

## THE BENEFITS OF DISTRICT COOLING IN A NUTSHELL

- \* 5 to 10 times higher efficiencies than with traditional comfort cooling
- \* Use of locally available natural and surplus energy sources that otherwise would be wasted or remain unused
- \* Substantially reduced energy consumption
- \* Better energy security for European citizens
- \* Significantly less CO<sub>2</sub> emissions
- \* Reduced expenditure for energy imports
- \* New employment and domestic welfare



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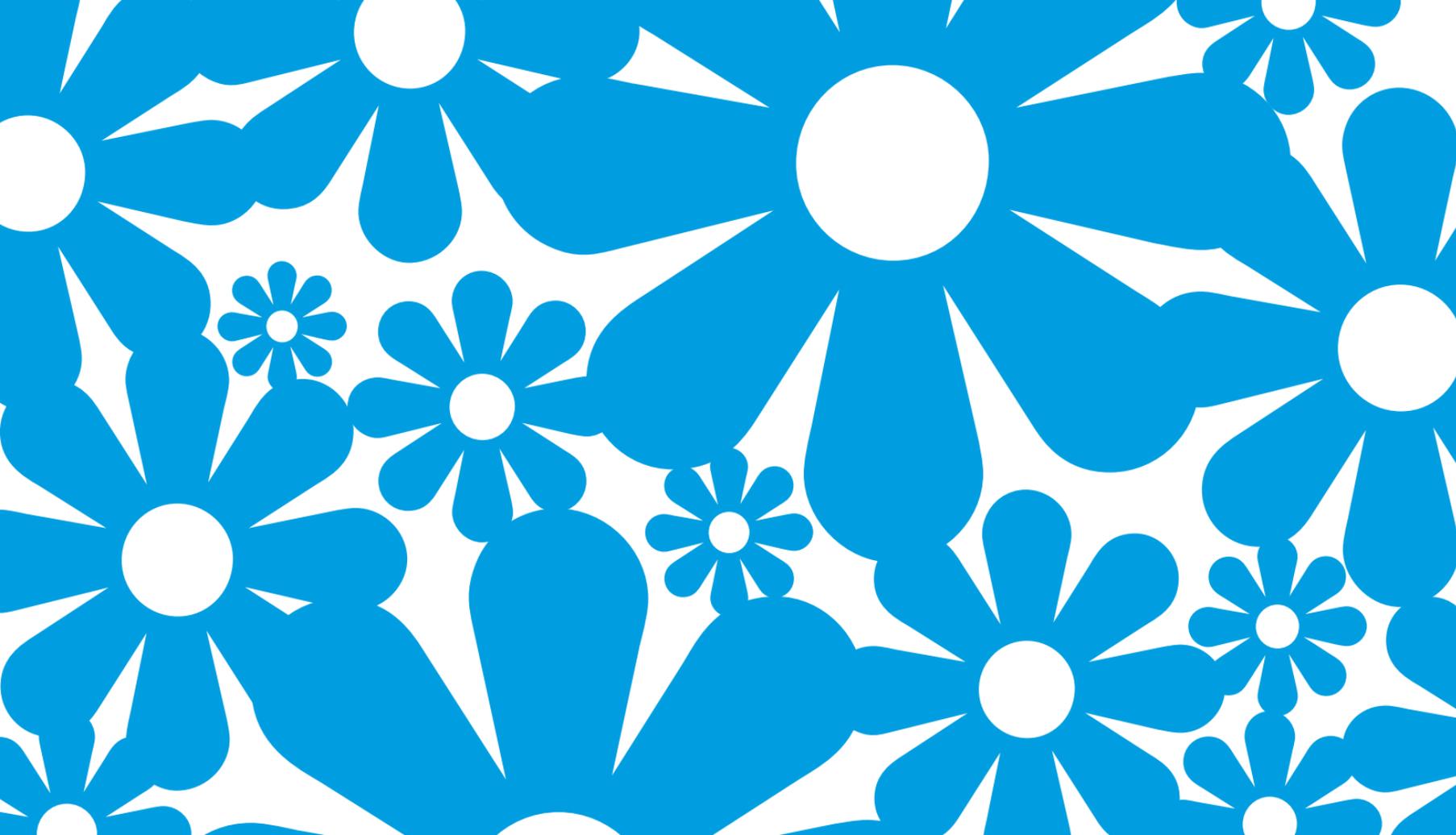


## DISTRICT COOLING

THE SUSTAINABLE RESPONSE TO EUROPE'S RISING COOLING DEMANDS



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Cooling makes our urban environments more productive and comfortable and not only on a summer day. Cooling is critical for the correct functioning of computers and manufacturing equipment, and vital for industrial processes. We may take it for granted, but our offices, the local shopping centers, hospitals, and many other facilities, as well as local industry all require cooling. In fact, cooling has become as important as a heating system.

Today, 40% of commercial and institutional buildings in Europe have cooling systems and demand is set to grow substantially.

District Cooling is the sustainable response to Europe's rising cooling demand. In this booklet you will find answers to the most frequently asked questions about District Cooling.

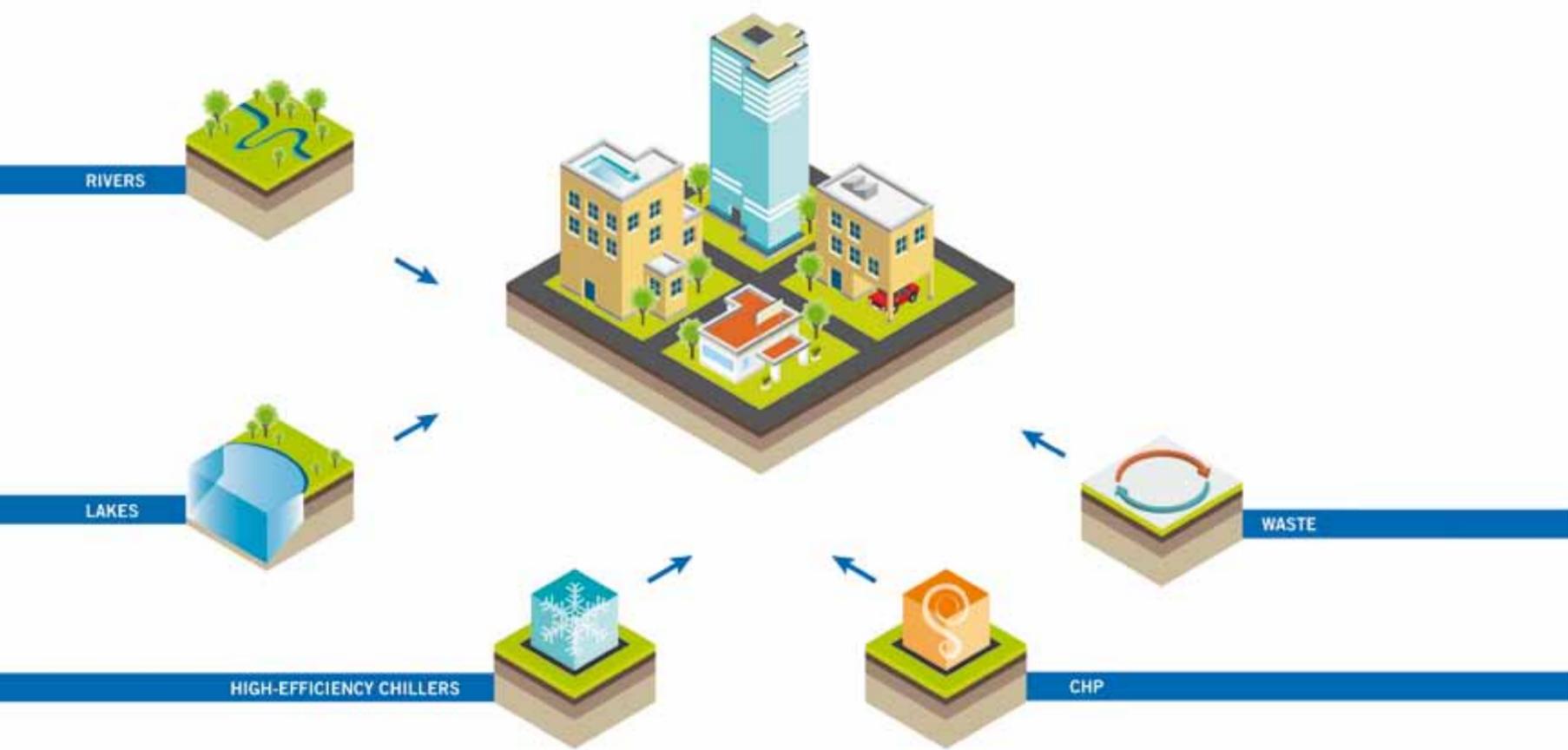


# 1. WHAT IS DISTRICT COOLING?

» District Cooling is an environmentally optimized cooling solution, using local, natural resources to produce cooling where and when it is needed.

The customer is connected to the cooling production via a pipe network. Chilled water is distributed to the buildings where it loses its cold content, thus cooling down the building temperature.





2.

## WHERE DOES THE “COLD” COME FROM?

» District Cooling makes the most of local resources and can combine different cooling sources, depending on local conditions and tailored to the users’ needs:

Natural Cooling. Cold water is directly extracted from oceans, lakes, rivers or ground water.

Use of surplus heat. In many processes, for example when electricity is generated or waste is burned, large parts of energy are set free in form of surplus heat. This heat can be converted into cooling and thereby be recycled in District Cooling networks.

High-efficiency chillers. These require significantly less electricity due to economies of scale.





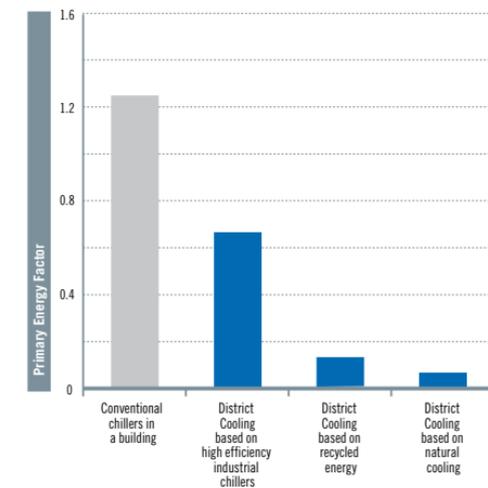
### 3. HOW DOES DISTRICT COOLING HELP SAVE ENERGY?

» Primary energy factors (PEF) make it possible to compare cooling solutions with regard to their contribution to reducing the use of fossil fuels.

Primary energy factors measure the combined effect of efficiency and the use of renewable and recycled energy sources. The assessment encompasses the whole energy cycle – from conversion to delivery to the customer. The lower the PEF value of a technology, the more fossil energy is being saved.

Operational data confirms that District Cooling schemes are far less energy-consuming than conventional air-conditioning systems.

Comparison of typical Primary Energy Factors of Different Cooling Solutions



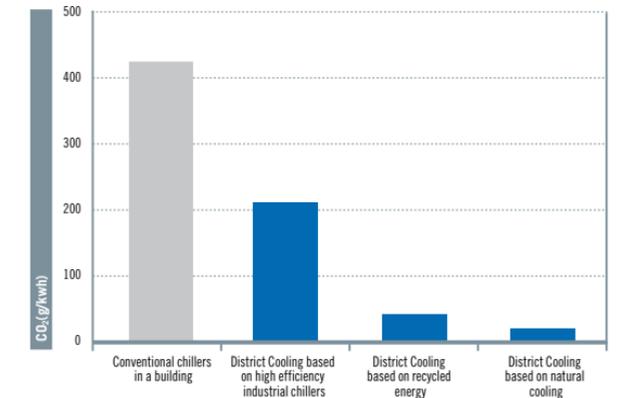


## 4. WHY IS DISTRICT COOLING A CLIMATE-SAVER?

» Due to the unique combination of renewable and surplus energies with efficient technology, District Cooling emits significantly less CO<sub>2</sub> than conventional air-conditioning systems.

If District Cooling were to expand to 25% of the cooling market in Europe, 42 to 50 million tons less CO<sub>2</sub> would be released into the atmosphere each year. This vast amount of CO<sub>2</sub> is equivalent to the average annual consumption of 9,500,000 passenger vehicles.

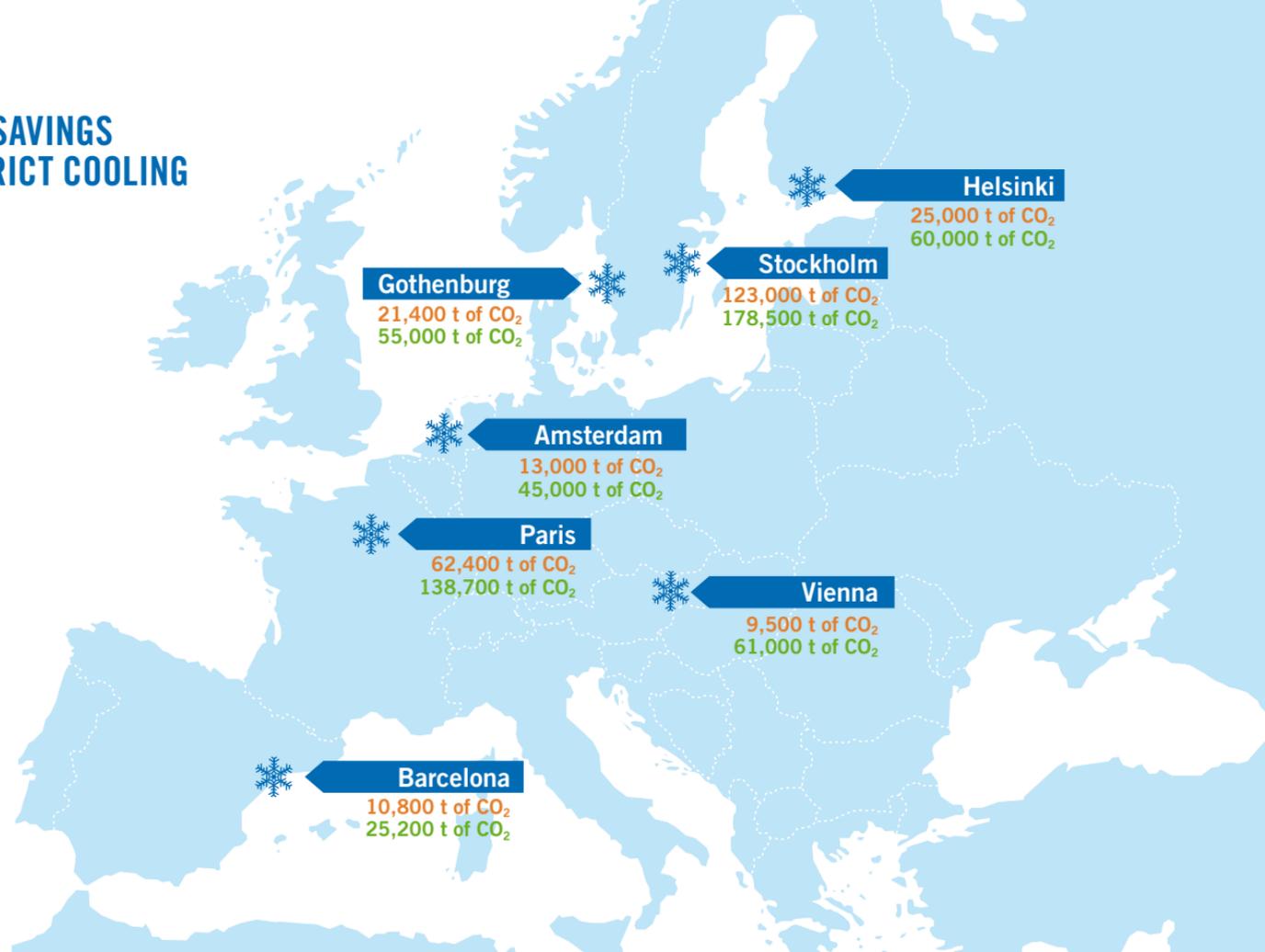
Comparison of typical CO<sub>2</sub> emissions of different cooling solutions





## ANNUAL CO<sub>2</sub> SAVINGS DUE TO DISTRICT COOLING

— in 2010  
— in 2020



## 5. WHERE CAN I FIND EVIDENCE THAT DISTRICT COOLING PROTECTS OUR ENVIRONMENT?

» District Cooling systems all over Europe provide evidence of how we can build a sustainable future. Indicated on the map are the already achieved and the projected CO<sub>2</sub> savings thanks to District Cooling in some of Europe's key urban centers. Many more systems exist, and a lot are currently under construction or in the planning stage.





## 6. WHAT ABOUT DISTRICT COOLING AND THE SECURITY OF ENERGY SUPPLY?

» Traditionally, comfort cooling is based on electricity to run the individual appliances. Consequently, electricity demand grows with the expansion of traditional air-conditioning.

Until recently, peak loads in many European countries have typically occurred during winters, but lately the highest peaks in many regions and countries have been registered in summers - in many cases touching capacity limits with risks for outages. The reason for this trend is often the increased need for comfort cooling. However, a potential threat to the environment and to electricity supply infrastructure can be converted into great opportunities for the energy business, its customers and society. That opportunity is named District Cooling.

If District Cooling were to expand to a share of 25% of the cooling market in Europe, energy consumption would fall by 50-60 TWh annually, which can be compared to the average annual electricity consumption of 10 Million European citizens. In addition, EU will avoid 30 billion € of investments for peak electricity capacity.



## 7. WHERE DO WE GO NEXT?

» District Cooling delivers on all three objectives of the European Union's energy policy: sustainability, competitiveness and security of supply.

Future generations depend on our ability to protect our natural resources. Effective actions must be taken to avoid or reduce the great economic and environmental threats caused by quickly rising demand for electricity to produce cooling. Time is short, but there is a golden opportunity to create relief: District Cooling.



8.

## WHAT CAN THE EUROPEAN UNION DO FOR THE EXPANSION OF DISTRICT COOLING?

» Today, European Union policies set the standards for our future living conditions. Therefore, utilities, urban planners and citizens will only opt for District Cooling, if European Union policies send clear signals.

The 21<sup>st</sup> century energy crisis should be seen as an opportunity to put emphasis on substituting imported energies by investments in local heating and cooling infrastructure that reduce expenditure for energy imports, create local employment and bring welfare to the domestic industry.

Cooling must be addressed systematically in European Union policies and cooling networks be explicitly promoted as essential strategic infrastructure for smart cities. The benefits, including price stability and environmental savings, will indeed be huge not only for local communities but for the European Union as a whole.

## ABOUT EUROHEAT & POWER



» Euroheat & Power is the international association representing the District Heating and Cooling (DHC) sector in Europe and beyond, covering all aspects related to District Cooling and District Heating including Combined Heat and Power (CHP). With a view to ensure continued growth of the sector, the purposes of Euroheat & Power are Advocacy, Image building, Technology development and transfer of Best Practices. Euroheat & Power unites 24 national CHP/DHC associations and has individual members (utilities, equipment suppliers and research institutes) in 32 countries.

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