D2.1 Factsheets on innovative energy practices in lighthouse cities

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Executive summary

This deliverable (i.e. D2.1) is part of TOMORROW project aiming at empowering local authorities to lead the transition towards low-carbon, resilient and more livable cities by engaging citizens and stakeholders in the development of 2050 transition roadmaps.
D2.1 aims to take stock of innovative and inspirational energy transition practices and to distill lessons from these innovative practices for the development of guidelines that support cities in creating and implementing transition roadmaps.
The innovative energy transition practices will also be shared via the TOMORROW Toolbox for cities with TOMORROW cities during a Roadmapping training and with other cities during the TOMORROW Masterclasses.
In addition, this deliverable also share examples of climate action roadmaps that other cities have been developing.

1. Introduction

It is more urgent than ever to act on decarbonisation and to mobilize society for this purpose. Just this month, December 2019, the new President of the European Commission, Ursula van der Leyen, has announced a European Green Deal with far reaching ambitions.[1] Since all local governments are facing the challenges of the energy transition and its ecological, economic, and social aspects, there is a need to join forces in order to learn from each other to achieve ambitious goals. Sharing experiences and collaborating generates the synergy and engagement necessary to create the cities of TOMORROW.

TOMORROW, a Horizon 2020 research project, aims at empowering local authorities to lead the transition towards low-carbon, resilient and more livable cities by engaging citizens and stakeholders in the development of 2050 transition roadmaps. Local transition roadmaps serve as a supportive and strong tool for cities in tackling climate change. More specifically, as part of the TOMORROW project the cities of Dublin, Brest, Mouscron, Valencia, Nis and Brasov will develop and implement transition roadmaps towards low-carbon, resilient and more liveable cities. These roadmaps will be co-developed by the cities through participatory governance processes engaging citizens and other stakeholders.

Throughout the project period, TOMORROW will develop a **Toolbox for cities** that provides inspiration and guidance towards creating transition roadmaps. This toolbox is a practical guide for those organisations interested to learn from, and get inspired by innovative energy transition practices in different cities in Europe and implement their own variants thereof. In its final version, the Toolbox for cities will be shared publicly on the TOMORROW project website and new material added throughout the project period in order to make it more user friendly and accessible to a wider public. The input to the Toolbox is provided through several tasks of the TOMORROW project. Task 2.1 of the TOMORROW project aims at "taking stock of roadmapping principles and process steps" (Grant Agreement)'. This task is concluded through two deliverables: one deliverable takes stock of innovative energy transition practices (D2.1, this report) and the second deliverable consists of a collection of remarkable transition roadmaps (see D2.2, to be delivered at the end of the project). . This Deliverable 2.1 thus focuses on innovative energy practices in fields such as urban governance and democratisation, business models or finance and smart technologies - which are shared via factsheets.

The deliverable has a twofold aim. On the one hand, it aims to take stock of innovative and inspirational energy transition practices that can be shared via the TOMORROW Toolbox for cities, with TOMORROW cities during a Roadmapping training and with other cities during the TOMORROW Masterclasses. On the other hand, it aims to distill lessons from these innovative practices for the development of guidelines that support cities in creating and implementing transition roadmaps. To increase the usability of these Roadmapping Guidelines and to increase the learning from other cities, this deliverable has also taken on the task to share examples of actual low-carbon roadmaps that other cities have been working on (and thus including some of the aspects that D2.2. will take up during the end of the project).

This deliverable is divided into the following main parts:

- Section 2 provides some background information on the governance of urban sustainability transitions.
- Section 3 introduces the importance of energy transition practices in urban energy transitions, provides our approach towards selecting 30 examples, provides an overview

[1] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

of the selected 30 innovative energy practices and concludes with an analysis on what to learn for the development of Roadmapping Guidelines (D2.3).

- Section 4 introduces the importance of roadmapping processes for urban energy transitions, provides our selection approach and an overview of 10 inspirational roadmaps. It concludes with the lessons learned for the development of Roadmapping Guidelines (D2.3).
- Appendix: Each of the innovative energy transition practices has a dedicated factsheet, which is added in an Appendix. These factsheets will be openly available for download from the TOMORROW website.

2. Sustainability Transitions and their governance

TOMORROW project aims to "support public authorities in the development of transition roadmaps that clearly outline the path to the European long-term 2050 targets and inform the ongoing implementation of SEAPs/SECAPs or similar plans and the development of future plans/targets for 2030 and beyond". In addition, TOMORROW will also test and promote "Innovative ways to enable public engagement in the energy transition, developing interface capacities within public authorities to engage with civil society". The project therefore considers the development of local transition roadmaps as a governance intervention that a) results in a tangible transition roadmap; b) is based on a process of collaboration and engagement of citizens and stakeholders within a city; and c) provides space for multiple innovations to emerge.

In order to bring forward its aims, TOMORROW builds on transition governance concepts, practices and tools. Transition governance (also called transition management) builds on concepts such as reflexivity, social innovation, social learning, participation, and action research. Transition management has been proven to be effective in supporting governance for sustainability transitions in multiple domains (e.g. energy, food mobility, water, waste management, education) and/or in specific geographical contexts where different domains overlap in one locality (e.g. regions, cities, neighbourhoods). Recent years have seen an increasing interest for urban transitions and for the application of transition arenas and living labs in the urban context (Roorda et al. 2014, Loorbach et al. 2016). From a transitions perspective, cities are seen as testbeds for innovative and alternative practices to tackle sustainability challenges. Therefore transition governance approaches are aimed to instigate urban transformative capacity (Wolfram 2016). As from the early 2000s, transition management applications have been implemented in diverse urban settings in e.g. The Netherlands, Germany, Belgium, France, Honduras, Uganda, Ghana, Australia, the UK, Sweden, Japan and China (Loorbach et al. 2016, Frantzeskaki et al. 2018, Von Wirth et al. 2019, Silvestri et al., 2018).

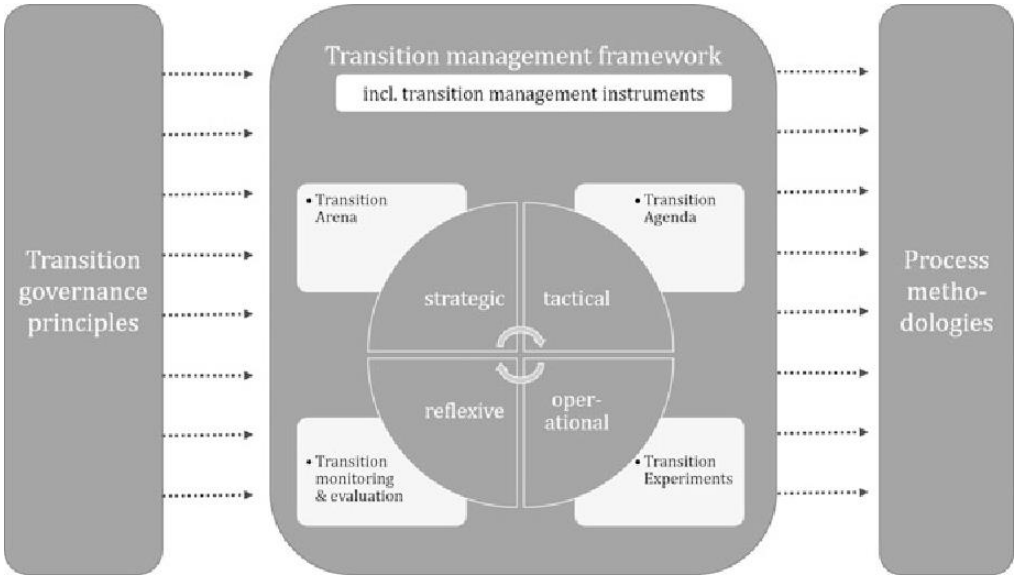
Transition governance intends to tap into the transformative capacity of change agents that strive to contribute to a more just and sustainable society. For people working on urban development, from policy makers to practitioners, the concepts and approaches of transition management can help understand the complexity of their task and the broader context that they aim to influence and change (Wittmayer and Loorbach, 2016).
Transition management can be used as an analytical lens to understand the dynamics of urban sustainability transitions both historically and in the present and as a heuristic to design instruments to influence dynamics in a certain system. Herein researchers are not just describing and analyzing transition management practices or developing instruments, nor are they merely involved in evaluating interventions and offering suggestions for improvement. Rather, researchers are often also actively involved in preparing and organizing participative processes in various contexts and policy fields. As such, transition management also implies a particular epistemological position vis-à-vis knowledge production by researchers, taking an explicitly transdisciplinary approach and making use of action research methods where the researcher is not an outside observer but an active part of the object of study and critically aware (and reflexive) of this being so (Wittmayer and Schäpke 2014).

The Transition Management approach is based on the following principles (adapted from Loorbach 2010):

- Content and process are inseparable. Insight into the system undergoing change is essential to influence it effectively.
- How transition management is used should be adapted to the context where it is applied.
- Long-term thinking guides short-term actions and policies.
- Objectives should be flexible and adjustable.
- Timing of interventions is crucial for effectively playing into ongoing dynamics.
- Creating protected spaces is needed for change agents to build up alternative structures.
- Focus on (social) learning including diverse perspectives, diverse knowledge and a variety of options is a necessary precondition for change.
- Participation from and interaction among diversity of actors is necessary to develop support for policies and to reframe problems and solutions.

These principles have been translated in a cyclical process model, see Figure 1 below. This serves to provide an overview of governance activities aiming at different levels and related instruments to be used in organizing participatory multi-stakeholder processes.

Figure 1. Elements of the transition management cycle (Wittmayer & Loorbach, 2016).



Transition management includes strategic, tactical, operational and reflexive activities (adapted from Loorbach et al, 2010):

- **Strategic activities:** focus on the long term and relate to structuring societal problems and envisioning alternative futures. This includes activities that involve vision development, strategic discussions, long-term goal formulation, collective goal and norm setting, and long-term anticipation. This means all activities that refer to the "culture" of a societal (sub-) system as a whole: debates on norms and values, identity, ethics, sustainability, and functional and relative importance for society. Main instrument: Transition Arena.
- **Tactical activities:** relate to the dominant structures (regime) of a societal (sub-)system. This means activities that trigger established patterns and structures, such as rules and regulations, institutions, organizations and networks, infrastructures and routines. More specifically tactical activities refers to initiatives and programs that deal with developing coalitions, transition agendas and developing programs, financial and institutional

regulation and frameworks, organizing networks and coalitions. Main instrument: Transition Agenda.

- **Operational activities:** involve initiating experiments and actions, mobilising actors, developing projects and activities and giving impulse for action. Operational activities have often a shorter-term horizon and are usually driven by individual ambitions, entrepreneurial skills, or promising innovations. Main instrument: Transition Experiment.
- **Reflexive activities:** relate to monitoring, assessment and evaluation of ongoing societal change processes (e.g. participatory or governance process), policies, activities and projects. These activities include all processes of learning throughout the involvement of a specific process, project or activity. Main instrument: Transition monitoring.

3. Innovative Energy Transition Practices

In this section, we first outline what we consider to be innovative energy transition practices and why these are important (see 3.1.), before we describe our approach towards selecting and describing a set of 30 of these practices (see 3.2). This is followed by an overview of the innovative energy transition practices that have been selected to be part of the TOMORROW Toolbox for cities (see 3.3.). In a final part, we share the lessons learnt from the analysis of the innovative energy transition practices (see 3.4).

3.1 Innovative energy transition practices

Sustainability transition scholars distinguish between dominant structures, cultures and practices in energy systems - thus the status-quo and the 'normal way' things are done here. Energy transitions are then understood as radical structural changes over the long term in the energy system that would lead to a structural reconfiguration of these dominant structures, cultures and practices. The most commonly identified way in which transitions occur is that the dominant status quo is put under pressure on the one hand by slowly developing trends such as digitalisation or individualisation and on the other hand by innovative energy practices that emerge.

These innovative practices showcase how a system with a different set-up could look like. They can be innovative in different regards such as for example taking up digital technologies, participatory governance approaches, taking account of democratic aspects, or innovate market relations or value propositions. Also, when integrated, for example, when technological innovations are combined with an innovative governance approach or a democratic participatory process their potential to contribute to just and sustainable energy transitions can increase.

Interesting for TOMORROW are those energy innovations that accelerate just and sustainable energy transitions and that can complement or support transition roadmapping. Interesting innovations include those that relate to:

- **Democracy**: Public participation is becoming more important in re-shaping the energy system. Democratisation of the energy system is connected to local ownership and involves new actors such as prosumers, energy cooperatives and municipal energy companies > allowing broad participation in energy transitions;

- **Governance:** New modes of governance are required in long-term change processes that involve multiple actors and domains (housing, energy, healthcare, etc.) and multiple scales (EU, regional, national, local) > multi-actor arrangements in energy transitions;

- **Smart Technologies:** Digitalisation and technology play a big role in the cities of TOMORROW. Smart city innovations can contribute to a more sustainable and alternative energy systems > using technology in energy transitions;

- **Market/business innovation:** Sustainability transitions also involve transforming financial structures. Large energy companies have vested interest not to change, whereas prosumers experiment with alternatives and are looking for new business models. The energy transition will bring about market/business innovation in multiple ways, including

social entrepreneurship, local economy, prosumer and cooperative models, etc. > financing energy transition.

3.2 Approach towards selecting and developing factsheets

To arrive at a selection of 30 factsheets of innovative energy transition practices (see Annex A), we can distinguish the following steps.

1. **Collecting a long list**

First, a long list of around 90 innovative energy transition practices have been collected through the following:

- Web research;
- Open call for inputs (to the DRIFT & Energy Cities network via websites and social media[2]);
- Calls for inputs from transition and energy experts at DRIFT and Energy Cities;
- Interviews with all TOMORROW partner cities.

2. **Arriving at a short list**

The long list of 90 innovative energy transition practices have been reduced to 30 innovations. Each innovation has been considered against a) the needs and interests of the TOMORROW city partners, and b) its perceived transformative potential and relevancy for urban energy transitions. The overall sample should also ensure a spread across different kinds of innovations (governance, democracy, smart technologies, business), geographies and city sizes. To this end, a focus group session has been organised with sustainability transition and energy experts with the aim to categorize the degree of innovation and relevance for cities.

3. **Developing a factsheet template**

In a next step, we set up a factsheet template for describing the 30 innovative energy transition practices. After rounds of consultation with the consortium partners, the factsheet template includes the following elements:

- **Description:** provides a short introduction of the innovative energy transition practice. This introduction includes why the innovative practice has been set up and how, as well as insights on its main organisational structure.
- **Goals:** provides the different aims of the innovative energy transition practice.
- **Actions/how it works:** presents the most important actions or activities that make up the innovative practice, e.g. (steps of) specific participatory processes or projects.
- **Transformative potential:** reflects on the innovative energy transition practice in relation to its potential to (contribute to) change the engrained structures, cultures and practices of the energy system.

[2] https://drift.eur.nl/wanted-remarkable-roadmaps-and-inspiring-innovations-for-the-energy-transition/
https://twitter.com/energycities/status/1180035787934572544

4. **Developing the factsheets**

After having established which innovative practices to focus on and how to describe them, we have relied on publicly available information to describe the innovative practices. This included the following: project websites, reports, case study reports, blog articles, interviews with project participants. Each final draft has been reviewed by two-three consortium members before it went into layouting.

3.3 Overview of 30 innovative transition energy practices

The TOMORROW Toolbox for cities on the TOMORROW website will include 30 innovative energy transition practices. In Table 1 below, we presents an overview of the final list of innovative practices. In Appendix A, we included the complete set of 30 factsheets.

Table 1. Overview of the energy innovations included in the TOMORROW toolbox

	Innovative energy transition practice	**City, Country**	**Title in Appendix A**
1	MeerEnergie	Amsterdam, The Netherlands	A neighbourhood's cooperative for heat recovery
2	Stadslab2050	Antwerp, Belgium	A city lab for Antwerp
3	Bristol Green Capital Partnership	Bristol, UK	Bristol Green Capital Partnership
4	Fossil-free Energy District (FED)	Gothenburg, Sweden	Fossil-free energy district
5	Le Grand Debat	Nantes, France	A Great Debate to accelerate the energy transition
6	Elektrizitätswerke Schönau (EWS)	Schönau, Germany	ElektrizitätsWerke Schönau: a citizens-driven energy company
7	Delft Climate Investment Fund (DCIF)	Delft, The Netherlands	Financial schemes for home renovations
8	Buurzame Stroom	Ghent, Belgium	Neighborhood Power for renewable energy
9	Green Participatory Budget	Lisbon , Portugal	Green Participatory Budget
10	Co-Responsibility in District Energy Efficiency & Sustainability (CoRDEES)	Paris, France	Co-Responsibility in District Energy Efficiency & Sustainability
11	EnergiaTa	Romania	EnergiaTa: Making prosumerism a reality

12	Open District Heating	Stockholm, Sweden	Open District Heating, a market place for excess heat
13	Bristol Community Energy Fund	Bristol, UK	Bristol Community Energy Fund
14	Living Streets	Ghent, Belgium	Living Streets
15	Klima Schule	Switzerland	The Climate School program
16	Utrecht maken we samen	Utrecht, The Netherlands	Making Utrecht together!
17	Vilawatt	Viladecans, Spain	Vilawatt: a new form of governance Partnership
18	Cooperative Energy Mouscron (COOPEM)	Mouscron, Belgium	COOPEM - Mouscron's energy cooperative
19	Internal contracting	Stuttgart, Germany	Internal contracting for energy-saving
20	Milano 2046	Milan, Italy	Milan 2046 - a laboratory for a common future
21	Jouliette	Amsterdam, The Netherlands	P2P energy exchanges with Jouliette
22	Energy Tables	Cádiz, Spain	Energy tables to fight energy poverty
23	ENGAGE campaign	Ivanić-Grad, Croatia	ENGAGE campaign in Ivanić-Grad
24	Rotterdam Climate Agreement	Rotterdam, The Netherlands	Rotterdam Climate Agreement
25	Zd Donostia/San Sebastián's Climate Action Plan 2050	San Sebastián, Spain	San Sebastián's 2050 roadmap
26	Quartierstrom	Walenstadt, Switzerland	District Power: citizens as energy prosumers
27	LICHT Leuven	Leuven, Belgium	LICHT Leuven - An inclusive partnership for a healthier city
28	Associação Portuguesa de Energias Renováveis - APREN	Portugal	APREN: a cooperative to accelerate the energy transition
29	Mannheim Auf Klimakurs	Mannheim, Germany	Mannheim on a climate-friendly course
30	Barcelona Energia	Barcelona, Spain	Barcelona's public renewable energy company

Table 2. Overview of the energy innovations in relation to the type of innovation

	Innovative energy transition practice	City, Country	Governance	Democracy	Technology	Market
1	MeerEnergie	Amsterdam, The Netherlands	●●○○○	●●●●○	●●○○○	●●●○○
2	Stadslab2050	Antwerp, Belgium	●●●●○	●●●○○	●○○○○	●○○○○
3	Bristol Green Capital Partnership	Bristol, UK	●●●●○	●●●●○	●○○○○	●●○○○
4	Fossil-free Energy District (FED)	Gothenburg, Sweden	●●○○○	○○○○○	●●●●●	●●●○○
5	Grand Debat	Nantes, France	●●●○○	●●●●●	○○○○○	○○○○○
6	Elektrizitätswerke Schönau	Schönau, Germany	●○○○○	●●●●●	●●○○○	●●●●○
7	Delft Climate Investment Fund (DCIF)	Delft, The Netherlands	●●●●○	●●●○○	●●●○○	●●●●○
8	Buurzame Stroom	Ghent, Belgium	●●●○○	●●●●○	○○○○○	●●○○○
9	Green Participatory Budget	Lisbon, Portugal	●●●●○	●●●●●	○○○○○	○○○○○
10	Co-Responsibility in District Energy Efficiency & Sustainability (CoRDEES)	Paris, France	●●●○○	○○○○○	●●●●●	●●●○○
11	EnergiaTa	Romania	●●●○○	●●●●○	●●●●○	●●●○○
12	Open District Heating	Stockholm, Sweden	●●●○○	○○○○○	●●●●●	○○○○○
13	Bristol Community Energy Fund	Bristol, UK	●●●●○	●●●●○	●●○○○	●●○○○

14	Living Streets	Ghent, Belgium	●●●●○	●●●●○	○○○○○	○○○○○
15	Klima Schule	Switzerland	●●○○○	●●●○○	○○○○○	○○○○○
16	Utrecht maken we samen	Utrecht, The Netherlands	●●●●○	●●●●●	○○○○○	○○○○○
17	Vilawatt	Viladecans, Spain	●●●●○	●●●●●	●○○○○	○○○○○
18	Cooperative Energy Mouscron (COOPEM)	Mouscron, Belgium	●●●●○	●●●●●	●●○○○	●●○○○
19	Internal contracting	Stuttgart, Germany	●●●○○	●●●○○	●●●●○	●●●●○
20	Milano 2046	Milan, Italy	●●●●○	●●●○○	○○○○○	○○○○○
21	Jouliette	Amsterdam, The Netherlands	●●●○○	●○○○○	●●●●●	●●●●○
22	Energy Tables	Cádiz, Spain	●●●●○	●●●●●	○○○○○	○○○○○
23	ENGAGE campaign	Ivanić-Grad, Croatia	●●●●○	●●●●○	○○○○○	○○○○○
24	Rotterdam Climate Agreement	Rotterdam, The Netherlands	●●●○○	●●●●●	○○○○○	○○○○○
25	Donostia/San Sebastián's Climate Action Plan 2050	San Sebastián, Spain	●●●●○	●●●●○	○○○○○	○○○○○
26	Quartierstrom	Walenstadt, Switzerland	●●●○○	●●●○○	●●●●●	●●●●○
27	LICHT Leuven	Leuven, Belgium	●●●●●	●●●●●	○○○○○	○○○○○
28	Associação Portuguesa de Energias Renováveis - APREN	Portugal	●○○○○	●●○○○	●●●○○	●●●●●

29	Mannheim Auf Klimakurs	Mannheim, Germany	●●●●●	●●●●○	●○○○○	○○○○○
30	Barcelona Energia	Barcelona, Spain	●●●●○	●●●●●	●○○○○	●●●●●

3.4 Lessons learnt for transition roadmapping processes

In this section, we summarize a number of lessons that we can draw from the different innovative energy transition practices for the development of a transition roadmapping approach for cities (as part of Task 2.3). We organized these insights along the different types of governance activities as distinguished by transition management scholars. More specifically, we have analysed how the different innovative energy transition practices contribute to promote strategic, tactical, operational and reflexive governance activities (see Section 2.3). Since, most of the analysed innovative energy transition practices engage in more than one governance activity level, our analysis focuses on the most relevant governance level. It thus considers the innovative practices as possible 'instruments' to be used if cities aim to develop activities of more strategic, tactical, operational or reflexive nature.

Innovative energy transition practices engaging in strategic activities

As described in section 2.3, strategic activities refers to processes and activities that involve structuring societal problems and envisioning alternative futures (e.g. vision development, strategic discussions, long-term goal formulation, collective goal and norm setting, and long-term anticipation). The following innovative energy transition practices engage in such strategic activities.

One of these initiatives is **'Le Grand Debat'**, an inclusive and democratic participatory process aimed at producing a shared roadmap. As part of this participatory process, multiple stakeholders from different societal domains (e.g. civil society, public authorities, private organisations and academia) have been involved to co-create a common vision to accelerate the energy transition. The result of the process is a roadmap taking into account an energy transition that provides benefits to all inhabitants, valorizes 100 percent of local renewable resources and promotes social equality. The roadmap includes 15 ambitions and 33 commitments as a starting point of a series of actions to be developed with the inhabitants and actors of the territory. This initiative promotes strategic activities since through the 'Le Grand Debat' process participants are encouraged to structure problems, envision the future of their city and develop long term goals.

The **Green Participatory Budgeting** developed in Lisbon city represents another strategic activity. Participatory Budgeting represent a form of citizen participation through which citizens have effective decision-making power over a portion of the Municipal Budget. It promotes citizens' engagement and participation in decision-making of the city regarding sustainability and climate change adaptation. It also contributes to civic education by enabling citizens to integrate their personal concerns with the common good, understand the complexity of problems and develop attitudes, skills and participatory practices. Additionally, this initiative promotes adapting municipal policies to human and environmental needs and increase the transparency and accountability of municipal activities.

Another example of innovative practices fostering strategic activities is **Stadslab2050**, an urban living lab located in Antwerp. It is a space open for collectively developing new ways of thinking

and doing and contributing to building a sustainable future for the city. The living lab plays a key role in creating a diverse network of (social) entrepreneurs, citizens, civil servants, academics and other stakeholders to find new ways of looking at challenges and create new solutions.
Another interesting example is the participatory process called **'Utrecht maken we samen'- We make Utrecht together** implemented by the Municipality of Utrecht. This participatory policy-making process involved residents with the aim to support the city to become carbon neutral and to develop the city's 2016 energy and climate plan called 'Energieplan' (Energy plan). The process has included three sessions focusing on: "Dreaming about the future" (e.g. envisioning), "Building scenarios", "Devising the energy and climate plan" (e.g. developing the energy plan).

Innovative energy transition practices engaging in tactical activities

Tactical activities refer to initiatives and programs that deal with developing programs, financial and institutional regulation and frameworks, organizing networks and coalitions. The following innovative energy transition practices engage in such tactical activities.
Bristol Green Capital Partnership initiative played an instrumental role in supporting Bristol city to win the Green Capital Award in 2015 by building a network of grassroots initiatives and other local organisations, businesses and two universities that develop multiple projects and activities on sustainability and social inclusion.
The energy company **ElektrizitätsWerke Schönau (EWS)** collaborates with different organisations, including local authorities. It supported the town council of Schönau to become highly aware of sustainability issues and to adopt a sustainable development political strategy. The company promotes awareness activities aimed at reducing the energy consumption.
Another initiative that promotes tactical activities is **"Buurzame Stroom"** (in English 'neighbourhood power') pilot scheme. This initiative by the Municipality of Ghent in collaboration with many stakeholders promotes the production of local renewable energy in Dampoort-Sint-Amandsberg neighbourhood by installing as many solar panels as possible and distributing the costs and revenues fairly in the community. The Municipality of Ghent, in particular, played a key role in initiating and also in maintaining these multi-actor collaborations. The community energy pilot project enhances social, economic and environmental transformation of neighborhoods and supports the creation of multi-actor collaborations and the development of new frameworks, regulations and business models promoting the production of affordable and renewable local energy.
Also **MeerEnergie,** an inclusive cooperative in which neighbours residents, companies and housing companies can become co-owners of the heat network, developed new coalitions and networks. Together, multiple stakeholders are investigating the feasibility of implementation of a project to transform the data centre's heat into heating for the local households.
The **Delft Revolving Fund (Fund) and soft loan scheme** is a financial instrument that encourages residents to invest in renewable energy and energy-saving measures. The project enhances the innovation of current financial and institutional regulations related to the energy consumption.
Also **Vilawatt project** in Viladecans (Spain) has been effective in contributing to create new coalitions and networks. The project has been involving citizens in the energy transition process by creating a Public-Private-Citizen Governance Partnership (PPCP). The PPCP represents a hub that engages public authorities, citizens and private companies and promotes energy savings through learning activities. Additionally the PPCP also manage the implementation of energy renovation projects in buildings and the production of renewable energy.

Innovative energy transition practices engaging in operational activities

Operational activities refer to experiments and actions that have a shorter-term horizon and involve mobilising actors and developing projects and activities, empowering and enhancing impulse for action.

An example of an innovative energy transition practice supporting operational activities is the **Bristol Green Capital Partnership**. This initiative supports the development of multiple and diverse projects aiming at enhancing (social) innovation, inclusive collaboration, building capacities of organisations and individuals and enhancing sustainable lifestyles. Some examples of these projects are *Better Bristol Campaign*, a match-funding campaign providing local sustainability organisations and groups with the opportunity to raise funds for their projects through a combination of crowdfunding and match-funding; and *the Green & Black Ambassadors initiative* addressing the exclusion of Black and Minority Ethnic communities in Bristol's environmental community, by conducting Community Action Research, creating media projects and radio shows, running leadership trainings and other activities.

Also **Living streets** initiative in Ghent supports the development of new experimentations in the urban space by generating new social dynamics with regards to social cohesion, mobility, sustainability and organisation of the public spaces. Residents are empowered to become change agents who can decide, in accordance with their neighbours, what an ideal street looks like, and what is necessary to get there.

COOPEM cooperative offers citizens the possibility to purchase photovoltaic installations through a collective group purchase. More specifically it empowers citizens to collectively organise around the self-consumption of renewable energy. The cooperative also collaborates with other societal actors (e.g. regional development organisations and energy companies) in joint project called *ColéCo* promoting the installation of solar panels on school roofs. The concept is for schools to make use of this energy during the day, while in the evenings the surrounding neighbourhood benefits from the photovoltaic energy produced.

Another example that can be considered in the category of operational activities is the **FED project,** that tested a local digital marketplace integrating district cooling, district heating and electricity into a single system at Johanneberg Science Park within Chalmers University of Technology. This project can be considered as an innovation fostering urban energy transitions by demonstrating a solution for energy efficiency and smart energy management in the housing sector and in public infrastructures.

Open District Heating offers a business model in which energy that would be wasted is transformed into recovered energy used to heat buildings. This initiative is one of the services of 'Stockholm Exergi', a district heating and cooling production and distribution company. The initiative it is a single project and it is not linked yet to broader city policies or regulations.

Innovative energy transition practices engaging in reflexive activities

Reflexive activities refer to monitoring, assessment and evaluation of ongoing societal change processes (e.g. participatory or governance process), policies, activities and projects.

An example of innovative energy transition practices supporting reflexive activities is **CoRDEES project.**

As part of this project, a new energy governance approach called 'The Urban Energy New Deal' is set up to collaboratively define the energy commitments with all stakeholders involved. In connection to this, a multi-user monitoring platform (the 'Community Energy Management Platform') is created in real-time to analyse and consolidate energy data from buildings and public facilities. Through this platform, each stakeholder has access to the energy data of the

neighbourhood. This means that the energy users become co-responsible of energy performance in the neighbourhood. The development of this monitoring platform represents a reflexive activity encouraging the assessment of energy data by the residents and fostering awareness raising on energy consumption.

3.5 Other lessons learnt

In this section we include other lessons learnt from the analysis of the innovative energy transition practices. More particularly we have found that these innovative practices play a key role in a) Linking technology and governance processes; b) enhancing multi-actor collaborations and partnerships; c) Promoting social inclusivity and democracy.

- **Linking technology and governance processes**

Some of the analysed innovative energy transition practices represent interesting examples of projects that integrate technological innovations with alternative governance or democratic processes. This is for example the case of **Burrzame stroom** integrating technical solutions with a participatory governance approach. Another example is CoRDEES project that combines the implementation of technological measures for producing renewable energy and defining efficient energy consumption with the principle of co-responsibility of the actors involved.
Financial instruments encouraging residents to invest in renewable energy and energy-saving measures like in the case of **Delft Revolving Fund (Fund) and soft loan scheme** represent cases in which tailor-made financial incentives have been combined with non-financial incentives such as technical assistance and communication campaigns. These instruments has been resulted effective in motivating homeowners to invest in more sustainable measures for their houses.

- **Enhancing multi-actor collaborations and partnerships**

The majority of the innovative practices include the collaboration among different societal actors from different domains and sectors. This means that collaboration between the municipality and other public authorities, residents, private companies, knowledge organisations and other organisations is enhanced in the majority of the practices.

- **Promoting social inclusivity and democracy**

Some of the analysed innovative energy transition practices represent inclusive and democratic processes in which the voice of multiple stakeholders is heard. This is for example the case of 'Le Grand Debat' initiative that involved 53,000 participants and 11,000 contributors from 270 different organizations. One of the aim of the initiative is to make 'energy transition' accessible to everyone. Participatory Budgeting represent a form of citizen participation through which citizens have effective decision-making power over a portion of the Municipal Budget.
Another example of an inclusive approach is COOPEM cooperative that aims to make photovoltaics (solar power) accessible to the largest possible number of citizens and companies in the area of Mouscron.

4. Transition roadmaps

In this section, we describe what we consider as transition roadmaps (section 4.1) and we present the methodological approach towards selecting and describing a set of ten transition roadmaps (section 4.2). In section 4.3, we then present the selected roadmaps that will become part of a collection of roadmaps to be included in the TOMORROW Toolbox for cities. Finally, in section 4.4 we describe the lessons learnt from the analysis of the roadmaps for developing Roadmapping Guidelines for cities.

4.1 Transition roadmaps and transition roadmapping

The TOMORROW project proposes that the development of transition roadmaps based on principles and approaches of transition management represent a way to support sustainability transitions in TOMORROW cities.
In this section we will describe what we mean with transition roadmaps and we will define the roadmapping process that will be supported as part of TOMORROW project.

- **Transition roadmaps**

A transition roadmap is an 'action plan' developed for a certain city or territory that includes the development of visions of what the city could be in the future, sets greenhouse gas emissions reduction targets, outlines actions to reduce those emissions, and launches implementation strategies.
Transition roadmaps "offer more granular operational tools, formula, instructions for strategy implementation" (Marcu et al. 2018) and can serve as a supportive and strong policy tool for cities in tackling climate change.
In other terms, a roadmap sets out a path to reach specific objectives/targets within a specified timeframe. They support questions such as: 'what is needed, and by when, to reach a zero-carbon city in 2050?'. According to the literature, an efficient roadmap considers the following questions (Jeffrey et al. 2013 in McGrail 2014):

- **Objectives:** Where do we want to go?
- **Status/Challenges:** Where are we now?
- **Process/Needs:** How can we get there?

The literature focuses especially on technology roadmapping considering particularly the process of 'exploration and communication of the relationships between evolving and developing markets, products and technologies over time' (Phaal et al 2003). This is for example the case of the Pathways to a Decarbonized Port roadmap developed by the Wuppertal Institute for the Port of Rotterdam (The Netherlands).

Numerous cities have already employed roadmaps to direct their energy transition plans, including cities such as Berlin (Germany), Paris (France), Stockholm (Sweden), Seattle (USA) or Cape Town (South Africa). "New energy for Rotterdam" is an example of an initiative in which a roadmap is designed for the energy transition towards a sustainable and resilient city that adapts to a changing climate by involving its residents. In this case the roadmap take strongly into

account societal processes, changing actor roles, and social innovation. In doing so, a roadmap has the potential to concretely navigate changing responsibilities among others.
The INTERREG IVC IMAGINE project also focused on the development of energy roadmaps. A "Low-Energy City Policy Handbook" have been published, giving first inspirational steps to local authority's decision makers.

- **Transition roadmapping**

In the TOMORROW project, we approach transition roadmapping as the process that combines principles and practices of transition management with the experiences of cities that have already developed innovative roadmapping processes in their cities. More specifically, the TOMORROW roadmapping process will include transition management principles such as the focus on frontrunners (e.g. change makers in a certain context) with innovative broader public engagement processes. This will allow to develop an ambitious vision a reflexive process focused on learning and, at the same time, engage a broader group of stakeholders. This means that the overall roadmapping process will be more democratic and inclusive contributing to an acceleration of the energy transition.

The process of developing a transition roadmap for TOMORROW cities serves different purposes:

- Raise the 2030 ambitions of cities towards low-carbon, resilient and more livable cities;
- Build capacities of local authorities and making them develop a strategy for orchestrating their energy transition;
- Support the commitment and co-ownership of the energy transition ambitions across each city through co-creating a shared narrative about the future of their city;
- Create space for multiple innovations (smart city, governance, democracy, market/business) and for co-creation of knowledge across sectors and societal domains.

4.2 Approach towards selecting transition roadmaps

In order to inspire TOMORROW cities and inform the development of Roadmapping Guidelines for the pilot cities, research has been conducted to collect innovative transition roadmaps. The selection of these ten transition roadmaps also provides insights for the finalization of Task 2.2 on 'Formulating Energy Transition Roadmap guidelines'. Task 2.2. will consist in formulating Energy Transition Roadmap guidelines based on principles and insights from transition management, the innovative energy practices, the selection of transition roadmaps and will take into consideration the energy transitions dynamics in the different contexts of TOMORROW cities. To make the selection of ten roadmaps, the following steps were devised.

1. **Collecting roadmaps to establish a long list**

The first step of the research was to collect a broad range of available roadmaps, from across the world. The focus of the roadmaps had to in some way be related to decarbonisation, and be published after 2010. The scoping of roadmaps was done by using:

- Web research;
- Open call for inputs (to the DRIFT & Energy Cities network via websites and social media[3]);

[3] https://drift.eur.nl/wanted-remarkable-roadmaps-and-inspiring-innovations-for-the-energy-transition/

- Calls for inputs from transition and energy experts at DRIFT and Energy Cities;
- Interviews with all TOMORROW partner cities.

This process resulted in a long list of 30 publicly available roadmaps. This process of collecting and sharing roadmaps will continue throughout the TOMORROW project - the collection will be available via the TOMORROW Toolbox for cities.

2. Making a selection for a short list

This long list of 30 roadmaps was then brought down to a selection of ten of the most relevant roadmaps in terms of thematic focus and level of ambition, for further developing the transition governance methodology. The selection of ten roadmaps was also chosen to reflect a diversity, in terms of scope, form and geography.

3. Determining relevant analytical lenses

To use the roadmaps to further develop transition governance, three main analytical lenses were chosen. After having taken stock of the needs and interests of the pilot cities during the kick off of the TOMORROW project, the decision was made to analyse roadmaps on three elements:

- What is the scope of the roadmap, and why was this decided?
- How did those involved arrive at the roadmap? Who was involved, and what roles did they have?
- How does the roadmap deal with the actual implementation? How is it linked to concrete actions and measures?

4. Analysing ten roadmaps

The ten roadmaps were then read more thoroughly using the questions described above, and an analysis was written up in the table as included under section 4.4.

4.3 Overview of ten transition roadmaps

Table 3 provides an overview of the ten selected roadmaps. The TOMORROW Roadmaps will be published on the TOMORROW website as part of the TOMORROW Toolbox for cities.

Table 3. Overview of the selected transition roadmaps for inclusion in the TOMORROW Toolbox for cities.

	Transition Roadmap	City, Country
1	Paris Climate Action Plan	Paris, France
2	Strategy for a fossil-fuel free Stockholm by 2040	Stockholm, Sweden
3	Leuven 2030 Roadmap 2025 - 2035 - 2050	Leuven, Belgium
4	CPH 2025 Climate Plan	Copenhagen, Denmark
5	Climate-Neutral Berlin 2050	Berlin, Germany
6	Seattle Climate Action Plan	Seattle, USA
7	Greenest City 2020 Action Plan	Vancouver, Canada
8	Cape Town's Action Plan for Energy and Climate Change	Cape Town, South Africa
9	Environmental Action 2016 – 2021 Strategy and Action Plan	Sydney, Australia
10	Yokohama City Action Plan for Global Warming Countermeasures	Yokohama, Japan

4.4 Analysis and lessons learnt from transition roadmaps

In this section we present the main lessons learnt from the analysed roadmaps. Table 4 presents the analysis of the roadmaps.

Table 4. Analysis of the roadmaps

	Transition roadmap	City, Country	Goals	Actors involved	Actions/Implementation
1	Paris Climate Action Plan	Paris, France	Paris attempts to achieve the goal of being a carbon-neutral capital by 2030. -Reduce local emissions by 100%, achieving the goal of zero emissions in Paris. -Promote an 80% reduction in the carbon footprint of Paris compared to 2004 levels and involve all local stakeholders in compensating for residual emissions in order to attain the zero net carbon target for the Paris area.	The roadmap has been developed as a result of a consultation process that involves multiple stakeholders. Between November 2016 and March 2017, 700 people (citizens, professionals, associations, experts and City of Paris employees) were involved in participating in around 100 hours of debates. The process also considered 280 proposals sent by citizens and 300 contributions made from the economic, academic and non-profit sectors.	Actions related to the following sectors: Renewable Energy Shared mobility and public transport Buildings: eco-renovated buildings Urban planning zero non-recovered waste circular economy Sustainable food system
2	Strategy for a fossil-fuel free Stockholm by 2040	Stockholm, Sweden	The City of Stockholm has set the goal of becoming fossil fuel free by 2040, with the milestone target of a maximum of 2.3 tonnes of CO2e per resident by 2020	The roadmap was developed by the City Executive Board in collaboration with the Environment & Public Health Committee.	The strategy is divided into three of the Environment Programme's target areas: sustainable energy use, eco-efficient transport and resource-efficient natural cycles. **Sustainable energy use** The City collaborates with energy companies, hospitals, etc. to gradually

					replace fossil fuels with renewable fuels to meet peak load demands. Progress to be reported in 2017. The City lobbies for legislation and regulations that support the use of fossil-free energy. The City implements a district heating system that reduces overall emissions by at least 240,000 tonnes of CO2 equivalent by 2020. Tasked to: Group board and Fortum Värme. The City acts to impose an energy consumption ceiling of 55 kWh/m2 Atemp in new-builds on municipally allocated land, with the ambition of achieving a level of 45 kWh/m2 Atemp. This will reduce emissions by at least 25,000 tonnes. **Eco-efficient transport** The City presents an action plan for a fossil free road transport sector and investigates the feasibility of prohibiting the sale of fossil fuels by 2040, with a sub-target for 2030. A report with proposals for action is to be presented for decision before the end of 2017. Tasked to: City Executive Board with support from Environment & Public Health Committee and Traffic Committee. The City acts to reduce road traffic sufficiently for CO2 equivalent emissions to fall by at least 80,000 tonnes. Tasked to:

					Traffic Committee and City Planning Committee. The City acts to reduce the use of fossil fuels for road traffic sufficiently to eliminate at least 140,000 tonnes of emissions. Tasked to: Environment & Public Health Committee, together with City Executive Board and Traffic Committee. **Resource-efficient natural cycles** The City investigates the potential for reducing the amount of fossil plastic in incinerated waste. Chemicals, health and other environmental impacts must be considered in addition to climate impact. A report with proposals for action is to be presented for decision before the end of 2017. Tasked to: Group board, together with Stockholm Vatten & Avfall and Fortum Värme. The City acts to increase biogas production to a level sufficient to correspond to an overall reduction of 20,000 tonnes of CO2 equivalent. Tasked to: Board of Stockholm Vatten & Avfall.
3	Leuven 2030 Roadmap 2025 - 2035 - 2050	Leuven, Belgium	Leuven aims at becoming climate-neutral city by 2050 and to reduce CO2 emissions by at least 80% compared to 2010.	The design of the roadmap included the participation of a broad network of stakeholders from local government, companies, knowledge	The roadmap establishes 80 climate yards clustered in 13 programmes. Each of these programmes represent a priority towards the goal of becoming a climate-neutral city. The objectives and measures to implement them

			Leuven's roadmap covers eight ambitions in which social actors and stakeholders are called to take action: 1. Climate neutral living 2. Climate-neutral urban functions 3. Climate-neutral movements 4. Sustainable consumption 5. Producing your own renewable energy locally 6. Increasing urban resilience for climate change 7. Working together on a climate neutral city 8. Sharing knowledge and innovating	institutions, civil society, and citizens.	are described in the roadmap. Each programme has its own coordinator, who needs to bring all the stakeholders and key actors together, as well as develop and implement the action plan.
4	CPH 2025 Climate Plan	Copenhagen, Denmark	Copenhagen aims to become the first carbon-neutral capital in the world. This climate plan formulates the initiatives to be implemented as well as the different ways in which stakeholders and actors need to be involved. These	The roadmap is the result of a collaboration among the local government, the business community, social organisations and research institutions.	Actions include the development of energy initiatives such as constructing a new combined heat and power station based on renewable energy; creating new windmills supporting residents to invest in green electricity; increasing heating with geothermal energy; improving heating efficiency at waste incineration plants by introducing flue gas condensation units; modernizing the district heating network is

			initiatives are divided in four themes: 1. Energy consumption 2. Energy production 3. Green mobility 4. City Administration initiatives		modernized to reduce heat losses from the pipes, replacing coal energy with renewable energy replaces coal at power stations that also converts to biomass.
5	Climate-Neutral Berlin 2050	Berlin, Germany	Berlin aims to become a climate-neutral city by 2050 by reducing its greenhouse emissions and implementing actions in these key measures: 1. Energy supply 2. Buildings and urban development 3. Economy 4. Traffic 5. Private households and consumption	The roadmap contains a series of strategies that are the result of a participatory process engaging numerous stakeholders from the public and private sector and civil society. The city of Berlin also recognizes the active role of the municipality on developing the different measures.	Among the actions, the roadmap requires the central and district administrations to organise their work in a carbon-neutral manner by the year 2030. The legislation also requires the establishment of refurbishment roadmaps for public buildings, in which the building stock of the central and district administrations will be systematically documented, and the necessary energy-related refurbishment measures put into an expedient order of priority.
6	Seattle Climate Action Plan	Seattle, USA	The roadmaps aims to: • Reach Zero Net Greenhouse Gas (GHG) Emissions by 2050; •Prepare for the likely impacts of climate change.	The creation of the plan is based on a process in which different stakeholders have been involved, from residents, businesses, experts and community leader. These different actors group have been involved in different activities.	The Action Plan considers to develop multiple short term and long term actions to achieve the emissions reductions for the transportation, building energy, and waste sectors. The Action Plan takes into account that the actions need to be implemented in a timely, coordinated and sustained way.

				• Carbon neutral community groups, convened by City Council, identified actions that the City could take in the short term to move forward on the carbon neutral goal. • "Getting to Zero," a proof of concept analysis outlined a potential pathway to carbon neutrality, which confirmed deep emission reductions were technically possible with sufficient funding and community support. • Technical Advisory Groups (TAGs), which included a cross section of sector experts, identified a range of actions in the transportation, land use, building energy, and waste sectors that would cost-effectively reduce emissions, and contribute to achieving other community goals. • A Green Ribbon Commission (GRC) of community, environmental, and business leaders considered the TAG recommendations and added their own ideas and perspectives	

				to develop recommendations in the sectors considered by the TAGs and for preparing for the impacts of climate change. • The public provided input throughout the process through website comments and community meetings, including targeted outreach to nine underserved communities where meetings were held in residents' native languages and neighborhoods.	
7	Greenest City 2020 Action Plan	Vancouver, Canada	-Green Economy: double the number of green jobs and businesses with green operations -Climate Leadership: require all new buildings built after 2020 to be carbon neutral -Green buildings: reduce CO2 emissions in existing buildings by 20% over 2007 levels -Green transportation: reduce driving and make the majority of trips by foot, bicycle, and public transit traffic	The roadmap is based on the work of the Greenest City Action Team (2009), a committee co-chaired by Vancouver mayor Gregor Robertson. The roadmap was approved by Vancouver city council in July 2011. The roadmap states that the city needs 'strong and effective partnerships with all of the organizations that have a key role to play in greening the city.' This includes other levels of government, non-profit organizations, businesses, social enterprises and citizens.	Four high priority actions: 1. Plan and implement a comprehensive corporate waste reduction and diversion program for all City facilities. 2. Develop a procurement policy and practice that supports the purchase and use of local food in City-run facilities, including community centres and Park Board restaurants and concessions. 3. Look for opportunities to green community events that the City runs, sponsors, and permits. 4. Plan and implement a program to significantly reduce greenhouse gas emissions as well as fossil fuel use in City-run buildings and

			-Zero waste: reduce solid waste going to landfills to 50% of 2008 levels -Access to nature: increase accessibility of green parks, greenways, and other green space, so that all Vancouver residents live within 5 minutes of these spaces -Lighter footprint: reduce Vancouver's ecological footprint by 33% over 2006 levels -Clean water: increase water quality and reduce water consumption per capita by 33% from 2006 levels -Clean air: increase air quality, measured against Metro -Vancouver and World Health Organization guidelines -Local food: increase amount of locally grown food		vehicles, and achieve carbon-neutral operations.
8	Cape Town's Action Plan for Energy and Climate Change	Cape Town, South Africa	-Citywide: 10% reduction in electricity consumption by 2012, off a 'business-as-usual' baseline	The Action Plan is managed and coordinated by the City's Energy and Climate Change Unit, across all directorates and departments.	The actions are prioritised according to a set of criteria: low carbon, economic development, poverty alleviation and resilience.

			-Council (local authority) operations: 10% reduction in energy consumption by 2012 10% renewable and cleaner energy supply by 2020. -Meet growth in electricity demand with cleaner/renewable supply, among other sources -Build a more compact, resource-efficient city -Develop a more sustainable transport system -Adapt to and build resilience to climate change -Improve the resilience of vulnerable communities -Enable local economic development in the energy sector -Access climate finance -Raise awareness and promote behaviour change through communication and education		The Plan has 11 objectives, with targets and detailed implementation plans involving 40 programmes and around 120 projects.
9	Environmental Action	Sydney, Australia	By 2021 to reduce emissions in	The development of the plan included a consultation process	A number of projects has been undertaken:

	2016 – 2021 Strategy and Action Plan		city operations by 44 per cent from 2006 levels and move to 50 per cent renewable energy	in 2007 and 2008 that involved residents, workers, students, business operators, industry associations, community organisations and visitors	-Resilient Sydney: developing resilience to physical, social and economic challenges in the 21st century. -Digital city:to keep Sydney competitive in an increasingly digital world. -Business and economy: to boost the economy of central Sydney. -Communities and culture Everyone belongs and can contribute to Sydney's cultural fabric. Sustainability Our contribution to a sustainable future. Architecture and design Helping maintain design excellence standards. Transport and access Integrated transport plans for a thriving city.
10	Yokohama City Action Plan for Global Warming Countermeasures	Yokohama, Japan	The plan aims to reduce Yokohama's greenhouse gas emissions per capita by 30 percent from the 2004 level by 2025, and 60 percent by 2050.	The plan has been developed by the City of Yokohama. The city collaborates with various entities such as residents and local companies to develop and implement the objectives of the plan	The plan outlines courses of action in seven areas: citizens' lifestyles, businesses, buildings, transportation, energy, the urban environment and greenery, and the city's offices.

We have divided the lessons learnt in the following: a) scope and reasons of development of transition roadmaps; b) actors involved and their roles; c) actions to be implemented.

- **Scope and reasons of development of transition roadmaps**

The majority of the roadmaps states that climate change is one of the greatest challenges of our times and they recognise the important role of cities in supporting an energy transition. This is for example what has been stated by the previous mayor and vice mayor of Stockholm city: *'The accelerating pace of climate change is jeopardising our future and that of our children. The relentless accumulation of greenhouse gases in the atmosphere must be stopped and rising global temperatures halted. Stockholm can and must be a leader in efforts to reduce human impact on the global climate by making a successful transition from a society built on fossil fuels to one based on renewables.' Karin Wanngård, previous Mayor of Stockholm and Katarina Luhr, Vice Mayor for Environment and Climate*
Regarding the scope of the roadmaps, all analysed roadmaps take into account the **energy**, **mobility** and **waste** sectors. The Strategy for a fossil-fuel free Stockholm by 2040, for example, includes three target areas: sustainable energy use, eco-efficient transport and resource-efficient natural cycles. Copenhagen's roadmap (i.e. CPH 2025 Climate Plan) considers goals and initiatives within four areas: energy consumption, energy production, green mobility and the City Administration. The area called 'City Administration' considers the reduction of energy consumption in the City Administrations's properties and services.
In the analysed roadmaps, the scope considers mainly the city and do not take into consideration the links between the city and the broader system. For example, regarding sustainable and green mobility, the roadmaps take into consideration the mobility system within the city (e.g. increasing cycling, using new fuels in the transport sector, developing public transport, implementing Intelligent Traffic Systems and traffic information, etc.) without considering related sectors such as aviation or the transportation of goods (e.g. import-export system). There are only some exceptions, such as in the case of the Paris Climate Action Plan that takes into consideration the **food system** and aims to reduce its related CO2 emissions by, for example, promoting short supply chains and local production and by strengthening the link between local consumers and producers.
Regarding the energy sector, the roadmaps consider the energy consumption and production of residential and commercial buildings in the city but do not contemplate the transport of goods (e.g. import-export) or the energy consumption of industries in the city.
Some of the analysed roadmaps, takes into account also other sectors such as **biodiversity** and **urban reforestation**. Vancouver's action plan aims to plant 150,000 new trees by 2020 and to increase urban parks, greenways and green spaces in the city. Also Sydney city aims to plant trees and to increase habitat vegetation to support biodiversity. More specific objectives are to increase the average total canopy cover by 50 per cent by 2030 and by 75 per cent by 2050.
Some of the analysed roadmaps take into consideration also **climate mitigation and adaptation measures.** This is the case of Cape Town that it is undertaking a number of key actions to adapt to and prepare for climate change risks and challenges.
Cape Town's plan is also the only roadmap among the investigated ones that it includes as one of its goals to **improve the resilience of vulnerable communities.**
In relation to the **economic sector**, the majority of the analysed roadmaps consider the energy transition and climate protection as an opportunity for economic growth. The Climate-Neutral Berlin 2050 roadmap describes the energy transition as providing 'new opportunities for established companies'. The Copenhagen's roadmap states that 'Copenhagen sees an opportunity to become carbon neutral while at the same time generating green growth'. More specifically, most of them do not consider the overall production and consumption structures, practices and

behaviors. This means that they do not take into account how to support citizens to reduce their consumption practices or to become more conscious of their consumption behaviors (e.g. buy local food and goods, fairtrade, food produced with sustainable agriculture, etc.). Only in a few cases

Only a few of the analysed roadmaps consider to fundamentally transform the economic system towards a more sustainable, equal and circular system.

This is, for example, the case of Paris's roadmap that considers to support actions related to change food consumption of the residents and to promote the link between producers and consumers. Vancouver's roadmap promotes the development of the green economy, including jobs in clean technology and products, green building design and construction, sustainability consulting and education, recycling and composting, local food, green transportation, etc.

The developed roadmaps are not binding but they serve as an aspiration and vision to reach in the future. This means that they do not have legal power and they just serve as guidelines for the city administration to achieve a certain vision and to implement the defined actions.

- **Actors involved and their different roles**

Some of the analysed roadmaps have been developed as the result of a participatory governance approach. This is for example the case of **Paris Climate Action Plan** that it is the result of a consultation process engaging diverse stakeholders. More specifically, in the period of November 2016 and March 2017, 700 people from different societal sectors (residents, experts, representatives of associations and organisations, civil servants, etc.) have been involved in multiple meetings and discussions. The results of these discussions have been included in the development of actions as part of the Action Plan. Also in the case of Berlin (i.e. **Climate-Neutral Berlin 2050)**, the roadmapping process has been taking into account the view and perspective of multiple stakeholders stakeholders from the public and private sector and civil society.

The roadmapping process organised to set up the **Seattle Climate Action Plan** has been including multiple activities with the purpose of gathering inputs, ideas for actions and reflections from different actor groups.

The process organised to develop **Leuven 2030** roadmap brought together a diverse group of local stakeholders with the aim to create a comprehensive roadmap to a carbon-neutral future and for creating an innovative governance model to implement it. More specifically, the roadmapping process engaged around 60 experts from various fields, such as energy, mobility and consumption (mostly from the city's university, KU Leuven, but also city staff and experts from the private sector). These experts participated in multiple sessions. The inputs from the sessions were processed and resulted in the roadmap document.

In other cases, the process of development of the roadmap has been led by the municipality with the collaboration and consultation of experts. In Stockholm, for example, the roadmap (i.e. has been developed by the City Executive Board in collaboration with the Environment & Public Health Committee. In the analysed roadmaps, it is difficult to access in depth information regarding the participatory approach that have been facilitated and organised. More specifically, it is difficult to understand from the analysis of the identified roadmaps to what extent residents and local organisations have been actively involved in the process or they have been solely consulted to agree on the actions developed by the City administrations and/or related experts.

- **Actions to be implemented**

All the analysed roadmaps identify actions that are related to **mobility, energy** and **waste** sectors.

In the case of Stokholm, for example, the roadmap takes into consideration the development of actions connected to sustainable energy use, eco-efficient transport and resource-efficient natural cycles:

- **Sustainable energy use:** involves actions such as a) set up collaborations between the city and energy companies and public or private organisations (e.g. hospitals) in order to replace fossil fuel energy with renewable energy; b) develop legislations and regulations that support the use of fossil-free energy; c) implement a district heating system that reduces overall emissions by at least 240,000 tonnes of CO2 equivalent by 2020; d) impose an energy consumption ceiling of 55 kWh/m2 Atemp in new-builds on municipally allocated land.
- **Eco-efficient transport:** includes actions such as a) presenting an action plan for a fossil free road transport sector; b) investigating the feasibility of prohibiting the sale of fossil fuels by 2040, with a sub-target for 2030; c) reduce road traffic sufficiently for CO2 equivalent emissions to fall by at least 80,000 tonnes and reduce the use of fossil fuels for road traffic to eliminate at least 140,000 tonnes of emissions.
- **Resource-efficient natural cycles:** actions refer to a) investigate the potential for reducing the amount of fossil plastic in incinerated waste; b) increase biogas production to a level sufficient to correspond to an overall reduction of 20,000 tonnes of CO2 equivalent.

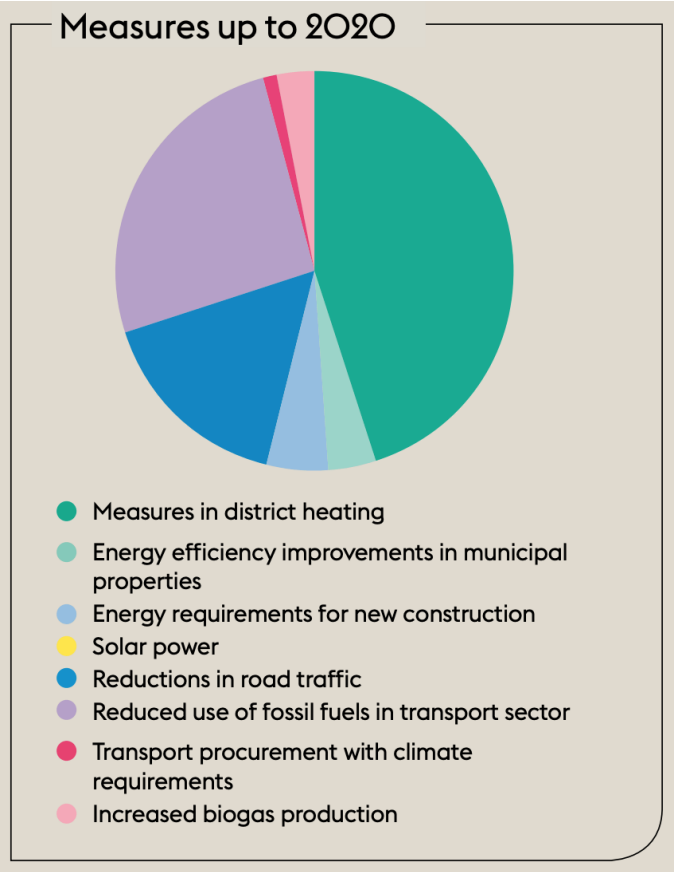


Figure 2. Summary of Stockholm's priority actions up to 2020.

Also in the case of the **CPH 2025 Climate Plan** for Copenhagen city, the listed actions refer to energy consumption, energy production and mobility. Additionally, the plan takes into consideration actions related to city administration initiatives.

- **Energy production:** considers actions such as installing land wind turbines within the city and other municipalities, developing offshore, biomass power generation, treatment of

organic waste and separation of plastics from domestic and commercial waste, and ensuring district heating is carbon neutral. According to the plan, 80% of greenhouse gas reductions will come from changes to energy production. One of the described projects is BIO4, a new biomass-fired combined power and heat unit, replacing a coal fired power plant, and wind farms at sea and on land.

- **Energy consumption:** refers to actions to reduce heat and electricity consumption (by 20% for commercial and 10% for residential buildings) including improvements for the construction sector, energy efficient buildings, and increasing solar cell coverage to supply 1% of consumption. One of the initiatives is the 'Energy Leap' project that aims to encourage large building owners to make energy savings and to promote energy efficiency improvements in buildings.
- **Green mobility:** considers actions aiming at improving public transport and cycle infrastructure by developing partnerships, using new fuels like hydrogen and biofuels, establishing intelligent traffic management, and influencing behaviour change through mobility programmes and 'attitude training'. By 2025 75% of all trips in Copenhagen should be on foot, by bike or public transport. One of the concrete project considers replacing diesel buses with carbon neutral buses, and Mobility as a Service (MaaS) which will provide residents and visitors with easier access to all forms of public transport.
- **City administration initiatives:** are actions with the purpose of reducing energy consumption by street lighting and municipal buildings by 40% and by installing solar panels on municipal buildings, shifting to non-polluting municipal fleets and sustainable procurement. One of the initiatives include new requirements for non-road mobile machinery in construction projects the City of Copenhagen is involved in.

Leuven 2030 roadmap is organized into 13 separate programmes, covering 10 thematic areas (energy, mobility, consumption, etc.) and three cross-cutting themes: governance and financing, engagement and social justice, and data and monitoring. Each programme is organized into multiple project clusters focusing on specific parts of the programme challenge and includes co-ordinators from a variety of public and private sectors. The Roadmap provides a framework for accelerated action and engaging key local stakeholders including not only actions intended for the city government, but also actions for private and other public actors. The entire Leuven community is engaged in the process of tackling climate change. Some of the achievements of Leuven 2030 are the following:

- Some parts of the Roadmap have been included into the city's policy plan 2019-2025. This is the result of the advocacy activities of Leuven 2030 for integrating the Roadmap within the policy plan during the plan-making process and through the participation in multiple discussions with city officials;
- Leuven 2030 found 16 individuals to implement the Roadmap.
- The Roadmap generated new momentum for climate action.

Other identified actions refer also to other sectors such as **food, governance and urban planning**.

The roadmap developed by Paris considers more than 500 municipal actions, organised around three timelines. By 2020, the city will accelerate the actions of the previous Climate Plan, reducing GHG emissions and energy consumption in Paris by 25% compared to 2004 levels and reaching a 25% share of renewable energy powering the city. By 2030, an operational action plan will be put in place to deliver the objective of reducing GHG emissions by 50%, reducing consumption by 35% and reaching a 45% share of renewable energy in the city. Finally, the goal for 2050 is to build a carbon neutral city, 100% reliant on renewable energy. Participants in the consultation process for the development of the Paris identified three priority themes for the

Plan: a sustainable food system, energy sobriety and territorial adaptation. Several proposals submitted by citizens were added to the Climate Action Plan, including a study for the implementation of a food donation platform from private individuals to the people in greatest need and the possible extension of connections for the t+ transit tickets between the tramway, bus, Metro and RER.

Regarding the **food sector**, the Paris's roadmap take into consideration that the food sector is responsible for almost 18% of the Paris carbon footprint. The Paris Climate Plan's aims to improve the food system in Paris and France by developing different actions. One of the actions refer to promoting short supply chains and local production by strengthening the link between consumers and producers and by eliminating barriers that hinder changes to the local agricultural system. Other actions listed in the roadmap consider to raise awareness about agricultural professions and food by setting up urban educational farms in Paris green spaces; to promote sustainable food consumption and flexitarian and vegetarian diets. In addition, on 3 May 2018 the Paris Council adopted the Paris Strategy for Sustainable Food based on stakeholders consultations conducted in 2017 and considering 40 actions across 4 main themes.

Also Vancouver's roadmap considers the development of actions related to the improvement of the food system. One of the actions described in the roadmap includes to draft a municipal food strategy to coordinate all aspects of the food system. This action aims to create linkages across City departments and to the Vancouver Food Policy Council, community partners, and other programs so that their efforts can strengthen one another and help us move more effectively toward the 2020 target. Another action refers to grow more food in the city through the promotion of urban agriculture, community gardening and urban farming. This also includes a plan to expand the number of farmers markets within the city. In all cases, the City will work with the Park Board, neighbourhoods, and landowners to determine the location and process for implementation of these resources. In addition the roadmap aims to make local food available in community centres, parks, neighbourhood houses, and other City-run facilities through a local food procurement plan. The City aims to use its significant purchasing power to buy just, sustainable, and locally produced food products.

Some of the analysed roadmaps take also into consideration actions related to **biodiversity** and **urban reforestation.**

In the case of Vancouver, for example, one of the high priority actions related to access to nature and reforestation is to create four to six new mini-parks by converting street right-of-ways to parks. These parks are developed in consultation with the local community to determine their use as community gardens, plazas, local orchards, community yards, or naturalized habitat. Another actions regard to acquire new parks in priority neighbourhoods and to plant 15,000 new trees on city land and other public property.

Some of the analysed roadmaps also consider the development of actions related to the **economic system.**

Vancouver's roadmap takes into consideration a number of actions to promote the Green Economy:

- Develop programs to support each of the five green job clusters that the City has identified as priorities. Programs might include research, technology hubs, business incubators, and network development.
- Establish a Green Enterprise Zone. This area would make the Downtown Eastside and False Creek Flats the "greenest place to work in the world" by focusing green companies and organizations, green infrastructure, as well as innovations in building design and land use planning in one location. The lessons learned from this zone would then be applied city wide.

- Deliver a business engagement program. This program can help Vancouver businesses make measurable improvements to their environmental performance and improve productivity and competitiveness.

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APPENDIX A

Factsheets on innovative energy practices

Funded by the H2020 programme of the European Union

DECEMBER 2019

TOMORROW

A neighbourhood's cooperative for heat recovery

AMSTERDAM, THE NETHERLANDS

KEYWORDS: COMMUNITY ENERGY

DURATION: Since 2014
WHO: Neighbourhood cooperative, companies and residents
BUDGET: Unknown

SUMMARY

The residents of the Middenmeer area in Amsterdam have discovered an energy source in their neighbourhood: heat released from the cooling of computers of the Equinix company, specialized in internet connection and data centers. A group of residents, therefore, created a cooperative, MeerEnergie, to investigate the feasibility of implementation of a project to transform the data centre's heat into heating for the local households. To that end, they started to collaborate with Equinix and Alliander, an energy company that develops and operates energy networks

GOALS

- Reduce the consumption of natural gas;
- Promote the development of an energy network that is cost neutral for residents;
- Reduce the impact of the neighbourhood on the environment by promoting the consumption of heat that otherwise would be wasted
- Develop an inclusive cooperative in which neighbours residents, companies and housing companies can become co-owners of the heat network;
- Use the cooperative as a starting point for future sustainable initiatives in the neighbourhood (e.g. energy-saving and solar energy projects)

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

- MeerEnergy cooperative has been created in order to make the data centre heat available for household consumption.

- MeerEnergie is engaging local residents in different ways and it is giving them different options to participate: some members can invest and can expect returns at a later stage while other members only participate to purchase heat. The idea behind this choice is to make the cooperative open and inclusive to all the neighbours and other local stakeholders.

> *"This is the first time that we are looking for cooperation with a resident cooperative at the scale level of an entire neighbourhood, to investigate how we can organise locally managed energy provision. How that will work out, we don't know yet (...) we learn a lot from what we are going to do here. We will use that knowledge and experience to make Amsterdam natural gas-free"*
>
> → Marieke van Doorninck, Alderman for Sustainability

- MeerEnergie cooperative has initiated the collaboration with relevant local stakeholders like the municipality, Equinix company, Alliander energy company as well as housing corporations. These actors are willing to collaborate and they consider MeerEnergie as an important pilot project that can be implemented in the future in other areas of the city. Equinix company has agreed on releasing the heat without costs and Alliander will be working on the development of the grid together with the MeerEnergie cooperative.

- Additional research and technical analysis still need to be conducted in order to install the heat network.

TRANSFORMATIVE POTENTIAL

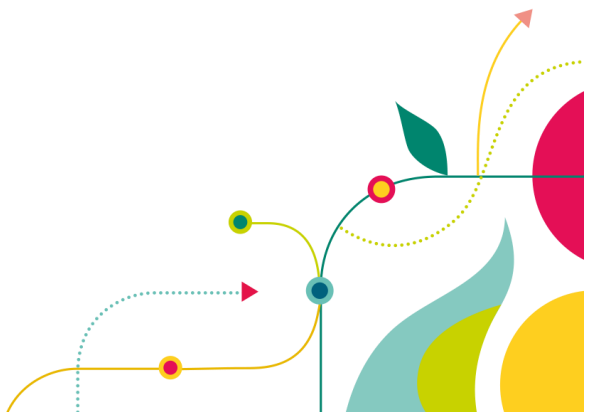
MeerEnergie is an example of a neighborhood cooperative promoting an innovative model of energy consumption and ownership. It can be considered as a pilot project for developing alternatives to the current heat markets in cities, for accelerating the energy transition and for exploring new forms of energy governance. MeerEnergie successfully developed collaborations among different local stakeholders: local residents, the municipality, energy company and a business. The combination of a technical solution to reduce energy with the development of local multi-actor collaborations has the potential to be replicated in other contexts.

MORE INFORMATION

MeerEnergie website (in Ducth)

Interview to MeerEnergie initiators

Article in de Brug Magazine (in Ducth)



A city lab for Antwerp

ANTWERP, BELGIUM

KEYWORDS: COMMUNITY ENGAGEMENT

DURATION: from 2013 onwards
WHO: City Council, citizens and other stakeholders
BUDGET: Unknown

SUMMARY

"Stadslab2050" is an urban living lab located in Antwerp. It is a space open to collectively develop new ways of thinking and doing, while contributing to building a sustainable future for the city. The lab has been initiated by the Municipality and brings together individuals from within and outside the city to co-create knowledge, network and develop new innovations and projects. The lab plays a key role in creating a diverse network of (social) entrepreneurs, citizens, civil servants, academics and other stakeholders to find new ways of looking at challenges and create new solutions. Individuals and organisations can participate in "Stadslab2050" by joining one of the workshops or by submitting a project during the open calls for projects.

GOALS

- Support the city of Antwerp to become CO2 neutral by 2050;
- Contribute to make Antwerp a more sustainable and liveable city;
- Generate creative processes of thinking and acting for building a sustainable future of the city;
- Create a diverse network of citizens, policy makers, entrepreneurs and other stakeholders to generate new ideas and solutions to address complex sustainability problems;
- Include citizens and other stakeholders in the urban policy-making process;
- Generate a space for synergy, creativity and innovation by addressing these three core goals: solve, learn and connect.

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

"Stadlab2050" provides the space for initiating and reinforcing partnerships and collaborations among citizens, companies, public institutions and other stakeholders contributing to build a sustainable city. The initiative provides a testing ground for innovations, offers a toolbox of methods and techniques in order to transform ideas into realistic and feasible initiatives. It is an urban laboratory aiming at addressing sustainability challenges, currently experimenting on diverse topics such as climate adaptation, energy, circular economy and mobility.

Stadslab is composed of three main groups:

- "Urban laborants": participants in the Stadslab with different backgrounds and level of expertise, who team up for testing the innovations and provide collective feedback.
- Strategic partners: the Municipality is the initiator of the Stadslab, but it is constantly searching for the cooperation of partners for collectively solving complex urban issues.

> *"One of the hidden gems of the city is the Stadslab2050. A lab that, unlike the central administration, has a lot of room for experimentation and dares to look openly to the future. I recently tweeted: 'Stadslab2050 makes Antwerp people proud again', and I still confirm that today"*
>
> → Gert Vandermosten, Stadslab2050

- Project team: municipal staff and external consultants, supporting the "urban laborants", guiding and facilitating the process of testing innovations and managing the Stadslab network.

TRANSFORMATIVE POTENTIAL

Stadslab2050 enhances the collaboration and co-creation of knowledge among multiple stakeholders for addressing complex sustainability challenges and contributing to build a more sustainable and carbon neutral city. Stadslab2050 represents an interesting example of an urban living lab. Urban living labs in general have a transformative potential since they enable synergies among diverse actors that normally are disconnected. These labs provide spaces for developing new ideas, critical reflections and actions by bringing together different perspectives, background and knowledge.

MORE INFORMATION

Stadslab2050 website (in Dutch)

Antwerpen Morgen (in Dutch)

Flemish Government website (in Dutch)

Bristol Green Capital Partnership

BRISTOL, UK

KEYWORDS: GOVERNANCE; GREEN PARTNERSHIP

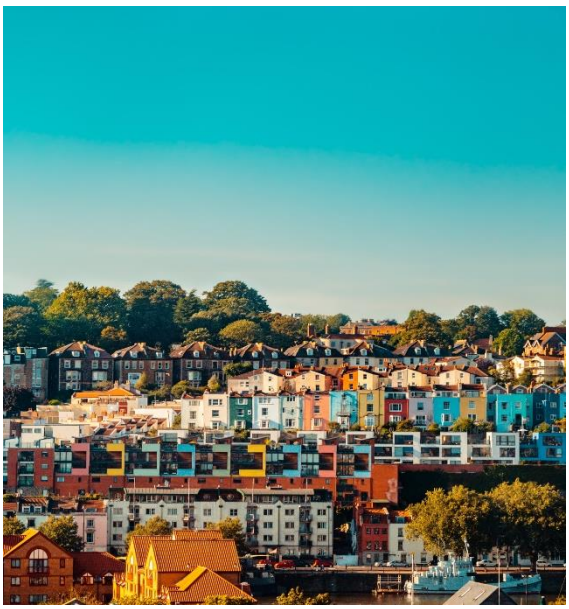
DURATION: Since 2007
WHO: more than 900 local member organisations
BUDGET: Donations, crowdfunding

SUMMARY

Bristol Green Capital Partnership (BGCP) is a Community Interest Company, an organisational model supporting social enterprises to work for community benefits. BGCP has been founded in 2007 and brings together different partners and organisations to develop and run multiple projects with the aim of building a more sustainable and equal Bristol. The first ideas for the development of the Partnership emerged in October 2006 during a debate about how to make Bristol a "green capital". The projects developed through the Bristol Green Capital Partnership are very diverse and support (social) innovation, enable inclusive collaboration, build capacities of organisations and individuals and enhance sustainable lifestyles. Bristol Green Capital Partnership allowes Bristol to win the Green Capital Award in 2015 by building a network of grassroots initiatives and other local organisations, businesses and two universities.

GOALS

- Work towards the city of Bristol as a more sustainable and low carbon city powered by renewable energy based on a circular economy, where citizens are aware of the importance of reducing, re-using and recycling resources and goods and based on sustainable food and mobility systems;
- Enable collaborations and collective actions across diverse sectors and provide leadership for making Bristol more sustainable and equal;



Funded by the H2020 programme of the European Union

TOMORROW

- Foster environmental sustainability and equality through the development of multiple projects, activities and collaborations in Bristol and the West of England.

HOW IT WORKS

The organisational structure of BGCP includes an executive team (Chief Executive, Operations Manager and Development Manager) running activities, projects and events in collaboration with the different partners, and a Board of Directors, governing the organisation.

The Partnership is a collaborative effort supported by the different member's organisations that provide financial and other types of support.

> *"Bristol Green Capital Partnership Community Interest Company works with partners to deliver a range of projects and initiatives that support the vision and mission of the Partnership – supporting innovation, enabling inclusive collaboration and promoting ambitious change."*
>
> → BGCP

Bristol Green Capital Partnership has resulted in many concrete actions, most importantly through multiple projects, such as:

- Better Bristol Campaign, providing local sustainability organisations and groups with the opportunity to raise funds for their projects through a combination of crowdfunding and match funding.
- The Green & Black Ambassadors initiative addressed the exclusion of black and minority ethnic communities in Bristol, by conducting Community Action Research, creating media projects and radio shows, running leadership trainings and other activities.
- Healthy City Week (in 2015, 2016 and 2017) offered a platform for individuals, organisations and communities to exchange ideas, develop collaborations and explore the intersections between the environmental sustainability of Bristol and the health of its citizens.
- Bristol WORKS connects organisations with young people in search of work experience in the field of environmental sustainability.
- Skills Bridge supports the establishment of collaborations on sustainability projects between members of the Partnership and the associated Universities in Bristol. It brings together both university students and community partners.
- Green Mingle offers individuals, organisations and members of the Partnership the opportunity to network, exchange ideas and make connections.
- Stepping Up is a leadership and career progression programme for individuals from a Black, Asian, Minority Ethnic (BAME) background with the aim to unlock their talents and potentials.

- Sustainable Development Goals aims at encouraging the adoption of the SDGs in Bristol city. The Partnership is one of the local stakeholders that formed the Bristol SDG Alliance to drive the definition of a policy framework for long-term city/region development and resilience, monitor progress and hold the local government accountable. It thus connects community and city-level actions to national and global challenges.
- URBAN ID aims at developing an integrated diagnostics framework and method to diagnose key urban challenges and to build a more resilient, sustainable and healthy city.

TRANSFORMATIVE POTENTIAL

This Partnership connects a diversity of organisations and individuals working towards a shared goal. It also moves beyond the "good intentions", to actual implement different projects. To live up to their transformative potential, it is important to carry out a proper monitoring of the progress and the connection between the different activities to ensure synergies and tipping points.

MORE INFORMATION

Bristol Green Capital Partnership website

Bristol Green Capital Partnership Annual Review 2017/2018

Our Future - A Vision for an Environmentally Sustainable Bristol

Fossil-free energy district

GOTHENBURG, SWEDEN

KEYWORDS: DIGITAL MARKETPLACE; ENERGY TRADING

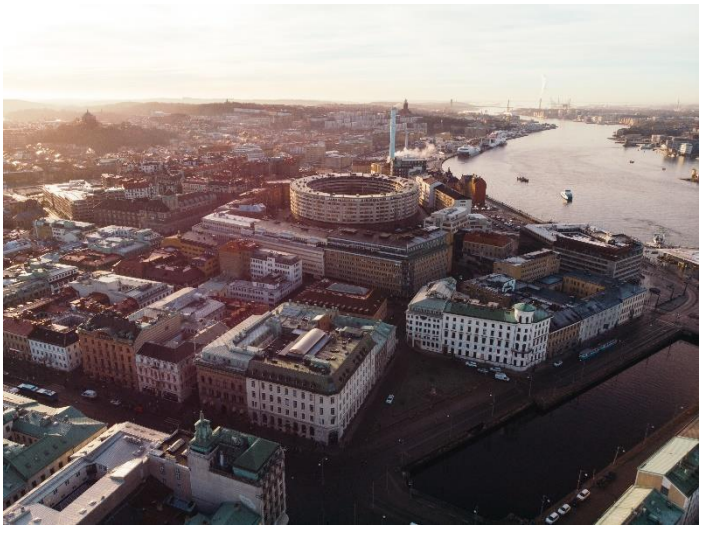
DURATION: From 2017 to October 2019
WHO: Municipality, energy companies, universities and research centres.
BUDGET: 5.8 million Euro (co-financed by the European Regional and Development Fund - Urban Innovative Actions Initiative)

SUMMARY

The Fossil-free Energy District (FED) project has been developed between 2017 and 2019 by nine local partners in Gothenburg representing academia, industry and municipality (e.g. property owners, global ICT provider Ericsson and Gothenburg's municipal energy company, Göteborg Energi). The FED project has tested a local digital marketplace at Johanneberg Science Park as part of Chalmers University of Technology that integrates district cooling, district heating and electricity into a single system.

GOALS

- Reduce the use of energy and the dependence on fossil fuel in the built environment;
- Support the energy transition in urban areas by developing, demonstrating and replicating a novel district level energy system, integrating electric power, heating and cooling;



Funded by the H2020 programme of the European Union

TOMORROW

- Establish a digital marketplace that allows buildings to automatically trade energy among themselves;

- Foster the energy transition in other areas by serving as an example for other cities.

HOW IT WORKS

- Setting up the FED demonstrator area was the first step. It provided the opportunity to test and validate a local energy market. The area is located at a campus (Johanneberg Science Park as part of Chalmers University of Technology) with around 15000 end-users including energy infrastructure, property owners and users, prosumers, and buildings with different needs and usage profiles. The existing energy system in the campus was equipped with heat pumps, additional solar PVs and energy storages.

> *"The FED project confirms Gothenburg as a frontrunner in developing the energy solutions of a fossil-free society (...) Hopefully, this model will prove capable of speeding up the energy transition across Europe"*
>
> → Ann-Sofie Hermansson, Mayor of Gothenburg

- The second phase consisted in the development of the FED System solution, providing a connection between the energy system and the local energy market: it consisted in an automated ICT solution developed by Ericsson company where AI-agents trade energy on behalf of the different market actors, like buildings consuming and/or generating energy.

- In parallel, the project set up a FED Business solution to create new sustainable markets by involving local stakeholders to use FED as a testbed. Five companies have already tested their products in the FED-system.

The project has developed a replication strategy offering insights on drivers, barriers and policy recommendations for the local, national and EU levels. The feasibility of scaling the FED solution in other contexts depends on the presence of existing energy infrastructures and on political, regulatory and societal aspects. Twelve new projects based on the FED-testbed have started. Six of these projects are EU-funded projects that will use the FED outcomes in different ways. Another plan for the future consists in making the campus of Johanneberg together with nearby buildings to become a testbed for local sustainable energy systems.

TRANSFORMATIVE POTENTIAL

The FED project represents an innovation fostering urban energy transitions by piloting a scalable and replicable solution for energy efficiency and smart energy management in the housing sector and in public infrastructures. Its transformative potential is demonstrated by the replication activities that have been already carried out by other projects. FED provided insightful recommendations on how to facilitate its replication in other cities such as on how to engage the different local stakeholders or on how to increase the flexibility of local energy systems for providing the conditions for new business models.

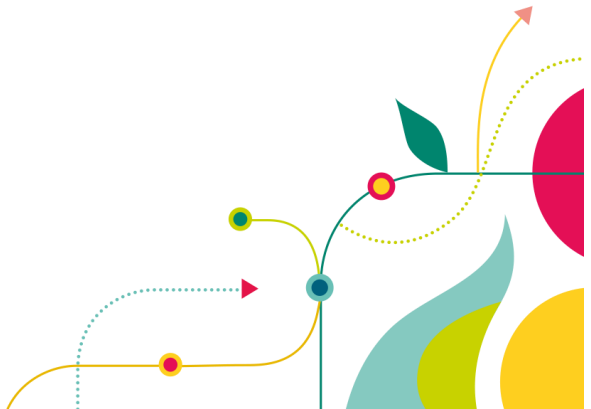
MORE INFORMATION

Project's website

Urban Innovative Actions

FED book

FED Policy Recommendations



A Great Debate to accelerate the energy transition

NANTES, FRANCE

KEYWORD: PARTICIPATORY GOVERNANCE

DURATION: since 2014
WHO: Citizens, communities, companies and municipalities
BUDGET: Unknown; co-financed by the European Regional Development Fund

SUMMARY

The metropolis of Nantes turned the energy transition into an opportunity to work on the future of its territory by opening the energy debate and enabling the collaboration between citizens, municipalities, companies, NGOs and other stakeholders. In 2014, Mayor Johanna Rolland and 23 fellow mayors in the Metropolitan Council decided to mobilise a broad range of stakeholders to co-create a common vision to accelerate the energy transition. On April 29, 2016, the council unanimously voted to develop "Le Grand Debat" (The Great Debate), taking local stakeholders' perspectives into account and promoting initiatives related to the energy transition.

GOALS

- Support multiple stakeholders of the territory to collaborate in the co-creation of the energy transition roadmap for the region;
- Accelerate the energy transition and ensure that it can benefit to all local inhabitants;
- Build the foundations for future citizen participation and active engagement of stakeholders.

Credits: City of Nantes

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

- A participatory process was organised over a period of seven months from mid-September 2016 to March 2017 and involved 53,000 participants and 11,000 contributors from 270 different organizations.

- The process included 80 events, organized within all of the 24 municipalities of the Nantes Metropolis area. The participatory process was organised under the watch of an independent commission of four citizens who took care of the management and transparency of the process as well as the production of a final report called "Le Grand Debat".

> *"The roadmap "Nantes, metropolis in transition" affirms a collective ambition that builds on the singularities of an energy transition in Nantes, as they clearly emerged in the debate: a 100% citizen transition, a transition for the benefit of all residents, a transition that values local resources."*
>
> → Johanna Rolland, Mayor of Nantes

- One of the results of "Le Grand Debat" consisted in the development of experimentation activities by 500 citizens with new ways of implementing the energy transition on Nantes' territory. These activities resulted in the launch of 10 crowdfunding campaigns, the development of 5 new projects, the evaluation of 12 projects led by the Nantes Metropolis and the creation of an "energy conservation" guide.

- The final report of "Le Grand Debat" on the energy transition was published in September 2017. The report led to the citizen-only commission calling on the Metropolitan Council and local stakeholders to produce a shared roadmap, which was then adopted unanimously by the Council on February 16, 2018.

- The Roadmap considers an energy transition that provides benefits to all the inhabitants and specifically focuses on mobility and housing issues, valorises 100 percent of local renewable resources and promotes social equality. The roadmap includes 15 ambitions and 33 commitments representing the starting point of a series of actions to be developed with the inhabitants and actors of the territory.

TRANSFORMATIVE POTENTIAL

Other cities have been inspired by "Le Grand Debat" process and they have implemented similar processes of multi-stakeholders participation and citizens' empowerment, such as in Cadiz or Viladecans (both in Spain). "Le Grand Debat" represents an inclusive and democratic effort for

producing a shared roadmap. In the time to come it will be interesting to understand how the implementation will benefit (or not) from this broad set-up.

MORE INFORMATION

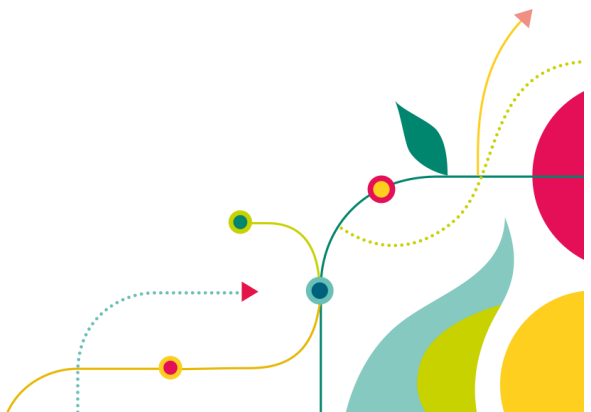
Le Grand Debat website (in French)

Roadmap report from the Nantes Metropolis (in French)

Official website of the city of Nantes

Dialogue Citoyen website (in French)

Promotional Video (in French)



ElektrizitätsWerke Schönau: a citizens-driven energy company

SCHÖNAU, GERMANY

KEYWORDS: COMMUNITY ENERGY;

DURATION: Since 1997
WHO: Energy company and residents
BUDGET: Unknown

SUMMARY

Elektrizitätswerke Schönau (EWS) is an energy supply company located in Schönau (Germany) in the Black Forest region. It was established in 1994 by a group of citizens - the "Parents for a nuclear-free future" association. The company operates the local power grid, sells green electricity throughout Germany and advocates a renewable energy supply. Since 1988, the changes in the regulation of the electricity market allowed EWS to supply its costumers with electricity generated from renewable and cogeneration sources. These sources are photovoltaic, wind energy, biogas, hydropower plants and power from small cogeneration units (generation of electricity and heat in just one device). Later on, EWS became a national scale electricity supplier. The company's model is not only based on obtaining energy from renewable sources but also promoting the reduction of energy consumption and advocating for the energy transition.

GOALS

- Contribute to the energy transition by generating 100% renewable energy in Germany;
- Decentralise the generation of energy, promote energy savings and increase energy efficiency;
- Subsidise the installation and use of cogeneration units and actively promote the creation of local energy cooperatives;
- Generate new jobs by decentralizing the energy and by promoting a sustainable economic model.

Credits : EWS

- Remain visible and active in the public sphere by campaigning against nuclear energy and by contributing to political debates on the energy transition.

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

- A group of anti-nuclear activists created EWS as a small and local renewable energy supplier. The first action they implemented was to take over the local grid to make it available for community use.

- When the German electricity market was deregulated in 1998, EWS took the opportunity to supply customers in Schönau exclusively with electricity generated from renewable and cogeneration sources.

> *"...Our cooperative is committed to the energy transition and a complete and efficient energy supply based on renewable energies. Civic engagement, codetermination and decentralization are among the cornerstones of our entrepreneurial activities"*
>
> → ElektrizitätsWerke Schönau

- In 1999, when the German electricity market was opened up to private households, EWS began to supply customers with green electricity on a nationwide scale.

- EWS activities, based on rigorous environmental criteria, are the following: exclude the supply of electricity from nuclear and coal-fired power plants, subsidize renewable energy systems, reduce electricity consumption and develop climate-friendly cogeneration units.

- EWS supplies approximately 160,000 households in about 800 grid areas across Germany. Since March 2015, EWS has been selling gas on a nationwide scale, serving around 11,000 natural and biogas customers.

- Since 2011, EWS has created a new legal entity: EWS Energie GmbH that designs, funds, builds and operates environmentally friendly power generation units. EWS Energie aims to subsidise local cooperatives and gives the opportunity to local citizens' energy co-operatives to acquire shares.

EWS supports the local economy by creating jobs, business activities and tax revenues for the local authority. The town council of Schönau has become highly aware of sustainability issues and has adopted a sustainable development political strategy.

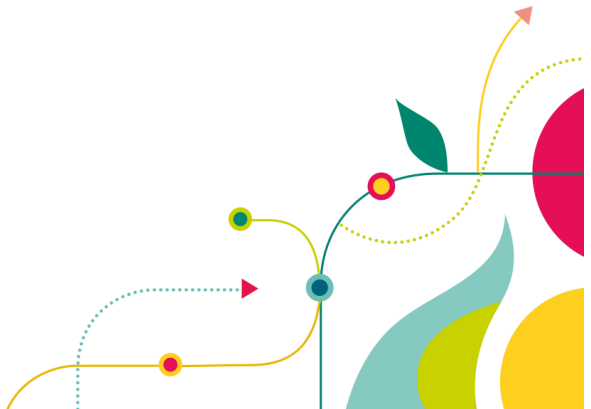
TRANSFORMATIVE POTENTIAL

EWS is more than an energy supplier: the company aims to foster a deep change in society by encouraging citizens to take action towards the energy transition.
The company contributes to accelerate sustainability transformation by fostering community participation in energy prosumerism and by engaging the local authority. EWS shows the potential of bottom-up initiatives to be scaled at the national level and to increase sustainability awareness of local authorities and residents as well as contributing to enhance the local economy. The EWS model can be inspiring for grassroots innovations or companies that could replicate this model in other contexts.

MORE INFORMATION

ElektrizitätsWerke Schönau's website

The Energy Transition Chronicles, Energy Cities



Financial schemes for home renovations

DELFT, THE NETHERLANDS

KEYWORDS: ENERGY EFFICIENCY, SUSTAINABLE BUILDINGS

DURATION: Since 2006
WHO: City Council, citizens and other stakeholders
BUDGET: €3.5 millions in 2015

SUMMARY

In 2003, Delft adopted a Local Energy Action Plan with the aim of reducing CO2 emission and increasing the consumption of renewable energy. As a follow-up action of this plan, in 2003, Delft set up the Delft Climate Investment Fund (DCIF) including a budget of €12 million to invest in the built environment (e.g industrial buildings, office buildings, new housings, social housing companies, etc.). This fund was not including existing private residential buildings and there were no financial instruments available to private homeowners. For this reason, in 2006, the city council of Delft set up financial instruments with the aim of encouraging residents to invest in renewable energy and energy-saving measures: a revolving fund and a soft loan scheme.

GOALS

- Contribute to achieving the goals defined by the Local Energy Action Plan adopted in 2003: decrease the energy consumption of Delft by 15%; reduce CO2 emissions by 15%; cover 5% of total energy consumption with renewable energy;
- Encourage residents to invest in renewable energy and energy-saving measures;
- Integrate tailor-made financial incentives with non-financial incentives such as communication campaigns and technical assistance for homeowners.

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

In 2006, the Municipality set up a revolving fund and a soft loan scheme with the seed money of €200,000. The Fund has been growing and in 2013, its value reached €500,000. For the first 9 years, the fund was under the direct control of the city's financial department.

In 2015 the Fund merged with other municipal revolving funds.

In the same year, its management was taken over by the bank Stichting Volkhuisvesting Nederland (SVn), but the decision making power stayed with the Municipality. This way, the Fund is more flexible as it does not need to undergo regular administrative procedures linked to municipal budget negotiations and allocations.

The Delft Revolving Fund has been funded by the city of Delft using its own budget. It issues low-interest loans on attractive terms to homeowners.

The following steps were taken to implement Delft's Revolving Fund:

- A team of experts with different backgrounds (e.g. financial, juridical, communication and environmental) was created to examine the options for a financial instrument and to encourage private homeowners to apply for the fund by offering advice and support.
- Since 2010, the municipality has launched a communication programme to stimulate awareness and activate investment in energy-saving measures. More specifically, a communication campaign "Delft wordt Groen" (Delft becomes Green) was launched on Facebook to raise awareness and stimulate action. The soft loan scheme is promoted more discreetly, as the municipality do not want to encourage citizens to live 'on credit'.
- The city of Delft has signed agreements with two organisations playing the role of local Energy Advice Centres: the cooperative Delft E Design and the company Reimarkt Delft. These organisations provide energy advice to homeowners and guide them in the process of house renovation. The city of Delft is also cooperating with other local stakeholders such as the Technical University of Delft, energy companies, etc. Homeowners can find all the information regarding the criteria and procedures to obtain the loan on the city's website. The homeowners can also download the loan application form. If they wish, they can get support from Delft E Design or Reimarkt Delft but they can also hire another advisor or make their own renovation plan.

- Once the homeowners apply for receiving a soft loan, the City board needs to make a decision in a maximum of eight weeks. The maximum loan amount is € 10,000. A higher amount is possible only in case of special requests. The interest rate is 4% lower than the market (10-year interest) with a minimum of 1.5%. Once the loan is approved and granted, the process of renovation can start. Delft E Design or Reimarkt Delft support the homeowners in the process of renovation.

Since 2006, the municipality has approved 35 loans for a total amount of €400,000. The total costs of measures carried out were €500,000. The municipality does not monitor results in terms of energy savings or type of households who took a loan. It has set the minimum value for insulation measures and can thus estimate energy savings.

TRANSFORMATIVE POTENTIAL

Implementing financial instruments to encourage residents to invest in renewable energy and energy-saving measures represent an important potential for reducing CO2 emissions in urban areas. Other cities have been implementing similar projects, including Riga (Latvia), Parma (Italy), Frederikshavn (Denmark), Bordeaux Metropole (France). These cases, in which tailor-made financial incentives like soft loan financing schemes have been used in combination with non-financial incentives such as technical assistance and communication campaigns show how to effectively motivate homeowners to invest in more sustainable measures for their houses.

MORE INFORMATION

Delf city website

Energy Cities' website

Infinite Solutions project

Neighborhood Power for renewable energy

GHENT, BELGIUM

KEYWORD: COMMUNITY ENERGY; ENERGY POVERTY

DURATION: Since 2018
WHO: City Council, citizens, energy cooperatives, distribution system operator, university, social protection association
BUDGET: Unknown

SUMMARY

In 2018 the city of Ghent initiated a participatory process engaging different local stakeholders that launched the “Buurzame Stroom” (Neighbourhood Power in English) pilot scheme. This project has been organised with the collaboration of different partners: Ghent University, two energy cooperatives, a social protection association and the local distribution system operator. “Buurzame Stroom” aims to increase the production of local renewable energy in Dampoort-Sint-Amandsberg neighbourhood by installing as many solar panels as possible and distributing the costs and revenues fairly in the community.

GOALS

- Maximize the potential for locally generated energy in the neighbourhood;
- Make Dampoort-Sint-Amandsberg a green energy district by installing around 5000 m2 of solar panels by the end of 2019;
- Produce ecological, social and economic benefits by making solar energy affordable and profitable to a large group of stakeholders and by optimising energy production at the local level;
- Facilitate a collective and participatory approach promoting a sense of community in the neighbourhood.

Credits: Buurzame Stroom

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

- The project has been engaging residents of the area with various profiles including vulnerable groups. It has been considering different types of buildings with different ownership structures.

- Participants in the pilot project can invest themselves or rely on an external financier. They can "equally share the costs and benefits without having to expand the present electricity grid".

> *"Without Neighbourhood Power, I would not have thought that solar panels were an affordable option for me. I quickly got a view of the real costs for an installation tailored to my consumption."*
>
> → Buurzame Stroom Participant

- Residents can choose to install solar panels on their roofs. If they decide not to, they can still register to participate to experiments on the energy network of the future - "WiseGRID" (e.g. digital 'smart' meters, home batteries, etc.).

The different partners of the project play different roles:

- The Municipality of Ghent is coordinating the project, initiating collaborations with multiple stakeholders and initiatives and mediating potential tensions arising among the different partners of the project;

- The two energy cooperatives provide engagement opportunities to residents. Ecopower (the largest energy cooperative in Belgium) plays the role of aggregator, empowering households to improve their knowledge on their energy consumption through demand response management via smart meters and open data applications. EnerGent sells photovoltaic panels to the residents and supporting them in investing in solar power production;

- Ghent University is a neutral contributor providing advice and knowledge;

- The social protection association engage the most vulnerable groups in the neighbourhood such as migrant families, inhabitants in transit and elderly people.

TRANSFORMATIVE POTENTIAL

The "Buurzame Stroom" project represents an innovative community energy pilot-scheme supporting a social, economic and environmental transformation of neighbourhoods.

The project represents an important experimentation supporting the creation of multi-actor collaborations and the development of new frameworks, regulations and business models to produce affordable and renewable local energy. The Municipality of Ghent has been playing a key role in initiating and maintaining collaborations and partnerships and integrating technical solutions with a participatory governance approach.

MORE INFORMATION

Buurzame stroom website (in Ducth)

Ghent Klimaat stad website (in Ducth)

Green Participatory Budget

LISBON, PORTUGAL

KEYWORDS: URBAN GOVERNANCE; PARTICIPATORY DEMOCRACY

DURATION: Since 2019
WHO: City Council, citizens
BUDGET: €5 million by South Pole and EIT Climate-KIC's City Finance Lab

SUMMARY

Participatory budgeting represents a form of citizen participation through which citizens have effective decision-making power over a portion of the Municipal Budget. In 2008, Lisbon City Council has introduced it in Lisbon. Citizens can submit proposals for the development of project in the city, and citizens vote on projects that they want to see included in the Lisbon City Council Activity and Budget Plan the following year. So far, approximately 1'950 projects have been funded. Since 2019, participatory budget has been labelled as 'green', meaning that the budget has been destinated to fund project proposals with the aim to contribute to sustainability and climate change mitigation and adaptation in Lisbon. This means that projects on sustainability and climate action are integrated into the city's Participatory Budget (PB), called the Lisbon Climate Citizenship Commitment.

GOALS

- Promote citizens' engagement and participation in the decision-making process of the city and contribute to civic education by enabling citizens to integrate their personal concerns with the common good, understand the complexity of problems and develop attitudes, skills and participatory practices;
- Accelerate the investments in projects related to sustainability and mobilise private investments for these projects;

Funded by the H2020 programme of the European Union

TOMORROW

- Integrate projects on sustainability into Participatory Budget, and increase the resources allocated by the City to new participatory instruments (e.g. PBs for schools);

- Encourage dialogue between citizens, public officials and civil society organisations in order to develop the best solutions to the problems taking into account available resources;

> *"Lisboners know better than anyone about the needs of their city. They live it daily, so their opinion is important"*
>
> Fernando Medina, President of Lisbon City Chamber

- Adapt municipal public policies to people's needs and increase the transparency and accountability of the municipality's activities.

HOW IT WORKS

Lisbon's Participatory Budgeting is structured into different phases:

- Process Preparation: preparatory work for the implementation of the PB, namely evaluation of the previous edition and preparation of the PB calendar.
- Proposal Submission: citizens submit their proposals online or in person.
- Technical Analysis and Public Consultation: citizens' proposals are analysed by the competent municipal service or by the Parish Council. Proposals considered eligible become projects and are listed on the Participation Portal.
- Project Voting: citizens can vote for projects through the Participation portal, at specific locations and via SMS. The most voted projects are then integrated into the proposed Municipal Budget and Activity Plan.
- Approval of the Budget and Plan by the City Council and the Municipal Assembly.
- Public Presentation of winning projects: the results of the voting are announced at a Public Ceremony and published on the Participation Portal.

Within the framework of 'Lisbon European Green Capital 2020', the participatory budget has been transformed into 'green participatory budget' with the aim of encouraging citizens to propose projects related to sustainability and climate change mitigation and adaptation.

The Lisbon's 'green' participatory budget was one of the first five innovative financing solutions supported by the City Finance Lab in 2018, a platform supporting the development of innovative financing solutions that increase investment in low-carbon, resilient and sustainable urban projects. This platform is managed by the company South Pole and operates across EIT Climate-KIC's programmes.

TRANSFORMATIVE POTENTIAL

The Green participatory budget shows the commitment of the City of Lisbon to promote an urban governance approach for sustainability transition. The Green PB encourages active engagement of citizens towards sustainability and supporting the collaboration between public authorities and citizens. Additionally, the initiative represent a catalyst to unlock private-sector capital for projects related to sustainability and climate change adaptation and mitigation. The potential for replication of this initiative in other cities is high since the City Finance Lab is promoting the process of scaling up of the Lisbon Green PB in other cities that already have set up Participatory Budgeting.

MORE INFORMATION

Lisbon participatory budget website (in Portuguese)

Climate Kic-Article

Co-Responsibility in District Energy Efficiency & Sustainability

PARIS, FRANCE

KEYWORDS: ENERGY MANAGEMENT; PARTICIPATORY MANAGEMENT

DURATION: Since November 2016
WHO: Municipality, private companies, research centres, real estate developers, architects, energy experts, residents
BUDGET: Around 4 million, EU funds (Urban Innovation Action)

SUMMARY

Paris has been one of the first municipalities in the world to adopt a climate action plan, setting goals for greenhouse gas emission reductions beyond those outlined by the European Union. As part of this action plan, Paris Municipality developed the Co-Responsibility in District Energy Efficiency & Sustainability (CoRDEES) project, focusing on innovative Smart Grids solutions and effective energy governance on the 54-hectare Eco District of Clichy-Batignolles.

GOALS

- Create a new energy ecosystem;
- Reach the energy efficiency objectives presented in the Paris Climate Action Plan: 50 kWh per square meter and 90% less CO2 emissions;
- Generate an integrated approach in which technical solutions are strongly connected to governance processes and stakeholder participation;
- Test out new services to empower stakeholders to self-manage community energy and to achieve energy efficiency goals.

Credits: Arthur Weidmann on Flickr CC BY-NC 2.0

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

- A new energy governance approach called "The Urban Energy New Deal" was set up to define the energy commitments together with all stakeholders involved. The project developed an instrumentation plan of the buildings. Sensors and meters have been installed by the energy companies for the monitoring of the energy consumption patterns of the residents, at both dwelling and building level.

- A multi-user monitoring platform (Community Energy Management Platform - CEMP) was finalised to analyse and consolidate energy data from buildings and public facilities in real-time. Through this platform, each stakeholder has access to the energy data of the neighbourhood. This means that the energy users become co-responsible of energy performance in the neighbourhood. The final User Interface design of the CEMP was finalised in October 2019.

> *"Smart grids at the local level are central to build a zero-carbon city. With the CoRDEES project, we experiment with smart grids solutions and effective governance mechanisms to reach ambitious energy performance targets. We hope the Clichy-Batignolles eco-district will act as a model for other cities"*
>
> Jean-Louis Missika, Deputy Mayor of Paris

- In order to facilitate all these processes, the project has created the role of the "Urban Sustainability Trustee Facilitator", an actor ensuring the participation and collaboration among the stakeholders in the neighbourhood, providing technical support, advice and energy coaching, as well as coordinating the implementation of services for improving energy use.

- Two companies have started to train tenants. One of these companies, launched the "CORDEES Ambassadors" initiative. Six experts organise meetings and door-to-door awareness activities. The ambassadors explain CORDEES initiative to citizens and raise awareness on efficient and sustainable use of energy.

TRANSFORMATIVE POTENTIAL

CoRDEES combines the implementation of technological measures for producing renewable energy and defining efficient energy consumption with the principle of co-responsibility of the actors involved. The data transmitted through a digital platform is accessible to the various stakeholders that are able to co-manage the energy of their neighbourhood. This makes the project an interesting case for increasing the energy systems' accessibility and co-responsibility by the users while making use of the potential of digital technologies.

MORE INFORMATION

CoRDEES project website (in French)

Urban Innovative Actions website

Urban Innovative Actions Video

The CORDEES project Journal N° 3

EnergiaTa: Making prosumerism a reality

ROMANIA

KEYWORDS: COMMUNITY ENERGY; PROSUMERISM

DURATION: Since 2016

WHO: NGO, energy company, citizens

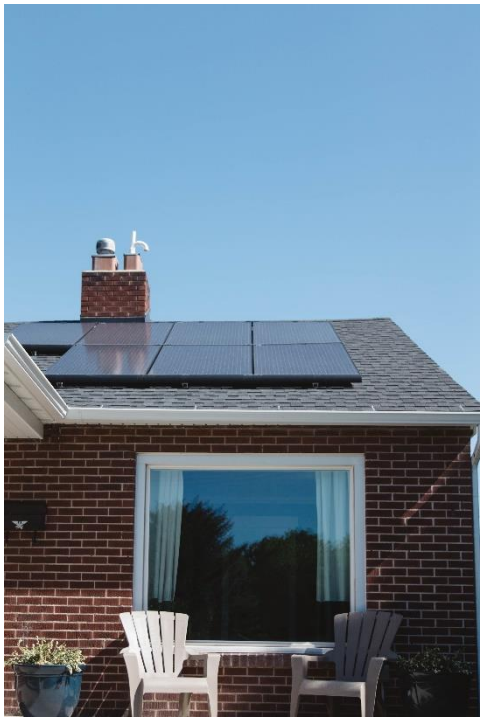
BUDGET: Unknown

SUMMARY

In 2016, Mihai Toader-Pasti and Claudiu Butacu realised that it was legally impossible for them to generate their own energy and feed excess energy back into the grid. Rather than giving up on their idea, they funded EnergiaTa. Their organization's innovative approach is that they structurally simplify and mainstream the process of becoming a prosumer, tackling every aspect of the process, as well as taking equity issues into account: from bureaucratic issues, to financial compensation and energy literacy.

GOALS

- Make it possible for Romanian households to easily sell their photovoltaic energy to the grid;
- Create a community of prosumers in Romania and a representation for small energy producers;
- Encourage prosumerism in Romania through raising energy literacy and awareness, to reach one million prosumers;
- Advocate for easy access and smooth administrative processes and remuneration for injecting back into the grid;
- Tackle energy poverty: ensuring that everyone in Romania can access clean and affordable energy by lowering energy bills, improving energy efficiency, and increasing household's incomes.



Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

After three years of lobbying done by EnergiaTa, since January 1, 2019 it is now possible for an individual to sell energy to the grid in Romania (photovoltaic energy under 27kW) at 0,047 Euro / kWh.

EnergiaTa has over 5000 members across Romania. In 2019, together with electricity utility company ENGIE, they launched a prosumer's guide, containing information on how to become a prosumer, what rights prosumers have, as well as information on existing subsidies, and what to look for when buying solar panels.

> *"On the medium term we hope to get to 100,000 prosumers in Romania, and in the long term, until 2050, we hope for Romania to function 100% on energy from renewable resources."*
>
> → Mihai Toader-Pasti, co-founder, EnergiaTa

EnergiaTa also organises events, including the first conference for Romanian prosumers, to bring together prosumers, utility companies, solar panel companies, and public authorities. It is also developing partnerships including with micro-financing organisations to provide community-specific energy solutions addressing energy poverty. This may include energy efficiency measures, as well as skills training and education to provide economic opportunities.

TRANSFORMATIVE POTENTIAL

EnergiaTa uses an innovative approach, bringing together citizens who want to innovate the energy system, campaign and collaborates for their rights, together with other actors. They have revolutionised the Romanian energy landscape by campaigning for prosumerism, and even by unlocking a range of subsidies. In addition, EnergiaTa promotes discussion around equity and aims to use prosumer technology to reduce energy poverty in Romania.

MORE INFORMATION

EnergiaTa's website

EnergiaTa's community

Ashoka's Blog

Open District Heating, a market place for excess heat

STOCKHOLM, SWEDEN

KEYWORDS: WASTE HEAT RECOVERY

DURATION: Since 2014

WHO: Energy company, businesses, residents

SUMMARY

"Open District Heating" is one of the services of "Stockholm Exergi" (previously called Fortum Värme), a district heating and cooling production and distribution company. With this project, the company encourages companies and businesses with excess heat that are located adjacent to their heating or cooling networks to sell energy supplied in the form of warm water. The water is injected into the pipe network (grid) and delivered to connected buildings. "Stockholm Exergi" is currently supplying 90% of Stockholm's energy demand with district heating.

GOALS

- Implement new sustainable energy solutions towards meeting Stockholm's climate adaptation goals;
- Use completely renewable and recovered energy for district heating by 2030;
- Use energy that otherwise would be wasted;
- Turn traditional customers/consumers into suppliers by offering revenue for their excess of energy.

HOW IT WORKS

- "Open District Heating" is mainly focussed on purchasing the energy released by data centres and grocery stores, situated nearby their heating and cooling networks, because they generate heat that they otherwise would need to cool down.

Funded by the H2020 programme of the European Union

TOMORROW

- "Stockholm Exergi" invests in the technical infrastructure, by converting the heat released into hot water with a pump and providing the pipe network necessary to deliver the district heating to heap up the households and offices in Stockholm.

- "Open District Heating" allows businesses to turn their costs for cooling into revenue from recovered heat. Both large and small companies can participate in the scheme by selling their excess heat to Open District Heating.

"Stockholm Exergi's investment in heat recovery is a key part of its efforts to create a sustainable city. By 2030, 100 per cent of Stockholm's district heating is to be generated from renewable and recovered energy"

→ Open District Heating

TRANSFORMATIVE POTENTIAL

"Open District Heating" offers a business model in which a potential waste is avoided: the energy is recovered and used to heat buildings. Thanks to this energy exchange, both suppliers and "Stockholm Exergi", benefit from this sustainable measure. The project is based on combining competitiveness of the business with energy recovering, aiming to achieve profitability and efficiency for both sides. Energy companies operating in other cities could also adopt this model.

MORE INFORMATION

Open District Heating website

Presentation by Stockholm Exergi

Bristol Community Energy Fund

BRISTOL, UK

KEYWORDS: COMMUNITY ENERGY

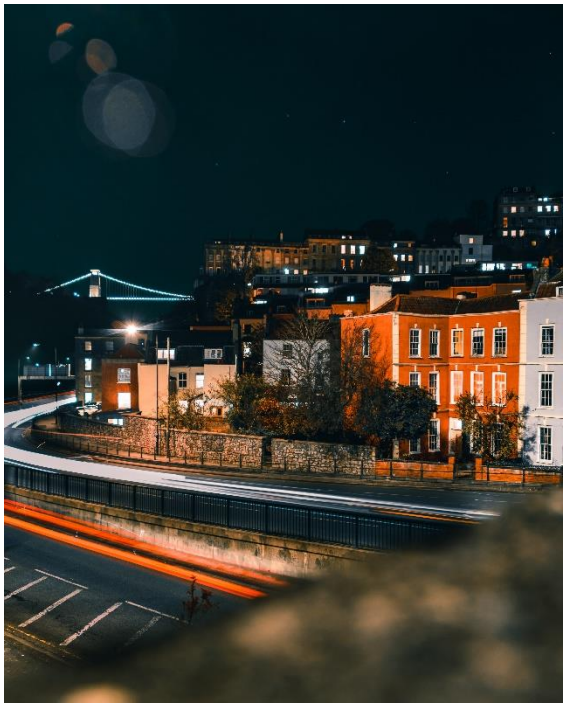
DURATION: Since 2015
WHO: Bristol City Council, local associations, NGOs and citizens groups, businesses
BUDGET: Total amount of grants: £ 223,869; total amount of funds: £128,000

SUMMARY

Bristol Community Energy Fund is an energy scheme created by Bristol City Council in 2015 with the aim of supporting and enhancing local energy production and consumption. More specifically, the initiative supports local groups through grant and loan offers and enable them to develop projects on sustainability, renewable energy and energy efficiency in the Greater Bristol area. The Bristol Community Energy Fund collaborates also with local businesses to support them to contribute to and address environmental and social issues in the city.

GOALS

- Promote local energy production and consumption;
- Support the development of projects on sustainability, renewable energy and energy efficiency by providing grants and loans to local groups and associations;
- Foster active participation of citizens and their collaboration with the local authorities and businesses contributing to the energy transition.



Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

The administration of the loan is run by the Community Energy Fund in collaboration with the Centre for Sustainable Energy (CSE). The organisations wishing to receive a loan need to send an application for a project. The applications are then analysed and selected by a decision panel formed by officers from Bristol City Council and the CSE.

> *"Bristol City Council has demonstrated that local authorities joining forces with their community can achieve big things. We already have links with our local groups and will now be exploring the possibility of what we can do working together*
>
> Jane Altouyan, Southampton City CouncIL

The organisations can use the loan for the following activities:

- Planning application costs;
- Solicitors fees for a landowner lease agreement;
- Solicitors fees for a Power Purchase Agreement (PPA);
- Financial modelling;
- Accountants fees for financial due diligence;
- Preparation and launch of share offer;
- Community engagement and consultation;
- Project management costs;
- Costs of arranging a grid connection.

So far, 39 different projects have been funded through the Bristol Community Energy Fund. The overview of the projects can be found online.

To date, the total amount of grants that have been issued through the grants programme of Bristol Community Energy Fund is £ 223,869. In November 2017, the Bristol Community Energy Fund has distributed £128,000 to local organisations and groups in order to support them to develop innovative projects on sustainability and renewable energy in the Greater Bristol area.

According to a monitoring and evaluation study of the Bristol Energy Network (BEN):

- The Bristol Community Energy Fund developed successful collaborations between new (non-energy) groups and other BEN members;
- The fund managed to reach more vulnerable and deprived areas;
- The participants of the fund found the application process clear and received support valuable;
- Reporting and data collection could be improved;

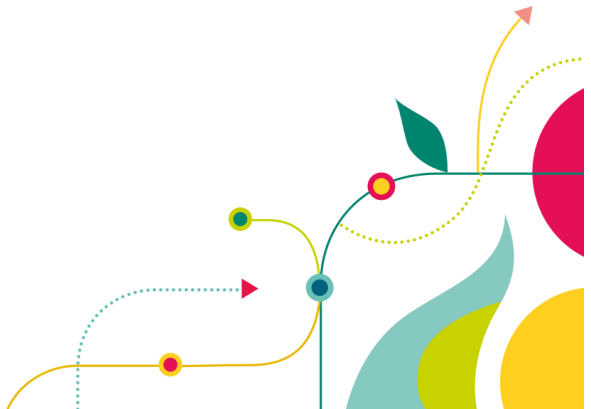
- The fund would benefit from the organisation of events to share experiences among the different member's organisations.

TRANSFORMATIVE POTENTIAL

Bristol Community Energy Fund represents an innovative initiative contributing to improving the urban governance of the Greater Bristol area and to promoting the sustainability and energy transition in the city. The loans and grants offered to local groups for developing sustainability-related projects empower citizens to become more active to transform their city and connect them to other organisations and businesses. The Bristol Community Energy Fund model could be adapted and applied in other cities thought the collaboration of local authorities with other local stakeholders.

MORE INFORMATION

Bristol Community Energy Fund's website



Living Streets

GHENT, BELGIUM

KEYWORDS: PUBLIC SPACE; LIVING LAB

DURATION: Since 2013
WHO: City Council, citizens and civil society organisation
BUDGET: Unknown

SUMMARY

"Living Streets"– "Leefstraat" in Dutch - is a living lab, in which every year, between spring and autumn, residents can decide collectively to reclaim public space in the streets of Ghent. During this period, citizens can choose to close their street to traffic and organise different events and gatherings. This initiative aims to transform the urban and environmental challenges into new opportunities for the city and to create community cohesion. Living streets contributes to improving the city liveability by giving space to creativity, co-creation of new activities, and by turning the residents of Ghent into change agents in their own reality.

GOALS

- Link residents to civil servants by bringing their ideas to the municipality;
- Rethink public space, mobility (and climate mitigation) in urban areas;
- Open up the policy making process by having residents decide on their streets;
- Foster personal interactions between neighbours' and reinforce social cohesion;
- Test street design interventions and forms of resident participation;
- Serve as an example for other cities to develop similar projects.

Credits : Lab van Troje

HOW IT WORKS

The implementation of the project is coordinated by the association "Lab van Troje", which acts as a bridge between the municipality and the residents, promoting and facilitating the development of the process.

Funded by the H2020 programme of the European Union

TOMORROW

One of the main challenges faced by the facilitators has been to find an alternative to street parking, in order to be able to replace parking spots with green areas. Residents worked on possible options with the Lab von Troje and proposed different transport solutions to go from a temporary parking space to the main streets. The initiative consists of two parts:

- The preparation process:
  Residents develop a plan for their street and organise meetings to get buy in from their neighbours. As a crucial condition, any objection that raised by neighbours must be addressed, and a solution must be found (e.g. ensuring access to mobility for elderly people).

"Imagine that you could temporarily transform your street into a beautiful green meeting place for the neighbourhood... That is what a living street is all about!"

→ Living Streets Initiative

- The implementation phase:
  Once the municipality accepted the plan, residents can implement the ideas and actions foreseen. During the implementation phase, the residents were supported by the municipality of Ghent with in kind contributions such as benches, but also with the necessary administrative help to transform the street into an open and safe space.

TRANSFORMATIVE POTENTIAL

Living Streets generated new social dynamics in cities, with regards to social cohesion, mobility, sustainability and organisation of the public space. Citizens felt empowered: they were able to decide with their neighbours about what an ideal street looks like, and what is necessary to get there. The municipality and civil servants supported the initiatives of the citizens, the exchange of expertise and the experimentation with co-creation. Ghent's experience has been used as a successful example to be replicated in other European cities, such as Brussels (Belgium), La Rochelle (France), Zadar (Croatia), Milton Keynes (United Kingdom), Turin (Italy), Ivanić-Grad (Croatia) and Rotterdam (The Netherlands).

MORE INFORMATION

Ghent Municipality's website

Energy Cities's website

Leefstraat website (in Dutch)

The Climate School program

SWITZERLAND

KEYWORDS: CLIMATE CHANGE; EDUCATION

DURATION: Since 2017

WHO: State, NGO, schools

BUDGET: Unknown

SUMMARY

The 'Klima Schule' (in English Climate School) programme developed by the climate NGO Myblueplanet is an educational program for schools. It focuses on encouraging education on sustainability issues and reducing the ecological footprint of schools. The program aims to integrate the themes of climate protection and sustainability in the mission statement and teaching curriculum of the participating schools. As part of this educational program, students and staff of the schools are introduced to the themes of sustainability, climate adaptation and mitigation for a period of four years. More specifically, the main subjects of the programme are energy, mobility, food and resources. The most active schools can also claim the Climate School label, by complying to a specific list of criteria.

GOALS

- Promote education on sustainability and climate protection in schools;
- Support schools to reduce their ecological footprint and making a concrete contribution to protecting the climate;
- Encourage students to actively participate and become aware of sustainability and climate protection issues.

HOW IT WORKS

During the four years of the training program, schools offer an e series of active learning activities on different subjects. Each year, students learn a main subject:

Funded by the H2020 programme of the European Union

TOMORROW

- Energy: students experience different types of renewable energy;
- Mobility: students learn what environmentally-friendly mobility means;
- Food: students learn about food production and can become actively involved in different sustainable food activities (e.g. climate-friendly cooking, sustainable agriculture, etc.).

""...We were able to assess the amount of electricity that a photovoltaic installation on a roof would produce. It would be cool to have solar panels in on our house."

Jeneera, 16 ans – Climate School student

Participation in the educational program has a positive effect on the image of the school since the results of each participating school are public. The schools that are more committed can apply for the Climate School label at the beginning of the programme. They will have to complete a training program and comply with the below list of criteria:

- Creation of a climate council;
- Anchoring of climate protection in the school's mission and curricula;
- Implementation of regular trainings for teachers and employees in the fields of climate, energy and sustainable development;
- Reduction of energy consumption by optimizing installations;
- Increase of the share of renewable energies;
- Promotion of climate-friendly mobility in schools;
- Consideration of climate-friendly products in new acquisitions and new investments;
- Extension of the recycling system and reduction of the volume of waste;
- Promotion of an eco-friendly diet;
- Communication of activities in schools and to Climate School.

TRANSFORMATIVE POTENTIAL

The Climate School programme represents an innovative approach contributing to support schools to promote education for sustainability and to reduce their ecological footprint. Through the programme, students learn in an innovative and active oriented way about challenges and solutions related to sustainability and climate change. Other municipalities in other cities and countries could be inspired by this approach and replicate this model in their schools and other educational institutions.

MORE INFORMATION

Klima Schule's website

My blue planet's website

Making Utrecht together!

UTRECHT, THE NETHERLANDS

KEYWORDS: COMMUNITY ENGAGEMENT; PARTICIPATORY DEMOCRACY

DURATION: Since 2015
WHO: City Council, citizens and other stakeholders
BUDGET: Unknown

SUMMARY

The Municipality of Utrecht has implemented "Utrecht maken we samen" (literally "We make Utrecht together"), an innovative participatory policy-making process involving residents, with the aim to support the city to become carbon neutral. In 2015 a team of experts from the municipality of Utrecht organised three days of debate to develop the city's 2016 energy and climate plan called "Energieplan" (Energy plan).

GOALS

- Facilitate a participatory policy-making process to co-create an energy plan to support Utrecht to become a carbon-neutral city;
- Enhance the participation and active engagement of different stakeholders in the energy transition process;
- Stimulate active engagement and sustainability awareness around energy consumption among local residents.

HOW IT WORKS

The participatory process was run by a diverse team consisting of: a researcher, a communication officer, a project manager (transition manager), an energy expert, an energy project manager, a planning manager, a logistics manager and a project coordinator. An energy consultant supported this team to produce information to be distributed to the participants, monitor progress and draft the energy plan based on the participants' contributions.

Funded by the H2020 programme of the European Union

TOMORROW

The team randomly selected 165 residents equally distributed in terms of geographic area (i.e. neighbourhood representation) and gender. These participants received a financial compensation (a €300 voucher to be used freely or a €600 voucher to be used for energy measures or electric transport).

Three participatory sessions took place between March and April 2015.

> *"We have followed a unique process. We are curious about the subsequent steps that will follow on the basis of this plan."*
>
> Utrecht's residents

- The first session was called "Dreaming about the future". It focused on acquiring knowledge related to the energy transition.
- The second session focused on building scenarios. The team of facilitators invited the participants to build two scenarios and provide them with a number of challenges to take into account. Additionally, two independent experts presented their vision of a climate-neutral Utrecht. Participants made a list of 10 priorities for three sectors: housing, work and transport.
- The third session was dedicated to devising the energy and climate plan. Taking the feedback of different stakeholders (i.e. business representatives, social housing corporations and energy companies) into account, the participants drew up a provisional energy plan. This plan was presented to the councillor in charge of sustainable development the same day.

The Energy Plan was finalised and it is the result of the active engagement of residents and the constructive feedback provided by energy stakeholders.

TRANSFORMATIVE POTENTIAL

The transformative potential of the participatory process organised by the Municipality of Utrecht relates on the one hand to its capacity for actively engaging citizens from different neighbourhoods. On the other hand, such process facilitates the co-creation of knowledge and collaboration between residents, energy experts and other local stakeholders. Through merging the needs towards sustainable energy futures with a strengthening of local democracy, public participation and inclusive citizens' engagement, this process strengthened local energy democracy.

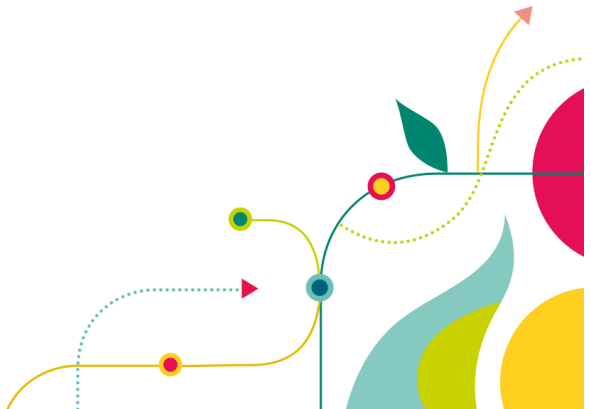
MORE INFORMATION

Utrecht Municipality's webiste (in Ducth)

Energieplan Utrecht (in Dutch)

Interpretation of the Energy plan by Utrecht's Municipal Executive

Energy Cities' website



Vilawatt: a new form of governance Partnership

VILADECANS, SPAIN

KEYWORDS: COMMUNITY ENGAGEMENT; PARTICIPATORY DEMOCRACY

DURATION: November 2016 - October 2019
WHO: Municipality, private companies and citizens
BUDGET: € 4,269,862.8 – Funded by EU Regional Development Fund (Urban Innovative Actions)

SUMMARY

Viladecans, a city in the province of Barcelona, has changed the role of communities by involving citizens in the energy transition process by creating a Public-Private-Citizen Governance Partnership (PPCP) as part of Vilawatt project. The PPCP is a central hub promoting energy savings through learning activities and managing the implementation of energy renovation projects in buildings and the production of renewable energy. The project partners are the Municipality of Viladecans, the Urban Ecology Agency of Barcelona and the Catalan Energy Institute (ICAEN). Private companies also participate and play different roles such as co-design the local energy currency.

GOALS

- Build an Integral Energy Operator, through a PPCP formed by citizens, businesses and the Municipality of Viladecans with the aim to achieve efficient management of energy, promote the energy rehabilitation of buildings and strengthen the local economy;
- Contribute to the energy transition and social justice locally by addressing energy poverty from within the energy system, and by promoting secure, clean and efficient energy
- Reduce the city's environmental impacts by creating a local renewable energy supplier and implementing energy efficiency measures.

Credits: Americo Ferraiuolo, CC BY-NC-ND 2.0

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

One of the core activities of the project was the creation of a new organisational structure: a Local Energy Operator (LEO) through the PPCP to achieve more efficient local energy management.

LEO aims to support the capitalization of savings to be used to finance the energy rehabilitation of 3 buildings of 60 homes selected through an open participatory process. To start, these rehabilitations have been carried out in the Montserratina neighbourhood

> *"We strongly believe in this project, because one of the most important challenges that cities have to face is the improvement of the quality of life".*
>
> → Carles Ruiz, Mayor of Viladecans

The PPCP is formed by 9 public and private partners:

- Viladecans City Council, the promoter of the project;
- Ubiquat Tecnologies, responsible for the co-design of the local energy currency;
- Cercle Gespromat, in charge of the management of social mediation and legal, financial and technical aspects related to the rehabilitation of buildings;
- EGM, a local energy consultant responsible for the analysis of data to create an energy information system;
- LIMA, promoting sustainable construction and contributing to the design of buildings with low environmental impact;
- VIGEM and VIMED, municipal companies, providing support in the technical management and implementation of the project;
- CÍCLICA, a cooperative supporting community participation and engagement;
- Barcelona Urban Ecology Agency, supporting the implementation of the local energy operator The Catalan Institute of Energy for the definition of the model of energy savings contract.

A complementary local currency called Vilawatt was designed to stimulate energy savings and to improve the local economy. Vilawatt will be adopted by PPCP members and local shops in the neighbourhood. The energy sector will be developed by empowering local professionals and thus creating new jobs opportunities.

A Strategic Participation Plan analysing the specific role of 10 social stakeholders (schools, political groups, local retail, demo-renovated buildings, residents, etc.) has been developed.

Based on this plan, four open spaces have been created to enable learning and knowledge exchange among citizens, business, professionals and schools.

Since September 2019, each space has been organising monthly learning programmes: residents are learning how to use energy more sustainably, schools are participating in programmes to save energy, professionals are working on trends and the future of the sustainable building sector, and local shops are benefiting from free power audits.

TRANSFORMATIVE POTENTIAL

Taking a multi-stakeholder approach, and thus combining the perspectives, needs and power of citizens with public and private sector allows for an integrated approach to address local energy needs in more sustainable and just ways. It goes beyond focusing on citizen initiatives or policies by taking also the private sector along in the energy transition efforts. In addition, the creation of a local energy currency represents an opportunity for strengthening the local economy and fostering community awareness on sustainable energy management.

MORE INFORMATION

Viladecans website in Spanish/Catalan

Urban Initiatives Actions website

Presentation of Vilawatt project

COOPEM - Mouscron's energy cooperative

MOUSCRON, BELGIUM

KEYWORDS: COMMUNITY ENERGY; SUSTAINABLE INVESTMENT

DURATION: Since 2017
WHO: City Council, citizens, companies
BUDGET: Unknown

SUMMARY

The Cooperative Energy Mouscron (COOPEM) was founded in 2017 by 14 citizens, two entrepreneurs, ENERGIRIS (a Brussels-based cooperative) and Aralia (an investor in PV), with the support of the municipality of Mouscron. Their aim was to make photovoltaics (solar power) accessible to the largest possible number of citizens and companies in the area of Mouscron. As a cooperative, citizens can be shareholders of COOPEM. In doing so, citizens benefit financially from the energy transition but more importantly decide on the strategy and actions of the cooperative. COOPEM has joined forces with regional development organisations Ideta and IEG, as well as the Energy IT company Haulogy, to create the project ColéCo. This project aims to stimulate enthusiasm and interest around the self-consumption of renewable energy in the 23 municipalities of Wallonia

GOALS

- Promote the production of renewable energy locally;
- Foster citizen organisation around the self-production of renewable energy;
- Make photovoltaic energy more accessible to citizens and local businesses;
- Offer a collective way to manage energy and an alternative financing model for renewable energy production.

HOW IT WORKS

COOPEM is a cooperative funded by citizens, aiming to promote local photovoltaic energy as well as a financial alternative model for energy production for citizens and local companies.

Funded by the H2020 programme of the European Union

TOMORROW

The Energy council member of Mouscron chairs COOPEM's on behalf of the City, which demonstrates the municipality's support for the cooperative and the city's effort towards mitigating CO2 emissions.

As a cooperative, COOPEM offers two types of packages: for citizens and for local businesses.

- Citizens have the possibility to purchase photovoltaic installations through a collective group purchase. Citizens benefit from a reduction on the cost of the installation and they receive advice and support throughout the process. COOPEM also takes care of the administrative aspects and the installation;
- Businesses are asked to pay a 10% fee as a contribution to the cost of the installation. Through the savings on the electricity bill they can pay back the investment (in approximately 2 to 3 years). After 10 years, the businesses become the owners of the solar panels and therefore get the full benefits from the energy savings.

> *"To start a real energy transition at the scale of a municipality, we must take the citizen by the hand, show him the way, accompany him as closely as possible in his personal projects and above all facilitate."*
>
> → Anne Cloet, Mouscron Deputy Mayor and President of the COOPEM

The joint project ColéCo promotes the installation of solar panels on school roofs. The concept is that schools can make use of the energy during the day, while in the evenings the surrounding neighbourhood benefits from the photovoltaic energy produced. ColéCo is inspired by the new European legislation on renewable energy communities, which mentions the principle of co-ownership, and local production and consumption of energy. In 2018, after one year of activity, COOPEM has installed around 90 PV units and public awareness has been increased.

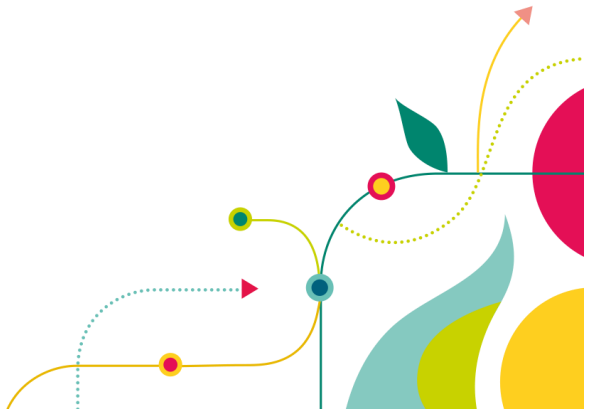
TRANSFORMATIVE POTENTIAL

In order to replicate such projects, political support is key. COOPEM needs to establish a close collaboration with public authorities to carry out the ColéCo project, especially regarding the use of the public grid and the installation of solar panels on the school's roofs. The initiative has a potential for replication in other cities. Other local authorities in Belgium are trying to adapt and replicate Mouscron's model in their contexts.

MORE INFORMATION

COOPEM website (in French)

Energy Cities' website



Internal contracting for energy-saving

STUTTGART, GERMANY

KEYWORDS: ENERGY RETROFIT; INNOVATIVE FINANCE

DURATION: 1998-2013
WHO: City Council
BUDGET: € 11,8 million euros in the revolving fund in 2013

SUMMARY

Stuttgart has successfully implemented an instrument to improve the energy performance of its municipal building stock, and significantly reduce its CO2 emissions: internal contracting, or "Intracting". Internal contracting allows the city to fund energy-saving and efficiency projects for buildings owned by the city, and is part of Stuttgart's Climate Protection Programme. The internal contracting is funded through a revolving fund, which is a stable fund that operates without any fiscal year limitation: it is replenished by repaying money used from the account. As a result, no interest or banking fees have to be paid for these investments, and projects can be started faster. In this case, the money used for the replenishment were the savings made thanks to the renovations. Between 1995 and 2013, the fund's worth increased from € 9,5 million euros, to € 11,8 million euros. It is estimated that the programme resulted in a total of 18 million euros of energy costs saved, within the time frame of 1995-2013 only.

GOALS

- Retrofit and renovate public buildings;
- Implement improvement of energy performance through internal contracting;
- Initiate awareness-raising activities

HOW IT WORKS

The Energy Department, which falls under the Office for Environmental Protection, manages this fund and finances energy efficiency projects, which otherwise would have to be contracted externally.

Funded by the H2020 programme of the European Union

TOMORROW

From investing in saving energy, to the actual costs that are saved through reduced energy consumption, all these financial flows remain within municipal control. The main step of the process are the following:

- To determine what properties were suited for internal contracting, the energy department performed data analyses and energy audits, and monitors what construction or renovation plans are set out for public buildings. As such, it has an integral vision on the management and energy efficiency of public buildings.

- The energy department then calculates costs with the construction department and contracts the facility department, which owns the housing stock, to have the construction department implement the renovations or energy saving project.

- Finally, the facility department pays back the investment to the energy department's revolving fund.

Examples of how internal contracts were implemented range from lighting controls to buildings a new heat and power plant for a public swimming pool. A key element for internal contracting is a well-coordinated administrative process, well-defined roles, responsibilities and communication between the parties involved

TRANSFORMATIVE POTENTIAL

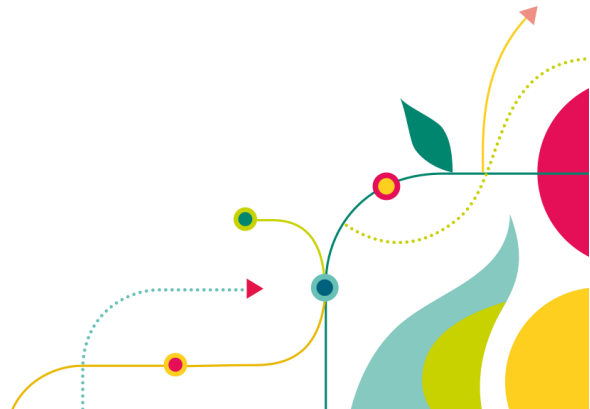
The example of Stuttgart is used as a pilot model for Internal Contracting. As part of the EU funded "Infinite Solutions" project, the Stuttgart model has been implemented in several cities: Udine (Italy), Águeda (Portugal), Koprivnica (Croatia), and Almada (Portugal). The details on this replication are available in the publication "Infinite Solutions Guidebook - Financing the energy renovation of public buildings through internal contracting".

MORE INFORMATION

Energy Cities Case Study

C40 Case Study

Interreg Website



Milan 2046 - a laboratory for a common future

MILAN, ITALY

KEYWORDS: FORESIGHT; VISIONING

PARTICIPATORY DEMOCRACY

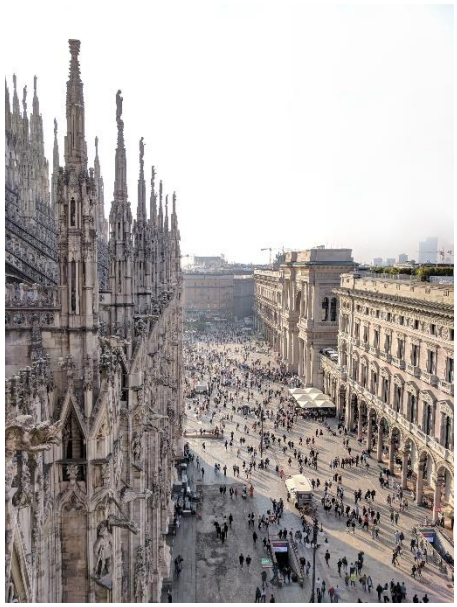
DURATION: Since 2017
WHO: City Council, citizens, universities, associations
BUDGET: Unknown

SUMMARY

"Milano 2046 - laboratorio per un futuro comune" (in English "Milan 2046 - a laboratory for a common future") is an urban living lab promoted by the Presidency of the City Council in Milan. The project seeks to create a desirable future for the city, by translating different visions and ideas from citizens and other stakeholders into projects and by taking into consideration existing city processes and initiatives. This urban laboratory also wants to raise awareness of the need of long term thinking in the political and collective debate and to better understand the key issues that should be considered when planning a city. One of the activities of "Milano 2046" is to conduct a research study to gather ideas, needs and interests from multiple local stakeholders in order to offer advice to the city government on how to further plan interventions.

GOALS

- Build a social sustainable process to improve the liveability in the urban area of Milan;
- Involve citizens in the development of the urban policies;
- Coordinate the different sustainable initiatives existing in the city to improve the development of policies;
- Offer transformative planning for the future of the city;
- Offer hypotheses of possible actions to improve urban quality to the governing bodies of the city.



Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

Milan City Council set up and facilitated the process. A number of experts with different backgrounds were selected to form a committee. These experts participate voluntarily and contribute to set the goals, methods, activities and timeline of "Milan 2046".

> *"Milan 2046 aims to offer the government of the city tools to plan its future interventions on the basis of economic but also sustainability and social equity indicators, which will be identified by the working groups and through our research"*
>
> Lamberto Bertolé, Milan Municipal Council

- A research based on the Delphi methodology was conducted as an innovative way for city planning. The research aimed at collecting ideas, priorities and interests of citizens and other stakeholders on the future of their city. The research adopted the BES-framework (Benessere Equo e Sostenibile - equitable and sustainable well-being), to measure quality of life and assess the effect of public policies on some fundamental social dimensions. The BSE indicators represent 12 domains: health, education and training, work and life balance, economic well-being, social relations, politics and institutions, security, subjective well-being, landscape and cultural heritage, environment, innovation, research, creativity and quality of services. Approximately 300 individuals were invited to participate and divided into 12 subgroups of approximately 30 people each. These participants were selected based on their expertise and experience in the domains of the BES framework and were part of the following categories:

  - Experts (e.g. University lecturers, professionals in the field, researchers, writers and specialized journalists);
  - Stakeholders (e.g. representatives of private organizations involved in the domain);
  - Community (e.g. individuals from the community not belonging to the previous categories, with a focus on young people in suburbs).

In total 249 people agreed to participate in the Delphi research and took part in the first phase of the research including the compilation of a first questionnaire. Of these, 222 people participated in the compilation of a second questionnaire. In addition, multiple meetings with various local stakeholders (e.g. former mayors of the city, representatives of the third sector, delegates of the main universities in the city) have been organised with the aim to identify different ideas and interests related to the future of the city.

- In September 2019, the Italian Alliance for Sustainable Development (ASviS) association, in collaboration with Milano 2046, organised the first edition of the one-week Milan Summer School on the well-being and sustainability of the city.
  This educational programme aims to raise awareness on sustainability issues and the Sustainable Development Goals among communities, businesses and individuals. Eight universities of the area of Milan participated in the Summer School. Through an interdisciplinary approach, the School aims at achieving a high profile and qualification training on environmental, economic and social sustainability issues, addressing the systemic challenges of sustainable development and promoting the adoption of concrete and effective solutions. The Summer School offered theoretical lessons, seminars and group works, with the active participation of both teachers and institutional representatives.

TRANSFORMATIVE POTENTIAL

The project "Milano 2046" is still in its early phase of implementation. However, the participatory research initiated by the urban laboratory is an important step to discover needs and desires of citizens, policy makers and other stakeholders regarding the future of their city. In addition, the educational activities such as the Milan Summer School represent a good starting point for contributing to raise awareness on sustainability issues. Additional programs and activities could be promoted, especially for fostering active participation and citizens' engagement around the topics of sustainability and social inclusion.

MORE INFORMATION

Milano 2046 website

Sustainability Article

Municipality of Milan blog (in Italian)

Interview with the President of the Municipal Council (in Italian)

P2P energy exchanges with Jouliette

AMSTERDAM, THE NETHERLANDS

KEYWORDS: BLOCKCHAIN; CIRCULAR ECONOMY

DURATION: Since September 2017
WHO: Living lab, energy-service Company, local community
BUDGET: Unknown

SUMMARY

Jouliette is a platform that aims to foster bottom-up transitions towards a fair and 100% renewable energy system. It is a peer-to-peer blockchain trading system, in which a token is created to exchange renewable energy within the living lab 'De Ceuvel'. De Ceuvel is a sustainable workplace for creative and social enterprises located in Amsterdam North. At De Ceuvel, energy is produced through solar panels. Thanks to Jouliette's smart-grid technology, community members can make transactions with a digital currency to buy energy, using blockchain technology. Through this system, both energy production and consumption are performed outside of the market limitations, allowing the Ceuvel community to manage their own micro-economy. Jouliette has been developed by Spectral, a smart energy services company, and in collaboration with Alliander, the network company responsible for the energy distribution in Amsterdam.

GOALS

- Foster community empowerment and peer-to-peer exchange of renewable energy;
- Become a landmark example of the energy transition and to be applied to other parts of Amsterdam;
- Foster circular economy.

Credits: Spectral

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

The development of Jouliette fostered a bottom-up energy transition in De Ceuvel:

- The platform and the digital currency allow renewable energy exchange within the community of De Ceuvel, stimulating the local production of green energy, empowering the role of their members, fostering the local economy and community self-sufficiency;
- The digital currency appears as a simple and reliable payment method, with a user-friendly application in which users can have an active role by configuring their market trading rules and conditions; managing their token wallets; viewing their consumption, production and CO2 savings;

> *"Jouliette and its associated broader applications represent an important step forward towards realizing a local, circular, resource-based economy. We're excited to launch it at De Ceuvel, which has become a globally visible showcase for sustainable urban development and a hub for clean-tech innovation"*
>
> → Philip Glade, CEO Spectra

- The community is already exploring further applications of Jouliette, such as using the currency at their local cafes and restaurants, facilitating a local time-bank system, and integrating other community services such as a car-sharing initiative.

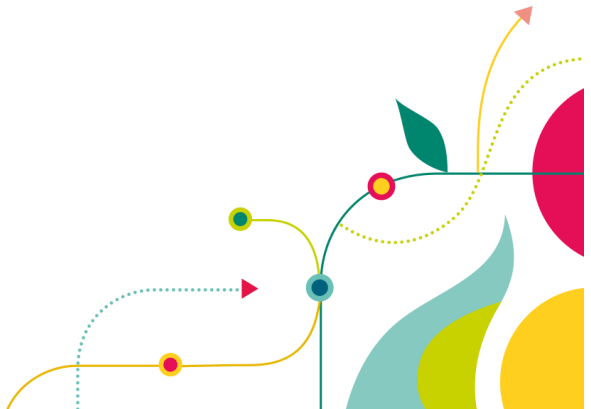
TRANSFORMATIVE POTENTIAL

De Ceuvel is a living lab, a space for innovation and experimentation. An important element of the lab is its smart-grid. By using this technology, the community is able to trade renewable energy through the exchange of a cryptocurrency. The fact that the community is able to manage its own economy independently from market players empowers individuals and fosters a sense of community. While De Ceuvel remains a particular example, due to its particular situation as a living lab, this initiative is an example of how modern technology can support the energy transition.

MORE INFORMATION

Jouliette website

Sprectal energy website



Energy tables to fight energy poverty

CADIZ , SPAIN

KEYWORDS: ENERGY POVERTY; PARTICIPATORY DEMOCRACY

DURATION: Since 2015
WHO: City Council, municipal energy company, citizens and other stakeholders
BUDGET: Unknown

SUMMARY

The city of Cádiz is addressing social and economic challenges through the facilitation of a participatory energy transition process. In May 2015, a citizen's coalition was elected in the municipal government. One of the goals of the new government was to support the energy transition as a way to increase sustainable use of resources but also promote social equity, fight energy poverty and create employment opportunities. The new municipal government developed various activities and projects such as the "Energy Tables", roundtables enabling the active participation of citizens in energy-related issues.

GOALS

- Promote energy efficiency and renewable energy use in public buildings;
- Foster citizens' empowerment and their collaboration with the public administration in developing energy services;
- Promote sustainable energy consumption habits;
- Fight energy poverty;
- Foster a democratic energy transition process;
- Create jobs in the energy sector;

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

> *"We join efforts to change our current centralised, polluting and dangerous model, which is responsible for climate change and serious social inequalities, for a sustainable, fair, renewable, distributed, democratic energy model, which generates local employment"*
>
> → Cadiz Municipality

- The City holds 60% shares in the local energy company Électrica de Cádiz. The city decided to use it to promote "a change in its energy model that would create employment and benefit citizens." The revenues from Électrica de Cádiz are used to cover energy costs of public buildings, public lighting and traffic lights, as well as subsidies for low-income households.

- The municipality created two working groups on energy called "Energy Tables". One is about fighting energy poverty and the other one on the energy transition in Cádiz. These roundtables were created with the aim of enabling citizens' participation and knowledge co-creation. The participants of the roundtables meet regularly, discuss ideas and propose actions and activities. These tables also allow the municipality to gather ideas from citizens and bring them to the attention of the local energy company. As an example, one of the activities proposed was a workshop about energy saving and understanding household's electricity bills. Participants of the roundtables asked the company to produce 100% renewable energy and to increase the production of local energy. Because of this proposal, Électrica de Cádiz municipal company installed PV panels on its roofs. In addition, the municipality offers tax reductions to citizens that install PV panels on their roofs or own shares in community renewable energy projects.

- Thanks to an application to monitor the energy consumption in public buildings and the organisation of trainings on energy issues for municipality employees, Cadiz City Council is increasing the energy efficiency in municipal buildings: they managed to save around 50% of the money previously spent on electricity bills.

- Another pilot project allowed eight unemployed people to be trained as energy advisers. They were then given an eight-month contract to draw up the Plan of Action against Energy Poverty. The advisory team provides advice to families in Cádiz on optimizing their energy contracts so that they can save money.

TRANSFORMATIVE POTENTIAL

The activities and projects developed by Cádiz municipality represent an innovative governance approach promoting the empowerment of citizens and their active engagement in energy transition processes. The Energy Tables gave the opportunity to citizens to come up with ideas that have been then implemented by the municipality and Électrica de Cádiz energy company. At the national level, the Spanish Government approved a Royal Decree regulating new conditions for self-consumption of energy that promotes collective self-consumption and establishes a simplified mechanism for compensation of self-produced and unconsumed energy. Thanks to this new legislation, new opportunities arise also for the replication of the Cádiz model in other cities.

MORE INFORMATION

Mesa de Transición Électrica de Cádiz (in Spanish)

Energy Cities' website

ENGAGE campaign in Ivanić-Grad

IVANIĆ-GRAD, CROATIA

KEYWORDS: CITIZENS ENGAGEMENT, AWARENESS RAISING CAMPAIGN

DURATION: Since 2010
WHO: Municipality of Ivanić-Grad, citizens, companies
BUDGET: Unknown

SUMMARY

Ivanić-Grad, a 15.000 people town in Croatia is committed to decarbonise its community as part of its participation to the Covenant of Mayors. Since 2010, the municipality has initiated the ENGAGE campaign aiming at actively engaging citizens in energy-saving actions and raising awareness on sustainable energy.

GOALS

- Contribute to mobilize citizens and other stakeholders to build a sustainable energy future;
- Raise awareness amongst citizens and other local stakeholders about energy savings;
- Promote the collaboration between citizens, local authorities, companies and other stakeholders.

Credits: Ivanić-Grad city

HOW IT WORK

- Since 2010, through the ENGAGE campaign, the municipality has been engaging around 300 citizens with different backgrounds and ages for developing multiple energy-saving activities.
- One of the first steps of the ENGAGE campaign was to engage citizens through a poster campaign that tells tangible local stories.
- Citizens make their own personal energy reduction pledge on a poster. The poster shows how they are going to use less energy in their everyday activities.

Funded by the H2020 programme of the European Union

TOMORROW

- The posters of all citizens are exposed in public spaces of the city during important events.
- 79 out of the 300 citizens participating in the campaign accepted to have their energy consumption monitored. They agreed on sharing data regarding their energy consumption at home and their mobility habits. All the data from all 79 people were then analysed and inserted in a document. A year later, the data was analysed again to assess the changes in the energy consumption. The results showed an average of 17% reduction in individual CO2 emissions.

> *"In the City of Ivanić-Grad the success of the ENGAGE Campaign is based on an excellent cooperation with stakeholders, associations and citizens. As a modern PR campaign, ENGAGE is implemented in every local event in the City"*
>
> Vlatka Berlan Vlahek, Head of Department of City Development, Ivanić-Grad

- Examples of behavioural change triggered by the ENGAGE campaign were the shift of mobility habits from individual cars to public transport and bikes, car sharing or soft modes.
- Private companies have also been involved in the campaign which they considered an opportunity to improve cooperation with the city and to promote their services to the citizens. For example, some taxi drivers have committed to start using biofuel instead of gasoline and diesel in their cars.

- The Key achievements of ENGAGE campaign in Ivanic-Grad are the following:

  - 77 tones of CO2 emissions prevented and 64,000 KWh of primary energy saved by engaging citizens and renovating public buildings within a year;
  - On average, a citizen has reduced his/her annual CO2 emissions by 17% within a year thanks to the campaign;
  - Joined the Covenant of Mayors in 2009;
  - As a signatory to the Covenant of Mayors the city of Ivanić-Grad commits to reducing its CO2 emissions by 21% by 2020.

TRANSFORMATIVE POTENTIAL

The ENGAGE campaign run by Ivanić-Grad municipality encouraged citizens to take concrete actions and have more sustainable lifestyle. It also represented an opportunity for strengthening the dialogue and cooperation between the city and its community. The lessons learnt from the overall ENGAGE campaign shows that campaigns need to be dynamic and they need to continue for a long time in order to engage as much stakeholders as possible. In addition, a key success factor remains the integration of such a campaign into already existing initiatives of the local administration.

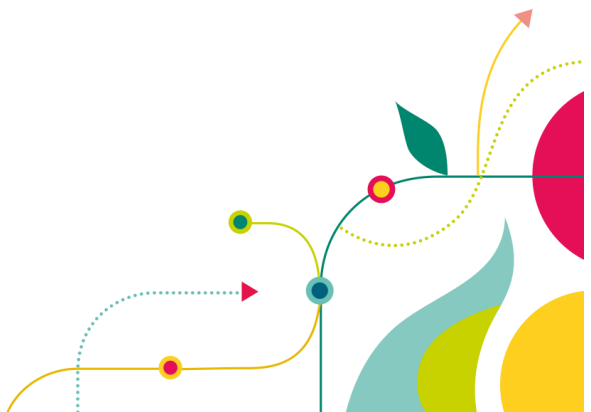
MORE INFORMATION

ENGAGE campaign

ENGAGE Campaign guidebook

Energy cities best practices

European Commission blog article



Rotterdam Climate Agreement

ROTTERDAM, THE NETHERLANDS

KEYWORDS: PARTICIPATORY GOVERNANCE; MOBILITY

DURATION: May-November 2019
WHO: City Council, citizens and other stakeholders
BUDGET: Unknown – Financed by the municipality

SUMMARY

Rotterdam has developed the Rotterdam Climate Agreement, resulting in 49 climate deals with concrete measures towards 49% CO2 emission reduction in the city by 2030 (compared to 2017). The climate deals have been developed in different sessions around five themes: port and industry; built environment; mobility; clean energy; and consumption. The 'Climate Table Mobility' proposes CO2 neutral, healthy, inclusive and affordable mobility for Rotterdam, in which shared and slow mobility are the norm, as well as improve the liveability and inclusivity. The tables were chaired by external experts, and the mobility table specifically was chaired by Derk Loorbach, director of the Dutch Research Institute for Transitions (DRIFT).

GOALS

- Transform Rotterdam into an accessible, healthy and inclusive city;
- Implement an experimental governance approach;
- Reduce CO2 emissions of the city;
- Build on existing dynamics and initiatives;
- Set up a platform to support the implementation of the proposed measures;
- Implement short-term interventions for political engagement.

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

More than 100 organisations have participated in the processes generated by the five climate tables. Each table corresponds to one of the themes of the 'Rotterdam Climate Agreement'. All the tables shared a common goal: to develop concrete and feasible measures to reduce CO2 emissions of the city. A council member and an independent chair were assigned to each table. The chairs were asked to consult societal actors and develop a concrete proposal. A team made by a secretary, a dedicated civil servant and an expert on the topic supported the chairs. The five chairs would have regular meetings and a monthly meeting with the respective council members.

> *"I am proud of the results, and inspired by the entrepreneurial power, involvement and commitment of all parties and people in this process. But we are not done yet. That is also the energy which is needed: the transition to a sustainable inclusive economy is a road full of surprises, uncertainties and resistances"*
>
> → Derk Loorbach, DRIFT - Mobility Table Chair

For example, the mobility table entailed six workgroups around different themes, assigning an expert civil servant to each one of them. The stakeholders involved were invited to share ideas and co-create interventions in the framework of four meetings. The process was supported and monitored by the Dutch Environmental Agency, who gave feedback on the feasibility of the measures. The result of the collaborative process resulted in 17 concrete measures.

TRANSFORMATIVE POTENTIAL

Several initiatives paved the way to the Climate Tables. Above all, the political programme by the government coalition "New Energy Rotterdam" put the issue of the achievement of the city's climate goals under the spotlight and pushed for more transformative interventions to mitigate the effects of climate change. Therefore, the municipality decided to fund the process of the climate tables. The process also encountered difficulties, including diverging agendas of the council members and stakeholders who did not agree with the process and withdrew their participation. Even now that the measures are published, the structure to ensure their implementation has not yet been created, while support from the government will be essential for the successful implementation of the measures designed.

MORE INFORMATION

Utrecht Municipality's website (in Dutch)

Website Rotterdam Climate Agreement (in Dutch)

Rotterdam Climate Agreement (in Dutch)

San Sebastián's 2050 roadmap

SAN SEBASTIÁN, SPAIN

KEYWORDS: PARTICIPATORY GOVERNANCE

DURATION: Since 2017
WHO: Municipality of San Sebastián, citizens, local stakeholders
BUDGET: Unknown

SUMMARY

In 2017, the municipality of San Sebastián initiated a participatory process with the aim to develop a local climate change strategy for the city and its citizens. The result of this participatory process is the 2050 roadmap: the "Plan de Acción Klima 2050 de Donostia/San Sebastián" (in English the Donostia/San Sebastián's Climate Action Plan 2050). Another aim of the process was to raise citizens' awareness of Climate Change and encourage them to take individual and collective actions. The plan has been approved by the City Hall on June 5, 2018. The roadmap has the overall vision to make San Sebastián city carbon neutral by 2050. The objectives included in the roadmap are also based on the 2050 Climate Change Strategy of the entire Basque Autonomous Community.

GOALS

- Make San Sebastián carbon neutral by 2050 by reducing CO2 emissions by at least 80% compared to 2007;
- Promote the active participation of citizens and mobilisation around Climate Change issues;
- Achieve zero emissions in transport;
- Decarbonise the energy sector;
- Produce and consume goods based on principles of the circular economy and promote zero waste;
- Sustainable maintenance, construction and usage of infrastructures and buildings.

Credits: Miquel Fabre

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

The process of development of the roadmap is based on:

- A study on the state of the art in climate change including an analysis of action plans (i.e. roadmaps) developed in seventeen cities in Europe.
- The results of an 'intergenerational workshop' taking place on December 15th 2016 and engaging 50 participants. The workshops aimed at collecting ideas, knowledge and visions related to Climate Change by a diverse group of participants.

> *"The city of the future needs people like those who have made the city of the present a reality. Citizens who are responsible, active and trained to achieve global, changing evolution, which is only possible by means of strong values and social capital."*
>
> → Estrategia 2030 Donostia/ San Sebastián

The results of both the study and the workshop resulted in the development of the 2050 roadmap. The roadmap identifies key sectors and associated objectives to be achieved in order to accomplish the overall goal to reduce CO2 emissions by more than 80% by 2050:

- **Occupation and land use:** Reduce land use by limiting the artificial occupation of more territory;
- **Mobility of people and goods:** Zero emissions in transport;
- **Production, consumption of goods and waste generation/Circular Economy:** Zero waste;
- **Construction, use and maintenance of infrastructure and buildings:** More than 80% of buildings with high energy efficiency;
- **Energy/Decarbonisation:** More than 80% of renewable energy on the total energy consumption.

The roadmap identifies five strategic areas of action:

- **Information:** i.e. the way citizens get to know and share information about climate issues;
- **Lifestyles:** i.e. the relationship between citizens' actions and CO2 emissions;
- **Infrastructures:** i.e. the way citizens experience the city's physical (e.g. infrastructure like buildings) character;
- **Technology:** i.e. the way citizens apply knowledge gained through e.g. smart applications to reduce their emissions;
- **Norms:** i.e. the way citizens adjust to and support each other within their social relations.

Those five strategic areas of action were then applied to four different sectors: Energy, Circular Economy, Land Use and Mobility. This exercise within the city's roadmap resulted in a diverse set of actions that will enable San Sebastián to reach carbon neutrality by 2050.

TRANSFORMATIVE POTENTIAL

The development and implementation of San Sebastián's roadmap represents an innovative process promoting active participation of citizens and collaborative governance. This initiative represents an innovative way on how to introduce climate change objectives into the structures and cultures of a city administration. San Sebastián's roadmap is an example of a municipality that it is redefining urban climate and energy governance and citizen participation and will hopefully inspire other cities to design and develop similar processes in their contexts.

MORE INFORMATION

Donostia/San Sebastián 2050 roadmap

Donostia/San Sebastián city website

Energy cities report

Local energy and Climate Roadmaps report

District Power: citizens as energy prosumers

WALENSTADT, SWITZERLAND

KEYWORDS: COMMUNITY ENERGY; BLOCKCHAIN

DURATION: Since 2018
WHO: Federal State, Universities, companies, citizens
BUDGET: Unknown

SUMMARY

"Quartierstrom" (district power in English) project aims to promote the production and consumption of solar energy locally. The project is led by ETH Zurich and the University of St. Gallen and involves multiple partners from universities and industry. Additionally, the project partners also collaborate with the local utility company, the Water and Electricity Works, and with local residents. The project has been supported by the Swiss Federal Office of Energy. "Quartierstrom" enables the set-up of exchange and remuneration of electricity between consumers, prosumers and the local electric grid provider. More specifically, it developed a prototype of a microgrid in which solar power is traded within a local community in Walenstadt. Thanks to the blockchain technology, the electricity produced from local rooftop panels can be sold directly from household to household on the lowest grid level, without the utility company as an intermediary. Owners of photovoltaic systems can sell surplus electricity to their neighbours, giving households without solar panels the opportunity to purchase clean and locally produced energy.

GOALS

- Promote the production and consumption of solar energy locally;
- Investigate if local energy markets with bottom-up grid tariffs are a viable approach in the local electricity supply systems and if blockchain is a suitable method for processing transactions in a local electricity market;
- Integrate a technological solution with active engagement of citizens as energy prosumers.

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

37 households participate in the project and form a local electricity market. Among these households, 28 participants owned solar power systems and 9 were consumers, including a retirement/nursing home. The systems combined have an output of approximately 290 kW and supply around 300,000 kWh of electricity annually. The electricity demand of the entire community is around 250,000 kWh per year.

> *"Communities made up of prosumers and consumers are economically and environmentally more efficient than individual households. Building such a community is an interdisciplinary task that we are implementing together with the utility of Walenstadt for the first time"*
>
> Sandro Schopfer, ETH Zurich

The project investigates:

- The technical feasibility of a blockchain-managed community energy system and its impact in terms of local utilization of solar energy, grid quality and energy efficiency;
- Suitable market mechanisms and resulting market prices for local electricity;
- The design of an appropriate user interface, user engagement over time and the overall acceptance of the system by the users.

As part of the implementation of the project, each household has been supplied with prototypical smart meters measuring currents, voltages and frequencies. These meters are integrated into a single board computer that connects the system to the blockchain.

The local grid operator and electricity supplier, the Water and Electricity Works Walenstadt, provided access to the distribution grid for the implementation of the project. Grid costs (i.e. bottom-up grid tariffs) for local transactions are lower than if the electricity would be purchased outside of the community. Bottom-up grid tariffs differentiate when solar energy is traded within the community network or if energy is purchased from outside the community network. Unfortunately, the Swiss legislation does not support these bottom up grid pricing schemes yet. In order to test the bottom-up tariff model, the project covered the grid costs from higher grid levels.

The local electricity market started operating from January 2019 and it will stop in January 2020. On the project's website it is possible to check the amount of solar power that is produced and self-consumed in the community and to analyse the level of self-sufficiency of the community.

The households participating in the project can use a web app to define their choices for buying and selling energy within the community. The solar power system operators determine the conditions under which they would like to market their surplus solar power to the neighbourhood, while electricity consumers can determine the maximum price of the electricity that they can buy within the neighbourhood.

TRANSFORMATIVE POTENTIAL

Generating and distributing electricity within the neighbourhood contribute to reduce the energy that needs to be transported from outside the community. The project represents an energy innovation promoting active engagement of citizens as energy prosumers and fostering local renewable energy production. The further analysis and dissemination of the results of the project will be very important for a better understanding of the feasibility of this innovative pilot and for determining its potential replication in other cities and countries.

MORE INFORMATION

District Power's website

Quartierstrom - Implementation of a real world prosumer centric local energy market in Walenstadt, Switzerland

ETH Zurich's blog

LICHT Leuven - An inclusive partnership for a healthier city

LEUVEN, BELGIUM

KEYWORDS: PARTICIPATORY DEMOCRACY; SUSTAINABLE MOBILITY; RENEWABLES

DURATION: Since 2015
WHO: City Council, citizens and other stakeholders
BUDGET: City Council, civil society organisations, citizens, schools

SUMMARY

LICHT Leuven ("Light Leuven" in English) is a partnership developed in the city of Leuven (Belgium) that brings together residents, companies, local authorities, cooperatives and associations for developing different projects related to sustainability. The initiative has been developed by the City of Leuven in collaboration with an energy cooperative and the organisation Leuven 2030. LICHT Leuven aims to contribute to building a more healthy and sustainable city and to making Leuven carbon neutral by 2030. The initiative supports the development of different projects, especially focused on sustainable mobility and renewable energy and all realized with the strong participation of citizens. One of the projects is, for example, to install solar panels on roofs of schools, companies and government buildings with the collaboration of citizens and other partners. Another project is related to sustainable mobility and develops a flexible, collaboration-based system of shared bicycles, cargo bikes or electric cars.

GOALS

- Promote the cooperation between citizens, companies, governments, cooperatives and associations to promote the transition to 100% green energy and mobility;
- Contribute to the goals set by Leuven 2030 Climate Action Plan to become a carbon-neutral city by 2030;
- Support the development of projects on renewable energy and sustainable mobility with the active engagement and participation of residents and other local stakeholders.

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

The project team of LICHT Leuven is the result of the collaboration between Leuven City Authority, the energy cooperative ECOPOWER and Leuven 2030.

All projects run by LICHT are designed and developed with the collaboration and active involvement of citizens. Every interested residents can participate or share ideas by contacting the LICHT team viavia the contact page on the project's website or by sending an email.

"Working together on renewable energy and sustainable mobility."

→ LICHT Leuven

LICHT Leuven promotes different projects:

- Solar panels on unused roofs: LICHT Leuven identifies large roofs of schools, hospitals, companies and public buildings that are unused and could be suitable for collective solar projects. In this way, residents of Leuven who live in an apartment or rental house can also invest in solar energy.
- Wind power: LICHT Leuven is investigating whether, despite the proximity to the airport of Zaventem, there are opportunities to install wind turbines along the European E40 route. Consultations are taking place with the airport, the province and the neighbouring municipalities.
- Sustainable mobility: LICHT Leuven, with the collaboration of the social enterprise Partago, has developed a system of shared electric cars to move from, to and within the city of Leuven. Additionally LICHT Leuven is researching concrete options for electric mobility with electric bike-sharing, cargo bikes and scooters.

TRANSFORMATIVE POTENTIAL

LICHT Leuven represents an innovative energy practice contributing to transform urban governance and supporting active engagement and sustainability awareness of residents. The initiative promotes the collaboration among different societal actors and fosters local empowerment by encouraging residents and local organisations to bring in their ideas and expertise for the development of projects contributing to the sustainable transformation of the city. The model of LICHT Leuven could be adapted and replicated by other municipalities in Belgium and in other countries.

MORE INFORMATION

LICHT Leuven's website (in Dutch)

Ecopower's webiste (in Dutch)

Partago's website (in Dutch)

Leuven 2030's website

APREN: a cooperative to accelerate the energy transition

PORTUGAL

KEYWORDS: COMMUNITY ENERGY; PARTICIPATORY DEMOCRACY

DURATION: Since 1988
WHO: energy suppliers, individuals and communities
BUDGET: Unknown

SUMMARY

The Portuguese Renewable Energy Association (Associação Portuguesa de Energias Renováveis - APREN) is a cooperative organisation set up in October 1988, promoting renewable energy in the electricity sector. The association collaborates with national (e.g. government and ministries), international institutions, municipalities and representatives of civil society related to renewable electricity generation. The association also represents an instrument of participation for the elaboration of energy policies in Portugal.

GOALS

- Promote the use and valorisation of renewable energy for electricity production in Portugal;
- Coordinate and represent the common interests of the APREN members in the promotion of renewable energy in the electricity sector;
- Cooperate with multiple national and international stakeholders connected to renewable energy production;
- Promote the acceleration of the energy transition in Portugal.

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

APREN is the main producer of renewable energy in Portugal, producing over 90% of the total renewable electricity in the country.

- At the national level, APREN is in constant dialogue with the Portuguese Government, ministries and other key stakeholders and networks related to energy and environmental issues.

- In the international arena, APREN participates in different European projects, such as "Keep on Track". Additionally APREN collaborates with similar European associations to influence European Energy Policy in the renewable energy sector.

- The association is also active in the organisation of events, congresses and other activities related to the production of renewable energy and sustainability.

In 2016, Portugal was able to supply the demand for energy with renewables sources for four days, combining wind, hydro and solar power. This is a remarkable event considering the European dependency from fossil-fuel energy. It was the second case in Europe, after Denmark.

TRANSFORMATIVE POTENTIAL

APREN plays a key role in the production of renewable energy in Portugal. In addition, it has been capable of developing multiple collaborations and networks at local, national and international levels supporting the change of energy policies and other important regulations related to the energy transition. APREN represents a successful example of a renewable energy association.

MORE INFORMATION

APREN's website

Mannheim on a climate-friendly course

MANNHEIM, GERMANY

KEYWORDS: COMMUNITY ENGAGEMENT; URBAN GOVERNANCE

DURATION: Since 2010
WHO: City Council, residents, businesses, public authorities, schools
BUDGET: Unknown

SUMMARY

The Municipality of Mannheim has developed a climate action plan that aims at reducing local CO2 emissions by 40 per cent by 2020. As part of this plan, Mannheim city has the purpose to implement climate protection activities related to different sectors such as mobility, resource conservation and energy and to promote the collaboration and networking among residents, experts and other local stakeholders. The city has been active in setting up a citywide campaign Mannheim Auf Klimakurs (Mannheim on a climate-friendly course) to engage local stakeholder in energy and climate actions. The campaign aims to strategically bundle energy and political climate protection measures and make them more visible.

GOALS

- Promote equal access to municipal services and encourage citizens' active engagement;
- Promote social innovation, social inclusion and sustainability education;
- Foster local and sharing economy;
- Implement climate protection and sustainability activities in different sectors;
- Encourage collaboration and networking among residents, experts and other local stakeholders.

Funded by the H2020 programme of the European Union

TOMORROW

HOW IT WORKS

The campaign consists of four spheres of activities. For each sphere, the city has been promoting and implementing more than 60 projects and activities.

Role Model City: the municipality leads by example, by taking concrete actions for sustainability and climate change mitigation and adaptation. Activities include:

- Street lighting: gradual conversion to LED technology;
- Supplying the city council with 100% green electricity;
- Public transportation tickets, car sharing, service bicycles: CO2-free business trips;
- FlurfunkE: "Energy and climate protection" action programme for the city council;
- A series of events on climate protection.

> *"The world needs new heroes, who lead the way and show what a responsible approach to our planet looks like"*
>
> → Katarina Ressel, Climate Protection Agency

Sustainable district: engaging key local stakeholders for the implementation of integrated district schemes and climate-friendly urban development. Activities include:

- Climate-friendly model districts;
- Sustainable mobility in the districts;
- Local supporting programme for the greening of roof, façade and unsealing surfaces;
- Energy advice in the districts: Energy Extra Tour for private homeowners, businesses and public facilities.

Local commitment: strengthening climate protection awareness and commitment by encouraging the active participation and engagement of local stakeholders in different projects and activities related to sustainability. Activities include:

- Environmental education for children and young people, "Climate heroes" project in schools and "Heroic acts for the climate" competition;
- An environmental award from the City of Mannheim for environmental and climate protection topics;
- Participation to "Earth Hour" and "Green Actions" (trees-sponsoring) campaigns;
- "Energy efficiency in sports clubs" funding programme;
- Participation in cycling campaigns, "Cycle to work", "Bicycle salon".

Active Businesses: actively engaging small and medium-sized companies and industries in Mannheim to help them contribute and commit to environmental and climate protection actions. Activities include:

- Climate Protection Alliance, a self-commitment programme for companies;
- Environmental award from the City of Mannheim: “Economies for the future”;
- Energy advice for trading, commercial and service companies “energy caravan”;
- Business mobility management.

TRANSFORMATIVE POTENTIAL

“Mannheim on a climate-friendly course” campaign is a great example of local community engagement through multiple projects and activities on sustainability and climate protection. The initiative started by Mannheim city represent an inspiring example of an inclusive and innovative urban governance approach facilitating multi-actor collaborations, improvement of municipal services and contributing to sustainability transformation.

MORE INFORMATION

Mannheim-auf-klimakurs website (in German)

Mannheim City Climate Analysis (in German)

Barcelona's public renewable energy company

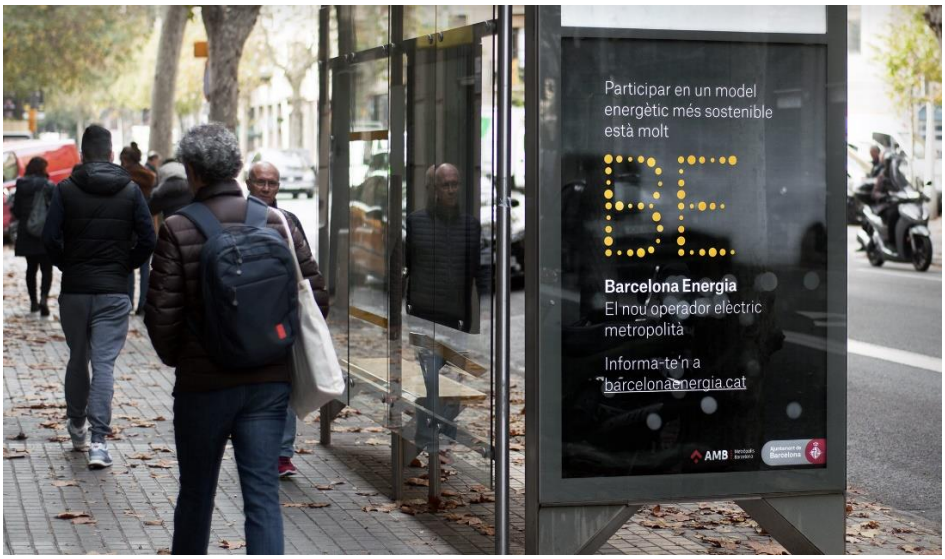
BARCELONA, SPAIN

KEYWORDS: ENERGY DEMOCRACY

DURATION: Since 2018
WHO: Municipality of Barcelona, public energy company, citizens, neighbouring municipalities of the metropolitan area
BUDGET: Unknown

SUMMARY

Barcelona Municipality has developed a wide-ranging strategy that aims at reclaiming energy sovereignty, fighting energy poverty and contributing to the energy transition through the creation of a municipal energy company. More specifically, the municipality of Barcelona, with the collaboration of the social movement 'Barcelona in Comú', initiated in 2018 Barcelona Energia (BE), a public renewable energy company. Barcelona Energia aims at contributing to the transition to sustainable energy by promoting self-sufficiency and favouring a locally produced 100% renewable energy supply. Private and public investments are used for installing solar panels on public and private roofs and other spaces (e.g. libraries, markets and civic centres). Since 2018, Barcelona Energia supplies renewable energy to buildings and facilities owned by Barcelona City Council and since 2019, also citizens are encouraged to invest in solar energy generation in their houses. Citizens are offered a range of tariffs for the production of their own energy and the most vulnerable residents are supported by the Municipality through subsidies.



Credits: Pexels

Funded by the H2020 programme of the European Union

TOMORROW

GOALS

- Promote energy sovereignty by promoting public and citizen renewable energy production;
- Fight energy poverty by providing a service that guarantees a basic supply of energy;
- Contribute to the energy transition and the fight against climate change by engaging citizens in decision-making processes and energy production.

"This initiative takes us beyond the traditional notion of public and makes democratization a foundational base. With people's participation, transparency and accountability, Barcelona Energía is showing us that energy can be clean, affordable, and democratic for all."

Marcela Olivera, researcher

HOW IT WORKS

- Since July 2019, Barcelona Energia started to supply electricity to a total of 3,908 service points including buildings of Barcelona City Council and 19 organisations of the municipal group of companies.
- Since 2019 Barcelona Energia offers the same service to residents in the Barcelona Metropolitan Area.
- The purchase and supply of electricity, both in public buildings in the metropolitan area and to the public has currently 20,000 users.
- Barcelona Municipality subsidises installation of solar panels by up to 50 per cent and offers discounts on VAT so that people can recoup the cost within three or four years.
- Barcelona Energia is currently the largest 100% public renewable electricity distributor in Spain. Other cities like Cádiz, Pamplona and Palma de Mallorca are also developing similar models in their cities.
- The city of Barcelona promotes awareness raising of the environmental, economic and social benefits of energy sovereignty. On the Barcelona Energia website citizens can find information regarding renewable energy production and how to become a client of Barcelona Energia.

TRANSFORMATIVE POTENTIAL

This initiative represents an innovative energy practice promoting the local generation of renewable energy, both for municipal facilities and for residents of Barcelona. The programme represents a clear commitment of the Municipality to develop an energy model based on a distributed and clean energy generation. It also sets a path that encourages the process of democratisation of energy and multi-stakeholder participation and active involvement (e.g. local authority, residents and companies). Other cities in Spain have been inspired by the Barcelona's model and they are adapting it to their contexts. Other local authorities, also outside of Spain, could learn from this initiative and replicate the model in their cities.

MORE INFORMATION

Barcelona Municipality website

Barcelona Energia website (In Spanish/Catalan)

Transformative Cities Atlas of Utopia

Barcelona Energia on Wikipedia (In Spanish)


drift
for transition


ENERGYCITIES


Brest
MÉTROPOLE

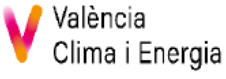

codema
Dublin's Energy Agency


Ville
MOUSCRON


AJUNTAMENT DE VALÈNCIA


Град Ниш
City of Niš


ABMEEO
Asociația „Agenția pentru Managementul
Energiei și Protecția Mediului" Brașov


València
Clima i Energia

TOMORROW

www.citiesoftomorrow.eu

Tomorrow is a Horizon 2020 funded project, aiming at empowering local authorities to lead the transition towards low-carbon, resilient and more liveable cities. In the framework of the project, six cities will develop 2050 transition roadmaps together with citizens and other local stakeholders and serve as pilot for the transition of European territories.

CONTACT | contact@citiesoftomorrow.eu