



HEATING AND COOLING

IN THE EUROPEAN ENERGY TRANSITION



BRUSSELS 26-27 FEBRUARY 2015

Energy



Heat Supply & Demand in a Low Carbon Energy System



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Heat Roadmap Europe 2050

STUDY FOR THE EU27

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 **EUROHEAT
& POWER**



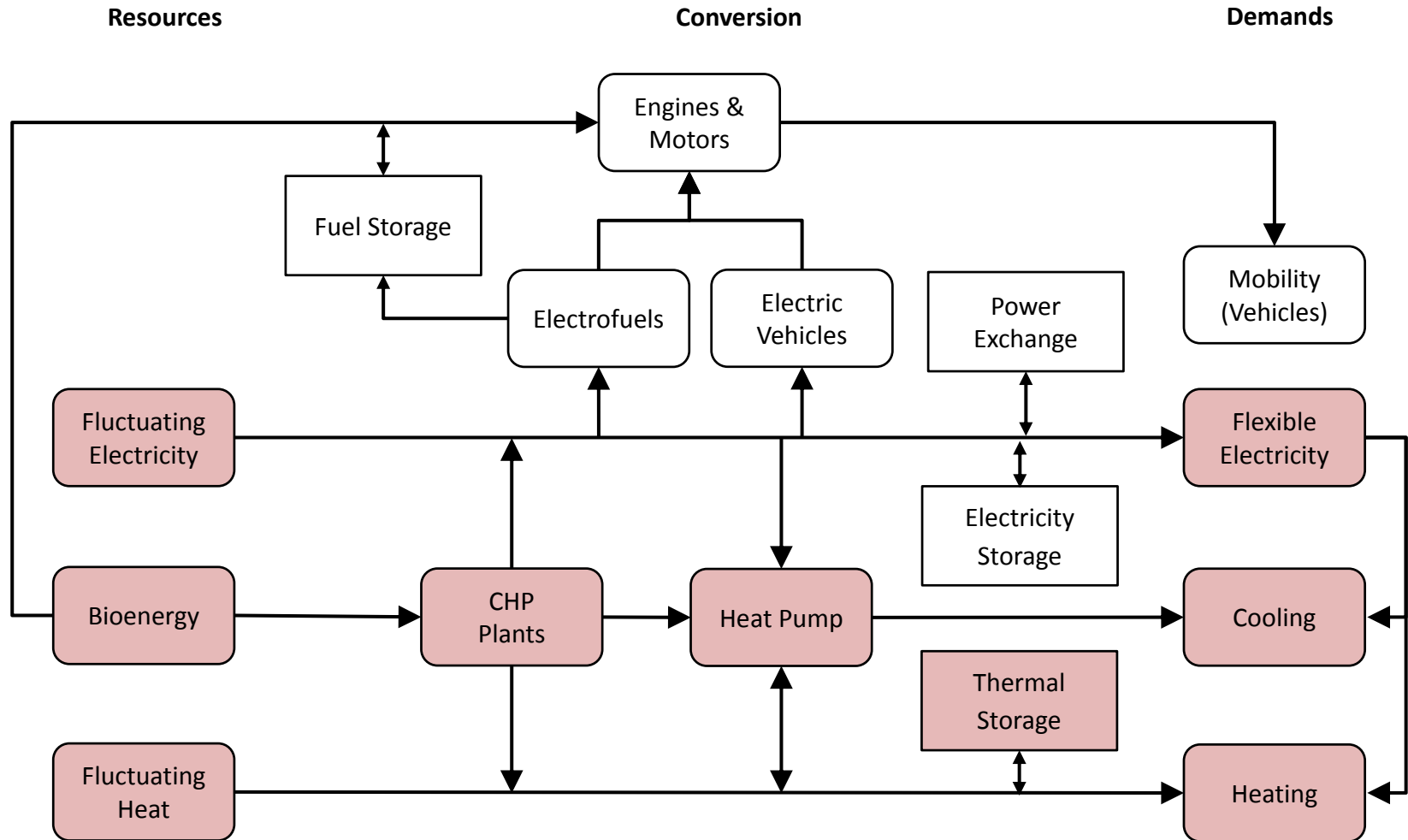
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Programme of the European Union



Heat Sector in a Low-Carbon Energy System



3 Options for the Heat Sector

1. Savings

- Reduce our demand for heat:
 - Space heating
 - Hot water

2. Individual Units

- Use a heating unit in each building:
 - Oil
 - Biomass
 - Heat Pumps
 - Electric Heating

3. Networks

- Share a heating network:
 - Gas Grid
 - Water (i.e. district heating)

How Much?

Which One?

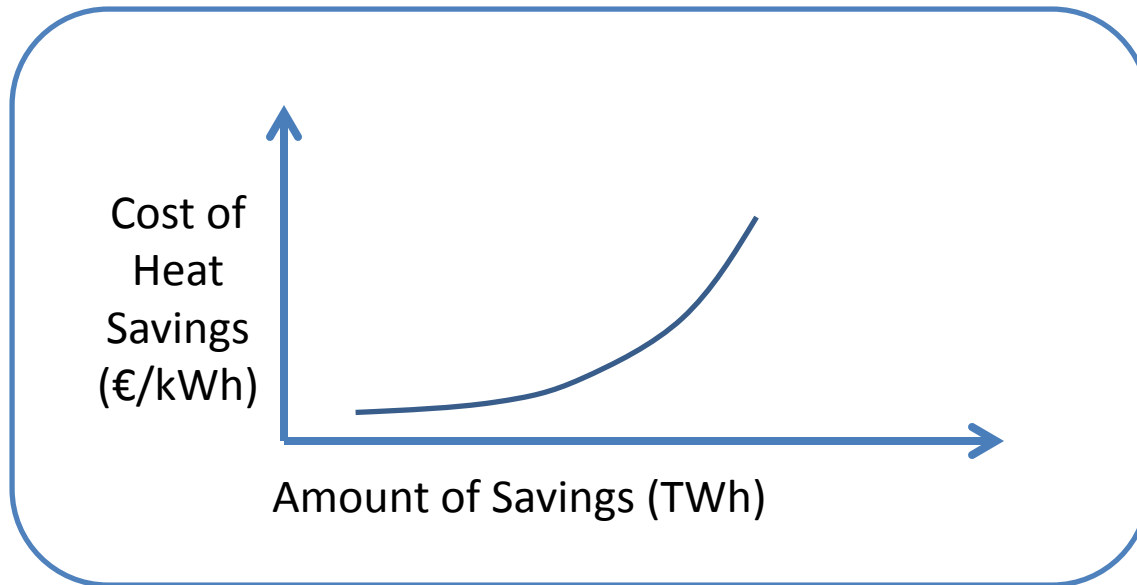
Which One?
&
How Much?

1. Savings

There is an economic balance between reducing heat and supplying heat

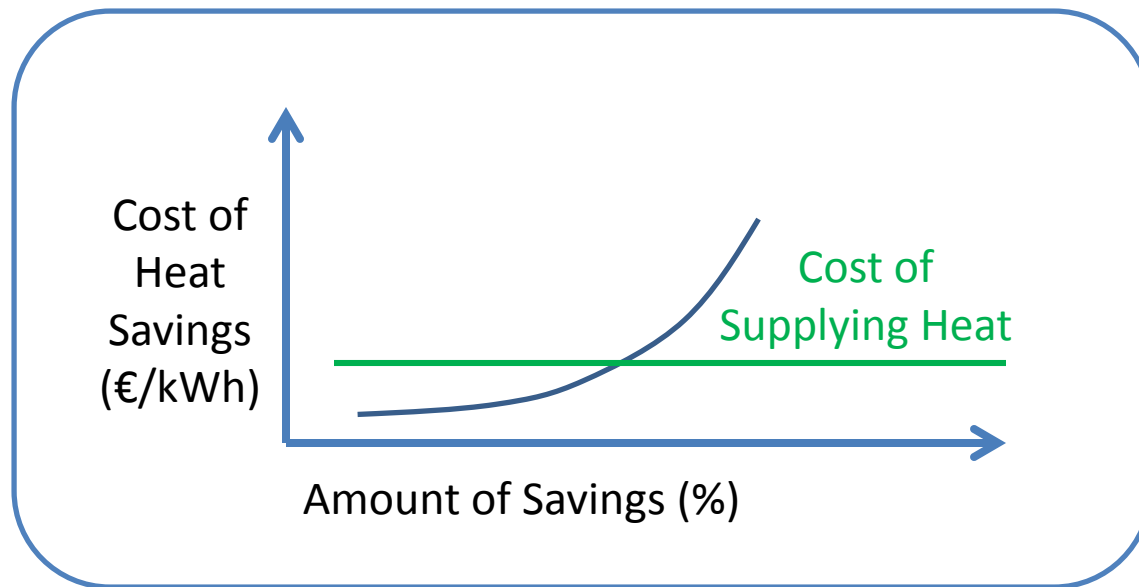
How much Heat should we Save?

- We should implement heat savings until the price of sustainable supply is less than the marginal price of additional savings



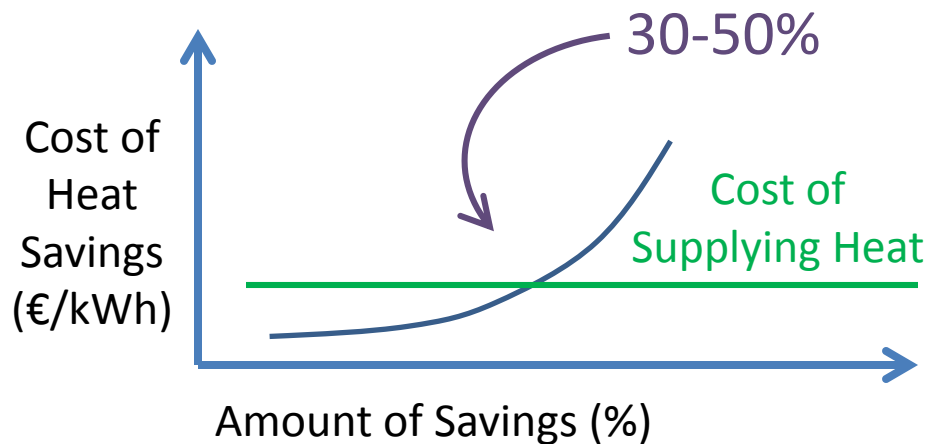
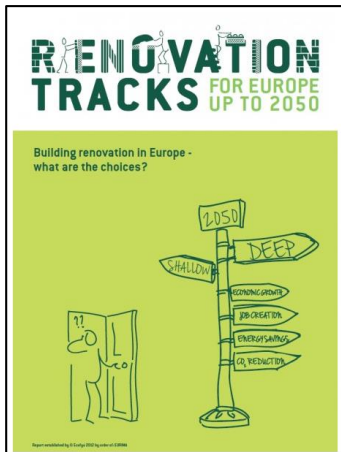
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3 Options for the Heat Sector

1. Savings

- Reduce our demand for heat:
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 - Hot water

30-50%
Reduction

2. Individual Units

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Which One?

3. Networks

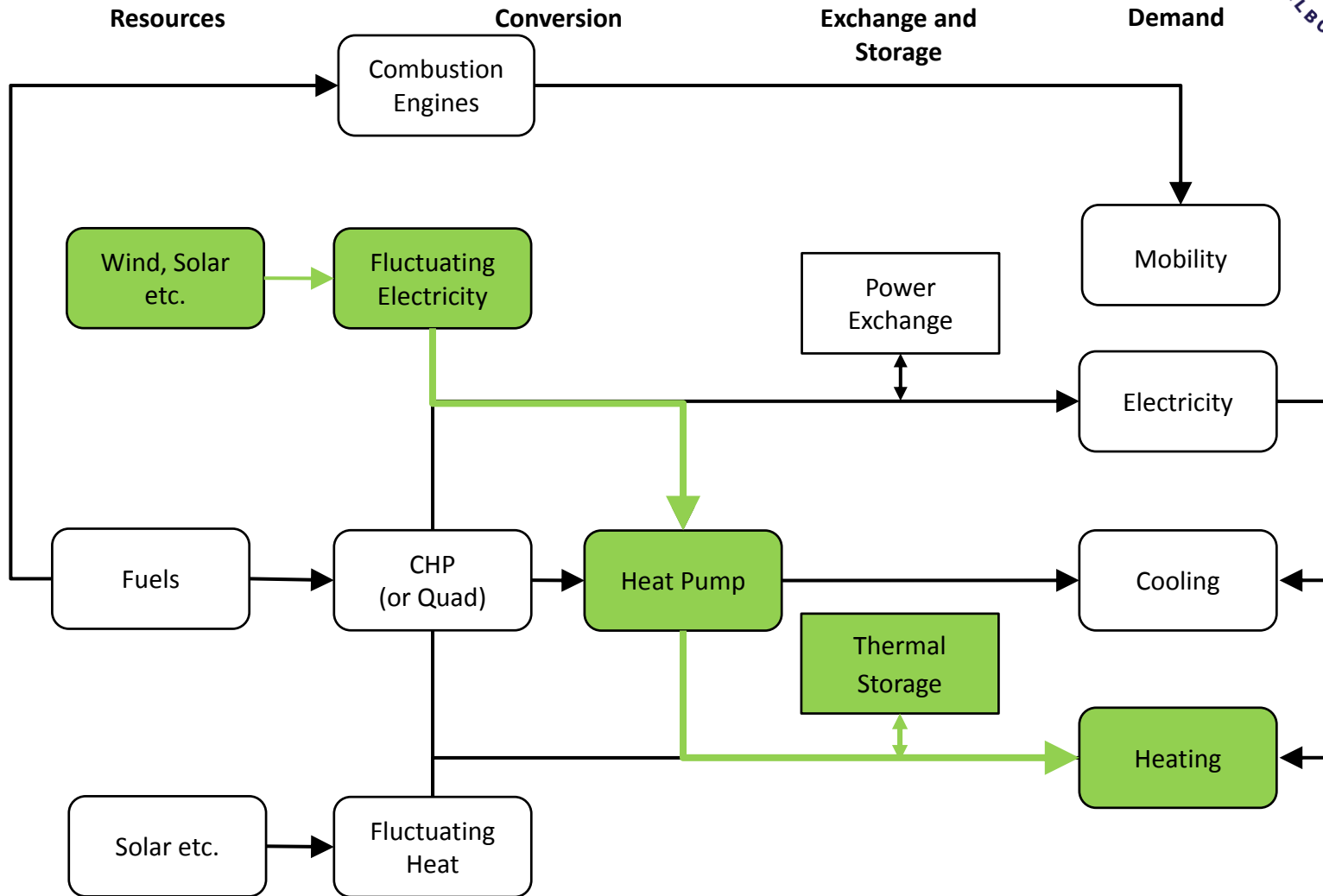
- Share a heating network:
 - Gas Grid
 - Water (i.e. district heating)

Which One?
&
How Much?

2. Individual Heating Options

Heating Unit	Sustainable Resources	Efficient	Cost	Cost Sensitivity
Electric Heating				
Heat Pumps				
Oil Boilers				
Biomass Boilers				

Heat Pumps & Thermal Storage



3 Options for the Heat Sector

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?%
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Which One?
&
How Much?

3. Heat Networks

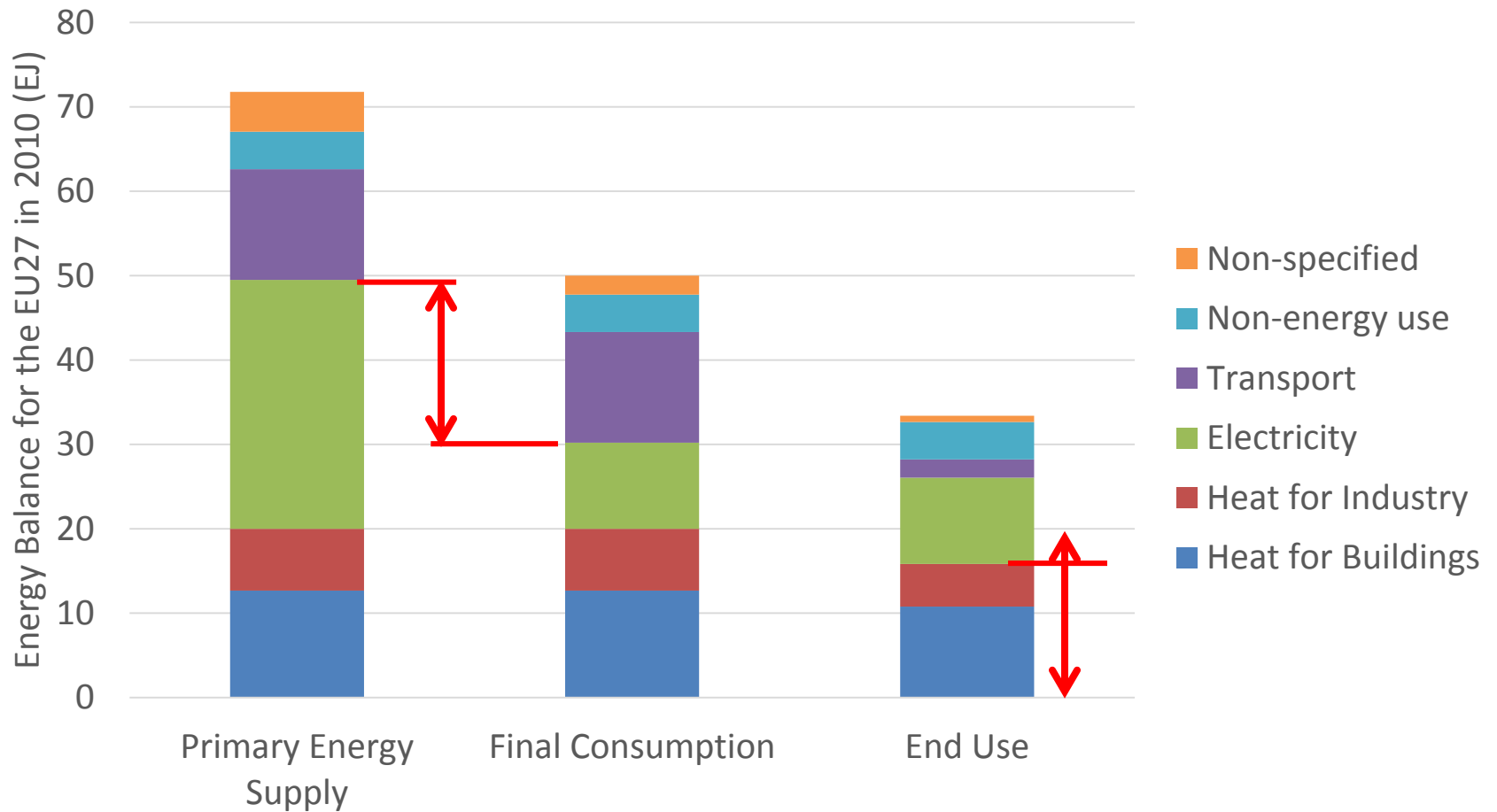
Heating Unit	Sustainable Resources	Efficient	Cost	Cost Sensitivity
Gas Grid				
District Heating				

Sustainable: creates flexibility (i.e. thermal storage) and it enables more renewable energy

Efficient: uses 'excess' heat

Cost: less fuel and 'shared capacity = less capacity'

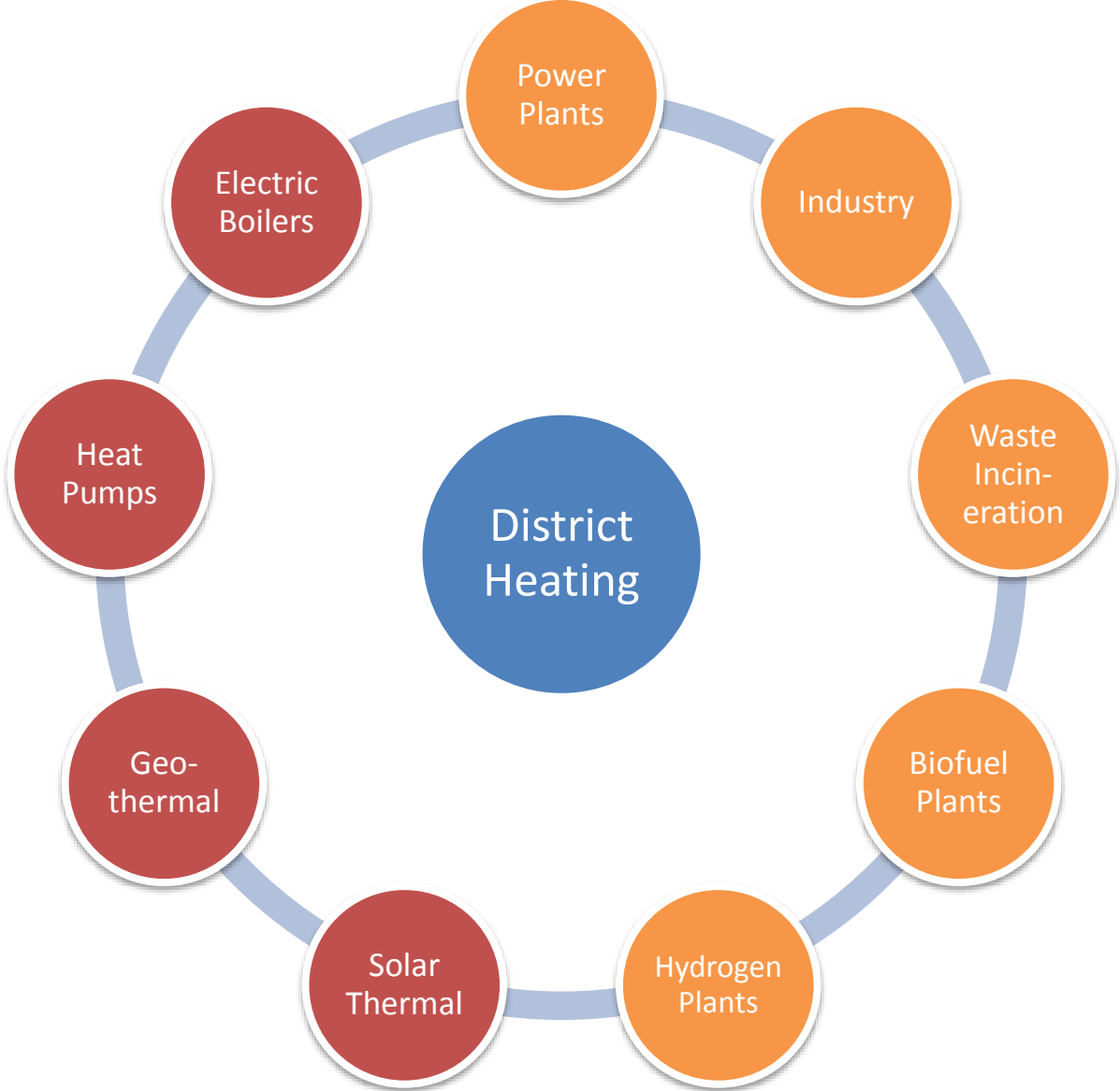
Efficient: More excess heat than we can use!



More 'excess heat' lost during electricity conversion than required in all EU buildings

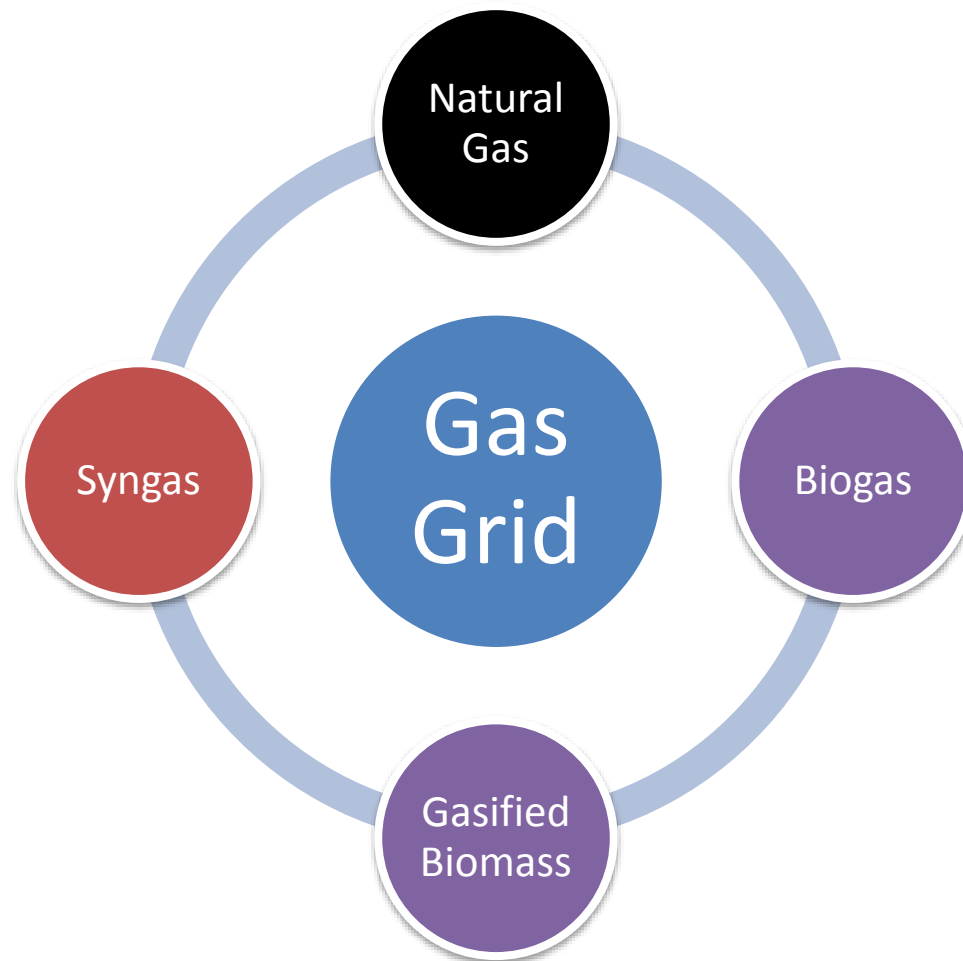
Potential Heat Sources for District Heating

Low value energy for a low quality demand



Potential Gas Sources for the Gas Grid

High value energy for a low quality demand



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?%
Heat Pumps

3. Networks

- Share a heating network:
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?%
District Heating

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30-50%
Reduction



Heat Roadmap Europe
2050 www.heatroadmap.eu

Conclusions

- **Savings:**
 - There is an economic balance between reducing heat and supplying heat
 - 30-50% heat savings is a good proxy for the economic limit of heat savings
- **Individual:** Heat pumps are the most suitable individual heating solution in a 100% renewable context
- **Networks/Urban:** District heating is the most suitable urban heating in a 100% renewable energy context

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Questions?

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