

### Report on capacitybuilding measures

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#### **AUTHORS**

Prepared by Julien Joubert, Energy Cities Reviewed by Michael Cerveny, Urban Innovation Vienna

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### Executive Summary

### New actors in heat market and citizens' involvement



Cities have to face an evolving heating and cooling market, steer its decarbonisation, and engage citizens in the process. To provide solutions, knowledge and best practices, the Decarb City Pipes 2050 consortium organised capacity-building sessions for local authorities on these topics. This report summarises the main outcomes of these sessions, during which experts from cities across Europe have been invited, such as Munich, Vienna, Rotterdam, Mechelen, Brussels, etc.

The exchanges underlined the needs to provide additional services to enable the adoption of clean technologies, such as advice, real-time monitoring, etc. New contractual approaches with consumers such as heat-as-a-service can be beneficial to meet the demand of consumers for more comfort, and flexibility, while saving energy.

The question of summer comfort and thus cooling is a rising issue for local authorities, which then strive to develop decarbonised solutions such as district cooling. A careful planning of the demand and a thorough assessment of the production potential are key in the process. The use of existing underground infrastructures and waste heat resources via absorption chillers can greatly lower the costs associated to this solution.

The question of trust and transparency are central in the transition process. These are key levers on which energy communities, a new actor in the heat market, are playing to develop projects and engage citizens. Energy communities can be an ally for local authorities, and sometimes a challenger of traditional utilities, like in Ostende (Belgium).

Local authorities have many possibilities to involve citizens in designing their strategies or implementing projects, such citizen assemblies. co-creation processes, consultations. surveys. meetings. etc. Success factors for citizens' involvement are: being in listening mode, addressing people concerns, providing holistic support, not only regarding energy, building trust thanks to direct personal contacts, being transparent, and defining responsibilities, clarifying the choices people have to made, taking the time and being flexible.

These are the conditions for an inclusive and just heating and cooling decarbonisation, in order to create desire for change and transform the "energy transition" into tangible actions.

### Introduction

#### Context and overall objectives of the project

Responsible for roughly half of the EU's final energy consumption, transitioning heating and cooling to energy efficient, renewable solutions will be critical to bring EU countries in line with their pledged climate and energy targets. Given the long-life cycles of the grid infrastructures involved and more so given the impact transition has on both homes and energy infrastructures, there is an urgency to start the planning of this transition today. But how? What first? Which systems? What heat sources are there? How to govern this process? Increasing complexity of the energy system together with technological uncertainties require a high level of knowledge and skills to act wisely. Cities are not yet fully equipped for this. They lack capacity and skills as well as financial & legal empowerment to act.

Decarb City Pipes 2050 showcases how local authorities can build capacity to succeed in this challenge. Seven cities - from frontrunners to beginners - join forces to learn from each other and elaborate innovative responses together. They explore pathways suitable for their local challenges and build up skills in the use of data, planning tools and instruments, techno-economic as well as process and transition management knowhow (see Figure 1). In a participatory process with stakeholders, each city developed tangible transition roadmaps, building up trust and commitment for its implementation along the way. In deep peer-to-peer exchanges, cities and utilities share knowledge to benefit from other perspectives, stages of advancement and planning traditions.

Climate urgency calls on all political levels to act more stringent and faster. In this EU-project seven cities - Bilbao, Bratislava, Dublin, Munich, Rotterdam, Vienna and Winterthur - team up to work out actionable roadmaps to decarbonize heating and cooling for buildings in 2050, taking up the challenge of phasing out natural gas in heating. And the seven Decarb City Pipes 2050 cities are getting real about showing the door to fossil fuels for heating:

- In <u>Heating and Cooling Outlooks</u> they showed what is technologically and economically possible and needed on a bigger scale (WHAT).
- Heating and Cooling Plans then gave a technical-economical spatial plan of what solution makes most sense where (WHERE).
- Finally <u>Transition Roadmaps</u> to energy efficient, zero-carbon urban heating and cooling show how the transition can take place (WHEN & HOW).

Together, they will advocate for the needed *changes to framework conditions*.

Guided by two scientific partners and a distinguished advisory board, the project aims to empower more than 220 public officers and improve more than 50 policies. Ultimately, it strives to motivate and support more than 80 cities to start the same roadmap process.



Objective and purpose of the deliverable

This report on *capacity-building measures (D.4.2.)* is based on the various capacity-building activites organised under tasks 4.3 *New actors in heat market* and 4.4 *Getting citizens on board*. The aim of these two tasks was to provide cities and utilities with expertise on the new actors in heat market, such as energy communities, and the importance of timely and well-managed citizen engagement processes for the heating and cooling transition.

FIGURE 1: TRANSITION MANAGEMENT KNOW-HOW

The objective of this deliverable is to give an overview of the main lessons learnt from the different capacity-building sessions organised with experts, the consortium partners, other local authorities, utilities and academics. It underlines the most meaningful experiences and provides good practices regarding innovation in the heat market, and citizens' engagement.

The heat market is experiencing a profound transformation with a clear increase of the cooling demand in the building stock, new business models being developed such as heat-as-a-service, or development of new actors like energy communities. The first part is dedicated to these topics.

The second part focuses on citizens' engagement in decision-making processes and roadmaping processes. Involvement of citizens, and accessible and clear communication of policy makers' decisions are key point to reach public acceptance and actions to decarbonise heating and cooling. General principles and good practices on this topic are presented in the second part of this report.

### Part 1 – New actors in heat market



### (Very-) low temperature district energy and heat as a service

The long-term horizons of the (district) heat market

The decarbonisation of energy systems offers new perspectives for the heating and cooling markets. Innovation can concern technologies, but it also lies in the way of considering the market, be it in the conception of heat systems or in the contracting format. There is thus space for reinventing our approaches, and some solutions are already there, waiting to be explored.

#### Rethinking the heat system: the case of Sharing Energy Amongst Adjacent Buildings

Techno-economic energy systems, conventional or low-carbon electricity, gas or district heating networks, always focus on delivering energy from production points to consumption points. And they often present a certain number of vulnerabilities, either technical or economic, because of their design. However, a fourth one based on reciprocity in which consumers are also producers is possible, which can be called "SEAMS (Sharing Energy Amongst Adjacent Buildings)". The SEAMS approach consists of bidirectional energy networks organised in a mesh system connecting nearby buildings, on the contrary to very-low temperature networks making a loop between buildings (often called "ambiant loop", and promoted by the concept of 5th generation *district heating and cooling*). This meash system between the different buildings allows thermal energy exchanges between buildings, based on their demand and their onsite thermal renewable energy productions, thanks to thermal energy storage systems. A study published in 2021 from David Bourguignon (Les Énergiques), Frédéric Adam (G-ON) and Pierre Crépeaux (City of Lorient (FR)) developed the concept of SEAMS as a decentralized, small-scale, heterogeneous, adaptable and modular approach to foster onsite renewable energy production used by neighboring buildings. In this study, they demonstrate the relevance of the approach in the French context in which "nearly 90% of the relevant homogenous heat density paths are of intrablock/interblock length, i.e. shorter than 750 m while roughly 50% of the total heat consumption is gathered into intrablock-sized paths, i.e. shorter than 250 m". The comparison between a SEAMS approach (based on a mesh design of the network, thermal energy storages and on site renewable energy production) and traditional energy systems, thanks to energy modeling and simulations, concludes that the SEAMS design offers an overall better performing system with competitive costs in terms of Levelised Cost of Energy (LCOE) and carbon abatement, deeper decarbonisation, and increased energy and peak demand sufficiency.

The main explanations from the authors of the overall efficiency of the SEAMS approach are the following:

buildings require large amounts of thermal energy, this form of energy is expensive to distribute over long distances but can be stored efficiently on the demand site in many different ways;

- thermal energy is abundant in urban areas, since most built surfaces, from streets to building façades and roofs, behave as solar thermal collectors, and waste heat is a common byproduct of many local activities;
- intrablock/interblock needs trigger reciprocal exchange of energy resources, either demand, supply or storage, and unused spaces (collector surface on the roof, storage volume in the basement or under the pavement) can be transformed into assets with immediate valuation;
- a mesh network topology is robust and adaptive, fostering endogenous growth and stepby-step innovation principles.

This approach means rethinking the whole dynamic of the heat system, its delivery, and its interactions. It also echoes another way of apprehending urban areas, architecturally speaking: houses and buildings could be designed better for energy harvesting.

Favouring exchanges between adjacent buildings means doing according to local resources, which need to be stored. Storage is also key in low-termperature network design (cf. Figure 2), such as in the case of the <u>Suurstoffi district</u> in Risch Rotkreuz, Switzerland. According to Nadège Vetterli, from ANEX, the key success factors in this type of projects are the organisation between the different partners and the risk coverage by the public authorities.



FIGURE 2: THERMAL NETWORK TYPOLOGY

The SEAMS are also forcing us to rethink the urban environment at the building level and go back to a neighbourhood approach, where talking to your neighbour is not only a matter of sociability, but also of energy exchanges. Such change of approach compared to traditional solutions is obviously easier to implement in new urban developments than in the existing built environment, for which it would require more time.

### Rethinking the way of contracting: heat as a service

Reflecting on the heat market also means looking for new ways of thinking about heat. Catapult Energy Systems, a UK organisation, has experimented heat as a service with the households of their Living Lab during the <u>Smart Systems and Heat</u> project. The main aim was to explore new business models and market structures favouring the use of district heat and low-carbon heat in buildings. The homes of households part of the trial were equipped with sensors and control device, allowing to set different temperatures in different rooms. This allowed to reveal the consumer preferences in detail, from "cool conservers" who often adjust temperatures to try and cut bills, to "toasty cruisers", who love feeling cosy and prefer not to put clothes on if they are cold.

Then the experience offered a hundred of households contracting schedules, based on the number of hours in the week during which they wanted to be warm, with a fixed price for this number of hours (offer caled the "FixedTime plan"). However they could not change their schedule. A higher price was offered for any extra hours of warmth outside the schedule.



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#### FIGURE 3: CONSUMERS' WISHES FOR "HEAT AS A SERVICE" (SOURCE: CATAPULT ENERGY SYSTEMS)

Heat plans allowing more flexibility were also proposed: FlexiTime (the mid-priced plan), offering, in addition of the Fixed Time plan, a number of Extra Warm Hours that consumers were free to use when they liked; or Unlimited, the most expensive plan, offering consumers a fixed price for an unlimited number of Warm Hours. Most people were interested in the FlexiTime plan, valuing the peace of mind in knowing that they would have all the heat that they needed. In practice, these consumers rarely used their spare hours, but they were ready to pay the extracost to get the flexibility. A significant part of the consumers also kept the fixed time plan, to save money. Few choose the unlimited plan, as they knew how many warm hours they used each week.

In addition, 85% of customers subscribing to a heat plan were open to alternatives to gas when replacing their boiler (vs. 33% for people who have not subscribed): it clearly underlines that if energy services could guarantee people the comfort they want, they might not care how it is

delivered. This experience highlighted three main concerns from heat consumers regarding lowcarbon heat as a service; it needs to:

- keep them warm
- be easy to control
- and give them a choice.

This is also confirmed by the fact that almost 80% of participants are also keener on having a heat pump with a heat-as-a-service contract, than having a heat pump alone. The concept of services is thus seen as an incentive to decarbonisation.

This new contracting system also implies new stakeholders' engagement and interactions with manufacturers, district heating providers, and a close cooperation with energy providers. Another challenge is to convince policymakers to design incentives for providers to embark on the experience of heat as a service.

#### Key takeaways

The decarbonisation of the heat market offers many opportunities to rethink it. Studies and innovative projects show that it would be possible to create a more robust energy system based on local on-site thermal renewable energy, energy storage and energy exchanges of nearby buildings.

Energy services will be a key component of the new heat market, and also an important enabler for the adoption of clean heat technologies, such as heat pumps. Heat-as-a-service can be an attractive solution for consumers if it provides the right level of quality and flexibility.

These two evolutions, local energy sharing and heat as service, imply an upheaval of the traditional considerations of heat delivery, which is at the end more centred on the building scale, even on the customers themselves.

These insights are based on the presentations and discussions from the online capacity-building <u>session</u> organised on 28<sup>th</sup> January 2022.

# District cooling: keeping cool (and decarbonised) when it gets hot in cities

Heat decarbonisation is receiving more and more attention. However, with the unavoidable rise of temperatures, the topic of cooling and its climate impact is also getting hotter in cities. There is a clear demand for cooling in cities – and some of them already have a district cooling network. District cooling emits less than individual cooling solutions, but how can we ensure the deployment of *decarbonised* district cooling?

#### New EU regulations for the cooling sector

Why decarbonising cooling systems? The first immediate answer to this question is quite simple: because there are European targets. The new Renewable Energy Directive recast adopted in November 2023 sets a biding objective of +1.1 percentage point increase of the share of renewables in the heating and cooling sector (H/C) per year for the period 2026-2030, and an indicative objective of +2.2 percentage point increase of renewable energy in district heating and cooling (DHC) networks per year. However, those targets bind heat and cold together, making it difficult to assess the real impact it could have on cooling. It is worth noting that the new *Energy* Efficiency Directive, adopted in September 2023, also increases the ambition for the decarbonisation and the efficiency of the cooling sector, and treats equally the heating sector and the cooling one. For instance, the article 25 on heating and cooling assessment and planning foresees a cost-benefit analysis of the most resource- and cost-efficient solutions to meeting heating and cooling needs, taking into account the energy efficiency first principle. It also introduces local heating and cooling planning for local authorities above 45,000 inhabitants. The article 26 on heating and cooling supply defines efficient heating and cooling networks according to their share of renewable energy, waste heat and cogenerated heat. The EU also recognises cooling (and heating) networks as "enabling activities" for the "transition of the energy sector" in the sustainable finance taxonomy, making them eligible to the green label.

The second reason for the decarbonisation of cooling systems is brought by climate change. With rising temperatures, cooling is becoming more and more relevant in many countries, not only for the industry or the service sectors, but also for residential buildings. Some cities have already started developing their own cooling networks – mind you, the one presented below are not even from Southern Europe... but in Germany and Austria!

#### The advantages of district cooling – the case of Munich

The City of Munich has started developing its own cooling network in 2014, consisting of eight groundwater plants of 16 MW, and operated by Stadtwerke München (SWM), the municipal energy utility. It already expanded with three new plants of 17 MW now in operation, and a 35 MW plant should be delivered in 2024. If, at the beginning, the main use was for refrigerating technical equipment or cooling groceries, the cooling demand for comfort has been increasing.

The main source is the lsar river with remaining underground streams. It supplies both heating and cooling, built in the same system. Two ways of generating cold are used: direct cooling via an heat exchanger between the groundwaters and the cooling networks or via heat pumps. One important point for the utility is a sustainable and safe use of the aquifer, used for drinking water. Thus there should be no excessive warming or cooling of the aquifer. SWM works in collaboration with the Chair of Hydrogeology of the city university to have a sound groundwater management. To optimise the costs of the exploitation of the near-surface geothermal potential for cooling, the company is exploiting the existing underground infrastructure, i.e. the underground transportation system of the city.

According to Patrick Krystallas from SWM, the district cooling network allows the city to save energy, between 50-70%, compared to decentralised cooling supplies! Indeed district cooling has an Energy Efficiency Ratio of around 24 in Munich. The other advantages of district cooling are:

- an increase of property value for the consumers: district cooling avoids space loose, and noise pollution compared to heat pumps (or air conditioners),
- gain of comfort: it doesn't require maintenance from consumers, there is no use of refrigerant or recoolers which can create hygiene problems (and have an high impact on climate change), and the security of supply is increased as a district cooling system has several generation plants (i.e. a redundancy).



FIGURE 2: COMPARISON 50 MW DISTRICT COOLING VS. SELF-SUPPLY (SOURCE: SWM)

### Identifying the potential for developing cooling networks

There are several tools that proved useful and efficient when it comes to heat mapping and planning, but cooling has only recently been included in the scope. In the frame of a recent LIFE project, HEAT&COOL, the CEREMA has developed a *tool* to identify and prioritise the areas with a high potential to create, densify or extend a district heting and cooling network.

Using a multi-criteria analysis, the tool provides development potential maps for heating and cooling networks, and maps of heating and cooling needs. The main indicators used, and their weighting, to determine the development potential of cooling networks, are the following ones:

Indicator	Weighting
A. Heating and cooling needs (collective housing and tertiary)	3
B. Heating and cooling needs nearby (collective housing and tertiary)	3
C. The proximity of an existing DHC network	2
D. The presence of large tertiary consumers (hospitals, schools, offices, swimming pools, etc.)	2
E. The presence of large residential consumers	0
F. Building heating system	0
G. The potential of waste heat	1
H. The vulnerability of buildings to urban heat islands	1
I. Geothermal resources	1
J. Thalassothermal resources	1
K. The possibilities of temporal energy aggregation (collective housing and tertiary)	1
L. The possibilities of energy aggregation (heat & cool production)	1

The data used in the tool comes from the French national database from tax services. It includes the characteristics on the buildings, the ratio of consumption per square metre and supported the creation of an inventory of heating and cooling networks. Additional data, such as the geothermal potential, was provided by local actors.

It is key for local authorities to have access to this kind of tools, as it accelerates the development process of networks: the opportunity study can be skipped, jumping directly to the feasibility study!

### Tips to develop district cooling networks - the experience from Vienna

Wien Energie, the municipal energy company of Vienna, operates four cooling plants in the Austrian capital. Three plants are currently in operation (39 MW), and the fourth one is under

construction (17,7MW). On the contrary to Munich, the district cooling networks are separated from the heating ones. Most of the cooling is provided thanks to geothermal use of ground water around the city and, in some cases, the ground water lake is used as a seasonal storage. Wien Energie mainly uses two technologies for cold generation: conventional compression chiller, or absorption chiller. The latest one is cost effective when the thermal input comes exclusively from waste heat, which is often highly available from Combined-Heat-and-Power plants in summer.

According to Burkhard Hölzl from Wien Energie, there are some key success factors on how to set up district cooling systems:

- Be careful before starting the construction:
  - Have a clear assessment of the cooling demand (cooling purpose, type of building, how much demand)
  - Explore the possibility to build a cooling plant (where to install the machines)
  - Check the existing infrastructure to find cheap and favourable costs and conditions for piping.
- Check the different technicalities and the economical and financial conditions:
  - Possibility of building re-cooling systems (open cooling towers, river water, dry coolers, re-cooling via the district heating network)
  - Some technologies are subsidised, and others not! In Austria, the use of absorption chillers with waste heat utilisation can be subsidised, not the conventional compression chillers.
- Carefully assess your customer potential before starting and once you have started!

#### Key takeaways

The decarbonisation of the rising cooling demand will be a challenge for local authorities in the future. Distict cooling is one of the main solutions, presenting many advantages, but also facing similar barriers than district heating. It also represents a clear business opportunity for local utilities.

These insights are based on the presentations and discussions from the online capacity-building <u>session</u> organised on 25<sup>th</sup> November 2022. Support materials of this session are available in Annex 1.

# Heat communities, an original actor in the heat market

Not-for-profit and citizen-led decarbonisation

When hearing the words "energy communities", immediate thoughts go to electricity production – wind farms, photovoltaics, ... However, especially after the energy crisis and the skyrocketing prices of natural gas, thermal communities are receiving a growing interest: they may be an ally for local authorities looking for decarbonising their heating systems.

#### Several definitions of energy communities

In times when ownership and inclusion are increasingly present in the debate of the transition, energy communities seem to bring an original perspective. Their governance model is very specific and relies on three concepts: they have a voluntary and open membership, they are controlled by their members, and they must have a positive environmental and sociological impact. Energy communities are thus a way to involve citizens, allowing them to go from passive consumers to actively taking part in the market. In addition, and what makes them different from most market actors, energy communities are non-profit and must reinvest potential benefits in the community. This makes them strongly anchored at local level and potential allies for local authorities to move further in their decarbonisation strategies.

Legally defined in 2019 by the European legislation (Clean Energy Package) and in theory transposed in national legislations by 2021, loopholes remain when it comes to proper definition and recognition of energy communities, especially for thermal ones. The European federation of citizen energy cooperatives and communities regularly assesses the *progress* of the transposition of the Renewable Energy Community (REC) and Citizen Energy Community (CEC) definitions in the European Member States, and the related enabling frameworks and support schemes. It is key to understand that two definitions of energy communities exist: the renewable energy community introduced by the Renewable Energy Directive II, and the Citizen Energy Community introduced by the Internal Electricity Market Directive. For REC, there is a clear obligation to ensure their autonomy towards their members, and that they can't be controlled by one of them in any way. In addition, REC can only develop activities linked to renewable energies and situated in proximity of where they are based. These constraints of autonomy and geographical scope don't apply for CEC.

### Citizen engagement: a challenge for citizen-led district heating! – the example of MeerEnergie in Amsterdam

In the Netherlands the role of thermal energy communities is still unclear, because their definition is only included in the electricity law, not in the heat law. MeerEnergie, a local energy cooperative in Amsterdam, calls for a clarification in the legislation, as it has created some issues for the development of a cooperative district heating project in the area of Middenmeer, especially when interacting with the municipality. The latter was constantly wondering if the energy cooperative was a marketparty or a citizens' representative, and thus which approach to adopt: tendering process (and thus competition) or co-operation.

Despite this issue, MeerEnergie, toogether with FIRAN (a subsidiary specialised in clean energies of the gas network operator Alliander), worked on new energy concepts to make use of the waste energy from the two data centres of the company Equinix. Meerenergie found an agreement with both the datacenter company (to provide their waste heat for free) and with the municipality of Amsterdam, to work hand in hand and coordinate the different street works. This joint action with the cooperative was beneficial for the local government, given the objective of the municipality to get rid of gas for heating within 30 years.

However, getting the DSO and the local authority onboard is not enough for a thermal community project to be born. Citizens must also be supportive. Of course, this is inherent to the concept of energy community, but it becomes even more crucial when the community is a district heating one. District heating takes intensive citizen engagement, according to Siward Zomer from Energie Samen, the Dutch energy cooperative association. As Siward puts it: "District heating projects are quite demanding compared to wind and photovoltaic where you only need the municipality and farmers. Here, you crucially need citizens because you need to access inside their houses". MeerEnergie addressed the issue in different ways: having personal contact with the residents, a combination of information sessions and formal decision making processes, and a transparency in tariffs setting.

#### Crowdfunding: a new way to fund district heating?

Citizen participation in thermal cooperatives is also important when it comes to funding district heating projects. District heating usually requires a huge capital investment and, despite sometimes the existence of subsidy programmes for cooperatives like in the Netherlands, it is difficult for citizen cooperatives to gather enough upfront capital, while getting subsidies for every stage is hard and uncertain. Crowdfunding, as alternative funding source, can be a solution, especially for energy communities.

According to Dr Chiara Candelise, from the Bocconi University, crowdfunding can help addressing different challenges for district heating projects. Crowd investors could be prepared to invest *patient capital*, i.e. without expectations of immediate and high returns, if the ethical, social, envrionmental and/or territoral benefits are well communicated. This can strongly enable access to finance for projects having low or medium return on investment, but wide non-financial benefits. Crowdfund is also an opportunity to increase public engagement during the financing

campaign, by increasing the local awareness about the projects, and potentially reaching new customers for the district heating networks. It also reduces the potential "nimbyism" (not in my background syndrome) by allowing redistribution of economic benefits in the territory and among citizens interested by the project.

This alternative financing source, through dedicated web platforms, is in constant progression in the energy sector, both in terms of projects and volume. If 70% of the funding volume went to solar photovoltaic and wind projects, there is a a progressive opening to other technologies. Average returns on investments are often in the 4% to 9% range. This is a key consideration to attract citizens, but transparency and sustainability impact are also among the top 3 factors influencing the investment decision.

### District heating communities challenging traditional utilities – the case of Beauvent in Belgium

Sometimes, the easiest path to facilitate the development of district heating cooperatives is to start with private customers and be price-driven. This is the choice the Beauvent cooperative from Oostende (Belgium) made. With a lot of chemical industries in needs of heat, the city government looked for ways to use the waste heat generated by the waste incinerator. This was in 2013. However, two years after the feasibility study commissioned by the city which demonstrated the techno-ecnomic potential of the project, traditional utilities showed no interest in developing a district heating network. After a repeated feasibility study and another absence of interest from private operators, the city of Oostende organised an info-session on the project at the end of 2015. Then, Beauvent, in agreement with its members, expressed interest. On its own, the cooperative made contracts with the companies, designed the network, made business model, and looked for national subsidies. It took them two years, but the construction started in 2018 and the first supply was achieved in 2019. Three years later, the network has been extended to the city centre and is now supplying thirty-five large residential buildings. From 4 GWh supplied in 2019, the network delivered more than 16 GWh in 2022. If in 2015, no traditional utilities were interested in this district heating project, the legislative and support framework has well evolved in Flanders: at the time, district heating was not recognised, today the technology is subsidised, as a way to going out of natural gas, a priority of the Region.

According to Jeroen Soenens from Beauvent, local authorities should not be afraid to work with alternative partners like heat communities. They won't loose control of the project, as heat communities are local by essence: they have local shareholders, decisions are made locally and the profits stay at local level.

#### Key takeaways

To achieve the decarbonisation of their heating systems, local authorities must look for new ways of cooperating or approaching projects – and this may imply looking for new actors such as energy communities. Working hand in hand, municipalities and thermal energy communities can develop projects which would otherwise not happen, like in the case of Oostende. In

addition, this is also a way of guaranteeing citizen involvement and ownership of the transition, facilitating acceptation and accelerating the heat transition at local level.

More information and resources about energy communities are available on the website of the EU-funded project <u>SCCALE203050</u>.

These insights are based on the presentations and discussions from the online capacity-building <u>session</u> organised on 17<sup>th</sup> January 2023. Support materials of this session are available in Annex 2.

### Part 2 – Involving citizens in the heating and cooling decarbonisation



### Creating desire for change – the lessons from the fossil-free neighbourhood of Heindijk in Rotterdam

Time, patience, personal contacts and social marketing

In the Netherlands, decarbonisation is often approached through the district perspective. It favours thus affordability, inclusiveness, and achievability. This is also the best way to minimise inconvenience for residents and the total costs, while maximising the potential combinations with other ongoing or planned projects. The neighbourhood of Heindijk, in Rotterdam, consists in 638 houses and 7 utilities. The size of the neighbourhood being ideal, the city decided to make it a pilot project for their program fossil-free districts by 2027. And citizens' engagement was at the core of the experiment.

#### Being present where people live, to create trust

The Heindijk neighbourhood is a strategic area with which to start: not too big, quite a heavy CO<sub>2</sub> emitter, and urbanistic works are planned to redesign the public space and replace the old sewage systems. A good opportunity to block the streets once, install district heating at the same time and minimise inconvenience for its inhabitants! To be close to the inhabitants in this decarbonisation journey, the city created the *Energiehuis* ("energy home"), as a true meeting point for the residents of the neighbourhood. It is a place where you can, of course, gather information on energy. It is also a socio-cultural place, where elderly people can come and play cards or just gather for a chat. Finally, it is a place where social workers support citizens in their job or training search. And because all these stakeholders are gathered in the same place, they inevitably interact, favouring for instance job searches or trainings related to energy or to accompanying elderly people. In a word, the *Energiehuis* is a neuralgic place, where many profiles coexist and interact. An ideal place to reach a large variety of citizens and embodying decarbonisation in the daily matters of the neighbourhood.



FIGURE 3: THE ENERGY HOME IN THE DISTRICT OF HEINDIJK

### Treating daily problems first, before starting decarbonisation strategies

The daily matters of the neighbourhood are actually more important than expected, when it comes to fighting climate change, and the city realised it quickly. Even though the goal of the pilot project in Heindijk was simple: to have an energy system which is affordable for everyone, at the lowest cost, it could not start immediately. Before being able to catch the attention of residents on the question of decarbonisation solutions, there was one problem which was occupying every conversation and making it impossible for residents to discuss anything else. This problem took the form of a fence which needed to be removed, as it had been illegally installed and was dividing the neighbourhood in two. Intense discussions with the city took place to finally solve the issue. The real decarbonisation work could then start.

### Listening and addressing people concerns, collaborating with motivated inhabitants

After ensuring that residents are in proper conditions to consider the decarbonisation matter, the city could focus on the next steps: the connection of buildings to district heating, which is the less costly solution to phase-out fossil gas according to its techno-economic study. They analysed the customer journey that residents should make to switch from gas to district heating and designed a communication strategy including a lot of direct contacts with and visits to inhabitants. The different contacts with inhabitants showed that cooking was quite a sensitive point: residents had a strong attachment to their gas stoves. Moving to an electric one was a major barrier for citizens and thus for the project. The city of Rotterdam organised then three cooking workshops on cooking on electric stoves. In parallel, the city could rely on one of the

inhabitants of Heindijk, Frank, who, with the support of the city, decided to publish a cookbook featuring the different cultures in the neighbourhood. The cookbook was distributed amongst residents and also helped raising awareness on electric stoves. Frank was one of the first to adopt electric stoves when he was given the chance.

### Betting on a restricted offer, in choice and time, to create desire

Once the barrier about cooking was down, a map of the residents' choices was designed by the city to motivate them to switch to district heating. It gathered five options: a complete fossil-free system at flat-level (electric stove for cooking and district heating for space heating), only district heating for heating space, only electricity for cooking, all electricity (heat pumps), or decide later. District heating being present in Rotterdam for already some years, most of the inhabitants are familiar with the technology, even though it looks more old-fashioned compared to electricity in their eyes. Yet, when looking at costs, the whole electrification option is more complex and expensive from a societal point of view in the case of the Heindijk district (when taking into account the costs of green electricity production and the reinforcement of power grids to distribute it).

To incentivize citizens towards the district heating solution, the city, together with the energy provider, provided different financial and social supports to the homeowners as summarised in Figure 6. The city took also in charge the whole coordination of the work, the development of the different contracts between the heat supplier, the installation company and the home owners.

#### THE OFFER FOR THE OWNERS Testing District heating Testing offer, choice map, Contribution owners 1500,communication material (average costs €14.500) among residents Cooking Subsidy € 500,-Personal contact Care offer with Bruynzeel inclusive Financing Cooperation with social Interest-free loan department for people with (financial) problems

FIGURE 4: THE DECARBONISATION OFFER FOR OWNERS IN HEINDIJK. (SOURCE: CITY OF ROTTERDAM)

The strategy chosen by both the city and the energy provider was clear: there will only be two moments to decide to connect to the district heating network. Either in 2021, or in 2027 when it should become mandatory for everyone in the neighbourhood to become gas free and when the city could not guarantee the same financial support offered in 2021. There was also an economic rationale in the financial support offered as en early connection makes it cheaper for energy companies, and then for the economic model of the whole project. To make it happen in 2021, at least 30% of participation was needed. Finally, more than 70% of buildings chose to switch to district heating. The initial reflection time was of 4 months, but even after two years, some people still expressed their interest – even though too late.

This fact clearly underlined the role each inhabitant plays on his or her neighbour in terms of acceptance and forced the city and the energy provider to adopt a house-by-house approach. This is especially critical when it comes to the choice of connection methods. Indeed, one rejection of the connection may mean a different (more complicated) way for other apartments in the same buildings to be connected to the network.

#### Useful learnings for the scale-up of the approach

Overall, the Heindijk pilot project turns out to be an inspiring case for the decarbonisation of districts, embracing a holistic and inclusive approach. The first takeaways from the experience are quite positive. You just need to meet some of the residents, like the Decarb City Pipes 2050 partners had the chance to, to confirm it. They gladly show the works which have been done and take the time to chat about their experience.

Even though homeowners must have three different contracting parties (the city, the energy provider, and the installation company), which is seen as an obstacle, 73% of the residents of the neighbourhood are connected to the district heating network in 2022. The estimated payback is of 30 years and the high temperature characteristic of the network does not make it mandatory to have a fully insulated house before being connected.

However, in spite of all those positive elements, the scale-up of the approach in other districts in the same conditions is questionable. The possibility for the city to subsidize most of the costs was especially linked to the fact that this project was a pilot case. The replication under the same conditions will depend on available budget and strong political will in the city.

#### Key takeaways

The main highlights of the approach in the Heindijk district, reported by the different stakeholders, include: the solid partnership between the city and the energy provider, the emphasis on personal contacts, the choice map which was designed, and the various information meetings. Finally, the cooperation with other departments, such as the social one, proved useful and allowed more inclusion of inhabitants.

Apart from the points underlined above for a succesfull engagement of citizens (creating trust, addressing daily problems of inhabitants, answering people concerns, and collaborating with motivated citizens), some key points of Rotterdam communication strategy are:

Inform in time, by providing enough time, but not to much

- Emphasize the positive points (lower costs, safer house, subsidies), instead of what people will loose
- Make the choice specific, and clarify them, with the choice map
- Build knowledge of people, as too little knowledge would lead to inertia.

These insights are based on the presentations and discussions during the site visit organised on 20<sup>th</sup> April 2022 by the Decarb City Pipes 2050 consortium (and especially the City of Rotterdam). Support materials of this site visit are available in Annex 3.

# Leveraging on co-creation to decarbonise heating systems

The needed piece for a just transition

Decarbonisation is often seen as a matter of political will and technical knowledge. However, **ambitious policies need adhesion from citizens to be successful and impactful** – hence the key role of co-creation.

What is co-creation?

Co-creation initially comes from the product and service design process. Co-creation supports the belief that a product can get better when involving consumers or end-users, from the beginning till the end. Policymaking can benefit from this approach, especially since debates are becoming more and more polarised. The example of wind power projects is telling: the "not in my backyard" effect has been so powerful lately that some municipalities anticipate that citizens won't want it and don't involve them anymore, increasing tensions and frustrations.

Yet, the list of benefits of co-creation is long:

- It helps early detections of potential gamechangers and showstoppers. It also avoids losing time in wrong assumptions.
- It helps overcoming the polarisation of debates and create trust. CEO, politicians, media lost credibility for people, but peers and neighbourhoods still have some credibility. Through co-creation, it is possible to have new ambassadors for your projects and potential multipliers.
- It can deeply change territorial dynamic, bringing back local pride and social cohesion.

Of course, setting such a process requires both willingness and process. It is an investment with uncertain outcomes and with a long temporality. Thus, according to Sabine Froning from Communication Works, it is important to focus on people with the highest interest and influence on the concerned projects or strategies. Other approacges can be applied with people having high interest, but low influence (for instance informing them), or people having high influence but low interest (consultation).

### Don't have predefined outcomes of co-creation processes

The city of Mechelen in Belgium realised that it cannot lead the decarbonisation alone and decided to take steps to form a local alliance. The city considers itself as the "heat director" of a heat coalition, it is the "project manager". To give more space to its citizens in order to accelerate the decarbonisation of its territory, the city of Mechelen first started by re-organising its services, to better support citizens and project developers. Then, it applied co-creation approaches in different actions of its heat strategies, among them:

- The development of a one-stop-shop (OSS) for condominium retrofit: the co-creation involved representatives from the city, the condominium associations and local residents. It allowed the city to become more knowledgeable of the condominium association's process, and to design the services of the city OSS for multi-family homes. Until now, the OSS was only supporting the renovation of single-family homes.
- The implementation of a transition arena: as the heat transition is a complex one, the city recognised its lack of knowledge and skills. This is the reason why the city set up a transition arena, i.e. a series of co-creation workshops with 20 experts with different backgrounds. The methodologies used were mainly the <u>Multi-Level Perspective</u> (to characterise the system and map its dynamics by identifying the dominant structures (regime), the innovative developments (niches) and the broader societal trends (landscape)) and the <u>X-Curve model</u> (to map the innovation and exnovation dynamics of a system), both promoted by the EU-funded project <u>Tomorrow</u>. According to Ighor Van de Vyver, from the city climate team of Mechelen, the administration should not restrain or have pre-defined outcomes of the co-creation process, except for the vision and the ultimate goal: a reduction of 40% of GHGH emissions between 2011 and 2030 in case of Mechelen. Then it is important to trust the co-creation process to be able to develop truly shared outcomes.

The city of Mechelen is part of the SHIFFT Interreg project, which has published a guidance document on co-creation and stakeholder engagement for sustainable heating, available <u>here</u>.

### No single organisation, individual or sector can fully transform Dublin alone

This reality is the main reason for citizens' and stakeholders' engagment in Dublin. In addition, scientific research proved that using participatory process with these most impacted at an early stage is key to ensuring that a transition is just. The city has thus developed surveys and minipublic (also called citizens' assemblies). It unrevealed several insights: the lack of trust in those most responsible, the willingess to be engaged through deliberative methods, and the main barriers people faced to be part of the energy transition: lack of information, finance and infrastructure.

The lack of information is a key barrier that the city of Dublin and Codema (the Dublin energy agency) had to address in the development of a new infrastrucutre in the Irish context: district

heating (which was almost non-existent in Ireland before 2020). These two actors developed a stakeholders' engagement strategy by identifying them, ranking them, and defining their main drivers, before engaging them. An important work has been done to communicate via brochures or site visits of the infrastructures that district heating is more than just a heating solution and has many more benefits.

At the end, a key learning for Dublin when developing the first large-scale district heating scheme in Ireland was the importance of transparency when engaging stakeholders and citizens: it is detrimental to build trust. Local authorities should allow accurate comparisons between different technologies, and strives to reduce the prices of the clean ones.

### Boosting decarbonisation strategies via climate citizen assemblies – the case of Grenoble

In 2022, the metropolis of Grenoble in France decided to launch a climate citizen assembly to answer two questions: how to reduce GHG emissions by 2030 and how to reach climate neutrality in 2050? The main goal was to have a renewed legitimacy for climate actions and boost the curent metropolis strategies with new actions.

In practice, 100 citizens were selected by lottery, taking into account a geographical balance between the different municipalities of the metropolis and a balance in terms of environmental awareness (to avoid gathering only environmental activists). These citizens interviewed 40 experts and 40 city officers, they worked during five week-ends and five webinars, for a total amount of 100 working hours per citizen involved. The assembly was animated by an operational committee, acting as an unbiaised facilitator.

If more than 350 propositions of actions were made at first, the citizen assembly ended over a final report containing 70 levers, broken down into 219 proposals organised in 9 themes. Several of them concerned the heating and cooling decarbonisation, such as the expansion and the decarbonisation of district heating and cooling networks. If around 30% of the propositions made were already part of the metropolis strategy, around 70% are new levers. The next steps for the propositions are their examination by the metropolis council to be voted, and officially approved or rejected. The metropolis council also committed to organise a local referundum regarding the most difficult propositions. For the approved propositions, the Metropolis will be in charge of defining the responsible organisation to implement them.

One of the main issues to ensure citizen involvment in the assembly was the question of the time, as the process is time consuming (citizens attended five working week-ends, from 8.30 to 18.30 on Saturdays and Sundays). To lower this barrier, the metropolis offered compensation to people for their commuting costs and for children care, as well as a small amount of 300 Euro per person at the end.

Apart from the effective implementation of the proposed actions which would take some time, one immediate benefit was the messages given to elected officials but also the local dynamic created around climate change. Several citizens from the assembly went to the different municipalities of the metropolis to present the propositions of the citizen assembly to elected representatives and other citizens.

### Key takeaways

Key features are to be kept in mind to develop successful co-creation processes with citizens:

- The most important for local authorities during co-creation processes is to LISTEN, while there coulbd be a tendency to try to convince people. Overlaoding people with arguments is not the right strategy to engage;
- Having no bias in the process, by having pre-defined outcomes, or trying to influence it;
- Meeting people where they are, not where city representatives are. Formats of the process should be defined to be inclusive (such as timing of the meetings);
- Being transparent all the way through, reporting back regularly;
- Don't overpromising but doing what the local authority commits to;
- Adapting the process, and being flexible, as this is not possible for citizens to have the full view of the project from the beginning. Direction will evolve during the process.

These insights are based on the presentations and discussions from the online capacity-building <u>session</u> organised on 14<sup>th</sup> February 2023. Support materials of this session are available in Annex 4.

## Empowering citizens to be part of the transition

#### How to best support citizens for them to act?

Empowering citizens so that they have the levers to act are detrimental for local authorities, as public authorities alone can achieved a full decarbonisation of their economies. Lowering the barriers, organising communities and building konwledge from citizens are severals ways to do.

#### Supporting citizens from A to Z

Empowering people is at the heart of citizen energy cooperatives, such as People Powered Retrofit. Initially funded by the UK governement, the cooperative aims at developing citizen-led refurbishment by creating long-term relationships with people and desinging local and tailormade solutions. The cooperative act as a one-stop-shop (OSS) for renovation, to adress the barriers faced by people when renovating (complexity and technicality of the topic, conflicting advice received, fear of risks, difficulties to find contractors and ensure high quality works). For People Powered Retrofit, the solution is a complete retrofit design service, supporting households from A to Z. It offers to homeowners a single point of contact, an assessment of the works to be done, and their design, support to contract suppliers, and on-site support to coordinate the works, until the handover. To be able to to achieve this service, the cooperative has created a network of local contractors, and provide them with trainings to ensure high quality of works. The service is very successful with more demand than what the cooperative can deliver. According to Jonathan Atkinson, from People Powered Retrofit, the key is to have a multi-disciplinary team able to provide tailor-made services to inhabitants. For the moment, the cooperative is mostly working with the "early adopters" of home renovation, for who the main goals are to increase their comfort and reduce their emissions. The reduction of their energy bills is also one of the goal, but not the main one. Their services are adapted to them, which explains their success.

### Transforming the (vague) "energy transition" into tangible projects

This is one of the key goals from CityMine(d), an organisation working on empowering people in different districts of Brussels to make an inclusive transition. They launched a project called "La Pile" to test the agency of people to reinvent electricity in the city. This lead to the creation

of a local energy community, Sun Sud, in the south district of Brussels, and a collective solar PV consumption scheme. This tangible project had several effects: it reinforces the social fabric, as meetings of the energy community are also good excuse for people to meet, and it also led to behavioural changes, as this testimony from one participant proved it: "*Ah! The sun's shining! I'm going to start my washing machine! Before, I had a dual time counter, so I had the habit to do everything by night".* According to Orson Dubois from CityMine(d), the key success factors are an active outreach and proximity despite the time it takes. For CityMine(d), the goal is to empower people via "community organising" and trust building, to give them the right framework so that they can take the lead, it is quite different from "community management" to incentivise people.

#### Increasing energy literacy

The H2020 ENCLUDE project aims at operationalising the energy citizenship concept, as well as catalyzing a chain reaction of decarbonization actions across the EU (and beyond) through a bottom-up approach. To achieve the latter, in 2022 it launched an Academy to co-create new knowledge and mobilise them to take actions. This was a six-month, online leadership development and civic engagement program for decarbonization, built around two tracks: the knowledge one demanding less involvement, and the action one for leadership participants developing their own projects. The content of the academy was mainly around design thinking for systemic transformation and energy systems.

To find participants able to make changes in their communities, the project partners worked with citizen NGOs and local authorities. This approach was quite successful with 96 participants confirmed, via two calls for applications. Participants were quite young, with an average age of 32, almost half men and half women, and with different occupations (students, engineers, film makers, NGOs representatives, or academics).

The results are several projects co-developed with participants. All generated contents are available online on the project website to be easily-transerable and replicated. In this journey to empower citizens via this Academy, there are some key learnings. According to VanjaDjinlev from ETH Zurich, the main challenge for participants developing their projects was the communication and the management. The organisation team used its networks to put the participants in contact with mentors, to further support them in the implementation phase. An additional challenge for the organising team of the Academy was the recruitment of citizens: people interested in were often willing to change the currciculum content to have something more personalised. The standardisation and the "large" audience (96 people involved finally against 30 persons initially planned) is a barrier for more personalised support, and maybe more impactful projects. Finally, the organisation team opened the applications not only to European citizens, but to other citizneships. It brought a diversity but more complexity in the program development, as the solutions are context-based.

### Key takeaways

These different examples of citizens' empowerment underlines:

- The importance of a tailor-made approach, according to the profiles and drivers of people;
- The power of "doing" concrete projects, which allows to make things tangible, motivates people to change their behaviours, and build social relationships;
- The key role of knowledge and methods.

These insights are based on the presentations and discussions from the online capacity-building <u>session</u> organised on 14<sup>th</sup> March 2023. Support materials of this session are available in Annex 5.

### Conclusion

The heat market is evolving with new technologies and approaches, steered by the effects of decarbonisation and decentralisation. Clean heat technologies, such as on-site thermal energy production, energy storage and building management system, can help redesigning a more robust and modular energy system to meet heating and cooling needs. More peoplecentric approaches and tailor-made services, such as heat as a service, can be a key enabler for the adoption of clean technologies. Local authorities and utilities willing to scale their deployment have clear interest to develop such services.

The cooling sector is not left apart in the decarbonisation efforts, with new EU targets and regulations introduced by the Fit-for-55 package. However, its decarbonisation is a relatively new topic for local authorities who need to build their capacities to plan its development in a decarbonised way and map the potential of the cooling sources, such as near-surface groundwaters. District cooling will play an important role to provide provided decarbonised cold, due its many benefits: very-high energy efficiency, gain of space, lack of noise, no hygiene problem and less maintenance costs for consumers.

The heat market sees the arrival of new actors, such as energy communities developing district heating projects. While their definition in the regulatory framework can still create confusion in some national contexts, they already demonstrated their added-value in developing district heating projects in close collaboration with citizens. As some examples showed, these new actors can challenge traditional utilities by developing projects with less profitability thanks to their not-for-profit approach. Thus, local authorities have a strong interest in collaborating with them.

The decarbonisation of the heating and cooling sector won't be achieved without a large mobilisation of citizens. Local authorities have many possibilities to involve them in designing their strategies or implementing projects, such citizen assemblies, co-creation processes, consultations, surveys, meetings, etc. Success factors for citizens' involvement are:

- o Being in listening mode,
- Addressing people concerns,
- Providing holistic support, not only regarding energy,
- Building trust thanks to direct personal contacts,
- Being transparent, and defining responsibilities,
- o Clarifying the choices people have to made,
- Meeting people where they are,
- Taking the time and being flexible.
## Annexes



Annex 1 – Support materials of the capacity-building session on district cooling organised on 25<sup>th</sup> November 2022

#### SWM Infrastruktur

Ein Unternehmen der Stadtwerke München / SW//M

# Municial Works of Munich district cooling in Munich

Dr.-Ing. Patrick Krystallas 25.11.2022

Öffentlich

### Overview: District cooling in Munich





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### **District Cooling: Occasion and Advantages**

- Comfort cooling (temperature control and dehumidification)
- Cooling of technical equipment and objects
- Cooling of groceries



- increase in value of the property
- space profit in the building and on the roof
- no noise pollution

#### gain of comfort

- security of supply an redundancy
- no expensive technology necessary, no problems with the hygiene of the recoolers and refrigerants
- no need for modernization and maintenance
- ecology
- very low primary energy factor
- efficient operation as well as using running waters und ground water



### The streams of munich are cooling the city center



SW//M

### Expansion of district cooling



expansion north (Schwabing) and east

## expansion of generation capacity

- 3 generating plants in operation ~ 17 MW
- 1 generation plant
  under construction ~
  35 MW



lift in chiller Odeonpllatz (03.18)



### Advantages using district cooling

- supply reliability
- redundandcy
- ecological advantages (recooling over running water, efficient technology, very good primary energy factor, use of waste heat)
- space advantages
- no maintenance and modernization
- no noise and other problems from recooling
- no problems with refrigerants



comparison 50 MW DC ↔ self supply

#### result:

Energy savings DC > 50%-70% Considering all components and optimized operation

### Near-surface geothermal potential







hydrogeological model of quaternary aquifer



14 15

16

17

18

10

11

12

13

hydrogeological model of tertiary aquifer

Source: TU Munich, Chair of Hydrogeology

groundwater temperature

Hotspot in the a city center



dynamic groundwater model of Munich



TUM Lehrstuhl Hydrogeologie AG Geothermie 2015

### Use of existing underground infrastructure





#### **District cooling by groundwater using**

#### District cooling with groundwater



north

### E.g.: District cooling "BMW-FIZ"

5 MWth (255 l/s, 8 Mio. m<sup>3</sup>/a)



Energy Efficiency Ratio (EER) ~ 24









#### District cooling by groundwater using

#### Heat supply with groundwater heat pump

Residental buildings, Offices,

# use of environmental heat for heat pump operation.

ALL AD .....

extraction of 13°C "warm" groundwater from the quaternary aquifer

infiltration of cooled up groundwater into the aquifer

25.11.2022 / District cooling in Munich



### E.g.: District cooling Moosach





Computing and service center of city concil ® h4a Architekten

2020



SWM staff appartements and kindergarten ® Laux Architekten



### Conclusion

- In addition to deep geothermal energy, Munich also has great potential in the area of near-surface geothermal energy, especially for the cooling supply
- The near-surface use of groundwater can make an important contribution to saving electrical energy, especially in view of increasing urban cooling demand
- Groundwater cooling networks are also well suited for providing heat using heat pumps - the combination of heating and cooling in a groundwater network offers economic and ecological advantages
- An important goal is a sustainable and safe drinking water use of the aquifer (no excessive warming up or cooling down of the aquifer).
- For optimal urban groundwater use, groundwater management is required, which SWM and the Chair of Hydrogeology are launching with the research project "Geo.KW".

#### **SWM Infrastruktur**

Ein Unternehmen der Stadtwerke München / SW//M

## Vielen Dank für Ihre Aufmerksamkeit.







Mapping tool for the development potential of heating and cooling networks

November 25<sup>th</sup>, 2022



- Presentation of the LIFE project "Heat&Cool
- The multi-criteria analysis method
- Demonstration of the online mapping tool



# The project LIFE H&C





LIFE H&C – outil Potentiel RCF

# Actions and actors of the LIFE H&C project

ACTIONS	RESPONSABLE	PARTENAIRES IMPLIQUES	PARTIES PRENANTES IMPLIQUEES	Calendrier
A.1. Potentiel de développement régional des réseaux de chaleur et de froid	CEREMA	REGION, MNCA, AMORCE, FNCCR	FEDENE, SNCU, DREAL, ADEME, métropoles	Oct 2021-oct 2022
C.1 Prise en compte des réseaux C/F renouvelables dans documents d'urbanisme	CEREMA	REGION, AMORCE, EVBDM, MNCA	DREAL, ADEME, DDT(M), agences d'urbanisme, métropoles	Fév 2022-Mars 2023
C.2 Faire évoluer les démarches d'évaluation et de labellisation existantes	envirobatBDM	REGION, CEREMA	DREAL	Sept 2021-Juin 2022
C.3 création d'un outil technico-économique adapté au contexte régional permettant d'orienter les choix de systèmes énergétiques faits par les collectivités, les aménageurs et les maîtres d'ouvrage de bâtiments.	AMORCE	MNCA, PAULLO, Région	ADEME, métropoles	sept 2021-juin 2024
C.4 Tester de nouveaux modèles de facturation des réseaux de chaleur et de froid	FNCCR	Région, AMORCE, Port de Bouc, MNCA	ADEME, métropoles	sept 2021-aout 2023
C.5 Réalisation d'un arbre des choix des montages juridiques appliqué aux réseaux de C/F	AMORCE	Région, MNCA	métropoles	sept 2021-avril 2022
C.6 Associer les abonnés, usagers et citoyens dans la gouvernance et le financement participatif	AMORCE	Port-de-Bouc, Région, PAULLO	Energie Partagée	sept 2021-sept 2025
C.7 Déploiement de la méthodologie et des outils développés et testés (AMO)	REGION	TOUS	DREAL, ADEME, Métropoles	octobre 2021-aout 2026
C.8 Sensibiliser et former les professionnels	envirobatBDM	Région	ADEME	Juin 2023-Aout 2026
C.9 Action de réplicabilité à l'échelle européenne	REGION	TOUS	Collectivités européennes	Mai 2025-mai 2026
E1. Campagne d'animation et sensibilisation des collectivités du territoire régional	REGION	EVBDM, AMORCE	ADEME, DREAL	Mai 2022 – aout 2026
E.2 Sensibiliser les citoyens	REGION		SEMAG – Ville de Gardanne	Avril 2023-Aout 2026
E.3 Outils de dissémination des résultats du projet (site internet, plaquettes)	REGION	TOUS		Toute la durée du projet
E.4 Réseautage E.5 séminaires	REGION	TOUS		2 séminaires : juin 2024 + juin 2026







REGION

SUD PROVENCE ALPES CÔTE D'AZUR

CLIMAT & TERRITOIRES DE DEMAIN

DÉCHETS LÉNERGIE LEAI

r.h





## **Construction of the "DHC Potential" tool**

 $\rightarrow$  The purpose is to identify and prioritise areas with a high potentiel to create, densify or extend a DHC netwok



**Deliverables** : maps, GIS datasets, methodological notes, presentation flyer



## Multicriteria analysis





LIFE H&C – outil Potentiel RCF

# **Criteria analyzed**

A. Heating and cooling needs (collective housing and tertiary)

- B. Heating and cooling needs nearby (collective housing and tertiary)
- C. The proximity of an existing heating network

D. The presence of large tertiary consumers (hospitals, schools, offices, swimming pools, etc.)

- E. The presence of large residential consumers
- F. Building heating system
- G. The potential of waste heat
- H. The vulnerability of buildings to urban heat islands
- I. Geothermal resources
- J. Thalassothermal resources

K. The possibilities of temporal energy aggregation (collective housing and tertiary)

L. The possibilities of energy aggregation (heat & cool production)



# gregation

### Criterion

 $\rightarrow$  Qualitative or quantitative information built from knowledge data of the territory (exploitation of databases or a census) directly influencing the relevance of a heat network project



# From criteria to indicators

## Purpose of the multi-criteria analysis:

 To obtain an aggregated and homogeneous result on the region allowing to prioritize the sectors and to determine the most relevant zones to develop a heating and cooling network

## Two complementary ratings:

- An **indicator** : each criterion is scored in a homogeneous way so that it can be compared to other criteria ;
- A weighting of indicators : indicators are weighted together (one indicator is given priority over another to qualify the potential).

#### Indicator

- $\rightarrow$  From a criterion
- $\rightarrow$  Scoring between 0 and 100
- $\rightarrow$  On a 100m\*100m grid





## From criteria to indicators

#### Criterion

 $\rightarrow$  Qualitative or quantitative information built from knowledge data of the territory (exploitation of databases or a census) directly influencing the relevance of a heat network project





#### Indicator

- $\rightarrow$  From a criterion
- $\rightarrow$  **Scoring** between 0 and 100
- $\rightarrow$  On a 100m\*100m tile



# Indicator weighting

A. Heating and cooling needs (collective housing and tertiary)		
B. Heating and cooling needs nearby (collective housing and tertiary)		
C. The proximity of an existing DHC network	2	
D. The presence of large tertiary consumers (hospitals, schools, offices, swimming pools, etc.)	2	
E. The presence of large residential consumers	Ø	
F. Building heating system	Ø	
G. The potential of waste heat	1	
H. The vulnerability of buildings to urban heat islands	1	
I. Geothermal resources	1	
J. Thalassothermal resources	1	
K. The possibilities of temporal energy aggregation (collective housing and tertiary)	1	
L. The possibilities of energy aggregation (heat & cool production)	1	



# **DHC development potential maps**

# Development potential of heating networks



# Development potential of cooling networks



# Development potential of heating & cooling networks





## Access to resources





LIFE H&C – outil *Potentiel RCF* 

## **Access to online resources**

## Link to the mapping tool :

https://carto.cdata.cerema.fr/1/life\_potential\_dhc.map

### Link to related resources:

https://reseaux-chaleur.cerema.fr/life-potential-dhc



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Luc Petitpain : luc.petitpain@cerema.fr Laurine Decros : laurine.decros@cerema.fr 25.11.2022 | EDK | Burkhard Hölzl

## **District Cooling in Vienna**

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### **District Cooling in Europe**

#### **Best-Practice in Europe**

PARIS

- Capacity (MW): 269
- Production: 486 GWh
- Length of networks (km): 79
- Buildings connected (substations): 664
- Customers: 664
- Year: 2018

#### LISBON

- Capacity (MW): 35
- Production: 70 GWh
- Length of networks (km): 22.5
- Buildings connected (substations): 140
- Customers: 3500
- Year: 2019

2

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#### STOCKHOLM

- Capacity (MW): 330
- Production: 420 GWh
- Length of networks (km): 250
- Buildings connected (substations): 672
- Customers: 434
- Cooled surface m. m2: 7.5
- Year: 2019



#### VIENNA

- Capacity (MW): 105
- Production: 113 GWh
- Length of networks (km): 13
- Buildings connected (substations): 130
- Customers: 130
- Year: 2018

#### HELSINKI

- Capacity (MW): 218
- Production: 187 GWh
- Length of networks (km): 79
- Buildings connected (substations): 510
- Customers: 390
- Cooled surface m. m2: 19
- Year: 2018

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### **District Cooling in Vienna**

#### Motivation for district cooling from an operator's point of view

- Missing puzzle piece to become a full-service energy provider (expansion of the product portfolio) Cooling in the context of District Cooling offers unique selling propositions
- Extension of the value chain und expansion of our services
- Enters the opportunity to sell other products (Cross selling)
- Optimal use of existing infrastructure (fault-clearing service, measurement, accounting, etc.)

Additional benefit for Wien Energie in case of a district heating connection at the project site:

- Use of existing waste heat during the summer with absorption chillers
- Subsidies for the use of absorptions chillers







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#### Fernkälte in Wien

#### Methods of cold supply to our customers



4



#### **District Cooling in Vienna**

#### Methods of cold supply to our customers



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### **District Cooling in Vienna**

#### Heating sources for district heating



- Absorption chillers are economical when exclusively provided with waste heat
  - Absorption chillers aren't necessary for cooling

•



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Strategy for the development of the district cooling network in the city center



Developement of the strategy based on:

- Customer potential
- Cooling plants
- Hydraulic requirements



### District cooling substation at the customer side



### How to use cooling?

## Ceiling cooling

approx.30-40W/m<sup>2</sup> \*

#### Floorheating/-cooling

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## 1. Surface cooling

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Foto: Variotherm

approx.20-40W/m<sup>2</sup> \*

(District-)cooling plants &

## Surface cooling

#### Advantages

- No drafts
- No fan noise
- Even cooling area

#### Disadvantages

- Low cooling capacity
- No possibility for dehumifying
- Large surfaces necessary

## Surface cooling isn't able to cover the full cooling load!

\*Dependant on flowtemperature (Dew point!) and roomtemperature!



## **District Cooling in Vienna** 2. Fan coils / Recirculating air cooling systems





## Cooling Plants in the center of Vienna

#### **Schottenring (In Operation)**

- Location Zelinkagasse
- In operation since 2013
- 15 MW Cooling Capacity, ~ 300.000m<sup>2</sup> cooled area
- Recooling via danube canal

#### **Renngasse (In Operation)**

- Location Renngasse/Freyung (Bank Austria Kunstforum)
- In operation since 2012
- 6 MW | ~120.000m<sup>2</sup>
- Recooling via cooling towers

#### **Stubenring (In Operation)**

- Location "Alte Post"
- In operation since 2022
- 18 MW | ~360.000m<sup>2</sup>
- Recooling via danube canal

#### MedUni (under construction)

- Location Mariannengasse
- Planned operation 2024/2025
- 17,7 MW | ~350.000m<sup>2</sup>
- Recooling via waste heat usage of the MedUni and cooling towers



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## Cooling Plant MedUni Campus Mariannengasse



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**WIEN ENERGIE** 

## Cooling Plant Stubenring – Standard Project schedule

Start 2018:

**Design Project** 

• 2019/20:

Construction Inlet structure  $(0,58 \text{ m}^3/\text{s})$ at the danube channel and construction of the connection line from the inlet structure to the cooling plan Start of construction Cooling Plant & pipe construction

• 2020/21:

Completion of inlet structure, Cooling plant (approx. 10 MW) and piping

• End of 2021:

**Commissioning Cooling Plant** 

April 2022:

First delivery of cold supply, ongoing expansion of cooling piping to connect more buildings



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Cooling plant in the courtyard of Postgasse 8





3. UG: Placement of the chillers



2. UG: Periphery / ventilation / electrical

- Construction Cooling plant in 2. + 3.UG (Courtyard building)
- 1. stage approx. 10MW of installed cooling capacity (4 chillers)
- Final stage of construction at approx. 15 18MW

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### Cooling plant in the courtyard of Postgasse 8 - Building





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**Solution** WIEN ENERGIE

Inlet structure - Section







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## Construction Inlet structure + Cooling water line





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## Inlet shaft / Screen



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### Cooling water line



Remains of the former city wall (Dominikanerbastei) Pipes along the street of the Franz-Josefs-Kai





Dominikanerbastei

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### Austria Campus

- Cooling capacity: 11,9 MW electric compression chillers
- Heating capacity: 8,2 MW District heating mixed with heatpumps
- Geothermal use floor slab/bored piles (storage for heating and cooling)
- Open cooling towers and hybrid recoolers
- Construction 08/2016 02/2018
- Commissioning 08/2017 04/2018

Bild © SIGNA

23

© Wien Energie | Öffentlich Diese Präsentation ist urheberrechtlich geschützt und Eigentum von Wien Energie | Alle Rechte vorbehalten Start for district cooling Wohnen Nordbahnhof

98 m

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### Cooling in residential buildings?

In the Nordbahnhof project, starting in 2022, both commercial buildings and approx. 1.500 apartments will be supplied with district cooling

#### Heatpump additionally feeds waste heat into the district heating network

#### **Different cooling systems**

#### Residential

- Surface cooling systems (approx. 80% of cooled apartments)
  - Ceiling cooling
  - Floor cooling (via underfloor heating)
- Recirculating air cooling units (approx. 20% of cooled apartments)
  - FanCoils

#### Commercial

- Individual solutions /w recirculating air cooling units
  - FanCoils
  - Air handling units





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## Urban development area 1020

- Start of district cooling network Austria Campus
- Decoupling/connection towards
  "Wohnen" Nordbahnhof
- Coupling of district cooling and the secondary district heating network through heatpumps
- Evaluation and search for more suitable sites for power plants and customers





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**WIEN ENERGIE** 

Customer potential survey

Standard Price (Base 2021) Prices are calculated for each customer

- Load price approx. € 100.000,- per MW and Year
- Energy Price approx. € 40,00 per MWh
- Mixed price at 1000 Fullloadhours: 140,00 € / MWh
- Depending on the project (for example depending on the length of the piping that is needed to connect the customer to the district cooling network) there's a one time charge .
- Construction costs including cooling substations



Costs for private Appartments? Bus-enabled valve controls residential customers depending on contract 2 Pricing models Costs (incl.) between EUR 150-530 depending on performance (fancoil/surface cooling), consumption and pricing model for a 70m<sup>2</sup> apartment





## Key factors district cooling

- Areas with high cooling demand
- Possibility to build a cooling plant (place of installation of the machines)
- Cheap and favourable costs and conditions for piping
- High spreads in the cooling network (return temperatures of the customers!)
- Possibility of building recooling systems (open cooling towers, river water, dry coolers, recooling via the district heating network)

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 Use of absorbers with waste heat utilization possible --> Subsidies possible





### Village im Dritten – Neighborhood solution with an anergy network







**Burkhard Hölzl | EDK** 

## Stay cool!

## Wer, wenn nicht wir. 🗲 WIEN ENERGIE

LILLIAL

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WIENER LINIEN | WIEN ENERGIE | WIENER NETZE | WIENER LOKALBAHNEN | WIPARK | WIEN IT BESTATTUNG WIEN | FRIEDHÖFE WIEN | UPSTREAM MOBILITY | FACILITYCOMFORT | GWSG

WIENER STADTWERKE GRUPPE

IIIII

Annex 2 – Support materials of the capacity-building session on heat communities organised on 17<sup>th</sup> January 2023



# Decarb City Pipes 2050

General framework for heat communities

RESCOOP.EU

## **Overview**

- REScoop.eu: A bit about us
- EU Legislative Framework
  - For Energy Communities
    - ➢ REScoop.eu Transposition Tracker
    - $\succ$  For Heating and Cooling (H&C)
- Temporary Emergency Rules
- What can municipalities do?
- Q&A



## **RESCOP.EU** : A bit about us

- European Federation of Citizen Energy Cooperatives and Communities
   -> Group of citizens who jointly
  - cooperative on energy transition projects
- Not for profit association
- Founded in 2013
- HQ in Belgium (Brussels & Antwerp)
- Sector federation of Cooperatives Europe





## **RESCOP.EU** : A bit about us







## **RESCOP.EU** : A bit about us

## **7 ICA principles**

- Voluntary and open membership
- Democratic member control
- Member economic participation
- Autonomy and independence
- Education, training and information
- Cooperation among cooperatives
- Concern for community





## EU Legislative Framework: For Energy Communities

- 2019: EU's Clean Energy for all Europeans Package
- Citizens -> Passive energy consumers
  - -> Active participants in the transition
- Recognises the importance of energy communities to achieve our climate targets
- Forces Member States to ensure certain rights, and establish certain frameworks, to guarantee equal conditions for energy communities.

Recast Directive 2018/2001 (Renewable Energy Directive II, or REDII) Recast Directive 2019/944 (the Internal Electricity Market Directive, or IEMD) Recast Regulation 2019/943 (the Internal Electricity Market Regulation, or IEMR)



Link: https://op.europa.eu/en/publication-detail/-/publication/b4e46873-7528-11e9-9f05-01aa75ed71a1/languageen?WT.mc id=Searchresult&WT.ria c=null&WT.ria f=3608&WT.ria ev=search

Link: https://energy.ec.europa.eu/topics/energy-strategy/clean-energy-alleuropeans-package\_es



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## EU Legislative Framework: For Energy Communities

<b>CEC</b> (Electricity Dir.)	REC (REDII)	
Legal entity	Legal entity	
Open and voluntary participation	Open and voluntary participation	
-	Autonomous (e.g. one-member-one-vote)	
Effectively controlled by members or shareholders	Effectively controlled by members or shareholders	
_	Situated in the proximity	
Members or shareholders are physical persons, local authorities, including municipalities, or small and medium enterprises.	<u>Members or shareholders are physical persons, local authorities, including municipalities, or small and medium enterprises.</u>	
Objective must be to provide environmental, social, or economic benefits to the community (not profit)	Objective must be to provide environmental, social, or economic benefits to the community (not profit)	

## EU Legislative Framework: Transposition Tracker



Link: <u>https://www.rescoop.eu/transposition-tracker</u>

#### Austria: Substantial Deficiencies

- Fails to go beyond EU definitions (no clarifications)
- Citizen participation is not ensured (insufficient governance principles)
- > Germany: Good Practice
- > Ireland: Good Practice
- > Netherlands: Average Progress
- No autonomy principle
- No designated authority (potential risk for abuse)
- > Slovakia: Substantial Deficiencies
- No autonomy principle
- Broad definition of profit use (potential risk for corporate capture)

#### > Spain: Average Progress

- No designated authority (potential risk for abuse)

- Energy communities included in NECPs, RRP, National Long-Term Strategy



## EU Legislative Framework: For Heating and Cooling (H&C)

#### Renewable Energy Directive (RED)

Art.23 strengthens the H&C target

Art.24 establishes an annual target to increase renewables within district heating and cooling (DHC)

Extends measures that Member States can take to achieve targets (e.g. integrate waste heat)

Art.18 + Annex IV improve training and certification of installers

Art.15a requires Member States to conduct economic and geographic analysis to identify DHC potential

#### **Energy Efficiency Directive (EED)**

Arts.23 & 24 requests that Member States carry out comprehensive assessments on efficient H&C every 5 years

Annex VIII describes the methodology for the assessment (they must be closely linked with energy union governance and climate action)

### EU Heating and Cooling Strategy (Link)

Sets out tools and actions to ensure that H&C contributes to climate neutrality (implemented in the Clean Energy Package)

Encourages to apply an integrated approach to the energy system (i.e. energy flows between users and producers)

- EU Studies to support policy:
- <u>Renewable Space Heating</u>: Overview of consumption data, technologies, fuel mix and regulatory frameworks, includes best practices
- <u>District Heating and Cooling</u>: Looks at market and regulatory framework + 10 case studies on best practices
- Roadmap on policy support for H&Cdecarbonisation: Recommends policies for spaceheating in buildings and processheating forindustry.
- Renewable Cooling: Analysis of the Delegated Act on the renewables methodology.



## **Temporary Emergency Rules**

• On 20&21 October: Council <u>conclusions</u> call for simplification of permitting procedures to accelerate RES roll-out.

#### Framework to Accelerate RES Deployment (Link):

- Considers that the "planning, construction, and operation of plants and installations" for renewable energy are considered as "overriding public interest and serving public health" -> RES becomes priority
- Maximum deadline of 6 months for granting a permit for a wind project.
- Maximum deadline of **3 months for granting a permit for solar equipment** and its storage + derogation from carrying out environmental assessments.
- Maximum deadline of **1 month for granting a permit for heat pumps** (HPs) below 50MW. Grid connections permitted for HP for self-consumers of up to 50kW.
- Applies from **29<sup>th</sup> December 2022** for 18 months.

#### Citizen-led & decentralised approach:

"Investing in small decentralised solar energy installations to become renewable self-consumers is one of **the most efficient** means for energy consumers to **reduce their energy bills**"

"Accelerate the deployment of small-scale solar installations for renewable self-consumers including for collective self consumers, such as **energy communities**, since these are the **cheapest** and more accessible options with **least environmental impacts**"



**consumers** with a capacity of **50kW** or less, the lack of a reply by the relevant authorities within **1 month** shall result in the permit being considered as granted"

10/15

"For the installation of solar equipment of renewables self-





### Figure 2. Total cost of owning and running different heating technologies, 2030-2040

Technology

Source: European Climate Foundation and the European Alliance to Save Energy, 2022. 11/15

**KESCOOP.EU** 

## What can municipalities do?

- Favourable public procurement rules:
  - ✓ Citizen-ownership objective for RES projects
  - ✓ Pre-requisite for community participation in tenders
- Supporting energy communities to encourage capacity-building, clustering, and project aggregation
- Support dialogue between local stakeholders (local authorities, citizens, energy communities, SMEs)
- "Matchmaking" of community projects.

- Municipal grants
  - ✓ Expert support (e.g. community organiser)
  - ✓ Give citizens offices for community organising
  - ✓ Funding of pre-development costs (e.g. feasibility studies)
- Establish One-Stop-Shops
- Support joint investments and partnerships
- Municipal planning and communication
  - ✓ Resolutions and procedures
  - Promotion, and provision, of platforms and tools for citizens to form heating communities
# What can municipalities do?



- (1) <u>https://energy-cities.eu/publication/how-cities-can-back-renewable-energy-communities/</u>
- (2) <u>https://www.rescoop.eu/uploads/rescoop/downloads/COMPILE\_D4.4.1\_Municipal-Guide.pdf</u>
- (3) https://www.sccale203050.eu/wp-content/uploads/2022/12/SCCALE-Municipal-Guide-Final-view.pdf
- (4) <u>https://www.rescoop.eu/toolbox/community-energy-a-practical-guide-to-reclaiming-power</u>





# Decarb City Pipes 2050

Thank you for the discussion!

felix.kriedemann@rescoop.eu / +32 486 942 547





## SUSTAINABLE COLLECTIVE CITIZEN ACTION FOR A LOCAL EUROPE

Capacity Building Session on Heat Communities - Tuesday 17 January









Siward Zomer Co-operative Director Energie Samen Secretary of the board MeerEnergie U.A.

# **MeerEnergie**

sccale203050.eu



### WHO ARE WE?





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### **5 PILOTS**

In Leuven, Poreč, Paris, Athens & Groningen

- Renewable energies production
- District heating
- Building renovation
- Behavioral change





001 Parentium / 002 Licht Leuven / 003 Buurtwarmte 004 Les Économes / 005 Hyperion II



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### 

### From traditional gas grid to district heating



- Deploy a sustainable district heating network
- Fostering residents' participation in their district heating
  project
- Organize local ownership of the collective heating system



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District heating in the our own hands



# Project area: Middenmeer district MeerEnergie

Residential area with 5000 residences, 7 schools, 2 churches, a shopping centre, restaurants/cafes and some small businesses

Various types of residences:

- Townhouses 1900 1930
- Apartments ca. 1930
- Apartments ca. 1950
- Flats ca. 1990

40% privately owned, 60% rental of which 20% public housing

±80% energy label D-G or unknown



# **U** EQUINIX





# Firan MeerEnergie

### Partners

- Collaboration agreement: MeerEnergie & Firan (infrastructure)
- Letters of Intent:
  - MeerEnergie & Equinix (heat source)
  - MeerEnergie & municipality
- Letters of support:
  - Public housing Alliantie & Eigen Haard
  - Rabobank

### **Cooperative structure**



- General assembly of members
- General management
- Topic working groups





### **KEY LESSONS LEARNED**





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### DISTRICT HEATING TAKES INTENSIVE CITIZENS ENGAGMENT

- You are making plans that include the interior of people's homes
- This means you need to involve everybody
- Impossible to reach whole community with only external consultants



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### **ROLE ENERGY COMMUNITY UNCLEAR**

No definition in heating law Constant discussions with municipal on role Are we a marketparty or citizens? Tendering (competition) or co-operation



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## Engaging local residents – personal MeerEnergie contact is key

#### >1000 members

Open access General Assembly: Combined information evenings & formal decision making

General management & topic working groups consisting of residents

Regular newsletter, website with extensive Q&A

Questionnaires to explore needs

'Woningschouw': 10 volunteers visiting ±60 residences to understand construction challenges, personal needs & concerns

Communication plan for next steps towards contracting







### **INCENTIVE TO PARTICIPATE**

- Community energy for and by the citizens
- Not for profit
- Transparancy in setting the tarrifs
- One promise we will have a dominant say in the matter



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#### Sensitiviteit op factoren Prestaties





### COMMUNITY DISTRICT HEATING HELPS BUT HAS ITS OWN CHALLENGES

- No development capital
- Social capital in early stage
- Getting subsidy for every stage is hard and uncertain

Financial framework needed on local and national level to support community district heating



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### WORKING WITH VOLUNTEERS TAKES A DIFFERENT APPROACH

- Working with volunteers takes a different approach from co-operatives and stakeholders
- More engagement
- Can be a strenght and a weakness
- Lighter tasks in working groups but large reach and ambassordors in the neigborhood
- As soon as tasks become bigger you will need to start paying people
- Find a right balance



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### **YOU CAN BE PART OF THE ENERGY TRANSITION!**

# LEARN MORE



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## A COMPREHENSIVE & REPLICABLE METHODOLOGY

#### SCCALE 20 30 50 toolkit

- Practical know-how tested in the pilots
- A collection of existing knowledge & tools within the community energy movement
- Online resources feeding into REScoop.eu Energy
  Community Platform



**Coming soon:** <u>Financing guide</u> | <u>Contractual guide</u> | <u>Municipal guide</u> | <u>Methodological guide</u> | <u>Policy</u> <u>briefings</u> | <u>Monitoring Tool</u>



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### CONTACT

Siward Zomer Energie Samen – MeerEnergie U.A.

Siward.zomer@energiesamen.nu

# Bocconi

### CROWDFUNDING A NEW WAY TO DEVELOP DISTRICT HEATING?

**Dr Chiara Candelise** 

GREEN, Centre for Geography, resources, Environment, Energy and Networks



#### Università Bocconi

GREEN Centre for Geography, Resources, Environment, Energy and Networks

Decarb City Pipes 2050 - Capacity Building Session on Heat Communities, 17 January 2023

# What is crowdfunding?

- Alternative finance raising funding through dedicated web platforms ٠
- Allows to **projects developers**: ٠
  - publicize the project to be financed
  - raise funding from the wide public
  - engage and communicate with the community of potential donors/investors (strong link to social network and digital communication)
- Allows **people** to: ٠

GREEN

- get to know the project in details
- **choose** where to put their money with **no intermediation** and in **full trasnparency**
- Crowdfunding models: ٠



# Crowdfunding in the energy sector

- New and innovative alternative finance instrument in the energy sector
- First platforms and projects in 2012
- Mainly financial models (equity and lending crowdfunding)
- Growing funding volume and projects

GREEN

— By 2017: 836 projects, over €320ml total funding volume



Source: Candelise, Grasso, Colelli, 2017

# Crowdfunding in the energy sector (2)

- Example: French platform Lendosphere
- Growth 2016-2021





Università Bocconi GREEN

Centre for Geography, Resources, Environment, Energy and Networks

## **Energy transition:** from large and fossil fuel generation....





Università Bocconi

**GREEN** Centre for Geography, Resources, Environment, Energy and Networks

### *Energy transition*: from large and fossil fuel generation.... ....to smaller, distributed renewables..





GREEN Centre for Geography, Resources, Environment, Energy and Networks

Bocconi

### *Energy transition*: from large and fossil fuel generation.... ....to smaller, distributed renewables..



## The role of citizens (crowd) and other actors

Transformation of energy sector (liberalization energy markets, transition toward cleaner energy systems, decentralized generation):

**smaller**, modular energy projects

- >Generation closer to point of consumption
- > energy consumer can become producer (**prosumer**)
- >open entry to **new players**, e.g. small firms, local authorities, citizens
- >Citizens, local authorities, can become energy producers
- Energy communities -> Citizens engage, invest and harvest benefits of clean energy investments, contributing to CO2 emission reduction





## The role of citizens (crowd) and other actors (2)





#### Università Bocconi

**GREEN** Centre for Geography, Resources, Environment, Energy and Networks

- Energy communities/cooperatives develop and manage district heating systems and are owned by their own customers.
- Out of the over 430 Danish district heating systems, 340 are operated as cooperatives, in addition to the municipally-owned ones (2018)

# Projects funded with crowdfunding

— Strong focus on renewables

- PV and wind account for about 70% of total funding volume





GREEN Centre for Geography, Resources, Environment, Energy and Networks

Source: Candelise, Grasso, Colelli, 2017

# Progressive differentiation of technology

— Funding volume in 2016-2017 also from technologies other than wind and solar PV, such as tidal, geothermal, bioenergy as well as energy efficiency measures.



Source: Candelise, Grasso, Colelli, 2017

## Why? benefits for developers

— Access to capital:

- Financing tool alternative and complementary to traditional financing
- access to a wider audience of potential investors, thus increasing possibility of funding;
- Engagement:
  - **increased visibility of the project** to final end users (e.g. heat consumer in district heating)
  - increase local consent (particularly relevant for projects proposed by *local public authorities*)
  - Reduce potential **nymbyism** (particularly relevant for private project developers interested in large projects with high perceived impact on the territory, e.g. large wind plant);
  - **redistribution of revenues/royalties** in the territories affected by the projects (particularly of interest to local public authorities, interested in wider socioeconomic benefits for their territories);
  - Reduction in planning risk, as a result of increased local involvement and support (mainly of interest of private developers, utilities).



Bocconi GREEN Centre for Geography, Resources, Environment,

Energy and Networks

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## Motivation to invest? (1)

 Projects on crowdfunding platforms provide average investment returns in the 4% to 9% range (apart from three outlier campaigns on funds published by Trillion Fund offering about 13% return)



Source: Candelise, Grasso, Colelli, 2017
### Why? Motivation to invest (2)

— Survey exploring perceptions of EU citizens regarding the use of crowdfunding for renewables rank transparency, expected returns and sustainability impact as the mostly citied factors affecting the decision to invest (Bergmann, Betz et al. 2016).





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Source: Bergmann, Betz et al. 2016

### Crowdfunding and district heating? (1)

Challenges for District Heating	Could crowdfunding help?
ACCESS TO FINANCE	
1. Access to finance, in particular for small to medium projects	<ol> <li>Crowdfunding provides access to finance:         <ul> <li>Equity model:</li> <li>allows to raise equity, possibly making easier access to bank loans</li> <li>supports cooperative expansion</li> <li>Lending model:</li> <li>Provides additional sources of debt</li> </ul> </li> </ol>
2. Projects with low/medium IRR: difficult to raise private capital, but wide social/environmental benefits and/or relevance for the territory	2. Crowd investors could be prepared to invest patient capital (no expectation of immediate/high returns), if combined with communication of the ethical/social/environmental/territorial benefits



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**GREEN** Centre for Geography, Resources, Environment, Energy and Networks Candelise C, 2018, "*Crowdfunding as a novel financial tool for district heating projects*" study under H2020 project TEMPO (Temperature Optimisation for Low Temperature District Heating across Europe), Brussels

Oh = 11

### Crowdfunding and district heating? (2)

Cnallenges	Could crowarunging neip?
PUBLIC ENGAGEMENT	
3. Lack of awareness and potential negative perceptions	3. Crowdfunding can increase local awareness and reduce negative perceptions by increasing the opportunities of communicating economic, social and environmental benefits of DH projects
4. Minimize impact of time lag and energy demand risk on profitability: need a minimum number of guaranteed customers connected to the DH network	4. Engagement of citizens through crowdfunding campaign during project development could help in guaranteeing a minimum number of connections
5. Economies of scale: increasing connections reduce the overall cost	5. Crowdfunding campaigns can help in increasing the public awareness, acceptance and customers connections
6. Reduce potential nimbyism (Not in my backyard syndrome)	<ul> <li>6.Crowdfunding can reduce nimbyism by:</li> <li>allowing redistribution of economic returns in the territory and among citizens interested by the project</li> <li>helping in creating a local community around the project</li> </ul>
7. Planning risk: relationships of private developers with local authorities and planners	7. Crowdfunding, besides raising capital, is a tool for local engagement

### THANK YOU

chiara.candelise@unibocconi.it

Università Commerciale Luigi Bocconi Via Röntgen 1 | 20136 Milano – Italia | Tel +39 02 5836.3820 green@unibocconi.it



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# Number and average size projects by technology

- PV large number of projects smaller size



### Source: Candelise, Grasso, Colelli, 2017

### Funding volume across countries

- Best performing countries: UK, Germany, France and Netherlands
- Trillion Fund (UK), alone has raised about 100€ml, 50% of which only in funds. Now closed



19

### Decarb City Pipes 2050 Capacity Building Session on Heat Communities

**Beauvent (BE)** 

Jeroen Soenens, Project Manager Heat 17 jan 2023 11:00-11:25 Jeroen.soenens@beauvent.be



### **Beauvent cv**

### Renewable energy cooperative (BE)

- Diksmuide, Belgium
- \* Main office in Oostende
- Founded in 2000
- ✤ > 8000 shareholders
- 1 share = 250 EUR
- max. 25 shares p.p.
- Dividend 3,25 tot 6% (= max by law)
- Increase shares = connected to project





### **Beauvent cv**

### Renewable energy cooperative (BE)

- \* 2000 2015 : wind + sun
- ✤ 2015 2022 : wind + sun + cogen + heat
- ✤ Nearly 250 projects
- \* Balance 40 M (2021)
- ✤ Team 12 FTE
- \* General manager
- Board (8 p)



### **Beauvent cv**

### Heat Projects

- \* DBFM / Design, Build (contractors), Finance, Maintain (beauvent + contractors)
- \* 2019 / Heat plant Varsenare
  - Cogen + absorption technology
  - ✤ Care House
- \* 2023 / Heat plant Pittem
  - ✤ BTES + HP
  - Hospital
- **\*** 2019 2023 / **District heating Oostende** 
  - ✤ District heating W2E



### Intro

- Oostende = coastal city
- ✤ Located in West-Vlaanderen
- \* 75.000 inhabitants
- \* Summer : multiple
- Chemical industry
- \* Waste industry (incinerate, recycle)



### Timeframe

- \* 2012 / Energiehuis Oostende ideas
- \* 2012-2013 / Feasibility study POM WVL / Funded by EU
- Mid 2013 / City government "we will do this"
- 2014 / no progress
- \* (mid) 2015 / no progress
- ✤ Why ?
- Traditional network operator = no interest (electricity, gas, water)





### Timeframe

- \* End 2015 / City government: information session
- \* 2016-2017 / Beauvent : administration
  - Contracts (W2E, clients)
  - Design (heat plant, network, heat station client)
  - Business model (+ subsidies)
  - Permits (local government)
- 2018 : start building by Beauvent
- 2019 : start exploitation by Beauvent



### Timeframe legislation

- \* 2017 / Bouwverordening Oostende
- 2021 / Klimaatplan Oostende
   Main role District Heating
- \* 2023 / Warmteplan Heat map Oostende (to do)
- \* 2015 2023 / Vlaanderen
  - From DH = unknown
  - \* to Gas = not longer mandatary and even gas = forbidden
  - \* to Subsidie for DH



Gemeentelijke stedenbouwkundige verordening Deze werd definitief vastgesteld door de gemeenteraad op 27/03/2017. goedgekeurd door Deputatie van de Provincie West-Vlaanderen op 15/06/2017 met uitzondering van de artike

### Toelichting

Het eerste deel behandelt de gemeentelijke stedenbouwkundige verordening. Herbij worden de relevante definities oggenomen bij het begin van elk hoofdstuk. In het tweede deel worden de beleidskeuzes die aan de besis liggen voor deze verordening toegelicht. In het derde deel treft t de adviezen, en hun verweking, en in het lastste doel treft uit tot dot de bijgen.



### Network

Warmtenet Oostende

- Network = 9 km
- Heat = 17 GWh (2022)
- Temperature = 90/60°C
- (main) Source = W2E
- # clients = 35





Warmtenet Oostende

### Stakeholders city





### Lessons learned

- \* City / think outside box / challenge 'natural' partners
- ✤ Loose control as city? No !
- ✤ We're local !
  - \* Our Share holders = local
  - \* Strong in (local) communication
  - \* Our decissions are made local
  - Our profits stay local



Annex 3 – Support materials of the site visit of the Heindijk neighbourhood in Rotterdam, organised on 20<sup>th</sup> April 2022

### NEIGHBOURHOOD HEINDIJK

20 APRIL 2022



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 893509

Lydia Hameeteman





Gemeente Rotterdam

ROTTERDAM. MAKE IT HAPPEN.

## **APPROACH PER NEIGHBOURHOOD**

- Goal:
  - Offer for every household
  - Achievable and affordable for everyone
  - maximal CO2 reduction at minimal social costs
- Approach: per neighborhood
  - Minimize inconvenience and total costs
  - Fair distribution of costs
  - Creating opportunities by combining other projects (public spaces, social)
- District Heating is logical alternative for natural gas
  - High demand for electricy; surplus of residual heat
  - Regional Energy Strategy







### **NEIGHBOURHOOD HEINDIJK**







### **APPROACH: 4 TRACKS**







### FINANCIAL: AFFORDABLE FOR EVERYONE / LOWEST COST



### 4 alternatives for natural gas:

- 1. District heating and insulation
- 2. All electric and insulation
- 3. District heating for appartement buildings and all electric single family houses
- 4. Low temperature district heating (heat from thesewerage)

### Total costs of ownership:

- Costs for infrastructure
- Costs for building relating measures
- Costs for energy

### Preferred alternative by inhabitants: no strong preference District heating:

- Most inhabitants are familiar with DH
- Attitude for DH depends on experience by themselves or by friends
- Confused with block heating

### All electric:

- Almost unknown (was in 2017)
- Complex and expensive
- Technically progressive



Total cost of ownership alternatives

## SOCIAL MARKETING RESEARCH





### No they cycle because its:

- 1. Faster
- 2. More convenient
- 3. Low cost
- 4. Easy
- 5. Gives them independence





## SOCIAL MARKETING RESEARCH







### Expected customer journey taken by residents

Take the time to convince residents to participate













## **COMMUNICATION STRATEGY**

- Inform in time: Enough time, but not to much
- Profit frame: empasize positive points (lower costs, safer house, lot of subsidy) in stead of what people will lose
- Make it specific: Choice map
- Enlarge self-efficacy: too little knowledge will lead to inertia (cooking workshops, personal contact and information map)
- Positive personal interaction: Complex message: personal visit at peoples homes, meetings, christmas party, etc.



Informed Choice decision





## THE OFFER FOR THE OWNERS



**District heating** Contribution owners 1500,-

(average costs €14.500)



### Testing

Testing offer, choice map, communication material among residents



**Cooking** Subsidy € 500,-Care offer with Bruynzeel



**Personal contact** 



**Financing** Interest-free loan



### inclusive

Cooperation with social department for people with (financial) problems





## **CHOICE MAP**

- 2 moments to connect to DH: 2021 en 2027
- Lot of options: voluntarily
- > 30% participation needed
- After 4 months: owners had to make a choice

	<b>FHH</b>
Ik kies voor	
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Eleff Verkeing and dataset i Rigs, uhreje in 2027, mill aan de slag met en andgare i jakti u gebruk maker van de remisiae kenig	<ul> <li>Vear statisticals holden local gebraik maken van die sakoslik. Neur andere marinem van anelgeneij energeneme zijne i tendelijfe sokoslike magelijk. En schart gebraik maken van die metetische ferung van der gemeente Robeslam.</li> </ul>
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## THE RESULTS

- 1<sup>st</sup> Round (2022):
  - 73% of the home owners on DH
  - One private renter
  - One social housing company
  - Few utility buildings
- 2nd aansluitronde (2027):
  - Other social housing company
  - And more...







### **AGREEMENTS HOME-OWNERS**

- Contract between Vattenfall home owner
- Contract between Gemeente home owner
- Contract between installation company home owner
- Contract between Vattenfall association of home owners



Geneerto Rottentare, vertegoneccentgel dear Anton van de Graats (Atteingshoot)/ Discoaren), Nema te noemen 'de gemeente'.

De tiowoner en de gemeente zijn van het velgende op de hoegte

- De Nederlandse overbee) wil in 2050 wijwel COnvej zijn. De geneoerte beeft tot doel om Richardem in 2050 grotendeole aantgesvrij te maken: on generates a test for som in estander in color generates and generation in the definition of the generates in the definition and generation in the generation of the generation in the definition of the generation of the generat
- Piema: Stedini;
- na ma. beaking: an gemeente heeft duarons sinds oktober 2019 bewonens benadtert freit de vraag of ij wilke aanstuten op het warmerat; Ja bevonens die hierop positief hebien gemageerd, hebien de Interlieverkaring outsverwarmen, onderstaven.

Om de aanstuting op het werntenet te realtaaren, spreken de bewoner en de gereente het wijgende not ekaar af:

### Artikal I - Doebtelling

Mat daze overcenicomát leggen de Devoner en de generante de ordonings afloraisen de motig zijn on de ventre ver de berecher aan te stutten op het vermienet. Als de aansluiting es het warntenet is gonoalsoont, kas de wining van de toesoner wordev umanmen mat de ladoceneum jo.

### Article 2 - Pinancierry annualing op het somelieret

De wonnig van de bewonen wordt ulterlijk in ektóber 2922 aangesktien op het wannen gemaante draagt bij aan de kostele voor het aanskilten van de woning van de bewonen inden aan de volgende voorwaarden wordt voldean:

De bevoner goat een aanstuitsversenkomst aan met Vatterfall. De bevoner verbeert medeverding aan de akteating van de oversenkomsten as de verbaarenbeert de noetig zijn on ein aanstulling op net vaarmeert te naissenen Daarbij goat het om overserkomsten met en verkzaarsheden van Vatterfall, Stadie en de Instalateur (voor Ispandige werkzaarinecters)

taken Aantgasunji eigenaar bokoners on gemeente Roteinter

ROTTERDAM.



electronic installateur sente selectionit den gespisciel ir de benedigte ingandige weitzaamheden uitvoer voor een aansauting op De ingabateur zorgt voor de aanleg en alweeking van de warmteledingen monat is alvestaaleerd oor Veterefal en de vadeoere en vermeeterbergen voner gaat daalvoor een overeenkomst aan met deze instalakeur in die monst wordt opgenomen dat de instalateur verachvoordelijk is voor het kodele set ver negelijke beschadigrupen aan de platinde, werden of wandaheering v

stern de instate delike spineting De planning van de inoandige werkpaanheden is afhankelijk van de planning van de werkpaanhaden twiten (in de straat) en wordt afgestame met de bewoner.

De gemeente vergoett de kosker voor het uitvoeren van de inpanitige werkzaamheden deo een rechtstreeken betaling aan de geselecteorde installateur.

### Atternatiant Eigen Installateur Devoner

As a beyonder, in allefating vari het voorgaanski, voor de stivooring van de insamolige wetstaamsdee gebruik naadr van een egen instatistieur, dae komen de kosten voor inpendige verbaarheten, evende de konten van herand een georgele sochandiging geteel voor egen roeceng aa de bewenne. Kovendere is de beenoer in dit givit jaat anstreasonskie, von dige uitvoestie von de konten van herander van de anstreasonskie voor anstreasonskie voor hij die uitvoestie van de konten van herander van de anstreasonskie voor anstreasonskie van de soorte voor die voordere voor de anstreasonskie voor anstreasonskie voor die voordere voor die voordere voorder

De gemeente teeft oan facilierende rol bij het aanskulien van de voring van de bewener op tet wernenert door Valenskel. Dit beteken dat de gemeente betrokken is bij het proces wa het aanskulen van de wering op het wormener on dat de gemeente aanse mat Vatental on de geselestewei bestellike zong voor een huldijk bij vrage en vikachen.

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THE REAL PROPERTY OF A DESCRIPTION

versie 19 oktober 2021. Dit document is een concept en alleen bedoeld als onderwerp van discussie. Jaan dit document kunnen geen rechten of aenspraken worden ontleend.

SAMENWERKINGSOVEREENKOMST VOOR DE AANLEG EN EXPLOITATIE VAN EEN WARMTENET IN DE GEMEENSCHAPPELIJKE GEDEELTEN VAN APPARTEMENTENCOMPLEX XXX

### De ondergetekenden:

1. But Warmtabachtf XX

Het Warmtebedrijf 10t en de Wilf's gezamenlijk en ieder aftenderlijk ook aangeduid als 'Partijfen)'

### Overwegende dat:

- A. De Gemeerte Rotterdem gestart is met het aardgewrit maken van bestaande bouw in gebied Henrofsk soor motiek van stednemearring.
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(d mei 202)

Oit installatiocontract bestaat uit de navolgende onderdelen: Indinacte onschuterg
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eachte Figenaat-bewonerjs) van de workog.

Algemene worwarden Signartie
 Weittekening per type woning Judiage)

## **CONNECTION METHODS**

- Could choose: outside the building (cove along the facade/ shaft inside the building or from the roof)
- 2 buildings decide through shaft in de appartements and 1 building through cove along the facade

in de gevel wordt een sleuf gemaakt. De leidingen worden in de sleuf aangebrecht. De sical legit con addetation in de lacar en stractair wan de pevel. By de woningen die willen aanskulten op statisverwanning, wordt in de gevel bij de textere en doorwoor gemaakt. De bestaande kool in de worken wordt wevillend, de lektingen worden



### Aansluitmogeliikheden appartementen Heindiik





Voordelan: - Er vinden alleen werkzaantheden plaals in de woningen die worden aangesloten

Er komt een koof in de karser ruust de keuken.

ollien averatiere og stødelvervarming, wordt in de komen nævet de lauter in de joner sam dennere grænskall. In de kamer Alemen førere høger høger het grakend de høre varmitekeldingen is kopen. Deze vorden desoperivisken naar de CV-kaut in de houten. De varmitekeldingen varden afgeverkt met een koof. In de kamer naast de keuken tomf den eve koef van opgeverk 70 em bij 20 om.

Er vinden alleen werkzaamheten plaats in de woningen die worden aangestoten ieni Er zijn meer werkzaantheden nodig dan bij optie 3 omdet de oude koof moet worden veggebroke De koof in de kaufon wordt een paar cantineter groter. De leidingen vorden via de kruipplimte onder de voningen naar de CV-kast in de The balance services for the initial service model network regions and in CV based in the balance sprace (IC). Existing is worked in order is understand a services of CV-based managements (IC). Solvers management is existent and existing is the service sprace vectories and solvers regions of advancement of existing is a model for worked management of performance of existence in the initial in CR entrands work region and performance of periods. Use advancement is the initial in CR entrands work region advancement generated in the three the initial initianee initial initi Voordelens Alle leidingen zijn netjes veggeweikt. Het aanzien van de workgen aan de buitentlijke blift ongevel tigd Voor deze optie moet in alle huizen werkzaamheden worden uitgevoerd, ook die niet willen aanstuiten, ondat de leiting door de schapiten worten getrokken Besluit VvE De WE geeft toestemming aan Vatienfalt om de kidingen deer de kuiprainte en de sekacht of legeni de gevel aan te leggen. De WE gaat een samereveldingssoereekonst aan met Vatienteil en geeft het mandoat aan het WE mming aan Vatienfall om de leidingen door de kruipruinte en de schacht of legen/in Sestuar om de overeenkomst en de aanstalling van de leidingen verder uit te werken.

In de samenvarkingsoversenkomst moeten abpraken worden gemaakt met Vatiantali over de toegang van de le bingen. De leidingen in het pand tot en met de allegesset zijn eigendam van Vatenfalt, net zoals bij gas en elektra de leidingen van Siedin zijn tot aan de gasteleidt úteitsmeter. Voorstel is om samen met een julist en uw extrain diffusion and MF all the worker





VATTENEALL









## **DECISION PROCESS 1ST BUILDING**

- Cove worked out by the architecture of the appartment building => very deep cove, around 60 cm. They didn't like that.
- Clarity about who is going to be connected to DH and who is not. (owners who were not going to connect to DH were afraid of a lot of inconvience, but that would by okay, yellow/blue lines almost everyone was going to connect to DH)













## **EVALUATION: TIP AND TOP**

### TOPS

### TIPS

- Personal contact
- Choice map
- Cooperation with social departments
- Information meetings

- Communication:
  - About the meetings
  - Not everyone recieved the news letter
  - Communication to the tenants
- Tenants were sorry that the offer did not apply to them, but only home-owners.







### Lydia Hameeteman Lc.hameeteman@rotterdam.nl







This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 893509



Gemeente Rotterdam

Annex 4 – Support materials of the capacity-building session on co-creation with citizens to decarbonise heating systems organised on 14<sup>th</sup> February 2023


# MAKING THE EYE OF THE NEEDLE BIGGER: CO-CREATION TO ACCELERATE THE HEAT TRANSITION

COMMUNICATION WORKS

#### "Co-creation refers to a product or service design process in which input from consumers plays a central role from beginning to end."

- Wikipedia



# WHY

Early detection of potential gamechangers and showstoppers · Less polarisation · New ideas · More trust · More communication · Better ambassadors · Higher acceptance and satisfaction · Future customer loyalty · Non-energy benefits · Local pride · Social cohesion · Better projects

COMMUNICATION WORKS

**Investment** with an uncertain outcome Takes time Requires communicating with people of different opinion People are difficult Requires efforts to digest new information Openness to change course May involve feeling uncomfortable, misunderstood, even dumb · It's burdensome – not only for you, but for everyone who is involved

WHY NOT

COMMUNICATION WORKS



Interest





# HOW

First and foremost, be prepared to listen. Use a third party and an unbiaised, flexible method. Meet people where they are, not where you are. Be transparent and consistent, report back regularly.



# We help you win the hearts and minds of people for the energy transition, environment protection, green businesses and science.

sabine@communicationworks.eu
+49 1520 8727000

## **CO-CREATING FUTURE HEAT**

**VISIONS** Ighor Van de Vyver Team Climate



- EU-project <u>SHIFFT</u>
  - Sustainable Heating: Implementation of
     Fossil-Free Technologies
  - Duration: Feb. 2019 tem. Maa. 2023
  - Budget: 5.707.426 €





Met steun van



### 10 partners of 4 countries (BE, FR, NL, UK)



With support of







- Guidance modules available
  - Module 1: co-creation and stakeholder engagement for sustainable heating
  - Other modules: <u>https://shifftproject.eu/publications/</u>





# HEAT STRATEGY MECHELEN



### **INTRODUCING... MECHELEN**

- Population of 87.000 citizens (5th city in Flanders)
- High climate ambitions: SECAP 'Klimaatactieplan Mechelen'
  - 87 ktCO<sub>2</sub> reduction by 2025
  - -40% CO<sub>2</sub> reduction by 2030
- Covenant of Mayors signatory since 2012
- Green Leaf Award winner 2020
- Member of the Board of Covenant of Mayors in 2021
- Selected for Intelligent Cities Challenge and EU City Facility
- Partner in multiple EU projects on climate mitigation and climate adaptation
- Submitted application for Net Zero Cities call for pilot cities











### **COCREATION IN PRACTICE**

- Examples of cocreation applied in our heat strategy
  - 1. Cocreating a one-stop-shop for condominium retrofit
  - 2. Collaboration with community energy initiatives
  - 3. Transition arena

# CONDOMINIUM RETROFIT



### **CLIMATE DISTRICT MECHELEN**



ruimte voor energie langs de

#### MECHELSE VESTEN

In de jaren '60 en '70 van de vorige eeuw werden op de Vesten (de Mechelse stadsring) naast statige 19-eeuwse herenhuizen soms haast lukraak hoogbouwblokken W gevolg. De appartementsgebouwen zelf ginenergetischgezien vaakinslechte staat. Een grondige renovatie dringt zich op.

Bovendien geven warmtekaarten van Mechelen aan dat de binnenstad en het gebied ten zuiden en ten noorden van de binnenstad, vele kansen biedt voor een warmtenet. De Vesten (de stadsring) zijn een goed vertrekpunt door de aanwezigheid van interessante warmteafnemers: verschillende hoogbouwblokken en stadsontwikkelingsprojecten.

Met dit project wil de stad onderzoeken wat de ruimtelijke impact en technisch-financiële haalbaarheid is van een warmtenet langs de Vesten. Aanvullend wil de stad een aanbod uitwerken voor de energetische renovatie van anonatementscholuwen.



Warmtekaart 1: Warmtedichtheid op raster (gebaseerd op open data van Fluvius, 2017)



vatie van appartementsgebouwen Warmtekaart 2: Lineaire warmtevraag (gebaseerd op open data van Fludoor syndici en VME's te ontzorgen. vius, 2017). Vanaf 2,5 MWh per m zijn er kansen voor warmtenetten.



Luchtfoto met stadsontwikkelingsprojecten (blauw) langs de Vesten (rood): 1. Keerdok-site - 2. KOMET - 3. Site Potterij/Speecqvest - 4. Ragheno - 5. Gasthuissite - 6. Tinelsite



Foto A: collage van de Koning Astridlaan (links van de KOMET-site)

5 hectare groen erbij of 2 keer de oppervlakte van de Kruidtuin



2000 nieuwe bomen



5 km dubbelrichtingsfietsring



Meer ruimte om regenwater op te vangen

Verkoeling

Plaats voor

ontmoeting



Minder geluidsoverlast **DE NIEUWE** VESTEN baanbrekende plannen

de geschiedenis van Mechelen

Gezondere lucht

22 vernieuwde bushaltes

15 veilige conflictvrije

kruispunten

3

Vlotte busverbindingen

Veilig en comfortabel wandelen langs en naar de binnenstad

> Nog aangenamer wonen, werken, studeren en ontspannen

# COCREATION

Three levels:
Higher – local government
Condominium association
Local focus group



• Typologie 2

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Typologie 3
 Typologie 4
 Schematische voorstelling van de vier typologieën van de appartementsgebouwen







### **CO-OWNED CONDOMINIUMS: PILOTS**

- Partners involved
  - Flemish government
  - 2 consultants (Contutti and Bureau Bouwtechniek)
  - 2 syndics, 3 homeowner associations

- Results: 3 buildings
  - #1: 85 dwelling units
  - #2: 25 dwelling units
  - #3: **12** dwelling units
- Renovation masterplan conducted in buildings 1&2
- Investment decision in GA planned (sep 2022)



Adres	Koningin Astridlaan 159-161, 2800 Mechelen
Bouwjaar	ca. 1979
Plannen beschikbaar?	scans beschikbaar bij syndicus
Aantal appartementen	85
Aantal leden VME	85 (?)
Verdeling eigenaars-verhuurders / eigenaars-bewoners	1/4* verhuurders – 3/4* eigenaar-bewoners (inschafting van syndicus)
Typologie gebouw	typologie 1 - middelhoogbouw - gelijkvloers + 7 andere bouwlagen - 5-6 appartementen per verdieping per inkomhal
Afwerking voorgevel bovendakse zijgevel achtergevel	natuursteen bekieding (d 8 cm), niet geisoleerd, wel spouw (d 5 cm) 1 geïsoleerd + leien, 1 niet afgewerkt, steens metsetwerk buitenspouwblad metsetwerk
Type dak	plat dak, verouderde dichting, ca. 6 cm isolatiedikte
Type schrijnwerk	aluminium, thermisch niet onderbroken (originele ramen)     niet consequent vernietuwd     deels dubbele beglazing (1* generatie), deels enkel glas     plaatsetlijk rolutiken
Aanwezigheid terrassen	<ul> <li>terrassen aan voor- en achterzijde gebouw</li> <li>op sommige terrassen dichting geplaatst, op sommige niet</li> </ul>
Aanwezigheid kelderverdieping	volledig onderkelderd, tuin aangelegd op gelijkvloers
Wijze van verwarmen	<ul> <li>collectief stooklokaal – 3 hoogrendementsketel op gas in cascade</li> <li>CV + sanitair warm water op deze ketels</li> </ul>





#### Ben jij appartementsbewoner? En wil je energiezuiniger wonen?

Stel je kandidaat, en wie weet starten we een begeleidingstraject om jouw appartementsgebouw energiezuinig te maken!

Concreet zoekt stad Mechelen twee Verenigingen van Mede-Eigenaars (VME's) die willen meestappen in het project 'Klimaatwijken: Ruimte voor energie langs de Mechelse Vesten'. Dit is een project van Departement Omgeving, het Team Vlaams Bouwmeester en het Vlaams Energie en Klimaat Agentschap.

- $\rightarrow~$  Woon je in een appartementsgebouw dat op of in de buurt van de Mechelse Vesten ligt?
- $\rightarrow~$  Kan het gebouw een gerichte renovatie gebruiken om energiezuiniger te worden?
- $\rightarrow~$  En wil je als VME niet alleen renovatieplannen maken, maar ze ook uitvoeren?

Lees de <u>uitgebreide projectinfo en selectiecriteria</u>, en toon alvast je interesse door je in te schrijven vóór 30 juni.



Mede-eigenaars

lage inkomens

Achiesverlening

rond financiering

Noodkoop

fonds VO

Litmeken noodkoor

fonds VO voor

gemene delen

EP ondersteuring

aamvraag

Noodkoopfonds

Infoliche alternatieve

financieringsmogelijk

heden

Mede-eigenaar

verhuurders

Adviesverlening

rond financiering

Minverbouw-

premies VO

vertiaurders

Website

Minverbouw

lening VO

Overzicht van de hefbomen die VME's stimuleren richting een energetische renovatie van appartementsgebouwen

Mogelikheden

WO

Mogelijkheden

ME

Condoreno

Andere

Bestoend Visorate unerheid

Legende

Bestaand

Mechelen



### Condiminiums on territory Mechelen



N = 1.408 condominiums N = 11.397 apartements

#### Nature of the condominiums:

- with CA: 561 condominium / 6759 apartements
- without CA: 750 condominium / 3252 apartements
- social housing: 97 condominiums / 1386 apartments

Year of construction (ap.buildinsg / apartements):

- Pre 2012: 955 (68%) / 7124 (63%)
- Post 2012, incl. renovation: 453 (32%) / 4273 (37%)



### COMMUNITY ENERGY INITIATIVE KLIMAAN



### **INTRODUCING... KLIMAAN**



### **INTRODUCING... KLIMAAN**

- Klimaan = **one family**, two organisations
  - 230 volunteers of citizen community Klimaan vzw
  - 1000+ shareholders of energy cooperative Klimaan cvso (member of RESCOOP.EU)
- Klimaan mobilises citizens for a sustainable society. They operate on four themes: **water, air, soil and energy**
- Activities range from raising awareness and positive actions to sustainable investments in renewable energy.
- Location: Mechelen and surrounding region (Bonheiden, Sint-Katelijne waver, Zemst,... in Flanders (Belgium)
  - <u>https://klimaan.be/</u>
  - https://coop.klimaan.be/



### **COOPERATIVE SOLAR**

- Zonnewijzer and Zonnewijzer.biz
  - Technical assistance and installation of rooftop PV for households and businesses
  - Eg. More than 750 advices and 250 installations in Mechelen since 2020
- (Solar) Energy Service Company (ESCO)
  - Installation of rooftop PV via third party investments and direct citizen participation
  - Eg. School Colomaplus in Mechelen (650#) and social housing Otterbeek (729#)





#### **TANDEMS** project

Cooperation between local governments and energy cooperatives as vehicles ('TANDEM') for a just and accelerated transition, including citizens in every step

- $\rightarrow$  Energy communities can help citizens to invest in renewables and energy efficiency
- → Local governments are uniquely well-placed to support community energy projects

#### Quick facts:

- > 23 citizen-led initiatives on energy and mobility sharing, collective renovations and collective heating facilities
- Estimated impact: 10,15 GWh/year RES
- Investments in RE: 7,9 million euro by 2025
- Budget:

1,8 million EUR (subsidy 95%)

OIKOPLUS

> Duration: 2022 – 2025; partnership: 11 partners from 4 countries (BE, NL, BG, A)



TANDEMS

### **ENERGY COMMUNITY OTTERBEEK**

#### BEFORE





- Pilot project on energy sharing
- Energy community in social housing: 70 homes and 15 appartements
- Objectives:
  - PV on all roofs (maximise rooftop potential)
  - Affordable and clean energy for social housing tenants
  - Energy sharing in community (benefit even without PV on your rooftop)
  - Living lab



### **ENERGY COMMUNITY OTTERBEEK**

#### AFTER



Type project	Zonnepanelen, merk: Jinko Solar
Aantal zonnepanelen	730 panelen
Vermogen omvormer	3 – 5 kVA (70 stuks)
Geïnstalleerd vermogen	288 kWp
Verwachte jaarlijkse productie	262 000 kWh/jaar
CO <sub>2</sub> -besparing	55 ton/jaar
Totale investering	250 000 EUR
Bouwjaar/ingebruikname	2022












## **TRANSITION ARENA: PROCESS**

- Transition arena
  - 3 workshops (2/2 16/2 7/3)
- Participants: 20 experts-stakeholders
  - Gender balance
  - Link with Mechelen
  - Different backgrounds (fuel poverty, spatial planning, community energy, heat networks,...)
- Methodologies inspired by Cities of Tomorrow / DRIFT:
  - Multi-Level Perspective
  - X-curve



# THANK YOU

Ighor Van de Vyver | Mechelen Klimaatneutraal ighor.vandevyver@mechelen.be | +32 470 90 18 17 www.mechelenklimaatneutraal.be | www.mechelen.be



Linked In

www.linkedin.com/company/stad-mechelen/ www.linkedin.com/in/ighor-van-de-vyver-32b6a19a







#### CONVENTION CITOYENNE MÉTROPOLITAINE POUR LE CLIMAT

## METROPOLITAN CITIZENS' CLIMATE CONVENTION





## THE FUNCTIONING OF THE CCC



- 100 citizens selected by lottery
- 1 Operational Committee
- 40 experts & 40 officers interwieded
- 5 week-end / 5 webinars : 100 working hours / Ccc member

#### A final report including :

- An introduction: messages to elected officials
- A vision of a carbon-neutral territory in 2050, giving general meaning to the proposals
- 70 levers that make this vision operational, broken down into 219 proposals organized into 9 themes

## **THE CONVENTION'S MANDATE**

## How to reduce greenhouse gas emissions by 2030?

Quelles actions mettre en place, notamment au niveau des politiques publiques métropolitaines, et en complément de celles déjà inscrites au Plan Climat Air Énergie Métropolitain, pour réduire plus particulièrement les émissions de gaz à effet de serre directes et indirectes lies à nos modes de vie et de consommation (alimentation, biens et services...) à l'horizon 2030, tout en favorisant la justice sociale, étant rappelé les préconisations scientifiques de réduction de 65% des émissions de GES d'ici 2030 comparativement à 1990 ?

## How to reach carbon neutrality by 2050?

Quelles actions mettre en place, et quelle trajectoire de budget carbone engager, pour que notre territoire métropolitain atteigne la neutralité carbone en 2050, ou sur une temporalité plus rapide à évaluer par les citoyens, tout en contribuant à la réduction des gaz à effet de serre à l'échelle planétaire et en permettant l'inclusion de tous et toutes ?

In addition, the Operational Committee (the body that coordinates the work of the Convention) asked for the consideration of **adaptation** to climate change.

## **PROGRAM OF THE CONVENTION**

#### 5 and 6 MARCH 2022

- Installation of the Convention
- Information on the climate in the world, in Europe, in France and on the metropolitan territory
- Interactions between climate, social and environmental issues
- Presentation of Grenoble Alpes Métropole and the Metropolitan Climate Air Energy Plan



- Meetings with economic actors, associations, politicians...
- Deepening of the long-term vision and elaboration of the first proposals to implement the vision

#### 8 and 9 OCTOBER 2022

- Measurement of consensus and dissensus around the different proposals
- Prioritization and finalization
   of proposals
- Collective adoption of the proposals

5



#### 7 and 8 MAY 2022

 Presentation of scenarios for achieving carbon neutrality by 2050

2

Development of a low-carbon vision of the territory in 2050



## 10 and 11 SEPTEMBER 2022

4

- Analysis of the impacts of the Convention's proposals
- Deepening of the drafting of the proposals

## WHAT HAPPENS TO THE PROPOSITIONS ?

- The Convention's proposals are proposed to and voted by the Metropolitan Council
- Specific propositions will be submitted to the relevant stakeholders / institutions
- The others, or those deemed "complex", will be the subject of a citizens' vote in 2023.



- Theme 1 : Agriculture and food
- Theme 2 : Housing and development/urban planning
- Theme 3 : Mobility of people
- Theme 4 : Consumption, waste and leisure
- Theme 5 : Energy production
- Theme 6 : Carbon sequestration and capture
- Theme 7 : Economic action of the territory
- Theme 8 : Awareness raising/education
- Theme 9 : Training and employment

## Habitat, aménagement et urbanisme



#### Lever 2.4 : Decarbonize heating and cooling systems

Gradient Action 2.4.1 - Ensure the elimination of individual gas, coal and oil heating systems. Limit fossil fuel heating systems in collective housing

Action 2.4.2 - Ensure the widespread use of low-GHG-emitting heating systems, solar hot water, heat pumps, reversible air conditioning and geothermal systems, and facilitate their economic installation

Action 2.4.3 - Systematize collective heating systems using wood, heat pumps or other low-carbon energy sources, rather than the multiplication of less efficient individual fireplaces, with the individualization of consumption costs



Action 2.4.4 - Generalize the connection to the district heating network of public and private buildings (condominiums) following the framework of the Climate Law

Action 2.4.5 - Renovate the aging district heating pipes, lower the water outlet temperature (apartments heated by the floor are forced to have a cooling system), couple the heating network to geothermal energy and deploy district heating. Improve temperature control and balancing between units

Action 2.4.6 - Promote positive energy new construction



Action 5.3.2 - Support the deployment of the biomass sector for district heating with wood of the forestry chips type and low added value recovered wood from waste disposal sites
The city's heating network, the 2nd largest in France



### ccc\_grenoble\_alpes

#### Participation Grenoble-Alpes Métropole

5



#### CONVENTION CITOYENNE MÉTROPOLITAINE POUR LE CLIMAT

For more information, contact : marine.fabre@grenoblealpesmetropole.fr

conventionclimat.grenoblealpesmetropole.fr



## **District Heating**

Stakeholder Engagement

JOHN O'SHEA & NEIL O'LEARY - CODEMA



## Public Engagement so far...



#### Home Energy Saving Kits Available in 170 libraries around Ireland



#### Sustainable Energy Communities

Work with over 100 SECs in Dublin



#### Climate Mitigation

Councils' Climate Change Action Plans / Dublin Climate Action Week



#### Think Energy Campaign

Engaging local authority staff and wider public to think about energy

## The Why

No single organisation, individual or sector can fully transform Dublin into a clean, healthy and sustainable city.

We believe in an ambitious, honest and inclusive transtion away from fossil fuels that is locally informed and locally led.





#### Why engage the people of Dublin?

"NESC's research on just transition has found that codesigning an inclusive, focused and participatory process with those most impacted at an early stage is key to ensuring that a transition is just."

According to TASC, "climate action processes which do not consider the needs and priorities of the communities in which they are implemented, may not be socially sustainable and may further erode the social contract".

Source: Ireland' s Climate Action Plan 2021 - Securing Our Future Source: TASC's Talking Green Survey



Zero Together Survey

## 02



Postcards from Dublin 2050



03

### A mini-public on Dublin's energy transition

## WHO DID WE HEAR FROM?







## **Key Insights**

- Environment and cost were key issues of concern
- Lack of trust in those most responsible
- Barriers include lack of information, finance and infrastructure
- Lack of engagement
- Desire to be engaged through deliberative methods

### WHAT IS A MINI-PUBLIC?



ZERĂ TOGETHER Towards a cleaner, healthier Dublin



# Need to Communicate that DH more than just a heating solution



Industrial Waste Heat – increasing plant efficiency



Thermal Storage – Cheap Energy Storage for Large Scale Demand side Response



Customer Safety – no onsite combustion or fuels



Low-carbon & lower local air pollution



Integrate more Renewable Electricity – Large scale Heat Pumps & Electric Boilers & RE CHP



Less Fossil Fuel Imports – increased security of supply



Low-cost heat – utilises waste and renewable sources of heat



New market – new local employment

## Local Demo Projects

- Shows that it can be done in the area
- Regular tours Allows the community to touch and feel the system that is mostly invisible to them and ask questions and spread the word
- Lucky that the first large-scale DH project has the "cool factor"
  - Innovative First of its kind in Ireland
  - Tangible to anyone who has a had a laptop on their lap
  - Makes logical sense use heat that's currently being dumped







## Stakeholder Mapping

- Name Name of company or organisation
- Annual demand (MWh/a)
- Peak demand (MW)
- Basis for peak demand estimate (e.g. assuming equivalent run hours, etc.)
- Use Type (e.g. residential, office, etc.)
- Heating System (e.g. gas boiler with radiators and hot water tank, electric storage heating, etc.)
- System F/R Temperatures (e.g. 82/71°C)
- Level of Interest/Engagement (rate from 1 to 5, with 5 being highly interested)
- Hyperlink to stakeholder folder where building data and meeting notes are saved
- Decision maker contact details (Name, role, email address)
- Technical data supplier contact details (name, role, email address)
- Date info last updated
- Heat-on year





## Stakeholder Engagement Process



Cod

## Stakeholder Engagement

Step 1 – Identify:

- Relevant stakeholders anyone who might contribute, has an interest in or be affected by the DH scheme
- Live list that will be updated more become known, changes in interest levels (e.g. personnel, drivers), load +/-
- Think of roles to be filled to deliver the project and assign stakeholders to each role

#### Step 2 – Rank:





	Area	Drivers	Local Authority	Developer	Customer
ак	Environmental	Carbon emissions reduction	×	×	<ul> <li>Image: A set of the set of the</li></ul>
		Increasing renewable energy share of the heating fuel mix	1	1	~
		Air quality improvement	×		
	Economic and financial	Reducing local authority energy costs	×		
		Job creation and stimulation of the local economy	×		
		Sustainable source of revenue for the local authority	~		
		Contract or service value for money	×	×	×
		Space savings in connected buildings	×	1	<ul> <li>Image: A set of the set of the</li></ul>
		Cost-effective compliance with building regulations	~	~	×
		Increasing regional competitiveness – attracting industry with low-carbon, low-cost heat	\$		
		Energy tourism	~		
		Trench sharing savings	~	~	
	Technical	Resolving performance issues with existing building heating systems	*		~
		Energy security and resilience	~	~	×
		System reliability and maintainability	~	×	×
		Innovation	~	×	<ul> <li>Image: A set of the set of the</li></ul>
	Social	Alleviating fuel poverty	1		×
		Reducing energy costs to customers			<ul> <li>Image: A set of the set of the</li></ul>
		Customer satisfaction (improved comfort, control, simple billing, customer service)	×		~
		Regeneration of housing stock	<ul> <li>Image: A set of the set of the</li></ul>		<ul> <li></li> </ul>
-		Protection of vulnerable customers	<ul> <li>Image: A set of the set of the</li></ul>		<ul> <li></li> </ul>
	Political	Local authority capacity and skills development	×		
		Compliance with national or regional policies	<ul> <li>Image: A set of the set of the</li></ul>	1	<ul> <li></li> </ul>
		Reputation	×	1	<ul> <li></li> </ul>
	Legal	Compliance with regulations	<ul> <li>Image: A set of the set of the</li></ul>	1	<ul> <li></li> </ul>
		Compliance with planning policy	×	1	<ul> <li>Image: A set of the set of the</li></ul>
		Compliance with metering/billing regulations	<ul> <li>Image: A set of the set of the</li></ul>	1	<ul> <li>Image: A set of the set of the</li></ul>
	Circumstantial	Planned new development (identified as a potential anchor load for an area wide network)	×		
		Capital funding becomes available	×	1	<ul> <li>Image: A set of the set of the</li></ul>
		Existing building or estate heating system reaching the end of its operational life	×	~	~
		Local heat source (identified or planned which could supply heat to buildings via a heat network)	~		~

St



- Step 3 Stakeholder Main Drivers:
  - Keeps your engagement relevant and focused
  - Some drivers may be positive or negative depending on the individual stakeholder

## Stakeholder Engagement



#### Step 4: Engagement

- Category A: two-way engagement (face to face meetings, emails, phone calls)
- Category B: encourage to share their views - sharing project progress updates and ask for comment
- Category C: keep informed about the project as it progresses – potential ally / influencer
- Category D: one-way engagement (e.g. brochures, webpage, email)



## Brochure – Category D Example Tallaght

- Short description
- Benefits economic, environmental, legal & technical
- DH development schedule
- Financial comparison capital cost, space, maintenance, heat price
- Building regulation compliance
- Contact details



The Tallaght District Heating Scheme (TDHS) A Guide to Connecting for Developers



https://www.codema.ie/images/uploads/docs/ TDHS Marketing Brochure for Developers.pdf





The Tallaght District Heating Scheme (TDHS) A Guide to Connecting for Developers

#### **Proposed Network**

The map shows the proposed main distribution network in Tallaght, with the planned Phase 1 connections marked by solid blue lines and the potential future connections marked by dashed blue lines.





Potential Pipe Route Map





## **Existing Building Engagement Process**

- Engage with potential customer
- Carry out a site survey of the premises (install heat meter on building heating system to measure demand, efficiency and temperatures)
- Assess the heat demand and calculate the connection cost and emission savings potential
- Compare to other low cost heating technologies
- Provide connection report with view to signing a letter of intent/ heat supply contract

			Annual
			tonnes
	Capex	Annual	CO2
Low-Carbon Heat Options	(€)	Cost (€/a)	Saved
DH Scheme			
Heat Pump (with SSRH grant)			
Heat Pump			
## Pricing and Distribution of Costs

- Heat price for customer needs to be competitive with the counterfactual
- Will likely have adjustment based on the return temperature
- Connection fees may be included up front or spread over the supply contract using more of a HaaS model (or a mixture of both) – will depend on preference of customer



#### Motivation tariff 2017

## Importance of Transparency



- Builds trust
- Allows for accurate comparison with alternatives
- Helps address potential for misinformation
- Drives competition on prices



## Awareness Future & Expanding DH Projects codema











## ?

# Email john.oshea@codema.iePhone (+353) 01 707 9818Web www.codema.ie



Annex 5 – Support materials of the capacity-building session on citizens' empowerment organised on 14<sup>th</sup> March 2023

### PEOPLE POWERED RETROFIT

## Decarb Pipes: 'Community Led Renovation'

**People Powered Retrofit** 

14 Mar 2022



## People Powered Retrofit - Citizen Led Refurbishment



#### Variety of interventions



#### **Citizen involvement**

Co-ops are trusted

#### Supply chain engagement



Local solutions

## **Our one Stop Shop offer**



## **Track record**





Semi-detached, fully wrapped up

Despite good intentions, homeowners are often put off energy-efficiency improvements because of the cost or mistrust of government schemes. But a Manchester co-op is showing just how much can be achieved, says Sarah Roe

10 TH BIG SSUE IN THE NOTION - 5-11 parameter zeros





was really cold. We would have the heating on full blast but it didn't

🜔 urbed

The AcCents' home is north Hanchester takes shope as on energy-officient chowcare

S-11 LANUARY 2015 - THE BIG REAR IN THE NOTION 19

## People Powered Retrofit pilot 2019 - 2021



## Barriers to a retrofit market

## **Barriers – what's blocking householders?**

- Overwhelmed by the **complexity** and technical detail
- Difficulty in making key decisions
- Concerns about risks and what could go wrong.
- Confused by conflicting advice from retrofit practitioners
- Problems finding contractors
- Problems ensuring high quality works.

## What householders want from a service

- A complete retrofit design service with a trusted 'single point of contact' aka golden thread
- Retrofit advice and signposting
- An assessment with an overview home measures
  'retrofit plan'
- **Procurement of contractors** through local supply chain networks.
- An onsite QA framework for contractors

## Personas and marketing

## Working with the willing...



INNOVATORS

## **Motivations and research**



Householder budget for retrofit works



Motivations for retrofit

Weighted average

5.0

## **Service Design**

Creating an end to-end-service





#### Carbon Co-op People Powered Retrofit - Pathway 1





## Experiences

## **Householder service**

- 100 householders in the service at different stages.
- Positive feedback on the service.
- More demand than capacity to deliver.
- Lots of need for quality approaches.



## **Contractor training**

- 300 contractors training in past 12 months
- 1,000 attendees to CPD
- New training offer and consultancy being sold to other clients



## **Replication and consultancy**

- More areas of UK using Home Retrofit Planner
- Significant demand from other organisations.
- Developing integration into other tools and services ie heat pumps, smart meters etc.



# Pitfalls and solutions

**Meeting demand! Getting stuck - service** design **Capacity - supply chain** engagement Income generation - value proposition **Scaling - business** planning





Deep retrofit 'Community of Practice' One Stop Shops – Examples from Europe

@PeopleRetrofit

## **Decarb City Pipes 2050**

- Capacity building session
- Empowering citizens for the heat transition



**Orson Dubois** orson@citymined.org







## Testing our agency to reinvent electricity in the city





... How to make sure that the transition is inclusive? ... What are the best ways to favour and support citizen initiatives and engagement?

## A few learnings on the way...

- Active outreach & proximity are crucial
- Build trust via community 'organising' rather than 'management'
- It's slow: take time and adapt
- Transform the (vague) "energy transition" into tangible projects





"My neighbour she doesn't believe me that without my dual time counter and with two energy bills, I'm still saving money!" Marie-Jeanne "Ah! The sun's shining! I'm going to start my washing machine! Before, I had a dual time counter, so I had the habit to do everything by night". Myriam





## More info:



### TOWARDS CO-OWNERSHIP AND INCLUSIVE PED-DEVELOPMENT













Orson Dubois orson@citymined.org +32 476 63 59 18



## **ENCLUDE Academy for Energy Citizen Leadership**

Vanja Djinlev Transdisciplinarity Lab (TdLab), ETH Zurich 14 March 2023





**ETH** zürich

## Agenda

- 1. H2020 ENCLUDE Energy Citizens for Inclusive Decarbonization
- 2. Establishing the ENCLUDE Academy:
  - 1. Structure and design
  - 2. Recruitment of participants
  - 3. The Open edX platform
  - 4. Participants description
- 3. Running the ENCLUDE Academy:
  - 1. Operational details
  - 2. Topics covered
  - 3. Case studies
  - 4. Participants' projects
  - 5. Ensuring continuity
- 4. Academy wrap-up & invite















## **ENCLUDE – Energy Citizens for Inclusive Decarbonization**

#### **Objectives**:

- Assemble, align, and adapt energy citizenship concepts
- Operationalize the energy citizenship concept at all scales of policy making
- Catalyze a chain reaction of decarbonization actions across the EU (and beyond) through a bottom-up approach (ENCLUDE Academy)

### Goals of the Academy:

- Co-creation of new knowledge with diverse stakeholders
- Uptake of this new knowledge to mobilize action for decarbonization














## **ENCLUDE Academy - Structure & design**



- The ENCLUDE Academy is a six-month, online leadership development and civic engagement program for decarbonization
- Two parallel tracks (levels of involvement):
  - "Knowledge" track (casual participants)
  - "Action" track (leadership participants)
- Curriculum structured around design thinking for systemic transformation AND relevant energy citizenship & energy transition info (equal footing)





## **ENCLUDE Academy - Structure & design**



#	Date	Start *	End *	Activity	Activity Remarks		Mode
1.	1 13.10	17:30	19:00	Module 1 introduction – Diving into the energy transition (Videos 1.1-1.3) Participants are expected to watch the videos before the session. During the module, facilitators and other participants answer each other's questions. Module is recorded for participants who cannot join.	Goal: Reinforce and discuss the topic of the energy transition and its relevance for participants' communities Expected outcome: Participants become familiarized with the vocabulary and concepts used in relation to the energy transition. They can make direct connections between the broader topic of energy transition and their own community-level concerns.	Mix of plenary discussion, Q+A and small group break outs (1.5h)	Online
1.	2 20.10	17:30	19:30	Module 1 work session – Design thinking workshop – "Empathy" and "Linking Empathy to Defining"	Goal: Leadership participants get training on the first two steps of design thinking Expected outcome: Participants get to know each other in a more intimate online setting and start thinking about forming groups for working together. Participants will start to identify and start working on what is the problem they want to address in their own communities, in relation to the topic of the energy transition.	Mix of plenary discussion, Q+A and small group break outs (2h)	Online
1.	24.10 to 28.10	TBD	TBD	Module 1 free session for individual/group work or for collecting ideas from the community Participants can meet online if they are a group. We have a "hotline" or "office hours" open for questions on Oct. 27 <sup>th</sup> .	Goal: Participants bring back the ideas picked up so far in the programme and connect it to their communities. Application of concepts in real life. Expected outcome: Participants could collect observations, opinions, conversations with the new perspective that has been introduced.	Variable	Online/ In-person hubs
1.	4 03.11	17:30	19:00	Module 1 reflection session – Integrating concepts and action	Goal: Participants share what they learn from the past week, some in plenary and others in small groups. Expected outcome: Participants reflect on the connection between concepts and real-life settings	Mix of plenary discussion, Q+A and small group break outs (1.5h)	Online





## **ENCLUDE Academy - Recruitment of participants**



**Aim:** Recruitment (head-hunting) of 25-30 leadership participants for the Academy according to a predefined participant profile

#### **Overview**:

- Meetings with 15 organizations (Ireland, Netherlands, North Macedonia, Greece, Niger)
- Meetings with municipalities (Scotland, Netherlands)

#### **Results**:

- Agreed support for module design and recruitment
- Desire to attend the Academy



## **ENCLUDE Academy - The Open edX platform**

ENCLUDE ACADEMY     Academy for Energy Citizen Leadership	Help VanjaDjinlev 🗸
View this course as: Staff ~	View course in: Studio
Course Dates Discussion Resources FAQ Instructor	

#### Academy for Energy Citizen Leadership

Pick up where you left off	Resume course	Course Tools Bookmarks Updates	
PLEASE JOIN THE NEXT SESSION: 02/03/2023, 17:30-19:00 CET LINK: https://ethz.zoom.us/j/69354123643	Dismiss Expand all	<ul> <li>Caunch tour</li> <li>Important dates</li> <li>Thu, Apr 27, 2023</li> <li>Course ends</li> <li>After the course ends, the course content will be archived and no longer active.</li> <li>View all course dates</li> <li>Course Handouts</li> <li>Join the WhatsApp group of ENCLUDE Academy!</li> <li>Next session link (03/02/2023, 17:30-19:00 CET)</li> </ul>	
⊘ Module 1	+		
⊘ Module 2	+		
⊘ Module 3	+	Course schedule Academy Facebook group	
⊘ Module 4	+	List of all assignments	
Module 5	+		



## **ENCLUDE Academy - The Open edX platform**

ENCLUDE ACADEMY Academy for Energy Citizen Leadership Help VanjaDjinlev ~							
View this course as	: Staff ~				View	course in: Studio	
Course Dates	Discussion Resources	FAQ Instructor					
Course / Module 3 / ision – "Ideating with systems thinking" and "Linking idea							
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## **ENCLUDE Academy - Participants description**



- 2 calls for applications; 96 confirmed applicants (43 casual, 53 leadership)
- Average age is 32; 54 male, 42 female applicants
- Europe, Africa, North America, New Zealand
- Occupation/functions:
  - Students (bachelor, master, PhD)
  - Engineers, film makers
  - NGO representatives
  - Professors & researchers
- Challenges:
  - · Communicating to and engaging effectively with citizens and institutions
  - Instructions on how to initiate a project















## **ENCLUDE Academy - Operational details**



- Every Thursday, 17:30-19:00 (19:30) CET
- Plenary and breakout rooms + different real-time engagement activities
- Weekly reflective journals (for all)
- Assignments (mandatory for leadership participants, recommended for casual)
- Collaboration, co-learning, co-creating







## **ENCLUDE Academy - Topics covered**



- Energy-related topics :
  - Intro to energy transition
  - Energy access & energy availability
  - Energy efficiency & prosumerism
  - Energy affordability & renewable energy
- Design thinking methodology steps:
  - Finding insights
  - Defining problems
  - Ideating solutions
  - Test prototypes







## **ENCLUDE Academy - Case studies**



#### **Collective energy initiatives (CEIs):**

- Political movements
- Collective targeted actions
- Energy communities
  - Electricity
  - Electricity & heat
  - Heat (thermal)
    - Drivers, barriers
    - Contextual factors
    - Citizen empowerment
    - Socio-technical & socio-institutional approach













## **ENCLUDE Academy - Ensuring continuity**



Aim: Make the Academy as a standardized, easily-transferable content for future use

#### How?

- Plenary sessions are recorded
- Materials (videos, reports, slides) are stored online
- Organizers' insights as notes for future use
- Implemented projects / ideas to be collected

#### By whom?

- Citizens
- Policy-makers
- Organizations?















## **ENCLUDE Academy - Wrap-up & invite**

# -----

#### Final presentations:

- 20 April
- 27 April

#### You are invited, please sign up:

https://encludeproject.eu/form/enclude\_academy\_final\_event

### Stay in touch:

info@encludeproject.eu

vanja.djinlev@usys.ethz.ch





## Thank you!

Vanja Djinlev Transdisciplinarity Lab (TdLab), ETH Zurich





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