Heat Roadmap Europe: Potential for Waste-to-Energy in District Heating Systems

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What do we do?

- Technical and socio-economic analysis
- Hourly simulation of energy systems
- Scenario building for deeply decarbonised and 100% renewable energy systems

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Our purpose in HRE4

• Creating scientific **evidence** to support long-term energy strategies at local, national, and EU level and empower the transition to a low-carbon energy system

• By **quantifying** the impact of various alternatives for addressing the heating and cooling sectors
HRE1, 2, 3, 4

- Study 1 (2012): will district heating play a role in the decarbonisation of the European energy system?

- Study 2 (2013): what is the balance between heat savings and heat supply at an EU level?

- Study 3 (2015, STRATEGO WP2): low-carbon heating and cooling strategies for 5 member states

Key findings

Everywhere
- Deep energy savings
- Combine savings and supply
- ~30-50% demand reduction

Urban areas
- District energy networks
- High demand density areas
- Supply ~50% of energy demand

Rural areas
- Mainly heat pumps
- Low demand density areas
- Remaining ~50% of the energy demand

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www.heatroadmap.eu
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Key findings for WtE

- WtE can and should be used in district heating systems
- District heating needs to develop
- The constraints are mostly geographic and temporal
- Planning approaches can be aligned

District heating source shares in HRE 2050

- CHP plants
- Geothermal
- Heat pumps
- Solar thermal
- Industrial excess
- Electric boilers
- Fuel boilers
- Waste incineration
- Fuel production heat recovery
1. DH needs to develop

- Without a DH system in place it is not possible to use WtE as efficiently
- These potentials exist all over Europe – especially in Spain!
2. Spatial and temporal

- Spatially, heat is more local than eg. electricity
- Temporally, only so many baseload sources can be cost-effectively integrated
  - Better locations of eg. WtE could allow for higher levels of integration
3. Planning approaches align

- In terms of effecting change, WtE and district heating have high synergies
- Efficient conversion and use of energy
- Collective approaches
- Part of municipality-led agency

~20 EJ/year
~5500 TWh/year
Conclusions and questions

There is potential to use WtE in district heating systems, as an a part of circular waste management

• District heating needs to develop
• The constraints are mostly geographic and temporal
• Planning approaches align

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Heat Roadmap Europe: www.heatroadmap.eu

Pan-European Thermal Atlas: www.heatroadmap.eu/maps

HRE Twitter: @HeatRoadmapEU

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