such as “street communities”, and Zürich inhabitants).

Identification of barriers and drivers

All the twenty-two key actors involved in the Zürich SI case identified the drivers and barriers influencing their case, related to attitudinal factors, capabilities and resources, contextual factors, and habits and routines. A description of these drivers and barriers is provided in the next pages of this section.

The **attitudinal** factors are mostly playing a facilitating role in implementing SI in this case. More specifically, general environmentalist predisposition was listed either as a strong driver (i.e. for the Civil Engineering and Waste Management Department, and the Energy Commission) or as a generic driver (i.e. for the Department of Public Utilities and Transport, the Department of Public Safety, the Presidential department, and the Health department) for the departments of the Municipality of Zürich. Among other key actors, the attitudinal factors were also identified as a strong driver, for example by the bike group “ProVelo” and by some of the political parties. Meanwhile, the attitudinal factors were perceived as a generic driver by other four key actors (e.g., the ZVV -Zürich Transport Authority, the SBB-Federal railways, car-sharing enterprises, and bike-sharing enterprises).

“General environmentalist predisposition” was identified as neither a barrier nor a driver by two key actors (i.e., the business community “City Vereinigung”, and the car group “Touring club Switzerland”). It was either not relevant for five other key actors (i.e., the IVT - of the Department of Civil, the Environmental and Geomatic Engineering of the University of Zürich, the Canton of Zürich, large enterprises like UBS, Crédit Suisse, Google, etc, working in Zürich territory, specific citizens’ groups, and Zürich inhabitants), or information was not made available for some key actors (i.e., other cities in the Canton of Zürich, shopkeepers of a street/ square, and Quartierkonferenz/ Quartiersvereine).

Regarding “behaviour-specific norms and beliefs”, three departments of Zürich Municipality (i.e., the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport, and the Department of Public Safety) and other seven key actors (i.e., the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, the ZVV - Zürich Transport Authority, the SBB - Federal railways, other cities in the Canton of Zürich, the bike group “ProVelo”, specific citizens’ groups, and Zürich inhabitants) identified mobility perceived as a public-space problem as a strong driver. While three other key actors (i.e. car-sharing enterprises, bike-sharing enterprises, and large enterprises like UBS, Crédit Suisse, Google, etc.) identified this belief as an important driver, one

key actor driver (i.e., the political parties) identified it as a motivating driver. It was identified as a generic driver by other four key actors (i.e., the Presidential department, the Health Department, the Energy Commission, and the Canton of Zürich), whereas two key actors (i.e., the business community “City Vereinigung”, and the car group “Touring club Switzerland”) identified it as neither a barrier nor a driver. For the remaining two key actors (i.e., shopkeepers of a street/ square, and Quartierkonferenz/ Quartiervereine), there was no information available.

“Other attitudes”, such as 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, act as a driver for most of the key actors (i.e., all the departments from the Municipality of Zürich involved in the case, Political parties, the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, the ZVV -Zürich Transport Authority, the SBB - Federal railways, and car-sharing enterprises), in different degrees. However, there was no information regarding these issues available for other key actors (i.e., bike-sharing enterprises, the Canton of Zürich, other cities in 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).

“Propensity to negotiation” was also identified as a driver in varying degrees by most of the involved key actors (i.e., the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport, the Department of Public Safety, the 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). This belief was not relevant for three key actors (i.e., the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, car-sharing enterprises, and bike-sharing enterprises). Information about the propensity to negotiation was not available for the remaining key actor – other cities in the Canton of Zürich.

“Perceived benefits of action” attitude was identified either a strong driver by key actors (i.e., the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport, the Department of Public Safety, the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, the ZVV - Zürich Transport Authority, the SBB-Federal railways, the Energy Commission, bike-sharing enterprises, and the Canton of Zürich) or as a generic driver by some other key actors (i.e., the Presidential department, the Health Department, car-sharing enterprises, and large enterprises). Nevertheless, seven key actors (i.e., Political parties, the business community “City Vereinigung”, shopkeepers of a street/ square, the car group “Touring club Switzerland”, Quartierkonferenz/ Quartiervereine, specific citizens’ groups, and Zürich inhabitants) were either ambiguous or had differentiated perceptions about this matter. The information regarding the attitudes toward perceived benefits of action was not available for the one remaining key actor – other cities in the Canton of Zürich.

Concerning the “attitudes towards creating a car-friendly city”, the key actors’ responses varied substantially. More specifically, this attitude represented a driver for seven of the key actors (i.e., the Department of Public Safety, car-sharing enterprises, the Canton of Zürich, other cities in the Canton of Zürich, the business community “City Vereinigung”, shopkeepers of a street/ square, and the car group “Touring club Switzerland”) in various degrees. Meanwhile, it represented a barrier to overcome for the other seven key actors (i.e., the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport, the Energy Commission, the ZVV - Zürich Transport Authority, the SBB-Federal railways, bike-sharing enterprises, and the bike group “ProVelo”). Moreover, for four of the key actors (i.e., Political parties, 12 Quartierkonferenz/ Quartiervereine, specific citizens’ groups, and Zürich inhabitants), this attitude was differentiated from strong driver to barrier. For two key actors (i.e., the Presidential department, and the Health department), this attitude was not relevant. For the remaining two other key actors (the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, and large enterprises), there was no information available.

When considering **capabilities and resources**, “literacy and social status” were identified as not relevant for almost all the key actors involved in Zürich SI case. Information about literacy and social status, however, was not available for three key actors (shopkeepers of a street/ square, 12 Quartierkonferenz/ Quartiervereine, specific citizens’ groups, and Zürich inhabitants). “Financial resources” were evaluated as a driver by ten of the key actors (i.e., all of Municipality of Zürich’s departments, the ZVV -Zürich Transport Authority, the SBB-Federal railways, the Canton of Zürich, large enterprises), whereas this resource was evaluated as a barrier by only three key actors (i.e., the business community “City Vereinigung”, shopkeepers of a street/square, and the car group “Touring club Switzerland”). For the other nine key actors (i.e., Political parties, the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, car-sharing enterprises, bike-sharing enterprises, other cities in the Canton of Zürich, the bike group “ProVelo”, 12 Quartierkonferenz/ Quartiervereine, specific citizens’ groups, and Zürich inhabitants), the information regarding financial resources was not available.

“Time resource” was not relevant or not applicable for most of the key actors (i.e., all the departments of the Municipality of Zürich, the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, the ZVV - Zürich Transport Authority, the SBB-Federal railways, car-sharing enterprises, Political parties, bike-sharing enterprises, the Canton of Zürich, other cities in the Canton of Zürich, large enterprises, the bike group “ProVelo”, 12 Quartierkonferenz/ Quartiervereine, specific citizens’ groups, and Zürich inhabitants). Yet, time represented a barrier for four of the key actors, perceived either as “more time needed for the SI” (i.e., the business community “City Vereinigung”, and shopkeepers of a street/ square), either as “the SI is time consuming and a loss of time” (i.e., the car group “Touring club Switzerland”).

“Knowledge and skills resource” was perceived as not applicable or no information was available about it by sixteen of the key actors involved (i.e., the Presidential department, the Health Department and Energy Commission, Political parties, the SBB-Federal railways, car-sharing enterprises, bike-sharing enterprises, other cities in the Canton of Zürich, large enterprises, 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). For the other five key actors (i.e., the Civil Engineering and Waste Management Department, the Depart-

ment of Public Utilities and Transport, the Department of Public Safety, the ZVV - Zürich Transport Authority, and the Canton of Zürich), however, this resource was considered as a weak barrier.

Regarding “human resources”, most of the key actors either did not provided this information, or considered that this information is not applicable to their context (i.e., Political parties, the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, the SBB-Federal railways, car-sharing enterprises, bike-sharing enterprises, other cities in the Canton of Zürich, large enterprises, 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). For some key actors (i.e., all the departments from the Municipality of Zürich, the ZVV -Zürich Transport Authority, and the Canton of Zürich), it was not clear enough if this specific resource represents a barrier or not.

In relation to “institutional complexity”, except three key actors (i.e., the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, car-sharing enterprises, bike-sharing enterprises) for which this information was not available, all the key actors that offered input on this resource stated that it acts as a barrier. Although, they stated that this particular barrier is manageable due to negotiation, human resources quality, and informal ties. Meanwhile, most key actors, sixteen to be more specific, reported that enhancement of informal ties (and work) represents a driver for them, excepting four cases where the key actors did not provide any information regarding this resource (i.e., Political parties, the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, car-sharing enterprises, bike-sharing enterprises, specific citizens’ groups, and Zürich inhabitants).

When it comes to **contextual factors**, “material costs and rewards” were not applicable in the case of five key actors (i.e., the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich, the bike group “ProVelo”, 12 Quartierkonferenz/Quartiervereine, specific citizens’ groups, and Zürich inhabitants), while there was no information from three other key actors (i.e., the business community “City Vereinigung”, shopkeepers of a street/ square, and the car group “Touring club Switzerland”). For the remaining fourteen key actors, it was identified as a barrier. “Laws and regulations” act as a barrier for thirteen of the key actors (i.e., all of Municipality of Zürich’s departments involved in the case, the ZVV - Zürich Transport Authority, the SBB-Federal railways, the Canton of Zürich, other cities in the Canton of Zürich, the business community “City Vereinigung”, shopkeepers of a street/ square, and the car group “Touring club Switzerland”). Though, this contextual factor acts as a driver for three key actors (i.e., 12 Quartierkonferenz/Quartiervereine, specific citizens’ groups, and Zürich inhabitants).

“Social norms and expectations” were identified as potential drivers by fifteen key actors (i.e., all the departments from the Municipality of Zürich included in the project, Political parties, the ZVV - Zürich Transport Authority, the SBB-Federal railways, car-sharing enterprises, bike-sharing enterprises, the Canton of Zürich, and other cities in the Canton of Zürich). For two key actors (i.e., specific citizens’ groups, and Zürich inhabitants), this factor is not applicable. “Supportive policies” were identified as either a strong driver by key actors (i.e., the ZVV - Zürich Transport Authority, and the SBB-Federal railways) or a generic driver by key actors (i.e., all of Municipality of Zürich’s departments involved in the

case, and the Canton of Zürich). For the remaining thirteen key actors, there was no information available related to this contextual factor.

“Direct democracy” was a weak barrier for eleven of the key actors (i.e., all of Municipality of Zürich’s departments involved in the case, Political parties, the ZVV - Zürich Transport Authority, the SBB-Federal railways, the Canton of Zürich, and other cities in the Canton of Zürich). The other eight key 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.

For **habits and routines** dimension, from the majority of the key actors, either there was no information available (i.e., Political parties, car-sharing enterprises, bike-sharing enterprises, other cities in the Canton of Zürich, large enterprises, the bike group “ProVelo”, and 12 Quartierkonferenz/Quartiervereine) or it was not relevant (i.e., the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport, the Department of Public Safety, the Presidential department, the Health Department, and the IVT - of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich). Although, for nine key actors (i.e., the Energy Commission, the ZVV- Zürich Transport Authority, the SBB-Federal railways, the Canton of Zürich, the business community “City Vereinigung”, shopkeepers of a street/ square, the car group “Touring club Switzerland”, specific citizens’ groups, and Zürich inhabitants), habits and routines represent a weak barrier which involves a certain degree of resistance to change.

Table 2 Barriers and drivers for the key actors of Zürich 's SI

	Key Actor 1 Municipality of Zürich- Civil Engi- neering and Waste Man- agement Department	Key Actor 2 Municipality of Zürich- Department of Public Utilities and Transport	Key Actor 3 Municipality of Zürich- Department of Public Safety	Key Actor 4 Municipality of Zürich- Presidential department	Key Actor 5 Municipality of Zürich- Health de- partment	Key Actor 6 Political parties	Key Actor 7 Municipality of Zürich- Energy Commission	Key Actor 8- IVT –of the Department of Civil, Environmen- tal and Geomatic Engineering of the Uni- versity of Zürich	Key Actor 9- ZVV -Zürich Transport Authority	Key Actor 10- SBB- Federal railways	Key Actor 11- Car- sharing enterprises (e.g. Mobili- ty)
1 Attitudinal											
General environmen- talist predis- position	Strong driver that moti- vates (e.g. towards the upgrade of biking)	Generic driver	Generic driver	Generic driver	Generic driver	Very strong in Greens; lower in socialists; less in the others	Strong driver (among the aims of the Commission)	Not relevant	Generic driver	Generic driver	Generic driver
Behaviour- specific norms and beliefs (mo- bility per- ceived as a public-space problem)	Strong driver that moti- vates action since its start	Strong driver that moti- vates action since its start	Strong driver that moti- vates action since its start	Generic driver (issue among oth- ers)	Generic driver (issue among oth- ers)	Driver that motivates in different ways all parties (issue shared by all parties)	Generic driver (the aim is the energy tran- sition and mobility im- prove- ment con- sidered in this frame)	Strong driver (core IVT issue)	Strong driver (core in the ZVV mission)	Strong driver (core in the local SBB mission)	Important driver that justify that importance of car- sharing

Other attitudes (promotion of technology innovation in mobility also for improving air quality and comfort)	Strong driver (also for riders and pedestrian's safety)	Strong driver (e.g. renew of bus fleet – hydrogen against fossil; Wi-Fi as attractive factor)	Ambiguous (e.g. not enough attention to the promotion of electric cars; lack of charging stations)	Generic driver	Generic driver	No information	Strong driver (technology innovation as a support for energy transition)	Strong driver (core IVT issue)	Strong driver (e.g. renew of bus fleet – hydrogen against fossil; Wi-Fi as an attractive factor)	Strong driver (improving trains for reducing emission and enhancing quality)	Important driver (e.g. use of electric cars)
Other attitudes (propensity to negotiation)	Strong driver; at the basis of the whole and complex decision-making process that involves so many actors	Strong driver; at the basis of the whole and complex decision-making process that involves so many actors	Strong driver; at the basis of the whole and complex decision-making process that involves so many actors	Generic driver (however relevant since the involvement in decision-making based in negotiation)	Generic driver (however relevant since the involvement in decision-making based in negotiation)	On the basis of the whole decision-making process. Should be strong (also among parties)	Generic driver (however relevant since the involvement in decision-making based in negotiation)	Not relevant	Strong driver; at the basis of the whole and complex decision-making process that involves so many actors	Generic driver (however relevant since the involvement in decision-making based in negotiation)	Not relevant
Perceived benefits of action (overall benefits in term of quality of life in various aspects)	Strong driver: we go ahead based on tangible benefits	Strong driver: we go ahead based on tangible benefits	Strong driver: we go ahead based on tangible benefits	Generic driver (benefits of the SI are less linked to his contribution)	Generic driver (benefits of the SI are less linked to his contribution)	Differentiated: improved quality of life appreciated, but not considered (in some parties) as linked to some SI actions. Strong driver in other parties	Strong driver: we go ahead based on tangible benefits	Strong driver: we go ahead based on tangible benefits	Strong driver: we go ahead based on tangible benefits	Strong driver: we go ahead based on tangible benefits	Generic driver (benefits of the SI are less linked to his contribution)
Create a car-friendly city"	Against (barrier considered to overcome)	Against (barrier considered to overcome)	Generic driver (still a part of their vision of mobility)	Not relevant	Not relevant	Differentiated: from strong driver to against	Against (barrier considered to overcome)	No information	Against (barrier considered to overcome)	Against (barrier considered to overcome)	Generic driver (still a part of their vision of mobility)

Deliverable 6.1

Drivers, Barriers, Actors, and Network structures

2 Capabilities and resources											
Literacy	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant
Social status	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant
Financial resources	Strong driver (SI related to wealth city)	Strong driver (SI related to wealth city)	Strong driver (SI related to wealth city)	Strong driver (SI related to wealth city)	Strong driver (SI related to wealth city)	No information	Strong driver (SI related to wealth city)	No information	Strong driver (SI related to wealth city)	Strong driver (SI related to wealth country)	No information
Time	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	No information	Not relevant	No information	Not relevant	No information	No information
knowledge and skills	Weak barrier: some very specific skills are missing	Weak barrier: some very specific skills are missing	Weak barrier: some very specific skills are missing	Not relevant	Not relevant	No information	No information	IVT* considers that there is a lack of K&S in the main actors of the SI	Weak barrier: some very specific skills are missing	No information	No information
human resources	Nor barrier nor driver	Nor barrier nor driver	Nor barrier nor driver	Nor barrier nor driver	Nor barrier nor driver	No information	Nor barrier nor driver	No information	Nor barrier nor driver	No information	No information
institutional complexity (competence conflicts)	Barrier managed thanks to negotiation, human resources quality, and informal ties	Barrier managed thanks to negotiation, human resources quality, and informal ties	Barrier managed thanks to negotiation, human resources quality, and informal ties	Barrier managed thanks to negotiation, human resources quality, and informal ties	Barrier managed thanks to negotiation, human resources quality, and informal ties	Barrier managed thanks to negotiation, human resources quality, and informal ties	Barrier managed thanks to negotiation, human resources quality, and informal ties	No information	Barrier managed thanks to negotiation, human resources quality, and informal ties	Barrier managed thanks to negotiation, human resources quality, and informal ties	No information
enhancement of informal ties (and work)	Strong driver "problem solving" for helping overcoming conflicts	Strong driver "problem solving" for helping overcoming conflicts	Strong driver "problem solving" for helping overcoming conflicts	Strong driver "problem solving" for helping overcoming conflicts	Strong driver "problem solving" for helping overcoming conflicts	No information	Strong driver "problem solving" for helping overcoming conflicts	No information	Strong driver "problem solving" for helping overcoming conflicts	Strong driver "problem solving" for helping overcoming conflicts	No information
3 Contextual factors											
Material costs and rewards	See "financial resources"	See "financial resources"	See "financial resources"	See "financial resources"	See "financial resources"	See "financial resources"	See "financial resources"	Not applicable	See "financial resources"	See "financial resources"	See "financial resources"

Laws and regulations	Barrier: may result in burdens	Barrier: may result in burdens	Barrier: may result in burdens	Barrier: may result in burdens	Barrier: may result in burdens	No information	Barrier: may result in burdens	No information	Barrier: may result in burdens	Barrier: may result in burdens	No information
Social norms and expectations	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	No information	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead
Supportive policies	Generic driver (some federal policies can facilitate)	Generic driver (some federal policies can facilitate)	Generic driver (some federal policies can facilitate)	Generic driver (some federal policies can facilitate)	Generic driver (some federal policies can facilitate)	No information	Generic driver (some federal policies can facilitate)	No information	Strong driver (supportive policy from Municipality and Canton on mobility)	Strong driver (supportive policy from Municipality and Canton on mobility)	No information
Direct democracy	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Generic driver: an incentive for action	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	No information
4 Habit and routine	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	No information	Weak barrier (involves some resistance to change)	Not relevant	Weak barrier (involves some resistance to change)	Weak barrier (involves some resistance to change)	No information

	Key Actor 12 Bike-sharing enterprises	Key Actor 13 Canton of Zürich	Key Actor 14 Other cities in the Canton of Zürich	Key Actor 15 Large enterprises: UBS, Crédit Suisse, Google, etc, working in Zürich territory	Key Actor 16 Business community "City Vereinigung"	Key Actor 17 Shopkeepers of a street/square where a project is implemented	Key Actor 18 Car group "Touring club Switzerland"	Key Actor 19 Bike group "ProVelo"	Key Actor 20 12 Quartierkonferenz/ Quartiervereine	Key Actor 21 Specific citizens' groups (e.g. "street communities")	Key Actor 22 Zürich inhabitants
1 Attitudinal											
General environmentalist predisposition	Generic driver	Not relevant	No information	Not relevant	Nor barrier nor driver	No information	Nor barrier nor driver	Strong driver (core in the groups' mission)	No information	Often not relevant (issue perceived only from some segments of the population)	Often not relevant (issue perceived only from some segments of the population)
Behaviour-specific norms and beliefs (mobility perceived as a public-space problem)	Important driver (justify the importance of Bike-sharing)	Generic driver (issue among others)	Strong driver in some municipalities; generic in others	Important driver (positive image of Zürich)	Nor barrier nor driver	No information	Nor barrier nor driver	Strong driver (core in the groups' mission)	No information	More or less a strong driver (related to the improvement of the quality of life)	More or less a strong driver (related to the improvement of the quality of life)
Other attitudes, (promotion of technology innovation in mobility also for improving air quality)	No information	No information	No information	No information (but It could be a strong driver)	No information	No information	No information	No information	No information	No information	No information

Other attitudes (propensity to negotiation)	Not relevant	Strong driver; at the basis of the whole and complex decision-making process that involves so many actors	No information	Generic driver (relevant since the involvement in decision-making based in negotiation)	Generic driver (relevant since the involvement in decision-making based in negotiation)	Generic driver (relevant since the involvement in decision-making based in negotiation)	Generic driver (relevant since the involvement in decision-making based in negotiation)	Generic driver (relevant since the involvement in decision-making based in negotiation)	Strong driver; at the basis of the whole and complex decision-making process that involves so many actors	Strong driver; at the basis of the whole and complex decision-making process that involves so many actors	Strong driver, also thanks to the Switzerland model of direct democracy
Perceived benefits of action (overall benefits in term of quality of life in various aspects)	Strong driver: we go ahead based on tangible benefits	Strong driver: we go ahead based on tangible benefits	No information (but we can imagine at least a generic driver)	Generic driver (benefits of the SI are less linked to their contribution)	Ambiguous: improved quality of life appreciated, but not considered linked to SI actions, such as limits in car traffic	Ambiguous: improved quality of life appreciated, but not considered linked to SI actions, such as limits in car traffic	Ambiguous: improved quality of life appreciated, but not considered linked to SI actions, such as limits in car traffic	Strong driver: we go ahead based on tangible benefits	Differentiated: improved quality of life appreciated, but someone does not consider it as linked to some SI actions. Strong driver X other	Differentiated: improved quality of life appreciated, but someone does not consider it as linked to some SI actions. Strong driver X other	Differentiated: improved quality of life appreciated, but someone does not consider it as linked to some SI actions. Strong driver X other
Create a car-friendly city"	Against (barrier considered to overcome)	Generic driver (still a part of their vision of mobility)	Generic driver (part of their vision of mobility outside Zürich)	No information	Generic driver (still a part of their vision of mobility)	Generic driver (still a part of their vision of mobility)	Strong driver (this is their vision of mobility)	Against (barrier considered to overcome)	Differentiated: from strong driver to against	Differentiated: from strong driver to against	Differentiated: from strong driver to against
2 Capabilities and resources											
Literacy	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant
Social status	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	No information	Not relevant	Not relevant	No information	No information	No information
Financial resources	No information	Strong driver (SI related)	No information	Generic driver (SI)	Barrier: fear of losing	Barrier: fear of losing	Barrier: fear of losing	No information	No information	No information	No information

		to area's wealth)		related to city's wealth)	revenue	revenue	revenue				
Time	Not relevant	Not relevant	No information	Not relevant	Barrier: SI can require additional time to potential buyers	Barrier: SI can require additional time to potential buyers	Barrier: SI causes loss of time	No information	No information	Not apply	Not apply
knowledge and skills	No information	Weak barrier: some very specific skills are missing	No information	No information	No information	No information	No information	No information	No information	Not applicable	Not applicable
human resources	No information	Nor barrier nor driver	No information	No information	No information	No information	No information	No information	No information	Not applicable	Not applicable
institutional complexity (competence conflicts)	No information	Barrier; managed thanks to negotiation, human resources quality, and informal ties	Barrier; managed thanks to negotiation, human resources quality, and informal ties	Barrier; managed thanks to negotiation, human resources quality, and informal ties	Barrier; managed thanks to negotiation, human resources quality, and informal ties	Barrier; managed thanks to negotiation, human resources quality, and informal ties	Barrier; managed thanks to negotiation, human resources quality, and informal ties	Barrier; managed thanks to negotiation, human resources quality, and informal ties	Barrier; managed thanks to negotiation, human resources quality, and informal ties	Barrier; managed thanks to negotiation and human resources quality	Barrier; managed thanks to negotiation and human resources quality
enhancement of informal ties (and work)	No information	Strong driver "problem solving" for helping to overcome conflicts	Strong driver "problem solving" for helping to overcome conflicts	Generic driver "problem solving" for helping to overcome conflicts	Generic driver "problem solving" for helping to overcome conflicts	Generic driver "problem solving" for helping to overcome conflicts	Generic driver "problem solving" for helping to overcome conflicts	Generic driver "problem solving" for helping to overcome conflicts	Generic driver "problem solving" for helping to overcome conflicts	No information	No information
3 Contextual factors											
Material costs and rewards	See "financial resources"	See "financial resources"	See "financial resources"	See "financial resources"	No information	No information	No information	Not applicable	Not applicable	Not applicable	Not applicable
Laws and regulations	No information	Barrier: may result in burdens	Barrier: may result in burdens	No information	Barrier: may result in burdens	Barrier: may result in burdens	Barrier: may result in burdens	No information	Generic driver (see direct democracy)	Generic driver (see direct democracy)	Generic driver (see direct democracy)

Social norms and expectations	Citizens' expectation may be a driver for going ahead	Citizens' expectation may be a driver for going ahead	Citizens' expectation may be a driver for going ahead	No information	No information	No information	No information	Citizens' expectation may be a driver for going ahead	Citizens' expectation may be a driver for going ahead	Not applicable	Not applicable
Supportive policies	No information	Generic driver (some federal policies can facilitate)	No information	No information	No information	No information	No information	No information	No information	No information	No information
Direct democracy	No information	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	No information	Strong driver: allow the opposition to have a couple of actions in SI	Strong driver: allow the opposition to have a couple of actions in SI	Strong driver: allow the opposition to have a couple of actions in SI	Generic driver: an incentive for action	Generic driver: an incentive for action (but it's almost a routine)	Generic driver: an incentive for action (but it's almost a routine)	Generic driver: an incentive for action (but it's almost a routine)
4 Habit and routine	No information	Weak barrier (involves some resistance to change)	No information	No information	Weak barrier (involves some resistance to change)	Weak barrier (involves some resistance to change)	Weak barrier (involves some resistance to change)	No information	No information	Weak barrier (involves some resistance to change)	Weak barrier (involves some resistance to change)

(*) Interviewed key informant

Identification of actors and of network structures

For each key actor involved in the Zürich SI case, a detailed description is offered in Annex 1 on different topics, such as actor's characteristics, their decisions and actions, collectives and structures they are a part of, and their most important or relevant interactions with other actor types. Below, a description of main relationships and interactions is provided.

The **Civil Engineering and Waste Management Department (Road, Building and Recycling)** key actor has a day by day cooperation with the Department of Public Utilities and Transport and the Department of Public Safety. This key actor has a day by day cooperation with the Presidential department and the Health department too, but with a lower intensity. Also, this key actor interacts with the Energy Commission and Political Parties from the Municipality of Zürich. Another interaction is with Zürich inhabitants, as this key actor should respect the decisions taken by the citizens through referenda. It also consults periodically with Shopkeepers of a specific street or square where a project will be implemented (e.g. pedonalization), with the Bike group "ProVelo", with 12 Quartierkonferenz/ Quartiervereine and with Specific citizens' groups (e.g. "street communities"). There is a mutual dependency of actions, and therefore often interactions between the Civil Engineering and Waste Management Department and Bike sharing enterprises and the Bike group "ProVelo".

The **Department of Public Utilities and Transport (Public Transport Services, Water Supply, Electricity Services)** cooperates on a daily basis with the Civil Engineering and Waste Management Department and the Department of Public Safety. This department also cooperates daily with the Presidential department and the Health department, too, but with a lower intensity. This key actor also cooperates with Political parties keeping, however, an independency from them. This key actor should also refer to the Energy Commission of the Municipality of Zürich and act accordingly, and should respect the decisions taken by Zürich inhabitants through referenda. It consults periodically with Shopkeepers of a specific street or square where a project will be implemented, with the Bike group "ProVelo", with 12 Quartierkonferenz/ Quartiervereine and with Specific citizens' groups (e.g. "street communities"). There is a day by day cooperation (on an informal basis, too) with the Zürich Transport Authority (ZVV) and the Canton of Zürich (Building Department and Department for Economic Affairs).

The next key actor from the Municipality of Zürich, **the Department of Public Safety**, cooperates daily with the Department of Public Utilities and Transport, and with the Canton of Zürich. This department also cooperates on a daily basis with the Presidential department and the Health department, but with a lower intensity. This key actor, too, should refer to the Energy Commission of the Municipality of Zürich and act accordingly, and to Political parties. Also, it should respect the decisions taken by Zürich inhabitants through referenda. The Department of Public Safety consults periodically with Car sharing enterprises, the Car group "Touring club Switzerland", the Bike group "ProVelo", 12 Quartierkonferenz/ Quartiervereine and Specific citizens' groups (e.g. "street communities"). Moreover, this key actor interacts with IVT of the University of Zürich, as it implemented studies useful for the work of this department.

The **Presidential department** has the following interactions: (a) Civil Engineering and Waste Management Department, Department of Public Utilities and Transport, Department of Public Safety, and Health department according to specific issues; (b) Energy Commission of the Municipality of Zürich and Political parties, to whom should refer and act accordingly; (c) Zürich inhabitants, of whom it should

respect the decisions taken through referenda; (d) periodic consultations with Large enterprises, Business community “City Vereinigung”, Shopkeepers of a specific street or square where a project will be implemented, 12 Quartierkonferenz/ Quartiervereine and Specific citizens’ groups (e.g. “street communities”).

The next key actor from Municipality of Zürich, **the Health Department**, has the following interactions, grouped by the type of relationship: (a) according to specific issues, with the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport, the Department of Public Safety, and the Presidential department; (b) it should refer to Political parties; (c) it should respect the decisions taken by Zürich inhabitants through referenda; (d) periodical consultations with 12 Quartierkonferenz/ Quartiervereine and Specific citizens’ groups.

The next key actor from Municipality of Zürich, **the Political parties**, offered the following information regarding its network and interactions: (a) they can affect all instances of the Municipality (Civil Engineering and Waste Management Department, Department of Public Utilities and Transport, Department of Public Safety, Presidential department, Health department, and Energy Commission of the Municipality of Zürich) as well as the Canton; (b) they are influenced by Citizens (Zürich inhabitants) through their vote.

The seventh key actor from Municipality of Zürich, **the Energy Commission**, interacts with the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport, and the Department of Public Safety according to specific issues. This key actor also interacts with Political parties, and with Zürich inhabitants.

The key actor **Institute for Transport Planning and Systems of the Department of Civil, Environmental and Geomatic Engineering (IVT)**, representing the scientific community involved in this SI case, interacts mostly with the Department of Public Safety, having a cooperation-based relationship.

The next key actor belonging to transport enterprises group, **Zürich Transport Authority (ZVV)**, interacts with the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport (mainly), the Department of Public Safety, the Canton of Zürich, Other cities in the Canton of Zürich, according to specific issues (policy). Also, it has an operational interaction with Federal railways (SBB). This key actor consults according to needs (e.g. extension of a line, new line, timetable, etc.) with Specific citizens’ groups (e.g. “street communities”) and Quartierkinferenz.

The tenth key actor, corresponding to the Transport enterprises group, too, **SBB - Federal railways**, interacts with the Canton of Zürich (mainly), with the Department of Public Utilities and Transport, and has an operational interaction with the Zürich Transport Authority (ZVV).

The eleventh key actor, **Car sharing enterprises (Mobility)**, interacts mainly with the Department of Public Safety from the Municipality of Zürich. This key actor is also having a cooperation-based interaction with SBB - Federal railways.

The twelfth key actor, belonging to the transport enterprises group, too, **Zürich bike sharing enterprises**, interacts mainly with the Civil Engineering and Waste Management Department from the Municipality of Zürich.

The thirteenth key actor, the **Canton of Zürich** (Building Department and Department for Economic Affairs), interacts with the Department of Public Utilities and Transport and Department of Public Safety (mainly) but also the Civil Engineering and Waste Management Department (operational and also informal interaction for the management of all the mobility issues). Because local railway is under the competence of the canton, this key actor also interacts with SBB-Federal railways. Also, this key actor is influenced by the decisions of the inhabitants of Zürich and all people of the Canton, and consults periodically with the Car group “Touring club Switzerland”, with the Bike group “ProVelo”, with 12 Quartierkonferenz/ Quartiersvereine, and with Specific citizens’ groups (e.g. “street communities”).

The fourteenth key actor, **Other cities in the Canton of Zürich**, interacts mainly with the Canton of Zürich, but also with SBB-Federal railways and the Zürich Transport Authority (ZVV).

The fifteenth key actor, **Large enterprises: UBS, Crédit Suisse, Google, etc..., working in the Zürich territory**, belonging to the business category, interacts with the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport and the Department of Public Safety from the Municipality of Zürich, but also with shopkeepers of a specific street or square where a project will be implemented (e.g. pedonalization).

The sixteen key actor **Business community “City Vereinigung”** interacts with several departments from the Municipality of Zürich, such as the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport and the Department of Public Safety, but also with shopkeepers of a specific street or square where a project will be implemented (e.g. pedonalization).

The seventeenth key actor, **Shopkeepers of a specific street or square where a project will be implemented (e.g. pedonalization)**, interacts with several departments from the Municipality of Zürich, such as the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport and the Department of Public Safety, and with the Business community “City Vereinigung”.

The eighteenth key actor, the **Car group “Touring club Switzerland”**, which belongs to the citizenship group, also interacts with several departments from the Municipality of Zürich (Civil Engineering and Waste Management Department, Department of Public Utilities and Transport and Department of Public Safety), with the Canton of Zürich, and Political parties (big influence on the conservative parties).

The nineteenth key actor, which belongs to the citizenship group, the **Bike group “ProVelo”**, interacts mainly with the Civil Engineering and Waste Management Department, but also with the Department of Public Utilities and Transport and the Department of Public Safety, and with the Canton of Zürich.

The twentieth key actor involved in the Zürich SI case, **12 Quartierkonferenz/ Quartiersvereine**, interacts with some of the departments from the Municipality of Zürich, such as the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport and the Department of Public Safety, but also with the Canton of Zürich. This key actor also interacts with the Zürich Transport Authority (ZVV) and Federal railways (SBB) (e.g. in relation to the creation of a new station, the extension of a tram/bus line; etc.), with Zürich inhabitants and also with Shopkeepers of a specific street or square where a project will be implemented in their area.

The twenty-first actor, namely **Specific citizens’ groups (e.g. “street communities”)**, interacts with several departments from the Municipality of Zürich, such as the Civil Engineering and Waste Management

Department, the Department of Public Utilities and Transport, the Department of Public Safety, with the Canton of Zürich, and also with the Zürich Transport Authority (ZVV) and Federal railways (SBB) (e.g., in relation to the extension of a tram line, a new station, etc.).

The next key actor, namely **Zürich inhabitants**, interacts with several departments from the Municipality of Zürich, such as the Civil Engineering and Waste Management Department, the Department of Public Utilities and Transport, the Department of Public Safety, the Presidential department, the Health department, the Energy Commission of the Municipality of Zürich, and Political parties, and also with the Canton of Zürich. This key actor also consults with 12 Quartierkonferenz/ Quartiersvereine, and Specific citizens' groups. Moreover, this key actor interacts with the entrepreneurial side, too, with the Business community "City Vereinigung", Shopkeepers, the Car group "Touring club Switzerland", and the Bike group "ProVelo" (related to Zürich people).

Essential description of network dynamics

The figures below illustrate the network structure of interaction between involved key actors in the Zürich SI case. As seen in both Figure 5 and Figure 6, the Zürich Municipality is the main hub for information flow between the key actors. Within the main hub, collaborative decisions are made among key departments of the Zürich Municipality (see Figure 7). The decisions at the Municipality level are influenced and shaped as a result of constant interactions with remaining key actors. The feedback about the impacts of those decisions on involved actors provides the base for further development and evolution of strategies addressing emergent issues. The strengthened and consolidated mobility strategy, which represents a model of holistic and persistent mobility plan, entails gaining in quality of life for citizens and improvement of air quality in the city.

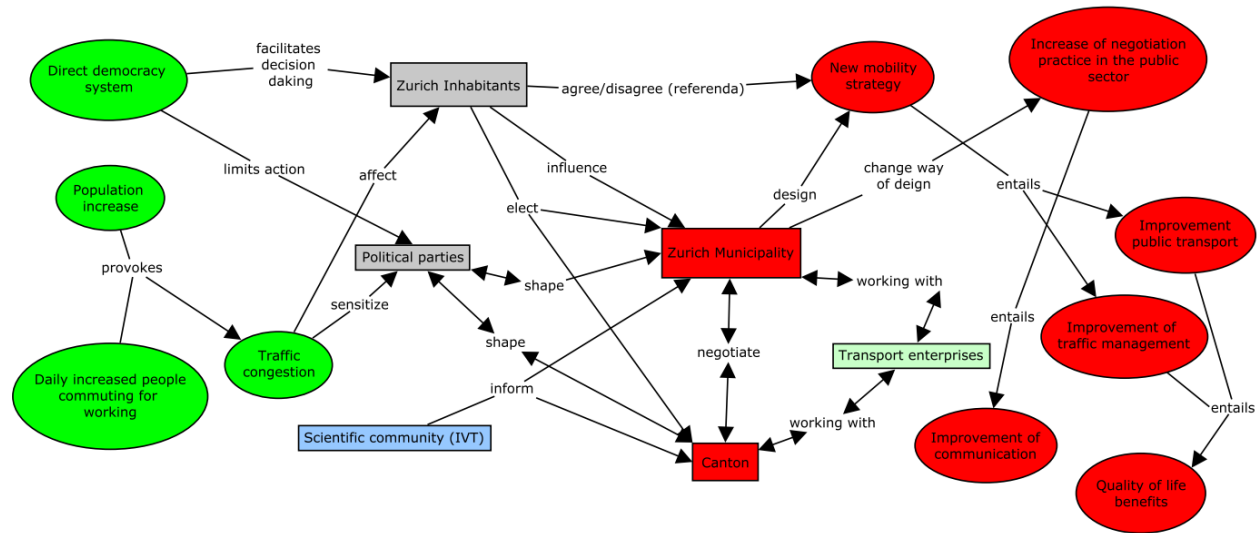
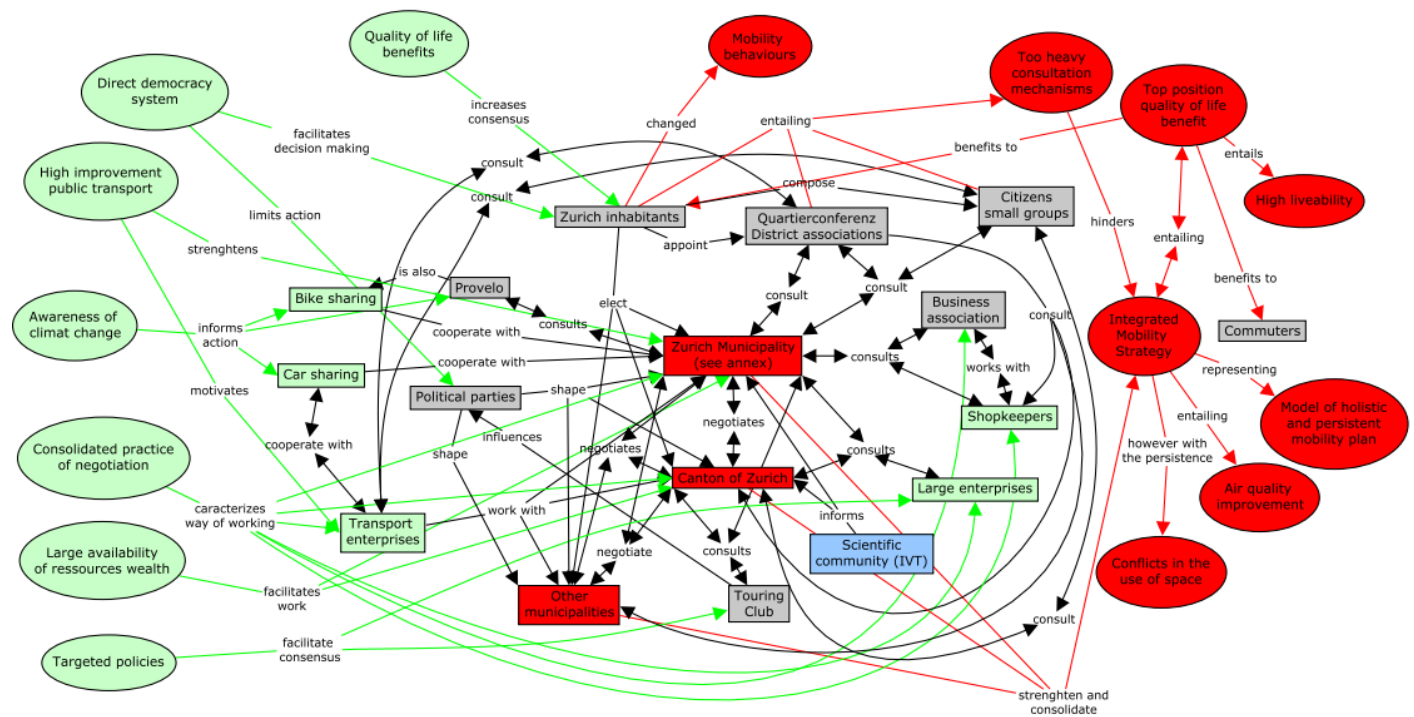


Figure 5 Zürich' SI in the seventies at its initial stage



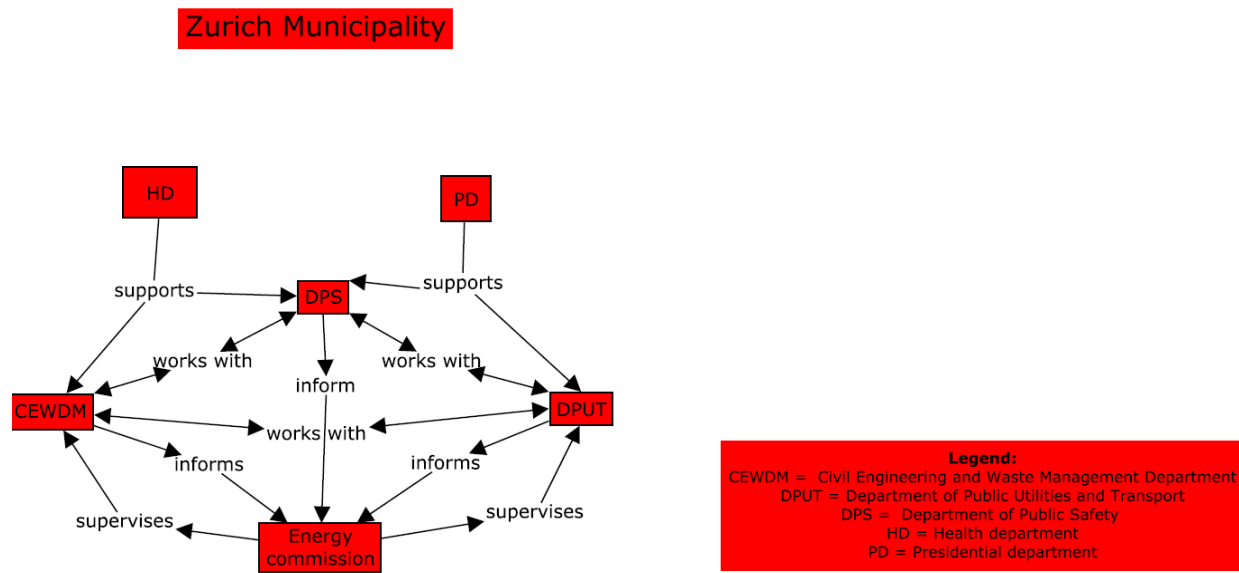


Figure 7 Zürich's municipality departments' interaction

2.1.2 Groningen

In the Groningen SI case, a total of eight key actors are involved, namely: (1) newspapers, (2) individual shopkeepers from Shopping Centre Paddepoel, (3) shopkeeper associations, (4) Burgemeester & Wethouders (B&W; Mayor and Councillors), (5) Department of Urban Development and Housing (Dienst Stadsontwikkeling en Volkshuisvesting), (6) citizens, (7) Echte Nederlandse Fietsersbond (ENFB; Cyclists' Union), and (8) ROVER (Travellers Public Transport - organization representing travellers in public transport).

Identification of barriers and drivers

All key actors involved in the Groningen SI case identified its barriers and drivers related to attitudinal factors, capabilities and resources, contextual factors, and habits and routines, which can affect their case.

In Groningen case, **attitudinal factors** are perceived mostly in a positive way, acting more as drivers than barriers for most of the key actors. Specifically, the “general environmentalist predisposition” is considered a driver by six of the key actors (i.e., B&W, DSenV, ENFB, ROVER, shopkeepers, shopkeeper associations), whereas only one key actor considers this attitude as both a driver and a barrier (i.e., citizens). Regarding “behaviour-specific norms and beliefs”, strong barriers were identified as being related to concerns about income (i.e., shopkeepers, shopkeeper associations), support in the use of the bikes, public transport and recreational value (i.e., ENFB, ROVER). The belief in democracy was identified both as a strong barrier and as a driver (i.e., B&W). The support and development the vision of a holistic traffic planning, focus at the inner city from a multi-functional perspective, and motivation to involve citizens in planning processes were attitudinal factors identified as drivers by one key actor (i.e., DSenV). Citizens, as key actors, are varying in terms of strength and direction regarding their beliefs on the impact of closing the park for car traffic, related to safety, accessibility, economics, ecology and use of the park for festivals.

“Other attitudes”, for example related to technology attributes, represent a strong driver for two of the key actors (i.e., B&W, DSenV), and a driver for other two key actors (i.e., ENFB, ROVER). However, this attitude acts as a barrier for two actors (i.e., shopkeepers and shopkeeper associations), based on the belief that a bike is not suited for shopping activities, and reluctance to change respectively, for one key actor (citizens). For one key actor (i.e., newspapers), the values of objectivity of information may be seen as both a driver and a barrier.

Regarding “perceived costs and benefits of action”, two key actors (i.e., shopkeepers and shopkeeper associations) identified both drivers and barriers in terms of time, effort, motivation, fear of losing customers, or decreased employment. Some of the key actors (i.e., DSenV, ROVER, ENFB) identified drivers related to improvement of the cycling infrastructure, the environmental quality and utility of the park, or PR benefits. One key actor (i.e., ENFB) identified one strong driver as being related to benefits for cyclists, in particular for their safety. For one actor (i.e., citizens), the costs and benefits in terms of accessibility and safety of the pedestrians (kids), cyclists and car-drivers, or the increased unsafety due to

more (freight) traffic in the neighbouring areas, vary in terms of strength and direction. The particular interest of politicians to win the next elections was identified as a barrier by one key actor (i.e., B&W).

When considering **capabilities and resources**, “literacy” was identified as either a strong driver (i.e., shopkeeper associations, DSenV, ENFB) or a driver (i.e., shopkeepers, ROVER) by five key actors, or as a strong barrier (i.e., citizens). “Social status” was considered in general as a driver, but with variation in the degree, as follows: a strong driver for two of the key actors (i.e., shopkeeper associations and ENFB), a driver by four key actors (i.e., shopkeepers, B&W, DSenV, ROVER) and a moderate driver by one actor (i.e., citizens).

“Financial resources” were considered both as drivers and barriers in the Groningen case. Namely, these resources are perceived as a driver, in different degrees, by four of the key actors (i.e., shopkeeper associations, citizens, B&W, DSenV). However, financial resources were considered at the same time barriers and drivers by one actor (i.e., shopkeepers), whereas it represents a clear barrier for three of the actors involved (i.e., newspapers, ENFB, ROVER). “Time” was identified as a driver by seven of the key actors (i.e., shopkeepers, shopkeeper associations, B&W, DSenV, citizens, ENFB, ROVER). The other key actor (i.e., newspapers), considers that this particular resource is not applicable for its context.

“Human resources” was identified as a driver by five of the key actors (i.e., shopkeeper associations, B&W, DSenV, citizens, ENFB), and a moderate driver by two key actors (i.e., shopkeepers, ROVER). One key actor considered this resource as not applicable in its specific context (i.e., newspapers). “Knowledge and skills” were considered a strong driver by one of the key actors (i.e., DSenV), a driver by four key actors (i.e., B&W, citizens, ENFB, ROVER), a barrier by two actors (i.e., shopkeepers, shopkeeper associations), whereas for only one this resource is not applicable (i.e., newspapers).

Taking into consideration the **contextual factors**, “material costs and rewards” are considered either as barriers (i.e., newspapers, DSenV) or as drivers (i.e., B&W). “Laws and regulations” are considered mostly as drivers (i.e., newspapers, B&W, DSenV, ENFB, ROVER). “Social norms and expectations” are seen mostly in a positive manner. More specific, this factor is acting as a driver for six of the key actors (i.e., shopkeeper associations, B&W, DSenV, citizens, ENFB, ROVER), whereas for one other key actor it is unclear, varying in strength and direction (i.e., shopkeepers). For one key actor, social norms and expectations is not applicable (i.e., newspapers). “Supportive policies” do not represent a factor of interest or of impact for five key actors from Groningen case (i.e., newspapers, shopkeepers, shopkeeper associations, ENFB, ROVER), but a (strong) driver for two of the key actors (i.e., DSenV, citizens). This factor represents both a driver and a barrier for one of the key actors (i.e., B&W).

Habits and routines represent a weak barrier for one key actor (i.e., ENFB) as it involved a certain degree of resistance to change. From the majority of actors, this information was not made available or it is not relevant for their specific context.

Table 3 Barriers and drivers for the key actors of Groningen's SI

1 Attitudinal	Key Actor 1 - newspapers	Key Actor 2 - shopkeepers	Key Actor 3 - shopkeeper associations	Key Actor 4 - B&W	Key Actor 5 - DSenV	Key Actor 6 - citizens	Key Actor 7 - ENFB	Key Actor 8 - ROVER
General environmentalist predisposition	NA	Very weak driver (nowadays more than in the 1990's)	Very weak driver (nowadays more than in the 1990's)	Driver (nowadays more than in the 1990's)	Driver (nowadays more than in the 1990's)	Varying - for some segments a driver, for other segments a barrier; further analyses of segments needed	Driver	Driver
Behaviour-specific norms and beliefs (specify)	NA	Strong barrier - concerns about income	Strong barrier - concerns about income	Belief in democracy - Strong driver as led to organization of referendum; Strong barrier as the plan for closing Noorderplantsoen was consulted publicly for over 10 years	Driver - supporting and developing the vision of a holistic traffic planning. Driver - focussing at the inner city from a multi-functional perspective (city center as living room). Driver - motivated to involve citizens in planning processes.	Varying in terms of strength and direction - different beliefs on the impact of closing the park for car traffic, related to safety, accessibility, economics, ecology and use of the park for festivals	Strong driver - supporting the use of the bikes, public transport and recreational value of the park	Strong driver - supporting public transportation
Other attitudes, (specify, e.g., about technology attributes etc.)	Driver but also a possible barrier - values of objectivity of information	Barrier - belief that shopping cannot be done biking, and a car is needed for this activity	Barrier - reluctance to change (often), some have a more adaptive attitude	Strong driver - environmental values of the local politicians	Strong driver - wide experience with infrastructural change, in particular favouring cyclists and pedestrians	Varying in terms of strength and direction - generic attitudes on the importance of biking for the city, and the symbolic value of the car (freedom, prosperity)	Driver - empathy for maintaining businesses in the region (e.g. closing the roads for cars but maintaining car access for a local restaurant)	Driver - perceiving the bike as an important part of the public transportation systems; Driver - arguing for more choice in transport options

Perceived costs and benefits of action (specify their nature)	NA	Barrier - costs in time and effort devoted to participate in shopkeeper associations and lobby; Driver - high motivation to participate individually and organize, as well-being of the business perceived to strongly depend on the park status	Strong barrier - Fear for losing customers due to a lower accessibility by cars; Strong barrier - especially of PR value - decreased employment; Driver - benefits in particular for café/restaurants, having a higher quality environment (terraces) and perhaps a more intensive usage of the park.	Barrier - particular interests of politicians to win next elections	Driver - benefits relate to improving the cycling infrastructure, improving the environmental quality of the park, improving the utility of the park for different groups of users.	Varying in terms of strength and direction - costs & benefits in terms of accessibility, safety for pedestrians (kids), cyclists and car-drivers. Increased unsafety due to more (freight)traffic in the neighbouring areas.	Strong driver - benefits for cyclists, in particular safety; Driver - PR benefits for the organization if lobbying succeeds	Driver - PR benefits for the organization if lobbying succeeds
Etc.	NA						Driver - empathy with the local community (closing more roads aimed at prevention of through traffic in adjacent neighbourhoods)	
2 Capabilities and resources	NA							
Literacy	NA	Driver	Strong driver	NA	Strong driver - long term experience in city planning	Strong barrier for non-Dutch speaking minorities	Strong driver	Driver
Social status	NA	Driver	Strong driver	Driver	Driver	Moderate driver - close to the park many high-income people, but also social housing	Strong driver	Driver
Financial resources	Barrier - partly dependent on shopkeepers adverts	Varying, depending on the type of business	Strong driver for organizing campaigns	Driver - municipality has budgets, but they have to allocate these over different departments like DS&V.	Driver - DS&V has its own budget, but they have to allocate these over different projects.	Moderate driver as areas around the park are generally in a more affluent part of the city	Barrier - impossible for ENFB and ROVER to organize a campaign at the same scale as the shopkeeper interest groups, even though they were the only organizations representing cyclists, pedestrians and citizens using public transport	Barrier - impossible for ENFB and ROVER to organize a campaign at the same scale as the shopkeeper interest groups, even though they were the only organizations representing cyclists, pedestrians and citizens using public transport

Time	NA	Driver - motivated to invest in participating in planning	Driver - representatives of shopkeeper associations present at every consultation, active in advisory bodies	Driver - FTE's allocated	Driver - FTE's allocated	Driver - representatives of neighbourhoods present at every consultation	Driver - representatives of ENFB present at every consultation	Driver - representatives of ROVER present at every consultation
knowledge and skills	NA	Barrier - low ability to predict the actual effects of closing the park for car traffic on sales	Barrier - a basic vision on city planning	Driver - large amount of time devoted, concerning generic vision on city development	Strong driver - city planners	Driver - experts in city planning living in the neighbourhood; Driver - high ability to create coalitions (e.g. between neighbourhoods and ENFB) and lobby (e.g. issue press releases, organize demonstrative bike rides, etc.)	Driver - ability to listen to groups (empathy) and to modify the propositions to answer other stakeholders needs (e.g. advocating for installing bike parking spots, as biking citizens will increase the sales of shops); Driver - high ability to create coalitions (e.g. between neighbourhoods and ENFB) and lobby (e.g. issue press releases, organize demonstrative bike rides, etc.)	Driver
human resources	NA	Moderate driver	Driver - high motivation to engage in actions	Driver - FTE's allocated	Driver - FTE's allocated	Driver - experts in city planning living in the neighbourhood; representatives of neighbourhoods are highly motivated and submit written opinions on B&W's plans of changing the traffic	Driver - ability to employ experts to provide commentary for city plans (e.g. traffic engineer B. Miedema providing a second written opinion of ENFB to the B&W); Human capital mainly comprising of volunteers, but with high skills and high motivation	Moderate driver - human capital mainly comprising of volunteers
3 Contextual factors								
Material costs and rewards	Strong barrier - publishing advertisements for shopkeepers results in revenue	NA	NA	Strong driver - allocating budget to projects on city development	Weak barrier - Investment in test; Weak barrier - upgrading of the road when cars are banned (limited costs)	NA	NA	NA

Laws and regulations	Driver - journalistic independence	NA	NA	Strong driver - national and regional legislation to improve the impact on environment and safety	Driver - test for the first decisive referendum in the Netherlands adjusting traffic rules for cars	NA	Driver - organization's internal vision and mission	Driver - organization's internal vision and mission
Social norms and expectations	NA	Varying in strength and direction - some may expect a decline in business (e.g. retail), others may expect benefits (café/restaurant). The shopkeepers may communicate this with their customers.	Driver - generic expectation of the city to continue developing in a cycling friendly direction.	Driver - strong expectation that a holistic traffic planning supporting biking, pedestrians and public transportation will benefit both the quality-of-life of the citizens as well as the economic prosperity of the city due to its attractiveness for visitors.	Driver - generic norm in favour of biking and walking as means of transportation in the city centre. Perception of the park as a city's park	Driver - expressing neighbourhood support for closing the park by using posters	Driver - public recognisability of the organization	Driver - public recognisability of the organization
Supportive policies	NA	NA	NA	Driver and barrier - generic communication of vision for the city	Driver - test closure of the park for one year, with steamrollers signalling the character of a test.	Strong driver - 1-year long test-period of closing the park to experience	NA	NA
4 Habit and routine								
Social norms and expectations	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	Citizens expectation may be a driver for going ahead	No information
Supportive policies	Generic driver (some federal policies can facilitate)	Generic driver (some federal policies can facilitate)	Generic driver (some federal policies can facilitate)	Generic driver (some federal policies can facilitate)	Generic driver (some federal policies can facilitate)	No information	Generic driver (some federal policies can facilitate)	No information
Direct democracy	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Weak barrier: can entail some delay in actions' implementation (e.g. waiting for referenda results)	Generic driver: incentive for action
4 Habit and routine	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	No information	Weak barrier (involves some resistance to change)	Not relevant

Identification of actors and of network structures

For each key actor, a detailed description is offered in Annex 1, on multiple topics such as the actors' characteristics, their decisions and actions, collectives and structures they are a part of, and their most important or relevant interactions with other actor types. Bellow, information regarding the actors' network and interactions is provided.

The first key actor, **newspapers**, interacts with shopkeepers.

The second key actor from Groningen SI case, **shopkeepers**, interacts with the newspapers (see above) by paying for adverts, and with citizens who shop there (lobby for keeping Noorderplantsoen open for cars).

The **shopkeeper associations** key actor interacts with other members of the "Traffic group investigation northern neighbourhoods", during consultancy meetings organized by B&W.

The **B&W** key actor interacts with other members of the "Traffic group investigation northern neighbourhoods" during consultancy meetings organized by B&W, but also with the Department of Urban Development and Housing and with the local community.

The fifth key actor, **DSenV** interacts with B&W.

The **citizens** key actor interacts with B&W in forming opinions, listening to opinions at meetings organized by B&W, and with shopkeepers, too.

Both the seventh key actor, **ENFB**, and the eight key actor, **ROVER**, have interactions with other members of the "Traffic group investigation northern neighbourhoods" during consultancy meetings organized by B&W.

Essential description of network dynamics

Citizens (Figure 8) represent one of the actors in this case study, an actor who has certain needs and expresses attitudes that are based on particular values. They receive and give information to the media and local government, these being other actors within the network of actors. Also, the citizens are grouped in citizen associations. Citizens' association is a different actor. Citizen associations promote a set of values and provide feedback on policy scenarios for the local government. The local government, based on political programs that promote certain values, creates policy scenarios and defines them based on the feedback received by consulting other actors from the network (citizens, schools in the neighbourhood, shopkeepers, shopkeepers' associations). Regarding the media, the behavior of this actor is guided by the objectivity of the information it delivers (as a value). It is financially supported by shopkeepers (another actor), whose policy is based on profit maximization. The shopkeepers are grouped / organized into shopkeepers' associations. Another actor in this network is represented by neighbourhood schools, whose attitude includes the safety of children as the main value.

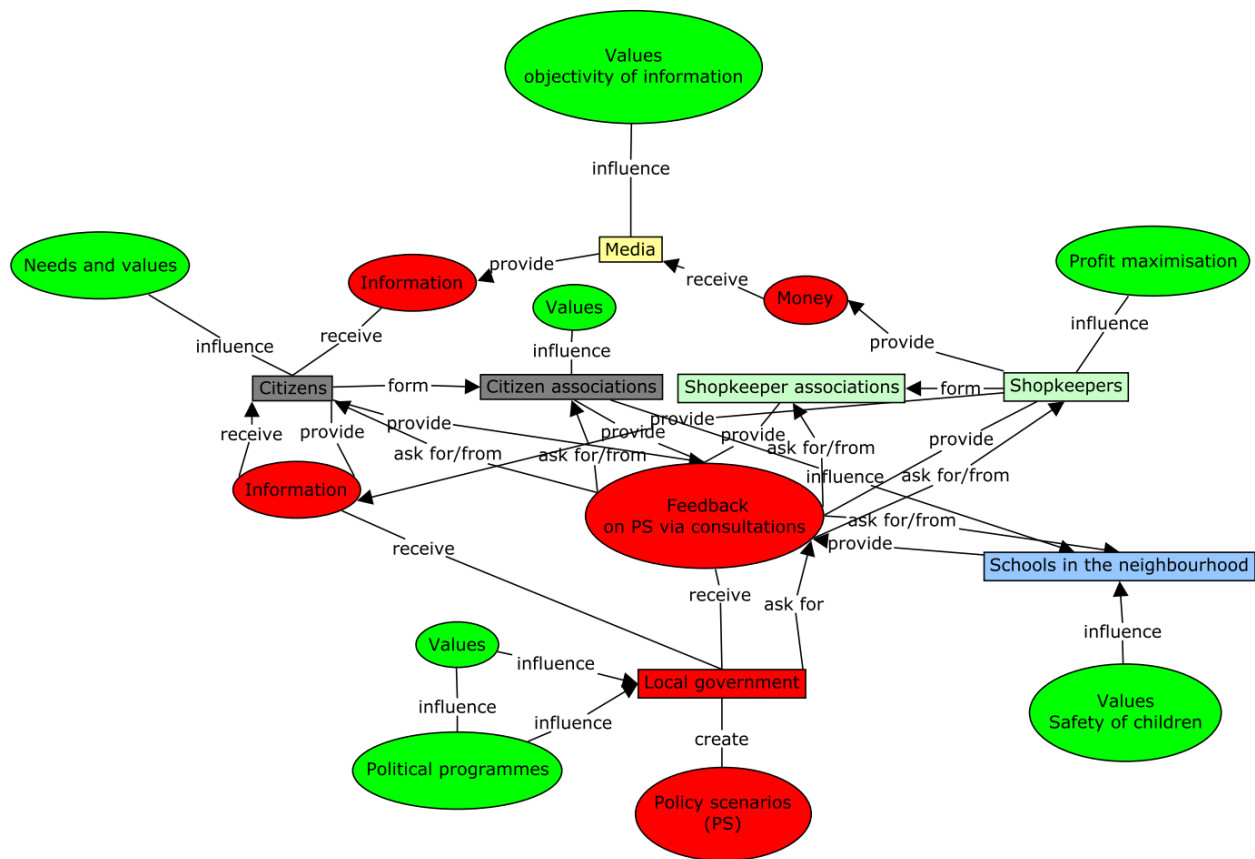


Figure 8 Groningen's SI main interactions

2.2 Cluster b) Island renaissance based on renewable energy production

The “Island renaissance based on renewable energy production” SI is based on the mobilization of the 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.

“Island renaissance based on renewable energy production” refers to the cases of Samsø and El Hierro, two islands getting a high level of autonomy based on renewable energies. The two social innovations experiences have been implemented in different time periods. The Samsø project has been implemented mainly from 1997 to 2007, but is now in a second or third stage, whereas the activities on El Hierro started after 2009. Interest is mainly on energy production and management, but also centred on changing energy consumption (housing and mobility).

2.2.1 Samsø

The six key actors involved in the Samsø SI case are: (1) the Local government, (2) Farmers, (3) the Local Trade Company “Ballen Maskinfabrik”, (4) Samsø Energy academy, (5) Samsø Vindenergi, and (6) Private NGO. The actors for which important facilitating and hindering factors were identified and described in the next section, are: Local government, Farmers, the Local Trade Company “Ballen Maskinfabrik”, Samsø Energy academy, and Samsø Vindenergi. For all the six actors involved in this case, a detailed description alongside with its central interactions is provided in Annex 1.

Identification of barriers and drivers

In the Samsø SI case, for each of the aforementioned five key actors, barriers and drivers were identified in relation to attitudinal factors, capabilities and resources, contextual factors and habits and routines.

These five key actors involved in the Samsø SI case perceive **attitudinal factors** mostly in a positive way, considering such factors more as drivers than barriers. Specifically, “general environmentalist predisposition” was evaluated as a driver by four key actors (i.e., Local government, Farmers, Samsø Energy academy, and Samsø Vindenergi), whereas for one other actor, this is not relevant (i.e., Ballen Maskinfabrik). “Behaviour-specific norms and beliefs” related to the responsibility of action, related to community ownership, or beliefs in sustainable developments, were considered a driver by three of the key actors involved (i.e., Local government, Samsø Energy academy, and Samsø Vindenergi). However, these norms and beliefs act both as drivers and barriers in the particular case of one key actor (i.e., Farmers). These norms and beliefs do not represent relevant factors for one key actor (i.e., Ballen Maskinfabrik).

“Other attitudes”, such as concerns about the local economy and depopulation of the island, orientation towards profit making, development of new business opportunities, social inclusion, or favourable attitudes towards wind power development and sustainable energy, were considered as drivers by all the key actors involved in the Samsø SI case. “Perceived costs and benefits of action” were evaluated as drivers by three of the key actors (i.e., Ballen Maskinfabrik, Samsø Energy academy, and Samsø Vindenergi), whereas for two of the key actors involved, these represent both a driver and a barrier (i.e., Local government, Farmers). The identified benefits of action were related to economic factors (e.g., revitalizing the economy, opportunities of investment, circular economy, achieving funding, business benefit of

developing technology), creation of jobs and subsequent tax revenue, building infrastructure, business opportunities, social inclusion, local ownership, community ownership, and increasing the education of people on energy and environmental issues.

Considering personal **capabilities and resources**, the five key actors perceive them more nuanced in terms of barriers and drivers. Whereas “literacy” was not important for none of the five key actors, and “social status” for four of the five key actors, “financial resources” were considered both a driver and a barrier by one of the actors (i.e., Local government), a driver by two actors (i.e., Farmers and Samsø Vindenergi) and a barrier by two key actors (i.e., Ballen Maskinfabrik and Samsø Energy academy). The “Time” resource was evaluated as a driver by one of the key actors (i.e., Local government). However, it does not represent a relevant resource for the other four key actors (i.e., Farmers, Ballen Maskinfabrik, Samsø Energy academy, and Samsø Vindenergi).

The “Knowledge and skills” resource is considered as having a facilitating role by three of the key actors which identified its drivers and barriers related to their case (i.e., Farmers, Samsø Energy academy, and Samsø Vindenergi). This resource was also evaluated as a barrier by two of the actors (i.e., Local government and Local Trade, Ballen Maskinfabrik). “Human resources” were identified as not relevant in the case of one key actor (i.e., Samsø Vindenergi), both a barrier and a driver in the case of another key actor (Local government), and as a driver in the case of two key actor (i.e., Farmers and Local Trade, Ballen Maskinfabrik). However, only one key actor identified human resources as being a clear barrier (i.e., Samsø Energy academy). Two of the key actors identified “other capabilities and resources” as being related to cyclical changes at the political level, and as acting both as a driver and a barrier for a consistent development of the project (i.e., Local government), but also as being related to “life time expectancy”, which is running out (i.e., Samsø Vindenergi).

Regarding **contextual factors**, “material costs and rewards” were considered both drivers (i.e., economic revenue for the island) and barriers (i.e., cost of investment) by one key actor (Local government), and a driver by two key actors in terms of expected revenue (i.e., Farmers and Local Trade, Ballen Maskinfabrik). This particular factor was evaluated as a barrier by one key actor (i.e., Samsø Vindenergi), seen in terms of costs in maintenance and insurance in the context of profit decline. “Laws and regulations” are seen mostly as a hindrance, more specifically as a barrier by two of the key actors (i.e., Farmers and Ballen Maskinfabrik), both a barrier and a driver by one key actor (i.e., Local government), and a driver for only one key actor (Samsø Energy academy). “Social norms and expectations” represent a driver for three key actors (i.e., Local government, Farmers and Local Trade, Ballen Maskinfabrik), whereas “supportive policies” are a driver for all the five key actors identifying their drivers and barriers related to the Samsø SI case. “Media reports” were identified as a contextual factor for Samsø SI case, evaluated mostly as a positive one, acting as a driver for four of the key actors (i.e., Farmers, Local Trade, Ballen Maskinfabrik, Samsø Energy academy and Samsø Vindenergi) and as a driver and barrier at the same time for the other key actor (i.e., Local government).

Habit and routine represent a predictive variable for pro-environmental behaviour which is evaluated as a barrier by two of the key actors (i.e., Local government and Samsø Vindenergi), and as both a driver and a barrier by one of the key actors (i.e., Farmers). Moreover, it was related to the habit of steering change towards environmental goals (i.e., Samsø Energy academy) or attempts to lobby contracts and business opportunities (i.e., Local Trade, Ballen Maskinfabrik).

Table 4 Barriers and drivers for the key actors of Samsø's SI

	Key Actor 1 - Local government	Key Actor 2 – Farmers	Key Actor 3 - Local Trade, Ballen Maskinfabrik	Key Actor n. 4 Samsø Energy academy	Key Actor 5 - Samsø Vindenergi
1 Attitudinal					
General environmentalist predisposition	Driver, moderate: environmental concern expressed through laws and regulations and social democracy policy	Driver, strong: general environmental concern.	Not relevant	Driver, strong.	Driver, moderate.
Behaviour-specific norms and beliefs (specify)	Driver. They had the responsibility to act.	Barrier and driver. They wanted to own wind energy, but were reluctant in accepting a co-operative model of ownership	Not relevant	Driver. Belief of the need of a general masterplan. Driver. Belief in sustainable development	Driver. Belief that community ownership should be part of wind energy developments.
Other attitudes, (specify, e.g., about technology attributes etc.)	Driver. Concerns about the local economy and depopulation of the island.	Driver. Profitmaking. They are entrepreneurs.	Driver. Wants to develop new business opportunities.	Driver, strong. Favourable attitudes towards social inclusion. General social attitude for a 100 % inclusion of island residents	Driver. Favourable attitudes towards wind power development and sustainable energy.
Perceived costs and benefits of action (specify their nature)	Driver. Revitalizing the economy. Investors favourable policy, favouring job creation and thereby generating more tax revenue. Cost. Barrier. Creating divisions in the community.	Driver. Benefit. Feed in tariffs were considered a good opportunity to invest in wind energy. Barrier. Cost of sharing land and co-ownership.	Driver: business opportunities. Possible contracts for building infra structure.	Driver. Benefit of achieving social inclusion. Driver. Achieving local ownership and circular economy. Driver. Achieving funding. Driver. Increasing the education of people on energy and environmental issues.	Driver. Business benefit of developing technology. Driver. Community ownership delivered.
Other					
2 Capabilities and resources					
Literacy	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant
Social status	Not relevant	Driver. They are relatively affluent and politically active. They have a relatively high status in the local community.	Not relevant	Not relevant	Not relevant
Financial resources	Driver and Barrier, strong. Financial resources were important. It was important to gain the competition to be the Danish energy Island and to get investors to join. High costs for infrastructure.	Driver. They have resources for investment or to use as collateral for bank loans. Always challenged by marked prices and failing crops, but stable in a longer perspective	Barrier. They could not invest their own resources, they relied on contracts.	Barrier. Lack of internal funding means that they had to rely on grants	Driver. They had limited resources to invest, which were joined into a co-ownership model.
Time	Driver. The municipality had time to prioritize this.	Not relevant	Not relevant	Not relevant	Not relevant
knowledge and skills	Barrier. Initially, the municipality did not have staff with necessary skills to handle planning applications for wind turbines.	Driver. They are knowledgeable and used to think through new opportunities of investment.	Barrier. Lack of knowledge about renewable energy. Driver, knowledgeable in their line of business.	Driver. Knowledgeable subjects led the process.	Driver. They had the skills to see the business opportunity and to organize themselves.

Deliverable 6.1

Drivers, Barriers, Actors, and Network structures

human resources	Driver. The largest employer on the island. Barrier. In the sense of lack of qualified human resources.	Driver, moderate. Under pressure. The generation shift is not easy because of young people moving to other type of jobs and other locations. Farms are growing in size. Small farms disappear and the number of farmers is declining.	Driver. They had idle employees that needed to be involved in new business or faced losing their jobs.	Barrier. People involved were limited to the scope of the tasks engaged in.	Not relevant
Other	Political, democratic changes every 4 years - both driver and barrier for a consistent development of the project.		Not relevant	Not relevant	Running out of life time expectancy
3 Contextual factors					
Material costs and rewards	Barrier. Cost of investments. Driver. Generating an economic revenue for the island.	Driver. The revenue from wind energy was a strong driver.	Driver. Expected revenue from a growing market.	Not relevant	Barrier. Cost Maintenance and insurance costs are growing more expensive. Profits are declining
Laws and regulations	Driver. Ambitious national policies were working in favour.	Barrier. The planning permission process was a hurdle but not a major one.	Barrier. Bureaucratic chores are time consuming.	Driver.	Part of the company administration?
	Barrier. Landscape protection regulations posed limits and required to be worked around.				
Social norms and expectations	Driver. Expectations by residents to be heard.	Driver, strong conservative traditional, private ownership is an expectation.	Driver. Building wind turbines was a business development expected by this type of business.		Not relevant
Supportive policies	Driver, main /strong. National supportive policies contributed.	Driver. Feed-in tariffs and government grants. National policies to protect farmers interest	Driver, strong. Depending on progressive policy aiming at an energy transition.	Driver. Green policies were a strong driver.	Driver. Feed in tariffs.
Media reports	Driver: positive media reports.	Driver: critical media reports on farmers' generated pollution. Driver: wind turbines owned privately met criticism.	Driver: presenting new products; media attention is important.	Driver: media was useful in generating a positive narrative of wind power, helping a local community to go green.	Driver: good marketing in the sales period during early implementation.
	Barrier. Negative reports about wind farm opposition. Risk of critical media reports on wind turbine planning /or the lack of a plan.		Wind turbine industry is a good story		
4 Habit and routine	Barrier. The administration was not used to work with this type of project.	Driver. Farmers routinely think about business opportunities .	Trying to lobby contracts and business opportunities	Habit of steering change towards environmental goals	Barrier. Not used to co-own energy projects.
		Barrier. Self-interest was a barrier for co-ownership.			

Identification of actors and of network structures

For each key actor involved in the Samsø SI case, a detailed description is offered in Annex 1, regarding actors' characteristics, their decisions and actions, and collectives and structures they are a part of, whereas below, information regarding the network and interactions between actors is provided. A summary of this description is offered below for the same five actors for which main drivers and barriers were identified.

The key actor **Local Government** is interacting with citizens, through calling public hearings, meetings and providing information for residents. Moreover, local government liaise with academic institutions and with private consultants to ensure that research is carried out and knowledge about the local economy is developed.

Farmers are investors and owners, they are organizational initiators, and are critical to social/cooperative ownership schemes while they favour private ownership. Nevertheless, they understand the farmers' community role and are capable of negotiating with other neighbour farmers and citizens.

The next key actor, **Local trade company Ballen Maskinfabrik** (plumbing and blacksmith contractor) works with the local government.

Samsø Energy Academy acts as a coordinator of the SI, and operates as an intermediary for fostering the cooperation between the public sector and private actors. In addition, this key actor liaises with academic entities to ensure that socioeconomic research is carried out and that knowledge is made available to itself and local residents; it also fosters global networks to ensure widespread attention on the Samsø case and therefore attempts to gain a stronger national role.

The next key actor, **Samsø vindenergi** needs to interact with landowners to make sure to lease land for the establishment and building of wind turbines. Also, this actor depends on state-supported programs and on the feed-in tariff scheme.

Essential description of network dynamics

In the case of Samsø, the main interactions happening in the early stage (Figure 9) have 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. Some local citizens, local business and some farmers felt that this new development was undesirable for environmental or economic reasons, but others within the same social groups saw that it could be an opportunity.

During the middle stage (Figure 10) of development of the SI, the Energy Academy was created and became the hub of the activities, the partnership with the local government and the farmers was strengthened and local and national media were approached or got in touch to spread the news regarding the SI, mainly presented in positive terms. At the same time, an international network of collaboration was developed.

In the mature stage (Figure 11), the Municipality dedicated resources to train its staff, in collaboration with Energy Academy. Energy Academy invests knowledge and training in various international research projects. Several factors such as social capital, community identity, or green economic growth offered the basis for Energy Academy.

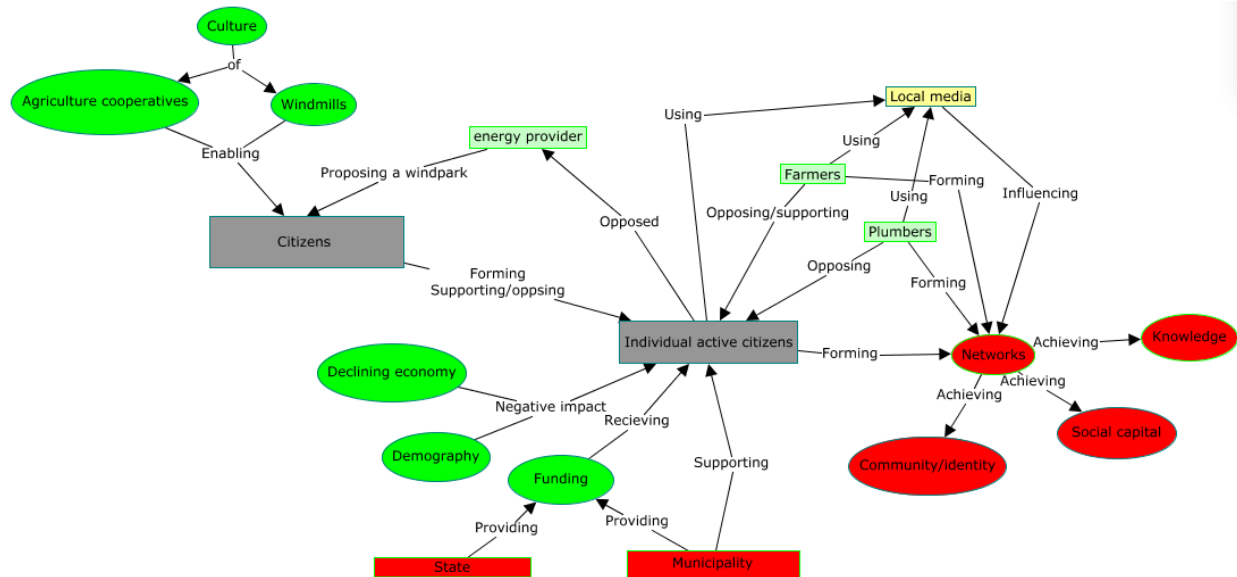


Figure 9 Samsø's SI early stage

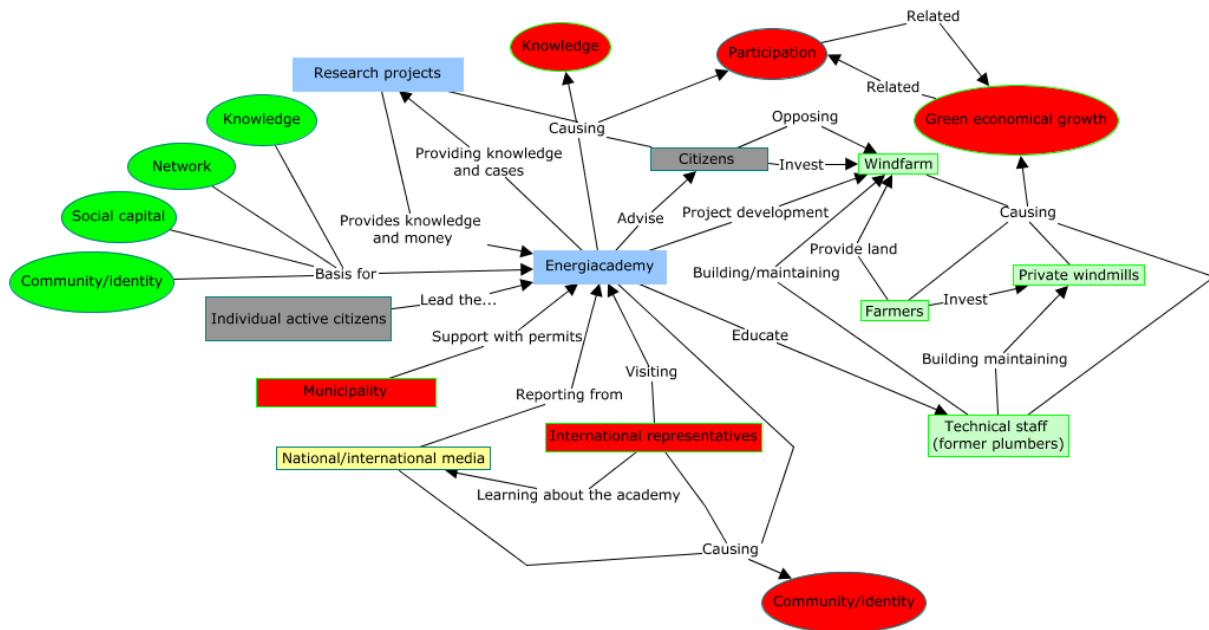


Figure 10 Samsø's SI intermediate stage

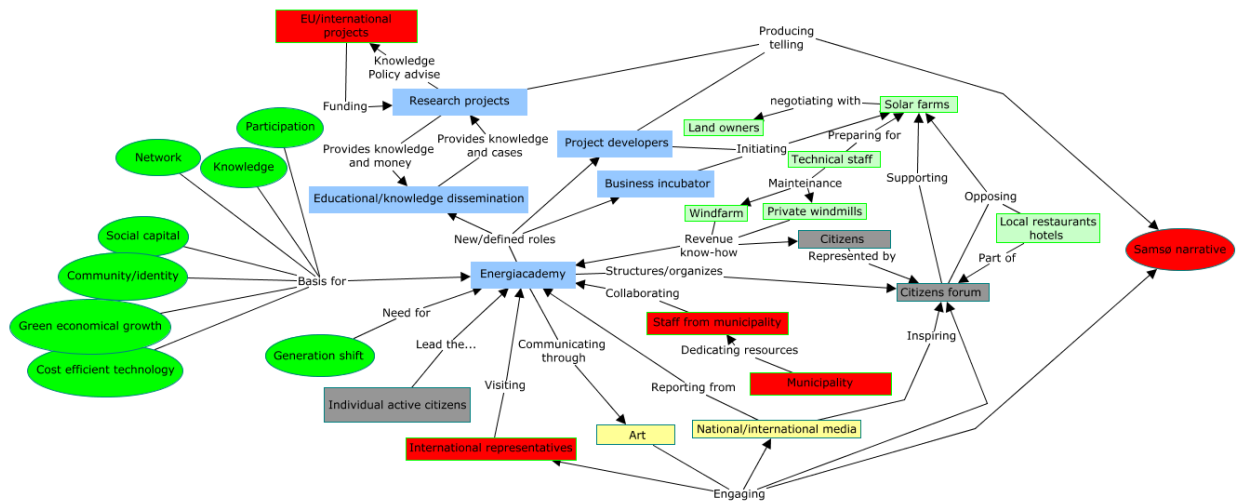


Figure 11 Samsø's SI mature stage

2.2.2 El Hierro

In the El Hierro SI case, three key actors are involved, namely: (1) Island government 'Cabildo of El Hierro' represented by Tomás Padrón, (2) Gorona del Viento El Hierro S.A., and (3) Island tourism Sector.

Identification of barriers and drivers

For each of the key actors involved, barriers and drivers were identified in relation to attitudinal factors, capabilities and resources, contextual factors and habits and routines, and summarised below.

The key actors involved in the El Hierro SI perceive **attitudinal factors** more as facilitators than barriers. More specifically, “general environmentalist predisposition” was assessed as being favourable for all the key actors involved, related to attitudes regarding shared pro-environmental attitudes in general and related to sustainable solutions for energy supply in particular, climate change and pollution reduction. The identified “behaviour-specific norms and beliefs” related to future development of El Hierro based on the protection of the natural resources of the island, the green economy, and the energy self-sufficiency, were assessed as drivers by one of the key actors (i.e., Island government 'Cabildo of El Hierro'), whereas the norms and beliefs related to expectancies from public institutions as the promoters of sustainable initiative, were assessed as barriers by one key actor (i.e., Island tourism sector). One other specific attitude was identified as a barrier by one of the key actors (i.e., Island government 'Cabildo of El Hierro'), related to a sense of isolation, perceived due to the islands’ geographical position and transport of resources and goods. “Perceived costs and benefits of action” was assessed as a barrier by two of the key actors (i.e., Island government 'Cabildo of El Hierro' and Island tourism sector), and as a driver by only one key actor (i.e., Gorona del Viento SA). The drivers identified here stem from the difference between the costs of maintenance and management on one hand, and benefits of the project, on the other hand. The barriers identified are related to high cost of the energy innovation and lack of communication infrastructures to link the island to other destinations (i.e., a good airport).

Regarding **capabilities and resources**, the key actors involved in the El Hierro SI case perceive more barriers than drivers, related mostly to financial and time resources. Regarding literacy and social status resources, no information is offered. For financial resources we have information from two of the key actors involved (Island government 'Cabildo of El Hierro' and Gorona del Viento SA), and for both this economical aspect functions as a barrier, due to limited financial resources and funds. In the same vein, time resource represents a barrier for two of the three key actors involved (Island government 'Cabildo of El Hierro' and Gorona del Viento SA), since development and building the SI in this case took 10 years for completion. Because for all the three key actors involved relevant expertise and knowledge already exists, the factor related to knowledge and skills was evaluated mostly as a driver. For one key actor (Tourist sector), knowledge and skills represents both a driver and a barrier due to inconsistencies across the representatives of the sector in the relevance of the SI for the island. Human resources represent a driver for one of the key actors involved (Gorona del Viento SA), whereas for the other two key actors, no information is available regarding this factor (i.e., Island government 'Cabildo of El Hierro' and Island tourism sector).

Considering **contextual factors**, “material costs and rewards” were assessed as barriers by one of the key actors (i.e., Gorona del Viento SA), whereas for the other two key actors no information was available. “Laws and regulations” represent a barrier for all three key actors involved in El Hierro SI case,

caused by the changes in national legislation and incentive system, which endangered the ownership and management of the SI. The “Supportive policies” factor was assessed as a strong driver by all key actors involved in the El Hierro SI case, because there were benefits from European, national and regional administrations supporting R&I in renewable energies (i.e., Island government 'Cabildo of El Hierro' and Gorona del Viento SA) or benefits from environmental policies developed in the island (i.e., Island tourism sector). Information regarding “social norms and expectations” is not available or deemed not important for El Hierro SI case.

Habit and routine category was evaluated as not relevant or no information was provided.

Table 5 Barriers and drivers for the key actors of EL Hierro's SI

	Key Actor 1 - "Island government 'Cabildo of El Hierro'"	Key Actor 2 - "Gorona del Viento SA"	Key Actor 3 - "Island tourism sector"
1 Attitudinal			
General environmentalist predisposition	Strong driver. The policy leaders of the island shared a pro-environmental attitude that led them to approve the island's sustainable development plan in 1996 which set up the basis for the energy innovation. Strong motivation and interest in renewable energies and in the technological challenges involved in launching a renewable energy project in El Hierro.	Driver. The political partners of this actor are committed to find sustainable solutions to energy supply. They are aware of the impact of carbon emissions in terms of climate change and associated costs derived from the transportation of fuel to the island.	Driver. The sector believes that the project is positive because it reduces the pollution of the island and the primary sector (agriculture) as well as the tourism can take advantage of this positive outcome.
Behaviour-specific norms and beliefs (specify)	Strong driver. Policy leaders of the island shared the strong belief that the future development of El Hierro should be based on the protection of the natural resources of the island, the green economy and the energy self-sufficiency. They aim to promote a touristic activity fostering natural and geological resources and limiting urbanism.	No information. See island government.	Barrier. General belief that sustainable and innovative projects should be promoted by the public institutions, especially the council of the island. The private sector is usually reluctant to take the leadership role, but they demand to the government more measures (e.g. subsidies to the private sector) in environmental and energy saving domains.
Other attitudes	Barrier. El Hierro is one of the smaller islands of the Canary Archipelago and their citizens suffer for a «double isolation» due to the resources and goods needs to be transported first to Tenerife and later to El Hierro. This negative sense of isolation and weakness is not positive for the entrepreneurship of the inhabitants and willingness to innovate and start new projects.	No information.	No information.
Perceived costs and benefits of action	Barrier. The high cost of the energy innovation (more than 60M€ of investment) is considered a barrier for this type of projects. However, the island council managed to obtain external funds and create public-private partnerships to fund the SI (Tomás Padrón, as the president of the island, managed to obtain funds from the national government, persuading the Spanish Prime Minister and the head of the National environmental department about the benefits of this energy innovation).	Driver. Once the SI innovation has been constructed and operating, the benefits of the project are higher than the cost of management and maintenance. This permits that benefits of the plant to be invested in subsidies and grants for people to adopt energy-saving solutions at homes, training and educational campaigns.	Barrier. This sector considers to be discriminated due to lack of communication infrastructures to the main islands (e.g. Tenerife). They believe that the energy project is positive to the island, but they can't take advantage of the interest of visitors because El Hierro does not have a good airport to receive the visitors showing interest in knowing the SI and/or staying in a sustainable and clean island.
2 Capabilities and resources			
Literacy	No information	No information	No information
Social status	No information	No information	No information
Financial resources	Barrier. See perceived costs.	Barrier. Limited financial resources. At the beginning, the company needed a credit loan to pay the salaries and the investments in the plant. As the plant currently has benefits, the company counts with sufficient capital for investment and research projects in new renewable energy solutions for the island.	No information about how the financial situation of this actor affects the SI

Time	Barrier. The development of the SI took more than 10 years, taking into consideration the R&I project, the construction of the energy plant and the fulfilment of legal and administrative requirements for the plant to produce energy. This was perceived as negative by the population of the island.	Barrier. The development of the SI took more than 10 years, taking into consideration the R&I project, the construction of the energy plant and the fulfilment of legal and administrative requirements for the plant to produce energy. This was perceived as negative by the population of the island.	No information
knowledge and skills	Driver. The leaders of the project were policy makers with technological knowledge and expertise in energies. However, this renewable energy project was a challenge, and they needed to create alliances with the Technological Institute of the Canary Island as well as with a private energy company capable to find the best technical solution to the project, taking advantage of the orography of the isle.	Driver. Relevant expertise and mastery of this actor in the field of renewable energies. The directors of the plant and employees are experts in the field of renewable energies and currently have contributed to the creation of similar renewable projects in other islands in the Canary archipelago.	Driver/barrier. Some interviewees believe that the support to the SI depends on the level of education of the citizens regarding sustainability and renewable energies. While some representatives of the tourist sector have a good knowledge on the benefits of this SI and communicate this project to the visitors, other seem to distrust in the government or think that this project is not relevant for the island.
human resources	No information.	Driver. See knowledge and skills.	No information
Etc.			
3 Contextual factors			
Material costs and rewards		Barrier. See financial resources.	No information.
Laws and regulations	Barrier. Several changes in national legislation descentivize the renewable energy market. Besides, national laws were not supportive to energy self-consumption projects. In 2013 a national law established that only the national regulator could be the owner of all new energy plants. This almost forced El Hierro to lose the ownership of the project in which they have invested so much efforts.	Barrier. Several changes in national legislation descentivize the renewable energy market. Besides, national laws were not supportive to energy self-consumption projects. In 2013 a national law established that only the national regulator could be the owner of all new energy plants. This almost forced Gorona del Viento to be managed by Spanish regulator instead of the owners of the company.	Barrier. Regulations are perceived as negative so as the business sector cannot be benefitted by the outcomes of the SI. They regret that the cost of the electricity cannot be subsidised by the council or the energy plant, although Gorona del Viento is a profit company and the island government receives economic benefits (distributed in different projects and policy measures).
Social norms and expectations	No information	No information	No information
Supportive policies	Strong Driver. At the beginning of the project, the promoters took advantage of European and national policies supporting R&I in renewable energies. Most of the funds for the SI were provided by the EU, national and regional administrations. Other supportive policies relate to tax subsidies to electric vehicles, and funds for installation of charging points for e-cars	Strong Driver. At the beginning of the project, the promoters took advantage of European and national policies supporting R&I in renewable energies. Most of the funds for the SI were provided by the EU, national and regional administrations.	Strong driver. This sector benefitted by the environmental policies developed in the island. The protection of the natural areas, the creation of a maritime reserve. Besides El Hierro became a biosphere reserve and an international geo-park. The renewable project Gorona del Viento and these natural resources attract an increasing number of visitors and tourists.
4 Habit and routine	No information/Not relevant	No information/Not relevant	No information/Not relevant

Identification of actors and of network structures

For each key actor involved in the El Hierro SI case, detailed information regarding different topics such as actors' characteristics, their decisions and actions, collectives and structures they are a part of, and their most important or relevant interactions with other actor types can be found in Annex 1. Also, their interaction patterns are described below, alongside with the El Hierro SI case map of the interactions and networks.

The first key actor, **Island government 'Cabildo of El Hierro'**, represented by **Tomás Padrón- (public and private actor) Pioneer of Wind-Pumped-Hydro Power Station of "El Hierro"**, interacts with the following entities: (a) National Government, (b) European Union, (c) Technological institutions and universities such as Institute Tecnologic of Canarias, Ocean Platform of Canary Islands, University of Las Palmas, Institute for Diversification and Energy Saving, for providing knowledge and technical support to the project, and (d) Regional Government of Canarias, which was involved in the management of the project and is currently one of the partners of the energy company Gorona del Hierro SA.

The second key actor, **Gorona del Viento El Hierro S.A.**, interacts mainly with: (a) National and International institutions in supporting changes in energy regulations that might modify the status quo of the project, (b) citizenship in promoting educational programmes and campaigns to raise awareness of the advantages of energy-saving, and (c) Education institutions such as high schools, universities, national and international research centres, providing support to academic programs, students' internships, gaining reputation as a centre for technological innovation and a laboratory for students to learn about renewable energies.

The third key actor, **Island tourism Sector**, interacts with Gorona del Viento S.A., a relationship based on the shared interest of promoting the energy plant as a touristic attraction of the island, and with Cabildo of El Hierro. This latter relationship is a collaborative one, pursuing more political support to the tourist sector in the island. The sector is consulted when new policies are being adopted that might affect the tourism activity in the island.

Essential description of network dynamics

Error! Reference source not found. corresponds to the first stage of the SI, and indicates the previous contextual conditions that favoured (or hindered) the development of the renewable energy project on El Hierro. One main actor in the island -Tomás Padrón- played a significant role as pioneer/promoter, gaining support and funds from the regional and national government, as well as the European Union. The figure represents the types of interactions occurring between the promoters and other types of agents when the SI was just a research and innovation project in renewable energies.

Figure 13 El Hierro's SI intermediate stage

shows the intermediate stage in the development of the SI, corresponding to the construction and implementation of the energy project. The promoters of the SI (lead by Tomás Padrón, president of the island Council) created a new public-private entity -Gorona del Viento SA- for the operationalization of the energy project. The figure identifies the main actors that became partners of energy plant, as well as

Error! Reference source not found. describes the third stage: Development of the energy project. In this phase, the wind-pump-hydro power station is already working as a public-private energy plant which supplies clean energy to the entire island. The Gorona del Viento El Hierro, S. A. is the new actor responsible for the power station's management. Besides, new types of interactions and collaborations start with new actors (such as education institutions). Citizens gain relevance at this moment, as they react positively or negatively to the social innovation. The figure illustrates a number of inputs from the SI (in red), which represent the impact on the economy of the island, the benefits obtained from the energy plant and new energy-saving projects developed (e.g. e-car charging points in the island).

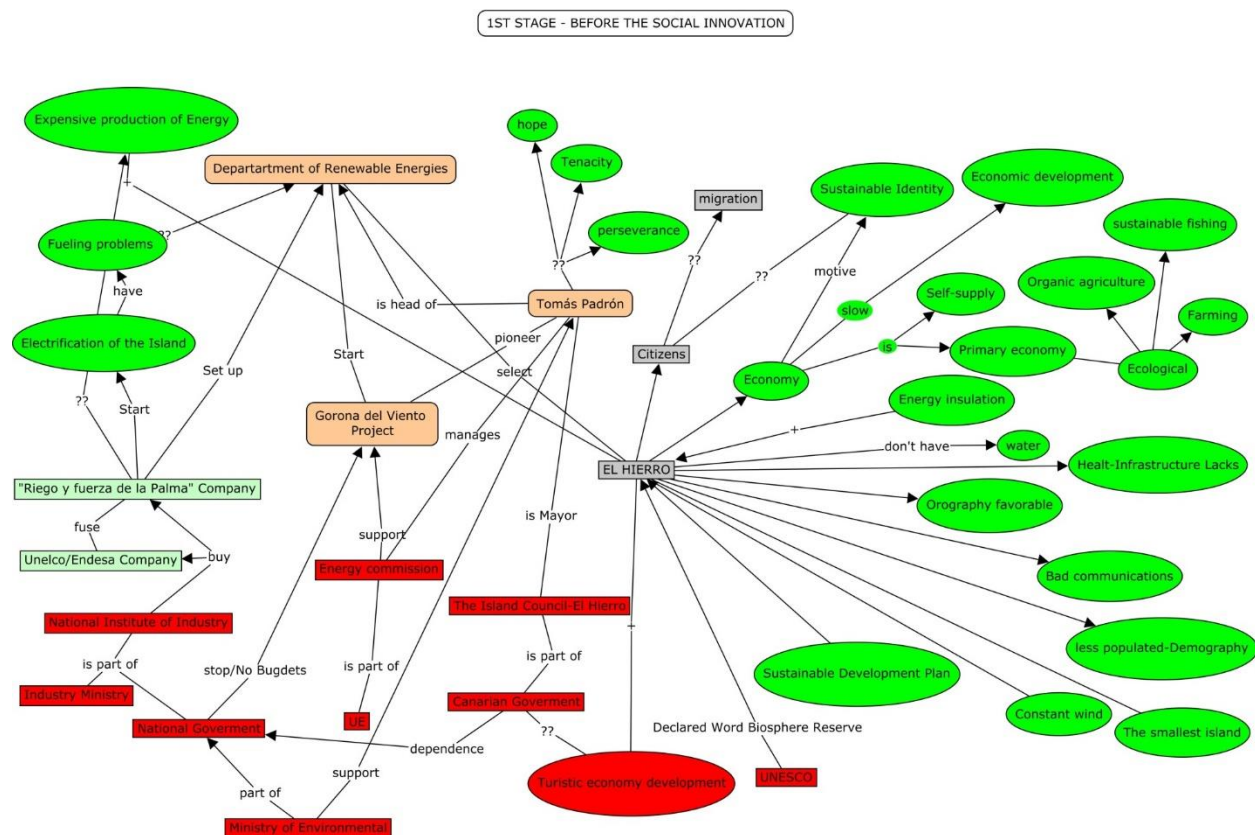
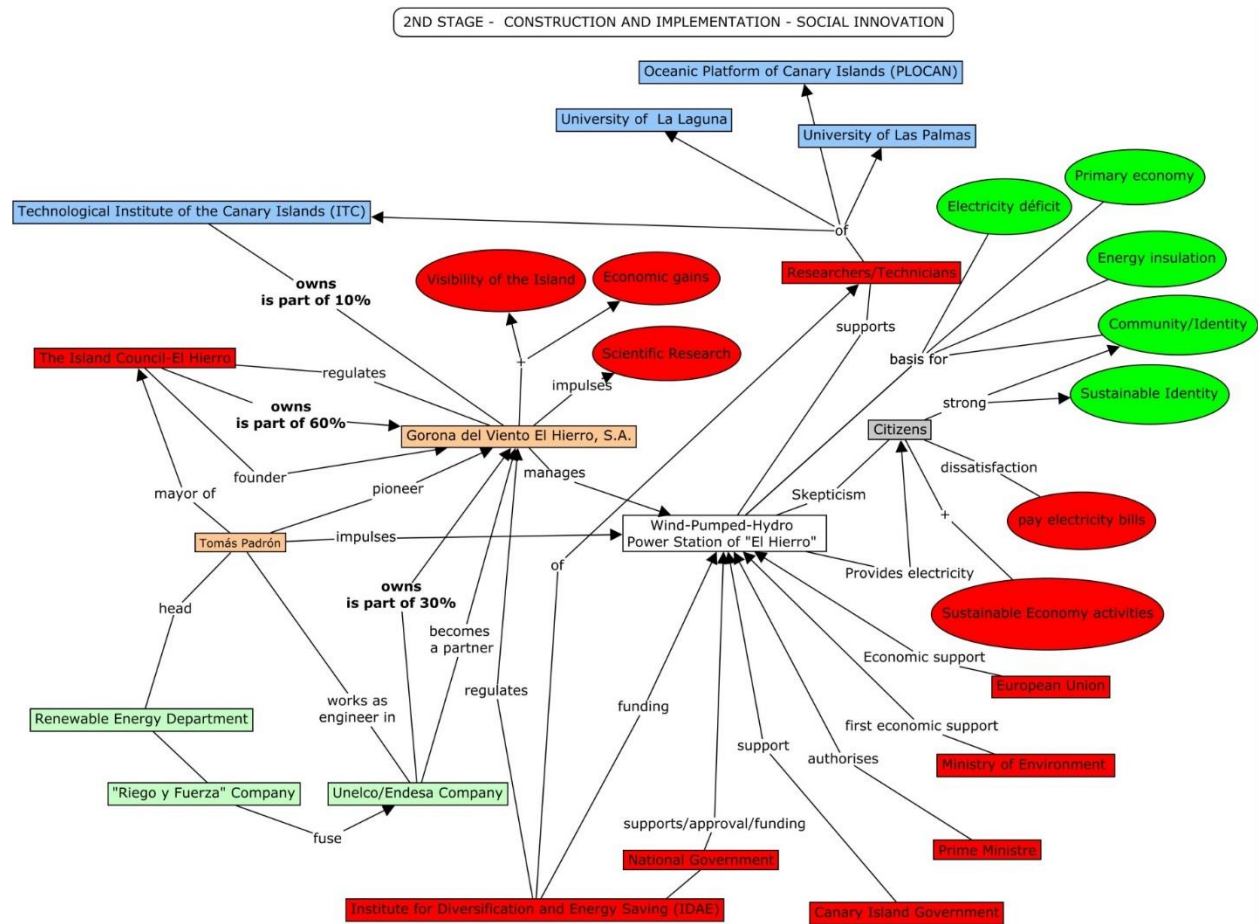
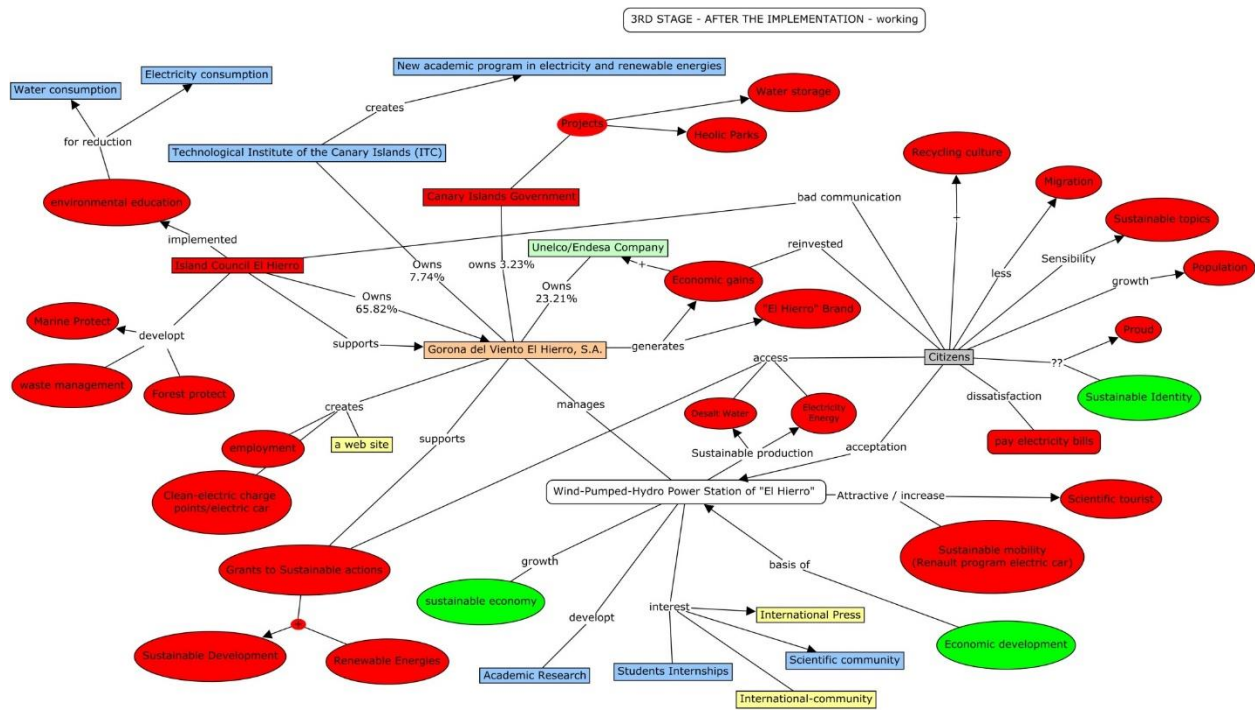


Figure 12 El Hierro's SI initial stage





2.3 Cluster c) Alliance for a district regeneration based on energy transitions

The Energy efficiency in district regeneration SI includes hard and soft measures to transform the district, such as local energy production and energy efficiency measures, urban green spaces, transport system transition measures and citizen participation. This cluster refers to the cases of Augustenborg (Ekostaden Augustenborg/Malmö) and Järva (Stockholm).

These two cases have many similarities, referring both to the regeneration process of two districts built in the '50s "People's Housing" programme and the '70s "million homes programme". In the following decades, because of de-industrialisation processes and demographic changes, both districts were affected by high rates of unemployment and social challenges. Finally, both cases developed measures for sustainable regeneration. The content of this is broad and varied, and in both cases included, renewable energy production.

In Järva the primary concern was the low energy efficiency of buildings, and an urgent need of building renovation and, therefore, was centred on the refurbishment of the buildings to increase their energy efficiency through insulation of walls and roofs. A wide array of interventions was also developed to foster sustainable mobility.

In Augustenborg, low-energy retrofitting was piloted in a smaller number of buildings but the main focus of the project was around a broader programme including waste management, stormwater management, biodiversity, community development and local employment. Energy efficiency, renewable energy production, and sustainable mobility were also important aspects of the project.

2.3.1 Malmö

In Malmö's SI case, five key actors are involved, namely: (1) City of Malmö, (2) MKB, (3) NGOs, (4) residents Augustenborg and (5) Greenhouse residents.

Identification of barriers and drivers

In the Malmö SI case, each of the five key actors involved identified its barriers and drivers related to attitudinal factors, capabilities and resources, contextual factors and habits and routines.

Attitudinal factors are seen in a positive light by the five key actors involved in the Malmö SI case, with 30 identified drivers and only two identified barriers for this category. "General environmentalist predisposition" was assessed as a driver by four key actors (i.e., City of Malmö, MKB, NGOs, and Greenhouse residents), related to motivation to improve the image of a low status neighbourhood, local and wider environmental concerns and issues, whereas for one key actor (i.e., residents Augustenborg), this predisposition is not relevant, as this particular actor was not involved in designing the first phase of the Malmö SI case but had a strong role in implementation and second phase development.

"Behaviour-specific norms and beliefs" related to interests in working in more integrated and solutions-based approach (i.e., City of Malmö, MKB), faith in organizations (i.e., NGOs) and the belief that is necessary to have a more sustainable lifestyle (Greenhouse residents), were identified as drivers by all the key actors involved for which this information is available. "Other attitudes", such as the interest in new technical solutions, socio-economic change, or in improving the quality of housing, energy performance

(for comfort, cost management, environmental concern), social inclusion, community cohesion and community life, social and economic inclusion, and the awareness of the benefits of green technologies for buildings were identified as drivers amongst all of the key actors involved, although a lack of collaboration across sectors was identified as a barrier, in particular with regard to stronger and deeper community ownership.

Similarly, “perceived costs and benefits” of action were assessed mostly as drivers by all of the five key actors involved in the Malmö SI case, being related to improvements in the image (of Malmö, of the administration, or of the area and buildings) (City of Malmö, residents Augustenborg), improvements in the drainage system and solving the flooding issues of the neighbourhood (i.e., City of Malmö, MKB, residents Augustenborg), improvements in the quality of building performance and housing (i.e., MKB, residents Augustenborg), improvements in safety, in social cohesion and in sustainability of the neighbourhood (i.e., City of Malmö), improvements in communication, collaboration and people reach (NGOs), or expectancies related to cheaper energy bills and traffic in the area (i.e., Greenhouse residents, residents Augustenborg). One barrier was identified here by one of the key actors involved (MKB), related to costs of interventions and the risk of improving rental rate.

Capabilities and resources are a factor acting more as a driver than as a barrier in the Malmö SI case, as there are only four hindrance elements identified, two elements acting both as a barrier and as a driver, and fourteen facilitator agents across all of the five key actors involved. More specifically, “literacy” and “social status” were evaluated as irrelevant factors for three key actors (City of Malmö, MKB and NGOs), as a barrier by one key actor (Citizens residents Augustenborg), and as a driver by the other key actor (Greenhouse residents) involved in the Malmö SI case.

“Financial resources” were assessed as a driver by three key actors (City of Malmö, MKB, Greenhouse residents), and as a driver by one of the key actors (NGOs). “Time” was evaluated as an irrelevant resource for three key actors (NGOs, Citizens residents Augustenborg and Greenhouse residents) involved in the Malmö SI case, whereas the other two key actors perceive time as both a driver and a barrier (i.e., City of Malmö and MKB), related to high pressure to deliver the project within limits for external finance.

“Knowledge and skills” of the individuals involved in the SI case acted as a driver for four of the key actors (i.e., City of Malmö, MKB, NGOs and Greenhouse residents) enabling to start and move forward with the project, whereas one of the key actor (Citizens residents Augustenborg) still requires extra work to engage individuals, although the project built on a strong engagement from a large number of individuals and their skills and ideas, making this both a driver whilst also with challenges. “Human resource” is seen as a driver by three of the key actors (City of Malmö, MKB and NGOs) involved in the Malmö SI case, whereas for two of them (i.e., Citizens residents Augustenborg and Greenhouse residents) this factor is not relevant. One other resource, social awareness of project managers to be precise, was identified as a driver by one of the key actors involved (i.e., City of Malmö), because this factor made the municipality more capable of acting.

Regarding **contextual factors**, material costs and rewards were assessed more in terms of benefits (i.e., NGOs and Greenhouse residents) or minor costs (i.e., City of Malmö and MKB) than perceived as barriers to overcome, because there was access to needed finances and resources. “Laws and regulations” represent another positive factor in the Malmö SI case, being identified as a driver by two of the key

actors involved in (City of Malmö and MKB), whereas was not important for the other three key actors (i.e., NGOs, Citizens residents Augustenborg and Greenhouse residents). “Social norms and expectations” act as drivers for three key actors (City of Malmö, MKB and Greenhouse residents) being related to expectations of improvement of the buildings in particular and at solving social issues such as unemployment and social exclusion in general, whereas this contextual factor acts both as a driver and a barrier for the other two key actors (NGOs and Citizens residents Augustenborg). “Supportive policies” were evaluated as not relevant for the context of three of the key actors (NGOs, Citizens residents Augustenborg and Greenhouse residents), but as drivers for two of the key actors (City of Malmö and MKB), as there were policies already in place in support of the project. Media reports was identified as another contextual factor, which was evaluated as a positive one for all of the five key actors involved in Malmö SI case.

Habit and routine was assessed as not influencing at all in the case of two of the key actors (City of Malmö and MKB), as a barrier in the case of other two key actors (NGOs and Citizens residents Augustenborg), and as a driver by the other key actor (Greenhouse residents).

Table 6 Barriers and drivers for the key actors of Malmö's SI

	Key Actor 1 - City of Malmö	Key Actor 2 - MKB	Key Actor 3 - NGOs	Key Actor 4 - Citizens residents Augustenborg	Key Actor 5 - Greenhouse residents
1 Attitudinal					
General environmental predisposition	Driver. Minor. The main purpose was improving the image of a low status neighbourhood	Driver. Local environmental concern related with flooding was a driver. Secondly wider environmental concern related with energy consumption of buildings	Driver. Some NGOs with strong global environmental interest, some with interest in local environmental issues	Not relevant. Citizens were not engaged at the start. Low income area, citizens did not have strong views.	Driver. Strong. They had to motivate why they wanted to live there.
Behaviour-specific norms and beliefs (specify)	Driver – interested in working in more integrated and solutions-based approach	Driver – interested in working in more integrated and solutions-based approach	Driver. Some culturally related drivers for example faith organisations		Driver. They thought that it was necessary to change their lifestyle in a more sustainable way.
Other attitudes, (specify, e.g., about technology attributes etc.)	Driver – interested in new technical solutions as well as driving socio-economic change	Driver. Improving the quality of housing and improving the energy performance for both comfort, cost management and environmental concern.	Driver. Improving community cohesion and community life.	Barrier. Cultural diversity initially created problems of trust.	Driver. They were aware and positive about green technologies for buildings.
		Driver. Improving social inclusion is perceived as important in MKB.		Driver. Once engaged they were concerned with the improvement of the buildings and the local area in general.	
				Further social and economic inclusion improvements were a driver.	
Perceived costs and benefits of action (specify their nature)	Driver. Benefit. Improving the image of Malmö through intervening on a low-income neighbourhood. Driver. Benefit. Experimenting new interventions.	Driver. Benefit. Improved overall quality of housing.	Driver. Benefits – opportunity to influence the development.	Benefits. Driver. Expected improvements in the flooding problems and more in general in the quality of building performance.	Benefit. Driver. Minor. Expected cheaper energy bills.
	Driver. Benefit. Improving the political image of the administration.	Driver. Benefit. Improved drainage system for the area.	Driver. Benefit. Creating a positive network. More joined up approach with other community organisations and working closer with city and MKB.	Benefit. Driver. Improved looks of the area primarily in its green areas and secondarily the buildings.	
	Driver. Benefit. Making the problem of flooding solved in the neighbourhood.	Cost. Barrier. Concern with cost of interventions and the risk of improving rental rates.	Driver. Reaching people not participating in public meetings	Benefit. Driver. Expected reduction of heavy traffic in the area.	
	Driver. Benefit. Increasing the safety of the neighbourhood and improving social inclusion.			Benefit, driver. Increased expenditure in area increased attractiveness and contributed to image	

Deliverable 6.1

Drivers, Barriers, Actors, and Network structures

				change.	
	Driver. Benefit. Improving the sustainability of the neighbourhood			Note: no real concerns about costs as there was a commitment not to increase rents	
Other					
2 Capabilities and resources					
Literacy	Not relevant	Not relevant	Not relevant	Barrier. Lacking language skills was a barrier that was addressed.	Driver. More educated and articulated. They had awareness and motivation.
Social status	Not relevant	Not relevant		Barrier. Possibly the low social status meant that they were less used to engage.	Driver. Middle income families more interested in environmental issues and more educated.
Financial resources	Driver. Major investment from City departments to cover core costs of the project. They were needed. They applied for grants to finance the project and they had an internal budget for that.	Driver. Strong. MKB invested for covering about 50% of the costs. Their business model of large publicly owned not-for-profit business allowed them to use their internal resources streaming from rents paid in their large housing stock.	Barrier. Therefore the municipality made available for NGOs finances to apply for funding and increasing their work for sustainability locally		Driver. Availability of financial resources enabled them.
Time	Driver.	Driver and Barrier. High time pressure to deliver project within limits for external finance, both driver and challenge to innovation	Not relevant	Not relevant	Not relevant
	High time pressure to deliver project within limits for external finance, both driver and challenge to innovation				
knowledge and skills	Driver. Very relevant. Having skilled managers like T.G. was important to start and implement the project.	Driver. Internal skills were important for both the financial and technical sides of the project.	Driver. Strong local knowledge and networks essential to developing the reach of the project and broader mobilisation	Barrier. Yes knowledge and skills required extra work to engage individuals.	Driver. More informed more aware.
human resources	Driver. Having a departments capable of taking up the task. Also, external consultants were taken in. The University of Malmö, businesses and residents were involved.	Driver. Certainly having a sufficiently large staff pool was necessary to take up this project.	Driver. Skilled people were available.	Not relevant	Not relevant

Other	Driver. Social awareness of project managers made the municipality more capable of acting.	No other		No	
3 Contextual factors					
Material costs and rewards	Cost. Financial cost was an issue but was not a barrier because finances were available or gained through grant applications and financial commitment from city	Minor barrier. Cost. financial cost was an issue but resources were available from external finance and from long term maintenance deficit so costs could be written off rather than put onto rents	Driver. Finance made available for NGO-led initiatives		Benefit. Possibly expected lower energy bills.
Laws and regulations	Driver. Because they created the institutional frame for interventions. Main issue was to go ahead of regulations and achieve more	Driver. Strong. They have obligations by law to provide certain standards of quality of housing and safety to the tenants and the flooding problem was real.	Not relevant	Not relevant	Not relevant
Social norms and expectations	Driver. Citizens expected action on the part of the municipality at a problematic time of the city, when unemployment and social exclusion were considered major problems.	Driver. Expectations on the part of tenants that they would improve the buildings, but there were no protests or strong demands.	Barrier and driver. Limited expectation to be involved in design and management – barrier to deeper level of involvement, driver for enthusiastic response	Limited expectation to be involved in design and management – barrier to deeper level of involvement, driver for enthusiastic response	Participative management of building demands establishment of new social norms in building and its relationship with surrounding
Supportive policies	Driver. Policies in place favouring environmental and social interventions would support the project.	Driver. Policies in place favouring environmental and social interventions would support the project.	Not relevant	Not relevant	Not relevant
Media reports	Driver. Reports on crime and social exclusion was driver to start and later positive reports reinforced the intention of continuing.	Driver. Media reports, negative initially, probably nudged MKB into acting. Later positive reports reinforced the commitment of MKB.	Driver. Reports on crime and social exclusion were a driver to start and later positive reports reinforced the intention of continuing.	Driver. When positive reports came through people felt more like engaging.	Driver. Positive reports likely reinforced intentions and commitment.
4 Habit and routine	No relevance	No relevance	Barrier. Not used to engage	Barrier. Not used to engage.	Driver. Possibly more used to engage in the community.

Identification of actors and of network structures

As previously stated, the five key actors involved in this case are: City of Malmö, MKB, NGOs, Citizens residents Augustenborg and Greenhouse residents. The interactions between the entities engaged in Malmö SI case are mostly between MKB and the city of Malmö, as co-creator in project management and development. The local community has a role in offering input in design process and stakeholder dialogue. Local community organisations' interaction with Augustenborg (Ekostaden Augustenborg) is described by roles such as stakeholder dialogue, input in design process, sometimes financier of initiatives, in-kind support (premises), so on and so forth. Augustenborg (Ekostaden Augustenborg) also interacts with contractors through demands in procurement process. Information regarding the relationships and networks in the Malmö SI case can be found below.

Essential description of network dynamics

In the mid 1990's (Figure 15), the City of Malmö was struggling with economic depression, unemployment and depopulation. Neighbourhoods, such as Augustenborg, suffered from bad reputation and the area was in need of renovation. As a response to the crisis situation, MKB (the municipal housing company) cooperated with the city of Malmö in launching a rejuvenation of the neighborhood. MKB and the City of Malmö cooperated in creating an ambitious process of involving residents in the process, and interest organisations joined in (Figure 16). A green narrative, "Augustenborg Eco-City", was created and became a model for social innovation which is now being used as a model for carrying out similar rejuvenation processes in other post-war neighbourhoods (Figure 17). Even though the project was a top-down initiative, the deep involvement of residents has been successful in creating an inclusive social innovation process.

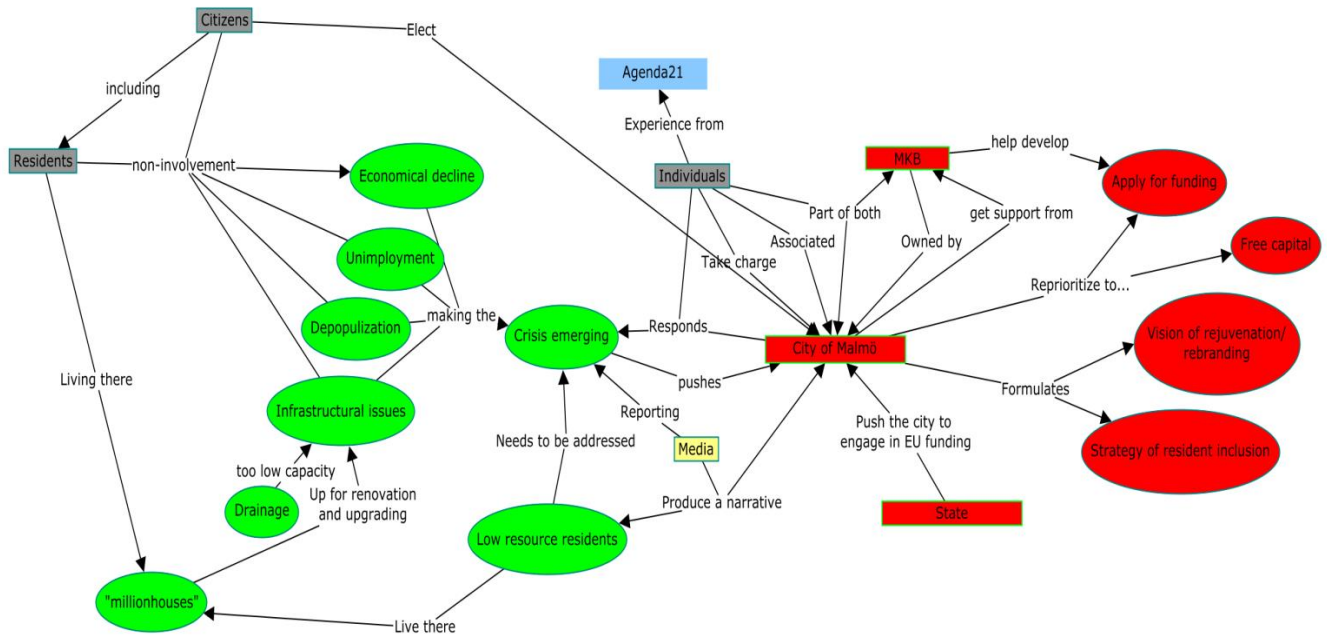


Figure 15 Malmö's SI initial stage



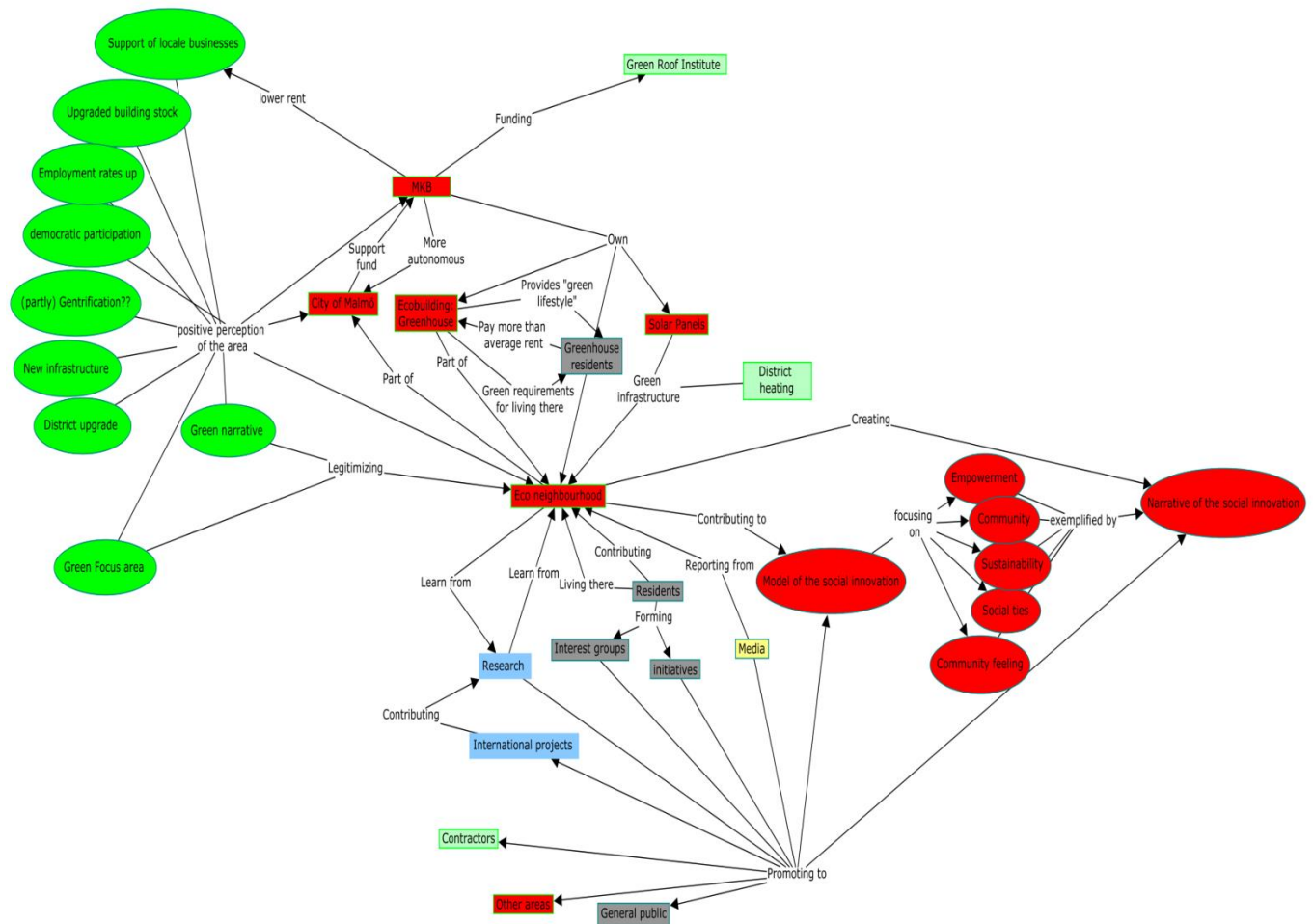


Figure 17 Malmö's SI mature stage

2.3.2 Stockholm

In the Stockholm SI case, seven key actors were identified, namely: (1) Urban Planning Administration (UPA), (2) Swedish Union of Tenants (SUT), (3) Svenska Bostäder, (4) The Environment and Health Administration, (5) Local and national media, (6) Residents and (7) Politicians. For six of them, main barriers and drivers were pinpointed and described below (Urban Planning Administration, SW Union tenants, Svenska Bostäder, Environmental health administration, Residents, and Politicians). For Urban Planning Administration, Swedish Union of Tenants, Svenska Bostäder, The Environment and Health Administration, Local and national media, and Politicians key actors, detailed descriptions are offered in Annex 1 on their networks and interactions.

Identification of barriers and drivers

The six main actors for which drivers and barriers were identified, in relation to attitudinal factors, capabilities and resources, contextual factors, and habits and routines, as mentioned above, are: Urban Planning Administration, SW Union tenants, Svenska Bostäder, Environmental health administration, Residents, and Politicians.

For most of the aforementioned key actors, **attitudinal factors** represent mostly favourable conditions, with more than fifteen drivers and about nine barriers identified. “General environmentalist predisposition” plays a facilitating role for most of the key actors, acting as either a weak driver (i.e., Urban Planning Administration), a moderate driver (i.e., Politicians), or a strong driver (i.e., Environmental health administration). For three key actors (i.e., SW Union tenants, Svenska Bostäder and Residents), this factor was not relevant. “Behaviour-specific norms and beliefs” did not influence five of the key actors (i.e., Urban Planning Administration, SW Union tenants, Svenska Bostäder, Environmental health administration, and Politicians). However, for the other key actor (i.e., Residents), the initial lack of trust towards the union of tenants and the Svenska Bostäder acted as a barrier.

“Other attitudes”, such as social concern about deprivation, inclusiveness of tenants, concerns regarding social inclusion, safety, and reputation of the neighbourhood, or place attachment and place identity, were considered as drivers by all the key actors identifying their drivers and barriers. Lack of trust towards the authorities was the only barrier identified by one key actor (i.e., Residents). “Perceived costs and benefits of action”, such as improving social inclusion, environmental sustainability, political gain and popularity, safety, reputation, learning about the benefits of consultation processes in neighbourhoods, gaining consent from residents, low rent or value for money of upgrading, acted as drivers amongst all of the key actors. Nonetheless, fear of increased rent rates, fear of displacement (having to leave their homes or community), and high cost of upgrading were identified as barriers for two of the key actors (i.e., SW Union tenants and Residents). Initial attitudes against creating consultation process and cultural differences were identified as other attitudes, specific to the context of the Stockholm SI case, which acted as barriers for two key actors (i.e., Svenska Bostäder and Residents). Concerns about safety and social exclusion in the neighbourhood acted as drivers in engaging in the social innovation for one key actor (i.e., SW Union tenants).

Capabilities and resources, such as “literacy” and “social status”, were identified as not important for five out of the six key actors (i.e., Urban Planning Administration, SW Union tenants, Svenska Bostäder, Environmental health administration, and Politicians). For one key actor (i.e., Residents), these re-

sources act as barriers due to lack of language skills or to the fact that some women were thought that they shouldn't be involved.

"Financial resources" were of no impact for two of the key actors (i.e., SW Union tenants and Politicians), acted as barriers for one of the actors (i.e., Residents) out of fear of higher rents, and acted as drivers for three actors (i.e., Urban Planning Administration, Svenska Bostäder, and Environmental health administration). "Time" was a resource evaluated as not relevant for most of the key actors (i.e., SW Union tenants, Svenska Bostäder, Environmental health administration, and Politicians). Yet, for one key actor (i.e., Urban Planning Administration), time acted as a driver, whereas for one other actor (i.e., Residents), it acted as a barrier.

"Knowledge and skills" were considered mostly favourable resources, too, as being evaluated as drivers by four key actors (i.e., Urban Planning Administration, SW Union tenants, Environmental health administration, and Politicians) and as barriers by only two key actors (i.e., Svenska Bostäder and Residents). "Human resources" were assessed also mostly in favourable terms, being identified as drivers by three key actors (i.e., Urban Planning Administration, SW Union tenants, and Environmental health administration), as not relevant for two key actors (i.e., Residents and Politicians), and as barriers by only one key actor (i.e., Svenska Bostäder). "Other capabilities and resources", specific for the Stockholm SI case were identified, in relation to interconnectedness with other units of the city administration (Environmental health administration), being perceived as a driver.

Considering **contextual factors**, the six key actors from Stockholm SI case identified over 20 drivers and only five clear barriers. More specifically, "material costs and rewards" related to financial aspects were evaluated as drivers in the case of two key actors (i.e., Svenska Bostäder and Environmental health administration), and as barrier by one key actor (i.e., Residents). "Laws and regulations" played a facilitating role for only one key actor (i.e., SW Union tenants), whereas this factor was evaluated either as a clear barrier by two key actors (i.e., Urban Planning Administration and Environmental health administration), or as both a barrier and a driver for one of the key actors (i.e., Politicians). "Social norms and expectations" and "supportive policies" factors were evaluated as drivers by five of the key actors (i.e., Urban Planning Administration, SW Union tenants, Svenska Bostäder, Environmental health administration, and Politicians), whereas only for one key actor (i.e., Residents) these two contextual factors played either a hindering role, or were deemed as not important, respectively. Similarly, "media reports" represented a driving contextual factor for five of the key actors (i.e., Urban Planning Administration, SW Union tenants, Svenska Bostäder, Environmental health administration, and Politicians), promoting change in the neighbourhood and reinforcing the process. For one of the key actors (i.e., Residents) this factor represented both a driver and a barrier, being related to resistance to change.

Habit and routine is a factor that had mostly a negative and neutral effect, acting as a barrier for two key actors (i.e., SW Union tenants and Svenska Bostäder). For two key actors (i.e., Urban Planning Administration and Environmental health administration), this factor was of no impact, whereas for other two key actors (i.e., Residents and Politicians) this information was not made available.

Table 7 Barriers and drivers for the key actors of Jarvå's SI

	Key Actor 1 - Urban Planning Administration	Key Actor 2 - SW Union tenants	Key Actor 3 - Svenska Bostäder	Key Actor 4 - Environmental health administration	Key Actor 5 - Residents	Key Actor 6 - Politicians
1 Attitudinal						
General environmentalist predisposition	Driver. Weak.	Not relevant	Not relevant	Driver. Strong. They applied to Swedish Sustainable Cities for funding.	Not relevant	Driver. Moderate. Environmental concern was present but not the main concern.
	The political climate is relevant. *The social democrats* were the majority in the board.					
Behaviour-specific norms and beliefs (specify)	Not relevant	Not relevant	Not relevant	Not relevant	Barrier. Initially lack of trust towards the union of tenants and the Svenska B.	Not relevant
Other attitudes, (specify, e.g., about technology attributes etc.)	Driver. Strong. Social concern about deprivation.	Driver. Strong. Attitudes in favour of inclusiveness of tenants.	Driver. Attitudes towards improving social inclusion. Driver. Concerns of high crime rates and negative reputation of the neighbourhood.	Driver. General positive attitude towards social inclusiveness fostering healthier neighbourhoods.	Place attachment and place Identity. Initially a barrier, later becomes a driver for involvement. Lack of trust towards the authorities was a barrier.	Driver. Strong. Concern with social inclusion. Driver. Strong. Concern with safety.
Perceived costs and benefits of action (specify their nature)	Driver. Strong. Benefit was social inclusion and secondarily environmental sustainability. Benefit: political gain from showing they were taking action on social exclusion and sustainability.	Drivers and barriers here refer to the acceptance of building upgrades. Driver. Low level of the rent. Driver. Value for money of upgrading. Barrier. High cost of upgrading. Barrier excessive increase of rents. Barrier. Strong. Losing their current homes and being relocated outside of the community. Place attachment/identity, initially worked as a barrier to accepting the plans of the municipality, later became a driver to support engagement.	(Initially) Benefit of improving socially the neighbourhood. Driver to start the process. (Later) Benefit of gaining consent from residents was a driver towards creating the dialogue. Benefit (secondary), driver, learning about the benefits of consultation processes in neighbourhoods. Benefit, driver, improving safety and reputational issues.	Driver. Improving the sustainability of the neighbourhood.	Barrier. Concern of having to leave their homes and being out of the community. Barrier. Fear of increased rent rates. Benefit. The idea that the interventions would make the area safer.	Benefits. Drivers. Safety and social inclusions envisaged as results of the interventions. Benefit. Strong. Increasing their popularity.
Other		Driver to engaging in the social innovation. Concerns about safety in the neighbourhood. Driver to engaging in the social innovation. Concern with social exclusion.	Barrier. Initial attitude against creating consultation process.		Barrier. Cultural differences, related with gender roles and the role of younger people, required to work harder on communication and recruiting housing ambassadors (volun-	

					teers).	
2 Capabilities and resources						
Literacy	Not relevant	Non relevant	Not relevant	Not relevant	Barrier. Language skills in Swedish	Not relevant
Social status	Not relevant	Non relevant	Not relevant	Not relevant	Barrier. Some women thought that they should not be involved.	Not relevant
Financial resources	Driver. Financial resources were available.	Non relevant	Driver. The financial resources were available and further resources were drawn in to recruit the SI facilitator	Driver. Yes. They applied for funding to a governmental scheme and they were awarded. The full interventions would not have been carried out without external funding.	Barrier. Residents feared higher rents.	Not relevant
Time	Driver.	Not relevant	Not relevant	Not relevant	Barrier. For some residents the time of meetings was not suitable for participating, but later they changed the meeting times.	Not relevant
knowledge and skills	Driver.	Driver. Strong, the presence of a skilled representative capable of involving the residents was pivotal for the project.	Barrier. Initially not enough knowledge of the neighbourhood.	Driver. L.E. personal initiative was pivotal to attract funding; therefore, her skills were relevant.	Barrier. Lack of knowledge about the local institutions' and tenants' union work. Barrier. Lack of skill in being capable of engaging in a participation process due to lack of experience.	Driver. Knowledge in the sense of awareness of the problems of the area.
human resources	Driver.	Driver. Strong.	Barrier. Initially, but they later recruited a facilitator.	Driver. As above stated, the availability of skilled personnel was important.	Not relevant	Not relevant
Other	None	None	None	Driver. Interconnectedness with other units of the city administration was important.		None
3 Contextual factors						
Material costs and rewards		Not relevant	Financial Cost. Relevant, but was a driver because of availability.	Driver. The financial cost was an issue and the grant obtained was useful.	Barrier. The potentially higher rental costs were a barrier.	Not relevant

Laws and regulations	Barrier. Wind energy was not suitable for the area because of planning regulations	Driver. Regulations demand for a tenants' union to be in place, as rents can only be negotiated through a tenants' union.	Not relevant	Barrier. The wind turbine was not allowed.	Not relevant	Driver/Barrier. Yes, as far as they allow or deny possibilities of interventions
Social norms and expectations	Driver. Strong.	Driver. Strong. The union had to prove to residents that their negative expectations towards the union were wrong and that the union was on the residents' side.	Driver. There are expectations that the municipality would create social inclusive neighbourhoods.	Driver. Expectation on the EH administration to improve sustainability.	Barrier. Negative expectations towards the municipality and the tenants' union.	Driver. Strong. The public expect them to act to solve social issues and crime problems, and to some extent also environmental problems.
Supportive policies	Driver.	Driver. The municipality has policies favouring processes of engagement of residents.	Driver. Policy objectives of the municipality to create socially sustainable neighbourhoods.	Driver. General municipal policies promoting urban sustainability.	Not relevant	Driver. Policies conducive towards sustainable urban interventions, more likely were a driver for politicians to act.
Media reports	Driver. Initially, negative reports were a driver to promote change in the neighbourhood. Driver. During the project, positive reporting reinforced the process.	Driver. Initially, negative reports were a driver to promote change in the neighbourhood. Driver. During the project, positive reporting reinforced the process.	Driver. Initially, negative reports were a driver to promote change in the neighbourhood. Driver. During the project, positive reporting reinforced the process.	Driver. Initially negative reports were a driver to promote change in the neighbourhood. Driver. During the project, positive reporting reinforced the process.	Barrier. Initially, negative reports were a barrier to accept change in the neighbourhood because of trust issues. Driver. During the project, positive local reporting reinforced the process.	Driver. Initially, negative reports were a driver to promote change in the neighbourhood. Driver. During the project, positive reporting reinforced the process.
4 Habit and routine	Not relevant	Barrier. In the sense that the union was usually only involved in rentals negotiation and not in wider processes of engagement.	Barrier. They were not used to social engaging consultations.	Not relevant		

Identification of actors and of network structures

The relationships network is described below, with a summary of its interactions, for the majority of actors. A detailed description is offered in Annex 1, on multiple topics such as actors' characteristics, their decisions and actions, collectives and structures they are a part of, and their most important or relevant interactions with other actor types.

Urban Planning Administration (UPA) interacts with the public (residents). As a City of Stockholm Unit, it is not mandatory to consult the public (residents) for implementing photovoltaics, but the Sustainable Järva Project arranged a lot of events for residents to promote the sustainable identity of Järva. These initiatives were very successful and generated pride amongst residents.

Swedish Union of Tenants (SUT) interactions are described in relation to Stockholm region office central unit and Svenska Bostäder. There were lots of discussions and disagreements with Svenska Bostäder about how to communicate with residents (making things more explicit, expressing in terms that will be widely understood). Attitudes within SB represented an issue.

Svenska Bostäder (SB) interacted with residents, helping them to move out and in again after the buildings' upgrading.

The Environment and Health Administration, interacts with the tenants, and with other inhabitants in the area, with the schools and nurseries, with Cykelfrämjandet (Swedish national cycling advocacy organisation) and NTI, and with all study visitors.

Politicians, express their opinions openly via media and debates. There is a channel where all agendas and political decisions can be reached by anyone.

Essential description of network dynamics

The City of Stockholm was the main actor starting the SI in Jarvå (**Error! Reference source not found.**), liaising with Svenska Bostäder, the public housing company. In the initial phase, the public's involvement was minimal and led to a backlash that spurred a different approach with an extensive dialogue process, finally involving the local residents extensively. This happened through the activity and recruitment of a "central figure" (in **Error! Reference source not found.**) that started to act as coordinator of the Jarvå dialogue. The media related with the residents in this early phase, amplifying their protests and leading to the reaction of the municipality. In the intermediate phase (**Error! Reference source not found.**) the dialogue grew but the main actors in the SI did not change. The media lagged behind in covering the new emerging narrative of a positive Jarvå, while the residents became more active and contributed to an education program developed in partnership with local schools. In the latter phase (**Error! Reference source not found.**) the model of Jarvå was further developed and extended to the area of Skårholmen.

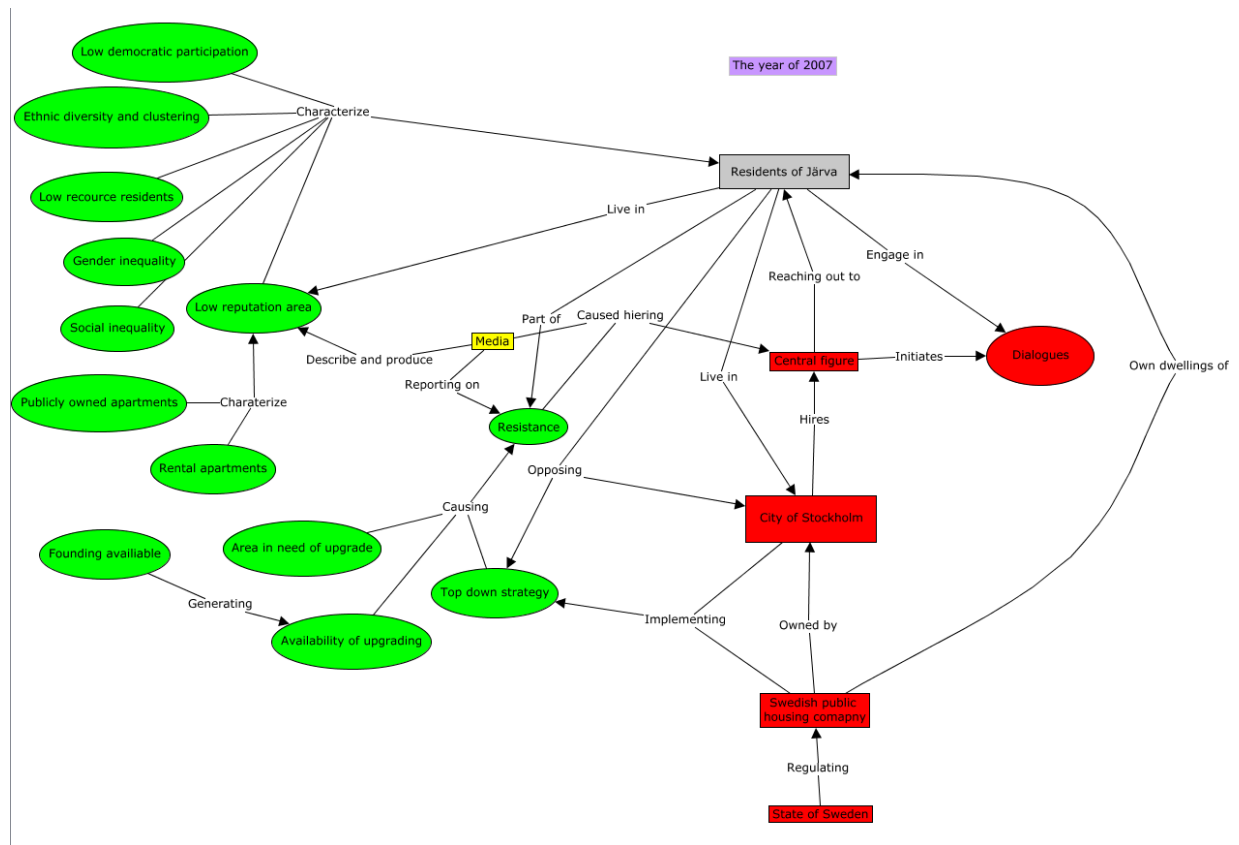


Figure 18 Stockholm Jarväs SI initial stage

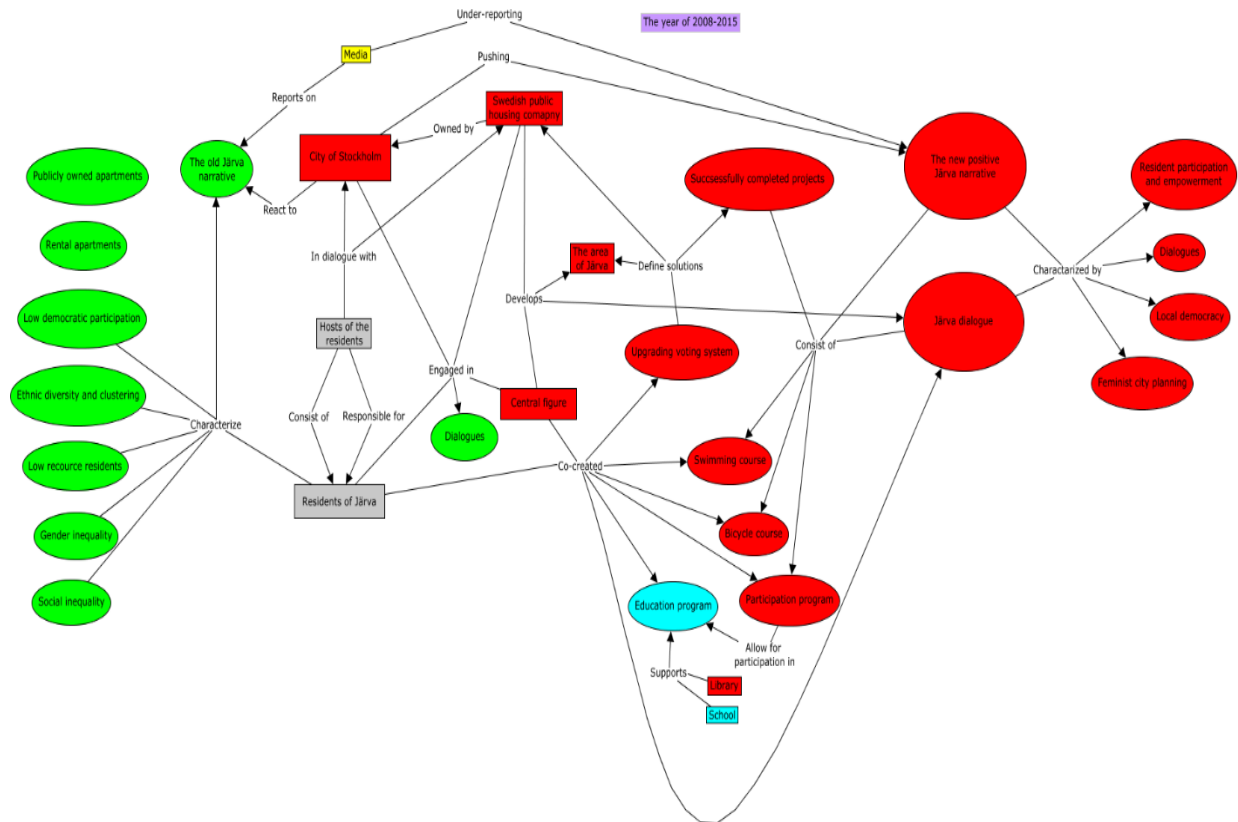


Figure 19 Stockholm Jarväs's SI intermediate stage

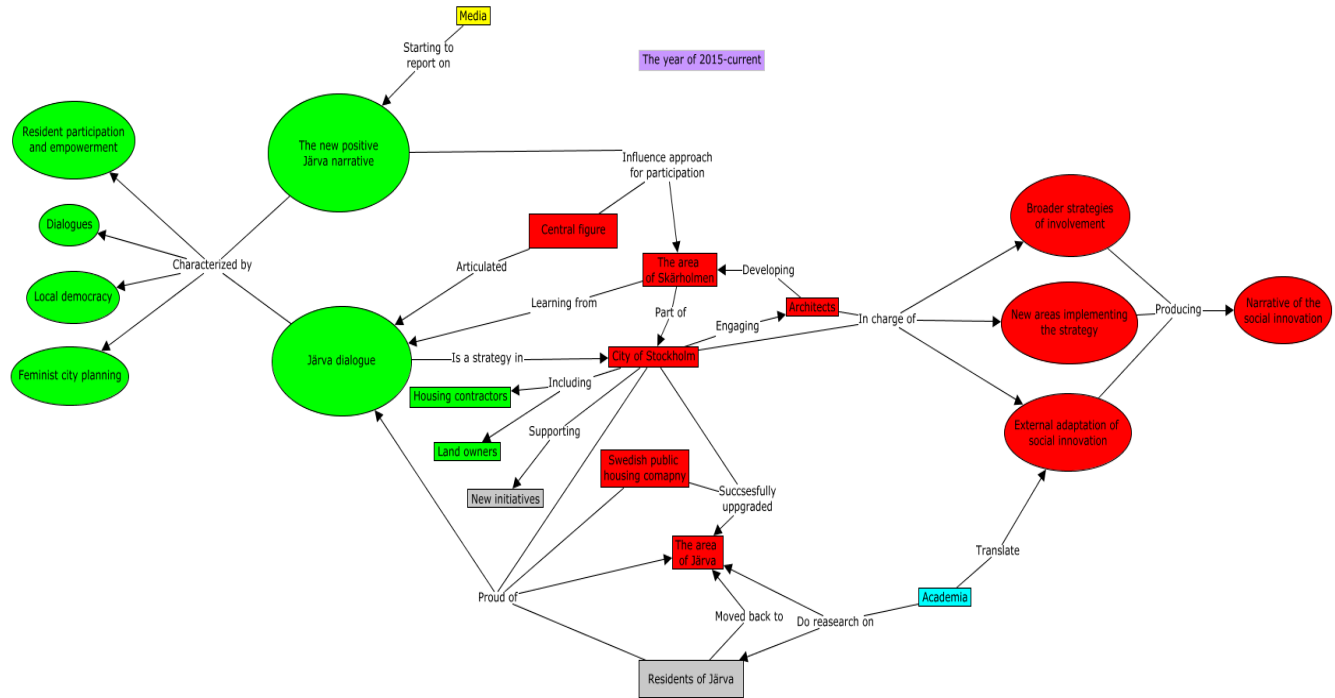


Figure 20 Stockholm Jarvå's SI mature stage

2.4 Cluster d) Urban mobility with super-blocks

The Urban mobility with superblocks SI (cases: Vitoria-Gasteiz/Spain and Barcelona/Spain) is based on an urban innovation (superblocks) that introduce low-carbon mobility practices through the organization of urban space, which minimizes the use of motorized modes of transportation. The city is reorganised into superblocks, i.e. areas designed to maximize public space and keep private cars and public transport outside of the neighbourhoods, redesigning the inner streets for use by pedestrians.

As in Cluster 1, there is very little interest for the main other sectors of energy consumption (e.g., housing, industry, etc.) or on energy production. Both cases originated in the last decade of the last century and are still on-going.

Both projects had the respective local authorities among their main promoters, and in both cases the “Agencia de Ecologia Urbana de Barcelona (AEU)” was involved, a public consortium consisting of the City Council of Barcelona, the Municipal Council and Metropolitan Area of Barcelona and the Barcelona Provincial Council.

2.4.1 Vitoria-Gasteiz

In Vitoria-Gasteiz SI case, three key actors are involved, namely: (1) Local public autonomous entity - Environmental Studies Centre (CEA), (2) Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz, and (3) Local cyclist association - Bizikleteroak.

Identification of barriers and drivers

Each of the three main actors involved in the Vitoria-Gasteiz SI case identified its barriers and drivers related to attitudinal factors, capabilities and resources, contextual factors and habits and routines.

Regarding **attitudinal factors**, the three key actors involved in the Vitoria-Gasteiz SI case identified nine drivers and only one barrier. More specifically, general environmentalist predisposition acts as a driver for all of the key actors, being related to experience in developing environmental projects (i.e., CEA), environmental awareness and collaboration towards enhancing the city's quality of life, being proud of the “environmental identity” label (i.e., Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz), or to defending the interest of the cycling community (i.e., Local cyclist association - Bizikleteroak). “Behaviour-specific norms and beliefs”, such as strong environmental commitment and capacity, or the belief that the number of citizens which use bikes for transport will increase if there are improvements at the infrastructure level, act as drivers for two of the key actors involved (i.e., CEA and Local cyclist association - Bizikleteroak), for which data is available.

“Other attitudes” specific for the Vitoria-Gasteiz SI case, such as willingness to engage in discussions about the mobility of the city, to contribute to the plan, or to learn about environmental issues and urban projects, played a facilitating role for two key actors involved in the SI case (i.e., Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz and Local cyclist association - Bizikleteroak). “Perceived costs and benefits of action” were identified as strong drivers by two key actors (i.e., CEA and Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz). However, this attitudinal factor played a hindering role in the case of one key actor (i.e., Local cyclist association - Bizikleteroak).

Capabilities and resources represent a mostly positive factor in the Vitoria-Gasteiz SI case, with six drivers and only one barrier identified among the key actors involved. While the “literacy” resource plays a facilitating role for one of the key actors (i.e., CEA), for the other two this information is not available. The “social status” resource is not important for all the key actors involved. “Financial resources” act as barriers for one key actor (i.e., CEA), and as drivers for one key actor (i.e., Local cyclist association - Bizikleteroak). Yet, this resource was not relevant in the case of one key actor (i.e., Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz). “Time” was perceived as a barrier in the case of one key actor (i.e., Local cyclist association - Bizikleteroak), as the engagement in participatory processes was seen as highly time-consuming. We do not have information regarding this resource from the other two key actors involved in the Vitoria-Gasteiz SI case. “Knowledge and skills” represent a driver for all the key actors, as they have access to professionals with expertise and experience in the SI case related matters, such as urban planning, sustainability, ecology, co-designing processes, or extensive knowledge on the mobility conditions of the city. Regarding “human resources”, we have available data from only one key actor (i.e., Local cyclist association - Bizikleteroak), which evaluated this factor as a driver.

Contextual factors, which were considered as affecting in any way the key actors involved in the Vitoria-Gasteiz SI case, were mostly perceived in a positive way, and much less as barriers. “Material costs and rewards” and “laws and regulations” represent contextual factors of no impact for all key actors involved in the SI. “Social norms and expectations” related to cycling were identified as drivers for two of the key actors (i.e., CEA and Local cyclist association - Bizikleteroak). “Supportive policies” were considered drivers by all three key actors involved in Vitoria-Gasteiz SI case. However, for one actor (i.e., Local cyclist association - Bizikleteroak), some regulations such as the prohibition of circulation with bikes in the city centre and pedestrian areas during the day, were evaluated as negative for this group. The “Regional context” was identified as a driver by one key actor (i.e., CEA), whereas this context was identified as a barrier by one other key actor (i.e., Local cyclist association - Bizikleteroak) involved in the Vitoria-Gasteiz SI case. Both evaluations were related to the planning of a new tramway infrastructure.

Habit and routine was assessed as a barrier by one of the key actors (i.e., Local cyclist association - Bizikleteroak) involved in the Vitoria-Gasteiz SI case, whereas for the other two key actors (i.e., CEA and Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz), this information is not available. The barriers identified are related to the habits of some cyclists to circulate in the pedestrian areas and sidewalks, as being considered negative for the conciliation between pedestrians and cyclists.

Table 8 Barriers and drivers for the key actors of Vitoria Gasteiz's SI

	Key Actor 1 - CEA (Environmental studies Centre)	Key Actor 2 - Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz	Key Actor 3 - Local cyclist association - Bizikleteroak
1 Attitudinal			
General environmentalist predisposition	Strong driver. The CEA has long experience in developing environmental projects in different domains (e.g. environmental education, green infrastructures, sustainable mobility, waste management, etc.).	Strong driver. Most of the institutions participating in the Forum share an environmental awareness and collaborate in the designing of policies that enhance the city's quality of life. There is also a kind of «environmental identity» in the city that is reported by many of the interviewees, which feel proud of being a green capital and having contributed to this achievement.	Driver. The main motivation for this actor to engage in SI is defending the interest of the cycling community; however, they also endorse the environmental aims underlining the superblocks model.
Behaviour-specific norms and beliefs (specify)	Strong driver. CEA employees share a strong environmental commitment and capacity of leadership of the environmental policies in the city. They have made much pressure inside the city council to launch the superblock projects and the sustainable mobility plan especially when policy makers were afraid of the political cost that the changes might have.	No information about specific norms or beliefs affecting the functioning of this actor.	Driver. Belief that if the city council improves the cyclist infrastructure, the number of citizens using bikes for commuting or other needs will increase, becoming a more sustainable city. This actor contributes pointing out the barriers and weakness of the cyclist networks and formulating proposals of improvement in terms of infrastructures, street connectivity, road security and evaluation of mobility behavior, etc.
Other attitudes	No information	Strong driver. Willingness of the members of the Forum to engage in discussions about the mobility of the city and contribute to the plan. They learned effective methodologies (e.g. world-cafe) by which participants discussed about concrete topics and made proposals and solutions to specific issues based on the needs of population. Willingness to learn about environmental issues and urban projects. Some interviewees acknowledge that contributing to the superblock plan was an enriching learning experience.	Driver. Willingness to engage in discussions about the mobility of the city and contribute to the plan.
Perceived costs and benefits of action	Strong driver. Superblocks programme were designed as the best solution to traffic congestion and environmental pollution in the city. The members of the CEA were strongly convinced of the benefits of this policy measure and made a huge effort in leading this project and the participatory processes launched at the beginning (elaboration of the sustainable mobility and public space plan). They are currently leading the revision of the Plan, after 10 years of implementation.	Strong driver. The potential benefits of the project are one of the reasons that motivate the members of the Forum to participate in the Forum and to follow-up the implementation of the sustainability mobility and public space plan. They also report that citizens share also the perception that the quality of the urban space has increased because of the superblocks (reduction of traffic noise, more public space available, low level of air pollution) as well as the superblocks are described as «vivid» spaces, spaces of socialization, with more pedestrians and bikes using the public space.	Barrier. This actor was a member of the Sustainable Mobility Forum for more than 10 years, actively contributing with their proposals. They are not members anymore due to recent confrontations with the head of the mobility department (policy maker) at the city council). They consider now that their participation in the Forum has not the expected benefit and that they are not well informed about future policies related to mobility.
2 Capabilities and resources			
Literacy	Strong driver. See knowledge and skills	No information.	No information.
Social status	Not relevant	Not relevant	Not relevant.

Financial resources	Barrier. The lack of financial and human resources has been pointed out as a limitation for launching more superblocks in new city areas. However, they managed to gain some external budget. The Basque Administration has financially supported several energy innovation projects and the CEA has benefitted from such external financing. The National government launched an investment programme in 2007-2008 («plan E») that funded the main physical infrastructures carried out in the pilot superblock. This actor has developed leverage in obtaining external funding (e.g. from the UE) to implement some energy projects and interventions related to sustainable mobility and superblocks.	Not relevant. This Forum has not competences in launching the superblocks (it is a multi-stakeholder deliberative formal space).	Driver. This actor receives public funds from the local government to conduct a series of activities related to active mobility. For example, they conduct several cycling courses with scholars, they conduct several studies about the use of bike in the city. They also participate in the Agenda 21 Forum. The lack of public funds might put in risk some of these activities.
Time	No information	No information	Barrier. Engaging in participatory processes is perceived as a high time-consuming activity and the members of this association have to dedicate part of their free time to study the projects, deliberate and present their proposals in the mobility forum or to the promoters of the superblocks plan. Sometimes they experiment frustration when their opinion is not taken into account or when they think that have not received sufficient information about new policy decisions already adopted by the municipality.
knowledge and skills	Strong driver. The promoters and CEA members leading the project are an interdisciplinary group of professionals with expertise in urban planning, sustainability, ecology that have also conducted other ambitious projects in the city. They have also participated in several EU-funded projects that enhanced their capacity of innovation, learning from other EU experiences in sustainable mobility and energy transitions.	Driver. The capacity of the members of the Forum to propose alternatives and new measures about the sustainable mobility plan has been relevant. Some of the members have background or experience in urban management, others belong to environmental NGOS, business sector, or are members of the local policy parties with special interest in environmental policies and mobility.	Driver. The representatives of this association have large experience in participating in co-designing processes. They have deep knowledge on the mobility conditions of the city, especially in cycling infrastructures. Moreover, they became a relevant actor for media and their opinions receive the coverage of local media.
human resources	No information	No information	Driver. Receiving public funds allows this actor to hire personnel to develop a number of dissemination, education and monitoring mobility. They elaborate studies and surveys focusing on the needs and behaviour of the cyclist community.
Etc.			
3 Contextual factors			
Material costs and rewards	No information about financial issues affecting the work of this actor.	No information about financial issues affecting the work of this actor.	No information
Laws and regulations	No information (see supportive policies)	No information/not relevant for the functioning of this forum	No information/not relevant for the functioning of this actor

Social norms and expectations	Driver. A change in social norms has been reported by some interviewees in terms of changes of modes of transportation. Cycling has become normative for several groups of population, such as youth people, public employees, journalists, even policy-makers.	No information about social norms affecting the contribution of this actor.	Driver. Change in social norms has been reported by some interviewees in terms of changes of modes of transportation. Cycling has become normative for several groups of population, such as youth people, public employees, journalists, even policy-makers.
Supportive policies	Driver. Specific plans and regulations have been approved that support the SI, such as the Sustainable Mobility and Urban Space Plan and others. Strategies at the EU and regional context aiming at reducing CO2 emissions are also relevant such as the Basque Strategy towards low-carbon transition.	Driver. The Forum is supported by city council, but nowadays has the capacity to organize its activity without the supervision of the city council. Their members are happy with this self-organizing methodology, deciding the topics of discussion of each session and inviting the members of the city council or specific city areas to participate or present the city projects in these sessions.	Driver. Specific plans and measures approved by the city council support the use of bikes in the city. However, other regulations, for example, the prohibition of circulation with bikes in the city centre and pedestrian areas during the day is considered as negative for this group. They claim more measures to conciliate the car and cycling use of roads, giving priority to bikes.
Regional context (new element)	Driver. The new tramway infrastructure planned by the regional government for the City of Vitoria-Gasteiz was critical for the transformation of the public transport system in the city. However, the enlargement of the tramway that regional and local institutions are currently planning is perceived as negative by citizens and several social actors, which abandoned the sustainable mobility forum protesting against the lack of willingness of both institutions to negotiate about this project.	Not relevant for the functioning of this forum	The enlargement of the tramway that regional and local institutions are currently planning is perceived as negative by this actor, which abandoned the sustainable mobility forum protesting against the lack of willingness of both institutions to negotiate.
4 Habit and routine	No information	No information	Barrier. The habit of some cyclists to circulate in the pedestrian areas and sidewalks is considered negative for the conciliation between pedestrians and cyclists. This actor demands to the city council a major control on people's behaviour, penalizing those cyclists that use the sidewalk instead the road or that circulate very fast in the areas where cyclist and pedestrians should share a common space.

Identification of actors and of network structures

Below, a short description of the networks of interactions relevant for the Vitoria-Gasteiz SI case, with its visual representation is offered. A more detailed description, for each of the key actors involved in the Vitoria-Gasteiz SI case, on different topics such as actors' characteristics, their decisions and actions, collectives and structures they are a part of, and their most important or relevant interactions with other actor types, is provided in Annex 1.

The first key actor, **Environmental Studies Centre (CEA)**, interacts with residents' associations and citizens, engaging in the participatory processes aimed at the implementation of superblocks and sustainable mobility measures at the neighbourhood level. This key actor also has a cooperative relationship with neighbourhood business and shopkeepers' associations, with public and private education centres located in the superblock/neighbourhood, with local political parties, and with cyclist associations. Moreover, local media helps to disseminate the city plans, usually providing a positive vision of the sustainability mobility measures. CEA also interacts intensively with public transport services.

The second key actor, **Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz**, interacts mainly with the City Council. Specifically, this interaction is with a number of municipal departments, such as TUVisa (managing the public transport buses system), Traffic and Mobility Service, local police, the Department of Economic Development, and the Department of Environment and Public Space.

The third key actor, **Local cyclist association Bizikleteroak**, as a member of the Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz, interacts with a number of **city stakeholders and associations**, related to sustainable mobility and environmental protection. Also, this key actor interacts with the local media, as it is considered a well-informed voice that can provide a relevant opinion regarding the policy measures to be implemented in the city. Bizikleteroak also interacts with a new association, "**Camina Gasteiz association**", which joined the Sustainability mobility forum.

Essential description of network dynamics

Error! Reference source not found. corresponds to the first stage of the SI, getting political commitment in sustainable mobility policies. The figure indicates the previous steps done by the city (e.g., city environmental forum) that paved the way for the SI. The figure identifies the main public and private agents that contributed to the elaboration of the Sustainability Mobility and Public Space Plan, which is the document that settled the distribution of the city in superblocks and introduced a radical change in the mobility system of the city.

Error! Reference source not found. describes the intermediate stage in the development of the SI, corresponding to the period between 2001 and 2009, which involved a radical change in the public transportation system and parking regulation. The promoters of the SI (i.e., CEA, city council), developed a series of participatory processes aiming at gaining the public support for the Sustainability Mobility and Public Space Plan. Several new formal spaces (e.g., "permanent technical group", "citizens' forum for sustainable mobility") have been created to communicate and discuss the main objectives and policy measures to be implemented in the city. The figure also indicates the type of relations and interactions

among the different actors and stakeholders in the city. Thus, social participation was the basis for a series of outcomes of the SI, such as social capital, social cohesion and community identity.

Error! Reference source not found. shows the third phase of the SI: Implementation of the superblock model (2009-present). This phase corresponds to the first pilot superblock (Sancho el Sabio, 2009) and the following adoption of a series of policies aiming at reducing the use of motorized traffic in the city centre and fostering active mobility patterns. The figure illustrates mainly the different types of actors and agents involved in the development of the social innovation or that influenced, with their support or their contestation, the different policy measures adopted in the Sustainability Mobility and Public Space Plan. A series of outcomes resulted of this phase, such as the development of new policies (e.g., “Master Plan for Cyclist Mobility”) or the protests and negative reactions from a sector of the citizens and stakeholders.

Error! Reference source not found. illustrates the relationships between the different actors and local agents involved in the current phase of development of the SI. This fourth phase corresponds to the ongoing evaluation and revision of the Sustainability Mobility and Public Space Plan, which started in 2018 (lead by the CEA). Such revision involves a public participatory process in which different actors and citizens will contribute to the design of the new measures to be adopted. However, as the revision of the Plan involves changes in the city mobility infrastructures, this already caused public contestation and support loss from a number of stakeholders and local actors participating in the Citizen Forum for Sustainable Mobility.

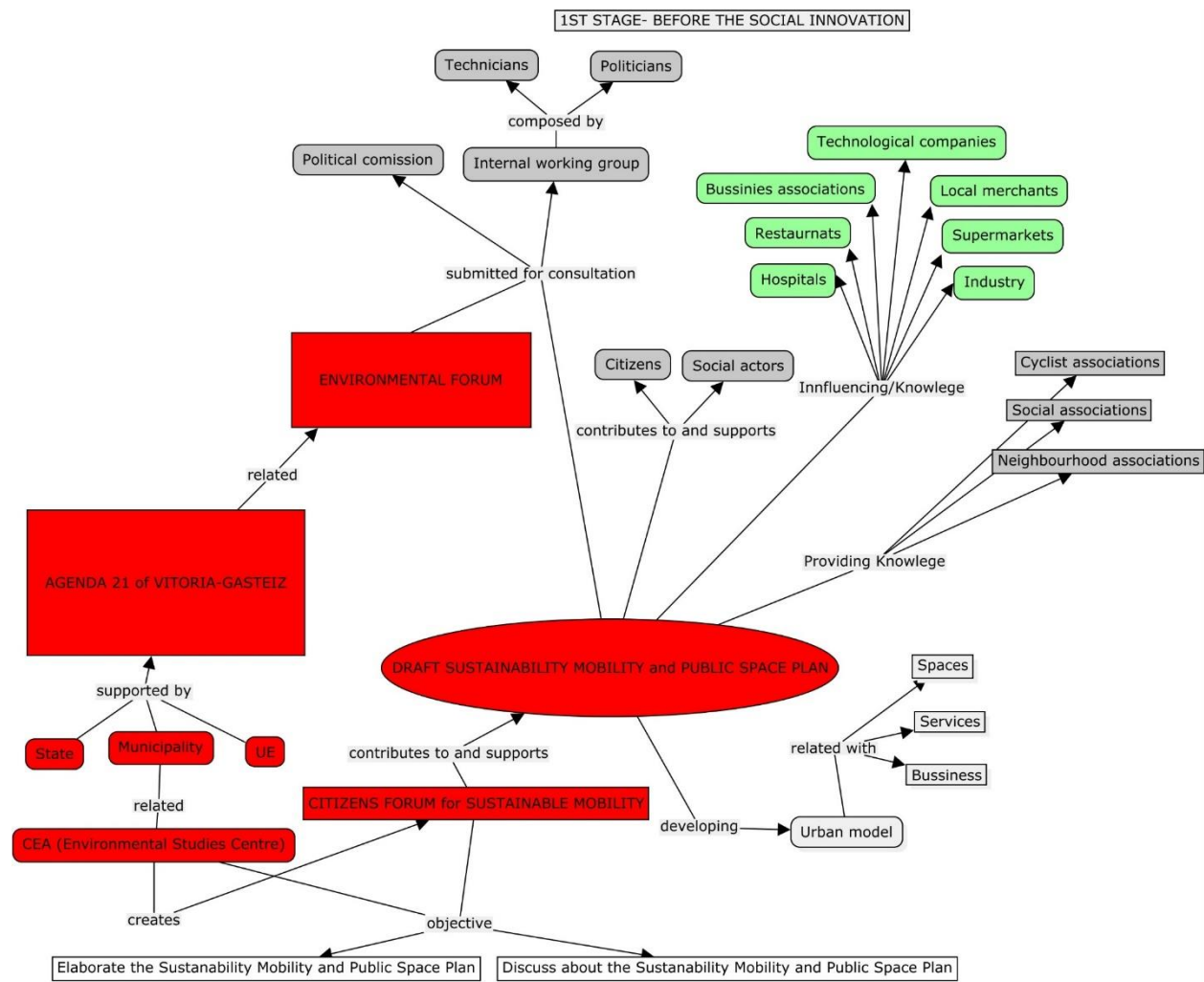


Figure 21 Vitoria-Gasteiz's SI initial stage

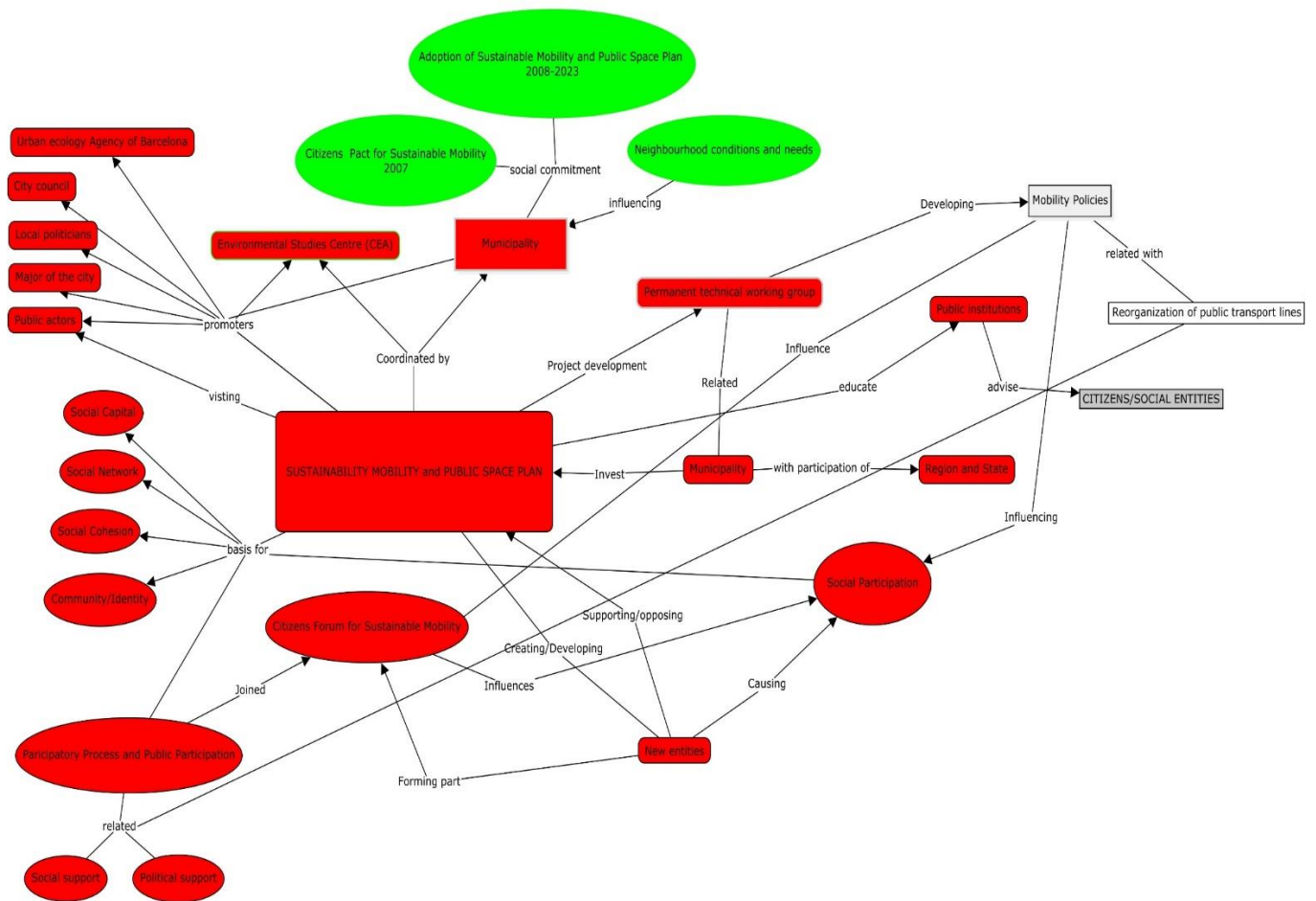


Figure 22 Vitoria-Gasteiz's SI intermediate stage

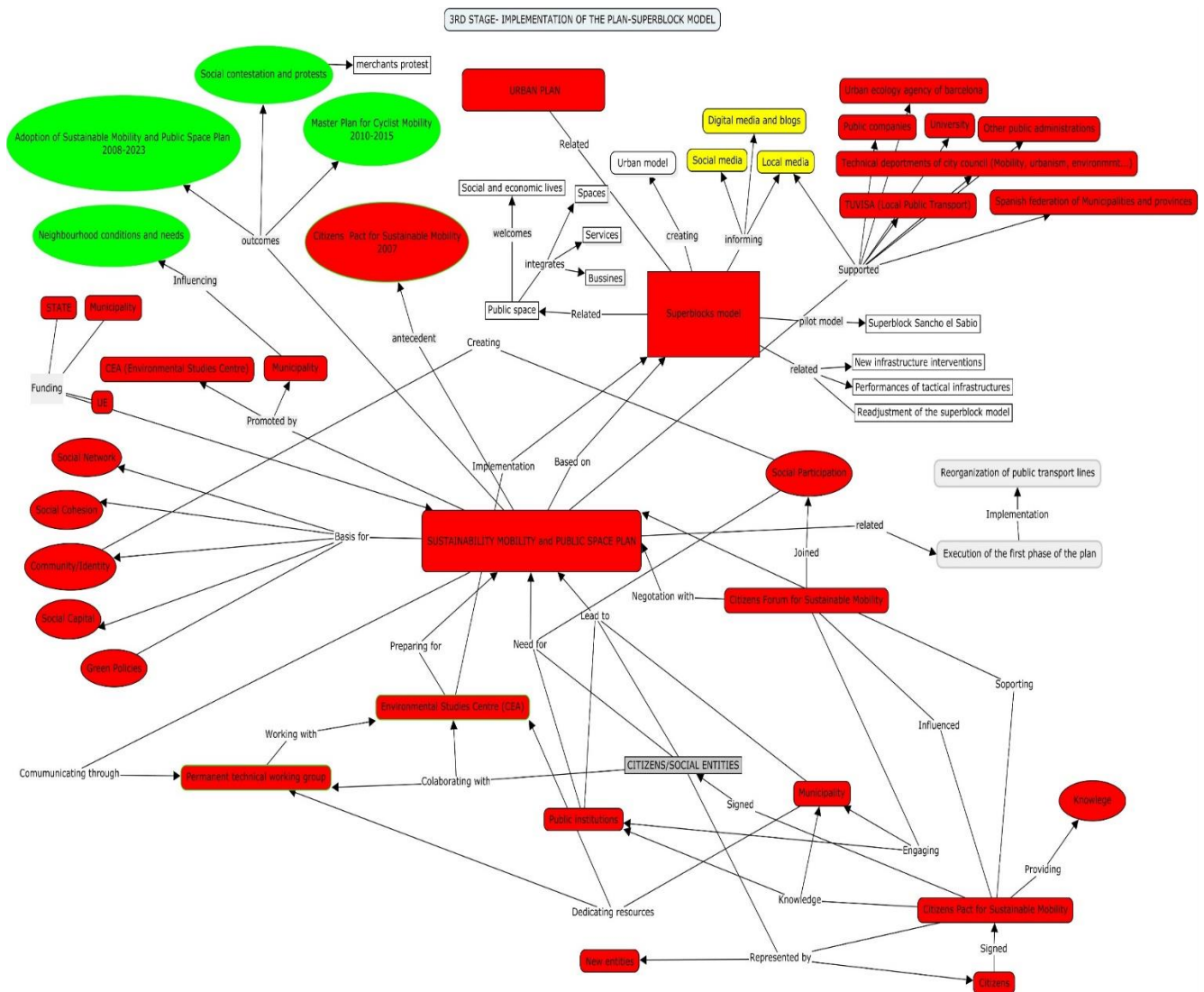
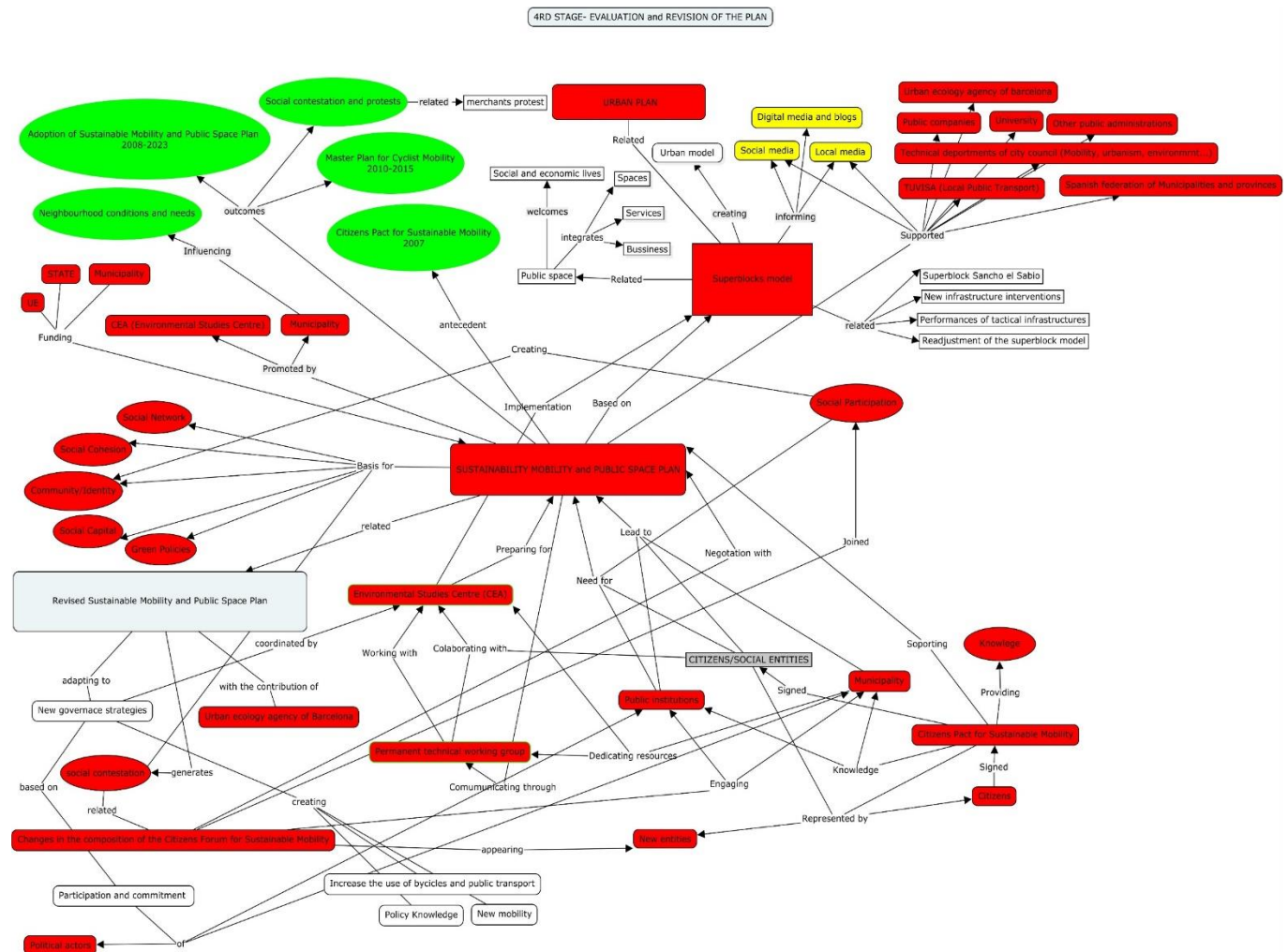


Figure 23 Vitoria-Gasteiz's SI third stage



3.4.2 Barcelona

In the Barcelona SI case, a four key actors are involved, namely: (1) Barcelona City Council, (2) Neighbourhood Business and Shopkeepers Associations, (3) Neighbours / Residents Associations, and (4) Individual Citizens (and frequent visitors).

Identification of barriers and drivers

In the Barcelona SI case, each of the four main actors involved identified its barriers and drivers related to attitudinal factors, capabilities and resources, contextual factors and habits and routines, shortly described below.

Attitudinal factors were mostly perceived as positive by all the main actors involved in the Barcelona SI case, with nine clear drivers and four clear barriers identified. Specifically, “general environmentalist predisposition” was assessed as a driver by all the four key actors, related to strong environmental sensibility and values, preserving neighbourhood’s traditional commercial activity, the need of improving people’s quality of life and traffic pacification, awareness of the impact of air pollution, noise and other environmental risks in their quality of life and health, or concerns about climate change and environmental issues.

“Behaviour-specific norms and beliefs” act as a driver for one key actor (i.e., Barcelona City Council) in terms of commitments related to environmental and societal challenges, such as reducing CO₂ emissions, increasing quality of life, or reducing the impact of air pollution on citizens’ health. This factor also represents a barrier for one other key actor (i.e., Neighbourhood Business/Shopkeepers Associations), being related to the belief that traffic prohibitions will jeopardize commercial activity. We do not have available information from the other two key actors (i.e., Neighbours/ Residents Associations and Individual Citizens) regarding behaviour-specific norms and beliefs.

“Other attitudes”, such as the positive attitude towards public participation and participatory/ concertation initiatives, or experiences related to multi-stakeholders’ public participation, were identified as drivers by three of the key actors (i.e., Barcelona City Council, Neighbourhood Business/Shopkeepers Associations and Neighbours/ Residents Associations), whereas non-active involvement in long-term participatory processes was assessed as a barrier for one key actor (Individual Citizens). “Perceived costs and benefits of action” were identified as barriers by two key actors (i.e., Barcelona City Council and Individual Citizens), as drivers by one key actor (i.e., Neighbours/ Residents Associations), and as both as a driver and barrier by one other key actor (i.e., Neighbourhood Business/Shopkeepers Associations).

Capabilities and resources played a more nuanced role in the Barcelona SI case, as the key actors involved identified a total of five drivers and four barriers. More specifically, “literacy” played a facilitator role for two key actors (i.e., Barcelona City Council and Neighbourhood Business/Shopkeepers Associations), whereas the same two key actors identified “financial resources” as barriers. “Social status” represents a resource which is either not important, or no information is available for it. “Time” was perceived mostly as a barrier by one of the key actors for which we have this information (i.e., Barcelona City Council), because this SI requires time for public participation, discussing the Action Plan with

stakeholders, and implementing the technical and infrastructural measures approved by the “promoting team”.

“Knowledge and skills” are perceived as drivers by two of the key actors involved (i.e., Neighbourhood Business/Shopkeepers Associations and Neighbours/ Residents Associations). However, in the case of one other key actor (i.e., Barcelona City Council), knowledge and skills plays both facilitating and hindering roles. Regarding “human resources”, we have available information for only one key actor (i.e., Barcelona City Council), for which this factor is perceived as a barrier.

Contextual factors, and more specifically “material costs and rewards” and “laws and regulations”, either are not of importance for the key actors involved in Barcelona SI case, either no information is available. Regarding “social norms and expectations” or “culture” factor, the perceptions of the key actors are either negative, as acting as barriers (i.e., Neighbours/ Residents Associations), or positive and negative at the same time, as acting as both barriers and drivers (i.e., Individual Citizens). This group of factors refers to the existing culture of mobility based on the ownership and use of private cars, a culture that is currently changing towards a more inclusive mode of transport (e.g., increase in number of citizens using bikes, e-bikes, public transport, or e-scooters, and new generations’ lack of interest in buying a car).

“Supportive policies”, such as approved plans and regulations related to green infrastructure, sustainable mobility, efforts to lower carbon emissions, enhancement of public transport system, bike, e-bike and car-sharing options, were identified across all the key actors involved in Barcelona SI case as drivers. “Metropolitan and regional context” was a new element introduced, related to a lack of better public transport infrastructures, and seen as barriers by two key actors (i.e., Barcelona City Council and Neighbourhood Business/Shopkeepers Associations). For the other two key actors involved in Barcelona SI case, no such information is available.

Regarding the **habit and routine** factor, information about specific habits and routines for two key actors (i.e., Barcelona City Council and Neighbourhood Business/Shopkeepers Associations), that might become a barrier or a driver for launching the superblocks programme is not available. For the other two key actors involved (i.e., Neighbours/ Residents Associations and Individual Citizens), habits and routines, such as using private car for moving in and outside the city instead of other modes of transportation, act as strong barriers.

	Key Actor 1 - BARCELONA CITY COUNCIL	Key Actor 2 - NEIGHBOURHOOD BUSINESS/ SHOPKEEPERS ASSOCIATIONS	Key Actor 3 - NEIGHBOURGS/ RESIDENTS ASSOCIATIONS	Key Actor 4 - INDIVIDUAL CITIZENS
1 Attitudinal				
General environmentalist predisposition	Driver The City Council has long experience in developing the Agenda 21 and the “Pact for Mobility” signed with a hundred institutions. This is an example of the environmental awareness and willingness to transform Barcelona in a more sustainable city. Besides, strong environmental sensibility has been observed in the interviews with promoters and social actors, so relevant people at low levels of decision share also pro-environmental values.	Driver? Not much information regarding the environmental predisposition of this actor. However, their motivation in engaging in participatory processes relates to the need of improving people’s quality of life, and traffic pacification is perceived as a good way to do that and, at the same time, to preserve neighbourhood’s traditional commercial activity.	Driver. In general, it has been observed that residents’ associations (interviewed) are aware of the impact of air pollution, noise and other environmental risks in their quality of life and health. These associations usually support superblocks arguing that this project might enhance the security and environmental conditions of the area. However, they are aware that only small interventions in districts do not solve the huge pollution issue in Barcelona, and that more projects are needed.	Driver. According to some interviewees, there is an increase in number of citizens concerned about climate change and environmental issues, although there is still a gap between attitudes and actual behaviour. The #Fridaysforfuture campaign in Barcelona gained large support from young and adult people, which might be taken as an opportunity for policy-makers to promote environmental policies in the city.
Behaviour-specific norms and beliefs (specify)	Strong driver. Barcelona has several commitments in terms of environmental and societal challenges to accomplish. Reducing CO2 emissions, increasing city quality of life, and reducing the impact of air pollution on citizens’ health, are key drivers for implementing the superblocks programme.	Barrier. Shopkeepers sector usually believes that traffic prohibitions will jeopardize their commercial activity and frequently have opposed to the idea of pedestrianization of streets and even superblocks. However, this vision is changing , and, in the case of Sant Antoni, this sector demands an extension of the superblock area to the closer streets, due to the positive impact on their businesses.	No information	No information
Other attitudes	Drivers. Long experience in multi-stakeholders’ public participation in neighbourhoods and districts. District councils are relevant bodies through which starting a discussion about superblocks at the neighbourhood area.	Driver. This actor presents a positive attitude towards public participation and welcomes participatory/concertation initiatives in which they have the opportunity to express their opinion and collaborate in the design of a policy measure.	Driver. This actor presents a positive attitude towards public participation and welcomes participatory/concertation initiatives in which they can express their opinion and collaborate in the design of a policy measure.	Barrier. Non-active involvement in long-term participatory processes. However, they can attend and participate in the open sessions organized by the city council presenting superblock Action Plan, supporting or opposing to the superblock initiative or demanding changes in the Action Plan. If they don’t support the superblock, they can create anti-superblock platforms or just participate in protests against the project or even organizing or voting. If they support superblock, they can create or join to new pro-superblock entities that organize (or join to) activities vindicating superblock benefits.

Perceived costs and benefits of action	Barrier. Superblocks programme was in danger when the pilot superblock caused huge contestation and citizen's protests and some local parties did not support the council. However, political resistance has decreased over 2 years, and population see this SI as a positive intervention with benefits in terms of social cohesion, quality of public space and health perception. This becomes a driver for launching more superblocks projects in other areas of the city.	Driver or barrier. As explained before, depending on the neighbourhood, there is a positive or negative perception of the impact of the superblock. In Poblenou, this actor opposed to the project, claiming they lost many customers that cannot reach by car to their business. In Sant Antoni and Sant Gervasi, superblocks are perceived by this actor as positive for their activity, because the number of people walking in the street will be good. However, some of them are concerned about changes in the type of activity in these streets (e.g. more bars and coffees, less shops).	Driver. The residents' associations perceive more positive than negative costs concerning superblocks. They are aware of the difficulties that some neighbours can find for parking their cars on the street, or that they need to change their driving habits inside the superblock, but they observe more positive outcomes than negative. It's a matter of changing individual habits for the common good.	Barrier. We don't have much information about this actor. According to the interviewees, citizens are usually reluctant about restrictions in car mobility arguing they will lose their right to reach their houses or parking. However, this perception appears to change when they experience the positive outcomes of a superblock or when they visit other superblocks and see that the quality of the public space is better than in their neighbourhood. This actor should be observed in each specific superblock area so as other types of costs or benefits might arise.
2 Capabilities and resources				
Literacy	Strong driver. The promoters (city technicians) and policy makers leading the project are well trained professionals with expertise in urban planning, sustainability and conducting other ambitious projects in the city. Moreover, the experience of BCNecologia (a public consortium dedicated "to rethink cities in key of sustainability"), brings large experience in developing long-term strategies and projects in sustainability, including the theoretical development of the superblock programme.	Driver. The leaders of these associations in Barcelona usually have good internal organization and training (even some of them have been involved in international projects), which permitted them to know other realities in Europe and observe how their business and quality of life in their cities can be enhanced by environmental projects like superblocks. This characteristic has been observed in one of the neighbourhoods under study; however, each district is different and might not be the same in future superblocks development.	No information.	No information.
Social status	Not relevant	Not relevant	No information	No information.
Financial resources	Barrier. The lack of financial and human resources has been pointed out as a limitation for launching more superblocks in new city areas. However, the investment has increased, and the planning team involves now a number of external consultancies that give support to the municipal promoting team.	Barrier. In terms of financial resources, shopkeepers' associations claim that lack of local budget for investments and infrastructures in the neighbourhood might delay the execution of the Superblock Action Plan.	No information	No information.

Time	Barrier. Superblocks are projects that require time for public participation, discussing the Action Plan with stakeholders and implementing the technical and infrastructural measures approved by the “promoting team”. So, this time investment was first perceived as inconvenient by the policy actors. However, due this strategy reduces contestations and protests, policy-makers learnt that going pace by pace is a better strategy, although they have to wait more to implement the superblock and to perceive its impact.	No information.	No information	No information.
knowledge and skills	Driver. See literacy.	Driver. This actor has long experience in negotiation and lobby activity in order to influence local policy measures. Besides, they are usually involved in neighbourhood activities, community dynamization, etc., and have a strong relationship with neighbours and other social actors. This actor is one of the most active in the co-designing of superblocks, so as they know very well which are the needs of the different groups in the district.	Driver. This actor has long experience in negotiation and lobby activity in order to influence local policy measures. Besides, they are usually involved in neighbourhood activities, community dynamization, etc., and have a strong relationship with neighbours and other social actors.	No information.
	Barrier: interviewees report that the promoting team needed specific skills related how to deal with citizens, how to negotiate the plan with different individuals and coping with stress, citizen’s anger, and dealing with confrontation among different parties involved in the participatory processes. Specific profiles have been hired for tackling this kind of issues.			
human resources	See financial resources	No information	No information	No information.
Etc.				
3 Contextual factors				
Material costs and rewards	Not relevant	Not relevant	Not relevant	Not relevant
Laws and regulations	No information (see supportive policies)	No information	No information	Not relevant

Social norms and expectations /culture	No information	No information	Barrier: existing culture of mobility based on ownership and use of private cars. However, this culture appears to be changing and some interviewees report an increase of the number of citizens that use bike, e-bike, public transport e-scooter, etc., as regular modes of transportation.	Barrier/driver: existing culture of mobility based on the ownership and use of private car. However, this culture appears to be changing and some interviewees and policymakers report that the new generations are not so interested in buying a car and they prefer to use other modes of low-carbon transportation.
Supportive policies	Driver. Specific plans and regulations have been approved in Barcelona that support the SI, such as the green infrastructure strategy, or the sustainability mobility plan. Strategies at the EU and national context aiming at reducing CO2 emissions are also relevant.	Not relevant at the neighbourhood level. However, they observe an increase of low carbon mobility due to: 1) the improvement in the municipal public transport and bike services, 2) limitations in park circulation, and 3) difficulties to park in the city centre	Driver. The enhancement of public transport system, bike, e-bike and car-sharing options is perceived by residents as positive policy measure that would contribute to a change in people's patterns of mobility. Besides, (green)infrastructural measures that increase the level of walkability in the city favour that people decide to walk or use a bike instead of driving their car.	Driver The enhancement of public transport system, bike, e-bike and car-sharing options is perceived by residents as positive policy measure that would contribute to a change on people's patterns of mobility. Besides, (green)infrastructural measures that increase the level of walkability in the city favour that people decide to walk or use a bike instead of driving their car.
Metropolitan and regional context (new element)	Barrier. The lack of better public transport infrastructures has been pointed out as a strong barrier for sustainable mobility in Barcelona, so much of the road traffic in the city is due to commuters (that work in industrial areas out of the city) and people living in nearby municipalities and working in BCN.	This actor points to the same limitations as the city council, in terms of the mobility of citizens in the metropolitan area of Barcelona and the insufficient public transport service.	No information	No information
4 Habit and routine	No information about specific habits and routines in city council that might become a barrier or a driver for launching the superblocks programme.	No information	Strong barrier. Habit is one of the main barriers for changing people's mobility behaviour, in particular, the habit of using private car for moving in the city and outside the city instead of using other modes of transportation persists among residents (especially the mature ones). Other interviewees observe that habits have changed in superblocks. For example, children play now on the streets of the superblocks' areas, and elderly people sit on the new benches, increase the number of people doing sports, promote cultural activities, or just enjoy the public space.	Strong barrier. Habit is one of the main barriers for changing people's mobility behaviour, in specific the habit of using private car for moving in the city and outside the city instead other modes of transportation persists among residents (especially the mature ones). Other interviewees observe that habits have changed in superblocks. For example, children play now on the streets of the superblock areas and elderly people sit on the new benches, an increase in the number of people doing sports, which promote cultural activities, or just enjoy the public space.

Identification of actors and of network structures

For each key actor involved in the Barcelona SI case, a detailed description is offered in Annex 1 on multiple, different topics such as actors' characteristics, their decisions and actions, collectives and structures they are a part of, and their most important or relevant interactions with other actor types. Below, a short summary of important interactions and a visual representation for this SI case of its network is provided.

The first key actor, **Barcelona City Council**, interacts with several entities at both the city and the neighbourhood level. At the city level, the “Barcelona Mobility Pact” is the permanent body launched by the City Council for deliberation and formulation of solutions to enhance sustainable mobility in the city (e.g., the elaboration of the Urban Mobility Plan). This relationship is based on communication and collaboration. Barcelona City Council also interacts in a cooperative manner with several working groups, such as the Bicycle Working Group. This key actor also engages public, private and social economy entities like the Barcelona Bike Hub, the NGO “Amics de la Bici”, the Association for the Promotion of Public Transport, the RACC Foundation, trade-unions, private transport associations and other for-profit and non-profit actors. The relationships with Barcelona City Council are also based on communication and cooperation for the co-designing of the superblock. At the neighbourhood level, principal actors involved in the superblock promoting team, or invited to the open participatory sessions are: (a) district organisations (e.g., neighbourhood stakeholders, residents’ associations, specific groups of interests such as supermarkets, shopkeepers, retail sector, etc.) which might facilitate networking among different neighbourhood actors, (b) public services located in the superblock, (c) cultural, social and sports facilities located in the superblock, (d) members of the local political parties, and (e) specific associations and platforms, grouping beneficiaries or people affected by the measure that might support or might oppose to the superblock.

This actor also interacts with other entities, as follows: existing residents’ associations that engage in the superblock promoting group, (new) pro-superblock platforms and anti-superblock platforms, neighbourhood business and shopkeepers’ associations, education centres located in the superblock/neighbourhood, public services, health services and cultural, social and sports facilities located in the superblock, mobility citizens’ initiatives and third-sector entities in the area which might provide support to the implementation of the superblock, local political parties, local media, public transport services, and transport private companies (e.g., taxi, other private transport services). A detailed description of all these interactions can be found in Annex 1.

The second key actor, **Neighbourhood Business and Shopkeepers Associations**, usually interacts with other neighbourhood organizations, such as residents’ associations, as well as with the cultural and educational sector of the district, relationships based on communication and knowledge sharing. They do so by participating in different forums and political bodies (e.g., district council) in which they establish relationships and create networks with other stakeholders for defending their common interests. Within the superblock participatory process (especially if they join the superblock promoting group), they establish collaborative relations with other neighbourhood stakeholders, as well as with the city council in the co-designing of the superblock Action Plan. These interactions are based on collaboration, transfer of knowledge, support and control. More specifically, Neighbourhood Business and Shopkeepers Associations interacts with the following entities: (a) Barcelona City Council for receiving information about

projects to be developed in the neighbourhood and provide feedback, (b) resident associations for transfer of knowledge, support, and collaboration in common activities (e.g., parties), (c) representatives of local political parties for knowledge sharing, cooperation, and control, and (d) local media for sharing information. More detailed information regarding the interactions between Neighbourhood Business and Shopkeepers Associations can be found in Annex 1.

The third key actor, **Neighbours / Residents Associations**, usually interacts with other neighbourhood organizations, such as the business and retail associations, parents' associations and school entities, as well as with the cultural and social sector of the district. These relationships are based on communication and knowledge sharing. They do so by participating in different forums and political bodies (e.g., district council) in which they establish relationships and create networks with other stakeholders for defending their common interests. This actor is in contact with the Barcelona City Council and district public bodies, for receiving information about projects to be developed in the neighbourhood and provide feedback, as well as for formulating demands and needs of the neighbourhood. They also apply for public subsidies to organize activities and parties.

They also interact with Shopkeepers for transfer of knowledge, support, and collaboration. In historical districts, both entities have long-term experience in working together, demanding changes and improvements for the neighbourhood. Neighbours / Residents Associations also interacts with Parents' associations and schools, an interaction based on knowledge sharing and cooperation. Moreover, Neighbours / Residents Associations interact with representatives of local political parties for knowledge sharing, cooperation, lobby, and control. These organizations maintain communication with district political bodies and representatives of the different political parties in the district. This key actor also shares information with the local media, which helps to inform the population about these associations' demands and needs.

The fourth key actor, **Individual Citizens (and frequent visitors)**, interacts with Barcelona City Council and District council for knowledge transfer and feedback provision, and with residents' associations, for knowledge transfer and feedback provision, relationships based on collaboration in activities. This key actor also interacts with pro- and anti-superblock platforms for knowledge transfer and feedback provision, being based on participation in activities and demonstrations. The interactions usually occur in informal contexts, such as conversations with other residents, conversations with representatives or members of the different neighbourhood associations, or parents' associations. In the context of the superblock project, they interact with the City Council and other stakeholders through participatory activities launched by the promoting group. These can be open sessions and informative meetings to inform citizens living and working in the area about the measures and changes in mobility, urban space, or in public transportation, which involve the approval of the superblock Action Plan.

Essential description of network dynamics

Error! Reference source not found. corresponds to the first stage of the SI, getting environmental commitment and stakeholders' engagement in environmental/sustainable mobility policies. The figure indicates the actors involved as promoters (i.e., Barcelona City Council), as well as a variety of local agents that supported, influenced or cooperated with the city council in the first development of the social

innovations. Besides, this slide remarks the pre-conditions that favour the SI (environmental context, city goals, resources and stakeholders' commitment). As a result of this first stage, a series of environmental milestones occurred, such as the Barcelona Mobility Pact, or the Citizen Commitment for Sustainability, that paved the way for the approval of the Urban Mobility Pact (among other strategies), representing the first step for the development of the Superblocks programme.

Error! Reference source not found. describes the second stage in the development of the SI, corresponding to the period 2014-2016 (superblocks' pilot experiences). The promoters of the SI (i.e., City Council and the Urban Ecology Agency), supported by a series of agents, launched a superblock pilot project which suffered from a lack of public participation at the beginning. The outcomes reflect the residents' reactions in the selected area, emerging two new social platforms pro- and anti-superblocks. In order to reduce the level of contestation, the promoter initiated a negotiation process, partially achieving public acceptability of the SI in this neighbourhood. Also, citizen mobilization favoured dynamics of community empowerment and social cohesion, at least among the people supporting the SI.

Error! Reference source not found. shows the superblock programme development (2016-present), implemented in several neighbourhoods. The figure illustrates the different agents involved in the SI at the city and neighbourhood level, as well as the main local actors involved in the co-designing process of each superblock (forming part of the neighbourhood promoting group). Both type and level of engagement of each local agent is also represented in the figure. The main outcomes are also described in the map, that lead to the infrastructural and social transformation of the area, with impact on citizens' behaviour, identity, health and city reputation.



Figure 25 Barcelona's SI initial stage



Figure 26 Barcelona's Si intermediate stage

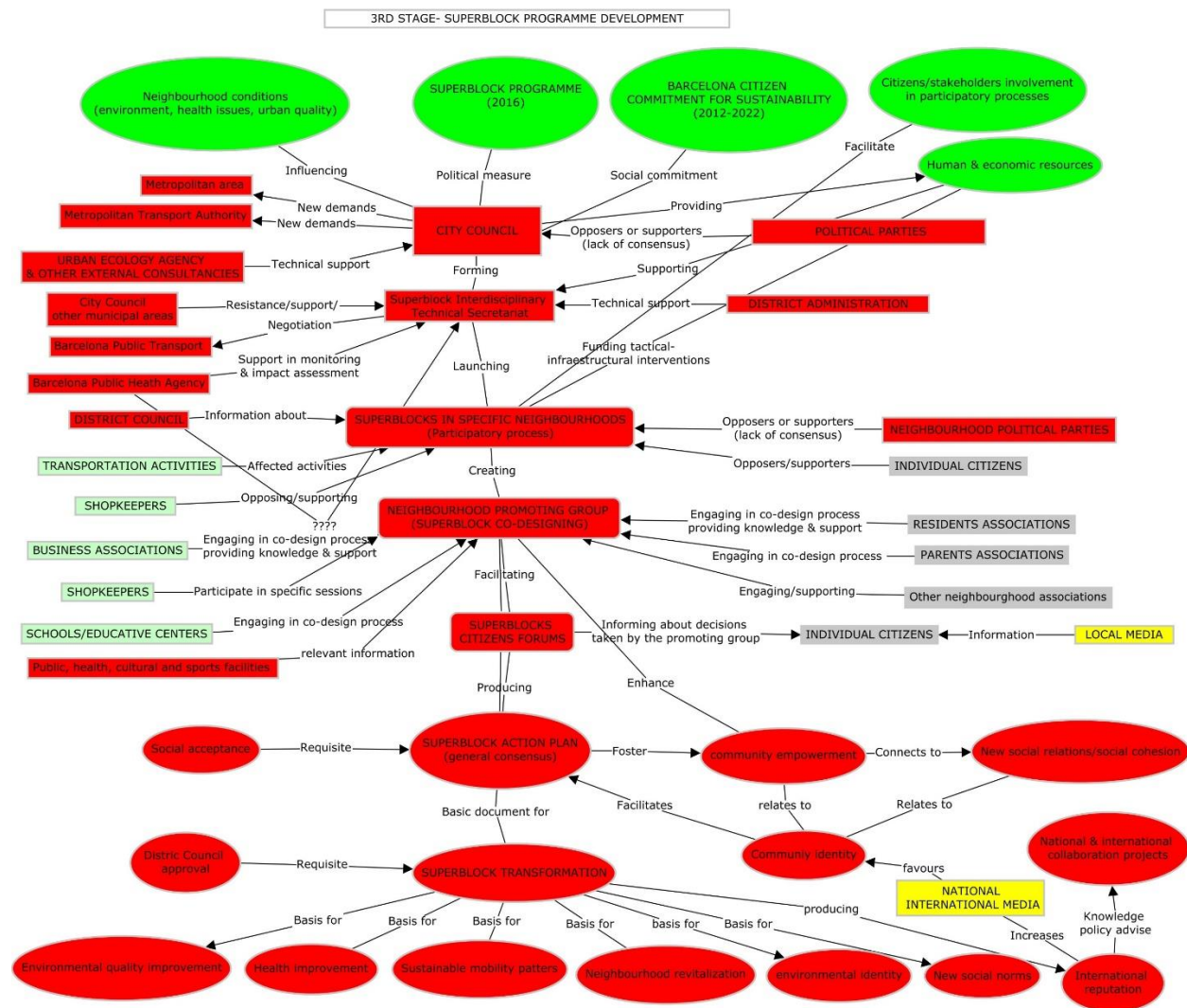


Figure 27 Barcelona's Si mature stage

2.5 Cluster e) Coordinated, tailored and inclusive energy efficiency schemes for fighting fuel poverty

The co-ordinated, tailored and inclusive energy efficiency schemes for fighting fuel poverty SI is characterised by public authorities working in coordination with supply companies and civil society organisations in order to implement energy efficiency measures for houses and buildings to fight fuel poverty with a tailored and inclusive approach. The two cases representing this SI are: Aberdeen from Scotland and Timisoara from Romania. These cases are rather young and still in development. Both cases aim at reducing energy consumption and greenhouse gas emissions through changes in energy use in the housing sector. Little (or no) attention is given to other sectors of energy consumption, (e.g., mobility).

The Aberdeen case focuses on the development of the Aberdeen Heat Network and associated household energy efficiency schemes in the city to fight fuel poverty. This case is currently developing and is going through the planning of a new phase of the heat network development in the Torry neighbourhood. Similar features characterise the Timisoara case.

2.5.1 Aberdeen

In the Aberdeen SI case, a total of ten key actors are involved, namely: (1) Aberdeen City Council, (2) Aberdeen Heat and Power (AHP), (3) District Energy Aberdeen Limited (DEAL), (4) Scottish Government, (5) Social Tenant, (6) Owner or Landlord, (7) Local business, (8) Energy Company, (9) OFGEM, and (10) SCARF. For three of them, drivers and barriers, as well as their characteristics, interactions and networks in relation with the local SI, are described in the next section. Specifically, these three actors are: Aberdeen Heat and Power (AHP), Aberdeen City Council, and SCARF. For nine of the key actors involved in the Aberdeen SI case, detailed descriptions can be found in Annex 1, namely: Aberdeen City Council, Aberdeen Heat and Power, District Energy Aberdeen Limited, Scottish Government, Social Tenant, Owner or Landlord, Local business, Energy Company and OFGEM.

Identification of barriers and drivers

For Aberdeen Heat and Power (AHP), Aberdeen City Council, and SCARF, drivers and barriers regarding the local SI were identified, in relation to attitudinal factors, capabilities and resources, contextual factors and habits and routines.

The first category, **attitudes**, represents mostly a positive factor. More specifically, “general environmentalist predisposition”, as well as “behaviour-specific norms and beliefs”, played a facilitating role for all three key actors who identified the barriers and drivers related to the Aberdeen SI case. The behaviour-specific norms refer to technical capacity and expertise, a keen interest in facilitating a non-market-led response to fuel poverty for the public good (i.e., Aberdeen Heat and Power), balancing public needs with cost-effective policy responses to austerity measures, strategic targets, income generation demands (i.e., Aberdeen City Council), and to technical and social responses to fuel poverty needs (i.e., SCARF). “Other attitudes” also have a facilitating role for two of the key

actors (i.e., Aberdeen Heat and Power and SCARF), and both a facilitating role and a hindering role for the other key actor (i.e., Aberdeen City Council). 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, are drivers for Aberdeen Heat and Power and SCARF. However, ensuring that its council housing infrastructure is well maintained through reliable heating is a driver for Aberdeen City Council. Aberdeen City Council also encounters a barrier here, originating from the difficulty over asserting greater control over regulations guiding local housing developments.

Regarding “perceived costs and benefits of action”, both costs and benefits were identified. Specifically, the costs are related to difficulties in persuading some potential beneficiaries of the heat network to come on board with its installation (i.e., Aberdeen Heat and Power), extending the next phase of the heat network project into the Torry area of the city, where there is a long-held lack of trust in the Aberdeen City Council and constraints imposed by funding (i.e., SCARF). The benefits are related to the number of people who have already been taken out of fuel poverty or the gradual installation of a heat network that could contribute to energy transition (i.e., Aberdeen Heat and Power), effectively maintaining housing stock and ensuring lower energy prices for the tenants (i.e., Aberdeen City Council), and the support of heat network for the clients to come out of fuel poverty (i.e., SCARF).

Regarding **capabilities and resources**, eight drivers and seven barriers were identified between the three key actors. “Social status” was identified by two key actors as a driver (i.e., Aberdeen Heat and Power and SCARF). However, social status was assessed as a barrier by another key actor (i.e., Aberdeen City Council). “Financial resources” are rather a barrier than a driver for Aberdeen’s case three key actors, acting as a hindrance for two of the them (i.e., Aberdeen City Council and SCARF), and both as a hindrance and a facilitator for the other actor (i.e., Aberdeen Heat and Power). “Time” represents a barrier for two of the key actors (i.e., Aberdeen City Council and SCARF), whereas “knowledge and skills” represent a driver for all of the three key actors. “Human resources” represent a driver for two of the key actors (i.e., Aberdeen Heat and Power and Aberdeen City Council). Human resources act as a barrier for one of the key actors (i.e., SCARF), based on a relatively precarious funding model, impeding the recruitment of new staff.

Contextual factors in the Aberdeen case are drawing a diverse picture for the three key actors, with a total of six drivers and eight barriers for all the elements included in this category. More specifically, “material costs” represent a clear barrier for Aberdeen City Council, while “material rewards” represent a driver for SCARF. Costs and rewards are both a driver and a barrier for Aberdeen Heat and Power key actor. “Laws and regulations” represent a barrier for two of the key actors, namely Aberdeen Heat and Power and Aberdeen City Council. However, for SCARF, no information is available regarding this factor.

The regulations requiring a minimum energy efficiency rating for private rented properties, and new local planning guidance represent barriers regarding the “laws and regulations” element. Regarding “social norms and expectations”, two drivers were identified by one actor (i.e., Aberdeen Heat and

Power), and one other driver was identified by one other actor (i.e., SCARF). Yet, three barriers related to ambiguities associated with how the system operates (i.e., Aberdeen Heat and Power), distrust of institutions in certain areas of the city (i.e., SCARF), or related to the unfamiliarity with this type of infrastructure (i.e., Aberdeen City Council), affected the three key actors. “Supportive policies” represent a driver for two of the key actors (i.e., Aberdeen Heat and Power and Aberdeen City Council), whereas for the other key actor, this information was not made available (SCARF).

Habit and routine represent a driver for two key actors (i.e., Aberdeen Heat and Power and SCARF), related to strong communications and close collaboration with clients and local community leaders.

Table 9 Barriers and drivers for the key actors of Aberdeen's SI

	Key Actor 1 - Aberdeen Heat and Power (AHP)	Key Actor 2 - Aberdeen City Council	Key Actor 3 - SCARF
1 Attitudinal			
General environmentalist predisposition	Driver	Driver	Driver
	The purpose that underwrote the establishment of AHP, which was to address fuel poverty in Aberdeen through the installation of a district heating network.	Aberdeen City Council, particularly through its Energy Managers – past and present – who oversee local planning and regulation related to energy, enabled AHP to come into being in the first place. AHP is an arms-length organisation that pertains to the Council. Around 70% of the work that AHP undertakes should be on behalf of the Council. Hence, the Council continues to guide and offer ongoing support to the initiative.	SCARF is a non-profit organisation that works to address fuel poverty in north-east Scotland. Its work is closely aligned with that of AHP. Some of its staff moved into positions at AHP, and at least one of its board members also is in AHP's board.
Behaviour-specific norms and beliefs (specify)	Driver	Driver	Driver
	Norms related to technical capacity and expertise; a strong interest in facilitating a non-market-led response to fuel poverty for the public good in Aberdeen.	Norms related to balancing public needs with cost-effective policy responses to austerity measures, strategic targets, and income generation demands	Norms related to need for technical and social responses to fuel poverty needs.
Other attitudes, (specify, e.g., about technology attributes etc.)	Driver	Driver	Driver
	This actor is interested in putting in place a durable infrastructure that can change the living conditions of those who have been living with fuel poverty in Aberdeen.	A central interest in ensuring that its council housing infrastructure is well maintained through reliable heating.	A strong understanding of the social conditions that tend to accompany/lead to fuel poverty.
		Barrier	
		Some difficulties over asserting greater control over regulations guiding local housing developments (which, if put in place, would support the expansion of the heat network).	
Perceived costs and benefits of action (specify their nature)	Costs: difficulties in persuading some potential beneficiaries of the heat network to come on board with its installation (particularly private owners and commercial organisations); district heating has now been installed in all the 'low hanging fruit' areas – those with densely populated council housing. It is less cost effective to install it in areas that are less population dense, which describe the majority of areas remaining to have district heating installed.	Costs: difficulties with extending the next phase of the heat network project into the Torry area of the city, where there is a long-held lack of trust in the council. Benefits: it has enabled the council to effectively maintain their housing stock, whilst ensuring lower energy prices for their tenants.	Costs: some distance from AHP's work currently due to constraints imposed by funding (they run on a bid-by-bid basis, with little or any core funding). Benefits: the heat network supports SCARF's clients in coming out fuel poverty.
	Benefits: the number of people who have so far been taken out of fuel poverty; the gradual installation of a heat network that could feasibly be converted to another energy source (from gas to hydrogen, for example), and could thus contribute to energy transition.		

2 Capabilities and resources			
Literacy			
Social status	Driver	Barrier	Driver
	AHP tends to be able to garner some trust amongst local people because it is not a commercial energy provider, but instead an arms-length organisation pertaining to the City Council.	In some quarters (in Torry, for example), the Council is not well trusted due to its handling of infrastructure projects in the area in the past. This has made it harder to persuade Torry residents to buy into the next phase of the heat network project, which is tied to the construction of a waste incinerator in the area.	SCARF has a strong history of engagement with local people and with other local organisations; this has enabled it to establish relatively effective relationships with local people, which are useful when there is a need to communicate with residents around the potential installation of new energy infrastructure.
Financial resources	Driver	Barrier	Barrier
	AHP is well resourced and highly independent financially, due to the payments it receives from its client-base.	Council funding has been subject to cuts from central government since the financial crisis of 2008.	As mentioned above, SCARF relies on project funds, and has little core funding. This means that its capacity for strategic, long-term planning is somewhat reduced.
	Barrier		
	Because it is not currently installing renewable energy (but instead gas), as the energy source for the heat network, it is not usually eligible to apply for much of the grant funding available for heat network projects (as these tend to support RE-based heat networks)		
	In order to expand the heat network, it must persuade commercial clients to be linked up to the heat network. However, the prices AHP can offer for the service are on a par with existing energy prices charged to companies.		
Time		Barrier	Barrier
		The team involved in energy management in Aberdeen is relatively small, which can lead to pressures on time.	SCARF's reliance on time-limited projects makes long-term planning and collaboration harder.
knowledge and skills	Driver	Driver	Driver
	AHP is a small organisation, employing just a few people. However, many of its staff and board members have a long history of working with the organisation or with aligned organisations (such as SCARF), and are therefore able to bring a dense skillset drawn from a close understanding of the field and the region. The organisation is also able to draw in expertise from consultants, who in many cases have also worked with the organisation for many years, or since its beginnings.	The Energy Manager at the City Council brings a long history of working in the area and in the field.	SCARF has been active in Aberdeen and the North-east since 1985, and has therefore developed a knowledge base around fuel poverty in the region that spans over several decades.
human resources	Driver	As above	Barrier

	AHP has been able to offer stable jobs to its small staff base because of its independent finances.		There may be some barriers to the entrance of new staff on account of SCARF's relatively precarious funding model.
3 Contextual factors			
Material costs and rewards	Barriers	Barrier	Drive
	AHP has encountered constraints on the funding it has been able to pull in from external sources because the heat network it is building currently relies on gas. Much of the funding that is available for the development of heat networks in the UK is directed only to those that are fuelled by renewable energy, which renders AHP's work ineligible. A number of people within AHP pointed to their frustration with this scenario, given that the highest costs entailed in the construction of the network were associated with the installation of pipework, and generation could in the future be relatively easily converted to renewable energy when external conditions rendered that conversion more viable than it currently is.	The Council may have difficulties installing the next phase of the heat network in Torry, in such a way that the energy prices charged are competitive with existing gas provision in the area. This is due to the relatively low-density population in the area, which means that more piping is needed for fewer numbers of clients, and the moderately low gas prices at the moment.	As above.
	Driver		
	Because properties are becoming harder to let in Aberdeen due in part to fluctuations in oil prices, landlords are becoming more interested in installing systems that would render energy more affordable and hence make their properties more attractive to potential tenants.		
Laws and regulations	Barrier	Barrier	
	AHP would like to see a regulation requiring a minimum energy efficiency rating for private rented properties. This might encourage landlords to take the step of paying for the heat network infrastructure.	One of our research participants at Aberdeen City Council suggested that the Council needs to establish new local planning guidance and lobby for national planning standards that would ensure that developers are obliged to construct enabling infrastructure in all new-build housing for the future installation of district heating pipes.	
Social norms and expectations	Driver	Barrier	Barrier
	Local Aberdonians with district heating installed have – by praising its impact on them – been influential in helping to persuade others to take it up.	Initially, it wasn't easy to persuade some members of the Council to support the installation of district heating in the city, partly because district heating is not a particularly common infrastructure in the UK.	When encouraging local people to install insulation on their homes, SCARF staff found it difficult to overcome histories of distrust of institutions in certain areas of the city.
	Barrier	As above, some neighbourhoods of Aberdeen distrust Council-led infrastructure initiatives.	Driver

	Some new clients have found it difficult to adapt to district heating in the first instance because of expectations around how bills are paid, and how the system will operate.		By collaborating with local leaders, SCARF was better able to engage with potential clients in these areas.
Supportive policies	Driver	Driver	
	The establishment of AHP as an arms-length body of Aberdeen City Council, with an independent board, has given AHP substantial autonomy in driving forward its agenda. This structure also ensured that AHP has had the space to drive forward a public interest agenda, without having to bow to commercial pressures.	Aberdeen Council's continued ownership of social housing blocks has been critical to the installation of district heating in the city. If Aberdeen had sold off its housing stock, as many other councils have done, it would not have the reliable client base it needed to pay for the district heating infrastructure and create a viable business model for AHP.	
4 Habit and routine	Driver		Driver
	AHP has maintained strong communications with its client base in Aberdeen – to the extent that the previous CEO of the company would sometimes be dealing with clients' technical difficulties on the weekends.		Close collaboration with local community leaders when seeking to communicate new energy initiatives to Aberdeen residents.

Identification of actors and of network structures

A summary of the interactions with other entities, for the three of the actors who have identified their drivers and barriers related to the SI, is provided below. Moreover, at the case level, a map of interactions and networks is available. A detailed description of nine actors involved in the Aberdeen SI case is offered in Annex 1, on different topics such as actors' characteristics, their decisions and actions, collectives and structures they are a part of, and their most important or relevant interactions with other actor types.

Aberdeen City Council, due to its many roles, interacts with almost all other actors in the case study. Nonetheless, the most important interactions are with its tenants, with Aberdeen Heat and Power, and with funding bodies and higher-level policy (i.e., Scotland, UK, Europe).

Aberdeen Heat and Power interacts with residents in agreeing new installs, collecting payments for heat, or in dealing with any faults. Moreover, this actor also interacts with the Council in agreeing pricing, discussing and planning new heat network projects, or collaborating on funding applications. Other interactions are with funding agencies in order to apply for funds, and with DEAL in receiving profits.

SCARF is a non-profit organisation that is active in Aberdeen and the North-east since 1985, thus having a strong history of engagement with local people and with other local organisations. This actor builds a close collaboration with local community leaders, a relationship proven useful in communicating new energy initiatives to Aberdeen residents and in engaging with future potential clients in the area. Another close collaboration emerged between SCARF and AHP, an interaction linked by their staff members.

Essential description of network dynamics

In Figure 28 the Stockethill project's network is outlined with the main public and private subjects that are connected through arrows representing their interactions. Particularly, the centrality of Aberdeen city council acting through the Aberdeen Heat and Power is evidenced, a not for profit company set up by the council itself. The city council interacts also with residents and the residents while the Aberdeen Heat and Power liaises with banks for financing.

In figures 29 and 30 the network of projects is expanded with future developments of heat and power stations and namely Heazlehead, Seaton, Tillydrone energy centres and the project for the Torry energy centre undergoing while the District Energy Aberdeen is created to cater energy provision for local businesses.

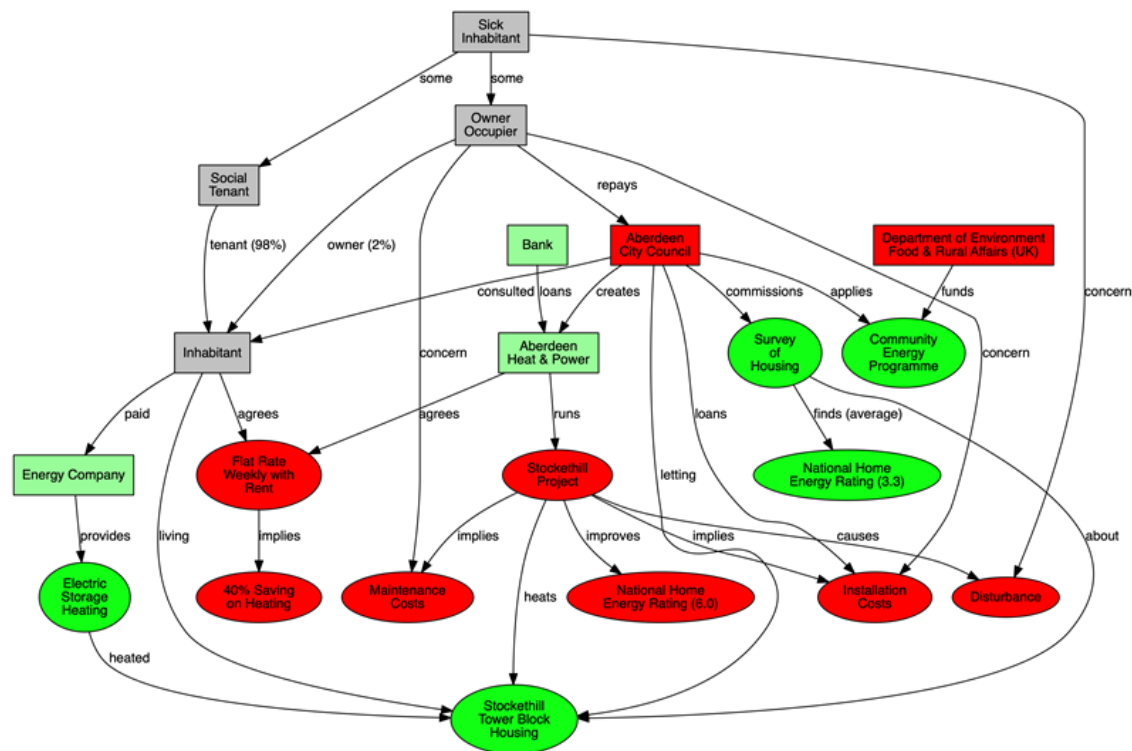


Figure 28 Aberdeen's map of actors' relations 1 – Stockethill Project

Deliverable 6.1

Drivers, Barriers, Actors, and Network structures

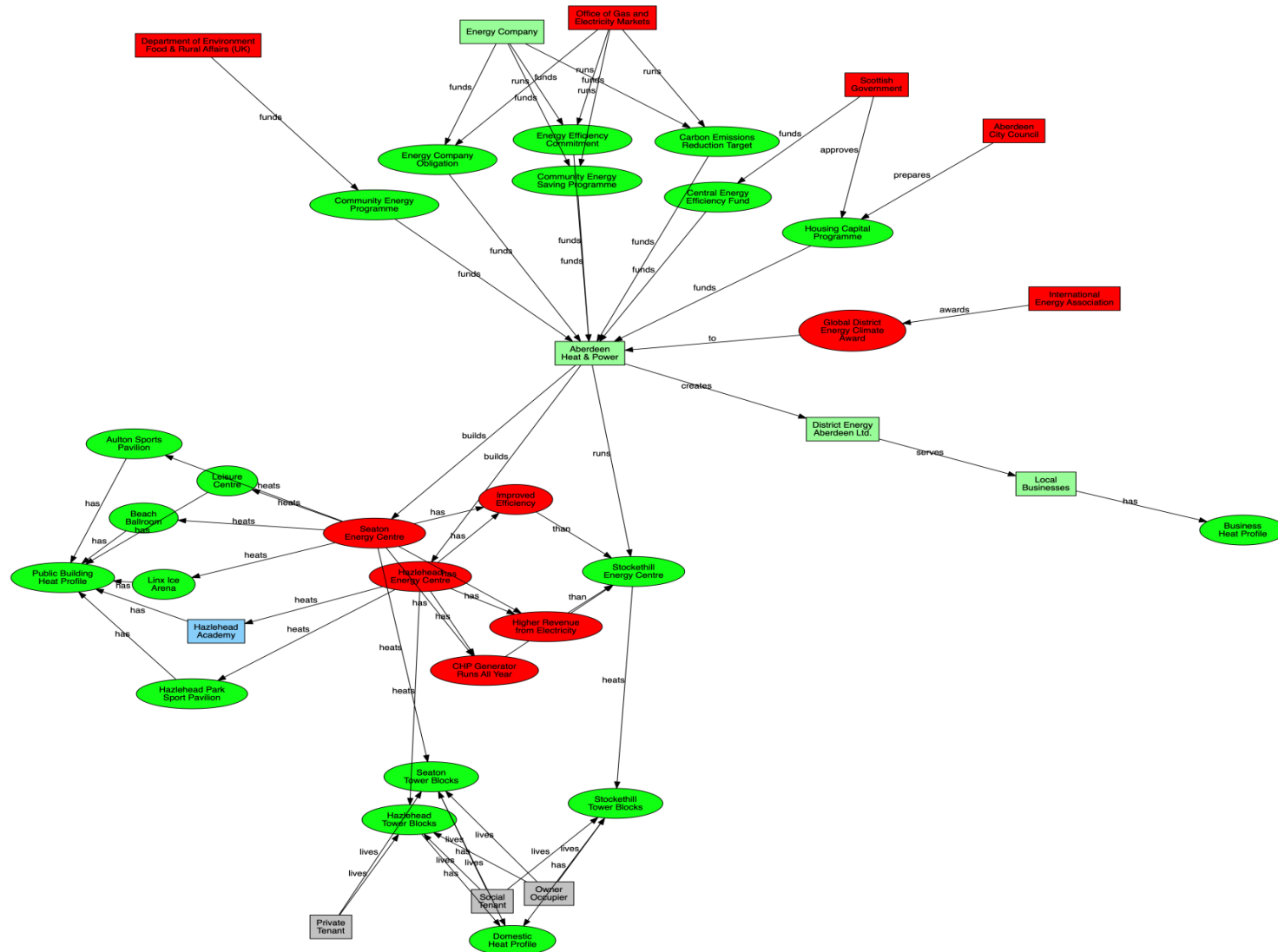
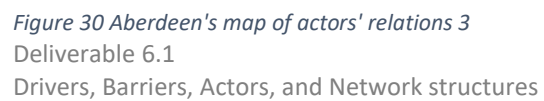


Figure 29 Aberdeen's map of actors' relations 2 – Stockethill and Hazlehead projects

Deliverable 6.1

Drivers, Barriers, Actors, and Network structures



2.5.2 Timisoara

In the Timisoara SI case, a total of three key actors are involved, namely: (1) Romanian Energy Cluster ROSENC, (2) Timisoara Municipality, and (3) Universitatea Politehnica Timisoara (UPT).

Identification of barriers and drivers

Taking into consideration the **attitudinal** factors, “general environmentalist predisposition” represents a driver for all three key actors from Timisoara, having a facilitator role for implementing the SI project in the energy domain. “Behaviour-specific norms and beliefs” also act as a driver for all the actors involved, being related to positive attitudes towards norms of competence and collaboration (Romanian Energy Cluster), political norms (Timisoara Municipality), or to working in multidisciplinary teams and latest research in the field (Universitatea Politehnica Timisoara). “Attitudes toward technology attributes”, such as changing the mentality of people regarding the use of renewable energy and implementation of innovative solutions, or quality standards of the technologies, acts as drivers for two of the key actors (i.e., Romanian Energy Cluster ROSENC and Universitatea Politehnica Timisoara). However, when associated with monitoring and control of other institutions, it becomes a barrier, as expressed by one of the key actors (i.e., Timisoara Municipality).

Regarding the “perceived costs and benefits of action”, costs such as difficulty in acceptance from different segments of the population (Romanian Energy Cluster ROSENC), turnover and limited institutional trust (Timisoara Municipality), or human resource development, time and finances related to investments in equipment (Universitatea Politehnica Timisoara) were identified. Moreover, some benefits, such as financial sustainability, availability of developed professionals, exchange of expertise between different actors (Romanian Energy Cluster ROSENC), collaboration and relationships building (Timisoara Municipality), or increased academic prestige, positioning in the rankings of higher education institutions, or the recognition offered at national and international level as a promoter of innovative solutions (Universitatea Politehnica Timisoara), were identified, too.

Regarding **capabilities and resources** in the Timisoara case, “literacy” was identified as a driver by one of the key actors (i.e., Universitatea Politehnica Timisoara). “Social status” was identified as a driver by two of the actors (i.e., Romanian Energy Cluster ROSENC, Universitatea Politehnica Timisoara), and as a barrier by the other one (i.e., Timisoara Municipality). “Financial resources” were identified as a driver by one key actor (i.e., Romanian Energy Cluster ROSENC), and as a barrier by one other key actor (i.e., Timisoara Municipality). The key actor perceiving financial resources as a driver overcomes the financial scarcity by unification of forces from a high number of member organizations. The Timisoara Municipality, even if possible source(s) of financial stability were identified, as being over-encumbered by administrative tasks, did not take any action at the time to tap into these sources. “Time” is perceived more as a barrier (i.e., Romanian Energy Cluster ROSENC, Timisoara Municipality) rather than a driver (i.e., Universitatea Politehnica Timisoara), mainly because there is no scheduled time and specific tasks drawn for this activity. Therefore, the tasks related to this SI are seen more like a supplementary job than one encompassed in the job description.

“Knowledge and skills”, in terms of diversity of expertise and permanent development, represent a driver for two key actors (i.e., Romanian Energy Cluster ROSENC and Universitatea Politehnica Timisoara).

One key actor considers this a barrier in the context of political interests and changes (i.e., Timisoara Municipality). The “Human resources” factor was evaluated as a driver by one of the key actors (i.e., Romanian Energy Cluster ROSENC). Yet, it was considered as a barrier by the other two actors (i.e., Timisoara Municipality, Universitatea Politehnica Timisoara). The difficulties are due to personnel fluctuations, aging of the existing expert holders, and most importantly, due to difficult access in the system by new knowledge holders.

Taking into consideration **contextual factors**, “material costs and rewards” were considered a barrier by one key actor (i.e., Timisoara Municipality), and a driver by one other (i.e., Universitatea Politehnica Timisoara). “Laws and regulations” were evaluated as barriers by one actor (i.e., Timisoara Municipality). “Social norms and expectations” were seen as a driver by one key actor (i.e., Universitatea Politehnica Timisoara), whereas one other key actor evaluated this factor as a barrier (i.e., Timisoara Municipality). The other remaining actor (i.e., Romanian Energy Cluster ROSENC), considered this factors as being both a driver and a barrier. The “Supportive policies” factor was considered a driver by one of the key actors (i.e., Universitatea Politehnica Timisoara), due to its autonomy in rewarding methodology.

Habit and routine factor was considered a driver by all three key actors from Timisoara case (i.e., Romanian Energy Cluster ROSENC, Timisoara Municipality, Universitatea Politehnica Timisoara).

Table 10 Barriers and drivers for the key actors of Timisoara's SI

	Key Actor 1 - Romanian Energy Cluster ROSENC	Key Actor 2 - Timisoara Municipality	Key Actor 3 - Universitatea Politehnica Timisoara (UPT)
1 Attitudinal			
General environmentalist predisposition	Driver	Driver	Driver
	The purpose for which this cluster was created, bringing together 62 members including private enterprises (56), public authorities (2), and universities (4) was to promote activities ranging from construction of large-scale renewable energy systems, photovoltaic farms development and operation, information and consultancy services in energy field to the development of integrated renewable energy systems in the urban area.	The Municipality, through at least one of its departments, namely the Environment Department, promotes the pro-environmental attitude, constantly organizing awareness campaigns for schools and general population.	For this academic institution, this attitude acts as a driver rather in well-defined actions, when they are asked for innovative solutions in various projects with environmental component.
Behaviour-specific norms and beliefs (specify)	Driver	Driver	Driver
	The behaviour is related to specific norms of competence in the field and norms of collaboration between members.	The concern for the public good; political norms.	Concern for the quality of solutions, norms of working in multidisciplinary teams, open attitude towards the latest research in the field.
Other attitudes, (specify, e.g., about technology attributes etc.)	Driver	Barrier	Driver
	This actor is interested in changing the mentality of people regarding the use of renewable energy and regarding the implementation of innovative solutions.	A certain attitude of control and monitoring of other institutions ensuring that these institutions meet the quality standards in their activities.	Quality standards of the technologies.
Perceived costs and benefits of action (specify their nature)	Costs: sometimes, the innovative solutions offered by this cluster are more difficult to accept by different segments of the population.	Costs: human resource fluctuates (in general, workers from administration are not very well paid for their services); due to the frequent political changes that are associated with legislative changes, this institution is perceived as being of limited trust.	Costs: due to the rapid changes in the technology area, the costs are mainly related to the continuous professional development of the competent human resource, time costs, and sometimes to massive investments in equipment.
	Benefits: carrying out many collaborative projects, the cluster manages the national and international funding for the implementation of innovative ideas. The benefits are seen in the financial sustainability, in the networks of developed professionals, and in the exchange of expertise between different actors.	Benefits: it has the benefit of being correlated with almost all public institutions, under various relationships.	Benefits: to be a recognized national and international promoter of innovative solutions and new technologies, increasing the prestige in academic research that attracts more projects and funding, a good positioning in the rankings of higher education institutions that can attract more students
2 Capabilities and resources			
Literacy			Driver.

			Through the mission of this institution, the concern for the continuous training of researchers is one of its priorities.
Social status	Driver.	Barrier.	Driver.
	In this case, the social status is a driver due to the concern expressed by this actor towards the way in which its solutions are perceived at social level, towards seriousness and civic involvement.	The Municipality, in the general perception, is associated with the political interests and with the too-fast and inconsistent changes that take place in the political scene.	Its social status as an institution of advanced research and education acts as a driver.
Financial resources	In general, due to the unification of the forces of the 63 member organizations of this cluster, the financial resource is not exactly a hindrance.	Barrier.	
		The financial resources are limited, and because of the burden of administrative tasks, people from this institution do not have time to write large-scale competitive projects from which to obtain a consistent financing.	
Time	Barrier	Barrier	Driver
	Even if this cluster has many members, the time is a barrier, because for most of them it is a second job.	For the employees of the Municipality, time acts as an obstacle in the implementation of innovative solutions because they have many routine daily tasks to perform and sometimes they experience the low role clarity. Moreover, the people in the management of the City Hall also have a representational function, participating in many events with the business, social and cultural actors.	In this case, time is not necessarily an obstacle because in the university there are two types of positions - teaching and research. People employed full time on research positions usually have time dedicated exclusively to research, so the time resource is precisely investing in finding innovative solutions in various fields of interest and in developing new technologies and products.
knowledge and skills	Driver	Barrier	Driver
	The diversity of knowledge and skills is an advantage in this case. Included in this cluster are various companies with similar interests in the field of energy, from public education institutions to the Municipality, from non-profit organizations to private institutions, each of them bringing their own expertise, depending on the project's particularities.	The problem in this case is not related to the set of knowledge and skills of the employees, but rather refers to a limited sharing of them from one department to another and to a weaker communication. Much of the effort invested in designing and implementing energy initiatives requires interdepartmental work, in which abilities and skills are shared.	Providing scientific knowledge to students and working in projects with multidisciplinary teams practically forces this actor to permanently develop its set of skills.
human resources	Driver	Barrier	Barrier
	The human resource is activated differentially according to the proposed project.	On the one hand, human resources are relatively fluctuating, and the entrances into the system are limited, on the other hand.	The human resource is relatively old, and the entrances into the system are conditioned by a series of academic and research norms.
3 Contextual factors			
Material costs and rewards	Not the case	Barrier	Drive

		Financial constraints are barriers for this actor in implementing substantial projects.	Although it may seem like an obstacle, this actor has the leverage needed to attract funding, especially through patents and projects funded by national and international entities.
Laws and regulations		Barrier	
		In general, in Romania, energy legislation is quite compelling and does not greatly stimulate sustainable consumption, nor does not define normative frameworks for controlling the energy poverty phenomenon.	
Social norms and expectations	Drive	Barrier	Drive
	This actor is stimulated by expectations regarding the impact of his innovative initiatives, it wants to change the mental set of people, and people are expected the actor to be a civically involved actor.	In this case, people expectation that the entire process is extremely bureaucratic and takes time becomes an obstacle.	In general, the social norms and expectations of people regarding this actor refer to its ability to form careers, to increase the social impact of research and to develop a learning community. All these aspects act as drivers for the behaviour of this actor in social innovation initiatives.
	Barrier		
	It is at the same time a barrier because it is related to the expectation of people that the solutions will be cheap and easy to implement.		
Supportive policies			Driver
			The universities have the freedom to develop their own methodologies for rewarding research results, through awards, distinctions, and even differentiated salaries.
4 Habit and routine	Driver	Driver	Driver
	A good strategy to deal with resistance is a habit for this actor - one technique applied in many initiatives is the marketing of the innovative product at the same time with its design phase and to involve all the main actors at the very beginning.	Putting into public debate different methodologies and analyses can be a driver for Municipalities.	The need to access higher professional levels and the routine of the research and of applying scientific methods can be considered the drivers for this actor.
			Barrier
			As a barrier, we can mention a certain resistance to change typical for a part of the academic community.

Identification of actors and of network structures

For each key actor involved in the Timisoara SI case, detailed information regarding actors' characteristics, their decisions and actions, collectives and structures they are a part of, as well as their most important or relevant interactions with other actor types, is provided in Annex 1. Below, information on the interactions between the key actors and other entities, as well as a map of the network describing the relationships between entities in the Timisoara SI case can be found.

The first key actor, **Romanian Energy Cluster ROSENC**, interacts with the city municipality, universities, and private enterprises. These relations are based on collaboration, exchange of expertise, and financial support.

The second key actor, **Timisoara Municipality**, interacts with other public authorities, Romanian and foreign legal persons, and citizens.

The third key actor, **Universitatea Politehnica Timisoara (UPT)**, interacts with business environment (private and public), research institutes, and academic institutions, both at national and international level.

Essential description of network dynamics

The first actor of the Timisoara case-study (Figure 31) is represented by the NGO ROSENC (Romanian Energy Cluster). Actor 1 has collaborative relations with European governing institutions, with local, regional and national public institutions, with Timisoara Municipality (actor 2) and with higher education institutions (actor 3). Also, actor 1 takes the expertise from the research institutes and offers expertise and innovative solutions to different entities (public and private institutions) working in the energy domain.

The second actor is represented by Timisoara Municipality. This actor relates to other entities by: representation relations at the level of national government, consultative relations with citizens, control relations over some public and private institutions, coordinates events and campaigns, facilitates foreign locally investments, collaboration with NGOs, technological transfer from universities etc.

The third actor is represented by a higher education institution (public sector). The actor is in a relationship of subordination to the Ministry of National Education, relation of collaboration with other national and international universities, relation of collaboration with Municipality (actor 2), offers expertise and consultancy for the first actor (NGO), collaborates with the business environment, is involved in community projects, contributes to local and regional economic development.

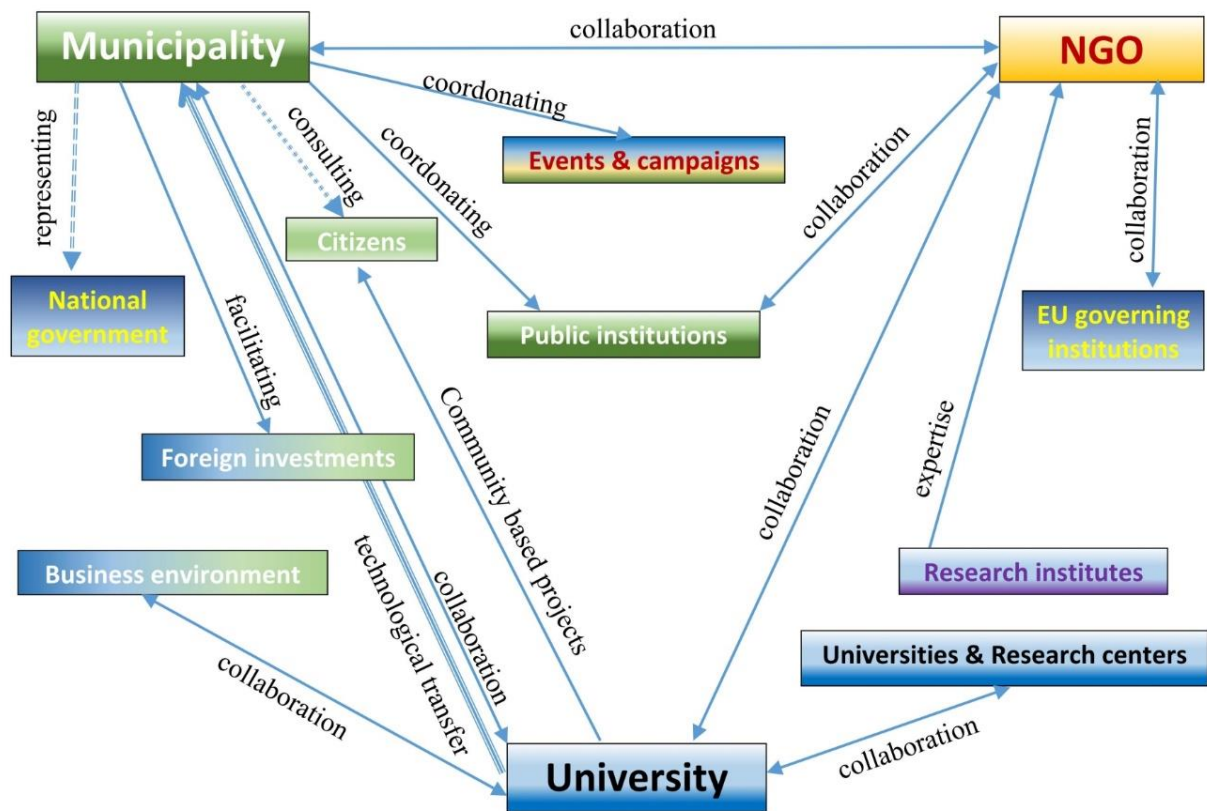


Figure 31 NGO's interaction with other actors in Timisoara's SI map of actors' relations

Section 3

Conclusions on drivers and barriers for social innovation

In order to draw the conclusions regarding the set of drives and barriers that we presented in earlier sections, we will first discuss them within the single cluster. We consider this analysis necessary in order to clarify the facilitating and inhibiting factors that act within the domains of social innovations (for example urban mobility, energy poverty, district regeneration/houses etc).

Following this analysis, we will highlight the main conclusions related to drivers and barriers from a cross-sectional perspective.

Cluster 1 – “Holistic, Shared and Persistent Mobility Planning”

- In cluster 1, general environmental predisposition is perceived as a driver for social innovation, for the vast majority of actors. Hence, the acceptance of the elements of social innovation can be facilitated by activating this predisposition / attitude.
- At the level of behaviour-specific norms and beliefs, we observed a variability in the opinions of the actors. We can infer that actions 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. Furthermore, there is a tendency to accept social innovation if this innovation ensures the safety of pedestrian and cyclists. Nevertheless, business actors driven by financial motivations consider restricting access for cars to city centres as a threat to their business. This makes business actors initially resistant to accept these social innovations.
- The benefits that act as drivers for social innovations in cluster 1 (benefits, such as improved cycling infrastructure, environment quality etc.) are valued higher by most actors than the costs (time, effort etc.) acting as barriers.
- Information about the innovative actions in cluster 1 is considered either a drive or is not a relevant aspect.
- The financial resources, as a whole, regardless of the type of actor, are perceived as a drive for social innovations in this cluster, in the sense that, if they exist, they make it possible to induce the element of innovation in this domain substantially.
- Human resources, although perceived as a drive of social innovation 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 in cluster1 unless they are associated with a high level of knowledge and skills.
- In terms of material costs, the general perception among the majority of actors, regardless of the specificity of their activity, is that this factor acts as a barrier to the implementation of social innovation in *“Holistic, Shared and Persistent Mobility Planning”*.
- Laws and regulations as contextual factors are perceived rather as barriers for social innovations than drivers in this cluster, with at least one exception, namely for the city residents (i.e. Zürich) who consider laws and regulations as a drive.
- Social norms and expectations act as drivers for innovation in cluster 1 while 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. Thus, supporting policies is a generic drive for DsenV (Groningen) and for most of the Zürich Mu-

municipality's Departments and for the Canton of Zürich, while for Groningen citizens and for Zürich transport authority, it is a strong one.

- Regarding habits, this factor is somewhat irrelevant to the social innovation process.

Cluster 2 – Island renaissance based on renewable energy production

- From the perspective of renewable energy production for the revitalization and economic development of the islands, the pro-environmental attitude is perceived as a driver of social innovation in this field. The general concern of people towards the environment, climate change and pollution are drivers of social innovation in the field of renewable energy production and consumption.
- 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 island 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 because innovation in cluster 2 is a long process involving a great deal of planning and processing of legal requirements.
- Therefore, 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, are 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 in this cluster.

Cluster 3 – “Energy efficiency in district regeneration”

- 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 for innovative solutions for district regeneration based on the energy transition.
- 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. It is worth noting, in this case, a set of beliefs that

have the power to facilitate or diminish the penetration of social innovation related to “Energy efficiency in district regeneration”. This set includes the 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”

- Similarly to the previous clusters, 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. Thus, we find that 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, this belief 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 in this cluster. The lack of financial and human resources has been pointed out as a barrier to social innovation. Time is also perceived as a barrier because engaging in participatory processes is a time-consuming activity.
- 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 social 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 in the process of social innovation in cluster 4, and may act rather as a barrier when undesirable behaviours are considered.

Cluster 5 - “Coordinated, tailored and inclusive energy efficiency schemes for fighting fuel poverty”

- 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 the social innovation. Material costs are a strong barrier to social innovation in the field of energy poverty, 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 technology 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.

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Annex 1

Identification of actors and of network structures

Zürich

In Zürich SI case, a total of twenty-two key actors are involved, grouped in seven broad categories, namely:

- (1) Municipality of Zürich with seven of its departments (Civil Engineering and Waste Management Department, Department of Public Utilities and Transport, Department of Public Safety, Presidential department, Health department, Political parties and Energy Commission of the Municipality of Zürich);
- (2) Scientific community (Institute for Transport Planning and Systems of the Department of Civil, Environmental and Geomatic Engineering of the University of Zürich);
- (3) Transport enterprises (Zürich Transport Authority – ZVV, Federal railways – SBB, Car sharing enterprises and Bike sharing enterprises);
- (4) Canton of Zürich (Building Department and Department for Economic Affairs);
- (5) Other cities in the Canton of Zürich;
- (6) Business (Large enterprises such as UBS, Crédit Suisse, or Google working in the Zürich territory, Business community “City Vereinigung” and Shopkeepers of a specific street or square where a project will be implemented); and
- (7) Citizenship (Car group “Touring club Switzerland”, Bike group “ProVelo”, 12 Quartierkonferenz/ Quartiersvereine, Specific citizens’ groups such as “street communities”, and Zürich inhabitants).

For all of the above-mentioned first key actors, detailed information regarding multiple topics such as (a) actor's characteristics, their (b) decisions and actions, (c) collectives & structures they are a part of and their most important or relevant (d) interactions with other actor types is offered below.

The Civil Engineering and Waste Management Department (Road, Building and Recycling)

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- promoter and main decision-maker during the whole implementation
- coordinating and implementing

(b) Decisions and actions

Decisions and/or actions:

- covers aspects such as public infrastructures, pedestrian and bike mobility

- takes care of monitoring the advancement of the plan in coordination with other two departments

Goals of the decisions and/or actions /objectives/:

- improved mobility based on bikes and walking
- improved environment

Factors influencing decisions and/or actions /sensing & prediction/:

- works in strong coordination with the Department of Public Utilities and Transport and Department of Public Safety
- has to consider decisions of citizens through referenda (Zürich inhabitants) and of specific groups (Bike sharing enterprises, Shopkeepers of a specific street or square where a project will be implemented, Bike group “ProVelo” and 12 Quartierkonferenz/ Quartiervereine mainly)
- yes, this actor takes into account future consequences of the decision/action during decision-making process

Adaptation capabilities /adaptation/:

- changes decision-making or actions in response to results of referenda (Zürich inhabitants) and other consultations (Bike sharing enterprises, Shopkeepers of a specific street or square where a project will be implemented, Bike group “ProVelo” and 12 Quartierkonferenz/ Quartiervereine mainly)
- no proof of changes of decisions/actions in relation to the environment

Learning capabilities /learning/:

- this actor learns continuously
- learns from other departments (Department of Public Utilities and Transport, Department of Public Safety, Energy Commission of the Municipality of Zürich mainly) and their interaction in the continuous monitoring of their actions
- learns from citizens and specific groups (see above)

(c) Collectives & structure

Groups /collectives/:

- part of the Municipality of Zurich

Organizational structure:

- the department has a chief selected according to the political majority in the Municipality (Political parties) and changing accordingly

(d) Interactions

Interactions /interactions/:

- day by day cooperation with Department of Public Utilities and Transport and Department of Public Safety; with Presidential department and Health department too, but with a lower intensity
- should refer to Energy Commission of the Municipality of Zürich and act accordingly (this happens not enough) and to Political Parties (keeping a remarkable independency from them)
- interacts with Zürich inhabitants (should respect the decisions taken by Zurich inhabitants through referenda)
- consults periodically with shopkeepers of a specific street or square where the project will be implemented (e.g. pedonalization), Bike group “ProVelo”, 12 Quartierkonferenz/ Quartiervereine and Specific citizens’ groups (e.g. “street communities”)
- interacts often with bike sharing enterprises and Bike group “ProVelo” (mutual dependency of actions, mainly from the Department to ProVelo and bike sharing)

The Department of Public Utilities and Transport (Public Transport Services, Water Supply, Electricity Services)

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- promoter and main decision-maker during the entire implementation
- coordinating and implementing actor

(b) Decisions and actions

Decisions and/or actions:

- this department is in charge of Public Transport management, taking care of tram and buses only, since the responsibility for trains is located at a higher federal level

Goals of the decisions and/or actions /objectives/:

- improved mobility based on an excellent system of surface mobility (trams and buses) interconnected with trains

Factors influencing decisions and/or actions /sensing & prediction/:

- works in strong coordination with Civil Engineering and Waste Management Department (Road, Building and Recycling) and Department of Public Safety
- has to cooperate strongly with Canton of Zürich (Building Department and Department for Economic Affairs) and with Zürich Transport Authority (ZVV)
- cooperates less with Federal railways (SBB)
- it should also consider decisions of citizens through referenda (Zürich inhabitants) and of specific groups (Shopkeepers of a specific street or square where a project will be implemented, 12 Quartierkonferenz/ Quartiervereine and Specific citizens' groups mainly).
- yes, this actor takes into account future consequences of the decision/action during decision-making process

Adaptation capabilities /adaptation/:

- this department changes its decision-making or actions in response to results of referenda (Zürich inhabitants), following its interaction with Canton of Zürich and Zürich Transport Authority (ZVV), and following other consultations (Bike group "ProVelo", 12 Quartierkonferenz/ Quartiervereine and Specific citizens' groups mainly)
- there is no proof of changes of decisions/actions for this actor in relation to the environment

Learning capabilities /learning/:

- this actor learns continuously
- this actor learns from the other departments (Civil Engineering and Waste Management Department, Department of Public Safety, Energy Commission of the Municipality of Zürich mainly) and their interaction in the continuous monitoring of their actions
- this actor learns from citizens and specific groups (see above)

(c) Collectives & structure

Groups /collectives/:

- is part of the Municipality of Zurich

Organizational structure:

- the department has a chief selected according to the political majority in the Municipality (Political parties) and is changing accordingly

(d) Interactions

Interactions /interactions/:

- day by day cooperation with Civil Engineering and Waste Management Department and Department of Public Safety, with Presidential department
- day by day cooperation with Health department, but with a lower intensity
- day by day cooperation with Political parties (keeping a remarkable independency from them)
- should refer to Energy Commission of the Municipality of Zürich and act accordingly (not enough)
- should respect the decisions taken by Zurich inhabitants through referenda
- consults periodically with Shopkeepers of a specific street or square where a project will be implemented, Bike group “ProVelo”, 12 Quartierkonferenz/ Quartiersvereine and Specific citizens’ groups (e.g. “street communities”)
- day by day cooperation (on an informal basis too) with Zürich Transport Authority (ZVV) and Canton of Zürich (Building Department and Department for Economic Affairs).

The Department of Public Safety

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- promoter and main decision-maker during the whole implementation
- coordinating and implementing actor

(b) Decisions and actions

Decisions and/or actions:

- in charge of the Motorised Private Transport and in general of traffic management, therefore managing all the aspects of traffic related to ICT and road safety

Goals of the decisions and/or actions /objectives/:

- improved mobility based on a dynamic traffic management

Factors influencing decisions and/or actions /sensing & prediction/:

- works in strong coordination with the Department of Public Utilities and Transport
- has to cooperate strongly with the Canton of Zürich
- should consider the decisions of citizens (Zürich inhabitants), of specific groups (Car group “Touring club Switzerland”, 12 Quartierkonferenz/ Quartiersvereine and Specific citizens’ groups mainly) and Car sharing enterprises
- yes, this actor takes into account future consequences of the decision/action during decision-making process

Adaptation capabilities /adaptation/:

- changes its decision-making or actions in response to results of referenda (Zürich inhabitants), and according to its interactions with Canton of Zürich and other consultations (Car group “Touring club Switzerland”, 12 Quartierkonferenz/ Quartiersvereine and Specific citizens’ groups mainly)
- there is no proof of changes of decisions/actions for this actor in relation to the environment

Learning capabilities /learning/:

- this actor learns continuously

- this actor learns from other departments (Civil Engineering and Waste Management Department, and Energy Commission of the Municipality of Zürich mainly) and their interaction in the continuous monitoring of their actions
- this actor learns from citizens and specific groups (see above)

(c) Collectives & structure

Groups /collectives/:

- part of the Municipality of Zurich

Organizational structure:

- the department has a chief selected according to the political majority in the Municipality (Political parties) and it's changing accordingly

(d) Interactions

Interactions /interactions/:

- day by day cooperation with Department of Public Utilities and Transport
- day by day cooperation with Presidential department and Health department, but with a lower intensity
- should refer to Energy Commission of the Municipality of Zürich and act accordingly (however this happens not enough)
- should refer to Political parties (keeping, however, a remarkable independency from them)
- should respect the decisions taken by Zurich inhabitants through referenda
- consults periodically with Car sharing enterprises, Car group "Touring club Switzerland", Bike group "ProVelo", 12 Quartierkonferenz/ Quartiersvereine and Specific citizens' groups (e.g. "street communities")
- day by day cooperation (on an informal basis too) with Canton of Zürich
- IVT of the University of Zürich implemented studies useful for the work of this department.

The Presidential department

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- involved in the decision-making during the implementation
- collaborative actor inside the Municipality

(b) Decisions and actions

Decisions and/or actions:

- works in a holistic way on urban development, which is something that should be closely coordinated with the work of Civil Engineering and Waste Management Department, Department of Public Utilities and Transport and Department of Public Safety
- involved in understanding the outcomes of the choices made in the plan

Goals of the decisions and/or actions /objectives/:

- improved mobility in the frame of urban development

Factors influencing decisions and/or actions /sensing & prediction/:

- cooperates with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport and Department of Public Safety
- has to cooperate with the Energy Commission

- should consider the decisions of citizens through referenda (Zürich inhabitants)
- should consider the decisions of specific groups (Large enterprises working in the Zürich territory, Business community “City Vereinigung”, Shopkeepers of a specific street or square where a project will be implemented, 12 Quartierkonferenz/ Quartiervereine and Specific citizens’ groups mainly)
- yes, this actor takes into account future consequences of the decision/action during decision-making process

Adaptation capabilities /adaptation/:

- this department changes its decision-making or its actions in response to results of referenda (Zürich inhabitants), and other consultations (see above)
- there is no proof of changes of decisions/actions for this actor related to the environment

Learning capabilities /learning/: Not applicable

(c) Collectives & structure

Groups /collectives/:

- is part of the Municipality of Zurich

Organizational structure:

- the department has a chief selected according to the political majority in the Municipality (Political parties) and is changing accordingly

(d) Interactions

Interactions /interactions/:

- with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport, Department of Public Safety, and Health department, according to specific issues
- should refer to Energy Commission of the Municipality of Zürich and act accordingly
- should refer to Political parties (keeping, however, a remarkable independency from them)
- should respect the decisions taken by Zurich inhabitants through referenda
- consults periodically with Large enterprises, Business community “City Vereinigung”, Shopkeepers of a specific street or square where a project will be implemented, 12 Quartierkonferenz/ Quartiervereine and Specific citizens’ groups (e.g. “street communities”).

The Health department

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- involved in the decision-making during the implementation
- collaborative actor inside the Municipality

(b) Decisions and actions

Decisions and/or actions:

- works on aspects such as checking the quality of air, or controlling transport and car noises

Goals of the decisions and/or actions /objectives/:

- improved mobility for improving health conditions

Factors influencing decisions and/or actions /sensing & prediction/:

- cooperates with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport and Department of Public Safety
- should also consider the decisions of citizens through referenda (Zürich inhabitants) and of specific groups (12 Quartierkonferenz/ Quartiervereine and Specific citizens' groups mainly)
- yes, this actor takes into account future consequences of the decision/action during decision-making process

Adaptation capabilities /adaptation/:

- changes in decision-making or actions in response to results of referenda (Zürich inhabitants) and according to other consultations (see above)
- there is no proof that this actor changed its decisions/actions regarding the environment

Learning capabilities /learning/: Not applicable

(c) Collectives & structure

Groups /collectives/:

- part of the Municipality of Zurich

Organizational structure:

- the department has a chief selected according to the political majority in the Municipality, and is changing accordingly

(d) Interactions

Interactions /interactions/:

- with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport, Department of Public Safety, and Presidential department, according to specific issues
- should refer to Political parties (keeping, however, a remarkable independency from them)
- should respect the decisions taken by Zurich inhabitants through referenda
- consults periodically with 12 Quartierkonferenz/ Quartiervereine and Specific citizens' groups.

Political parties

(a) Characteristics

Sector: -

Number of actors of this type in the case: 13; 5 are the most important ones

Important characteristics of the actor /state variables/:

- involved in the decision-making during the implementation
- should approve many strategic/policy documents and/or specific measures
- all political parties more or less agree with the mobility strategy objectives, but there are some differences related to specific measures; right-wing parties don't appreciate strong restrictions in car use (e.g. limits for cars on streets; increase in parking costs, etc.), whereas left-wing and green parties appreciate these measures, as well as the expansion of bike lanes

(b) Decisions and actions

Decisions and/or actions:

- the decision-making process is sometimes affected by the fact that now, in the Canton the majority is represented by right-wing political parties, whereas in the municipality, left and green political parties are in majority

- sometimes, political parties promote referenda against specific measures they don't appreciate (it happens successfully)

Goals of the decisions and/or actions /objectives/:

- each party tries to stop the decisions they don't appreciate

Factors influencing decisions and/or actions /sensing & prediction/:

- specific groups (e.g. Touring Club supports right parties, bike groups support green parties)

Adaptation capabilities /adaptation/:

- this actor adapts according to the results of referenda and elections

Learning capabilities /learning/: Not applicable

(c) Collectives & structure

Groups /collectives/:

- political parties

Organizational structure:

- the department has a chief selected according to the political majority in the Municipality, and it changes accordingly

(d) Interactions

Interactions /interactions/:

- Political parties can affect all Municipality's departments (Civil Engineering and Waste Management Department, Department of Public Utilities and Transport, Department of Public Safety, Presidential department, Health department, and Energy Commission of the Municipality of Zürich), as well as the Canton
- Citizens (Zürich inhabitants) influence political parties through their vote.

The Energy Commission

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- should be involved in the decision-making of the mobility strategy (considering interaction among energy issues and mobility); this happens but not enough according to EC
- collaborative actor inside the Municipality

(b) Decisions and actions

Decisions and/or actions:

- the Municipality of Zurich has an Energy Plan that includes Mobility, "managed" by the Energy Commission

Goals of the decisions and/or actions /objectives/:

- improved mobility in the frame of an energy transition towards low-carbon

Factors influencing decisions and/or actions /sensing & prediction/:

- cooperates with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport and Department of Public Safety (not enough)
- should consider the decisions of citizens through referenda (Zürich inhabitants)
- should consider the decisions of specific groups (Large enterprises, Business community "City Vereinigung", Shopkeepers, 12 Quartierkonferenz/ Quartiersvereine and Specific citizens' groups mainly)

- yes, this actor takes into account future consequences of the decision/action during decision-making process

Adaptation capabilities /adaptation/:

- changes decision-making or actions in response to results of referenda (Zürich inhabitants)
- changes decision-making or actions according to consultations (see above)
- there is proof for adaptation capabilities of decisions/actions related to the environment

Learning capabilities /learning/: Not applicable

(c) Collectives & structure

Groups /collectives/:

- belongs to the Department of Industrial Enterprises
- part of the Municipality of Zurich

Organizational structure:

- the department has a chief selected according to the political majority in the Municipality (Political parties) and changing accordingly

(d) Interactions

Interactions /interactions/:

- with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport, and Department of Public Safety, according to specific issues
- should refer to Political parties (keeping, however, a remarkable independency)
- should respect the decisions taken by Zurich inhabitants through referenda.

Institute for Transport Planning and Systems of the Department of Civil, Environmental and Geomatic Engineering (IVT)

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- the IVT is part of the Department of Civil, Environmental and Geomatic Engineering (D-BAUG) at ETH Zurich and is participating within the Network City and Landscape (NSL)
- the three research groups are: Transport Planning, which provides demand modelling for public and individual transport; Transport Systems which covers supply and infrastructure level items such as network/supply design, production planning, infrastructure operations and design, safety, project management and infrastructure maintenance; and Traffic Engineering, which considers traffic engineering and traffic safety on the supply level

(b) Decisions and actions

Decisions and/or actions:

- IVT worked on several mobility aspects for Switzerland, such as simulation studies in Zurich for various issues (e.g. parking), and was involved in the discussions on the transports planning for the university quarter, responsible for a very large portion of traffic generated in the centre of Zurich
- IVT implemented studies on car sharing

Goals of the decisions and/or actions /objectives/:

- cooperating in improving mobility from a scientific perspective

Factors influencing decisions and/or actions /sensing & prediction/:

- findings coming from scientific research

Adaptation capabilities /adaptation/: NOT RELEVANT

Learning capabilities /learning/:

- yes, as scientists' roles usually require learning capabilities

(c) Collectives & structure

Groups /collectives/: ETH

Organizational structure: University institute

(d) Interactions

Interactions /interactions/:

- this actor mainly cooperated with Department of Public Safety.

Zürich Transport Authority (ZVV)

(a) Characteristics

Sector: Enterprise (VBZ)/network of enterprises (ZVV) (i.e., private sector)

Number of actors of this type in the case: 2

Important characteristics of the actor /state variables/:

- ZVV area comprises the entire canton of Zürich, and portions of neighbouring cantons (such as Aargau, Schaffhausen, Schwyz, Thurgau and St. Gallen), with a few lines extending into or crossing the territory of southern Germany
- implementing actor inside the Municipality and the Canton

(b) Decisions and actions

Decisions and/or actions:

- ZVV-Zürich Transport Network or Zürich Traffic Network is a public transportation system, combining rail, bus, tram, trolleybus, lake boat, cable
- VBZ owns and operates trams, trolleybuses, buses, and a funicular
- VBZ operates without owning one more funicular, a rack railway, and the Stadtbahn Glattal light rail system
- all of VBZ's passenger services are operated within the tariff and ticketing system provided by ZVV
- ZVV tariff also covers other passenger transport services in and around the city, including SBB

Goals of the decisions and/or actions /objectives/:

- improved mobility in the Zurich Municipality and in the Canton

Factors influencing decisions and/or actions /sensing & prediction/:

- decisions from the Canton and the Municipality of Zurich

Adaptation capabilities /adaptation/:

- ZVV changes its decision-making or actions according to Canton' and Municipality' decisions

Learning capabilities /learning/:

- very well developed

(c) Collectives & structure

Groups /collectives/:

- ZVV groups all the enterprises playing a role in the public transport mobility in the Canton of Zurich

Organizational structure:

- depends on the Canton and the Municipality

(d) Interactions

Interactions /interactions/:

- interacts according to specific issues (policy) with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport mainly, and with Department of Public Safety, Canton of Zürich, Other cities in the Canton of Zürich
- operational interactions with Federal railways (SBB)
- consults according to needs (e.g., extension of a line, new line, timetable, etc.) with Specific citizens' groups (e.g. "street communities"), and with Quartierkinferenz.

SBB - Federal railways

(a) Characteristics

Sector: private

Number of actors of this type in the case:

Important characteristics of the actor /state variables/:

SBB-Swiss Federal Railways is the national railway company of Switzerland. It is usually referred to by the initials of its German, French, and Italian names, either as SBB CFF FFS, or used separately

- implementing actor inside the Municipality and the Canton

(b) Decisions and actions

Decisions and/or actions:

- SBB is in charge of the railway network in the city and in the canton of Zurich (sort of metropolitan network)
- In Zurich are 25 railway stations, all very well connected; however, SBB doesn't manage all lines
- some lines are managed by SZU, a railway company and transport network in the canton of Zürich in Switzerland; the network comprises the Uetliberg railway line and the Sihltal railway line, a cable car and a network of bus services

Goals of the decisions and/or actions /objectives/: see above

Factors influencing decisions and/or actions /sensing & prediction/:

- SBB depends on the decisions taken at the national level
- local train traffic in the Canton of Zurich is under the responsibility of the Canton
- federal level and Canton of Zurich control also the majority of SZU (owned also by the Municipalities of Zurich, Adliswil, Langnau am Albis, Horgen, Thalwil and Uitikon)

Adaptation capabilities /adaptation/: NOT RELEVANT

Learning capabilities /learning/: NOT RELEVANT

(c) Collectives & structure

Groups /collectives/: NOT RELEVANT

Organizational structure:

- SBB is led in an entrepreneurial manner
- a performance agreement between Swiss Federal Railways and the Swiss Confederation defines the requirements, being updated every four years; at the same time, the compensation rates per train and track-kilometre are defined

(d) Interactions

Interactions /interactions/:

- mainly with Canton of Zürich
- with the Department of Public Utilities and Transport
- with Zürich Transport Authority (ZVV), operational.

Car sharing enterprises (Mobility)

(a) Characteristics

Sector: private

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- implementing actor inside the Municipality and the
- created thanks to “active citizens” groups in the mobility sector

(b) Decisions and actions

Decisions and/or actions:

- Mobility Car sharing (officially Mobility Cooperative, also known as Mobility Car Sharing or simply Mobility for short) is a Swiss cooperative of car sharing, covering almost all organised car sharing in Switzerland
- in Zurich operates as an actor in the day-by-day implementation of the mobility strategy

Goals of the decisions and/or actions /objectives/: -

Factors influencing decisions and/or actions /sensing & prediction/:

- decisions from the Municipality (Department of Public Safety)

Adaptation capabilities /adaptation/: NOT RELEVANT

Learning capabilities /learning/: NOT RELEVANT

(c) Collectives & structure

Groups /collectives/: NOT RELEVANT

Organizational structure: see "decisions and actions"

(d) Interactions

Interactions /interactions/:

- mainly with the Department of Public Safety
- cooperates with SBB - Federal railways .

Zurich bike sharing enterprises

(a) Characteristics

Sector: private

Number of actors of this type in the case: 3 - "Züri rollt" – Free Bicycle Rental in Zurich; Züri Velo; E-Bike Rental (EGO Movement)

Important characteristics of the actor /state variables/:

- implementing actor inside the Municipality and the Canton -> phase?

(b) Decisions and actions

Decisions and/or actions: -

Goals of the decisions and/or actions /objectives/: -

Factors influencing decisions and/or actions /sensing & prediction/:

- decisions from the Municipality (Civil Engineering and Waste Management Department)

Adaptation capabilities /adaptation/: NOT RELEVANT

Learning capabilities /learning/: NOT RELEVANT

(c) Collectives & structure

Groups /collectives/: NOT RELEVANT

Organizational structure: -

(d) Interactions

Interactions /interactions/:

- mainly with the Civil Engineering and Waste Management Department.

Canton of Zürich (Building Department and Department for Economic Affairs)

(a) Characteristics

Sector: public local authority

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- implementing actor inside the Canton (and therefore the Municipality) -> phase?
- it could be considered a co-promoter -> phase?

(b) Decisions and actions

Decisions and/or actions:

- Canton's major roles:
 - canton runs its own road network, trunk network, something between the local network and the national trunk, and highways system, which is run by the federal government
 - canton is commissioning the public transport services, doing it in conjunction with the local level, the local communities, and municipalities

- canton is responsible for parts of the centre, and works on parts that are built and maintained also
- canton also owns a share of the international airport operating companies

Goals of the decisions and/or actions /objectives/:

- improved mobility based on a dynamic traffic management

Factors influencing decisions and/or actions /sensing & prediction/:

- the Canton has a very good way of cooperating with the interested departments of the Municipality (mainly Department of Public Safety and Department of Public Utilities and Transport)
- it should also consider the decisions of citizens through referenda (Zürich inhabitants) and of specific groups (Car group “Touring club Switzerland”, 12 Quartierkonferenz/ Quartiervereine and Specific citizens’ groups mainly)
- it should also consider the decisions of Car sharing enterprises
- yes, this actor takes into account future consequences of the decision/action during decision-making process

Adaptation capabilities /adaptation/:

- sometimes, the Canton has conflicts or concurring interests, mainly due to the fact the canton owns parts of the trunk road network, located at the borders of the city. The municipality of Zurich is responsible to build, maintain and operate that part of the road network, but only with the consent from the canton, situation which requires a negotiation process.
- the city of Zurich is always focused on creating more liveable urban spaces, with public transports low speed, on giving pedestrians their spaces, whereas the canton is interested to have relatively high capacity roads, to ensure that there is enough capacity on these roads,
- there is also good personal relationship

Learning capabilities /learning/: See above

(c) Collectives & structure

Groups /collectives/:

- the major actors involved are Building Department and Department for Economic Affairs

Organizational structure:

- as part of the Canton, the above mentioned departments have chiefs selected according to the political majority in the Canton (Political parties), changing accordingly

(d) Interactions

Interactions /interactions/:

- mainly interacts with the Department of Public Utilities and Transport and Department of Public Safety, but also with Civil Engineering and Waste Management Department (operational and also informal interactions for the management on all mobility issues)
- with Zürich Transport Authority, as ZVV exists mainly at the Canton level
- with SBB-Federal railways, as local railway is under the competence of the canton
- with Zürich inhabitants and all people from the Canton, as it should respect the decisions taken by them through referenda
- consults periodically with Car group “Touring club Switzerland”, Bike group “ProVelo”, 12 Quartierkonferenz/ Quartiervereine, and with Specific citizens’ groups (e.g. “street communities”)

Other cities in the Canton of Zürich

(a) Characteristics

Sector: public local authorities

Number of actors of this type in the case: 169 municipalities

Important characteristics of the actor /state variables/:

(b) Decisions and actions

Decisions and/or actions:

- not so relevant; however, the Zurich mobility strategy depends on the Canton, that entails also other municipalities beyond Zurich (around 70% of inhabitants of the Canton live in these municipalities). Moreover, some of these Municipalities, such as Adliswil, Langnau am Albis, Horgen, Thalwil and Uitikon, own (directly) a part of SZU

Goals of the decisions and/or actions /objectives/: NOT AVAILABLE / NOT APPLICABLE

Factors influencing decisions and/or actions /sensing & prediction/: NOT AVAILABLE / NOT APPLICABLE

Adaptation capabilities /adaptation/: NOT AVAILABLE / NOT APPLICABLE

Learning capabilities /learning/: NOT AVAILABLE / NOT APPLICABLE

(c) Collectives & structure

Groups /collectives/: 169 municipalities divided in 12 districts

Organizational structure: NOT RELEVANT

(d) Interactions

Interactions /interactions/:

- mainly with Canton of Zürich
- with SBB-Federal railways (serves these municipalities; moreover, some of them - see above - own SZU)
- with Zürich Transport Authority (ZVV) (ZVV network accommodates all these municipalities).

Large enterprises (UBS, Crédit Suisse, Google, etc..., working in the Zürich territory)

(a) Characteristics

Sector: private

Number of actors of this type in the case: many

Important characteristics of the actor /state variables/:

- enterprises, important players for Zurich's wealth and wellbeing -> role?? -> phase??

(b) Decisions and actions

Decisions and/or actions:

- almost all large enterprises (e.g. UBS, Crédit Suisse, Google, etc.) working in the Zürich territory have a person responsible of liaising with the municipality (for mobility, sustainability issues), consulted at least twice a year

Goals of the decisions and/or actions /objectives/:

- to improve the mobility in Zurich

Factors influencing decisions and/or actions /sensing & prediction/: NOT AVAILABLE/ NOT APPLICABLE

Adaptation capabilities /adaptation/:

- there is a good exchange with local authorities; these companies are „very comfortable with that, and they are very satisfied to have this exchange of opinions “

Learning capabilities /learning/: see above

(c) Collectives & structure

Groups /collectives/: NOT AVAILABLE/ NOT APPLICABLE

Organizational structure: NOT RELEVANT

(d) Interactions

Interactions /interactions/:

- with Civil Engineering and Waste Management Department, Department of Public Utilities and with Transport and Department of Public Safety
- with Canton of Zürich

Business community “City Vereinigung”

(a) Characteristics

Sector: entrepreneurial association

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/: -

(b) Decisions and actions

Decisions and/or actions:

- business community, working together with the city in the plan implementation and design in the city centre
- demanded that the city centre be better served not only by public, but also by private traffic and that the number of visitor parking spaces be significantly increased

Goals of the decisions and/or actions /objectives/:

- for 50 years, the City Association Zurich has been committed to an attractive and liveable inner city, therefore, it is important to improve the mobility

Factors influencing decisions and/or actions /sensing & prediction/: NOT AVAILABLE / NOT APPLICABLE

Adaptation capabilities /adaptation/: NOT AVAILABLE / NOT APPLICABLE

Learning capabilities /learning/: NOT AVAILABLE / NOT APPLICABLE

(c) Collectives & structure

Groups /collectives/: NOT AVAILABLE / NOT APPLICABLE

Organizational structure: NOT RELEVANT

(d) Interactions

Interactions /interactions/:

- with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport and Department of Public Safety
- with Shopkeepers of a specific street or square where a project will be implemented (e.g. pedonalization).

Shopkeepers of a specific street or square where a project will be implemented (e.g. pedonalization)

(a) Characteristics

Sector: private

Number of actors of this type in the case: Many (can refer to “City Vereinigung”)

Important characteristics of the actor /state variables/: -

(b) Decisions and actions

Decisions and/or actions:

- this actor is consulted by the Municipality

Goals of the decisions and/or actions /objectives/:

- to save their business (mobility should facilitate access for potential clients)

Factors influencing decisions and/or actions /sensing & prediction/:

- safeguard their business
- some may be sensitive to social and environmental values

Adaptation capabilities /adaptation/: NOT AVAILABLE / NOT APPLICABLE

Learning capabilities /learning/: NOT AVAILABLE / NOT APPLICABLE

(c) Collectives & structure

Groups /collectives/: many (can refer to “City Vereinigung”)

Organizational structure: NOT RELEVANT

(d) Interactions

Interactions /interactions/:

- with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport and Department of Public Safety

- with business community “City Vereinigung”.

Car group “Touring club Switzerland”

(a) Characteristics

Sector: Non-profit association (citizens group)

Number of actors of this type in the case: One - 1.5 million members in Switzerland

Important characteristics of the actor /state variables/:

- TCS represents car owners’ interests

(b) Decisions and actions

Decisions and/or actions:

- very active in Zurich for allowing, as far as possible, the use of cars in the entire city, including its centre
- promoted actions against the increase of parking prices, against park restrictions in the streets, against the restriction of spaces for cars in the streets, and against the decrease of speed limits

Goals of the decisions and/or actions /objectives/:

- to guarantee the use of private cars in the entire city

Factors influencing decisions and/or actions /sensing & prediction/: see above

Adaptation capabilities /adaptation/: NOT AVAILABLE / NOT APPLICABLE

Learning capabilities /learning/: NOT AVAILABLE / NOT APPLICABLE

(c) Collectives & structure

Groups /collectives/: see below

Organizational structure:

- structurally, TCS consists of 24 sections (Zurich section is one) and a central Club
- each section delegates a representative to sit on the Board of Directors
- it appoints a director who manages the Central Club’s business

(d) Interactions

Interactions /interactions/:

- with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport and with the Department of Public Safety
- with Canton of Zürich
- with Political parties (big influence on conservative parties).

Bike group “ProVelo”

(a) Characteristics

Sector: Citizen Group promoting mobility on bikes

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- bike sharing
- participant in the SI

(b) Decisions and actions

Decisions and/or actions:

- consistently looks at all road construction projects in the canton of Zurich, paying close attention whether the project in question brings improvements to cycling and whether these improvements meet the requirements for consistent cycling

Goals of the decisions and/or actions /objectives/:

- to improve the mobility in Zurich by increasing the use of bikes
- to improve bikers' safety (some prerequisites for using the bicycle as a means of transportation: the infrastructure must meet the requirements of the cyclists, the use of the infrastructure should be clear and simple)

Factors influencing decisions and/or actions /sensing & prediction/: NOT AVAILABLE / NOT APPLICABLE

Adaptation capabilities /adaptation/: NOT AVAILABLE / NOT APPLICABLE

Learning capabilities /learning/: NOT AVAILABLE / NOT APPLICABLE

(c) Collectives & structure

Groups /collectives/: NOT AVAILABLE / NOT APPLICABLE

Organizational structure: NOT RELEVANT

(d) Interactions

Interactions /interactions/:

- mainly with Civil Engineering and Waste Management Department
- with the Department of Public Utilities and Transport and the Department of Public Safety
- with Canton of Zürich.

12 Quartierkonferenz/ Quartiervereine

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1 - composed by the presidents of the 25 district associations (12 one in each of the 12 sub-areas of Zürich); and in the other in the surrounding area (in total 25)

Important characteristics of the actor /state variables/:

- this actor represents the common interests of the district associations (Quartiervereine) towards politics, administration and the public
- provides services for its affiliated district clubs (the conference is formed by the presidents of the 25 district associations and led by a volunteer board)

- could be considered a public actor
- could be considered a decision-maker

(b) Decisions and actions

Decisions and/or actions:

- represents the networks of citizens'/stakeholders' associations in each of the sub-areas of Zürich that are periodically consulted for any important decision concerning mobility (among other)

Goals of the decisions and/or actions /objectives/:

- district associations represent the population's interests and the trade in relation to the city administration
- they are also important agents of integration and networking: their events serve the purpose of will formation and information, entertainment and local history
- usually, district clubs support socio-cultural activities (i.e., operating a district museum, issuing a district newspaper)

Factors influencing decisions and/or actions /sensing & prediction/: see above

Adaptation capabilities /adaptation/: NOT AVAILABLE / NOT APPLICABLE

Learning capabilities /learning/: NOT AVAILABLE / NOT APPLICABLE

(c) Collectives & structure

Groups /collectives/: see above

Organizational structure:

- see above (Quartierkonferenz and Quartiervereine/District associations)
- a 2011 agreement regulates the cooperation between the city of Zurich and the district associations

(d) Interactions

Interactions /interactions/:

- with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport and with the Department of Public Safety
- with Canton of Zürich
- with Zürich Transport Authority (ZVV) and Federal railways (SBB) (e.g., in relation to the creation of a new station, the extension of a tram/bus line, etc.)
- with Zürich inhabitants and with Shopkeepers of a specific street or square where a project will be implemented in their area.

Specific citizens' groups (e.g. "street communities")

(a) Characteristics

Sector: -

Number of actors of this type in the case: many

Important characteristics of the actor /state variables/:

- informal groups of city's inhabitants (from a street/little area), with similar, specific interests

(b) Decisions and actions

Decisions and/or actions:

- specific citizens' groups (e.g., street communities) related to specific projects (e.g., in relation to the extension of a tram line, the pedestrianisation of a square, the change in traffic fluxes in a street, the development of piazza pop-up, etc.) -> all phases

Goals of the decisions and/or actions /objectives/: NOT AVAILABE

Factors influencing decisions and/or actions /sensing & prediction/:

- citizens' interests and will

Adaptation capabilities /adaptation/: NOT AVAILABE

Learning capabilities /learning/: NOT AVAILABE

(c) Collectives & structure

Groups /collectives/: NOT AVAILABE

Organizational structure: NOT AVAILABE

(d) Interactions

Interactions /interactions/:

- with Civil Engineering and Waste Management Department, Department of Public Utilities and Transport, Department of Public Safety
- with Canton of Zürich
- with Zürich Transport Authority (ZVV) and Federal railways (SBB) (e.g., in relation to the extension of a tram line, a new station, etc.).

Zürich inhabitants

(a) Characteristics

Sector: private citizens

Number of actors of this type in the case: approximately 400,000 (urban agglomeration has 1.3 million; the metropolitan area has 1.8 million; every day 1 million people travel across the city borders)

Important characteristics of the actor /state variables/:

- Inhabitants of the city

(b) Decisions and actions

Decisions and/or actions:

- participate in many ways to the life of the city
- involved in the mobility strategy
- all main decisions must be endorsed by citizens through public consultations such as referendums (referenda can be initiated by citizens themselves)
- at least 10 important referenda results already influenced the implementation of the mobility strategy in Zurich

Goals of the decisions and/or actions /objectives/:

- citizens approved or rejected many important aspects of the mobility strategy

Factors influencing decisions and/or actions /sensing & prediction/:

- citizens' interests and will

Adaptation capabilities /adaptation/: NOT AVAILABE

Learning capabilities /learning/: NOT AVAILABE

(c) Collectives & structure

Groups /collectives/: see above

Organizational structure: NOT AVAILABE

(d) Interactions

Interactions /interactions/:

- with several departments from the Municipality of Zürich (Civil Engineering and Waste Management Department, Department of Public Utilities and Transport, Department of Public Safety, Presidential department, Health department, Energy Commission)
- with Canton of Zürich
- with Political parties in political/local elections
- with 12 Quartierkonferenz/ Quartiervereine, Specific citizens' groups (consultations)
- with Business community "City Vereinigung", Shopkeepers, Car group "Touring club Switzerland", Bike group "ProVelo".

Groningen

In Groningen SI case, a total of eight key actors are involved, namely (1) newspapers, (2) individual shopkeepers from Shopping Centre Paddepoel, (3) shopkeeper associations, (4) Burgemeester & Wethouders (B&W; Mayor and Councillors), (5) Department of Urban Development and Housing (Dienst Stadsontwikkeling en Volkshuisvesting), (6) citizens, (7) Echte Nederlandse Fietsersbond (ENFB; Cyclists' Union), and (8) ROVER (Travellers Public Transport - organization representing travelers in public transport). For each of the aforementioned key actors, a description is offered bellow, on different topics such as actor's characteristics, their decisions and actions, collectives and structures they are a part of, as well as their most important or relevant interactions with other actor types.

Newspapers

(a) Characteristics

Sector: private

Number of actors of this type in the case: 3 (Dagblad van het Noorden, Groninger Gezinsbode, Loeks)

Important characteristics of the actor /state variables:

- number (and type) of agents the reported information reaches
- objectivity of reported information
- running adverts of local shopkeepers

(b) Decisions and actions

Decisions and/or actions:

- report on the events related to the closing of Noorderplantsoen for cars (action)
- run adverts (paid for by shopkeepers) (action)
- to run adverts in exchange for non-objective information(?) (decision)

Goals of the decisions and/or actions /objectives/:

- maximisation of money for adverts from shopkeepers (if running adverts)

Factors influencing decisions and/or actions /sensing & prediction/: not clear

Adaptation capabilities /adaptation/: NA

Learning capabilities /learning/: NA

(c) Collectives & structure

Groups /collectives/: no

Organisational structure: NA

(d) Interactions

Interactions /interactions/:

- shopkeepers, running adverts in exchange for printing negative information about closing Noorderplantsoen for cars.

Shopkeepers

(a) Characteristics

Sector: private

Number of actors of this type in the case: about 80-90

Important characteristics of the actor /state variables/:

- Project design

(b) Decisions and actions

Decisions and/or actions:

- lobby against closing Noorderplantsoen for cars (action)
- organise themselves in associations (action)

Goals of the decisions and/or actions /objectives/: maximise selling

Factors influencing decisions and/or actions /sensing & prediction/: no

Adaptation capabilities /adaptation/: no

Learning capabilities /learning/: no

(c) Collectives & structure

Groups /collectives:

- collectives (Council Shopping Centre Paddepoel (Stichting Winkelcentrum Paddepoel)
- Cooperative Association of Owners in the Shopping Centre de Paddepoel (Coöperatieve Vereniging Eigenaren in het Winkelcentrum De Paddepoel)
- KvK (Kamer van Koophandel) – Chamber of Commerce are described separately

Organizational structure: no

(d) Interactions

Interactions /interactions/:

- newspapers - pay for adverts
- citizens who shop there - lobby for keeping Noorderplantsoen open for cars

Shopkeeper associations

(a) Characteristics

Sector: -

Number of actors of this type in the case: ± 6 , but less than 10

Important characteristics of the actor /state variables/: NA

(b) Decisions and actions

Decisions and/or actions:

- participate in the meetings organised by the local government (action)
- lobby for keeping Noorderplantsoen open for cars also via writing petitions to the local government (action)
- sue the local government (action)

Goals of the decisions and/or actions /objectives/: maximise selling

Factors influencing decisions and/or actions /sensing & prediction/: NA

Adaptation capabilities /adaptation/: NA

Learning capabilities /learning/: NA

(c) Collectives & structure

Deliverable 6.1

Drivers, Barriers, Actors, and Network structures

Groups /collectives:

- associations of individual shopkeepers
- members of the Traffic group investigation northern neighbourhoods
- as a collective most of the organisations formed The Consultative Body Small and Medium Sized Business (representatives the municipality, the KvK, GOF, KNOV, NCOV)
- The Businesspeople's Consultation Traffic Structure Groningen-north

Organisational structure: NA

(d) Interactions

Interactions /interactions/:

- interactions with other members of the Traffic group investigation northern neighbourhoods during consultancy meetings organised by B&W.

B&W

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/: -

(b) Decisions and actions

Decisions and/or actions:

- form consultant working groups advising on creating policy scenarios (closing Noorderplantsoen as one of the 5 scenarios) - in 09.1980 created Traffic group investigation northern neighbourhoods (action)
- make decisions about the final policy scenario; Action: organise consultations with stakeholders (i.e. 10.1983 public hearing about Traffic Plan Noorthern Neighbourhoods (+/- 120 residents and representatives of the Shopping Centre Paddepoel) (action)
- get opinions on the Discussion Plan from stakeholders (04.1984 - 10 opinions) (action)

Goals of the decisions and/or actions /objectives/: getting re-elected

Factors influencing decisions and/or actions /sensing & prediction/: polls, people's satisfaction; individual values

Adaptation capabilities /adaptation: rules are unclear

Learning capabilities /learning/: NA

(c) Collectives & structure

Groups /collectives: part of a larger local government

Organizational structure: mayor + 6 councillors; 1982: Jacque Wallage + 4x PdvA + 2x CDA

(d) Interactions

Interactions /interactions/:

- interactions with other members of the Traffic group investigation northern neighborhoods during consultancy meetings organized by B&W
- interactions with Department of Urban Development and Housing (Dienst Stadsontwikkeling en Volkshuisvesting) commissioning them to draft the policy scenario (i.e. Traffic Plan Northern Neighborhoods)
- interactions with local community on the basis of which satisfaction is assessed.

DSenV

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/: NA

(b) Decisions and actions

Decisions and/or actions:

- drafting the Traffic Plan Northern Neighborhoods - assessing the effects of 5 policy scenarios on local traffic - 03.1983 (action)

Goals of the decisions and/or actions /objectives/: unknown

Factors influencing decisions and/or actions /sensing & prediction/: NA

Adaptation capabilities /adaptation/: NA

Learning capabilities /learning/: NA

(c) Collectives & structure

Groups /collectives/: part of a larger local government

Organisational structure: NA

(d) Interactions

Interactions /interactions/: with B&W

Citizens

(a) Characteristics

Sector: -

Number of actors of this type in the case: 100 or more, but less than 1000 (number and socio-demographic characteristics to be checked with statistical data)

Important characteristics of the actor /state variables/:

- for or against closing Noorderplantsoen for cars
- motivations for the decision (needs, values)
- threshold for evoking cognitive dissonance
- typical practices (socio-demographic characteristics, geo location)

(b) Decisions and actions

Decisions and/or actions:

- for or against closing Noorderplantsoen for cars (decision)
- sharing information within a social network [broad, including all signaling actor types (e.g. putting posters in windows)] (action)
- receiving information from social network (e.g. listening to opinions at meetings organized by B&W, reading newspapers, talking to shopkeepers when shopping) (action)

Goals of the decisions and/or actions /objectives/: maximize needs satisfaction

Factors influencing decisions and/or actions /sensing & prediction/: motivations (needs, values)

Adaptation capabilities /adaptation/: NA (decision-making strategy remains constant, it's the arguments that feed into the algorithm that change)

Learning capabilities /learning/: information sharing according to HUMAT; SMARTEES survey to investigate what influences a perceived expert status

(c) Collectives & structure

Groups /collectives/:

- within neighborhood (geo-location dependence) interest groups more coherent on certain interests, e.g. neighbourhoods Oranjebuurt, Noorderplantsoenbuurt, Hortusbuurts - strongly for closing the park for cars and Paddepoel and Selwerd inhabitants against a car-free park (as traffic moves to their neighborhood)
- some inhabitants form informal stakeholder associations, e.g. Parent's committee for the Nassauschool – elementary school located at Nassaulaan (Oranjebuurt)

Organizational structure: NA

(d) Interactions

Interactions /interactions/:

- B&W - forming opinions, listening to opinions at meetings organized by B&W
- shopkeepers - neighborhoods doing shopping in Paddepoel systematically interact and exchange opinions with shopkeepers who are dissonant and don't want a decrease in income.

ENFB

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/: NA

(b) Decisions and actions

Decisions and/or actions:

- participate in the meetings organized by the local government (action)
- lobby for closing Noorderplantsoen for cars also via writing petitions to the local government (action)

Goals of the decisions and/or actions /objectives/: improve biking conditions

Factors influencing decisions and/or actions /sensing & prediction/: NA

Adaptation capabilities /adaptation/: NA

Learning capabilities /learning/: NA

(c) Collectives & structure

Groups /collectives/: a collective actor

Organizational structure: NA (not important from the perspective of the study, as far as we know)

(d) Interactions

Interactions /interactions/:

- interactions with other members of the Traffic group investigation northern neighborhoods during consultancy meetings organized by B&W

ROVER

(a) Characteristics

Sector: -

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/: NA

(b) Decisions and actions

Decisions and/or actions:

- participate in the meetings organized by the local government (action)

- lobby for closing Noorderplantsoen for cars also via writing petitions to the local government (action)

Goals of the decisions and/or actions /objectives/: to improve public transport

Factors influencing decisions and/or actions /sensing & prediction/: NA

Adaptation capabilities /adaptation/: NA

Learning capabilities /learning/: NA

(c) Collectives & structure

Groups /collectives/: a collective actor

Organizational structure: NA (not important from the perspective of the study, as far as we know)

(d) Interactions

Interactions /interactions:

- interactions with other members of the Traffic group investigation northern neighborhoods during consultancy meetings organized by B&W

Samsø

In Samsø's SI case, for six key actors, descriptions and relationships were identified. A detailed description is offered below, on multiple topics such as actor's characteristics, their decisions and actions, collectives and structures they are a part of and their most important or relevant interactions with other actor types.

Local Government

(a) Characteristics

Sector: public

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- decision-maker and beneficiary -> all phases
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- In the following paragraph I will focus on the implementation of wind turbines on Samsø. The local government is the overall planning authority and it is the local government who finally after approving the projects is instrumental in making the plan fit the structure of the regional plan according to Danish law. Planning where and how the physical infrastructures should be built and constructed. This is related to both legal matters and knowledge of the area and ownership of the land. The political /democratic elected government, Municipality is the link between the bureaucratic handling and the legal decisions, but as a side effect be-

ing local means also being responsible as a private person who will be confronted on the street by the so called "parliament of the streets". The bright side is that the local government can make plans for the community and also by its own decision make investments and own projects - if it by all means serves the common good.

Goals of the decisions and/or actions /objectives/:

- To make Samsø island 100% self-supplied by renewables it was needed to produce 100% electricity from wind power. To achieve this goal, the local government needed to find suitable places for enough capacity to meet this goal. So where could you plant them? The planning authority needed to follow general law, and restrict some protected areas but at the same time listen to and accept proposals from a number of private developers. They were in their right to make proposals but the local government also needed to listen to a growing opposition towards too much private ownership. To make most people and groups happy the goal was to make room for both on the planning and then successfully achieve 100% renewable electricity.

Factors influencing decisions and/or actions /sensing & prediction/:

- In wind power you meet high restrictions from a superior law that protects the Danish landscape. Financing is a big factor. How do you find a combination of private investments and at the same time allow cooperative ownership but on private land!? Opposition against wind power, a difficult factor to handle for a local government who pretends to listen to all citizen groups. Having an overall goal to achieve. 100% renewable energy being the selected Danish energy island was a strong driver. To be a part of the Danish ambition from the government is a very influencing fact. Top down policy working for bottom up action. The locals would never work without a national framework.

Adaptation capabilities /adaptation/:

- The local government depends on law and regulators. They can make a common decision and they can decide investments and they can indict laws that will help private actors to act in favor of the common masterplan. But at the same time the local government is also restricted in the adaptation because they are depending on private and citizens' actions. Before Samsø was selected to be the Danish energy island there were no plans to implement large scale MW wind turbines. We needed to make a new local plan to make it possible. It took some discussions in the democratic level as well as the bureaucratic who did not have the skills and capacity to handle these kind of structures.

Learning capabilities /learning/:

- yes, there is a steep learning curve, as trying to implement things a local government did not try before requires learning/capacity building
- the local government needs to look a bit further than the usual bottom-line for economy and in handling public budgets
- a future sustainable masterplan is not a usual business therefore the members of the government/municipality need to learn and implement structures that are new and unknown for them. Bureaucrats seem to do what they are used to before going into the unknown. Samsø

had a slow start with a lot of critical hesitation and fear from the local government before we slowly learnt to handle large scale wind projects.

(c) Collectives & structure

Groups /collectives/:

- All groups in the local government have to be involved in the process as part of the work. They cannot exclude any parties with an interest. Working in a cooperative way takes an attitude for group cooperation. As a democratic part of the process the local government needs to align the masterplan with relevant groups and interest organizations in the community. The local government is generally not good in handling groups. They need to act on behalf of an entire community so nobody is left out. But at the same time they need to listen to the major groups of interest. Farmers, tourist organizations and trade and business is influential as lobbyists.

Organisational structure:

- The actor is a public entity and just as in a local government there is a multiple layer structure with democratic committee of elected members and a bureaucratic system below administering the decisions made in the committee. The combination of a democratic and a bureaucratic layer is interesting. Samsø has changed a lot since 1998 where the island's local government was the winner of the Danish energy island competition. Today the bureaucrats are well informed and educated - but in the beginning we had to put up with a lot of resistance from the bureaucrats themselves because they did not know how to handle the projects and the landscape planning for wind power.

(d) Interactions

Interactions /interactions/:

- as a Local government it is expected that they call public hearings, meetings and info for people so people can act according to insightful info and according to a general masterplan
- local government include academic entities and consultants to ensure research and knowledge as well as learning processes
- local government needs to ensure a widespread attention and therefore a stronger regional, national, and European role
- investments and financing must be in place.

Farmers

(a) Characteristics

Sector: private

Number of actors of this type in the case: 20 or more, but less than 100

Important characteristics of the actor /state variables/:

Farmers are dynamic actors in the establishment of wind power. They play an important and powerful role in the local community as well as in all matters concerning administration of the landscape.

- participant and beneficiary -> all phases
- secondary characteristic -> mature implementation

(b) Decisions and actions

Decisions and/or actions:

- Farmers are business men and professionals in their trade and work. They act as free agents but also often as a group. They have relatively much power and play an influential role in the establishment and ownership of wind power. They act fast and they make decisions according to their ownership of the land where wind turbines most likely will be established. Farmers are "conservative " by tradition but also very engaged in the local community. In the establishment and planning phase of the Samso energy island plan the wind turbines was due to a lot of very intense discussions. Farmers wanted to own all the wind turbines and the community had a wish to be involved and establish local cooperatively owned turbines. The farmers needed to hear these facts because the final decision was not in their hand but in the hands of the local government.

Goals of the decisions and/or actions /objectives/:

The project is aiming at a superior goal which is a 100% sustainable society. Any actions leading in this direction is a temporary goal. The farmers were to get as much ownership as possible and at the same time not lose the possibility of getting a planning permission! This was a delicate process where the project planner - the energy academy and the local government wanted to be successful in implementing the goals of the national energy island plan - the farmers were more short sighted and wanted to see the business for their farm only. But realizing that they needed to negotiate with the neighbors made them more flexible and the result was there eventually and made the implementation satisfactory for all parts.

Factors influencing decisions and/or actions /sensing & prediction/:

When working on a masterplan with a future goal it is important to accept future goals as a concept/argument for acting. A common direction/goal is leading multiple actions in the same direction. But in practice the national Feed in tariff was a strong driver for decisions. Feed in tariff is a guaranteed minimum price per kWh electricity for 10 years, which makes it safer to invest in wind power. The establishment of the energy island project made it easier for farmers to take part in the project. Having a neutral entity like the energy academy, made it much easier to act as a private entity. The energy academy is not an authority and therefore it is not bias in the ownership except the situation in which a widespread public participation is the goal.

Adaptation capabilities /adaptation/:

- If it is necessary to change decision makers in the process, we will do so. Maybe there is an ownership issue that creates a barrier for action - then we will try to divert the power to people who will be more suitable for making great decisions.

Learning capabilities /learning/:

- yes, there is a steep learning curve; trying to implement things with farmers who have not tried to build wind turbines before requires learning/capacity building
- farmers are used to investigate and require information and learn new things and skills

- farmers are practical people and they learn how to navigate very fast; they use consultants and experts if needed and they are usually well prepared.

(c) Collectives & structure

Groups /collectives/:

- Farmers are well organized and often stronger networkers than many other organizations. This means they have an advantage in the establishment of wind power. They can work individually but in wind power where land is needed they work in groups of 3-5 so they can allocate a site for a group of wind turbines. This is good for the authority whose role is to identify the best site for building wind power

Organizational structure:

- farmers are individuals by nature, but in business they come organized as the Samso farmers' association
- they are strongly represented in politics and in business

(d) Interactions

Interactions /interactions/:

- farmers are investors and owners
- farmers are organizational initiators
- farmers are critical to social /cooperative ownership if they can own privately but they understand the farmers' community role with neighbors.

Local trade company Ballen Maskinfabrik (plumber and black smith contractor)

(a) Characteristics

Sector: private

Number of actors of this type in the case: there are maybe 15 of these companies on Samsø but one is special, and it made a great difference in the establishment of wind power

Important characteristics of the actor /state variables/:

The contractors are crucial for business and activity in action. The plumber/installer is making things work and their skills are needed to be able to implement the technical part of the 100% renewable energy island.

- participant and beneficiary -> mature implementation
- the plumber/contractor is a vital component of the community because they can fix things and they can make things happen in praxis -> mature implementation

(b) Decisions and actions

Decisions and/or actions:

- The plumber Ballen Maskinfabrik played a vital role in the understanding and implementation of wind power in Samso. Initially this plumber company started building their own versions of wind turbines for the first wind power cooperative in Samso. They obviously had a seat in the steering committee of the energy academy and in the process. The other reason was naturally the business potential. Finishing the process would make a great business opportunity.

Goals of the decisions and/or actions /objectives/:

- to implement the energy plan, the contractor should imagine having a role in the implementation and building of structures around the wind turbines, there was a very strong drive for the plumber Ballen Maskinfabrik.

Factors influencing decisions and/or actions /sensing & prediction/:

- When working with a masterplan with a future goal it is important to accept future goals as a concept/argument for acting. If the energy plan for some reason would not be realised any possible business opportunities would disappear. This made the company very engaged and involved in the preparation to make sure it would be realised. Also, here feed in price and an active version of the state top down project would be realised. The masterplan became also the company business plan.

Adaptation capabilities /adaptation/:

- The company changed their main area of expertise from shipbuilding/maintaining fishing boats to building wind turbines. Fishing was going down and there was a great need for new business ideas. Wind power was one of these ideas and the company soon adapted the new technology and became an actor in the business.

Learning capabilities /learning/:

- plumbers/contractors need to be flexible and ready to go for new marked potentials
- I believe learning is part of a successful company, especially when it comes to a remote isolated community like Samsø where new businesses are scarce.

(c) Collectives & structure

Groups /collectives/:

- Contracting is a competitive business and we see a lot of individual action. But between the companies we can also see grouping of relevant competences. So, electricians, carpenters, builders work together in consortiums from contract to contract.

Organizational structure:

- The private sector is often a one-man ownership organized as a such. But they are also ready to enter organizational structures if it serves a purpose and can help develop new ideas and eventually new business.

(d) Interactions

Interactions /interactions/:

- mentioned above

- contractors like Ballen Maskinfabrik work with local government and make sure they are well informed about plans and ideas that might turn into businesses.

Samsø Energy Academy

(a) Characteristics

Sector: NGO

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- participant and beneficiary -> all phases
- secondary characteristic -> project design

(b) Decisions and actions

Decisions and/or actions:

- This actor is the Samsø Energy academy (SE). The role is to act as a project secretary, developer and administrator - until any type of energy project is mature enough to stand alone administrated by its owners, the shareholders. When we focus on the establishment of wind power as a part of the energy island development plan, SE acts as the pre-preparation entity. SE defines the goal and sets up the framework/masterplan where wind power has a role. The definition is loose but determined. Decisions are made only with general purpose, not for the final conclusion. SE calls meetings and creates a high level of knowledge so decisions can be made at a high level of capacity and information. The SE is also acting on the preparation of the financing structure while making arrangements with banks and financing institutions. In other words, SE acts as a provider of info and data so that the next phase where contracts are made, and binding decisions are made SE steps down and leaves it to the actual owners to solve. SE decides the plan and structure and works for this to happen while the contracts and practical administration is outside SE.

Goals of the decisions and/or actions /objectives/:

- SE is aiming at a superior goal which is a 100% sustainable society. Any action leading in this direction is a temporary goal for SE. For wind power this means that SE implements the plan in the preparation before meetings and presents the data and budgets needed for investors to join. SE is also responsible for the plan scale. To be 100% self-supplied means that SE looks after this goal for meeting a 100% electricity in the system. SE works as a promotor and a supervisor. SE does not get paid from the stakeholders - funding is from state funds so SE can keep arm's length to ownership and own interest in the business case the wind turbines present. Stakeholders have been very interested in the business part and SE played the role of a democratic unit whose main goal is sharing the ownership in a fair way.

Factors influencing decisions and/or actions /sensing & prediction/:

- When working with a masterplan with a future goal it is important to accept future goals as a concept/argument for acting. A common direction/goal is leading multiple actions in the same direction.

Adaptation capabilities /adaptation/:

- If it is necessary to change decision makers in the process SE will navigate according to what works. A very pragmatic attitude one might think but the role as the moderator is so important that SE need to adjust itself to any situation when necessary for the positive result of 100% renewable energy transition. Maybe there is an ownership issue that creates a barrier for action - then SE will try to divert the power to whom will be a better decision maker.

Learning capabilities /learning/:

- Yes, there is a steep learning curve. Trying to implement things we have not tried before requires learning/capacity building. Working with the establishment of wind power requires a lot of learning. The staff of SE has to be ready to learn and to go to technical institutions to be informed about the latest info needed for the establishment of wind power in the system.

(c) Collectives & structure

Groups /collectives/:

- All groups involved in the process are part of the work. SE cannot exclude any parties with an interest. Working in a cooperate way takes an attitude for group cooperation. The success of the project implementing wind power is basically that SE is able to include all groups and separate a specific interest from dedicated stakeholders. Maybe there is opposition somewhere and if SE does not listen to these groups it can backfire badly and cause problems later in the process. Listen to all groups and work for an integrated local ownership structure that leaves no one behind.

Organizational structure:

- The actor is a private NGO and that is what we call "arm's length" to the municipality and other public authorities. This is a strong division of interest that ensures a trust-based representation in a community. SE has a steering committee that is representing all major institutions that work with areas of interest for SE. Aalborg University. NRGi, the local utility, Central Denmark Region, Samso Local government, Samso trade and business, TI Denmark's technical institute, CORA, Copenhagen based NGO. All of the above are represented in the steering committee.

(d) Interactions

Interactions /interactions/:

- as a coordinator SE operate as a middleman for cooperation between public sectors and private actors
- SE include academic entities to ensure research and knowledge as well as learning processes
- SE include global networks to ensure a widespread attention and therefor a stronger national role.

Samsø vindenergi

(a) Characteristics

Sector: NGO

Number of actors of this type in the case: 3

Important characteristics of the actor /state variables/:

The Samsø vindenergi is a wind cooperation with app 400 members and owners of shares in the co-operatively owned windturbines.. Samsø vindenergi serves as the organizational structure elected by the shareholders

- decision-maker and beneficiary -> early implementation
- serves as the organizational body of the ownership structure for the coop -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- The organization is part of the establishment of wind turbines and serves as the contact for private citizens who want to own shares and participate in the ownership. On behalf of people the organization operates and administrates the daily business, maintenance, economy and payments

Goals of the decisions and/or actions /objectives/:

- to make sure people make profit and that the wind turbine is working perfectly to serve the purpose of the 100% renewable energy island

Factors influencing decisions and/or actions /sensing & prediction/:

- Need for the organization is basically if there are share buyers, if so, the organization will be in business. The organization needs a full support from the shareholders to be able to make decisions. For the economy a feed in tariff and security for the project is important.

Adaptation capabilities /adaptation/:

- As soon as the wind turbine is established the business is quite easy. When the turbine reach end of lifetime expectancy the organization needs to reorganize and re-establish agreement for this new investment. If successful.

Learning capabilities /learning/:

- yes, there is a steep learning curve, as trying to implement things we did not try before requires learning/capacity building

(c) Collectives & structure

Groups /collectives/:

- all groups involved in the process are part of the work; we cannot exclude any parties with an interest
- working in a cooperate way takes an attitude for group cooperation

Organizational structure:

- the actor is a private NGO with a steering committee elected among the ownership group structured around a coop

(d) Interactions

Interactions /interactions/:

- The organization needs 100% financing and cannot make bank loans. There is a need for full financing from shareholders to establish the coop
- The organization needs to interact with landowners to make sure to lease land for the establishment and building of a wind turbine
- The organization is depending on a state supported program with a quarantined minimum price called the feed in price.

Private NGO

(a) Characteristics

Sector: NGO

Number of actors of this type in the case: 10 or more, but less than 20

Important characteristics of the actor /state variables/:

- participant and beneficiary -> all phases
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- the role is to act as a project secretary, developer and administrator - until any type of energy project is mature enough to stay alone administrated by its owners, shareholders

Goals of the decisions and/or actions /objectives/:

- a 100% sustainable society; any actions leading in this direction is a temporary goal

Factors influencing decisions and/or actions /sensing & prediction/:

- When working with a masterplan with a future goal it is important to accept future goals as a concept/argument for acting. A common direction/goal is leading a multiple action of many things in the same direction

Adaptation capabilities /adaptation/:

- If it is necessary to change decision makers in the process, we will do so. Maybe there is an ownership issue that creates a barrier for action - then we try to divert the power to whom will be a better decision maker

Learning capabilities /learning/:

- yes, there is a steep learning curve, as trying to implement things we have not tried before requires learning/capacity building

(c) Collectives & structure

Groups /collectives/:

- all groups involved in the process are part of the work; we cannot exclude any parties with an interest
- working in a cooperate way takes an attitude for group cooperation

Organizational structure:

- The actor is a private NGO and there is what we call "arm's length" to the municipality and other public authorities. This is a strong division of interest that ensures a trust-based representation in a community

(d) Interactions

Interactions /interactions/:

- as a coordinator we operate as a middleman for cooperation between public sectors and private actors
- we include academic entities to ensure research and knowledge as well as learning processes
- we include global networks to ensure a widespread attention and therefore a stronger national role.

El Hierro

In El Hierro SI case, a total of three key actors are involved, namely: (1) Island government 'Cabildo of El Hierro' represented by Tomás Padrón - (public and private actor) Pioneer of Wind-Pumped-Hydro Power Station of "El Hierro", (2) Gorona del Viento El Hierro S.A., (3) Island tourism Sector, and (4). For each key actor, a description is offered below, on multiple, different topics such as actor's characteristics, their decisions and actions, collectives & structures they are a part of and their most important or relevant interactions with other actor types.

Tomás Padrón - (public and private actor) Pioneer of Wind-Pumped-Hydro Power Station of "El Hierro"

(a) Characteristics

Sector: public and private

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- expertise in energy technologies and pioneer of the social innovation - > decision-maker -> early implementation
- perseverance and capacity of persuasion -> involved in the design of the social innovation: financing, authorisation, construction of the plant, implementation and monitoring -> early implementation
- leadership capacity and social recognition -> follow-up

(b) Decisions and actions

Decisions and/or actions:

- He is considered one of the leaders of the project. He insisted to carry on the project despite his energy company asked him "to no longer work in the project".
- He was one of the main responsible persons taking decisions on the technological innovation (starting the implementation of the R&I project).

- He also managed the collaboration between private company (Endesa), the Technologic Institute of Canarias and the Municipality of El Hierro for the creation of Gorona del Viento SA company.

Goals of the decisions and/or actions /objectives/:

- improving renewable energies in El Hierro and gaining technologic expertise (personal goal)
- energy self-sufficient island based on renewable energies, as approved in El Hierro Sustainable Development Plan (political goal)

Factors influencing decisions and/or actions /sensing & prediction/:

- Economic factors. High cost of electricity in an isolated territory. The electrification of the island in the 70s showed the high costs of the electricity (based on fuel) services in a small territory with little population (electricity costs was the higher in the Canary Islands). Such economic factors motivated the search of energy alternatives in order to reduce the energy cost.
- Technological capacity.
- Environmental impact and geographic conditions of the island have been also taken into account when the project was developed.

Adaptation capabilities /adaptation/:

- Yes, in the beginning he followed a personal and professional goal on developing a technological innovation. However, such ambitions changed over time so as environmental and social reasons became stronger. The project was envisioned as paying a relevant role in the future development of the island and environmental impact was considered in the designing.

Learning capabilities /learning/:

- According to the actor, learning was a continuous process not only gaining technological knowledge and expertise but also about "the perseverance, the tenacity and hope" about what started a personal (and solitary) project.

(c) Collectives & structure

Groups /collectives/:

- The actor was first an employee of the private energy company operating in the island, becoming the head of the Renewable Energy Department. Later he became the president of the government of the Island and a member of the regional Canary Island.

Organizational structure: NOT RELEVANT

(d) Interactions

Interactions /interactions/:

- National Government. Concretely, one of the milestones of the project relates to the personal connection to the Prime Minister of Spain. When the prime minister visited the island, Padron persuaded him to support the renewable energy project. Eventually, the proposal was submitted and approved in the Spanish Parliament and the National Government provided the economic funds to start the construction of the energy plant.

- European Union. The actor gained the support of the European Union for funding the research and innovation project consisting on the Hydroelectric Power Station "El Hierro".
- Technological institutions and universities. Interaction with Institute Technologic of Canarias, Ocean Platform of Canary Islands, University of Las Palmas, University for Diversification and Energy Saving. These actors provided knowledge and technical support to the project.
- Regional Government of Canarias. The regional government was involved in the management of the project and is currently one of the partners of the energy company Gorona del Hierro SA.

Gorona del Viento El Hierro S.A.

(a) Characteristics

Sector: public

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- Gorona del Viento El Hierro S.A. is a company created exclusively for the management of the energy plant (the Wind-Pumped-Hydro Power Station). The company produces renewable energy and, due to the technological innovation, is gaining capacity to supply most of the energy needed in the island. - > Decision-maker -> Follow-up
- Gorona del Viento S.A. is not an energy commercial operator, so as the company does not commercialise the energy (does not sell it directly to the population). This caused certain confusion among the islanders, that believed that having an electric installation in the isle would involve a cut on their energy bill (however, in Spain the price of energy is regulated by the state that applies the same taxes and costs for all the Spanish territory) - > Decision-maker -> Mature implementation
- Private-public partnership among the island and regional government, the Canarian technological institute and the private energy company Endesa SA. -> Follow-up

(b) Decisions and actions

Decisions and/or actions:

- Gorona del Viento has taken the decisions regarding the construction of the energy plant, its exploitation and maintenance. The company develops communication and dissemination activities as well as supports education programs in renewable energy technologies (internships). Gorona del Viento conducts energy saving programs aiming at energy use reduction in households and business. Gorona launched an energy supply program for charging (for free) all electric vehicles in the island, aiming at a reduction of CO2 emissions by transportation.

Goals of the decisions and/or actions /objectives/:

- As the company responsible for the running, operation and maintenance of Hierro's Wind - Pumped-Hydro Power Station, its goals related to the efficient management of the project becoming a profit company with capacity to invest in research and innovation, looking for

more efficient renewable energy sources (adapted to the geographical characteristics of the island)

Factors influencing decisions and/or actions /sensing & prediction/:

- technological capacity; Gorona del Viento takes into account the technical expertise provided by different actors, such as the ITC, IDAE, PLOCAN and regional universities (La Laguna and Las Palmas).
- national and regional regulations and norms that might support or limit the development of renewable energy sector in the island
- geographical and social characteristics of the island
- political context supporting the development of the project

Adaptation capabilities /adaptation/:

- Gorona del Viento, in addition to providing clean energy, had to develop complementary measures in order to reduce the use of fossil energy and CO₂ production when renewable energy sources are not sufficient. The company has implemented (in cooperation with the island government) energy strategies pursuing population energy saving behaviour in households, farms, hotels or business.

Learning capabilities /learning/:

- Gorona del Viento's leaders learned that working with the local populations is necessary for achieving the goal of becoming a 100% renewable energy island and gaining self-sufficient capacity. Gaining the support of the population to the project becomes a key goal so as energy self-consumption and energy saving behaviours in different domains (households, mobility) are perceived as necessary steps in the future development of the project.

(c) Collectives & structure

Groups /collectives/: NOT RELEVANT

Organisational structure:

- Gorona del Viento SA is a Private-public partnership. The Island Council owns the 65,8% of the company, while Endesa holds 23,21%, the Canary Island's Institute of Technology holds 7,74% and the Canary Island's Government the 3,23%. The president of the company is also the president of the island government as well as several members of the board of directors are members of the island and regional government.

(d) Interactions

Interactions /interactions/:

- National and International institutions - Interactions related to changes in energy regulations that might modify the status quo of the project. Also, common projects have been developed in collaboration with the regional government and regional technological institutions.
- Citizenship - Gorona del Viento promotes educational programmes and campaigns to raise awareness of the advantages of energy-saving. The plant also welcomes residents and tourists to visit the plant and know more about the goals and activity conducted in the facility.

- Education institutions - Permanent interaction with high schools, universities, national and international research centres providing support to academic programs, students' internships, gaining reputation as a centre for technological innovation and a laboratory for students to learn about renewable energies.

Island Tourism Sector

(a) Characteristics

Sector: private

Number of actors of this type in the case: 20 or more, but less than 100

Important characteristics of the actor /state variables/:

- Participant and beneficiary - > All phases
- Tourism is considered as a sustainable activity in the island, that focuses on active leisure and nature-based activities in the biosphere reserve of El Hierro or the maritime reserve of La Restinga, which makes the difference amongst other islands in the Canary archipelago. Tourism is an underexploited activity in the El Hierro
- Beneficiary actor that takes advantage of the increasing reputation of El Hierro as a "100% sustainable island". The energy project has become one of the principal tourist attractions of the island for a new sector of visitors, interested in renewable technologies and scientific development

(b) Decisions and actions

Decisions and/or actions:

- the tourism on the island promotes scientific tourism and reinforced the sustainable actions on the conventional-tourism

Goals of the decisions and/or actions /objectives/:

- increase tourism activity in the island and their economic gains

Factors influencing decisions and/or actions /sensing & prediction/:

- regulations of the island
- transport and connections with other islands

Adaptation capabilities /adaptation/:

- yes, since the start of the Wind-Pumper-Hydro Power Station of El Hierro a new type of tourism has been generated-so-called "scientific tourism" by the islanders

Learning capabilities /learning/: NOT AVAILABLE

(c) Collectives & structure

Groups /collectives/:

- YES. This sector is associated to the Centre of Touristic Initiatives "CIT El Hierro". "CIT El Hierro" is an association of local entities and private companies formed by the three municipalities of the island as well as many of the companies dedicated directly or indirectly linked to tourism activity. CIT goals are to "promote the excellence of the island of El Hierro, as well as to promote different projects and initiatives based on a relationship of collaboration and co-operation between its associates and public institutions, defending their interests, providing useful information and support to develop its activities as well as promoting the culture, historical heritage and traditions of the Island as well as maintain and care for our environment and environment".

Organizational structure: NOT RELEVANT

(d) Interactions

Interactions /interactions/:

- Gorona del Viento S.A. relationship based on the shared interest of promoting the energy plant as touristic attraction of the island
- Cabildo of El Hierro. Collaborative relationship pursuing more political support to the tourist sector in the island. The sector is consulted when new policies are being adopted that might affect the tourism activity in the island

Malmö

In Malmö SI case, there are five actors involved, namely "Residents Augustenborg" "Greenhouse Residents" "City of Malmö" "NGO" and "MKB Augustenborg" (Malmö Kommunala Bostads). For these key actors, a description is offered bellow, on different topics such as actor's characteristics, their decisions and actions, collectives and structures, and their most important or relevant interactions with other actor types.

Residents Augustenborg

(a) Characteristics

Sector: private citizens

Number of actors of this type in the case: 1000 or more, but less than 10 000

Important characteristics of the actor /state variables/:

- Participant and beneficiary -> all phases
- A necessarily important starting point for community consultation. High level of engagement pre-design and design phase, and in after use -> unknown

(b) Decisions and actions

Decisions and/or actions:

- contributes to the design process of different parts of the project. Contributes to new ideas and projects that they initiate. Also more passive role for many with lesser active interaction

Goals of the decisions and/or actions /objectives/:

- Maximizing benefit for the local community from an individual perspective, family, friends, improved living environment and quality of life

Factors influencing decisions and/or actions /sensing & prediction/:

- Cultural perspectives, relationships with neighbours, long-term commitment to the neighbourhood, participation in community organisations and services, trust relationship with city and MKB

Adaptation capabilities /adaptation/:

- varying level of commitment over time but certain dynamic flexibility

Learning capabilities /learning/:

- varying level of learning some positive experiences of participating in change processes, building trust and relationships, also some negative experiences, disappointment, conflict

(c) Collectives & structure

Groups /collectives/:

- None

Organizational structure:

- None

(d) Interactions

Interactions /interactions/:

- Community educational organisations, employment services, social services, libraries, culture dept, cultural organisations, other community associations, MKB, school, etc.

Greenhouse Residents

(a) Characteristics

Sector: private citizens

Number of actors of this type in the case: 20 or more, but less than 100

Important characteristics of the actor /state variables/:

- Participant and beneficiary -> mature implementation
- Important starting point for community consultation. High level of engagement post-occupancy -> mature implementation

(b) Decisions and actions

Decisions and/or actions:

- Contributes with new ideas and projects that they initiate. Community building within the resident group and also in relation to the rest of the community. Also more passive role for some with lesser active interaction

Goals of the decisions and/or actions /objectives/:

- Maximising benefit for the local community from an individual perspective, family, friends, improved living environment and quality of life

Factors influencing decisions and/or actions /sensing & prediction/:

- Cultural perspectives, relationships with neighbours, long-term commitment to the neighbourhood, participation in community organisations and services, trust relationship with city and MKB, environmental awareness and commitment

Adaptation capabilities /adaptation/:

- varying level of commitment over time but certain dynamic flexibility

Learning capabilities /learning/:

- varying level of learning some positive experiences of participating in change processes, building trust and relationships, also some negative experiences, disappointment, conflict

(c) Collectives & structure

Groups /collectives/:

- Tenants association

Organizational structure:

- None

(d) Interactions

Interactions /interactions/:

- community educational organisations, employment services, social services, libraries, culture dept, cultural organisations, other community associations, MKB, school, etc, local sustainable businesses etc.

City of Malmö

(a) Characteristics

Sector: public sector

Number of actors of this type in the case: less than 10

Important characteristics of the actor /state variables/:

- Decision-maker -> all phases
- responsible for early initiation, design, delivery, development, management -> follow-up

(b) Decisions and actions

Decisions and/or actions:

- Fundamental role in decision making, role in the project steering group, political decision-making, control of external finance

Goals of the decisions and/or actions /objectives/:

- Changing the image of the neighbourhood, developing and testing new solutions, working towards shared political targets, delivering commitments to external funders

Factors influencing decisions and/or actions /sensing & prediction/:

- Political goals, organisational goals, financial and other resource constraints, delivery time-scale, developmental potential for other business

Adaptation capabilities /adaptation/:

- Long(ish) term commitment to finding solutions to problems that arise and a high level of commitment to adapt to challenges in the course of delivery

Learning capabilities /learning/:

- Shared learning, individual learning, some organisational learning and transfer of knowledge and skills to other agents

(c) Collectives & structure

Groups /collectives/:

- None

Organizational structure:

- high level of commitment to work together as one and solve any silo challenges that may arise

(d) Interactions

Interactions /interactions/:

- local community organisations, businesses, regional and national government, other projects elsewhere.

NGO

(a) Characteristics

Sector: Private sector

Number of actors of this type in the case: less than 10

Important characteristics of the actor /state variables/:

- Participant -> all phases
- Important starting point for community consultation. High level of engagement pre-design and design phase, and in after use -> all phases

(b) Decisions and actions

Decisions and/or actions:

- Contributes to bringing the community together for finding common goals and ambitions in the pre-design and design phases. Some organisations fill the result with content through active, organised use, i.e. Gnistan

Goals of the decisions and/or actions /objectives/:

- Maximising benefit for the local community from the specific objectives of individual organisations, i.e. focus, tenant engagement, youth and children, Muslim population etc

Factors influencing decisions and/or actions /sensing & prediction/:

- Own organisational mission and objectives, understanding of wider interests of the community

Adaptation capabilities /adaptation/:

- Varying level of commitment over time but certain dynamic flexibility

Learning capabilities /learning/:

- Varying level of learning. Some such as Gnistan have a high level of learning, engagement and interaction

(c) Collectives & structure

Groups /collectives/:

- n/a

Organizational structure:

- most of NGOs are purely local, but some such as Tenants association have city, regional and national levels which are not necessarily fully aligned

(d) Interactions

Deliverable 6.1

Drivers, Barriers, Actors, and Network structures

Interactions /interactions/:

- community educational organisations, employment services, social services, libraries, culture dept, cultural organisations, other community associations.

MKB Augustenborg

(a) Characteristics

Sector: private

Number of actors of this type in the case: less than 10

Important characteristics of the actor /state variables/:

- decision-maker and beneficiary -> all phases
- lead partner -> all phases

(b) Decisions and actions

Decisions and/or actions:

- design and implementation process, implementation of outputs from stakeholder engagement, investment, procurement, delivery

Goals of the decisions and/or actions /objectives/:

- maximizing attractiveness of the neighborhood
- saving money through decreased tenant turnover due to increased satisfaction
- brand development

Factors influencing decisions and/or actions /sensing & prediction/:

- long term impacts, medium term costs and benefits

Adaptation capabilities /adaptation/:

- some adaption to results of stakeholder dialogue processes, changes according to project costs, changing design concepts, future management costs
- phased development, so there was an opportunity to change approach between phases

Learning capabilities /learning/:

- learning from the process of trialling new methods, new processes and new technologies
- some ability to scale up successful solutions across stock

(c) Collectives & structure

Groups /collectives/:

- individuals in the organization have a critical role in giving the mandate to innovate, or support and driving innovation at different levels; 3-4 critical individuals central to project development and project delivery

Organizational structure:

- positive aspects have been around the mandate of middle managers to drive development in their geographical areas. The downside of this has been, however, an issue of over-dependence on individual middle managers (a change of manager can have very negative consequences).
- Another challenge has been around mainstreaming across the organization if there are only champions at middle management level who lack the mandate to scale up. Different objectives for area management and for new development.

(d) Interactions

Interactions /interactions/:

- The city of Malmö - co-creator in project management and development
- local community - stakeholder dialogue, input in the design process
- local community organizations - stakeholder dialogue, input in the design process, sometimes finance of initiatives, in-kind support (premises) etc.
- contractors - through demands in the procurement process.

Stockholm

In Stockholm SI case, for six of the key actors involved, namely (1) Urban Planning Administration (UPA), (2) Swedish Union of Tenants (SUT), (3) Svenska Bostäder, (4) The Environment and Health Administration, (5) Local and national media, and (6) Politicians, a description is offered below, on different topics such as actor's characteristics, their decisions and actions, collectives & structures they are a part of and their most important or relevant interactions with other actor types.

Urban Planning Administration (UPA)

(a) Characteristics

Sector: public

Number of actors of this type in the case: 10 or more, but less than 20

Important characteristics of the actor /state variables/:

- decision-maker -> early implementation
- secondary characteristics -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- giving permission for location and size of photovoltaics on each building; Svenska bostäder applies for permission

Goals of the decisions and/or actions /objectives/:

- producing the sustainable identity of Järva and producing renewable energy

Factors influencing decisions and/or actions /sensing & prediction/:

- It was not possible to build wind turbines due to location and political aspects. So, photovoltaics became the new symbol for Sustainable Järva. Influenced by the political management

Adaptation capabilities /adaptation/:

- Svenska Bostäder and Environment and health administration (Lisa) wanted to communicate this new profile and therefore held numerous events for residents. Showing off the photovoltaics, guided tours on swimming hall and building lifts to see roof tops.

Learning capabilities /learning/:

- the residents responded very positively, and this was a boost for the project (Sustainable Järva)

(c) Collectives & structure

Groups /collectives/:

- 2013-14 ca the PVs were implemented, and the acceptance and pride of the project already existed. Svenska Bostäder, Environment and Health Administration (Lisa), Hyresgästföreningen. Politicians used it for visibility

Organisational structure:

- UPA (Urban Planning Administration) is part of the City of Stockholm (administratively), and they have their own political board that decides the overarching missions (commissioner, *beställare* in Swedish) and the UPA has a director who is responsible to supply the political board with decision making materials

(d) Interactions

Interactions /interactions/:

- As a City of Stockholm Unit it is not regulated that it is necessary to consult the public (residents) for implementing photovoltaics, but the Sustainable Järva Project arranged a lot of events for residents to promote the sustainable identity of Järva. Thus was very successful and generated pride amongst residents.

Swedish Union of Tenants (SUT)

(a) Characteristics

Sector: public

Number of actors of this type in the case: less than 10

Important characteristics of the actor /state variables/:

- participant -> all phases
- secondary characteristics -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- Swedish Union of Tenants (HGF) represents the residents of rental housing and negotiates rents and conditions for renting apartments (including participation in the Sustainable Järva project). Membership in Union of Tenants is not obligatory for residents, but in Järva they represent all, not only members. It is not a state unit but it is a function that is regulated by law (comparable to workers' unions). Mobilizing residents, and fight for dialogue, and negotiate a deal for the renovation process based on different levels. The three different upgrading packages was introduced by (Nurcan, early phase). Nurcan becomes a central person in the early phases, and was present and discussed with residents who threw tomatoes. Jan Hanspers was a central person, before Nurcan he was the representative, and fought for residents' rights, and he was alone, and the issues became too big, and Svenska Bostäder then supplied funding for increased involvement, and Nurcan was hired (2009) to represent residents. They cooperated and then he retired. Nurcan became a representative. Nurcan had insights in immigrant groups, and has a different background. Language barrier insights, and was accepted as a local representative at least partly because of immigration background.

Goals of the decisions and/or actions /objectives/:

- to find the best model for making the Sustainable Järva a positive change process for residents

Factors influencing decisions and/or actions /sensing & prediction/:

- Residents reactions, the egg and tomato throwing was a wake-up call, and Svenska bostäder understood that the letter was the wrong approach and that the plans to replace a building that had burned down with exclusive semi attached buildings (model from Gothenbourg, Göran Wendell, VD i Göteborg Svenska Bostäder, men kom till Svenska Bostäder Stockholm, och ville få till samme successprosjekt som i Gbg). Nothing concrete, and protests was the response for a letter sent out saying that residents in the nearby buildings were to move out and the buildings would be destroyed. No concrete info about where residents would move, or plans were shared in this letter. The thought was to build exclusive housing units that would attract high-resource residents to mix the area residential composition, but people wanted to stay and wanted information. People had identity place attachment. Gentrification PLANS!

Adaptation capabilities /adaptation/:

- the dialogues started as a response to the negative reactions to the early plans and communications

Learning capabilities /learning/: -

(c) Collectives & structure

Groups /collectives/:

- Housing companies (especially Svenska Bostäder), Hyresgästföreningen, youth organising themselves (Megafonen) and making demands, they collected the views of the youth (svenska Bostäder och Hyresgästföreningen gav lön till initiativtagarna för att de skulle samla åsikter). They got an office in Järva, and worked with youth, they also offered homework assistance (läxhjälp), so not only for participation in Sustainable Järva, but also empowerment of youth in Järva.

Organizational structure:

- Swedish Union of Tenants (SUT) is a membership organisation that is managed by local elected representatives (????) and central ones (Nurcan) are to represent all tenants of rental apartments. Different units for different areas. Järva is a separate local unit of this organisation and the local representatives cooperated with the central organisation representative (Nurcan)

(d) Interactions

Interactions /interactions/:

- As the Stockholm region office central unit (in Globen), for Hyresgästföreningen, the organisation employees are located in Globen, and Nurcan represented Järva (very demanding and rewarding process). Lots of discussions and disagreements with Svenska Bostäder: about how to communicate with residents (making things more explicit, expressing in terms that will be widely understood, but Svenska Bostäder ville ha det på sitt sätt. Attitudes within SB was an issue.

Svenska Bostäder (SB)

(a) Characteristics

Sector: public

Number of actors of this type in the case: 20 or more, but less than 100

Important characteristics of the actor /state variables/:

- decision-maker -> all phases
- secondary characteristic -> project design

(b) Decisions and actions

Decisions and/or actions:

- Svenska Bostäder (SB) understood - in communication with tenants - that without involving the residents and also Hyresgästföreningen they would not succeed with rejuvenating the area identity. The cooperation begins with demands from Hyresgästföreningen, and agreements are made with regards to meetings, dialogues, and a check-list is developed internally (2010), influenced by a demands list from Hyresgästföreningen (2009 from Nurcan). Upgrading brochures were developed and sent to residents. A cooperation process map is developed, after initiative from HGF (Nurcan) in 2010-2011. From 2011-2015, the brochures are developed in cooperation with Hyresgästföreningen, and also invitations are developed in cooperation with Hyresgästföreningen, and also meeting agendas. Introduction meetings

were created before all upgrading processes (for each housing unit) where info is given (brochures) and also project leader - and all involved competences present themselves to the residents. Still this model is used, and smaller meetings are arranged continually where small group works are developed including a detailed mapping of views. Also, a co-decision representative is assigned for each building (in cooperation with Hyresgästföreningen (HGF) and Svenska Bostäder (SB))

Goals of the decisions and/or actions /objectives/:

- to find the best model for making the Sustainable Järva a positive change process for residents

Factors influencing decisions and/or actions /sensing & prediction/:

- Residents reactions, the egg and tomato throwing was a wake-up call, and Svenska bostäder understood that the letter was the wrong approach and that the plans to replace a building that had burned down with exclusive semi attached buildings (model from Gothenbourg, Göran Wendell, VD i Göteborg Svenska Bostäder, men kom till Svenska Bostäder Stockholm, och ville få till samme successprosjekt som i Gbg). Nothing concrete, and protests was the response for a letter sent out saying that residents in the nearby buildings were to move out and the buildings would be destroyed. No concrete info about where residents would move, or plans were shared in this letter. The thought was to build exclusive housing units that would attract high-resource residents to mix the area residential composition, but people wanted to stay and wanted information. People had identity place attachment. Gentrification PLANS!

Adaptation capabilities /adaptation/:

- the dialogues were started as a response to the negative reactions to the early plans and communications

Learning capabilities /learning/:

- Svenska Bostäder understood - in communication with tenants - that without involving the residents and also Hyresgästföreningen they would not succeed with rejuvenating the area identity. HGF was not very involved to begin with, and the credibility amongst residents for HGF was not good. HGF (Jan and Nurcan) began a process of establishing dialogues, and HGF allowed for one building to be built to replace the burned down one (and this is exclusive with higher rents) but that the other buildings would be negotiated with residents and upgraded. HGF invited residents to a dialogue with Svenska Bostäder and people came to discuss. Conspiracy theories on exclusive unaffordable housing squeezing them out (founded in actual plans) and after seeing that Svenska Bostäder fought for their rights and became their representatives. Residents began to see that Svenska Bostäder and Hyregästföreningen are two different things, and HGF represent their interests in the process. First discussion meeting (dialogue) with tenants was held in relation to the Trondheimsgatan 4, Svenska Bostäder, HGF, and they did not agree (2008-09). After these first dialogues, a cooperation agreement was established (samrådsavtal) and action agreement (handlingsavtal!) with three different levels of upgrading package solutions was established. An activity program was developed by HGF (Nurcan name? Johan Flyckt involved) for involving residents and mobilise them and to collect opinions and suggestions. The open meetings and dialogues (involving youth), were started in 2009; HGF SvB, Familjebostäder, Stockholmshem, Stadsdelsförvaltningen participated in meetings in Akalla, later Husby, Rinkeby and then,

Tensta (but the process still did not involve all resident groups, so it was decided to reach out specifically to the silent groups (women). Nurcan asks women why (calls et cetera) they did not come to meetings. A check-list (demands to involve women) was formulated by Nurcan and sent to Svenska Bostäder (2010-2011 finns!, agreement reached in Sept 2010). As a result, the meetings were relocated closer to residents (in closest building possible) and with more time to plan for participation by inviting two weeks ahead, and that children could join et cetera. This was first discarded by Svenska Bostäder, but later agreed. [(Svenska Bostäder made an internal checklist for roles in their own organisation (who does what? 2011, Also accessible)]

(c) Collectives & structure

Groups /collectives/:

- Housing companies (especially Svenska Bostäder), Hyresgästföreningen, youth organising themselves (Megafonen) and making demands, they collected the views of the youth (Svenska Bostäder och Hyresgästföreningen gav lön till initiativtagarna för att de skulle samla åsikter). They got an office in Järva, and worked with youth, they also offered homework assistance (läxhjälp), so not only for participation in Sustainable Järva, but also empowerment of youth in Järva.

Organizational structure:

- Svenska Bostäder is a municipal housing company that owns rental apartment blocks. Part of the City of Stockholm administratively, and has local districts and offices. Nurcan was recruited by her opponent, as she was good at managing groups and group processes, and driven. She was encouraged to apply as property manager, but she denied because her competence profile did not include property management, and then instead she was offered a position as rebuilding coordinator, that she accepted. Shifting roles in 2015 from HGF to SB.

(d) Interactions

Interactions /interactions/:

- As part of Svenska Bostäder, she interacted with residents in connection to moving out and in again after upgrading. The same work but from a different perspective organisation wise. After one year in this position, Nurcan wanted more challenging tasks. This was less demanding than the previous position in HGF. She was then offered a new position as coordinator for social sustainability in 2017 and she accepted: She got more mandate, power, her own budget - enabling more freedom in approaching residents. She had already become involved with the communication with residents and the change process of Husby Center even though it was not part of her formal responsibility. Her long-term experience from Järva was useful in this new role as coordinator for social sustainability. Working with CSR (Corporate Social Responsibility) issues. The company (SB) was to take more social responsibility (political decision, and also from EU to City of Stockholm, that all companies shall take more CSR). This is part of Svenska Bostäders assignment. The women need a place to meet and gather, and Husby Center was not accessible for women. Feministic Urban Planning grew from dialogues with residents. Nurcan put these aspects on the agenda from 2015- and onwards. Husby Center redefined - challenging the local patriarchy! - also expressed in media. Media reported on this need and women expressed their needs and wants in public. A Cafe in Husby center was male dominated and women had to pass when shopping for groceries or home or to the subway. Feeling of being controlled. 5 workshops (2015-) (were carried out to follow up

the unsafely issues of women (map with dots, 2009), and these helped to identity and specify the problem of feeling unsafe, and during these workshops accumulated in Feministic Urban Planning. But should SB work with this, and the Feministic Urban Planning can also repel...but not until 2017, the feministic Urban planning was defined. It got media attention before it was defined. Nurcan begins to co-define FUP. Brochure from a women perspective/point of view.

Environment and Health Administration

(a) Characteristics

Sector: public

Number of actors of this type in the case: less than 10

The Environment and Health Administration is part of the city of Stockholm (administratively) and their main responsibility in the Sustainable Järva project was the role of project manager for the whole project. The application to Delagation for sustainable cities was done by this actor, the steering group was led by Gustaf Landahl, the project management was done by Lisa Enarsson. This actor also led the communication work package: information and participation led by Cecilia Malmgren. Anette Riedel also participated in this work. Other experts from the Environment and health Adm. participated at events informing about energy and climate issues.

Important characteristics of the actor /state variables/:

- decision-maker -> all phases
- secondary characteristic -> project design

(b) Decisions and actions

Decisions and/or actions:

- Lisa Enarsson from the Environment and Health Administration participated in a working group for developing Järva called "Järvalyftet", in the group participants from different administrations collaborated led by the City Council. (Stadbyggnadskontoret, Exploateringskontoret, Trafikkontoret, stadsdelsförvaltningarna, utbildningsförvaltningarna, kulturförvaltningen). A document Vision Järva 2030 was developed and decided upon by the politicians. There were mostly social sustainability issues in this vision as this is an area with challenging social issues. There was only a note that the new buildings in the area should be energy efficient. Lisa Enarsson initiated an application to the delegation for sustainable cities, where energy efficient renovation, renewable renovation, improvement of biking lanes, car-sharing, and information and participation - education was included. This became a puzzle part that was missing. Lisa Enarsson then became the project leader throughout the whole project, with part project leaders from Trafik administration, Svenska bostäder and Environment and health adm. (Cecilia Malmgren)

Goals of the decisions and/or actions /objectives/:

- to add the ecologic dimension of sustainability to the Järva area
- to change the identity to awards a sustainable area

- to reduce energy-use by 50 % in renovated buildings with 350 apartments in Akalla, Husby, Rinkeby and Tensta
- to add renewable energy by implementing a wind turbine (which was later turned into 10 000 m2 of PVs)
- to improve the biking lanes and to change behaviour through information and participation processes (Climate event week every year, study circle leader education to do study circles in the associations in the area with 10 occasions and at least 10 persons in each study circle, biking courses for grownups, events for showcasing new renovated apartments, events for PV etc.)

Factors influencing decisions and/or actions /sensing & prediction/:

- politicians wanting to change the attitude in the area and promoting Sustainable Järva; it was important to replace the wind turbine with something else that could work as a symbol for the Sustainable Järva therefore the 10 000 m2 PV was perfect also that it was set up in an area built in the 60-70ies which was unique
- another factor was the earlier mistake from Svenska Bostäder asking tenants to move to demolish their houses and build row houses instead; the will of Svenska Bostäder to make it right again and to get the trust back from the tenants was important for the way all communication was done, in a positive way gathering as many as possible to show the positive change. The fact that we had funding and needed to report that all parts had been done, made the plan stable, not making it possible to take decision to remove actions that were described in the project application. Otherwise the building project leaders often get new decisions to remove parts that cost too much in renovation plans.
- the factor that we were working together, many departments in the city made the project successful also the holistic approach giving synergies strengthening the identity of the area

Adaptation capabilities /adaptation/:

- the wind turbine was adapted into PVs

Learning capabilities /learning/:

- The project learnings were many: (a) renovation is best done in cooperation with tenants, it is possible to reduce energy for heat with 50 % but harder for electricity and hot water, (b) biking skills are not only good for a climate friendly transport but a great opportunity for integration and making people proud and feeling well to be able to bike as colleagues do, (c) tenants in Järva are eager to adapt to sustainable actions as a way of contributing to the Swedish society

(c) Collectives & structure

Groups /collectives/:

- Järvalyftet (mentioned above)
- the sports club managing Akalla by involved in biking courses and climate week and NTF and cykelfrämjandet as well

- the work packed groups: Energy, sustainable transportation and information and participation
- schools and nurseries where actions were done to engage children
- Järva rent och snyggt - who hosted the study circles,
- the research team.

Organizational structure:

- The Environment and Health Administration is part of the city of Stockholm (administratively) and their main responsibility in the Sustainable Järva project is to manage the whole project. There was a steering group with high level representatives from The environment and health administration, Svenska Bostäder, the traffic administration and the city council. There were Work packages for: Energy - renovation and renewable city, Sustainable Transportation, Information and participating and Evaluation. The project also reported to and cooperated with the Järvalyftet.

(d) Interactions

Interactions /interactions/:

- Interactions were made with the all actors mentioned above: the administrations, the tenants and other inhabitants in the area, the schools and nurseries, Cykelfrämjandet and NTI, all study visitors...

Local and national media

(a) Characteristics

Sector: private

Number of actors of this type in the case: 20 or more, but less than 100

Important characteristics of the actor /state variables/:

- decision-maker -> all phases
- writing and reporting about the area (this was done in all phases) -> follow-up

The media normally write news about this area when there are burning cars or inhabitants throwing stones or shoutouts. With the Sustainable Järva project there were many articles with a positive character, important for the inhabitants of the area to also get good news. Anyhow when one event in Husby about PVs was ongoing with hundreds of people participating, there were riots in the neighbourhood and the journalist who was only interested in the riots, not the positive actions...

(b) Decisions and actions

Decisions and/or actions:

- The media reports on the status and living conditions of Järva. They are central in creating the narrative. There is a difference between how the local media (Järva) reports on the area, and how the central (national and Stockholm region) media channels report. Central media

tend to focus on problems and crime levels, serious events and general low status aspects while the local media reports on local successes and also is part of the participation process. The local media channels present a very different narrative with focus on meetings, dialogues and also meet the locals and report from their perspective. Personal meetings with individuals and businesses. Ex Järva direct. In addition, Sustainable Järva (I think this should rather be the Järva dialogue?) has their own Facebook group that informs about the project as part of reporting on local news. Also, there are citizen driven Facebook groups that focus on the neighbourhood, for example. It is not connected to any political party, and is not professionally driven. Can be sharing photos. UPA follows the discussions on these groups for inspiration, but not actively participating. UPO personnel has been invited in to the locked Facebook groups. Sharing local narratives of Järva.

Goals of the decisions and/or actions /objectives/:

- One important part of the project was to change the attitude to the area, and the media is an important part to make this happen. Therefore, the positive articles and reporting during the project was very welcome.

Factors influencing decisions and/or actions /sensing & prediction/:

- The local media is following all the political decisions made that are relevant for Järva. From a democratic point of view this is important for inclusion and empowerment. They check political agendas actively in every different political board (especially Järva direkt). This is driven by "Direktpress" who produce local news all over Stockholm, but they are extra important in a low-resource neighbourhood where people have less influence and less access to media. The local newspapers are free and financed by advertising! The magazine is delivered to all households in the neighbourhood. This free magazine is one of the most important sources for information about Sustainable Järva. Their role of reporting positive news from the area was very important. Many long articles like two pages about the renovation where published in local newspapers, but also articles in branch newspapers for professionals with energy theme where published.

Adaptation capabilities /adaptation/:

- This is difficult to pinpoint from an outside perspective. The general agenda is not to help the project but to sell newspapers and ads. The larger media channels are also part of a general divide between low-resource areas and wealthy ones. Polarisation of groups, both ethnical and economic groups.

Learning capabilities /learning/:

- Difficult to pinpoint from an outside perspective, but Media does report on current hot topics such as integration problems, and crimes (car fires, shootings). Difficult to change the focus into reporting about positive news in an area where they normally only give the negative picture.

(c) Collectives & structure

Groups /collectives/:

- People are being interviewed, but also UPA, and the politicians are interviewed and reported from statements given. Local Media collects opinions and creates a dialogue - or at least present a two perspective view, usually opposite views. For instance, the new political majority

has suggested to sell apartments to residents for ownership, but locals have protested. Some have also been positive. Local Media reports on facts and what this would mean for local residents. There were also many articles where the project manager Lisa Enarsson or part project managers were interviewed which helped to spread the word about the project activities both in the area but nationally as well.

Organisational structure:

- Commercial actors within the media sphere, and also non-commercial citizen initiatives

(d) Interactions

Interactions /interactions/:

- Mostly interviews and reports on political decisions and suggestions, and with the persons working in the project and tenants, and inhabitants. Both with residents and professionals ... Also reporting on results (mostly short-term) and on local opposition, opinions, complains about maintenance issues et cetera.

Politicians

(a) Characteristics

Sector: public

Number of actors of this type in the case: less than 10

The mayor and vice mayors from both political blocks were all very engaged in the actions done by the project with the goal of trying to make change in the area. Karin Wanngård, Ulla hamilton, Per Ankersjö, Larsson and also the local politicians were engaged participating in inaugurations and events.

Important characteristics of the actor /state variables/:

- decision-maker -> all phases
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- The environment and health administration initiated the Sustainable Järva project and the politicians approved the project, and they gave it priority. The overall goals of the city of Stockholm are set by the politicians depending who is in majority in the City of Stockholm, and all projects in the city need to be consistent and contributing to fulfilling these goals. The majority can change, and then the project can be changed or get other priorities, but project with external financial subsidies are mostly stable. All units in the City of Stockholm have their own political board who decide upon the projects initiated by the specific administration. Many political boards are involved here decisions were taken in the Environment board, Traffic board and Svenska Bostäder board, and for the PVs, the real estate board and Familjestäders board were added.

Goals of the decisions and/or actions /objectives/:

- to turn the area into an area with sustainability identity

Factors influencing decisions and/or actions /sensing & prediction/:

- clustering of low socio-economic groups (unemployment, low education level, low health, low democratic participation). The conservative Majority wanted to use urban development as a tool to improve the social conditions in Järva, to demonstrate a successful method for urban development through the Järva 2030 Vision in the Järva lyftet. The Sustainable Järva project was initiated by the environment and health administration to add the environment puzzle part which was missing

Adaptation capabilities /adaptation/:

- the political majority changes with municipal elections (every 4th year, 2022 next election), it changed in 2018 to a right wing, who have downgraded the renovation activities as a whole in favour of building new buildings. It consequently gets less attention than previously. (actually I think this was the left wing, the social democrats who started and now the conservative parties continue) The Vision 2030 is not mentioned anymore...

Learning capabilities /learning/:

- media, social problems in the area, low education results, are influencing politicians

(c) Collectives & structure

Groups /collectives/:

- political parties and their representatives represent different opinions

Organizational structure:

- City of Stockholm is governed by politicians in different boards. Many boards are involved in Sustainability Järva.

(d) Interactions

Interactions /interactions/:

- the politicians express their opinions openly via media and debates. There is a channel where all agendas and political decisions can be reached by anyone.

Vitoria-Gasteiz

In Vitoria-Gasteiz SI case, a total of three key actors are involved, namely (1) Local public autonomous entity - Environmental Studies Centre (CEA), (2) Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz, and (3) Local cyclist association- Biziklteroak. For each of the aforementioned key actor, a description is offered below, on different topics such as actor's characteristics, their decisions and actions, collectives & structures they are a part of and their most important or relevant interactions with other actor types.

Environmental Studies Centre (CEA)

(a) Characteristics

Sector: public

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- public actor - The Environmental Studies Centre (CEA) is an autonomous body “whose mission is to look out for the sustainability in Vitoria-Gasteiz”. The CEA is the main promoter of the social innovation so as it is in charge of the elaboration of the Sustainability Mobility and Urban Space Plan that contains the superblock model
 - > decision-maker -> all phases
- environmental aimed - CEA has been a scenario of debate that has favoured the approach of positions among the representatives of different political parties, as well as different departments goals in the city council
 - > all phases
- the CEA has extended a culture of sustainable mobility that has been endorsed by the entire public institution and seems to influence future policy developments

(b) Decisions and actions

Decisions and/or actions:

- The CEA articulated a participatory process to deliberate and reach a city-wide agreement concerning the ambition and objectives of the Plan.
- CEA organised a series of workshops on mobility, environmental protection, etc. The outcomes of these participatory processes paved the way for the drafting of the Sustainable Mobility and Public Spaces Plan, and the signing of the Citizens' Pact for Sustainable Mobility by more than one hundred entities in the city.
- Concerning the social innovation, CEA is in charge of the monitoring and impact assessment of the Plan, as well as makes proposals for the improvement of the Plan, in coordination with the political bodies and environmental and mobility department of the city council.

Goals of the decisions and/or actions /objectives/:

- The CEA pursues environmental goals related to the reduction of CO2 emissions based on reduction of traffic and increase of public spaces and green areas for social uses. The social innovation aims to achieve a change in citizens' mobility behaviour. A second goal relates to the increase of citizens' participation in decision making, becoming a "space for debate and political pedagogy".

Factors influencing decisions and/or actions /sensing & prediction/:

- political consensus
- geographical conditions that favour active mobility patterns
- environmental awareness and environmental policies that are basis for the mobility plan. The existence of the Agenda 21 and the Environmental Forum paved the way for the creation of the sustainable mobility forum

- new transport policies coming from the regional government; the construction of the tramway line in the city was the revulsive for changing the local public transport system
- new residential developments in suburbs that required transport and mobility services
- support from cyclist and environmental associations that provided with knowledge and proposals for the improvement of the cyclist infrastructure

Adaptation capabilities /adaptation/:

- CEA has demonstrated its adaptation capacity when political changes and budget restrictions jeopardised or involved necessary changes in the development of the Plan. Besides, the CEA was able to develop a deliberative and participatory process targeting different actors and beneficiaries, reaching a city-wide agreement concerning the ambition and objectives of the Sustainability Mobility and Public Space Plan.

Learning capabilities /learning/:

- Learning capacity involves technical and policy learning regarding sustainable mobility strategies. Learning also relates to social abilities, such as capacity of negotiating with policy-makers, stakeholders and citizens. the experience of the participatory process that informed the Plan, as well as the communication campaign launched before the implementation of the Plan was a learning experience in terms of gaining social acceptability and citizen engagement. Learning capacity served also to be involved in new sustainable mobility projects at the European level and develop new active mobility programs and interventions in Vitoria-Gasteiz.

(c) Collectives & structure

Groups /collectives/:

- Vitoria-Gasteiz is a member of the ICLEI international local network. It is also member of the European Sustainable Cities Platform. Its international projection facilitated that Vitoria-Gasteiz has been "Green Capital" 2012, in acknowledgement for its exemplar environmental policies and sustainable mobility policies. Recently the city received the 'Global Green City Award 2019' that endorses the environmental policies launched by the city council and supported by the CEA.

Organizational structure:

- The CEA is an autonomous center of the city council whose presidency is held by the Councilor for the Environment. It is regulated by a Governing Council that operates in a municipal government commission mode, in which all local political groups are members. CEA has hired a large number of employees dedicated to implementation and design of environmental policies, including environmental education and the elaboration and monitoring of the sustainability mobility and public space plan.

(d) Interactions

Interactions /interactions/:

- **residents' associations and citizens** that engage in the participatory processes aiming at the implementation of superblocks and sustainable mobility measures at the neighborhood level

- **neighborhood business and shopkeepers' associations** (cooperative relationship); both entities represent the main usual economic activity inside the area and superblock measure might affect their activity; CEA usually invite them to make proposals of changes regarding the interventions planned in the area; the merchants' association have been also members of the Sustainability Mobility Forum and collaborates in common projects related to active mobility, promotion of cycles etc.
- **education centres** located in the superblock/neighborhood (cooperative relationship); public and private educative institutions located in the area as well as parent's associations among others; education entities are interested in launching educational and training programs for children; main conflicts with education community arise when the city council attempts to limit car traffic nearby the school in order to increase safety for children. However, restrictions do not satisfy parents that bring their children by car and need to approach the center
- **local political parties**; they support the Plan and have contributed to the co-design, the development and approval of different actions. When contestation and protest from shopkeepers arise against the Plan, all local parties endorse the project and support the party running the city
- **cyclist associations**; CEA maintains a constant communication with the cyclist associations. The city council signed several agreements in order to promote the use of bikes in the city. Ciclist associations provide information and support to the policy actions. However, this good relationship has changed in the last year and one of the main associations, Biciletoak, has positioned against the new Mobility Plan due to differences with the city council
- **local media**; it helps to disseminate the city plans usually providing a positive vision of the sustainability mobility measures. In terms of the superblocks, mass media facilitated the social acceptance of the Plan as well as provided information to citizens about the changes in transport policies, and interventions and measures to be implemented in the different neighborhoods. Currently, the role of media is relevant for the expansion of the superblock model along the city, with a positive approach
- **public transport services**; CEA maintained intense communication and collaboration with the local public transport company when the public transport system was radically changed in 2008. Bus drivers were involved in planning design and the bus company introduced technological innovations supporting the sustainability mobility plan. Such interaction involves negotiation and modification of bus routes, creation of new routes, etc.

Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz

(a) Characteristics

Sector: public

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- Permanent participatory body impulsed by the city council initially coordinated by the CEA and formed by representatives of political parties, public and private entities, stakeholders

and NGOs. Its mission is to establish a platform to discuss sustainability mobility strategies and make proposals of new policies to be implemented by the city council

- Multistakeholder participatory approach. Entities forming part of the Forum are: cyclist associations (e.g. Gasteizko Bizikleteroak), environmental associations (e.g. Ecologistas en Acción), retail associations (e.g. GasteizOn) and bus drivers have actively engaged in the discussions

-> participant and beneficiary -> all phases

- Changes in internal organisation in the last 4 years involved that CEA left the coordination role of the Forum and nowadays representatives of different social organisations and citizens are the coordinators of the Forum
- The Forum plays a deliberative role, providing input about the design, implementation and monitoring of the mobility policies and planning of the superblocks. During the current work of revision of the Sustainable Mobility and Public Space Plan, the new Plan has been presented to the members of the Forum who provided with both positive and negative feedback regarding the new measures contained in the revised Plan

-> all phases

- The Forum provides support and recognition to the public policies related to sustainable mobility. There exist a consensus regarding the common frame that should inform future public plans and strategies

-> follow-up

(b) Decisions and actions

Decisions and/or actions:

- The Forum has not decision capacity but plays a deliberative role providing input regarding low carbon policies and measures. When a consensus exists, the Forum provides social support and recognition towards sustainability urban plans.

Goals of the decisions and/or actions /objectives/:

- promoting social and political consensus regarding low-carbon mobility plans and superblocks interventions

Factors influencing decisions and/or actions /sensing & prediction/: NOT AVAILABLE

Adaptation capabilities /adaptation/: NOT AVAILABLE

Learning capabilities /learning/: NOT AVAILABLE

(c) Collectives & structure

Groups /collectives/: NOT RELEVANT

Organisational structure:

- A range of stakeholders have participated overtime in the 'Citizens Forum for Sustainable Mobility' involving institutional and social actors such as representatives of all the political

parties of Vitoria-Gasteiz, representatives of the Sectoral Environment Council, economic agents, federations of taxi drivers, merchants, public transport sector participated.

(d) Interactions

Interactions /interactions/:

- City Council - a number of municipal departments participate in the deliberative sessions when their intervention is requested by the Forum: TUVISA, managing the public transport buses system; Traffic and mobility service; Local police; Department of economic development; Department of environment and public space.

Local cyclist association Bizikleteroak

(a) Characteristics

Sector: NGO

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

This actor is a public technical university, member of the energy cluster with advanced Bachelor, Master and Doctoral studies in architecture, Communication and IT/Robotics.

participant and beneficiary -> all phases

- Cyclists association bizikleteroak.org (Bicycle Users) has been at the forefront of the fight to make cycling a respected means of transportation, promoted by all sectors of society in Vitoria-Gasteiz. This association signed the ‘Citizens Pact of Sustainable Mobility in 2007 which defined a common framework for a model city
- This actor played a relevant role in the implementation of the Sustainable Mobility and Public Space Plan endorsing low carbon policies and supporting the decisions taken by the local government when contestation arisen from several sector of the city. They receive much media coverage and they manifested openly their support to the plan, it was very useful
- In 2019 this actor resigned as member of the ‘Citizens Forum for Sustainable Mobility’ due to their disagreements with the city council about the revision of the Mobility Plan and a series of measures contained in the new plan
- This organisation develops several learning programmes training children and adult people how to drive the bicycle in the road. This actor also conducts studies about cyclist mobility in the city and provides recommendations to policy makers about how to improve low carbon mobility system

(b) Decisions and actions

Decisions and/or actions:

- Lobby role. They do so by designing projects, lobbying local government, working with other groups, organising informational and recreative activities, demonstrations and other forms of

social mobilisation. This actor has strongly endorsed sustainable mobility policies implemented by the city council, being also active members.

Goals of the decisions and/or actions /objectives/:

- The main goals of this association is to "defend the rights of people using bicycles as a means of transport". They claim traffic calming measures as well as the improvement of road safety conditions for pedestrian and cyclists. They aim to increase citizens' competences for cycling on streets and interurban roads.

Factors influencing decisions and/or actions /sensing & prediction/:

- Factors related with the role taken in the decision-making and related with the impact of this new mobility using bicycles as a means of transport.

Adaptation capabilities /adaptation/: NOT AVAILABLE

Learning capabilities /learning/:

- They learn to establish collaborative relationships with other associations and taking an active role in the decision making. They get involved in designing projects, organising campaigns and lobbying local government.

(c) Collectives & structure

Groups /collectives/:

- They work at the regional, national and European level as members of the ConBici (Spanish-Portuguese Bike Defense Organization) and ECF (European Cyclists' Federation).

Organisational structure:

- This actor works at the regional, national and European level as members of the ConBici (Spanish-Portuguese Bike Defense Organization) and ECF (European Cyclists' Federation)

(d) Interactions

Interactions /interactions/:

- as members of the Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz, they interact with a number of **city stakeholders and associations** related to sustainable mobility and environmental protection
- **local media** - the activity developed by this actor received much media coverage from local journals, radio and TV to whom they maintain a permanent contact. Bizikleteroak is considered a well-informed voice who can provide a relevant opinion regarding the policy measures to be implemented in the city
- **"Camina Gasteiz association"** - this new association has joined the Sustainability mobility forum and they get agreements with cyclist's associations and they launched public actions asking improvements in pedestrian and cycling facilities while more control and prosecution of traffic infractions (Pedestrian-cyclist coexistence is a sensitive issue, especially in the pedestrian area of the city centre).

Barcelona

In Barcelona SI case, a total of four key actors are involved, namely (1) Barcelona City Council, (2) Neighbourhood Business and Shopkeepers Associations, (3) Neighbours / Residents Associations, and (4) Individual Citizens (and frequent visitors). For each key actor above-mentioned, a description is offered below, on multiple, different topics such as actor's characteristics, their decisions and actions, collectives & structures they are a part of and their most important or relevant interactions with other actor types.

Barcelona City Council

(a) Characteristics

Sector: public

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

decision-maker -> all phases

- decision-maker: multidisciplinary working team forming the technical secretariat in charge of the Superblock programme
- internal division: Barcelona is administratively divided in second-level bodies called “district councils” that are also involved in the implementation of the superblock programme in their districts
- lack of political consensus: regarding superblocks model; although most of the local parties support the policy, some did not support superblock implementation in specific districts while others involve in the “superblock promoting groups”
- weak position: The Council of Barcelona was led (in the previous period) by a new party (Barcelona in Común) in a minority position which is more susceptible to critics and protests from citizens and media (currently they achieved an agreement with socialist party). Former Council of Barcelona approved the superblock programme (2015) and launched several superblocks initiatives in 5 neighbourhoods with different levels of implementation. After local elections in May2019, the continuity of the same party in the government will permit the implementation of the Superblock Programme in new city districts

(b) Decisions and actions

Decisions and/or actions:

- The City Council is involved in the conception of the innovations as well as in the implementation and follow-up of the project. Council actions have high influence in the development social innovation. They decide in which districts they will act, they lead the project and participatory process for the co-designing of the Superblock Action Plan. The City Council has the last decision about if the superblock is implemented or not when social contestation and political differences arise at the district level.

Goals of the decisions and/or actions /objectives/:

- The City Council pursues certain environmental goals related to reduction of carbon emissions based on reduction of traffic and increase of green areas. Second, the policy aims to

achieve a change towards sustainable mobility behaviour and changes in use of public space. Superblocks involve restrictions in car circulation inside the superblock and the rehabilitation of public space for sports, social interaction, playgrounds, green areas (e.g. parks, urban gardens) etc

Factors influencing decisions and/or actions /sensing & prediction/:

- existence of social demand/social consensus for a superblock in the specific area
- involvement of representative groups of the district/affected area in the promoting group that will co-design the action plan
- agreement in the promoting group about the convenience of the superblock and measures included in the Action Plan
- capacity to introduce the changes included in the Action Plan (funds, collaboration of other public departments)

Adaptation capabilities /adaptation/:

- Yes, the technical secretariat in charge of the Superblock programme is open to changes suggested by the participants in each superblock promoting group as well as those proposed by citizens and stakeholders in open reunions organized by them. The aim is to adapt the plan to the reality of each area and the existing social demands as well as gain certain consensus about the measures included in the Action Plan, the priorities and the phases of implementation of the superblock.

Learning capabilities /learning/:

- Learning-by-doing process about how to facilitate efficient deliberative and participatory processes with citizens and stakeholders in each superblock (social skills and best practices). learning relates to capacities of building trust, gaining people's confidence and engaging citizens in deliberative processes, which involves time, resources and the combination of open forums and small-group work with stakeholders

(c) Collectives & structure

Groups /collectives/:

- Barcelona City Council is member of the Metropolitan Area of Barcelona, a supra-municipal body which is not directly involved in the superblock programme but has competences in mobility and transport of citizens among Barcelona and the surrounding cities and towns and big infrastructures (e.g. airport).

Organizational structure:

The superblock project is being implemented by the Municipality of Barcelona. The Superblocks Technical Secretariat counts on the assistance of different consultancies that provide support. A key support on the superblock programme is from the Urban Ecology Agency.

A second-level local administration involved in the programme is the level of different district administrations in which Barcelona territory is organized. Every district counts on an administrative office, specific budget approved at the district level as well as a district council in which political parties and neighbourhood social actors and groups of interest. The districts usually play a counselling role and some of their members can form part of the superblock working group that defines the action plan,

providing expertise and knowledge on the needs of each borough. However, in few occasions (e.g. Superblock of Poblenou), the district council has acted in opposition to the implementation of the superblocks, supporting those critical voices that were reluctant to the urban innovation and voted to eliminate the urban interventions and permit road traffic to enter again in the area.

The structure and the different bodies involved in the programme are:

- City council: urban model department- technical secretariat in charge of the Superblock programme
- Urban Ecology Agency: public institution with expertise in superblocks design led by Salvador Rueda (prestigious urban designer that convinced last mayor to develop superblock pilot programme)
- Other municipal departments with responsibilities in public transport/mobility, urban design, gardening,
- Mayor of Barcelona and political areas of the local government that might support or be reluctant to the programme
- District councils in which superblocks are being implemented (second-level local administration)
- Barcelona Public Health Agency (ASPB) which monitors the environmental and health impact of the superblocks programme

(d) Interactions

Interactions /interactions/:

Barcelona City Council interacts with a number of entities at both the city and the neighbourhood level.

Communication and collaborative interactions: At the city level, the “Barcelona Mobility Pact” is the permanent body launched by the City Council for deliberation and formulation of solutions to enhance sustainable mobility in the city (e.g. the elaboration of the Urban Mobility Plan). The Pact gathers together different public institutions such as the Agència Salut Pública de Barcelona and the Barcelona Metropolitan Area, transport entities (e.g. Transports Metropolitans de Barcelona) and a number of associations related to mobility (e.g. Associació per a la Promoció del Transport Públic, STOP Accidents, Sindicat del Taxi de Catalunya, Federació Catalana de Transports de Barcelona, VanAPEDAL).

Cooperative interactions: Several working groups, such as the Bicycle Working Group, engage public, private and social economy entities like the Barcelona Bike Hub, the NGO “Amics de la Bici”, the Association for the Promotion of Public Transport, the RACC Foundation, trade-unions, private transport associations and other for-profit and non-profit actors.

Communication and cooperative interactions for the co-designing of the superblock: At the neighbourhood level, principal actors involved in the superblock promoting team or invited to the open participatory sessions are:

-District organisations: neighbourhood stakeholders, residents’ associations, specific groups of interests (e.g., supermarkets, shopkeepers, retail sector, etc.). These entities might facilitate networking relationships among different neighbourhood actors

- Public services located in the superblock (transfer of knowledge)
- Cultural, social and sports facilities located in the superblock (transfer of knowledge)
- Members of the local political parties (both support or control)
- Specific associations and platforms grouping beneficiaries or people affected by the measure that might support or be opponents to the superblock (their existence does not occur in all the superblocks) (both support, cooperative relationships and control)

Entities:

- Existing residents' associations that engage in the superblock promoting group (cooperative relationship). They provide input about the needs of the neighbourhood, best solutions to implement the superblock measure in the area, neighbourhood characteristics and dynamics that might interfere with the measures adopted. resident's associations usually have a long-term cooperation participating in the promoting group and supporting the city council in the presentation of the superblock action plan in open sessions at the neighbourhood level and sometimes at the district level, in the district council.
- (New) pro-superblocks platforms and anti-superblocks platforms. They arise as a response for the implementation of a superblock in a specific area. They group inhabitants living inside the superblock and other residents and people affected by the measure. Such entities engage in the superblock participatory process providing input about the needs of the area, transmitting social demands to the city council (collaborative interactions, information provision) and monitoring the fulfilment of their requirements (control interactions). Anti-superblocks platforms might lead contestation and protests during and after the participatory process (in Poblenou they prepared a law suit against the city council).
- Neighbourhood business and shopkeepers' associations (cooperative relationship). Both entities represent the main usual economic activity inside the area and superblock measure might affect their activity. City council invite these associations to join the superblock promoting group. Besides, they organizer specific participatory sessions with these collectives in order to find solutions to potential issues due to traffic limitations in the area. Retailers and hostel associations often have a positive collaborative interaction with the city council, providing input, solutions, and sometimes supporting the city council in the presentation of the superblock action plan in open sessions at the neighbourhood level.
- Education centres located in the superblock/neighbourhood (cooperative relationship). Public and private educative institutions located in the area as well as parent's associations among others. They usually enrol in the participatory processes launched by the Technical Secretariat in each district or neighbourhood affected by the Superblock neighbourhood.
- Public services, health services and cultural, social and sports facilities located in the superblock (knowledge sharing interaction). They provide information about mobility needs and patterns of transport related to their specific areas.
- Mobility citizens' initiatives and third-sector entities in the area which might provide support to the implementation of the superblock (type of interaction: knowledge-sharing, support, collaborative interactions, control).
- Local political parties. Type of interaction: they can support the superblock or manifest against the project. They can join the superblock promoting group and contribute to the co-

design of the Action Plan (collaborative interactions) or just monitor from outside and support or not the project (control)

- Local media. Type of interaction: sharing information. Local media helps to disseminate the project and the benefits of the superblock in the area. However, media can also contribute to create social alarm and amplification of protests or confrontation when there is not a consensus about the project.
- Public transport services. Council of Barcelona interacts with the bus transport service in order to introduce the necessary changes in the bus services inside the superblock. Such interaction involves negotiation and modification of bus routes, creation of new routes, etc. Together with bus, other sustainable mobility facilities might be affected by the superblock, e.g. bike sharing, and coordination is needed.
- Transport private companies (e.g. Taxi, other private transport services) affected by traffic restrictions inside the superblock. Type of interaction: sharing information, negotiation.

Neighborhood Business and Shopkeepers Associations

(a) Characteristics

Sector: NGO

Number of actors of this type in the case: NOT AVAILABLE (depends on the neighborhood)

Important characteristics of the actor /state variables/:

This actor makes decisions and elaborate the normative acts that keep the good functioning of the local public administration, elaborates reports and strategy projects, drafts local budget, coordinates public services for citizens, decides about different authorisations.

- Stakeholders: Specific associations representing neighborhood or district commercial activity. They might gather both small and large business located at the neighborhood or just the traditional retail and hotel/bar business (several entities included in this actor category)

-> participant and beneficiary -> early implementation

- Neighborhood activism. They establish networking relationships with other groups in the neighborhood and have large capacity of mobilization
- They are usually afraid of changes. They are reluctant regarding restrictions in car mobility arguing they will lose customers. Besides, traditional retail shops are afraid of changes in the type of commerce due to the re-urbanization of streets and squares (e.g. substitution of small shops by bars and terraces)
- Collaborative relationship with the city council. The type of collaboration with the promoters differs depending the superblock. They are very active and usually engage in the superblock participatory process starting as opponents but changing as supporters if they demand are taken into account

-> mature implementation

(b) Decisions and actions

Decisions and/or actions:

- These associations decide if they join or not the promoting group launched by the city council for the co-design of the superblock.
- They decide if they support or not the superblock Action Plan.
- They can support or oppose to the superblock initiative or demanding changes in the Action Plan. If they don't achieve their goals they have the capacity to mobilise citizenship to protest, collect signatures against the project or even organising non-official referendums regarding the superblock.

Goals of the decisions and/or actions /objectives/:

- Their goals are related to the maintenance (and improvement) of the existing commercial/business activity in the area, taking into consideration their clients' needs (e.g. car parking in supermarkets). They pursue that the superblock does not damage their income and, if possible, they achieve increase their benefits. Second, as residents of the district, they aim to improve neighbourhood's quality of life by enhancing public spaces and demand the city council actions oriented to the rehabilitation of the area while preserving traditional activities.

Factors influencing decisions and/or actions /sensing & prediction/:

- feeling that their interests and opinions are taken into account by the promoters
- changes that permit the maintenance of the commercial activity (and the related needs of transport of goods)
- physical improvement of affected area, which makes public space attractive for people visiting and shopping
- agreement in the promoting group about the convenience of the superblock and measures included in the Action Plan

Adaptation capabilities /adaptation/:

- Yes, the technical secretariat in charge of the Superblock programme is open to changes suggested by the participants in each Superblock promoting group as well as those proposed by citizens and stakeholders in open reunions organized by them. The aim is to adapt the plan to the reality of each area and the existing social demands as well as gain certain consensus about the measures included in the Action Plan, the priorities and the phases of implementation of the superblock.

Learning capabilities /learning/: NOT AVAILABLE

(c) Collectives & structure

Groups /collectives/:

- Neighbourhood shopkeepers, retail and business associations can be part of the Consell de Barri, a district council, open to the citizens and stakeholders, which discuss the topics of rel-

evance for the neighbourhood. These associations are usually part of city-level federations and the commerce chamber that represents them in city-level forums.

- In several cases (e.g. Poblenou), some members of these associations are part of new platforms created against the superblock project pursuing the restoration of the former situation so as they feel that the social innovation might cause a decrease in their economic activity.

Organizational structure: NOT RELEVANT

(d) Interactions

Interactions /interactions/:

Business and shopkeepers' associations usually interact with other neighborhood organizations, such as the residents' associations, as well as with the cultural and educative sector of the district (communication, knowledge sharing). They do so by participating in different forums and political bodies (e.g. district council) in which they establish relationships and create networks with other stakeholders for defending their common interests (lobby, influence).

Within the superblock participatory process (especially if they join the superblock promoting group) they establish collaborative relations with other neighborhood stakeholders as well as with the city council in the co-designing of the superblock Action Plan (types of interactions: collaborative relations, transfer of knowledge, support, control).

Entities:

- Barcelona City Council: these associations usually interact with the city council as well as district administrative bodies for receiving information about projects to be developed in the neighborhood and provide feedback. (see actor 1. for more information).
- Residents associations. Type of interaction: transfer of knowledge, support, and collaboration in common activities (e.g. parties). In several districts, both entities have long-term experience in working together demanding changes and improvements for the neighborhood, creating platforms or campaigns.
- Representatives of Local political parties. Type of interaction: knowledge sharing, cooperation, control. These organizations maintain communication with district political bodies and representatives of the different political parties in the neighborhood. Political parties are organizations to transmit their demands and needs and they do so in both formal bodies as the district council and informal contexts. In the superblocks participatory working groups political parties are sometimes represented, being a new way of maintaining such interaction.
- Local media. Type of interaction: sharing information. Local media helps to inform population about their specific demands and needs when a conflict arises in the neighborhood or a relevant project is being launched in the area (such as the superblock).

Neighbors' / Residents' Associations

(a) Characteristics

Sector: -

Number of actors of this type in the case: NOT AVAILABLE (depends on the neighborhood)

Important characteristics of the actor /state variables/:

- Stakeholders: Associations representing neighborhood residents 'interests. They are formed by women and men living in the neighborhood or district affected by the superblock project. They develop different types of activities, demanding to authorities' changes in the neighborhood conditions as well as organizing cultural and educative activities on their own. They use social media and other communication tools to keep residents informed
-> participant and beneficiary -> early implementation
- Neighborhood activism. They establish networking relationships with other groups in the neighborhood and have large capacity of mobilization
- Collaborative relationship with the city council. The type of collaboration with the promoters differs depending the superblock. They are usually active in demanding investments for the neighborhood participating in district council meetings and maintaining regular communication with the city council and the political parties' representatives in the district

(b) Decisions and actions

Decisions and/or actions:

- They can support or oppose to the superblock initiative or demanding changes in the Action Plan. However, residents' associations are usually the actor that proposes the city council to implement a superblock in the neighborhood or the main actor supporting the project.
- These associations decide to join the promoting group launched by the city council for the co-design of the superblock. They decide if they support or not the superblock Action Plan.
- They represent all residents so they have to balance the interest of their associates and pros & cons of the project. In the case of Poblenou, the neighborhood association received the critics of part of the population because its position was in favor of the project while residents were divided in two pro and anti-superblock platforms.
- They explain to the citizens the benefits of the Superblock and the main changes involved in the action plan.
- They monitor the implementation and outcomes of the superblock.

Goals of the decisions and/or actions /objectives/:

- improvement of the neighborhood conditions and residents' quality of life. Superblocks are perceived as a good strategy for the re-urbanization of the area (e.g., investment in public furniture), gaining public space for spare and social interaction (new square, children playground), gaining green areas, and increasing safety conditions due to traffic restrictions
- social cohesion is also one main goal of these associations. Superblocks are perceived as urban measures that might enhance interaction among residents, being spaces open for people to rest, walk, and play and organize social and cultural activities that permit citizens know each other

Factors influencing decisions and/or actions /sensing & prediction/:

- feeling that their interests and opinions are taking into account by the promoters

- changes that permit the maintenance of the commercial activity (and the related needs of transport of goods)
- physical improvement of affected area, which makes public space attractive for people visiting and shopping
- agreement in the promoting group about the convenience of the superblock and measures included in the Action Plan

Adaptation capabilities /adaptation/:

- Yes, this actor is open to changes when they are provided by an alternative solution that fulfills their needs. They are flexible in their demands and comprehensive with other's stakeholders needs.

Learning capabilities /learning/: NOT AVAILABLE

(c) Collectives & structure

Groups /collectives/:

- Neighbors'/residents' associations can be part of the Consell de Barri, a district council, open to the citizens and stakeholders, which discuss the topics of relevance for the neighborhood.

Organizational structure: NOT RELEVANT

(d) Interactions

Interactions /interactions/:

Residents associations usually interact with other neighborhood organizations, such as the business and retail associations, parents' associations and school entities, as well as with the cultural and social sector of the district (communication, knowledge sharing). They do so by participating in different forums and political bodies (e.g. district council) in which they establish relationships and create networks with other stakeholders for defending their common interests (lobby, influence).

Entities:

- Barcelona City Council and district public bodies: neighbors' associations usually interact with the city council administrative bodies in the district for receiving information about projects to be developed in the neighborhood and provide feedback as well as for formulating demands and needs of the neighborhood. They also apply for public subsidies to organize activities and parties.
- Shopkeepers. Type of interaction: transfer of knowledge, support, and collaboration in common activities (e.g. parties). In historical districts, both entities have long-term experience in working together demanding changes and improvements for the neighborhood.
- Parents associations and schools. Type of interaction: knowledge sharing, cooperation.
- Representatives of local political parties. Type of interaction: knowledge sharing, cooperation, lobby, control. These organizations maintain communication with district political bodies and representatives of the different political parties in the district. Political parties are organizations to transmit their demands and needs.

- Local media. Type of interaction: sharing information. Local media helps to inform population about these associations' demands and needs when a conflict arises in the neighborhood or a relevant project is being launched in the area.

Individual Citizens (and frequent visitors)

(a) Characteristics

Sector: private citizens

Number of actors of this type in the case: NOT AVAILABLE (depends on the neighborhood)

Important characteristics of the actor /state variables/:

- Individual active and non-active citizens that can be residents in the superblock area or frequent visitors (e.g. workers). They are considered as “beneficiaries” of the programme although in some cases this actor becomes an opponent and engages in protest and social contestation against the superblock

-> beneficiary -> mature implementation

- They are not necessarily members of city/neighborhood associations by they can be motivated to join social movements or platforms that defend their interests and needs. Maintenance of individual actors in active mobilization of resources is not easy and sometimes their commitment decreases overtime. In Poblenou the level of contestation has descend after 2 years. However, the pro-superblock platform is still very active although their members have diversified their activities, promoting cultural and social activities in the superblock area
- First reaction is usually interest on changes in their neighborhood. They are reluctant regarding restrictions in car mobility arguing they will lose their right to reach their houses or parking

(b) Decisions and actions

Decisions and/or actions:

- Individual residents/visitors do not usually join the promoting group launched by the city council for the co-design of the superblock (except if they have special interest or expertise).
- They can attend and participate in the open sessions organized by the city council presenting superblock Action Plan, supporting or opposing to the superblock initiative or demanding changes in the Action Plan.
- If they don't agree with the superblock, they can organize themselves in specific anti-superblock platforms or just participate in protests, signing against the project or even organizing or voting in non-official referendums regarding the superblock
- If they support superblock they can create or join to new pro-superblock entities that organize (or join to) activities vindicating superblock benefits.

Goals of the decisions and/or actions /objectives/:

Their goals depend on their position taken regarding the superblocks:

- If they perceive the project as positive, their goals are related to the improvement of the neighbourhood conditions and residents' quality of life. Superblocks are perceived as a good strategy for the re-urbanization of the area (.e.g investment in public furniture), gaining public space for spare and social interaction (new square, children playground), gaining green areas, and increasing safety conditions due to traffic restrictions. They demand several services and facilities (e.g. sports areas, public furniture), including sustainable mobility alternatives (e-biking services) to be provided by the city council.
- If they perceive the project as negative, their goals are related to the restoration of the previous situation, arguing that the superblock produces more inconveniences and negative impact that benefits (e.g. problems of connectivity between the affected area and the principal traffic networks, increase of pollution in the surrounding streets, car restrictions and changes in bus stops, etc.).

Factors influencing decisions and/or actions /sensing & prediction/:

- changes that permit the maintenance of their mobility patterns and car/public transport connectivity with the main streets and the rest of the city
- perception that the superblock will enhance the neighborhood conditions and residents' quality of life without limiting car access between their households and main streets as well as to the parking areas
- physical improvement of the affected area, making (new) public space attractive and safe for people to stay in
- feeling that their interests and opinions are taking into account by the superblock promoters (city council)

Adaptation capabilities /adaptation/: NOT AVAILABLE

Learning capabilities /learning/: NOT AVAILABLE

(c) Collectives & structure

Groups /collectives/: NOT AVAILABLE (depends on the specific neighbourhood where the superblock is launched)

Organizational structure: NOT AVAILABLE

(d) Interactions

Interactions /interactions/:

Individual citizen interactions usually occur in informal contexts such as conversations with other residents, conversations with representatives or members of the different neighborhood associations, parents' associations, etc.

In the context of the superblock project, they interact with the city council and other stakeholders in the context of the participatory activities launched by the promoting group. These can be open sessions and informative meetings to inform citizens living and working in the area about the measures and changes in mobility, urban space, public transport etc. that involve the approval of the superblock Action Plan.

Entities:

- Barcelona City Council and District council. Type of interaction: knowledge transfer. Feedback provision.
- Residents associations. Type of interaction: knowledge transfer. Feedback provision. Collaboration in activities.
- Pro and anti-superblock platforms. Type of interaction: knowledge transfer. Feedback provision. Participation in activities, demonstrations.

Aberdeen

In Aberdeen SI case, for nine key actors involved, namely (1) Aberdeen City Council, (2) Aberdeen Heat and Power, (3) District Energy Aberdeen Limited (DEAL), (4) Scottish Government, (5) Social Tenant, (6) Owner or Landlord, (7) Local business, (8) Energy Company, and (9) OFGEM, a description is offered below, on multiple, different topics such as actor's characteristics, their decisions and actions, collectives and structures they are a part of, and their most important or relevant interactions with other actor types.

Aberdeen City Council

(a) Characteristics

Sector: public

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

Aberdeen City Council is the central actor in this case study. Its main important characteristics are related to its budget and its relationships with other actors that enable it to achieve its goals, both financially and politically.

- goals, budget, and leveraging of other funding -> decision-maker -> all phases
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- how to heat social housing
- where to route district heating network
- how to institutionalize running the network

Goals of the decisions and/or actions /objectives/:

- to provide affordable heat to its social tenants
- to disperse heat from the energy from waste plant
- to reduce carbon emissions

Factors influencing decisions and/or actions /sensing & prediction/:

- right-to-buy occupants of former social housing
- energy usage profile
- 'difficult to heat and difficult to treat' building stock

- high rates of fuel poverty
- regulation
- availability of supporting funding

Adaptation capabilities /adaptation/:

- scale and routing of projects adjusted according to budget available and sign-off by committee
- elected representatives determine policy

Learning capabilities /learning/:

- the organization can learn through adjusting its policies and procedures for designing, choosing and implementing projects

(c) Collectives & structure

Groups /collectives/:

- Aberdeen City Council is a member of various projects and consortia, including Heatnet and SMARTEES

Organizational structure: departmental

(d) Interactions

Interactions /interactions/:

- due to its many roles, interacts with almost all other actors in the case study
- the most important interactions are with its tenants, with Aberdeen Heat and Power, with funding bodies and higher-level policy (Scotland, UK, Europe).

Aberdeen Heat and Power

(a) Characteristics

Sector: private

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

They own and run the heat network in Aberdeen. They make decisions about pricing and, in consultation with the Council, consider opportunities for expansion. They are a not-for-profit private sector institution, which is important in establishing trust and addressing fuel poverty.

- heat network -> decision-maker -> all phases
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- heating price
- heat networks' expansion
- heat network's maintenance

Goals of the decisions and/or actions /objectives/:

- to provide affordable low-carbon heat for Aberdeen's citizens (primarily, but not exclusively, in social housing)

Factors influencing decisions and/or actions /sensing & prediction/:

- price competition for conventional heating systems
- willingness of residents to tolerate disruption
- ability of private residents to pay for installation
- planning
- availability of grants
- heating profile of domestic dwellings
- physical/engineering ideal operating conditions of the infrastructure

Adaptation capabilities /adaptation/:

- created a spin-off 'for-profit' company (DEAL) to serve businesses
- engagement with residents

Learning capabilities /learning/:

- learns from own and others' experiences

(c) Collectives & structure

Groups /collectives/: -

Organizational structure:

- conventional hierarchical structure with a board that has positions for representatives from residents

(d) Interactions

Interactions /interactions/:

- with residents in: agreeing new installs, collecting payments for heat (via Council probably for social tenants), and dealing with any faults
- with the Council in agreeing pricing, discussing/planning new heat network projects, and collaborating on funding applications
- with funding agencies in applying for funds
- with DEAL in receiving profits.

District Energy Aberdeen Limited

(a) Characteristics

Sector: private

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- turnover
- profit
- number of customers
- contribution to heat network ideal operating conditions
- profit -> participant -> mature implementation
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- which businesses to approach
- pricing

Goals of the decisions and/or actions /objectives/:

- to make a profit
- to contribute to ideal heat network operating conditions

Factors influencing decisions and/or actions /sensing & prediction/:

- businesses' tenancy of buildings they occupy
- proximity of the heat network

Adaptation capabilities /adaptation/:

- they can adjust pricing

Learning capabilities /learning/:

- they can learn which businesses are most likely to want to participate

(c) Collectives & structure

Groups /collectives/: -

Organizational structure: -

(d) Interactions

Interactions /interactions/:

- sends profit to Aberdeen Heat and Power
- has local businesses as customers.

Scottish Government

(a) Characteristics

Sector: public

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- budget (received)
- budget made available for businesses/home owners/councils to apply for to support low-carbon energy and address fuel poverty
- budget made available -> decision-maker -> all phases
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- makes funding available to support low-carbon heating and address fuel poverty

Goals of the decisions and/or actions /objectives/:

- to achieve policy objectives
- to get re-elected!

Factors influencing decisions and/or actions /sensing & prediction/:

- funding from UK Government via Barnett formula
- any additional funds raised through national (Scottish) taxation
- public perception

Adaptation capabilities /adaptation/:

- essentially determined by regular elections

Learning capabilities /learning/: -

(c) Collectives & structure

Groups /collectives/: -

Organizational structure: -

(d) Interactions

Interactions /interactions/:

- elected by citizens
- commented on by media
- gives money to councils
- creates grants/funding mechanisms to support policy
- receives budget from UK government.

Social Tenant

(a) Characteristics

Sector: private citizens

Number of actors of this type in the case: 10 000 or more

Important characteristics of the actor /state variables/:

- income, savings, demographics, health
- budget available for rent/food/energy -> decision-maker -> all phases
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- how to spend money
- agree to installation of heat network

Goals of the decisions and/or actions /objectives/:

- to meet human needs

Factors influencing decisions and/or actions /sensing & prediction/:

- budget
- employment status

Adaptation capabilities /adaptation/: -

Learning capabilities /learning/: -

(c) Collectives & structure

Groups /collectives/:

- residents' associations

Organizational structure: -

(d) Interactions

Interactions /interactions/:

- pays rent to the Council.

Owner or Landlord (owner of domestic property)

(a) Characteristics

Sector: private citizens

Number of actors of this type in the case: 10 000 or more

Important characteristics of the actor /state variables/:

- budget/income, demographics (if occupier), health, budget for home improvements
- budget for home improvements -> decision-maker -> mature implementation
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- decides whether to join heat network
- decides whether to use heating
- switch the energy supplier
- maintains current heating system in working order

Goals of the decisions and/or actions /objectives/:

- to meet human needs (if occupier)
- to maximise profit (if landlord)

Factors influencing decisions and/or actions /sensing & prediction/:

- regulation, funds, availability of grants and other incentives

Adaptation capabilities /adaptation/: -

Learning capabilities /learning/: -

(c) Collectives & structure

Groups /collectives/:

- residents' associations
- landlords' associations

Organizational structure: -

(d) Interactions

Interactions /interactions/:

- with funding bodies to apply for grants for home improvements
- with the council (if landlord) to register as a landlord (and maintain this status)
- with AHP to join the heat network and pay for it
- with Energy Companies to pay energy bills, and maintain heating system.

Local Business

(a) Characteristics

Sector: private

Number of actors of this type in the case: 100 or more, but less than 1000

Important characteristics of the actor /state variables/:

- tenancy of business premises, profit, heating costs
- decision-maker -> early implementation
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- decides to join heat network

Goals of the decisions and/or actions /objectives/:

- to reduce costs

Factors influencing decisions and/or actions /sensing & prediction/:

- grants available
- cost of joining

Adaptation capabilities /adaptation/: -

Learning capabilities /learning/: -

(c) Collectives & structure

Groups /collectives/: -

Organizational structure: -

(d) Interactions

Interactions /interactions/:

- with DEAL, as potential customer.

Energy Company

(a) Characteristics

Sector: private

Number of actors of this type in the case: 10 or more, but less than 20

Important characteristics of the actor /state variables/:

- customers (citizens and businesses), turnover, infrastructure owned, pricing options
- pricing for energy -> decision-maker -> early implementation
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- decides whether to accept new customers
- decides whether to cut off existing customers
- decides pricing tariffs
- decides whether to move customers to different tariffs

Goals of the decisions and/or actions /objectives/:

- to maximize profit for shareholders
- to comply with regulations

Factors influencing decisions and/or actions /sensing & prediction/:

- regulations
- energy market

Adaptation capabilities /adaptation/:

- build new infrastructure
- close existing infrastructure

Learning capabilities /learning/: -

(c) Collectives & structure

Groups /collectives/:

- "The Big 6", comprised of small scale energy companies (100,000 or fewer customers nationally)

Organizational structure:

(d) Interactions

Interactions /interactions/:

- with customers, as described above
- with OFGEM for regulation
- with communities and other applicants for funding mechanisms determined by OFGEM

OFGEM

(a) Characteristics

Sector: public

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- power to regulate and hold energy companies to account
- design of schemes funded by energy companies to enable people to save energy and cut carbon emissions -> decision-maker -> early implementation
- secondary characteristic -> early implementation

(b) Decisions and actions

Decisions and/or actions:

- designing schemes
- issues fines to Energy Companies

Goals of the decisions and/or actions /objectives/:

- to regulate the market
- to ensure it works

Factors influencing decisions and/or actions /sensing & prediction/:

- energy prices
- government policy

Adaptation capabilities /adaptation/:

- encouraging consumers to switch their energy supplier

Learning capabilities /learning/: -

(c) Collectives & structure

Groups /collectives/: -

Organizational structure: -

(d) Interactions

Interactions /interactions/:

- with energy companies in designing schemes and enforcing regulation
- with energy company customers in handling unresolved complaints(?)
- with citizens, businesses and communities for paying incentives.

Timisoara

In Timisoara SI case, a total of three key actors are involved, namely Romanian Energy Cluster ROSENC, Timisoara Municipality and Universitatea Politehnica Timisoara (UPT). For each key actor, a description is offered below, on multiple, different topics such as actor's characteristics, their decisions and actions, collectives & structures they are a part of and their most important or relevant interactions with other actor types.

Romanian Energy Cluster ROSENC

(a) Characteristics

Sector: NGO

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

- energy cluster involved in national and international projects in which it had the role of leader or participant -> involved in the decision-making process
- a decision maker involved in all phases of the project, from the design phase to the follow up phase
- involved in provisioning financial resources
- in charge with communication between members of the project
- is involved in organizing awareness campaigns related to energy
- participated at meetings with beneficiaries

(b) Decisions and actions

Decisions and/or actions:

- it implements projects to construct eco houses, participates in the elaboration of schemes related to energy efficiency, promotes activities ranging from construction of large-scale renewable energy systems to photovoltaic farms development and operation

Goals of the decisions and/or actions /objectives/:

- promote the West region of Romania and Timis County as leader in the fields of renewable energy; is a cluster that has more than 7.500 members and, in order to reach/maximize its aim, it intends to increase the number of members

Factors influencing decisions and/or actions /sensing & prediction/ (influence the actor's decisions):

- efficiency, simplicity and profitability of the product/solution
- its sustainability
- the degree in which the beneficiaries accept the solution

Adaptation capabilities /adaptation/:

- yes, sometimes; usually, when the national regulation were changed, the actor will adapt

Learning capabilities /learning/:

- the actor learns lessons both from the implementation of the project and from the other collaborators; for instance, the actor learns new technologies from specialists in the field, new marketing modalities, the actor learned from the studies of market that he carries out as part of his activity

(c) Collectives & structure

Groups /collectives/:

- 62 cluster members including private enterprises, authorities and universities; without a classic organizational structure

Organizational structure:

- we cannot talk about departments, but the cluster members, depending on their area of expertise, write competitive national and international projects, implement solutions, contribute to the development of energy policies

(d) Interactions

Interactions /interactions/:

- city municipality
- universities
- private enterprises

The relations are based on collaboration, exchange of expertise, financial support.

Timisoara Municipality

(a) Characteristics

Sector: public

Number of actors of this type in the case: 1

Important characteristics of the actor /state variables/:

This actor makes decisions and elaborate the normative acts that keep the good functioning of the local public administration, elaborates reports and strategy projects, drafts local budget, coordinates public services for citizens, decides about different authorisations

- decision-maker and beneficiary
- coordinating actor -> involved in the monitoring phase of different projects

(b) Decisions and actions

Decisions and/or actions:

- takes decisions to finance different entities, local projects, coordinates different events and campaigns, manages the relationship with national and international representatives, proposes professional development trainings, manages databases, control other institutions, convenes commissions, follows the execution of different projects

Goals of the decisions and/or actions /objectives/:

- attracting foreign investors through creating of value-adding jobs
- facilitating the transfer of technology and know-how
- boosting the competitiveness of firms and companies

- tailoring policies

Factors influencing decisions and/or actions /sensing & prediction/:

- legislative factors
- opportunities on the labor market
- visibility and the prestige of the institution

In the case of this actor, the decisions are taken considering their long-term effects on the population, on the level of economic development of the city.

Adaptation capabilities /adaptation/:

- In general, the decisions are not changed
- In particular cases, such as advanced technological development in various fields, these decisions can be subject of changes. For example, due to the alarming increase in pollution, the new decision to invest in healthy ways of commuting, by purchasing public bicycles and scooters.

Learning capabilities /learning/:

- the actor learns regularly

(c) Collectives & structure

Groups /collectives/:

- member of the Romanian Energy Cluster ROSENC

Organizational structure:

- 8 directions/departments and 4 services; for our project goals, the department for environment and the department for energy are of interest

(d) Interactions

Interactions /interactions/:

- other public authorities,
- Romanian and foreign legal persons, and
- citizens.

Universitatea Politehnica Timisoara (UPT)

(a) Characteristics

Sector: public

Number of actors of this type in the case: 2

Important characteristics of the actor /state variables/:

This actor is a public technical university, member of the energy cluster with advanced Bachelor, Master and Doctoral studies in architecture, Communication and IT/Robotics.

- participant -> early implementation
- coordinating technical aspects of the project, preparing the product for implementation, providing technical support

(b) Decisions and actions

Decisions and/or actions:

- innovation and research in the field of engineering, some of the products being used in the field of energy
- financing of some students' projects bringing a social innovation component

Goals of the decisions and/or actions /objectives/:

- within the projects that this actor carries out and which are also of interest to our topic, the objective is to improve the technical performance of the products and to adjust the technical specifications according to the latest discoveries in the field
- to make the product easy to use by the beneficiary

Factors influencing decisions and/or actions /sensing & prediction/:

- accessibility
- innovative nature
- the existence of a robust expertise in the field
- factors that can increase the prestige of the institution

Adaptation capabilities /adaptation/:

- not necessarily changes the decisions, but rather the actor adapts to the dynamics of technological change

Learning capabilities /learning/:

- by definition, this actor represents an intensive learning environment because one of the components of its attributions are linked with advanced research

(c) Collectives & structure

Groups /collectives/:

- member of ROSENC Energy Cluster

Organizational structure:

- 9 faculties, some of them being of high interest to us, namely Electroenergetic Faculty, IT, Robotics and Constructions and Architecture Faculty

(d) Interactions

Interactions /interactions/:

- business environment (private and public),

- research institutes, and
- academic national and international institutions.