

# Urban waste heat potentials

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 767429.

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# Waste heat potentials in a national perspective

The ReUseHeat Project demonstrates replicable systems for recovery and reuse of waste heat at urban level.

## Potential sources:

- Waste water treatment plants
  - Nice, France
- Metros
  - Bucharest, Romania
- Data centers
  - Braunschweig, Germany
- Service sector
  - Madrid, Spain

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# Waste heat potentials in a national perspective

These are demonstrated in the four cities.

Our task:

Should we integrate these excess heat potentials from a national perspective?



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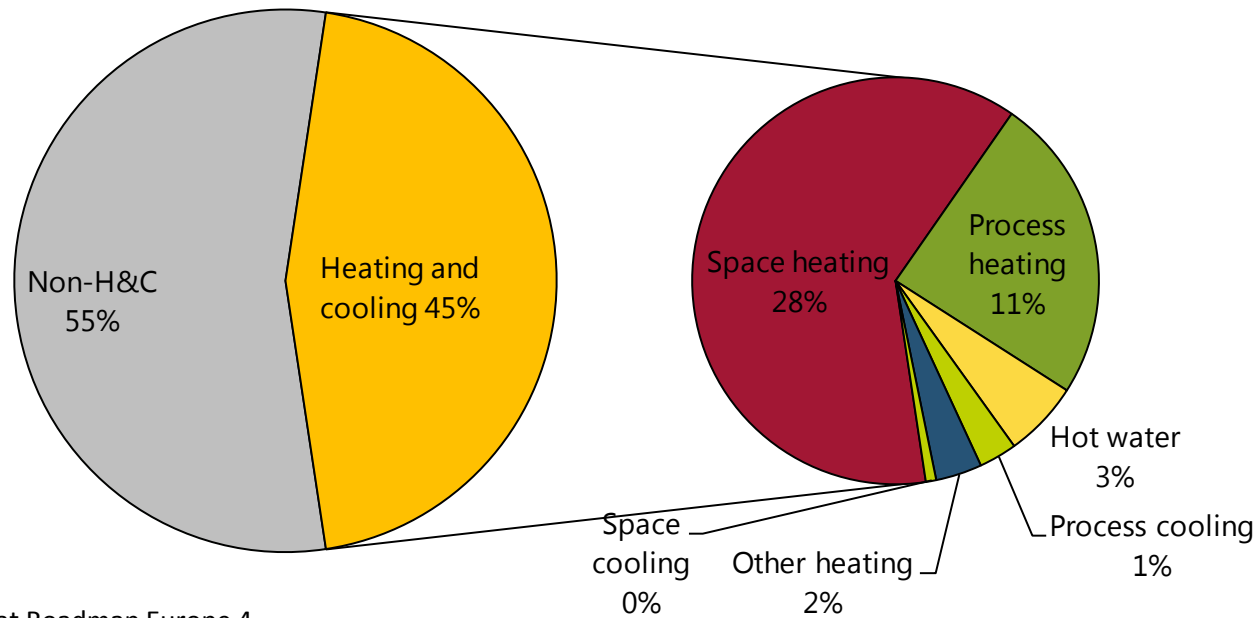


# Heating and cooling markets

France final energy demands

→ 44% of all energy in France is for heating

Heating shares:  
37% in Spain  
55% in Germany  
62% in Romania



Source: Heat Roadmap Europe 4

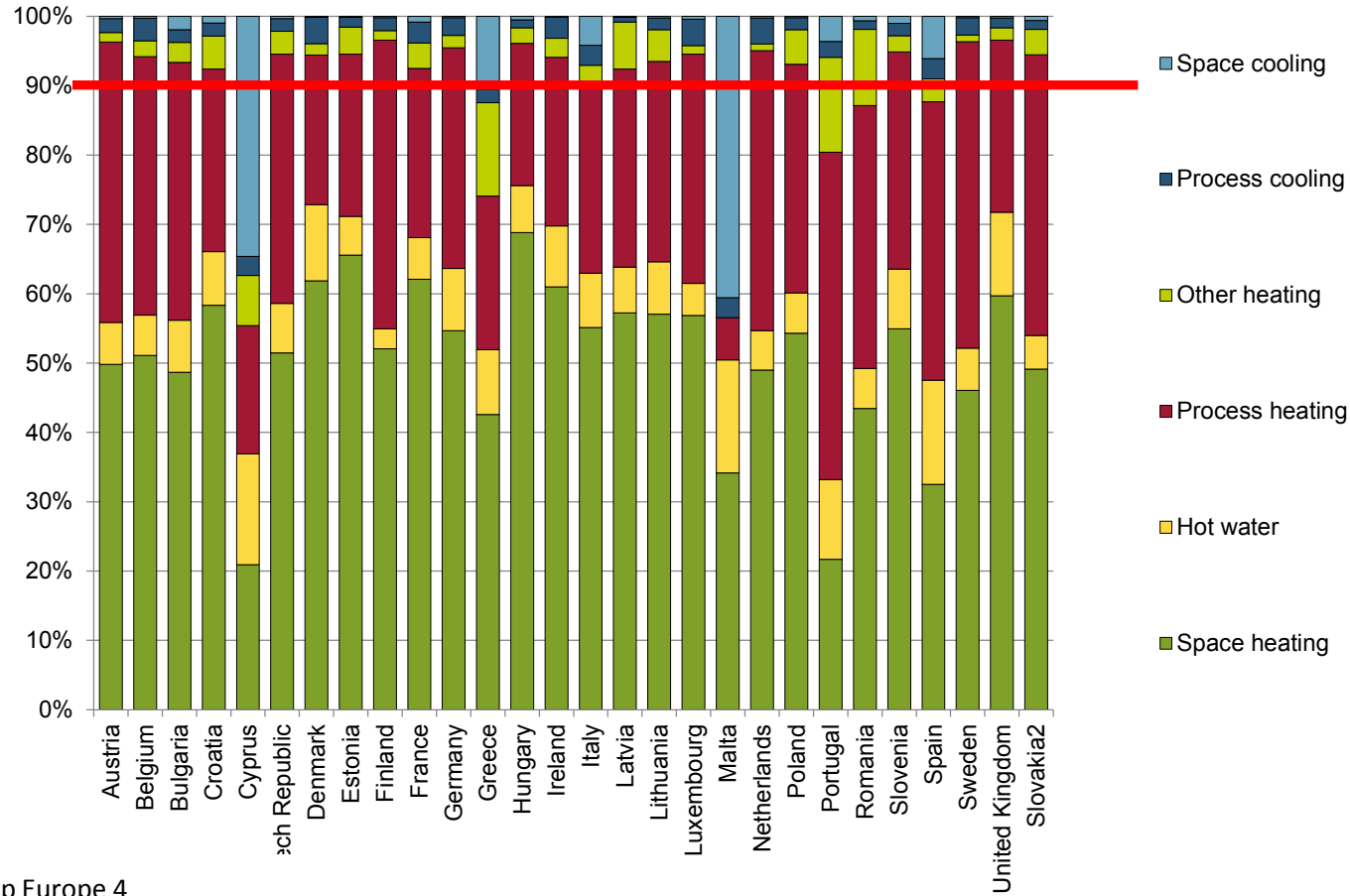


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# Heating/cooling shares



Heating share of H&C:  
 +60% in all EU countries  
 +90% in all but three countries

Source: Heat Roadmap Europe 4



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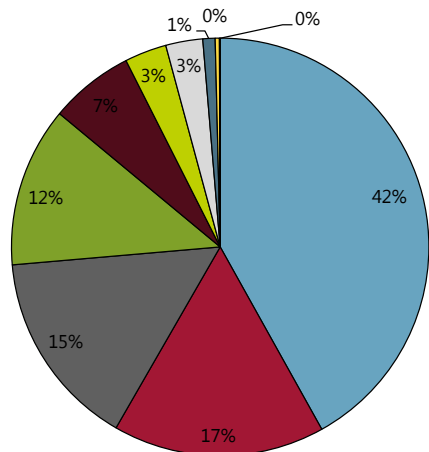


# Can the resources be integrated?

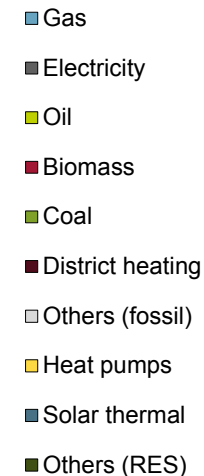
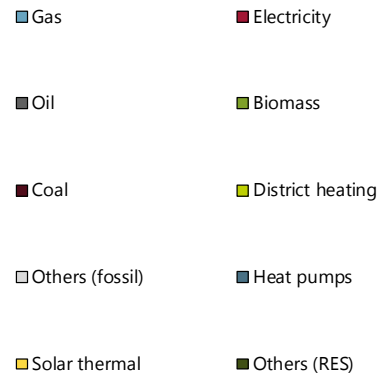
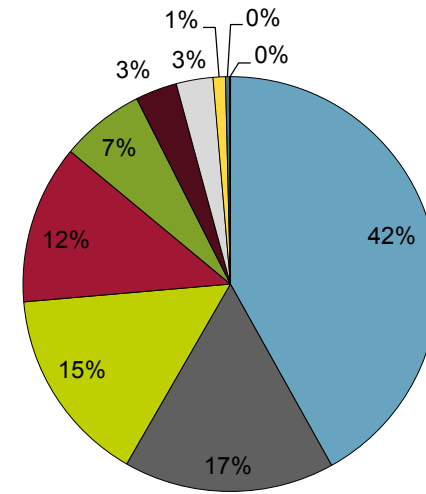
- The excess heating sources require district heating!

Energy carrier shares of final heating and cooling demands

France – 3% District heating



Germany – 10% District Heating



Source: Heat Roadmap Europe 4



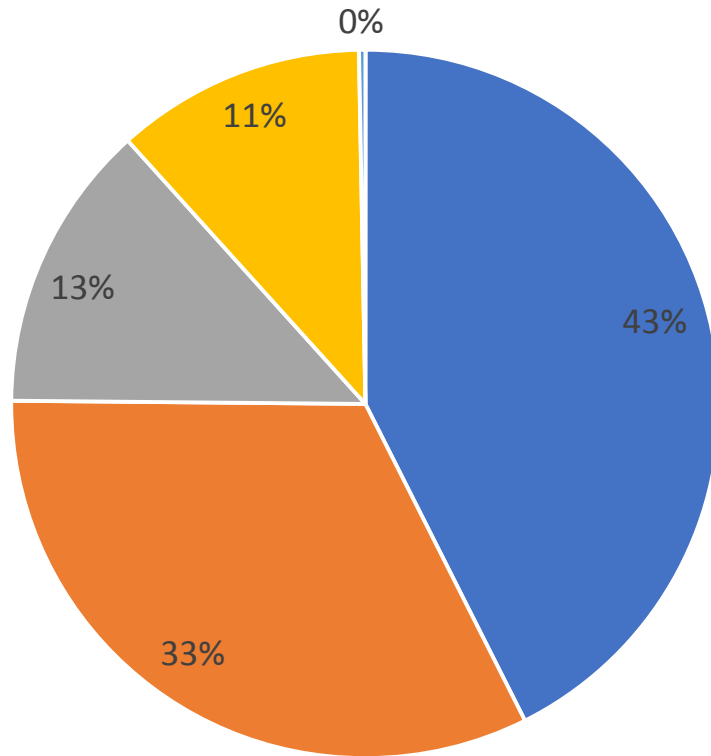
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# District heating supply mix

DH supply mix France



More than 75% is CHP or boilers

In the future these might be supplied by biomass

■ CHP plants ■ Fuel boilers ■ Geothermal ■ Waste incineration ■ Heat pumps



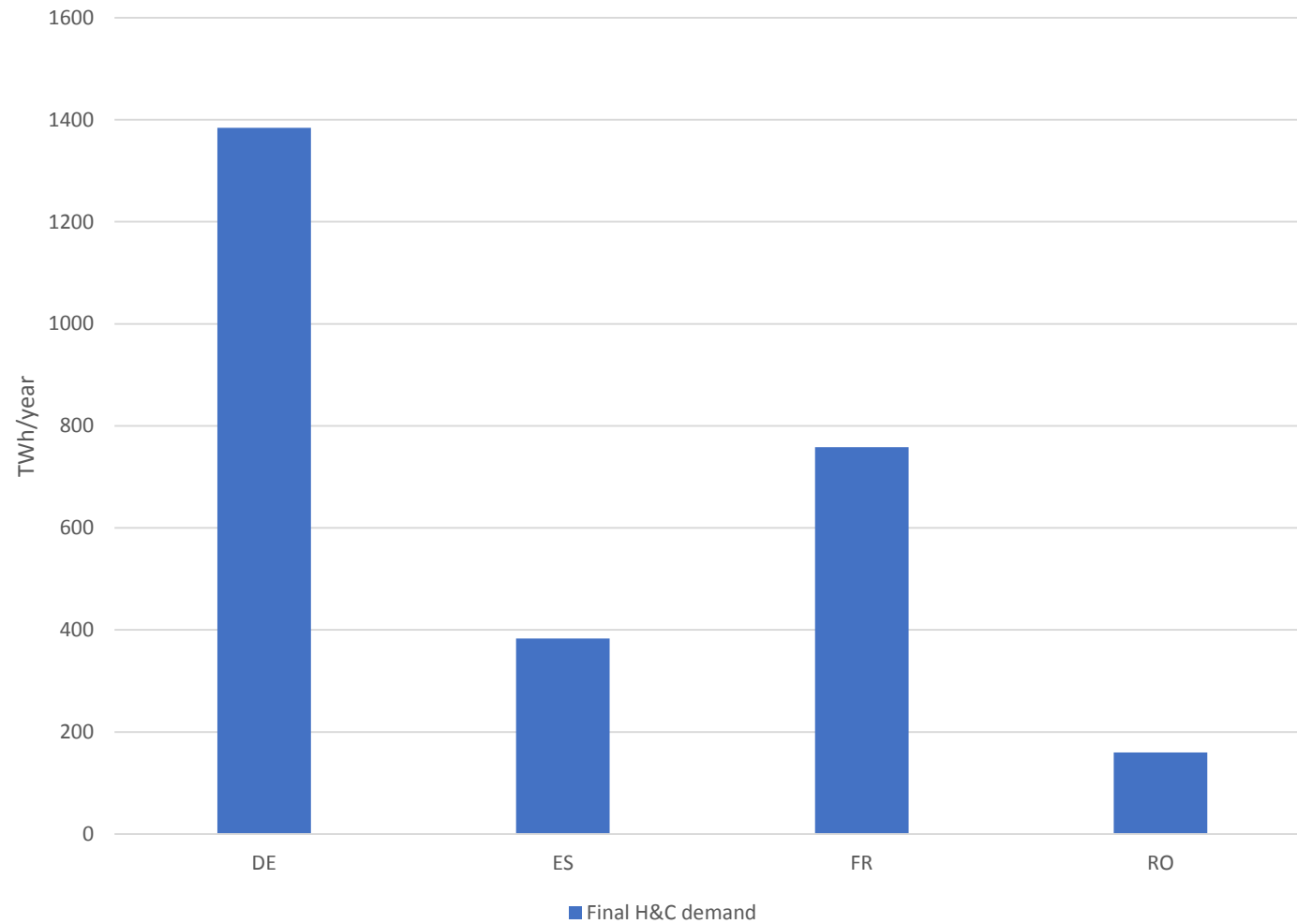
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Source: Heat Roadmap Europe 4

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# We need to integrate other resources



Source: Heat Roadmap Europe 4



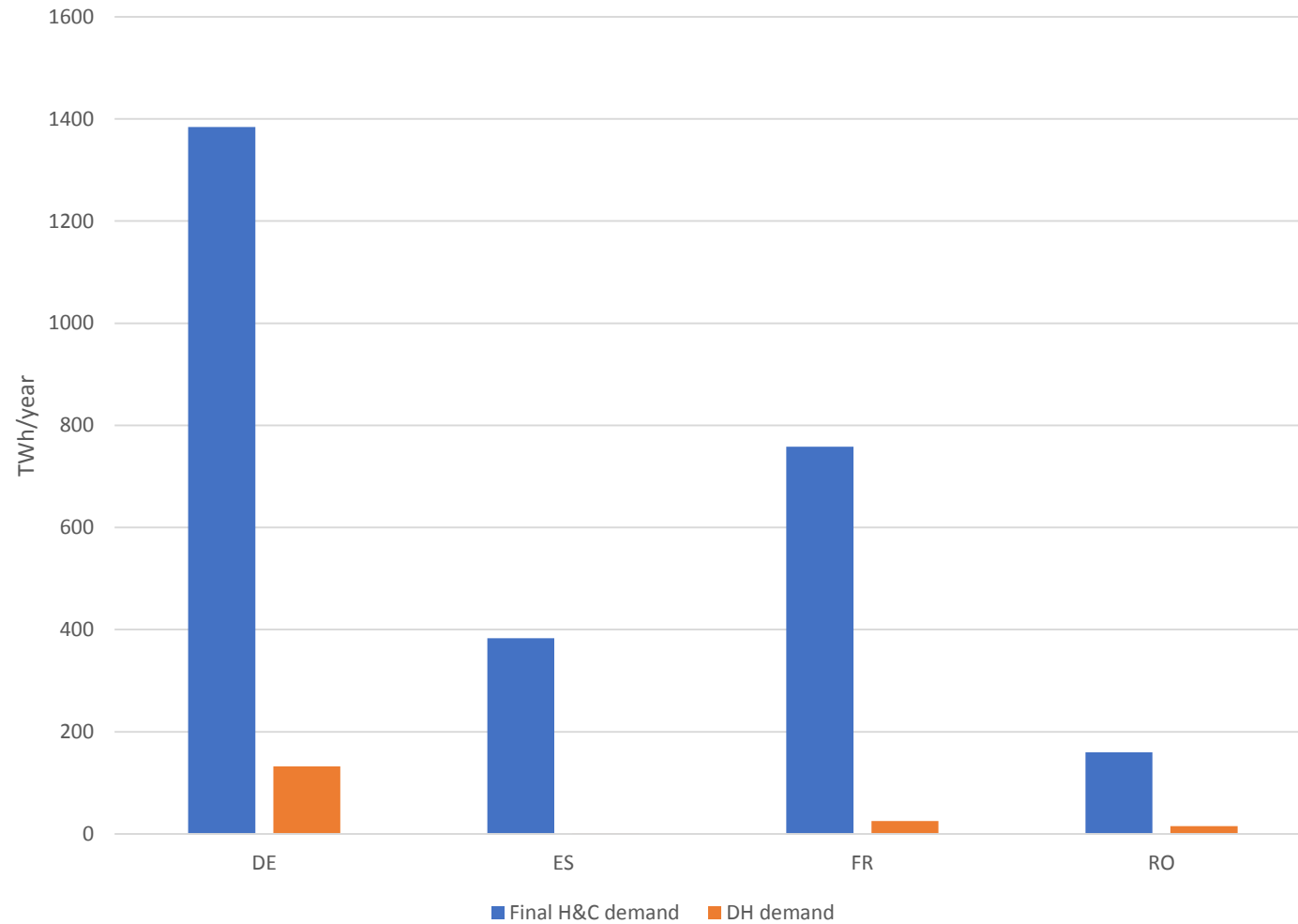
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# We need to integrate other resources



Source: Heat Roadmap Europe 4

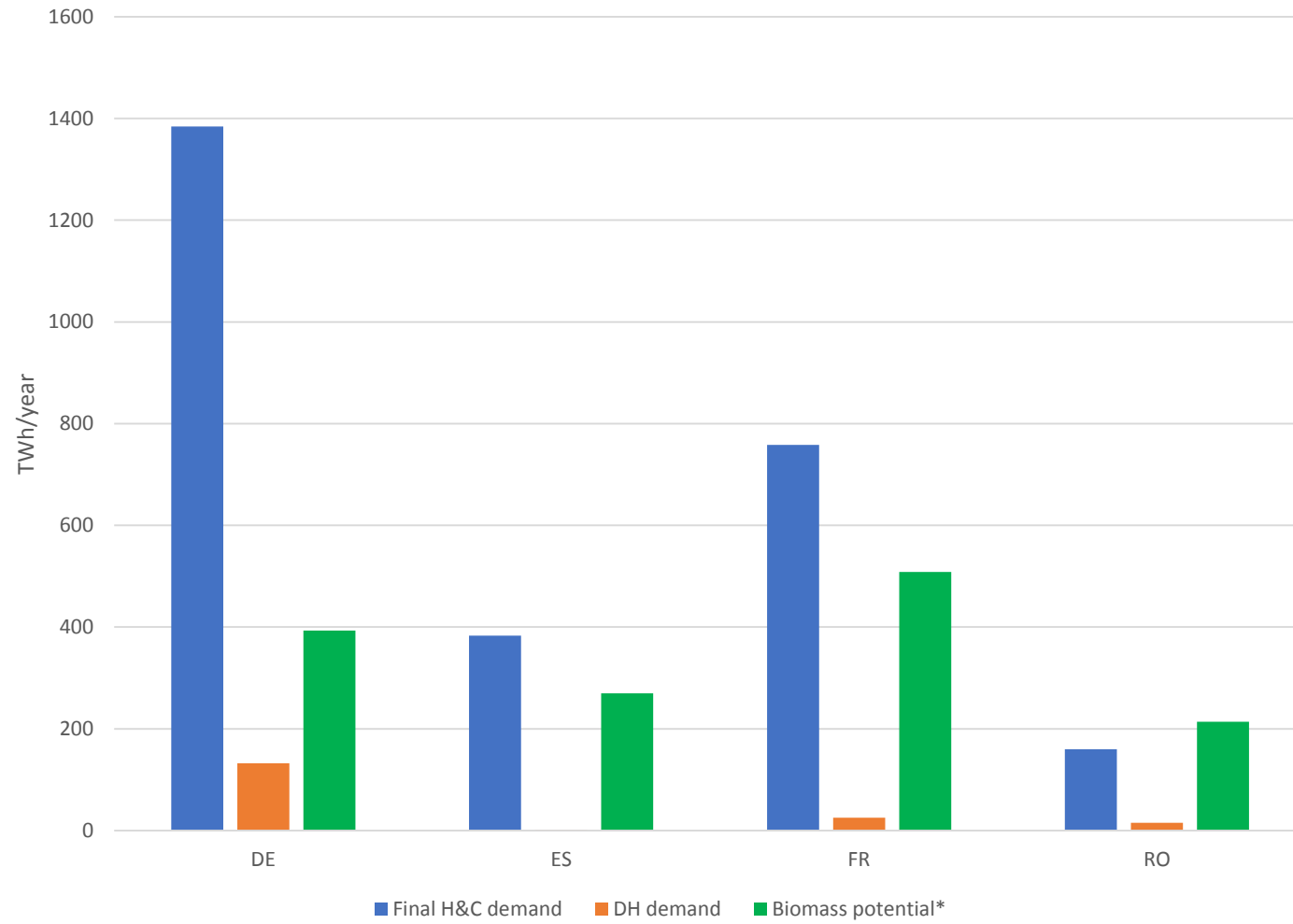


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# We need to integrate other resources



Source: Heat Roadmap Europe 4



\* Biomass potential in 2020 medium availability  
JRC, The JRC-EU-TIMES model. Bioenergy potentials  
for EU and neighbouring countries, 2015

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## We need to integrate other resources

- District heating allows for resources that would otherwise be wasted:
  - Geothermal
  - Solar thermal
  - Waste incineration
  - CHP plants
  - Excess heat from industries
  - Excess heat from
    - Waste water treatment plants
    - Metros
    - Data centers
    - Service sector



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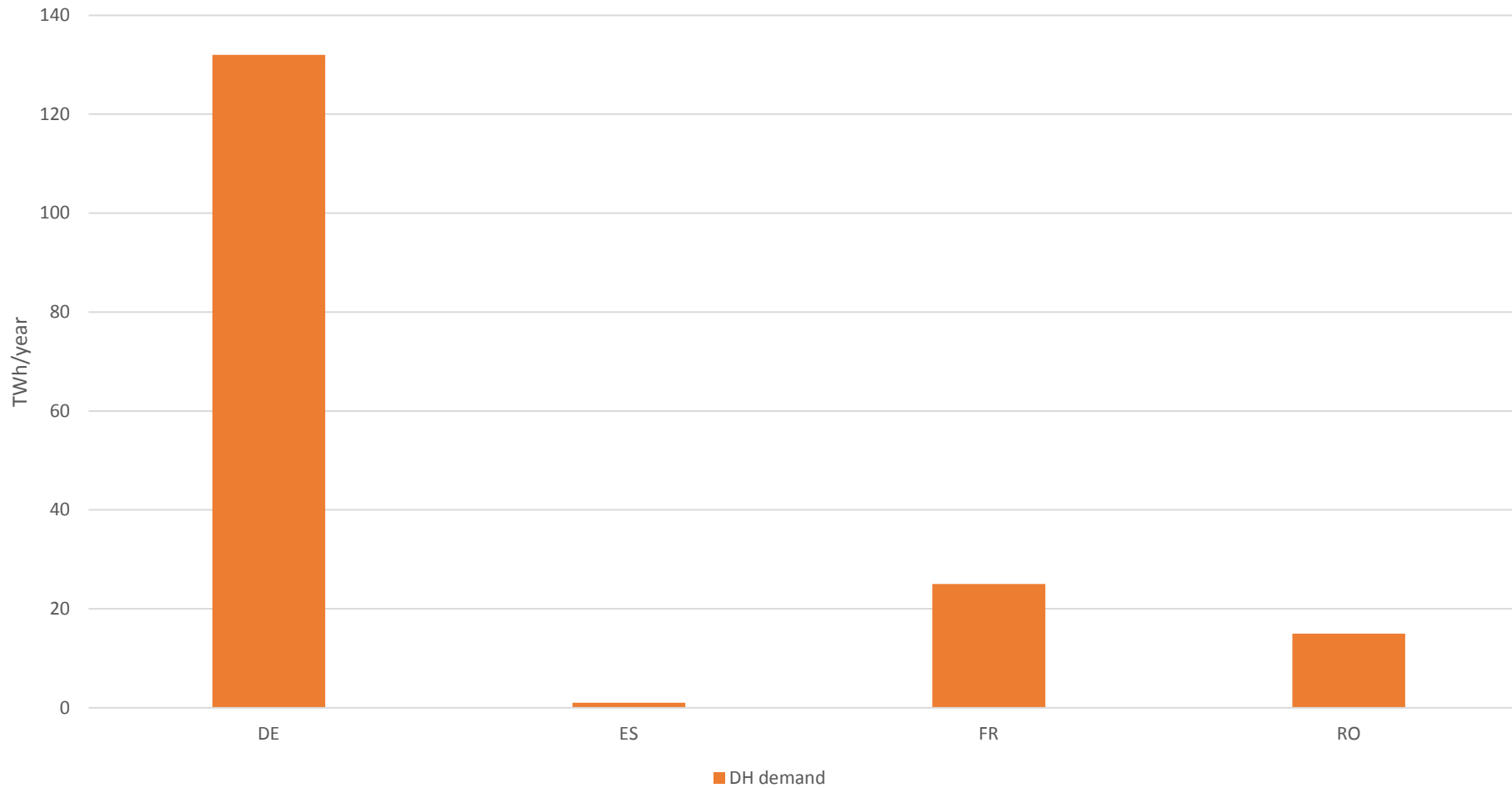
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# We need alternative resources

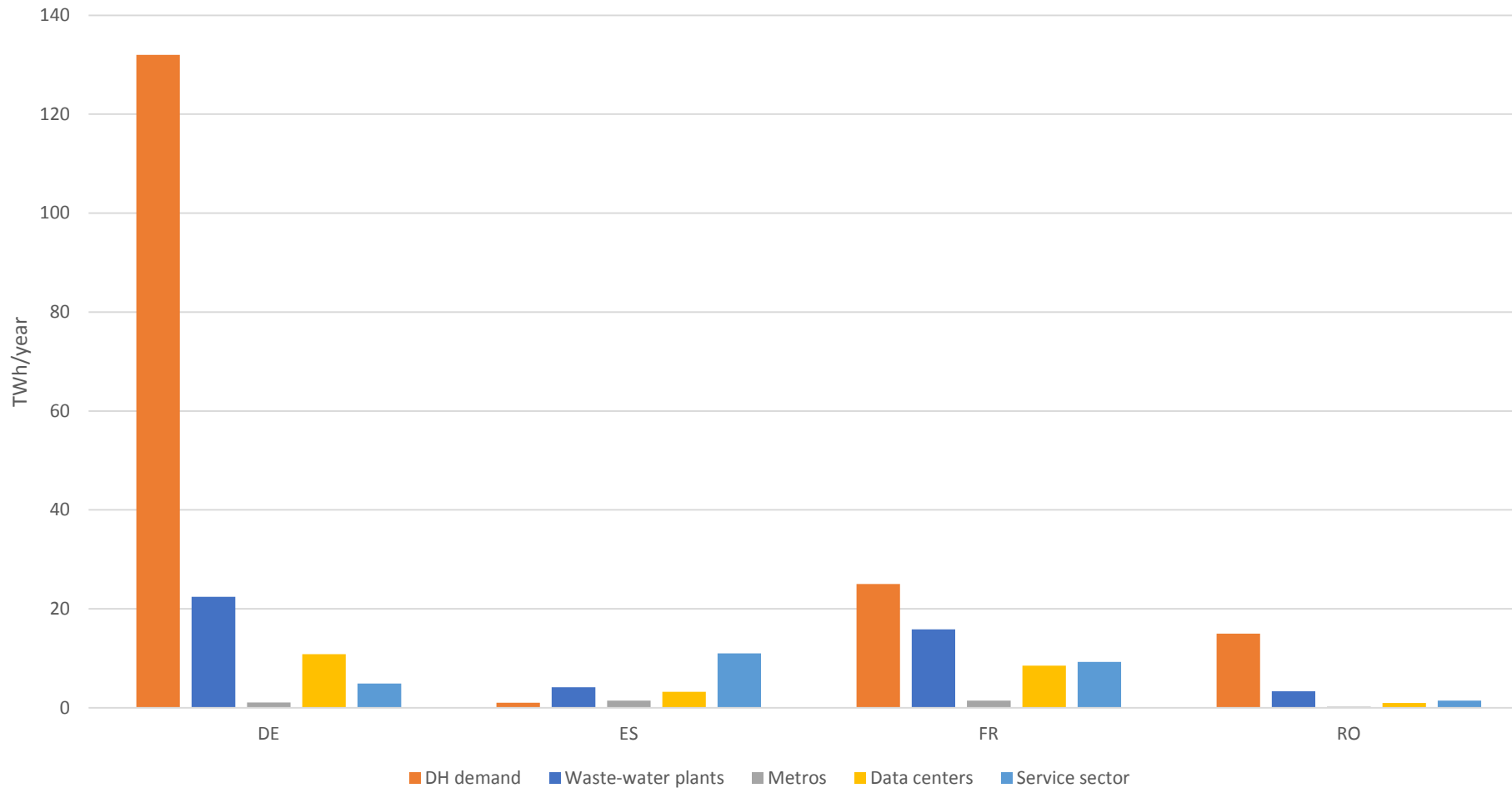


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# We need alternative resources



Disclaimer:  
These excess potentials are only initial estimates

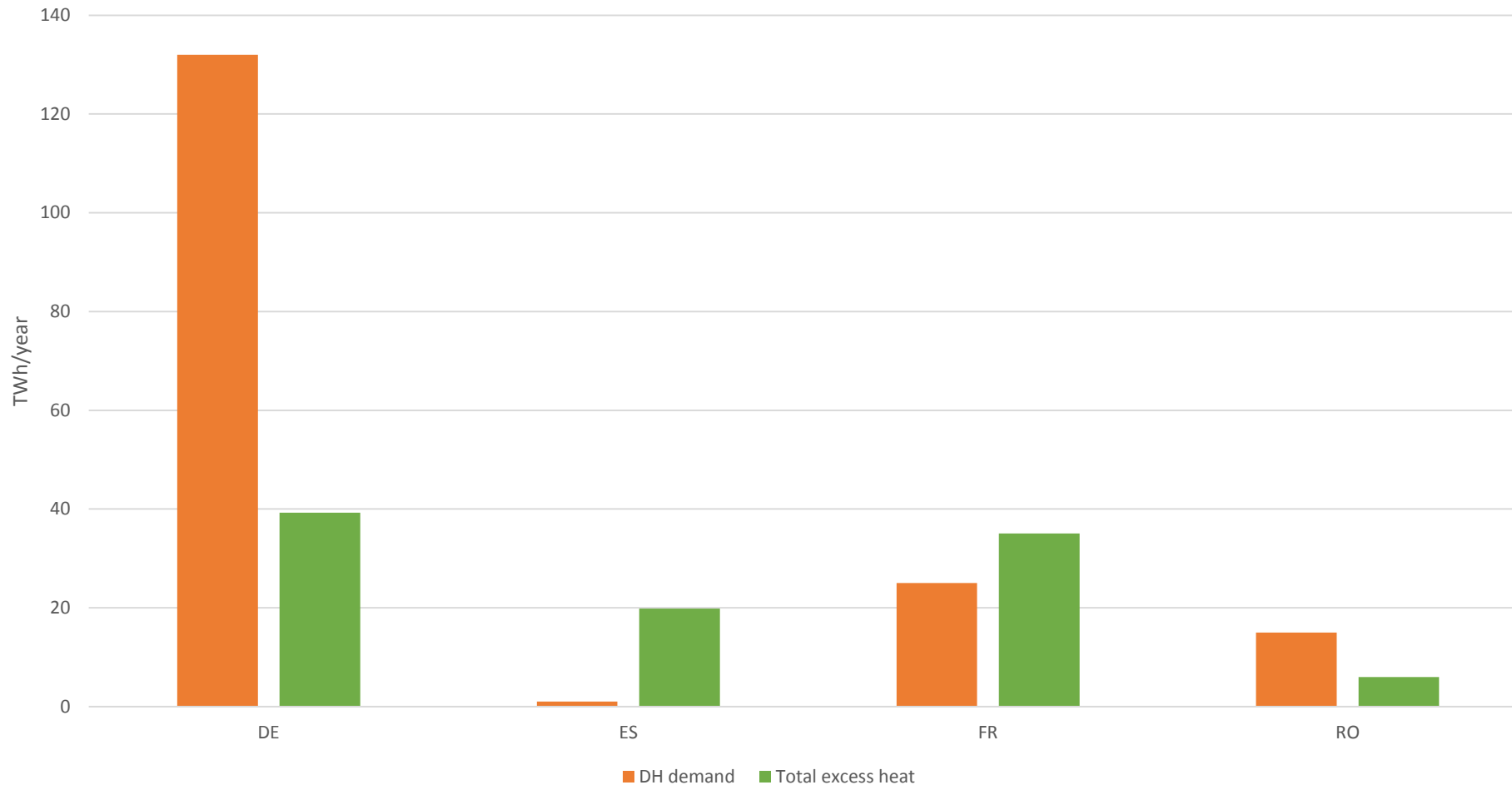


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# Scenarios and outcome

Energy system analysis of installing these four heat sources in the four demonstrator countries:

- The effect of the individual heat sources in each country
- The optimal mix of excess heat in each country

Effects on:

- Energy system costs
- CO<sub>2</sub>-emissions
- Primary energy – how does it align with biomass resources?
- Excess electricity and district heating production in the system

Final results by ultimo February 2019



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# Thank you!

## Questions?



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