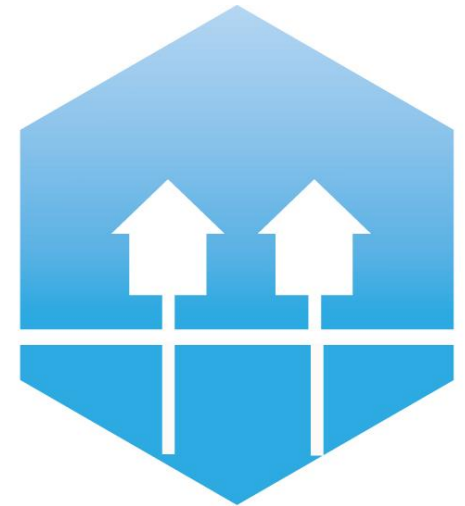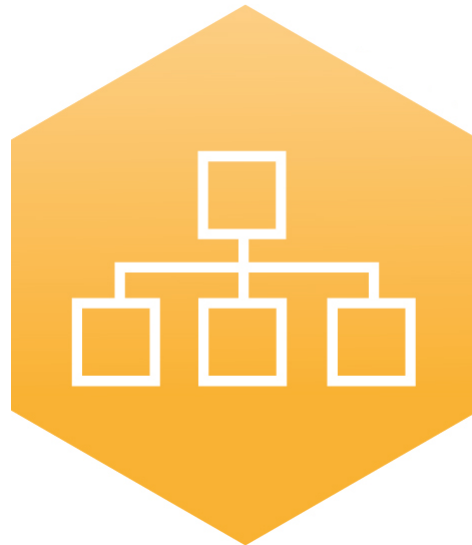International Conference on Smart Energy Systems and 4th Generation District Heating
Copenhagen, 25-26 August 2015

Matching heat demand with heat supply resources in district heating systems

David Maya-Drysdale
Aalborg University, Sustainable Energy Planning

Introduction - STRATEGO

http://stratego-project.eu/

- WP2: Deep assessment of national heating and cooling strategies
  Czech Republic, Croatia, Italy, Romania, and the United Kingdom

  - What heating and cooling technologies do we need?
  - How much of each technology and how do these technologies fit with the rest of the energy system?
  - How much district heating is feasible?
  - How much renewable & excess heat resources are available?
  - **Quantify** what the impact will be

- 16 partners from 12 EU countries
  - AT, BE, CZ, DE, DK, ES, HR, IT, PL, RO, SE, UK
- 32 month project
  - From April 2014 until November 2016

AALBORG UNIVERSITY
DENMARK

International Conference on Smart Energy Systems and
4th Generation District Heating, Copenhagen, 25-26 August 2015

Today's presentation

Can we match the district heating demand with available renewable heat resources in the future?

STRATEGO method

2050
BAU heat
demand → 2050
Heat
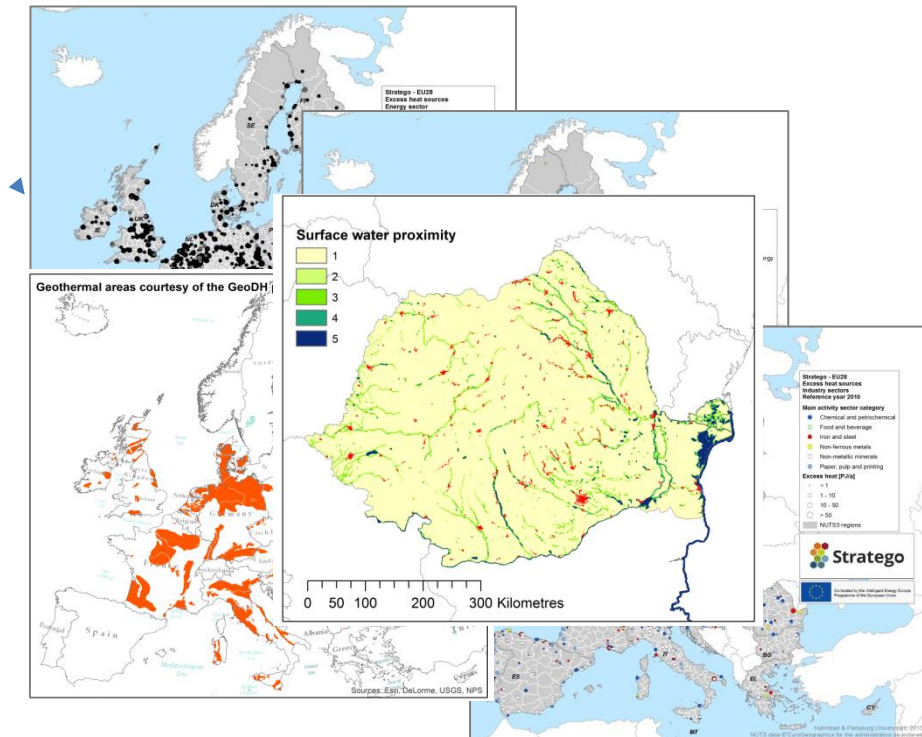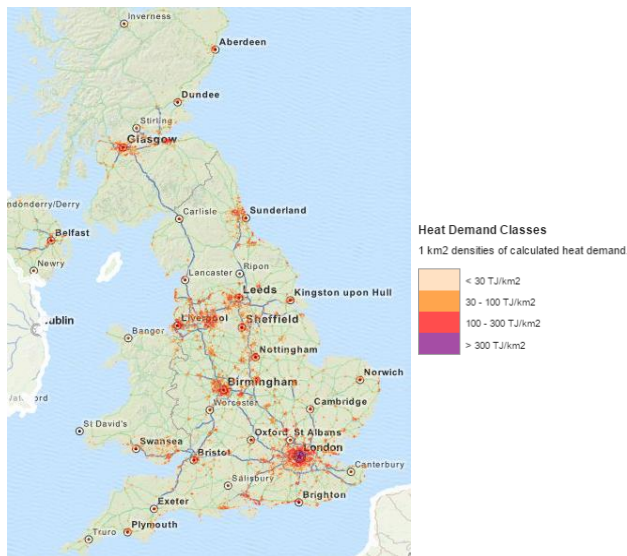savings → 2050 DH
potential → Renewable
heat
potential

How much district heating is feasible & renewable resources available?

District heating potential

	Czech Republic	Croatia	Italy	Romania	United Kingdom
% of heat demand	40%	40%	60%	40%	70%
District heating supply	40 TWh	7 TWh	258 TWh	35 TWh	251 TWh

How much renewable & excess heat resource is available?

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Can we match the resource with district heat?
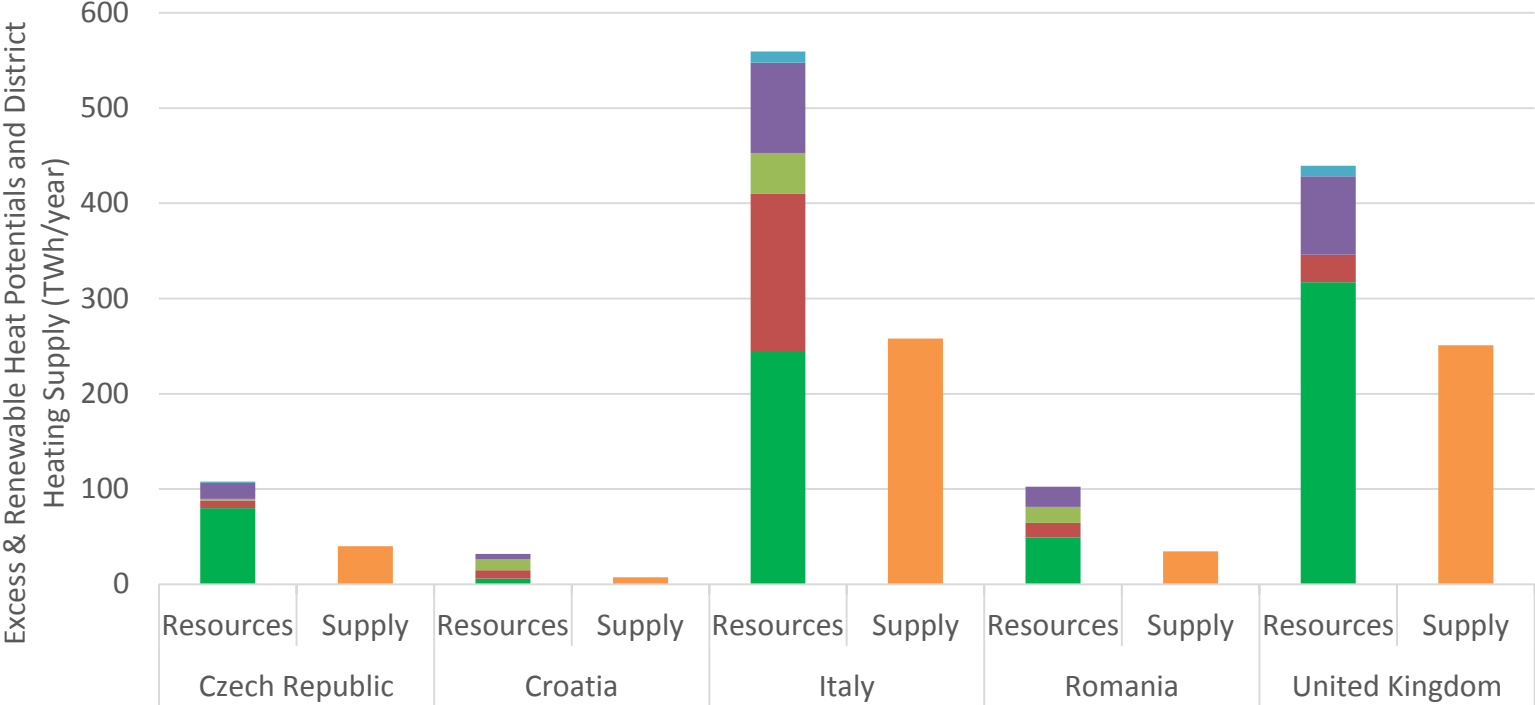
- Decide how much of each resource to implement
    - Resource available
    - Technical specifications
    - Cost
    - Reliability of the supply in the future

How to match heat demand with resources: baseload restrictions

- Some renewable heat sources supply baseload and are not fluctuating
  - Industry excess heat
  - Waste incineration
  - Geothermal

	Czech Republic	Croatia	Italy	Romania	United Kingdom
2050 baseload % of district heating	31%	28%	26%	42%	32%

How to match heat demand with resources: cost

- Industrial excess heat is usually the cheapest, followed by waste incineration heat and finally, geothermal heat

How to match heat demand with resources: security of supply

- A geothermal plant is more predictable over the long term than industry

- Waste incineration in the future may reduce due to an increase in recycling or a reduction in people's waste
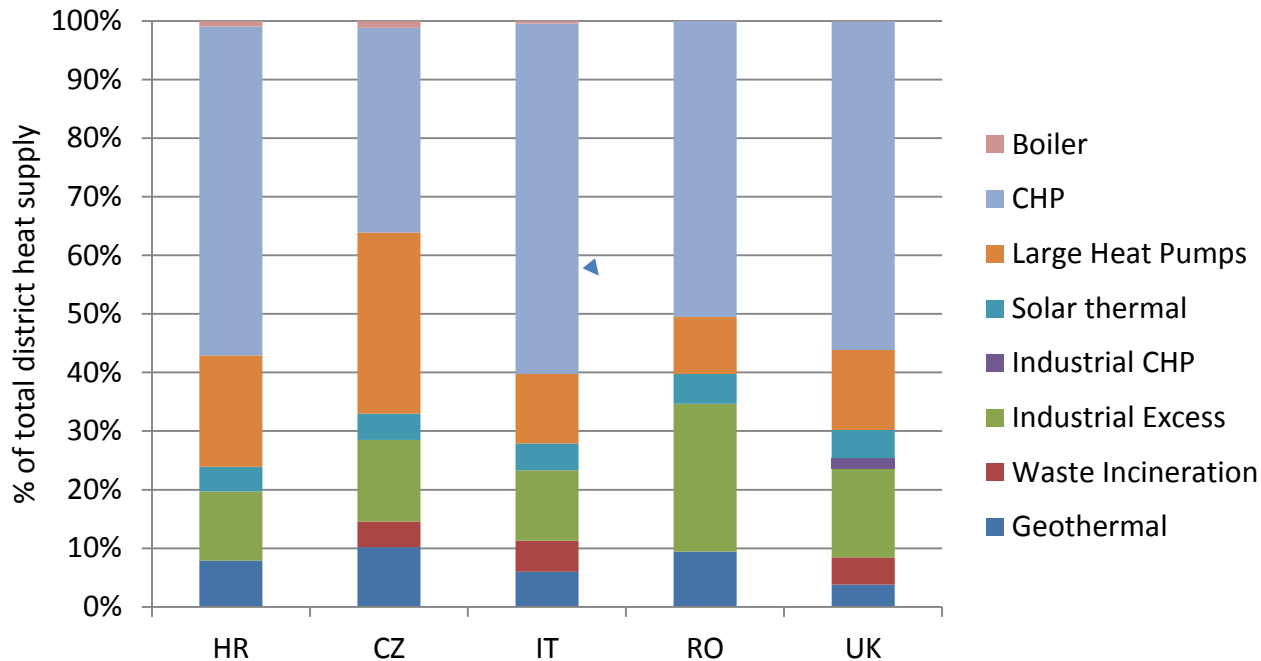
Final baseload integration

Utilised (% of total DH production)	Czech Republic	Croatia	Italy	Romania	United Kingdom
Geothermal	11%	9%	7%	10%	4%
Waste incineration	4%	0%	5%	0%	5%
Industrial excess	16%	14%	13%	28%	16%
Total baseload supply	**31%**	**23%**	**25%**	**38%**	**25%**
Total baseload demand	31%	28%	26%	42%	32%

Renewable & excess heat integration

First attempted investigation

Further information

http://stratego-project.eu/

http://www.heatroadmap.eu/

Thank you