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EURACTIV

DECARBONISING EUROPE'S HEATING SECTOR

EVENT REPORT
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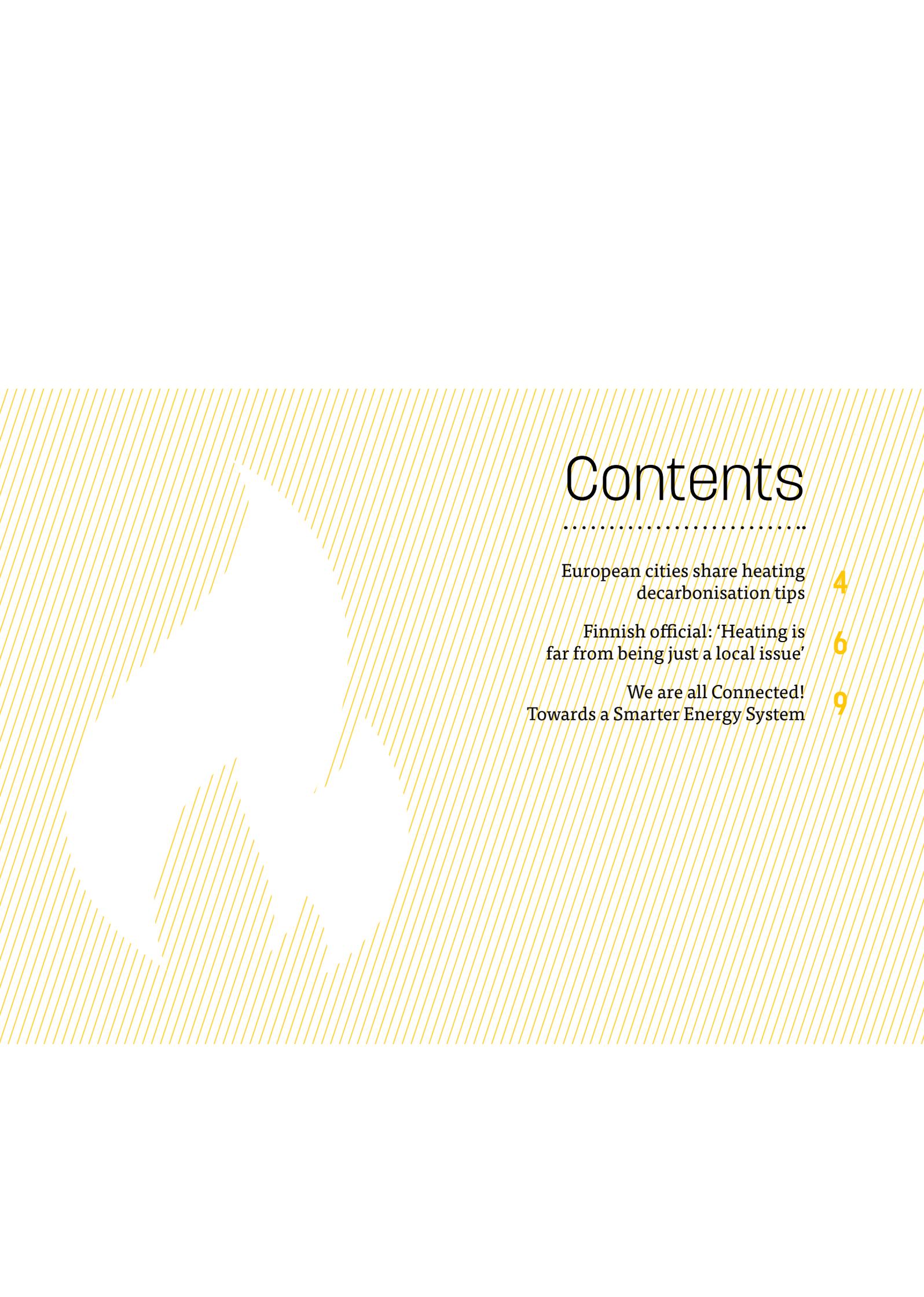




DECARBONISING EUROPE'S HEATING SECTOR

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Heating is responsible for almost half (40%) of the EU's total energy consumption, and a large share of the bloc's carbon emissions. Yet, politicians are reluctant to confront the issue head-on. EURACTIV examines the reasons behind this and some of the solutions being considered at local and EU level.



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European cities share heating decarbonisation tips

By Dave Keating | EURACTIV.com



97% of Copenhagen's heat is provided by warmth generated as a byproduct of power plants, which is harnessed and poured into homes, saving households €1,400 annually. [Luiz Eduardo / Flickr]

Cities with decades-old combined heat and power systems are emitting less carbon than others, and EU policymakers are looking at how to emulate this across the bloc.

When Copenhagen opened its first district heating power plant in 1903, climate change was an unheard-of phenomenon. And as the system rapidly expanded in the 1970s and 80s in response to the oil crisis, the motivations were more about energy security and economics rather than the environment.

But now, that early development has given the city a leg up in the fight against

climate change. Today 97% of the city's heat is provided by warmth generated as a byproduct at power plants. This waste heat is ordinarily released into the air or sea, but in Copenhagen it is harnessed and poured into homes, saving households €1,400 annually.

Perhaps more importantly, it averts 65,000 tonnes of CO₂ each year that would have been generated from normal heating.

According to the European Commission, 50% of the EU's annual energy consumption comes from heating and cooling – a fact unknown by most of the public. Natural gas generates almost half of the EU's heating

and cooling, followed by coal, biomass, fuel oil and nuclear. Renewable sources generate only about 5%.

The Commission released a heating and cooling strategy in 2016 which aims, among other things, to promote the use of ambient heat that is otherwise wasted through combined heat and power systems.

This week, stakeholders and policymakers gathered in Brussels to look at the state of play of district heating across Europe. What emerged was a picture of cities at extremely different stages of development. But what is

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clear is that cities are looking enviously at the Copenhagen example and want to emulate it. Is a new EU heating and cooling strategy needed?

Paul Voss, managing director of industry association Euroheat & Power, urged the Commission to provide a policy framework that will support the development of these systems. Cities that have put the systems in place recently have already seen impressive economic and climate benefits, but they need more policy support, he said.

CITY EXAMPLES

Astrid Madsen, process manager for the energy transition in the city of Rotterdam, said the Dutch city wants to put in more district heating solutions but is facing many political obstacles.

"What we've found is there is a surplus of carbon-free heat and a shortage of carbon free electricity – because we don't have that much room for turbines and solar panels in our area," she said.

"We need financial instruments. District heating makes sense, but it's a high upfront cost and a long-term investment. If you have a higher return on investment it ends up having high connection costs. Dropping a few percent on return of investment you dramatically drop the connection costs and then you have a good proposition for the end."

But without consistent policy coming from EU level providing investors the confidence to make this up-front investment, she said it won't come.

"You need to have clear rules. It starts on an EU level but it drops down to the national level," she said. "District heating might be more local but I want to avoid that it becomes a completely separate set of rules, because then you end up in isolation instead of integration. A lot of national rules and regulations are needed. But having a clear path from

the EU will help also at national level to build the right frameworks."

The city of Espoo in Finland is further along in its district heating situation, but still faces obstacles. Mikael Lemström, Vice President of heating and cooling at Fortum, which provides the city with its heat, explained to the conference how district heating has expanded there. In 2011 the city's district heating network was 22 kilometres long. Today it is 120 kilometres. Energy recovery units have grown from nine megawatts last year to 29mw today. They want to expand further, but at a certain point cities run into a beguiling capacity problem.

"The capacity need itself is so huge that this sector coupling deserves some kind of note, some kind of regulation," he said. "Today's heating customers are paying for electrical capacity."

CONSUMER BUY-IN

Much of the discussion at the conference centred on how to convince homeowners to refit their buildings. Emma Coker, a low carbon heat analyst with Bloomberg New Energy Finance (BNEF), explained that the typical upfront costs of a central home heating system using a ground-source heat pump is €15,000, compared to €3,132 for a gas boiler.

Over time, the consumer should recoup those costs. But how do you convince them to make the up-front investment?

"Why doesn't every home have a heat pump? Because they're expensive," she said. "I don't know about you, but I don't have an extra 15,000 euros lying around to spend on a heat pump."

She noted that while district heating globally has been growing, that comes in spite of Europe rather than because of it. The global growth is being driven by Asia in industrial networks – in Europe it is declining.

It's a worrying development because Asia has the most coal in district heating networks. "Europe's getting cleaner and smaller, Asia's getting bigger and

dirtier," she said. A big part of the problem is that Europeans don't want to make the investment.

Philippa Nuttall Jones, editor of Foresight Climate & Energy, noted that back when the existing gas systems were installed, nobody thought about consumer acceptance. "In the Netherlands in the '60s nobody asked if people wanted to be hooked up to gas, they just did it. So how important are consumers here?"

Panellists remarked that the regulatory situation in Europe is much different now than it was in the '60s. But consumer attitudes may be the same. "A lot of low-income people don't want to participate, they just want it to be taken care of," said Coker. "That's where government comes in."

Karlis Goldstein, a policy officer with the European Commission's energy department, said district heating is very much on the minds of EU officials as the new commission prepares to take office.

"District heating systems will be part of the solution, like gas and electricity and biomass," he said. "The discussions that we're having is the foundation for a completely transformed system. The way that we have district heating today is not necessarily the kind of district heating we're going to have in 2050."

He noted that things have evolved since the Commission released its heating strategy several years ago. "We now have targets for 2030, plus the 2050 vision for carbon neutrality, yet we have no new district heating strategy," he said. "That's a lot to be thrown in the mix."

"We need detail by the end of 2020 from member states. We're looking into the substance of energy efficiency first. In a nutshell it means thinking about non-capital investments before you do them – improving things that you already have."

"The Commission is now changing its mandate, and the next people will have to decide what the next period will bring," he added. "But we're looking into all of these opportunities, we're not ruling anything out."

INTERVIEW

Finnish official: 'Heating is far from being just a local issue'

By *Frédéric Simon* | EURACTIV.com



A 203-metre high chimney of a heating plant Budapest District Heating Works Co. is lit with the Hungarian national colours in Budapest, Hungary, 21 October 2016. [EPA/ZSOLT SZIGETVARY]

Achieving climate neutrality by 2050 requires decarbonising the whole economy, including the energy-hungry heating sector, says Finland's Riku Huttunen. And that will involve cooperation at

all levels of government, including local and EU authorities, he argues.

Riku Huttunen is the director-general for energy at the Ministry of Economic Affairs and Employment

in Finland, which currently holds the EU's six-month rotating Presidency. He answered in writing to questions from EURACTIV.

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Heating represents almost half (40%) of the EU's total energy consumption. As such, it is also responsible for a large share of greenhouse gas emissions. Yet, politicians seem reluctant to confront the issue head-on. Why is that?

First of all, I want to underline that the Finnish Presidency aims at advancing the EU discussions to set a clear vision of climate-neutral EU by 2050. To achieve this kind of ambitious target, we need to decarbonise the whole economy, including heating.

When it comes to heating, you are right, it is often forgotten or overlooked compared to electricity supply. One reason might be that heating is considered a local or regional solution.

However, thinking about market rules and the Emissions Trading Scheme, this is far from being just a local issue. It is the responsibility of national and EU policymakers to implement policies and measures valid for the heating sector in different operating environments in Europe.

EU policies relevant for heating should enable decarbonisation and deployment of innovative energy technologies while avoiding technological lock-ins in the heating sector.

Some policymakers seem to assume the problem will solve itself upstream, once the entire energy system will have switched to renewables – whether electricity or gas. Would that indeed be a desirable outcome?

Some key principles are important, one of them being technology neutrality. Another is sector integration, or sector coupling.

If we follow these principles and concepts, we must not define too precisely beforehand which

technologies and energy systems will be the winners. It is crucial to work in a systemic way and to avoid excluding eligible solutions. We are going to need them all when decarbonising our economies, including district heating.

The EU has agreed a target to increase renewables in heating and cooling by 1.3% every year starting in 2021. Will that be enough to decarbonise the entire heating system by 2050?

It is a good start. Actually, the obligation expires when a member state has reached a 60% share of renewables in heating and cooling. Anyhow, it is a tool to ensure progress in the transition.

Fossil fuels – oil, gas, and coal – cover around 75% of the demand in the heating sector in Europe. So how fast can we get this number down to zero? Are there any obvious decarbonisation pathways to get to net-zero emissions by 2050?

There are definitely some challenges in decarbonising the heating sector. The EU Community should collaborate, also through Public-Private Partnerships, to find and develop good, sustainable and cost-effective heating and cooling solutions for our citizens.

In the long run, one pathway could be to electrify the heating sector. But technology is not the only thing needed. For example, individual building owners often lack both knowledge and financing to carry out the transition. Reasonable funding sources and dissemination of good practices can be important tools in this regard.

Some experts have called for a complete ban on new individual oil and gas boilers as of 2030, for instance. Do you think that would be a good idea? Is that an objective that should be set

at the EU level?

Well, a ban can sometimes be a solution, but it can also be very expensive for stakeholders and citizens. I would therefore focus on careful analysis of different kinds of policy measures and choose those which provide cost-effective and socially feasible results.

However, it is clear that we can't go on investing in fossil solutions forever.

The battle to decarbonise heating is sometimes depicted as a duel between renewable electricity and gas. But can the two actually work together? How does district heating fit in this context?

Actually, district heating can play an important role in the energy transition. District heating can provide additional flexibility to the system. It can also be a cost-efficient solution and enabler of sector integration.

For example, heat pumps in district heating networks can enable usage of renewable electricity. When there is cheap wind or solar power available, it can be stored in a heat storage site (a water tank, or an underground cavern for instance).

District heating, electricity and gas sectors can interplay in many ways, and we really need that. When new heat energy sources become available, it is cheaper to integrate them to the district heating system rather than to all buildings individually.

Finland is one of the European leaders on district heating. What could other European countries learn from Finland's experience? Are there any basic do's and don'ts? What are Finland's future plans for district heating?

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Yes, we are one of the leaders, not just in Europe but also globally. The Finnish approach is market-based without heat price regulation and without specific competition policy rules on heat markets.

District heating competes with individual heating, like ground source heat pumps and biomass boilers. The state is ensuring a fair playing field, but in the end, customers are free to choose or change their heating source.

Thermal networks in Europe are still largely reliant on coal (25%) and gas (30-40%) while renewables make up only 20% of the energy input, chiefly biomass. How fast can decarbonisation happen there?

Smart energy systems and sector integration can boost decarbonisation faster than we imagine. Deploying sustainable bioenergy where possible and combining that with industrial-scale heat pumps and waste heat

solutions in district heating networks can do the trick. However, the task is not easy and we need to work in a determined way to be successful. Another crucial issue is to put the customer at the centre and help them optimise their energy usage.

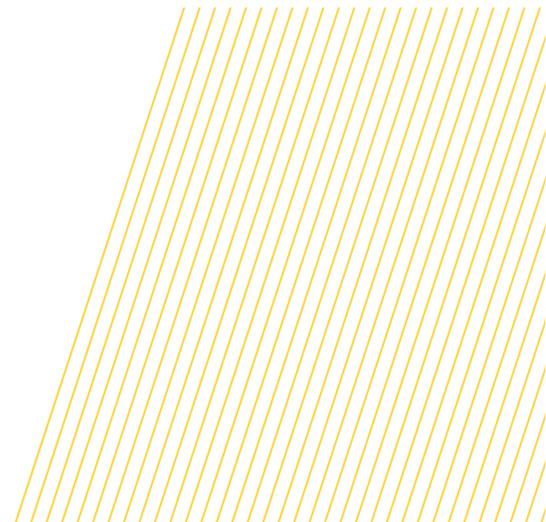
Kadri Simson, the EU's incoming energy Commissioner, has been tasked with facilitating the integration of the electricity, heating, transport and industry sectors – sometimes referred to as 'sector coupling' or 'sector integration' in EU jargon. How could this work from the point of view of the heating sector?

What an excellent question! We need additional flexibility in our energy system to deploy clean energy across the economy.

By better integrating the energy systems – for example, electricity and heating sector –, we can reduce emissions in a cost-efficient way. The issue of smart sector integration was also discussed by the EU energy ministers at the Energy Council

meeting on 24 September.

Energy technologies and sector integration as an essential part of the new energy system are high on our Presidency agenda.



OPINION / PROMOTED CONTENT

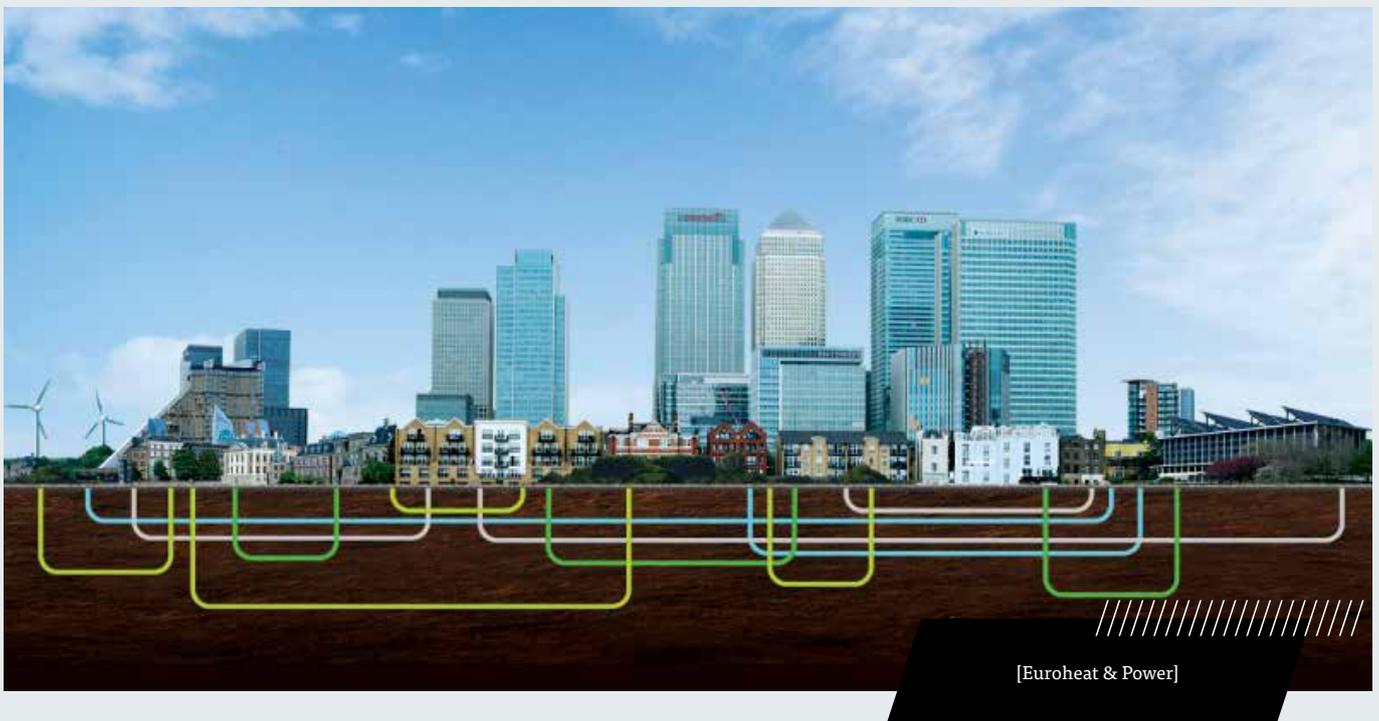
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We are all Connected!

Towards a Smarter Energy System

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By Paul Voss | Euroheat & Power



It's a time of transition and change in Brussels and the climate and energy arena is awash with new ideas, ambitions and personalities. Though it may not yet have made many headlines, the recent emergence of 'sector integration' as a (apologies for this...) 'sexy' topic at EU level may well end up being one of the defining elements of the next five years.

Paul Voss is the Managing Director of Euroheat & Power.

Put simply, sector integration means thinking about the constituent elements of our energy system as interrelated parts of a whole rather than individual features. And while the current debate seems heavily focused on the possible interaction between gas and electricity, there is so much more to it than that! By developing and implementing the concept of energy system integration in the broad sense of the term, the EU can find the pathway to an easier, faster and more cost-effective energy

transition. At the risk of committing a serious breach of copyright, it's time to start thinking different!

Ever since the publication of the first edition of Heat Roadmap Europe back in 2013, the European district heating and cooling (DHC) community has been captivated by the idea that heat networks can and should be more than just energy-efficient local heating infrastructure. They can also play an important role

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in the wider energy transition by providing a physical link between what would otherwise be isolated parts of the system. Coupled with large heat pumps, DHC networks can absorb large amounts of renewable electricity, providing vital balancing and storage costs to the grid at a fraction of the cost of batteries. Similarly, heat networks can connect sources of waste heat and cold from data centres and factories with nearby buildings, turning a by-product that would otherwise be simply thrown away into a precious resource that can heat people's homes.

Quite understandably, given its leading role in constructing the internal energy market through the 90s and early 2000s, the European Commission has instinctively reached for gas and/or electricity-based solutions to Europe's various energy challenges. Their pan-European nature and status as 'known commodities' makes them a tidy fit with the EU's regulatory frameworks and institutional architecture.

But the scale and urgency of the climate and energy challenges facing Europe today are such that we literally cannot afford to overlook new ways of doing things on the grounds that they are unfamiliar. Happily, there are signs that the incoming team of European Commissioners will be up for the challenge. In her mission letter to the incoming energy Commissioner Kadri Simson, President-Elect Ursula von der Leyen has instructed her to explore ways to 'facilitate the smart integration of the electricity, heating, transport and industry sectors'. This is a genuinely exciting piece of policy innovation with the potential to transform and accelerate the energy transition at both EU and local level.

Speaking of local, one essential precondition for success in achieving the smart integration that Mrs. von

der Leyen has called for is to achieve more coordination and coherence between Europe's energy policies and those being carried out by cities. In the heating and cooling sector in particular, local authorities will play a leading role in delivering the change necessary to fulfil the EU's overall decarbonisation objective. And since heating and cooling account for more than half of Europe's energy use and an ever-increasing majority of Europeans live in cities, decisions made in town halls across the EU will go a long way towards determining the EU's future energy needs. How, for example, can Brussels make useful assessments of the future infrastructure investments without a clear picture of plans at local level? In this context, a richer and more meaningful dialogue with city leaders and representative organisations such as the Covenant of Mayors is essential.

Finally, while it's fine to make lists of what everyone else needs to do, the DHC industry itself has its own work to be getting on with. The case for heat networks has traditionally been based primarily on energy efficiency. This is no longer enough. With the EU (hopefully!) standing on the brink of a commitment to net zero emissions, DHC networks will need to do their share. While there has been steady progress in increasing the share of renewable or otherwise decarbonised sources in our systems over the past decade or so, we, together with the wider heating and cooling sector, need to pick up the pace! DHC is nothing more and nothing less than pipes and water. It's up to us to make sure that water carried a suitably green tint and to provide our customers and cities with the information, comfort and service they deserve. On October 1st in Brussels we will come together to make clear our intention and ability to do what is necessary. Hope to see you there!



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