

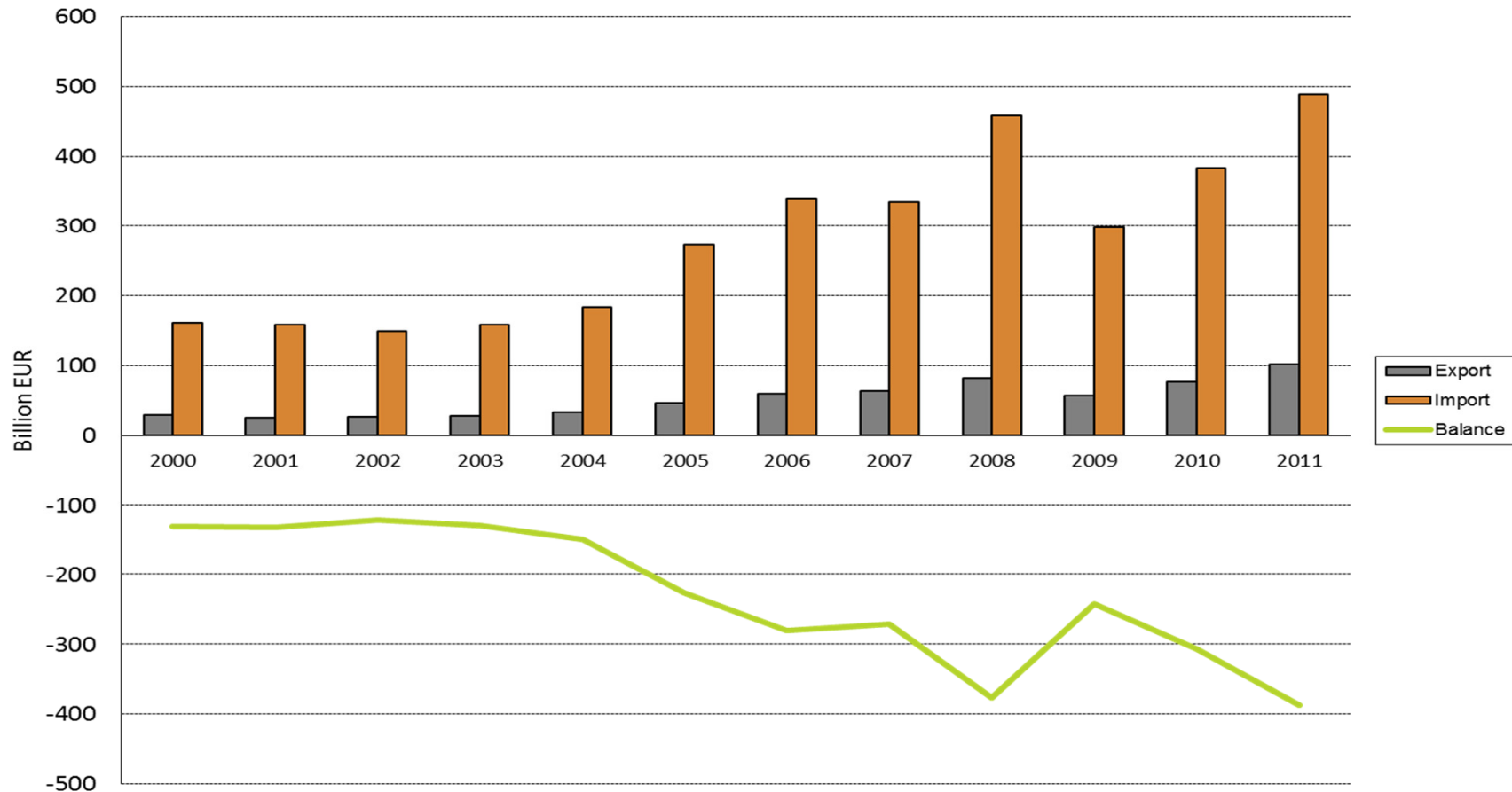
CHP and DHC Development in Europe, Policy Context, Experiences and Lessons Learned



Birger Lauersen
Manager International Affairs
Danish District Heating Association

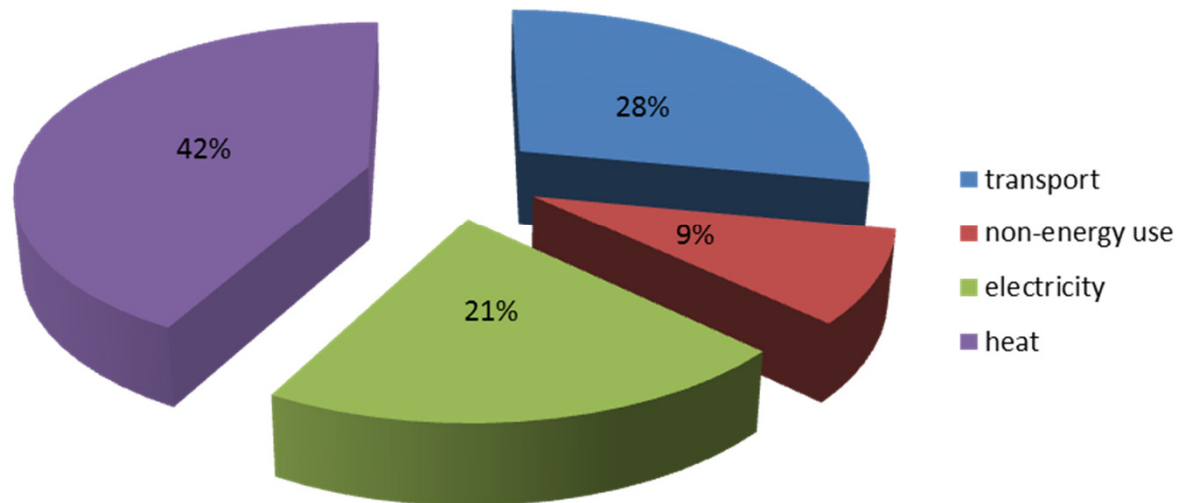
Europe's energy dependency is increasing

EU27 energy export and import values



Heat: the elephant in the room !

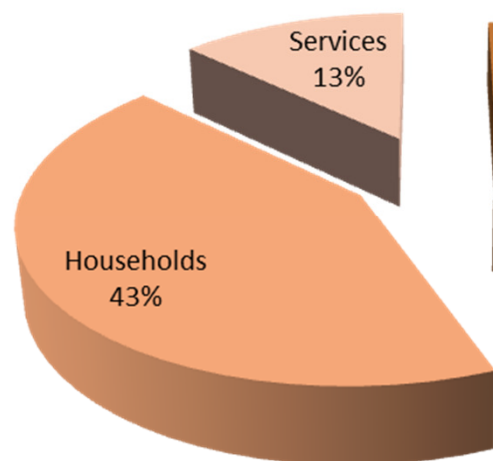
Final energy demand by energy service, 2011 (EU 27)



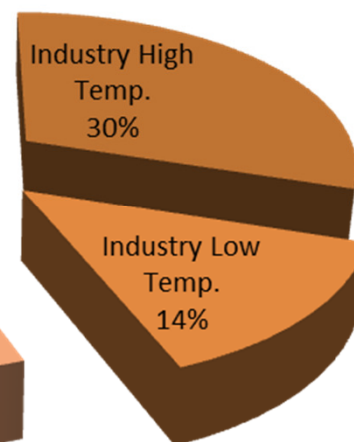
Source: IEA, 2011

Heat demands in Europe

Residential and Services sectors

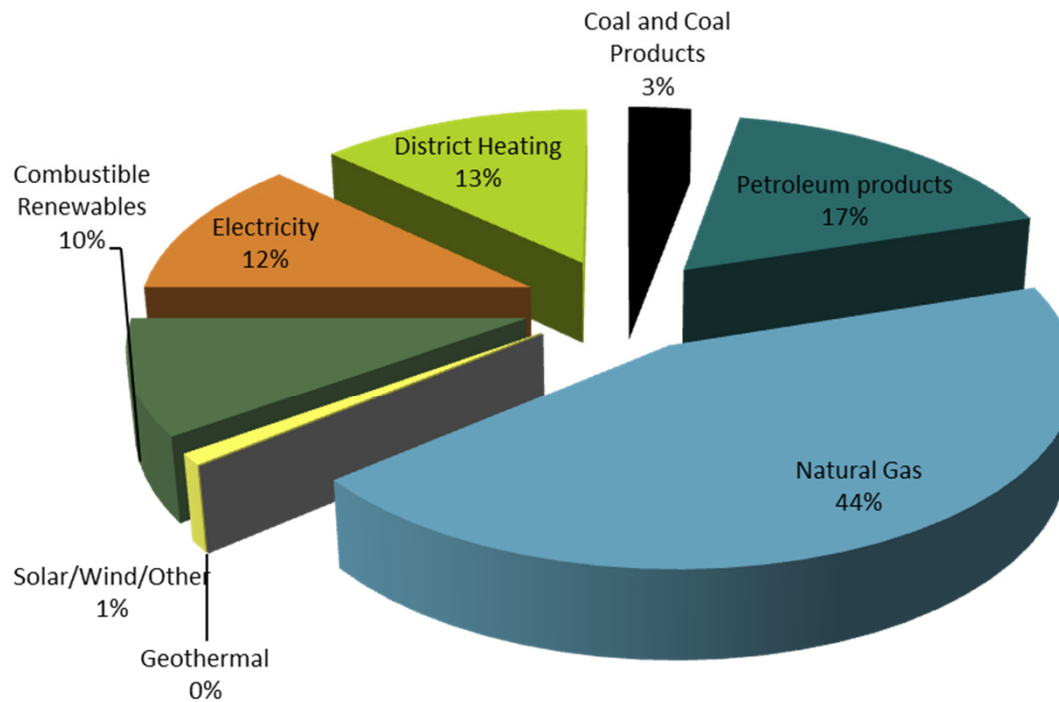


Industrial processes

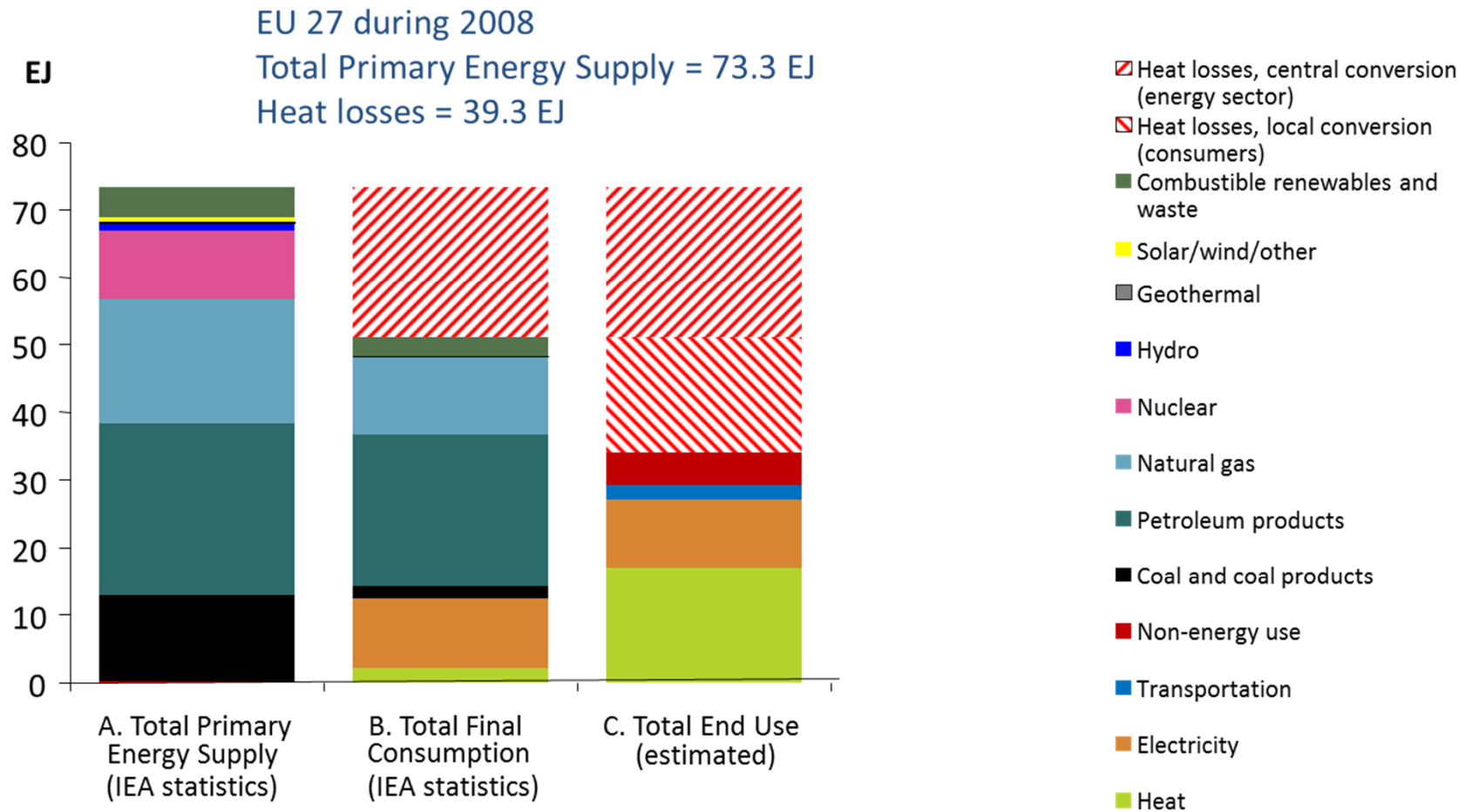


Source: RHC - Platform, data as of 2006

Origin of heat supply to residential and service sector buildings, 2010 (EU 27)



The EU is wasting energy (heat)...



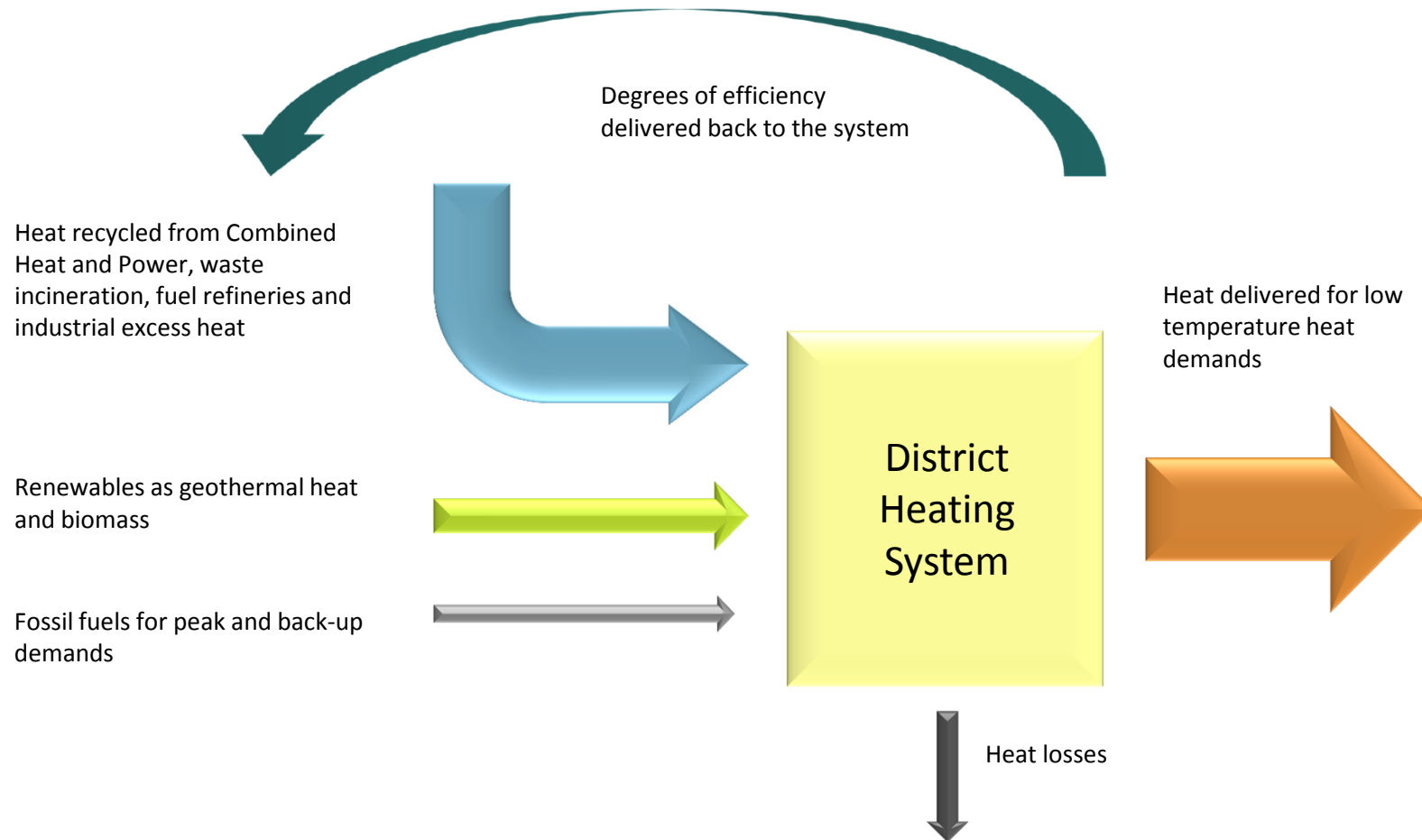
The fundamental idea



- The fundamental idea behind modern District Heating and Cooling is **efficiency**:
to make use of local fuel, heat or cooling sources that otherwise would be lost or remain unused.



Operational concept of modern DH system



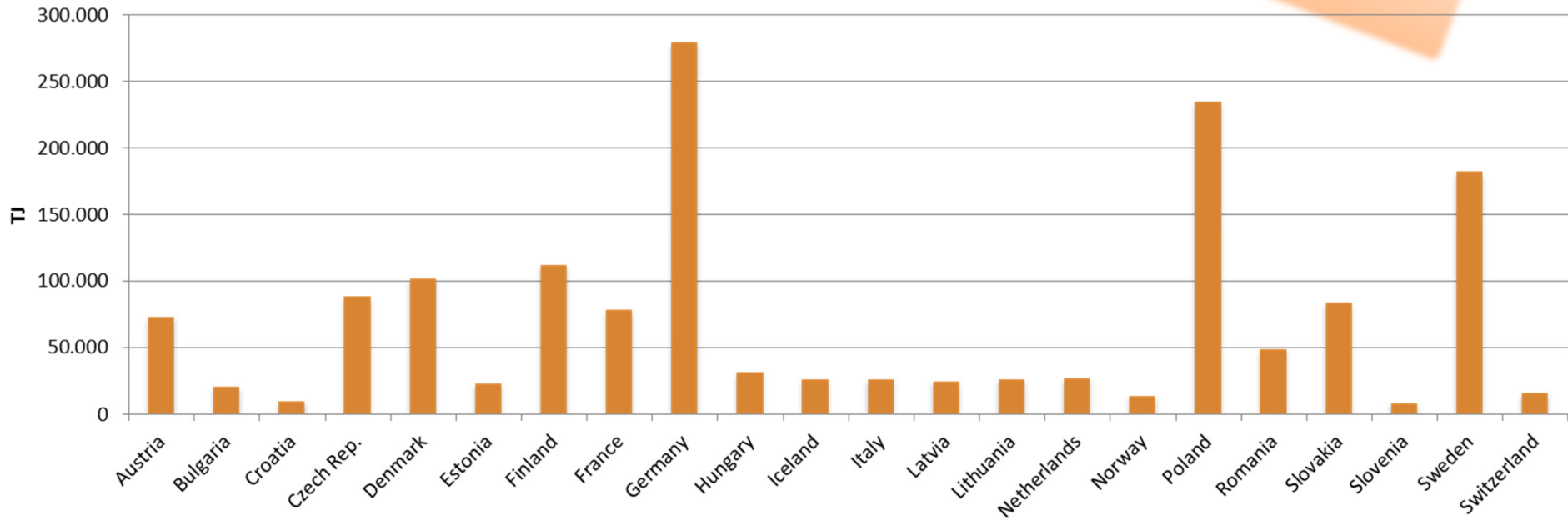
Source: Ecoheat4EU project (2011)

Status of the DHC sector



Top 3 Largest markets:
 Germany (280 TJ), Poland (235 TJ)
 and Sweden (182 TJ)

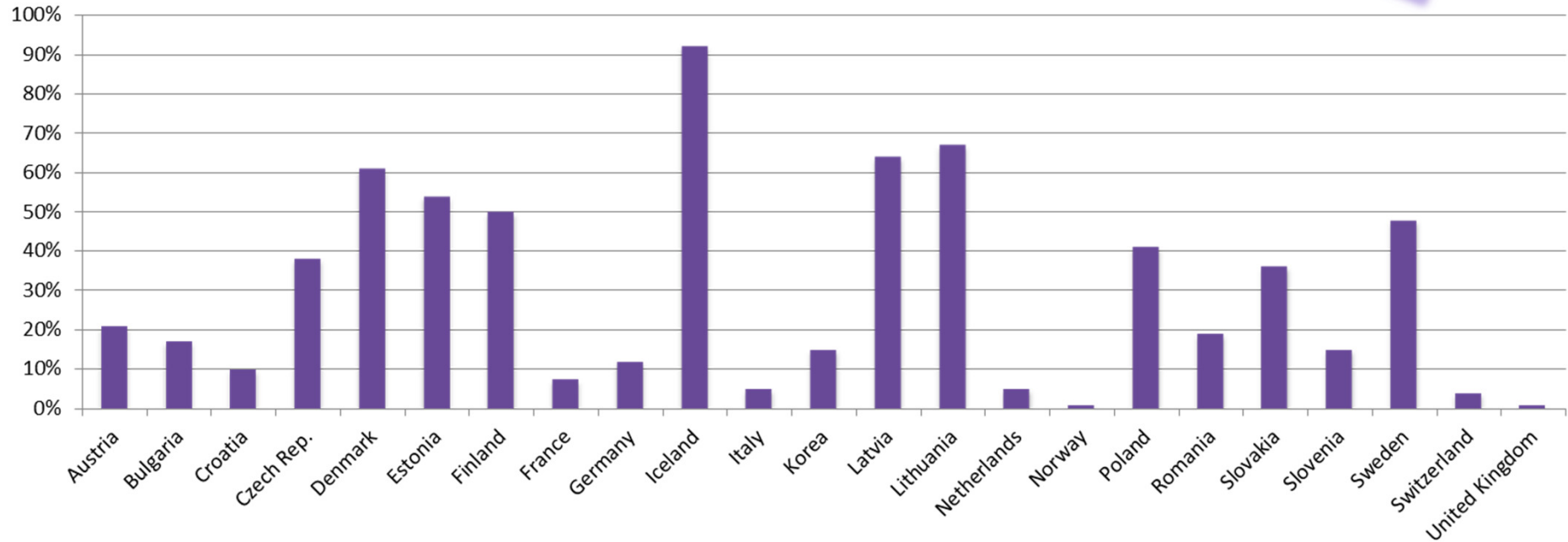
District Heating sales in 2011



Source: Euroheat & Power (DHC Country by Country survey 2013)

Top 3 DH share:
Iceland (92%), Lithuania (67%) and
Latvia (64%)

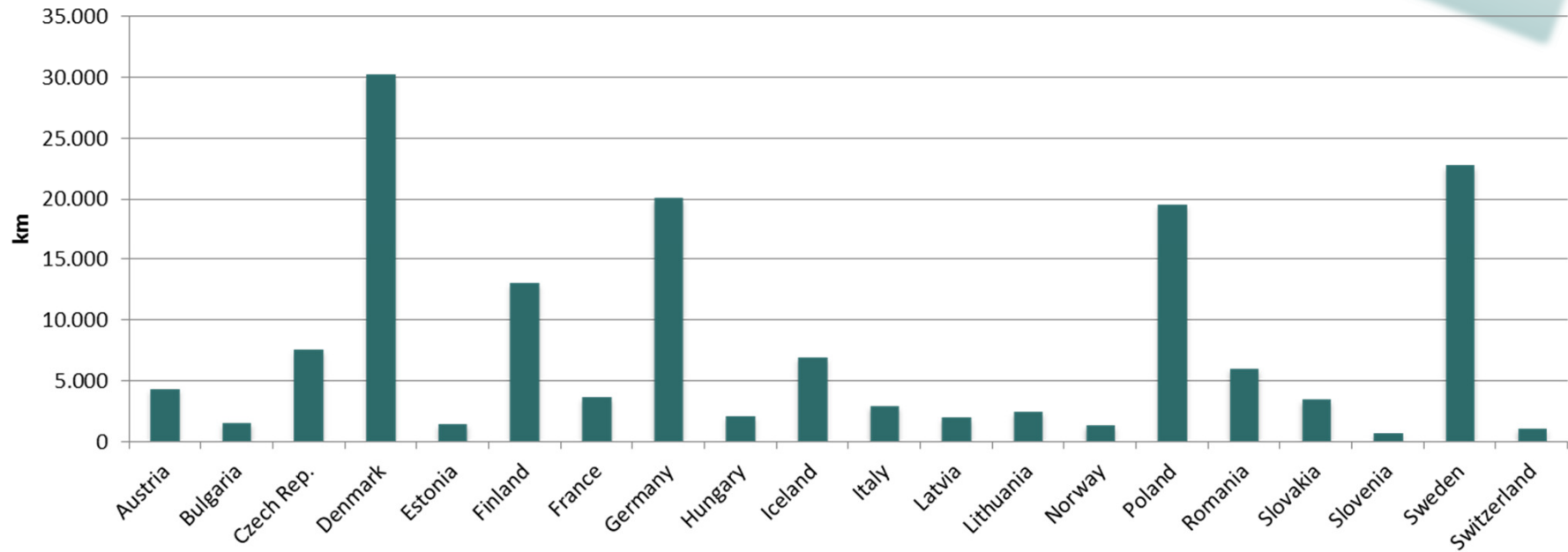
Share of citizens served by District Heating in 2011



Source: Euroheat & Power (DHC Country by Country survey 2013)

Top 3 trench length of DH pipeline system:
 Denmark (over 30,000 km), Sweden (nearly 23,000 km) and Germany (over 20,000 km)

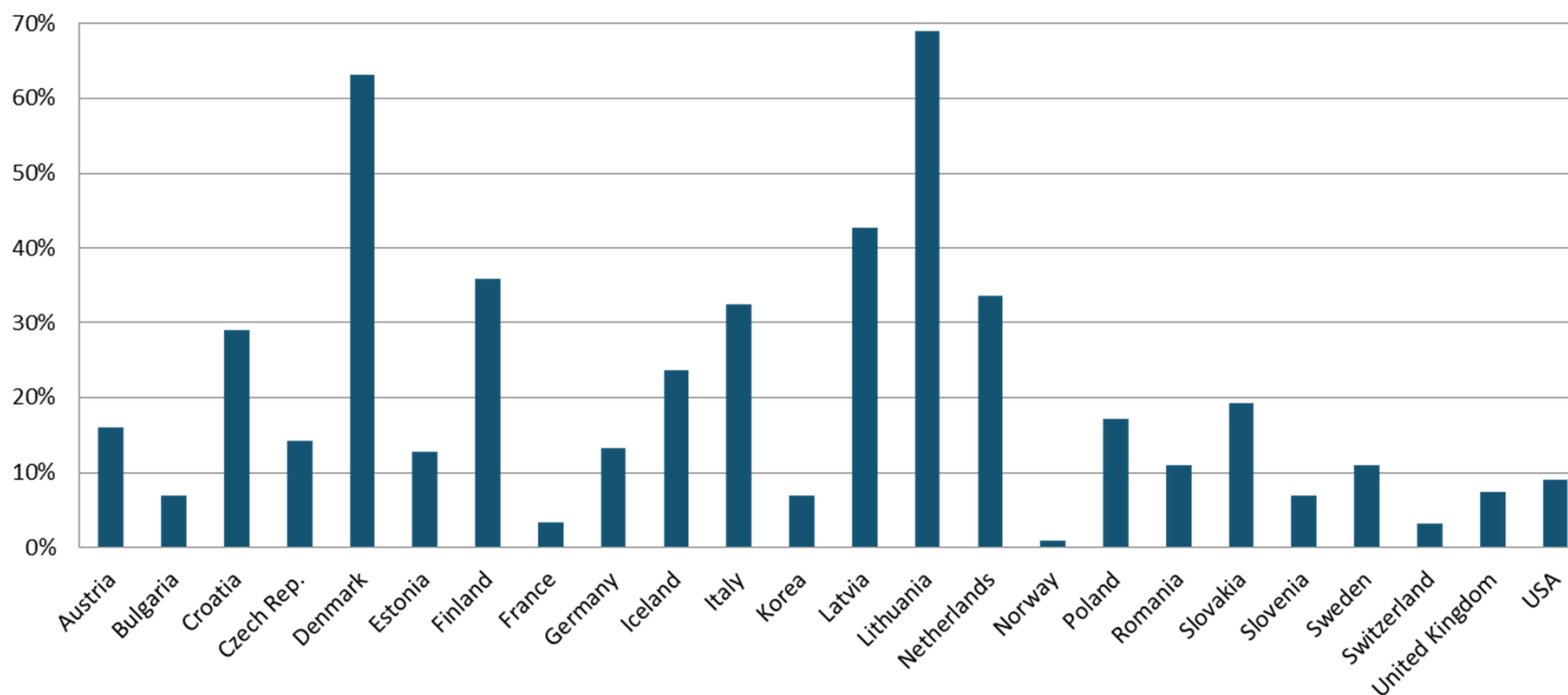
Trench length of District Heating pipeline system in 2011



Source: Euroheat & Power (DHC Country by Country survey 2013)

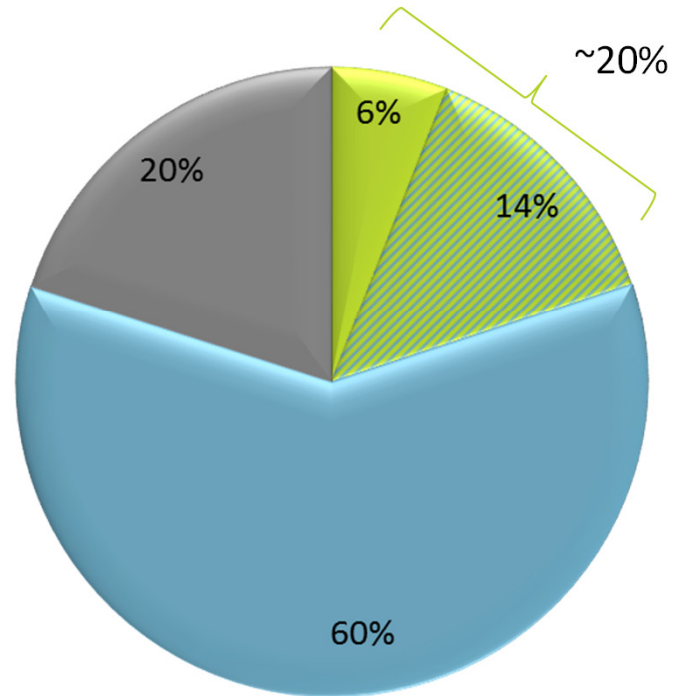
Share of CHP in electricity generation

Total share of CHP in national electricity production in 2011



Source: Euroheat & Power (DHC Country by Country survey 2013)

Energy supply composition for DH generated in EU for 2011 (EHP categories)



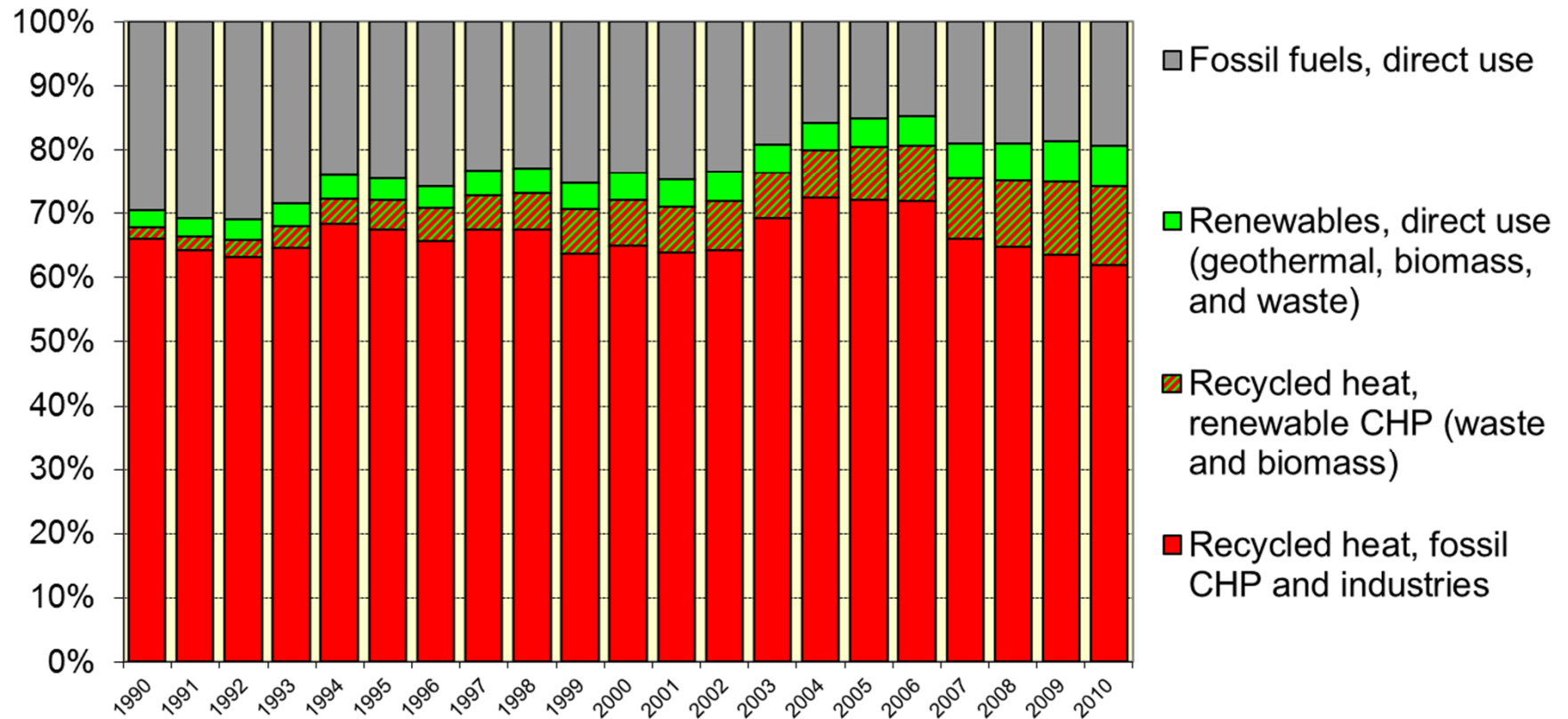
- Recycled heat
- Recycled heat from RES
- Direct use of RES
- Other

Source: Euroheat & Power (DHC Country by Country survey 2013)

Development of the DHC sector

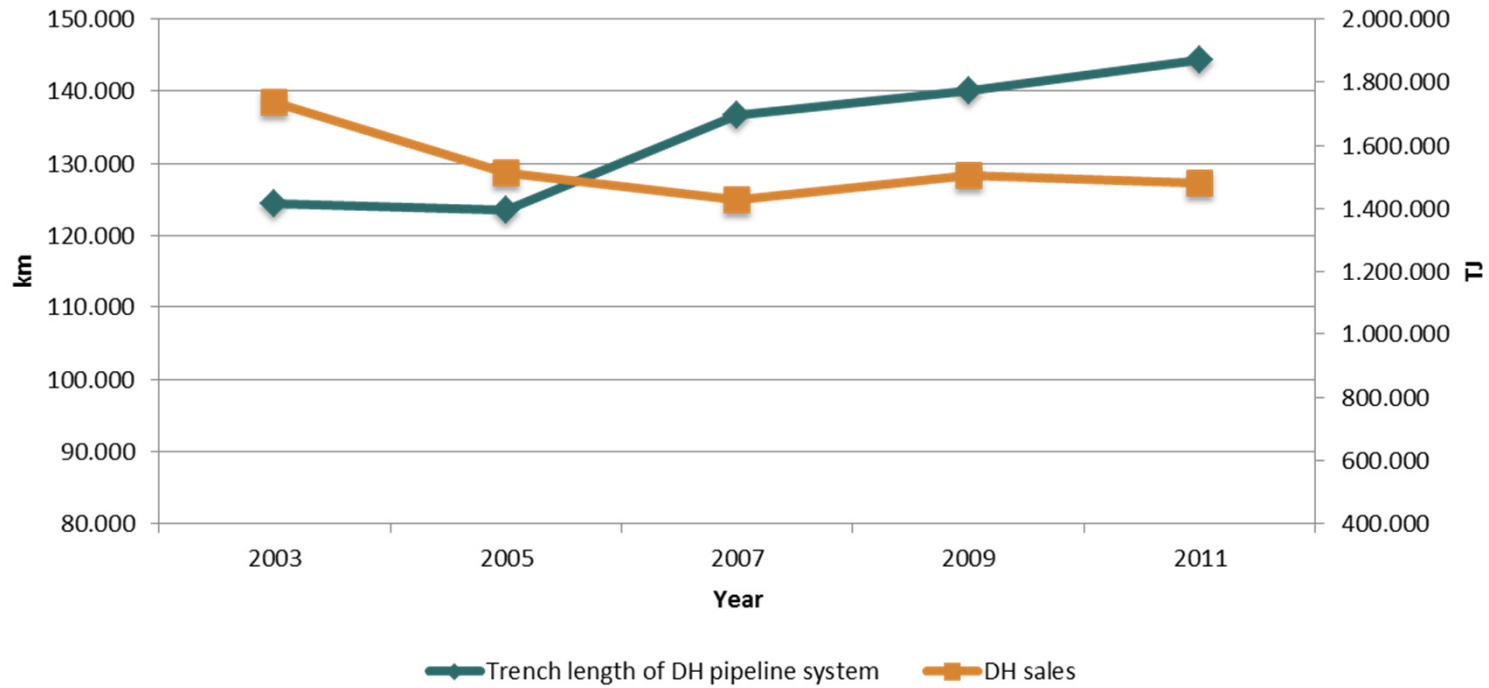


EU27 - Heat sources for District Heating



Source: Prof. Sven Werner, Halmstad University (based on IEA statistics)

Development of total trench length of DH pipeline system & total DH sales



Source: Euroheat & Power (DHC Country by Country survey 2005, 2007, 2009, 2011 and 2013)

Potential of the DHC sector




Some already see it

Heating & Cooling: huge potential **ETP
2012**

The diagram illustrates a central 'District heating and cooling network' represented by a green circle containing icons of houses and buildings. Four arrows point towards this central network from different energy sources: 'Renewable heat' (sun, tree, globe), 'Integration with electricity' (wind turbines, house with plug), 'Co-generation' (power plant with lightning bolt), and 'Surplus heat' (factory with smokestack).

*Heating and cooling account for 46% of global energy use.
Their huge potential for cutting CO₂ emissions is often neglected.*

 International Energy Agency
© OECD/IEA 2012

Societal benefits of DH networks

efficient distribution and use of heat for a wide variety of users

“open source” technology (fuel flexibility and diversity)

efficient management of supply and demand of energy

lower costs of energy generation

increase of energy efficiency through use of CHP

reduced CO2 emissions

creation of jobs at every level of the economy

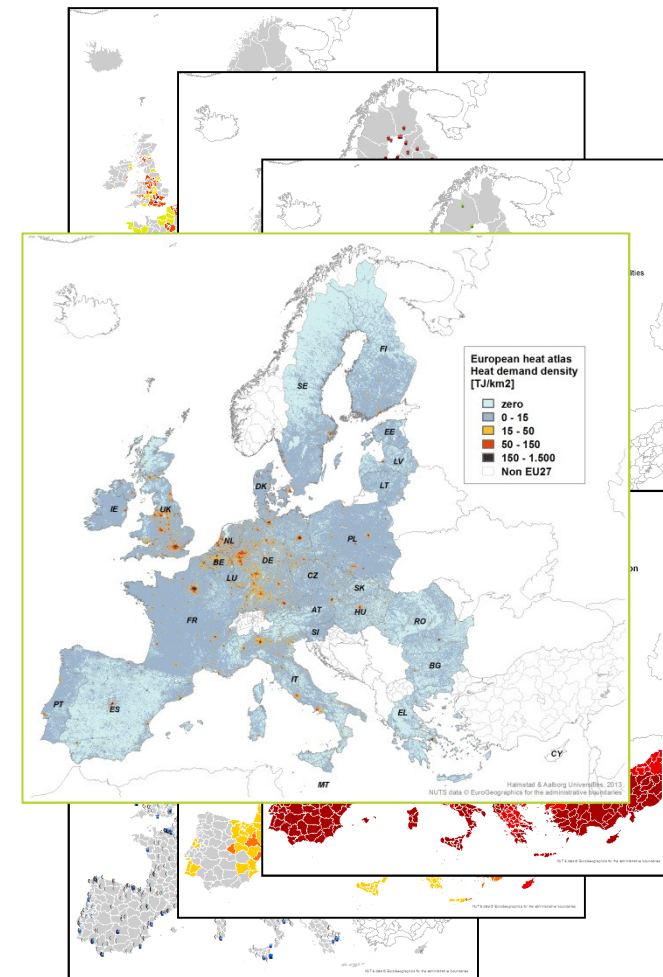
Opportunity

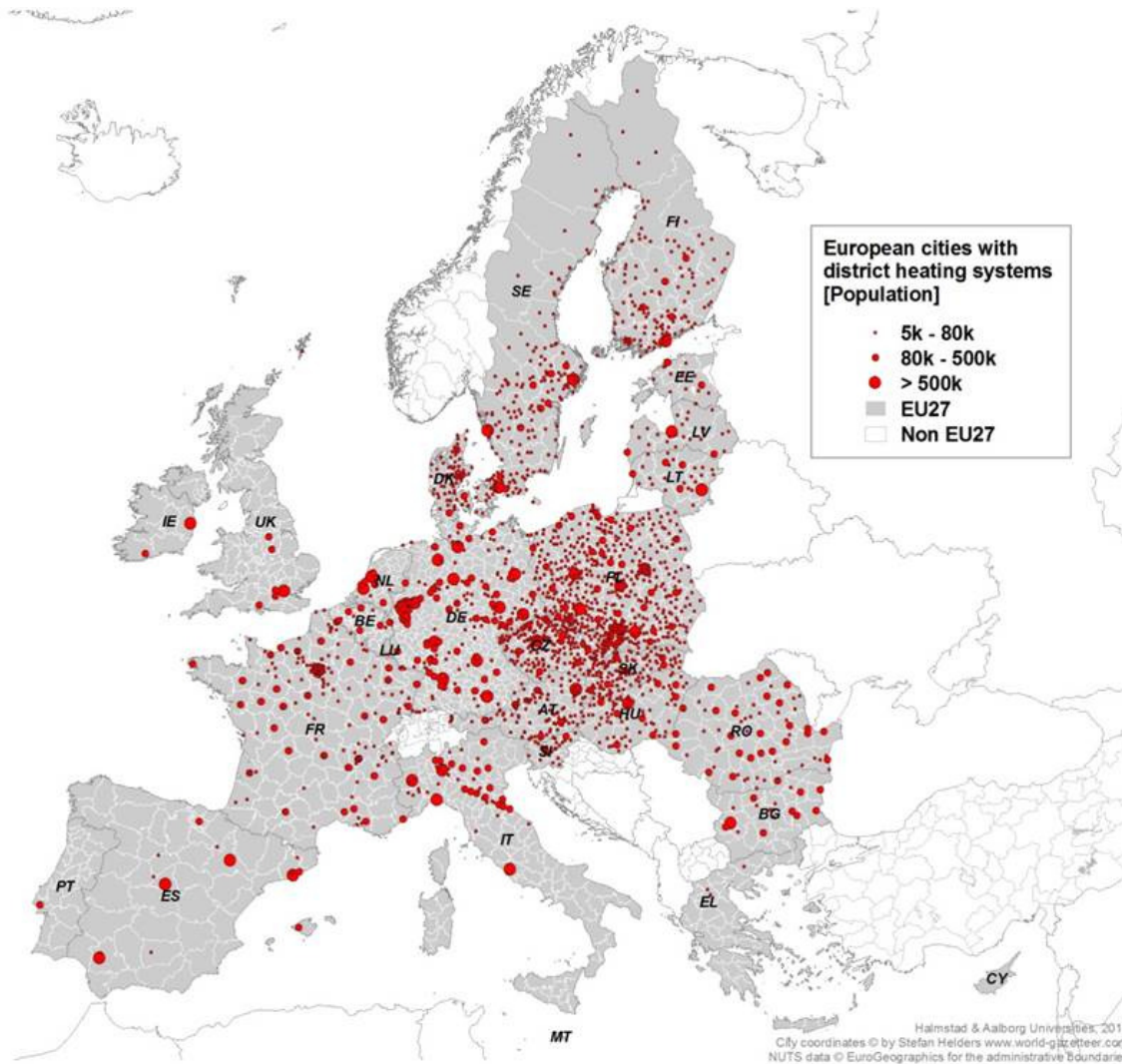
- Heat Demand in Urban Areas

Many Energy Sources

- Power and Heat Generation
- Waste Management
- Industrial waste heat
- Geothermal heat
- Solar Thermal

Source: Heat Roadmap Europe II (2013)

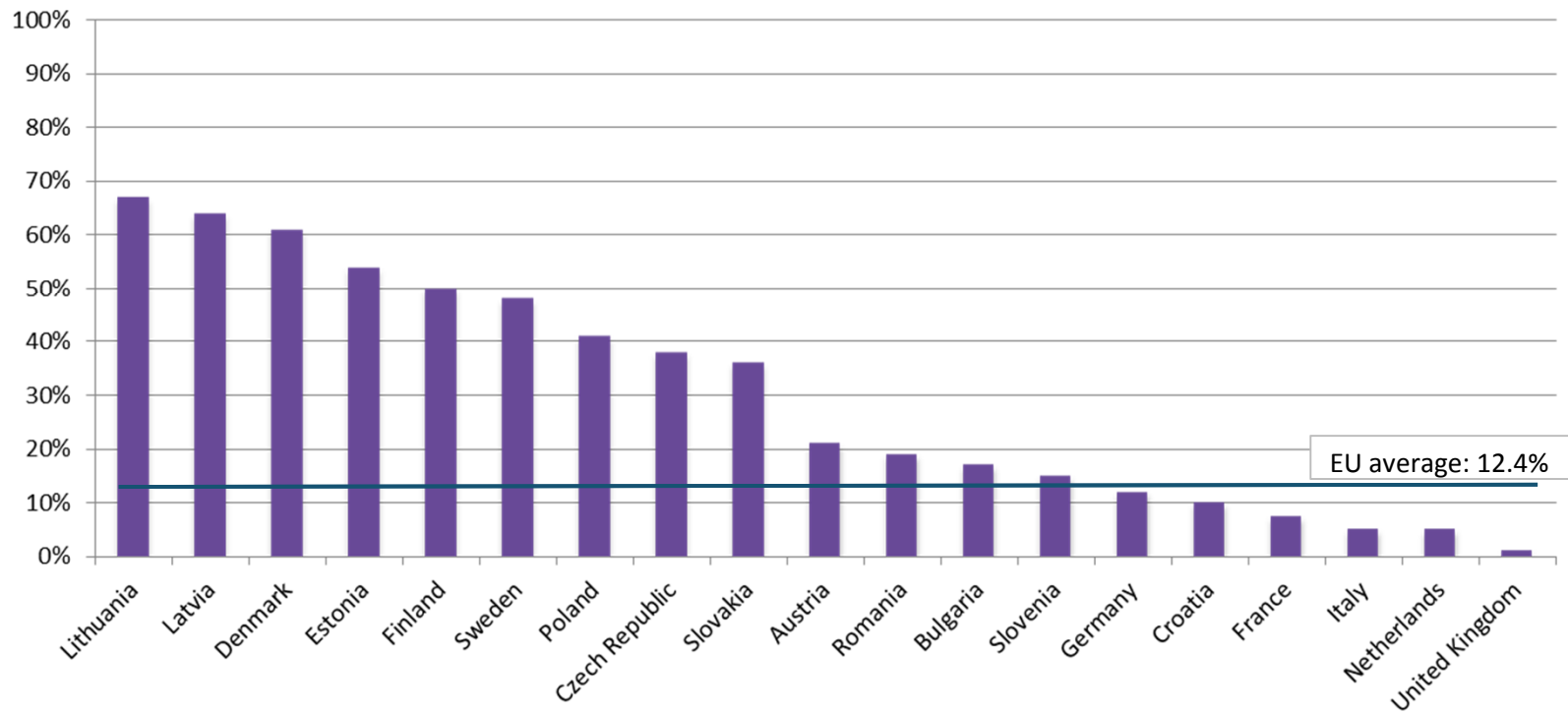




... and over
5000 DH
systems
already exist
in the EU

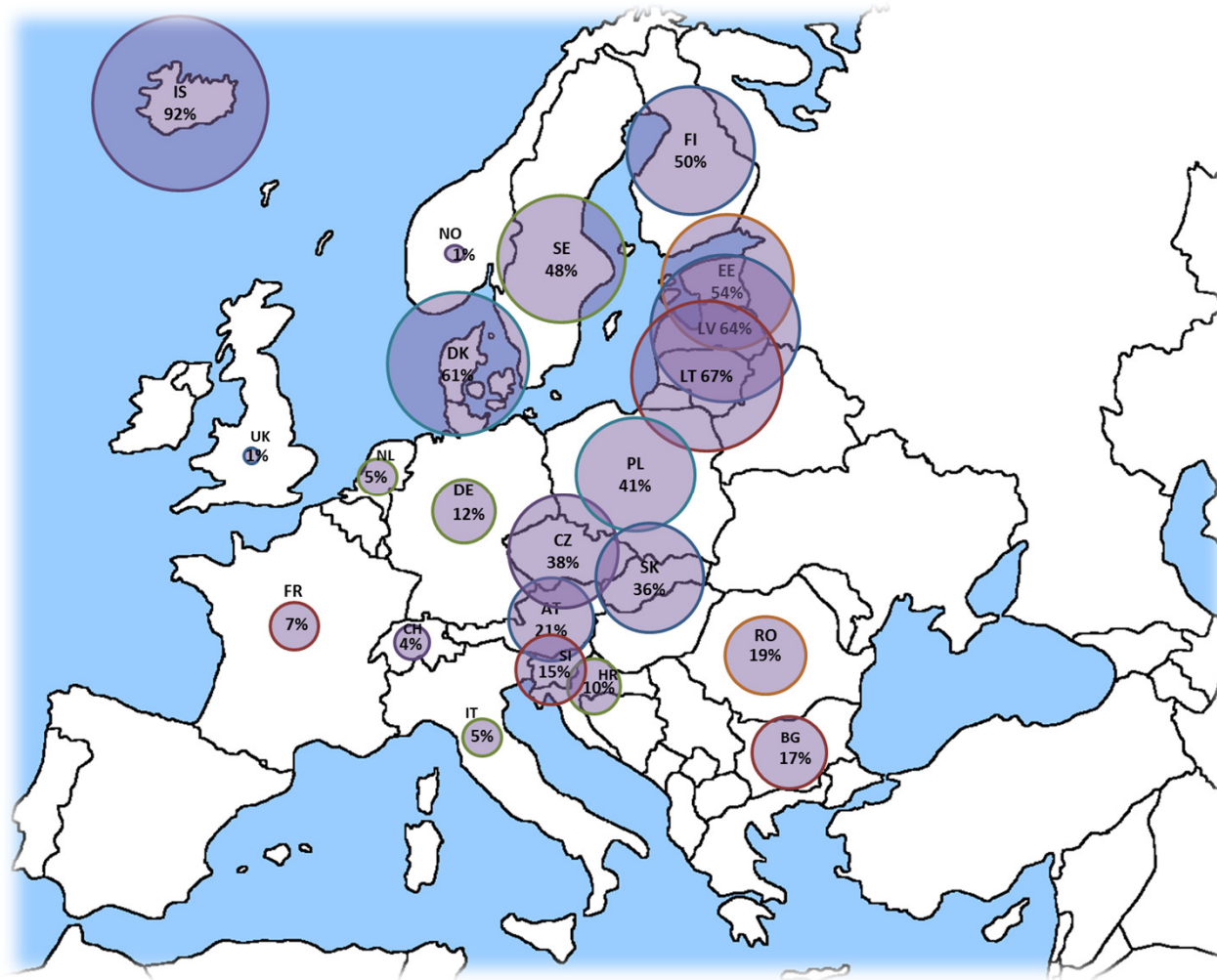


Share of citizens served by District Heating in EU countries (in 2011)

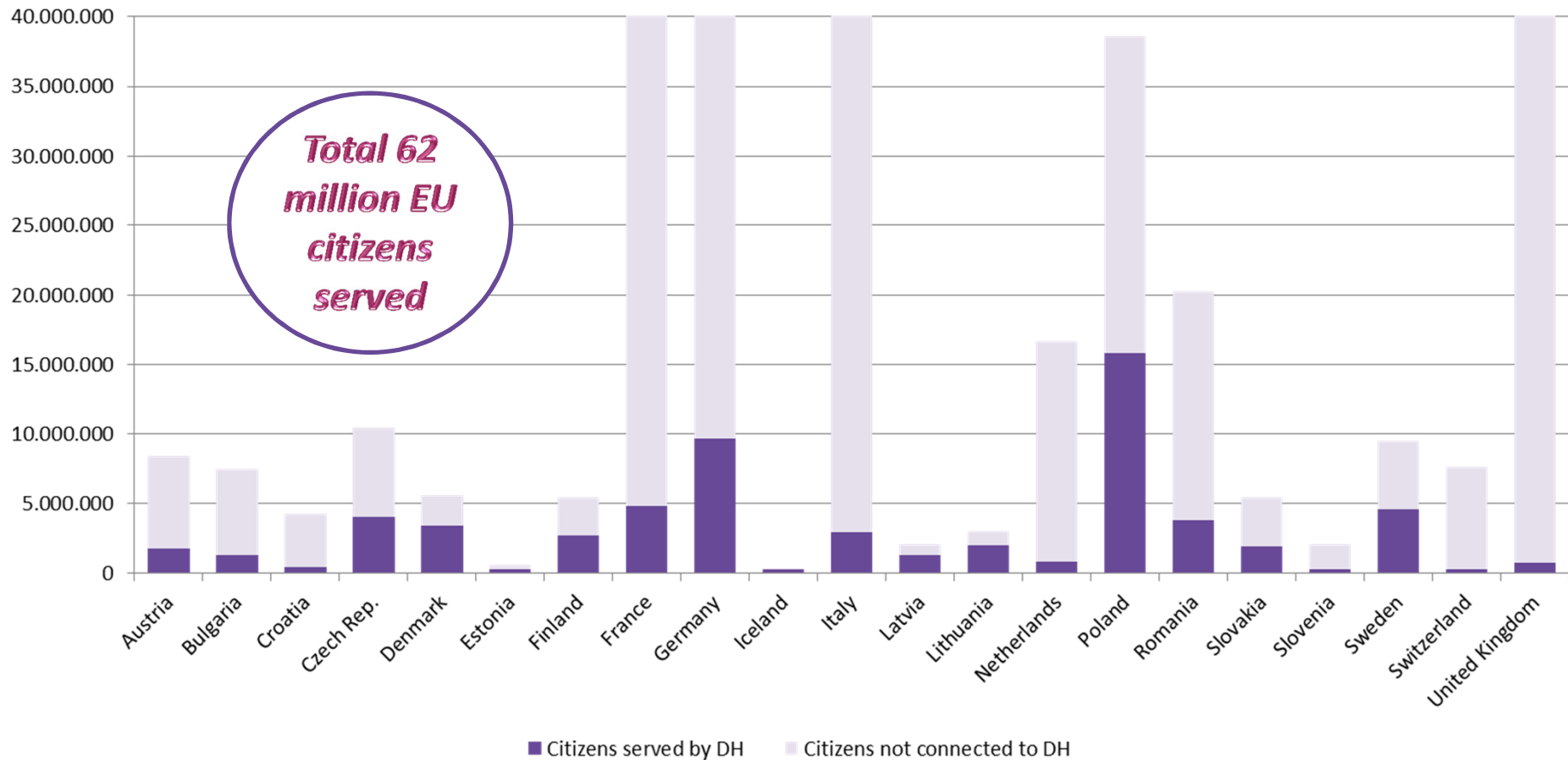


Source: Euroheat & Power (DHC Country by Country survey 2013)

Share of citizens served by District Heating



Number of citizens served by District Heating (in 2011)



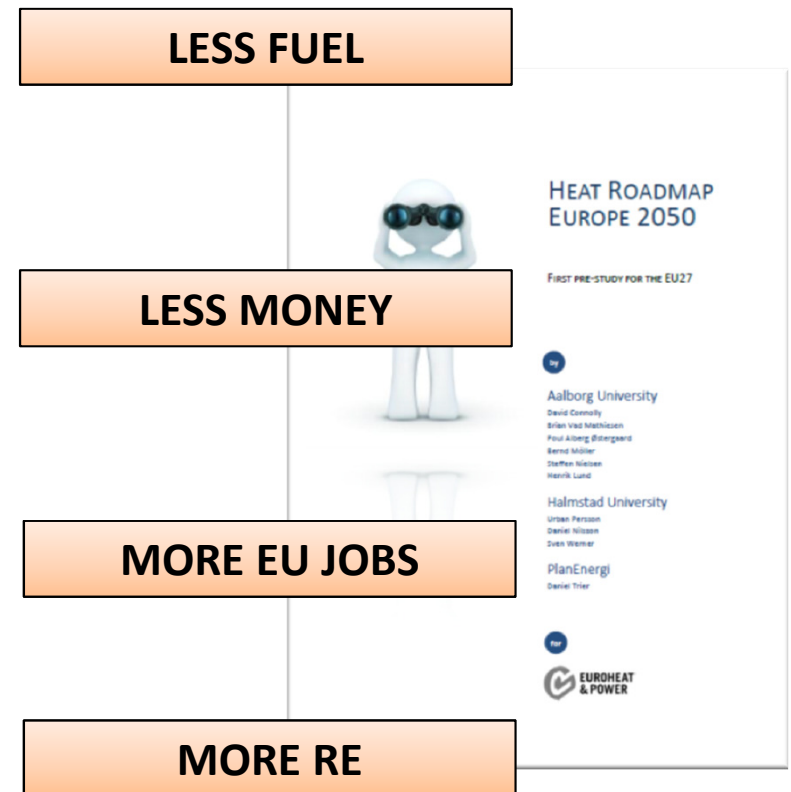
Source: Euroheat & Power (DHC Country by Country survey 2013)

Doubling share of District Heating:

- ***Dependency on the import of energy would fall***
by a volume equal to the annual energy consumption of Poland
- ***Need for primary energy supply would be reduced***
by an amount equal to the annual energy consumption of Sweden
- ***CO2 emissions would fall by 400 million tons a year***
corresponding to the total annual CO2 emissions from energy generation in

50% DH and CHP

- Decrease primary energy supply and especially fossil fuels and CO2 emissions
- Decrease annual costs of energy in Europe by approximately €14 Billion in 2050
- Create additional 220,000 jobs over the period 2013-2050
- Further integration of RES



Benefits of DHC by 2050



1. Cheaper Comfort

Annual savings of
B€100/year while still
achieving decarbonisation

15% lower total heating and
cooling costs

Lower costs of the EU28
energy supply for citizens
and businesses

220,000 more jobs per year
than in business as-usual
scenario in the energy
sector



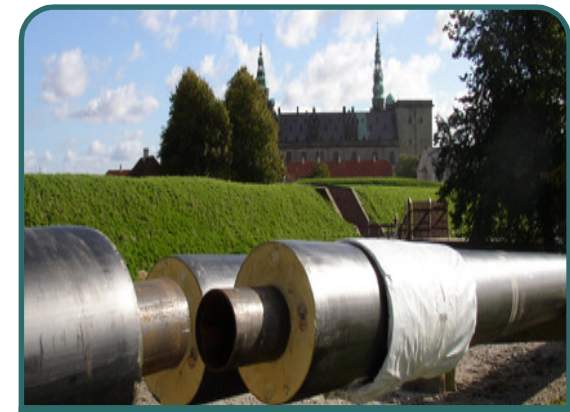
2. Faster Decarbonisation

Infrastructure that ensures
efficient use of renewable
heat and electricity

Recycling of heat otherwise
wasted and an increased
penetration of renewable
energy

Large heat savings and new
more efficient energy
conversion

Supports the general goals
in the Energy Efficiency
scenario from the European
Commission



3. Better Energy

Increases the security of
supply with local resources
and renewable energy

Creating a flexible
infrastructure

Enhanced energy efficiency
with a balanced choice of
technologies

Reducing risks and the
adverse effects of
technology lock-ins



Sector's own view of the future

49% of the Sector see their own business growing over the next 5 years

46% of the Sector see their level of investment related to DHC growing over the next 5 years

64% of the Sector have or are involved in investment plans in RES to be realised in the next 5 years

Source: Euroheat & Power (2013 District Heating and Cooling Barometer)

Challenges ahead

72% of the Sector think that the regulatory framework doesn't provide sufficient incentives to the development of DHC

49% of the Sector believe that R&D in DHC requires more attention/funding in order to keep pace with competing technologies

Source: Euroheat & Power (2013 District Heating and Cooling Barometer)

District Cooling



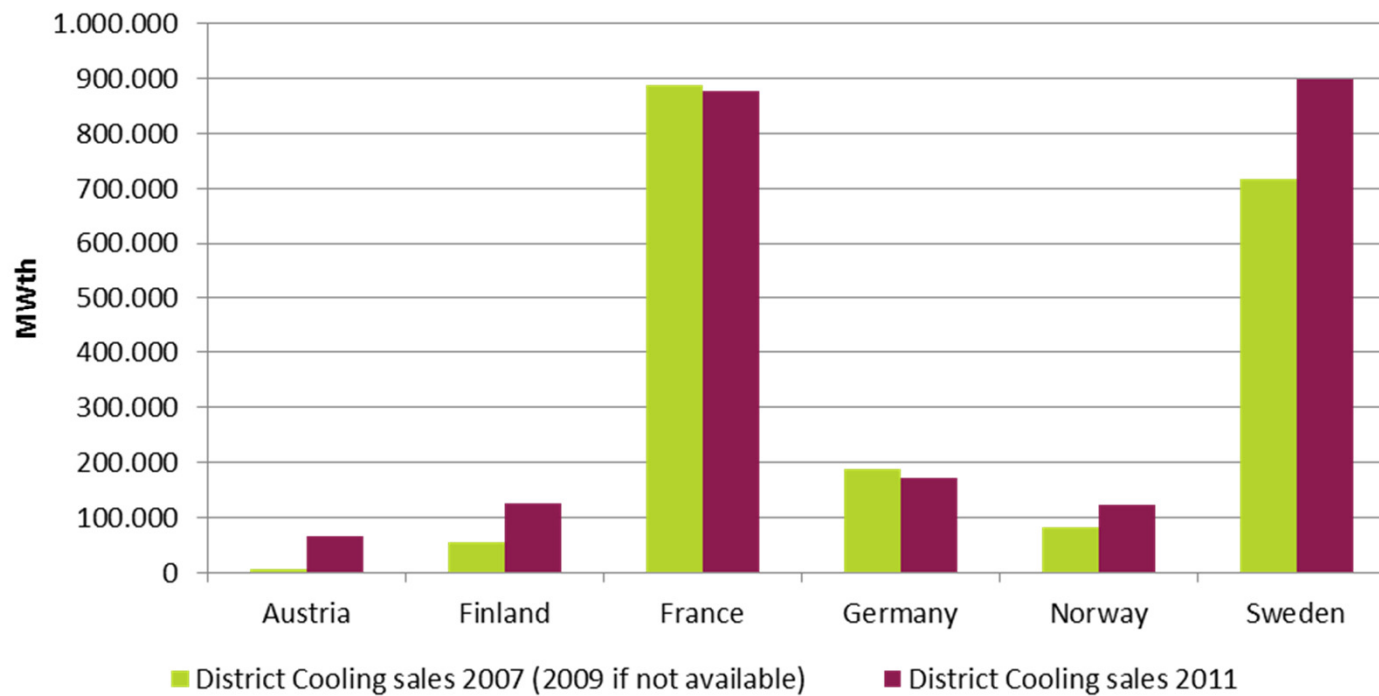
District Cooling – state of play

- Increase of cooling demands over last 20 years
- AC market = 280 TWh (estimation RESCUE projects)

(% saturation)	USA	Japan	Europe
Commercial	80	100	27
Residential	65	85	5

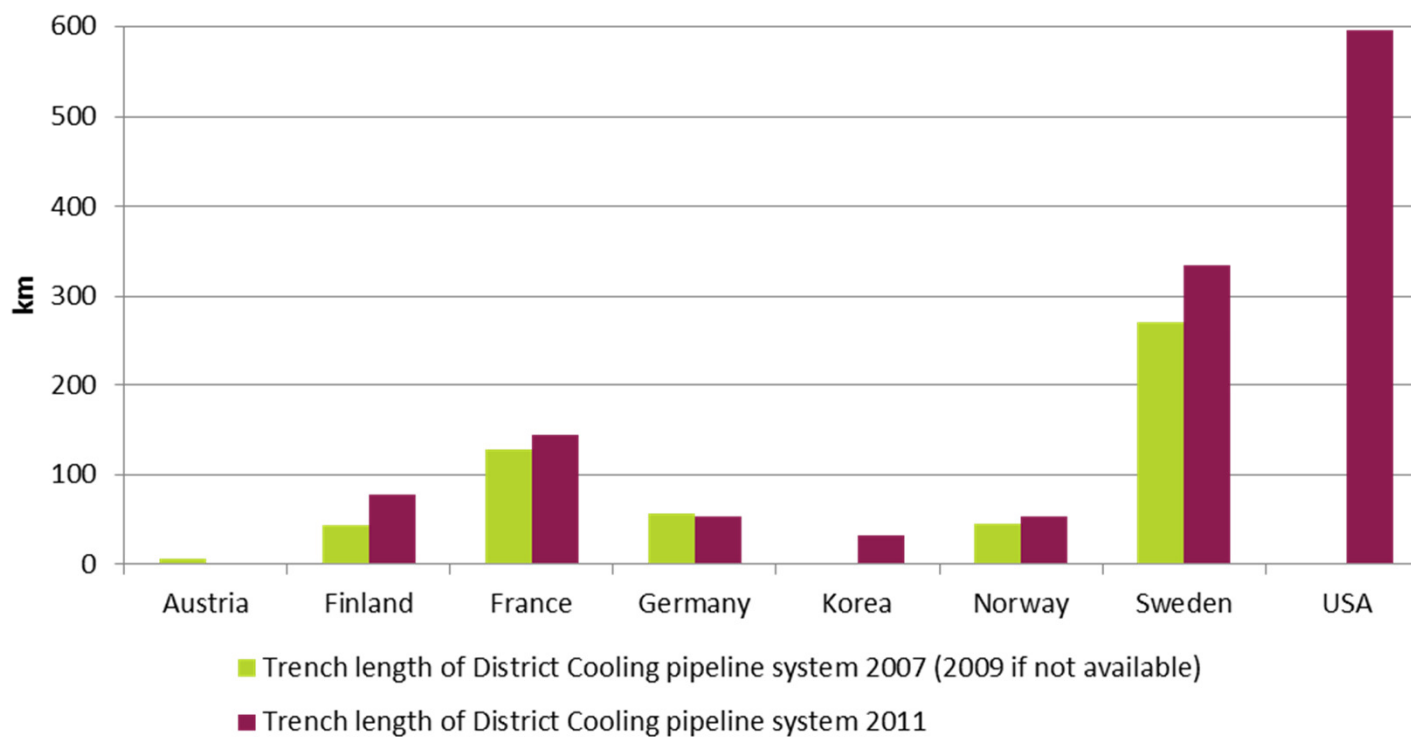
- DC an alternative to AC with industrial chiller, absorption, free cooling
- Recent systems started operations in Barcelona (Olympic area), Amsterdam (Zuitas), Vienna (town-town)
- Sweden 25% market share !

District Cooling sales in Europe



Source: Euroheat & Power (DHC Country by Country survey 2013)

District Cooling trench length development



Source: Euroheat & Power (DHC Country by Country survey 2013)

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The international association
of district heating & cooling.
Welcome.

Thank you for attention!



**TUESDAY 24 JUNE 2014
14:30 - 16:15
CHARLEMAGNE BUILDING, BRUSSELS, BE**

A Heating and Cooling Strategy for Europe



37th Euroheat & Power Congress, 27-28 April 2015, Tallinn, Estonia