Future district heating including solar district heating !

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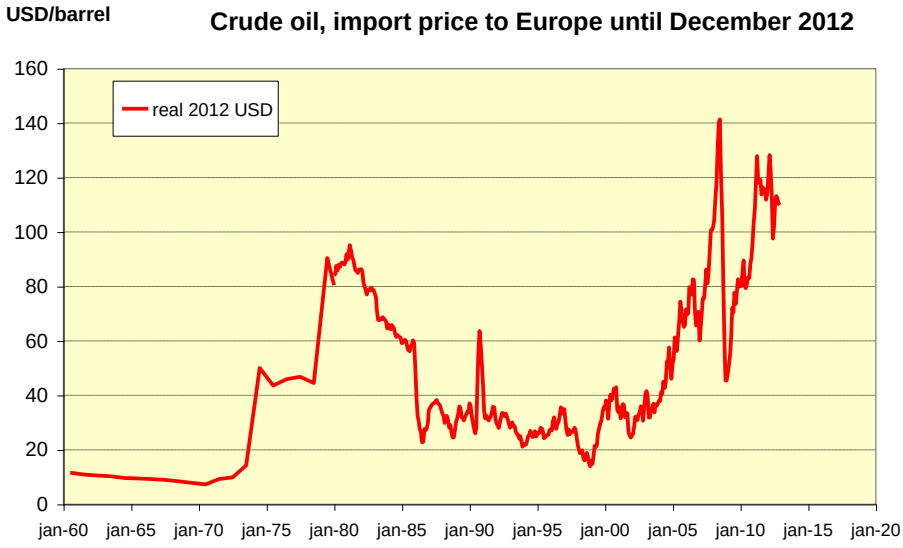
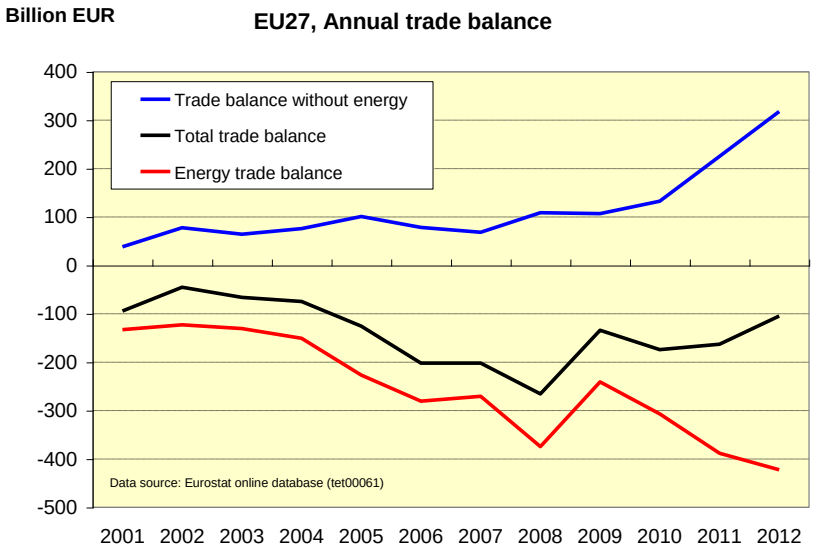
Outline

- Current energy cost level
- EU27 trade balance
- Fundamental idea of district heating
- Heat Roadmap Europe
- Future conflict between heat recycling and renewable heat supply
- Conclusions

Current energy cost level: Fossil fuels are expensive



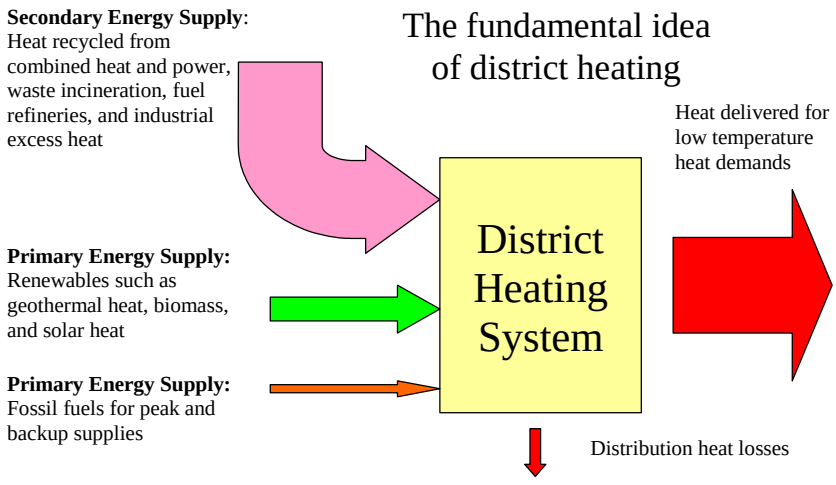
EU27 trade balance: Fossil fuels are expensive



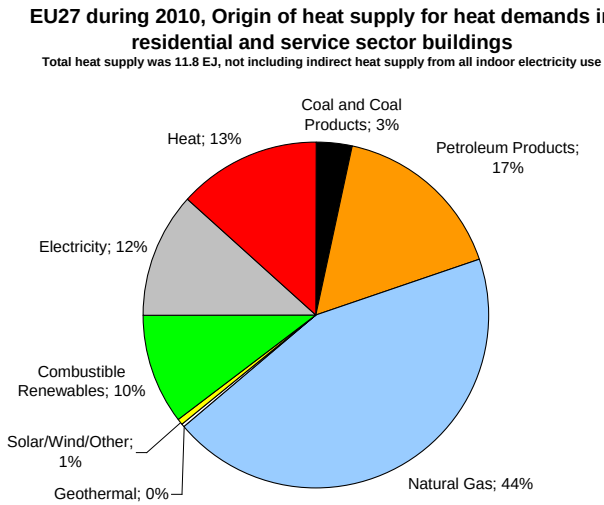
First conclusion

- Since fossil fuels are expensive, the EU27 trade balance will benefit from less import of fossil fuels
- Fossil fuels can be substituted with higher energy efficiency and renewables

The fundamental idea of district heating



Current heat supply for heat use in buildings

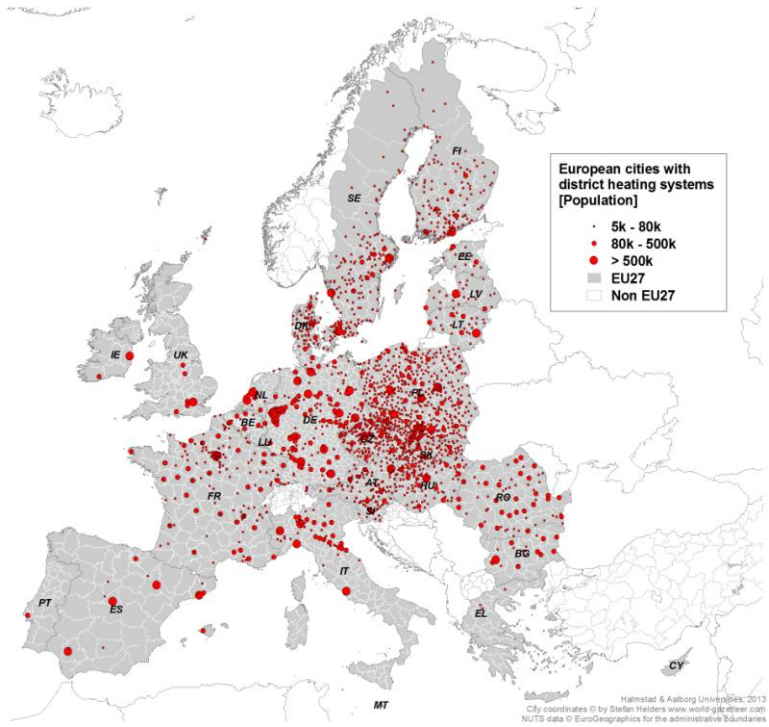


Premium district heating countries

- Countries with about half of the heat supply to buildings from district heating:
- Denmark, Sweden, Finland, Estonia, Latvia, Lithuania, and Poland.
- What would happen with the EU27 energy balance if the market share for district heating became 50% ?

Heat Roadmap Europe

- Cooperation between the Aalborg and Halmstad universities
- 1. Mapping of future possibilities
- 2. Modeling of the future benefits with 50% market share for district heating in 2050
- First pre-study, May 2012 (BAU-scenario), giving 10% lower heating costs with 50% district heating
- Second pre-study, May 27, 2013 (energy efficiency scenario with lower heat demands)



Current district heating systems

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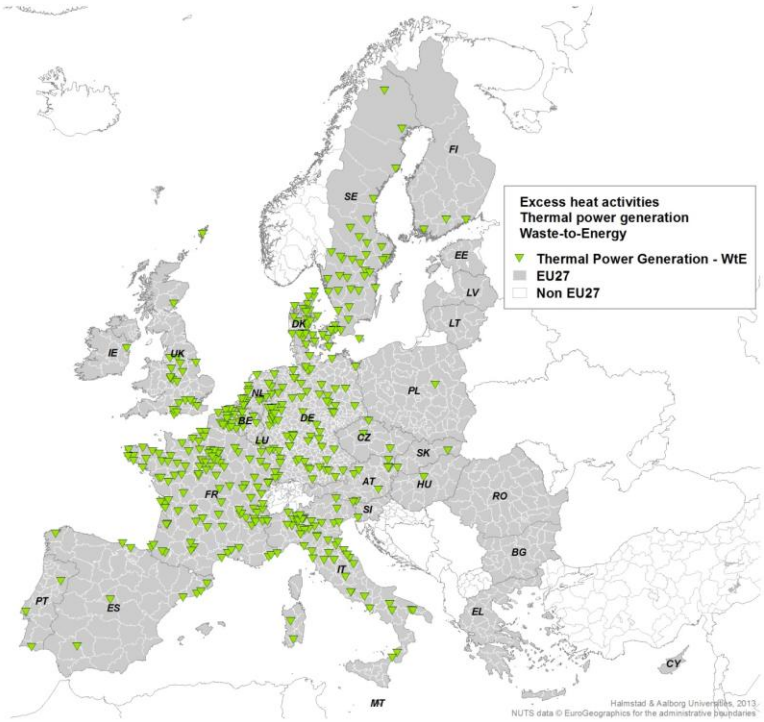

Current Waste-to Energy plants

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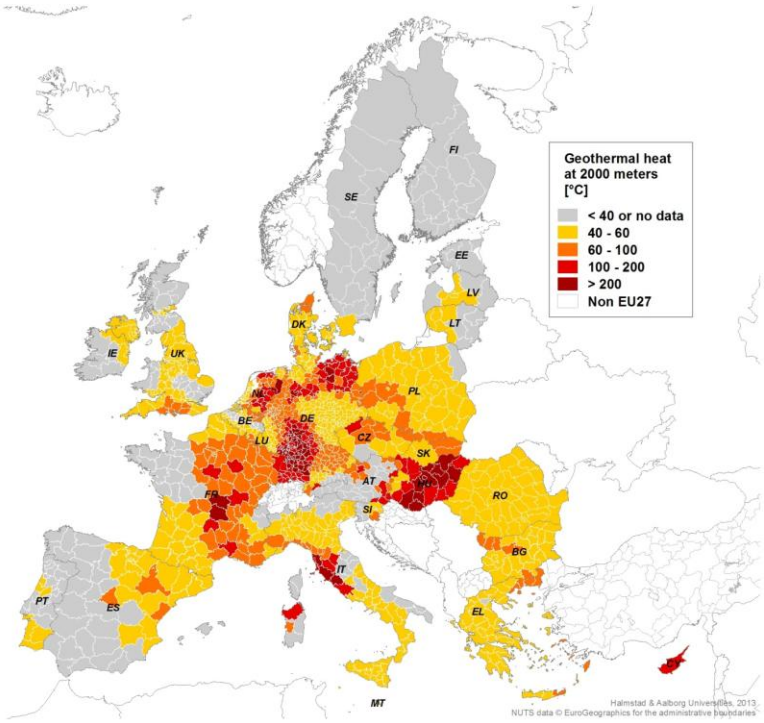

Geo-thermal heat

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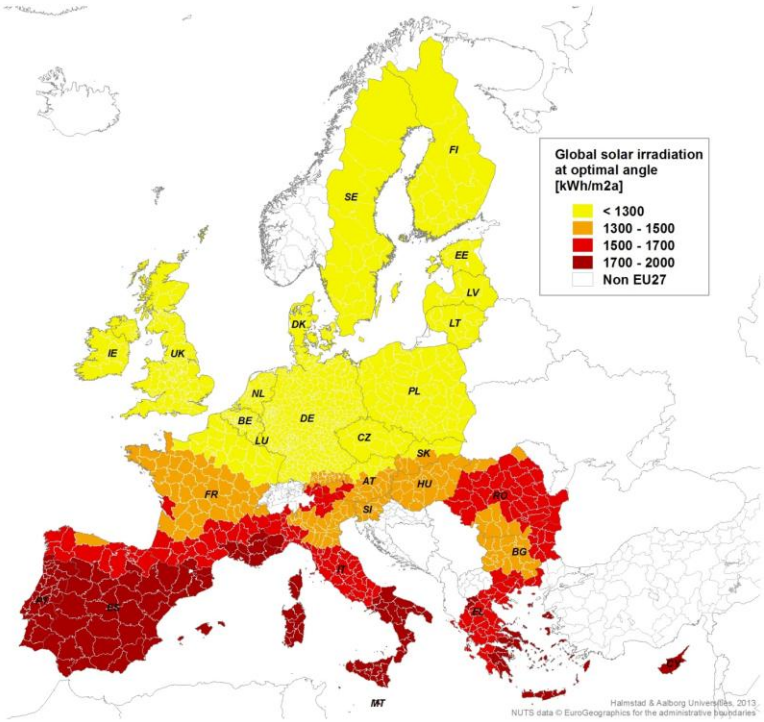

Solar heat

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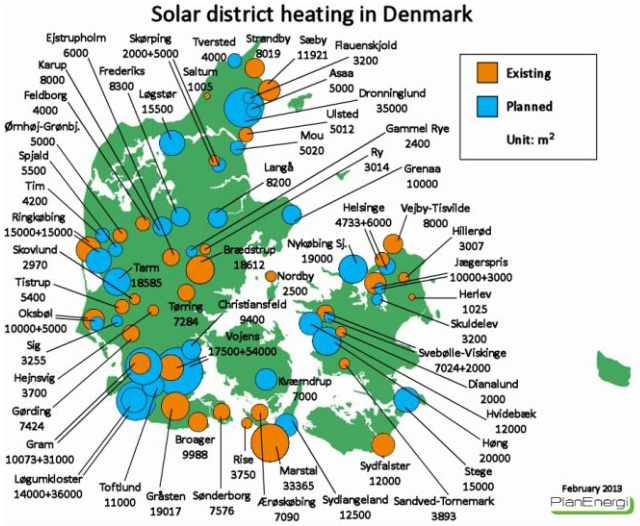
The Danish success story



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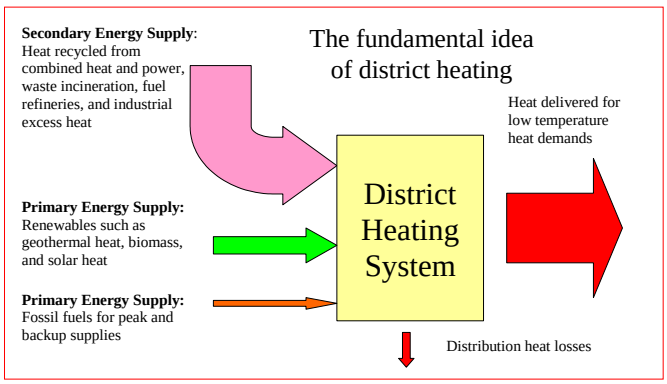
Solar energy in 2050 within the second Heat Roadmap Europe pre-study

- Total heat market for buildings: 2648 TWh
- Individual Solar Thermal: 130 TWh (5% of the heat market)
- District heating deliveries: 1324 TWh (50% of the heat market)
- Large-Scale Solar Thermal: 100 TWh (6% of heat supply in district heating systems)
- Excess Wind Power: 65 TWh (4% of heat supply in district heating systems)

Future conflict between heat recycling and renewable heat supply



Future conflict between heat recycling and renewable heat supply

- Can be solved by customer choices between solar heat and other heat supply as waste incineration.
- Customer choices can be introduced today by additional offer in the price model, giving customers a possibility to chose a certain proportion with solar heat with a certain price.

Conclusions

- Important to substitute fossil fuels due to European competitiveness and trade balance.
- District heating systems can recycle heat losses and bring in the renewables
- Solar heat can increase its competitiveness by using the economy-of-scale in district heating systems (solar collector fields and seasonal heat storage)
- However, a conflict between heat recycling and renewable heat supply in some systems