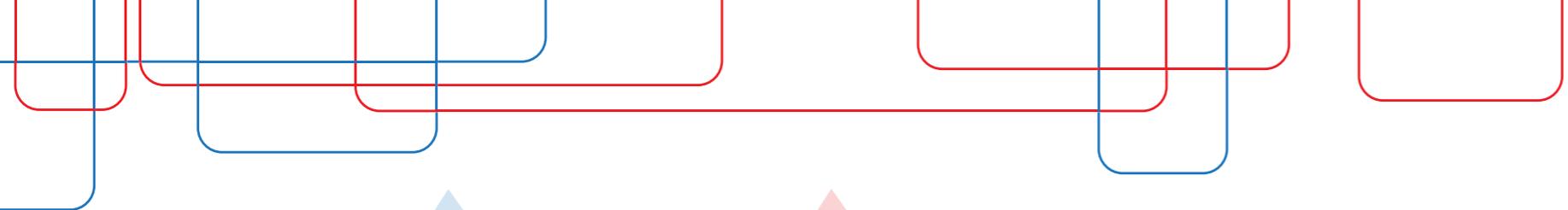


# DISTRICT HEATING AND COOLING

A MODERN SOLUTION TO TRADITIONAL CHALLENGES

BECOME A #DHCitizen!





District heating is a system for **distributing heat through a network of hot water pipes** for residential and commercial heating requirements, such as space and water heating.

At its core, district heating and cooling is about **connecting local energy sources with local needs**.

District energy is a **community-based solution** that will play a key role in the **sustainable cities** we want to live in.

District heating currently accounts for **around 12% of heating in Europe**. With the right investments, this share could grow to **50% by 2050**.

# Why District Heating?

District heating contributes to climate change mitigation. The system is technology-neutral, allowing for **increased use of renewable energy**.

The system is highly efficient and uses locally-available heat sources. This reduces the overall need for energy and so less fossil fuels are consumed, resulting in **reduced GHG emissions**.

Using local and diverse renewable energy sources reduces the need to import fossil fuel energy, thus **increasing energy security**.

District heating contributes to meeting **climate and energy targets** by reducing fossil fuel consumption through increased efficiency.

District heating provides a range of benefits at all levels

GLOBAL

NATIONAL

District heating is a solution that **makes consumers' lives easier** and increases the resilience of communities.

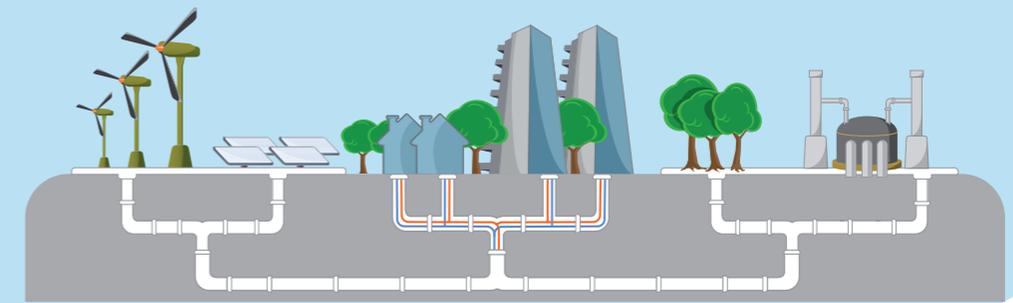
It also **makes our cities safer places to live**, by avoiding local air pollution from individual heating solutions and eliminating the risk of gas leaks.

LOCAL

# What is a District Heating System?

Heat is generated in large-scale, highly-efficient plants, close to an urban settlement. This heat can be generated from a variety of sources including conventional fossil fuels, waste heat from industry and renewable energy sources such as solar thermal, geothermal and biomass.

GENERATION



DISTRIBUTION

This heat is then distributed as hot water to nearby residential and commercial buildings, via a series of insulated pipes running below our cities. The return pipe leaving the building transports the cooler water back to the generation plant, creating a loop.

# Modernisation of District Heating

## Old systems: supply-side driven

- High temperature, heat loss and inefficient
- Lack of control over system (flow, temperature, leaks)
- Fossil-fuel based
- Found primarily in Nordic countries and Central & Eastern Europe

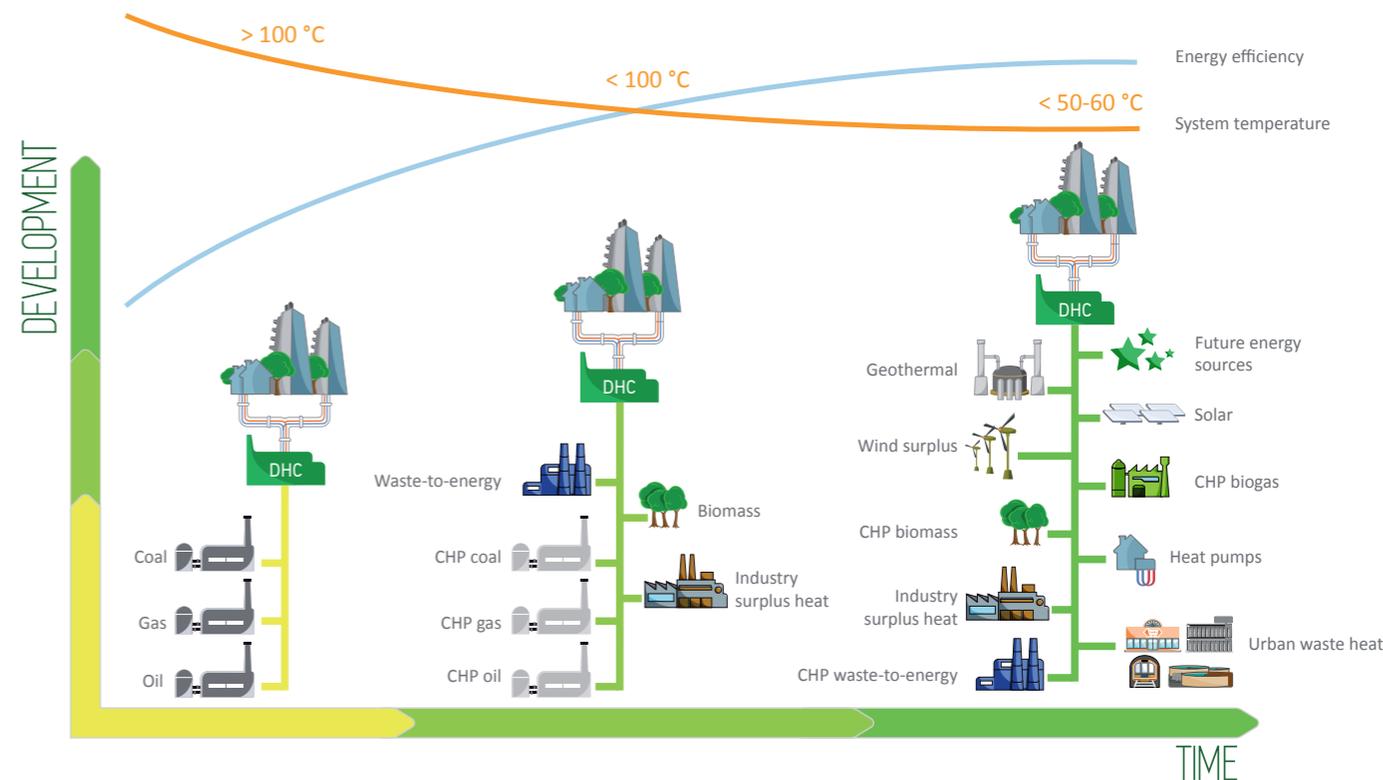
## Modern systems: demand-side driven

- Highly efficient and low temperature
- State of the art control systems (flow, temperature, energy source)
- Digital, smart system with large amounts of data that is exploited and used in day-to-day operations
- Metering and consumption-based billing
- Increased share of renewables
- Found in most European countries



The evolution of District Heating and Cooling mirrors that of the broader energy transition...

# District Heating and Cooling means constant evolution



... higher efficiency, more renewables and greater flexibility leading to a better energy system.

# Harnessing the power of the network

Like the cities they serve, District Heating and Cooling networks are designed to **bring together local resources and ingenuity** in order to maximise efficiency.

They provide a vital route to market for a wide range of **low carbon resources, which could not otherwise be integrated** into the dense urban environment.

They transform individual communities **from passive participants to active drivers and architects** of the energy transition.



## What does this mean for Citizens?

District heating provides citizens with a **reliable and affordable source** of increasingly low-carbon heat.

Unlike gas boilers, district heating infrastructure is installed outside of people's homes. Storage, maintenance, replacements and system upgrades cause **minimal disruption to citizens' lives**.

Buildings connected to district heating networks are fitted with a heat-transfer station, that controls the transfer of heat to the building. The transfer station is typically owned and maintained by the building manager or system operator.



## District Heating is for Cities

District heating is a sustainable solution for cities that delivers both **autonomy and energy security**.

At the city level, coupling district heating with electricity and gas networks can provide **flexibility and resilience to the overall energy system**, by acting as a source of thermal energy storage and integrating variable renewable energy such as wind and solar.

District heating systems are the ideal solution for providing a reliable source of heat to social housing areas, both new and existing. This can help to **alleviate energy poverty**, which remains a significant issue across the EU.



# Discover the UpgradeDH case studies!

The UpgradeDH project supports the upgrading and retrofitting process of DH systems in different climate regions, covering various countries, which can be replicated all over Europe. Here are some of them:

## Salcininkai LITHUANIA



The town operates a municipality-owned district heating system that provides heat to 2,200 of the town's 7,000 inhabitants. While over 85% of the heat is produced from biomass, the aging network suffers large heat losses, mainly due to pipe corrosion. Old pipelines and other system elements are being replaced to reduce network losses and the possibility of integrating solar thermal energy is being assessed.

## Marburg GERMANY



The municipal utility operates an 9 km long district heating network, whose largest connected heat consumer is the Philipps-University Marburg. The network is set to be completely renewed to increase efficiency and help Marburg become CO<sub>2</sub>-neutral. This will be achieved through refurbishment of old substations, power-to-heat integration, optimisation and expansion of the network.

Around 80% of Tuzla's 170,000 inhabitants are connected to its district heating network. The system is based on coal-fired CHP. A large number of substations and distribution pumps have been replaced in recent years and a remote control management system was introduced. Further improvements are underway, including upgrading the remote control management system, integrating heat storage and renewable energy resources, and introducing consumption-based billing.

## Tuzla BOSNIA HERZEGOVINA



The city of Bologna, is served by several district heating networks. These networks are used mainly to supply heat to residential consumers. The main challenges to improving the system are technical constraints. Efforts are underway to upgrade several aspects of the networks, including integration of heat pumps, introduction of remote monitoring, heat generation and pressure optimisation.

## Bologna ITALY



## Join the movement!

Europe needs to  
expand, upgrade, modernise and decarbonise  
its district heating networks!

### Find out

where  
your heat  
comes  
from

### Educate

other people in  
your community  
about district  
heating

### Speak

to your  
local  
politician

No energy transition without  
sustainable cities

No sustainable cities without  
sustainable heat

No sustainable heat without  
District Heating and Cooling

Become a #DHCitizen!

For more information on district heating, please visit [www.dhccitizen.eu](http://www.dhccitizen.eu)





Edited by DHC+ Technology Platform c/o Euroheat & Power in the framework of the UpgradeDH project  
More information: [www.upgrade-dh.eu](http://www.upgrade-dh.eu)



The UpgradeDH project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 785014.

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