

The new energy reality

Today's energy challenges call for smarter and more energy efficient cities focusing on sustainable resource utilisation. Intelligent district heating plays a key role in this development.

As global energy demand and urbanisation continue to rise, fossil fuels are being exhausted and the financial as well as environmental costs of energy production increase. This necessitates a focus on reducing consumption as well as improving the efficiency of how energy is produced, managed and distributed.

Cities represent only 2-3% of the total land surface, but nearly half of the world's population lives in cities – and this number is expected to increase to 80% by 2050. Today, cities are responsible for 75% of energy consumption and between 60-80% of total global emissions.

Source: lgi-consulting.com/sectors/

Earth Overshoot Day – the date on which humanity's resource consumption for the year exceeds Earth's capacity to regenerate those resources that year – comes earlier every year.

[Learn more at overshootday.org](http://overshootday.org)

The potential of district heating

District heating is fundamentally about moving heat from accessible energy sources to consumers with a heat demand. It involves the production of hot water at a central plant, which is then piped underground to individual buildings for space heating and domestic hot water.

The benefits of district heating include:

- It is **more efficient** than an individual boiler and also, the local environmental impact is reduced
- It is **flexible, environmentally sound and makes perfect "green" sense** because it allows utilities to put waste heat to good use and to integrate renewable energy sources like wind and solar efficiently
- It can use all kinds of fuel, which **provides fuel flexibility and a secure supply of energy**, and unlike local boilers, district heating can quickly be converted
- It is **easy and safe** for the consumers because it requires a minimum of maintenance and limited technical skills.

Date of EOD on the release year

| Year | Overshoot date |
|------|----------------|
| 1987 | December 19 |
| 1995 | November 21 |
| 2005 | October 20 |
| 2008 | September 23 |
| 2010 | August 21 |
| 2015 | August 13 |
| 2016 | August 8 |

Today, approximately 50% of the EU's annual energy consumption goes to heating and cooling, while 20% goes to electricity and 30% is used on transport. For years, the smart electricity grid and "the electrification of everything" has been positioned as the answer to the energy challenges of the future.

However, the potential to optimise energy consumption related to heating and cooling is actually far greater. It is just a much more fragmented industry than electricity – and one that was previously lacking an overall focus.

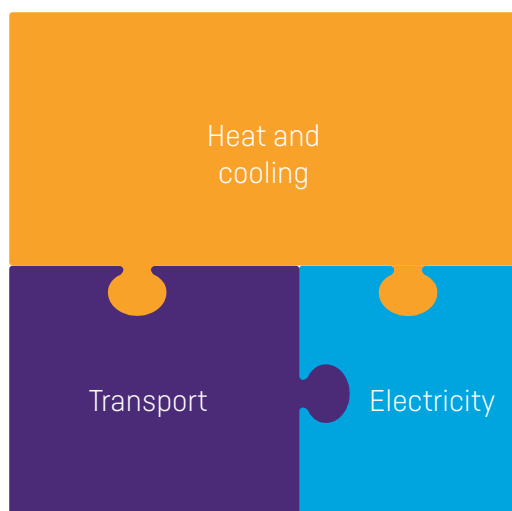
At European level, district heating is now considered an existing and proven technology with great potential to support the EU targets for the energy sector, including decarbonisation. For example, the waste heat from power generation, industry etc. must be transported and distributed wherever the demand is – which is what district heating is all about.

Today, district heating only makes up approximately 10% of Europe's total energy consumption for space heating, but studies have shown that it is realistic to increase this number to 50% by 2050¹.

Fully unlocking the potential of district heating requires one overall system integrating the different energy sources – and thereby adding intelligence to urban energy communities. Enter the era of smart cities.

It is estimated, that the waste heat from power plants and industry in Europe would cover the entire European heat demand, if it were collected in district heating systems.

Source: heatroadmap.eu



Political consensus and focus

Through the EU's Energy Union, even more focus has been put on the energy sector and its role in achieving a more efficient use of energy resources as well as reducing pollution and CO₂ emissions.

However, with European imports of gas and oil from Russia and the oil states amounting to approximately EUR 400 billion every year, security of supply is also a key driver of this development – in some countries perhaps even more so than sustainability.

Accordingly, the European Commission's Heating and Cooling Strategy⁴ published in February 2016, recognises the crucial role of district heating in the decarbonisation of European buildings, shifting to renewable energy as well as in realising a sustainable, independent and secure supply of energy.

The share of renewable energy in heating and cooling was estimated to be 17% in 2014. As part of the EU's energy and climate goals for 2030, EU countries have agreed on a new renewable energy target of at least 27% of final energy consumption by 2030⁵.

Denmark was one of the first nations to use district heating, which is described as the backbone of Denmark's energy supply. The success of district heating in Denmark is the result of a combination of grass roots, a strong political focus, and long-term planning in the energy sector.

While district heating is undisputedly a well-proven concept by now, it continues to evolve. The experiences and development of state-of-the-art technologies in pioneering countries such as Denmark continue to create new opportunities in a new energy reality.

Danish district heating in numbers

- Approx. 430 district heating plants and 60,000 km of pipes
- 63% of all Danish homes – that's 3.2 million Danes – are connected to district heating systems
- 98% of Copenhagen is covered by district heating
- Approx. 10,000 people work in the Danish district heating industry.

Source:

Dansk Fjernvarme, danskfjernvarme.dk
