District Energy in the City of Gothenburg

- Business models

Ulf Hagman

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Göteborg Energi

celsius smart cities

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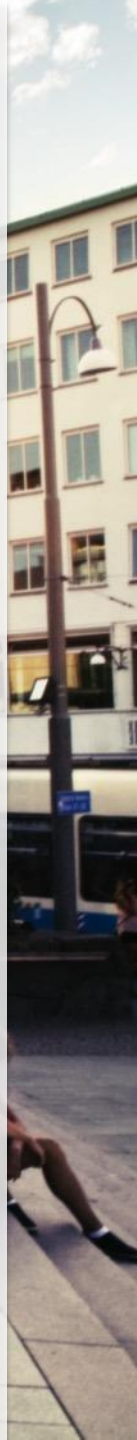


Our responsibility

Gazing into the future

Important developments:

- Smart Energy Networks
- Energy efficiency
- Business models

R&D – in order to be at the forefront

Research

- Collaboration with Chalmers University
- Research foundation
- Trade organisation research

Strategic development projects

- CELSIUS
- Electricity
- Riksbyggen Positive Footprint Housing
- HSB Living Lab
- FED

CELSIUS background

- One tool for reaching the energy efficiency targets
- Replicability of district heating / cooling concepts
- Roll-out of smart DH and DC by presenting ‘best practice’

- Total budget MEUR 26, EU Contribution MEUR 14

CELSIUS

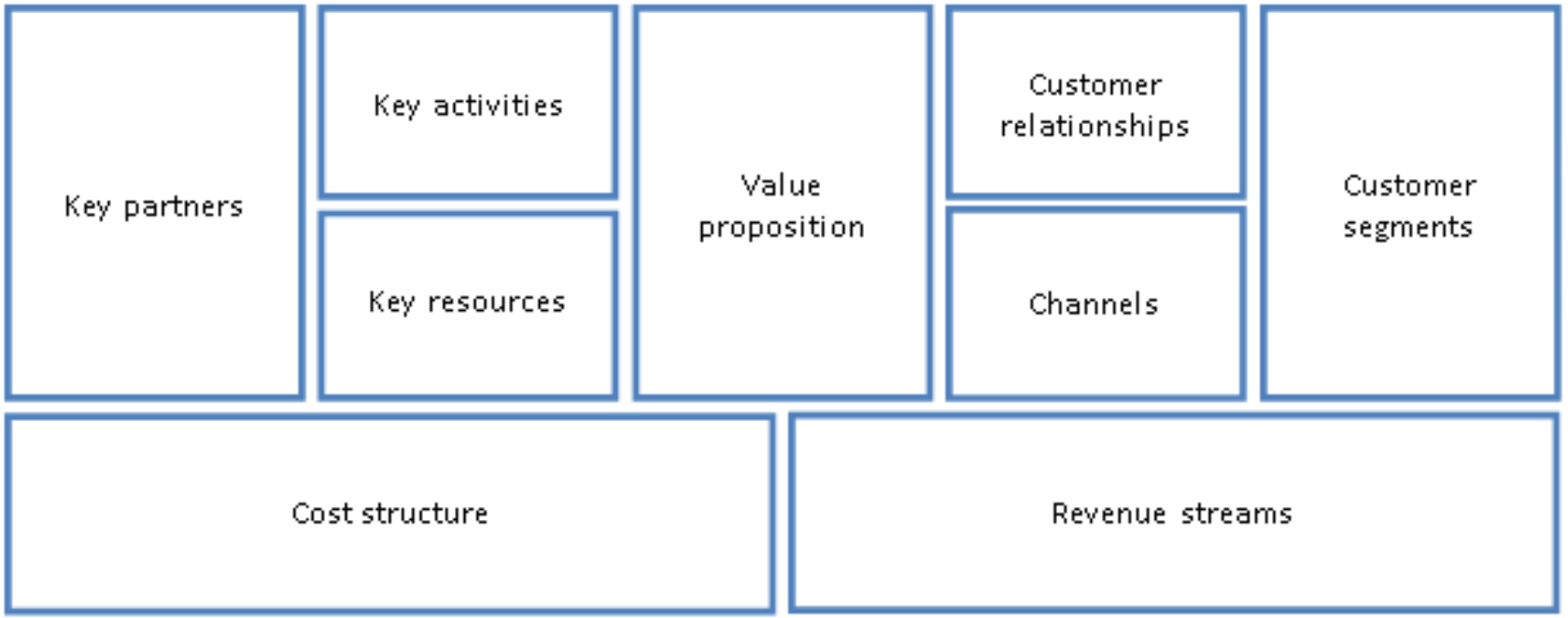
- 5 partner cities: Gothenburg, London with Islington Borough, Genoa, Cologne, Rotterdam
- 20 renowned partners
- 4 years: April 2013 – December 2017
- 10 new Demonstrators + 20 existing
- Goal of 50 CELSIUS Member Cities
- Knowledge transfer
- Legislation and policy work
- A growing network with the addition of CELSIUS City Supporters

Challenges for DH in Sweden

Reduced demand	Changed customer requirements	Rule changes	Cost structure
1. Energy efficiency in existing buildings 2. New buildings have very low heat demand 3. Less remaining potential for conversion to district heating 4. Increasingly efficient heat pumps 5. A warmer climate 6. Hard to find new profitable markets for DH companies	1. The customers wants to be able to influence their heating costs 2. Customers want DH with specific climate and environmental properties 3. Lack of confidence among customers 4. Questioned environmental and climate benefits	1. Pricing rules and customer terms 2. Conditions for waste heat supplier access 3. Instruments and EU-directives without regard to the conditions for DH 4. The municipality law might limit the possibilities of supplying services	1. Substantial fixed costs 2. Large reinvestment needs, mostly within distribution systems 3. Fuel costs – increased chip prices and reduced reception fees for waste 4. High revenue demand from the owner might result in reduced competiveness 5. Low electricity prices, lower income for combined heat and power (CHP)

Source: CELSIUS WP6, based on business case document for district heating (Rydén, Sandoff et al. 2013)

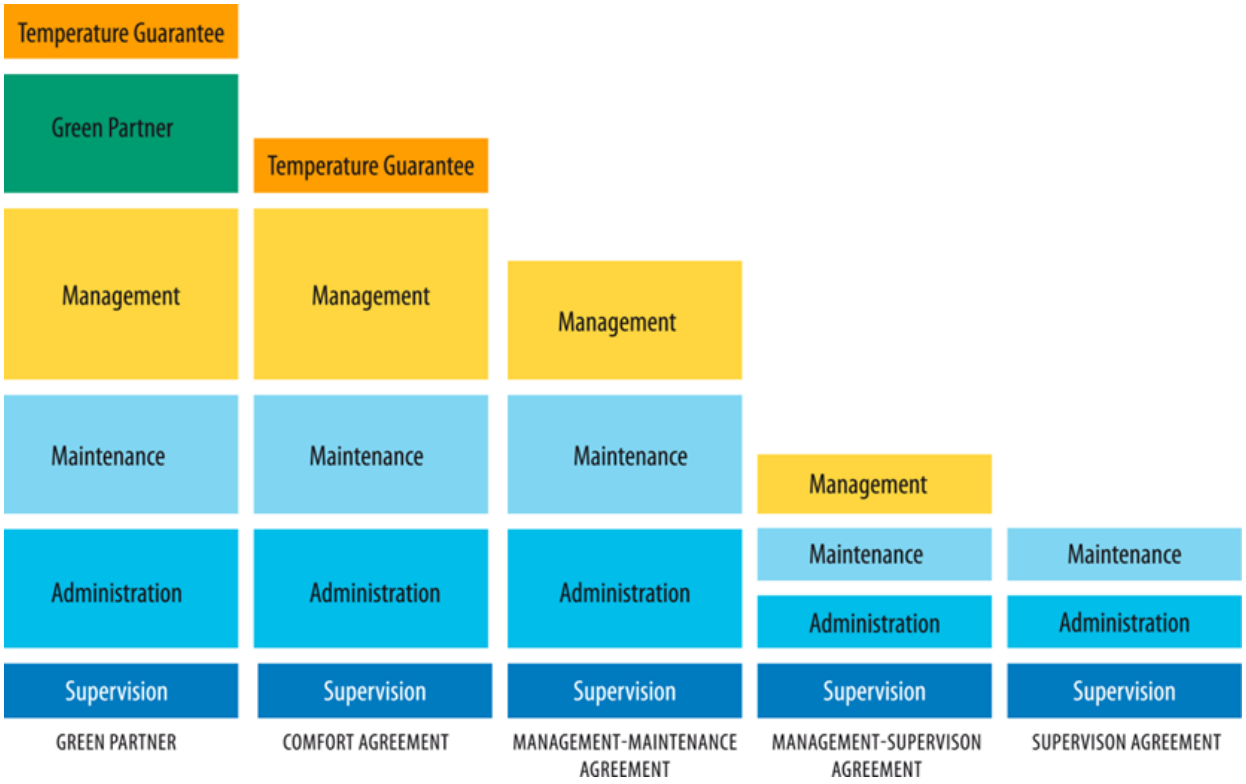
Business model framework



1. Value proposition to customers
2. Strategic endurance and competitiveness
3. Infrastructure and resources
4. Economy

Source: CELSIUS WP6, based on business case document for district heating (Rydén, Sandoff et al. 2013)

Possible added values



The 5 levels of Energy Service Agreements offered by Göteborg Energi.

- Energy efficiency Services - comfort agreements to supervision
- Other products in combination (EV charging infrastructure, DC, Optofiber etc)?

Key factors for success in Gothenburg

- Environmental concern and political pressure
- Taxation on fossil fuels
- Low cost heat (Industrial waste heat, and waste fuels)
- Long term investment policy – multiple years for new connections
- Long term supply contracts
- Several price models, and seasonally adjusted price levels

DH is a local business

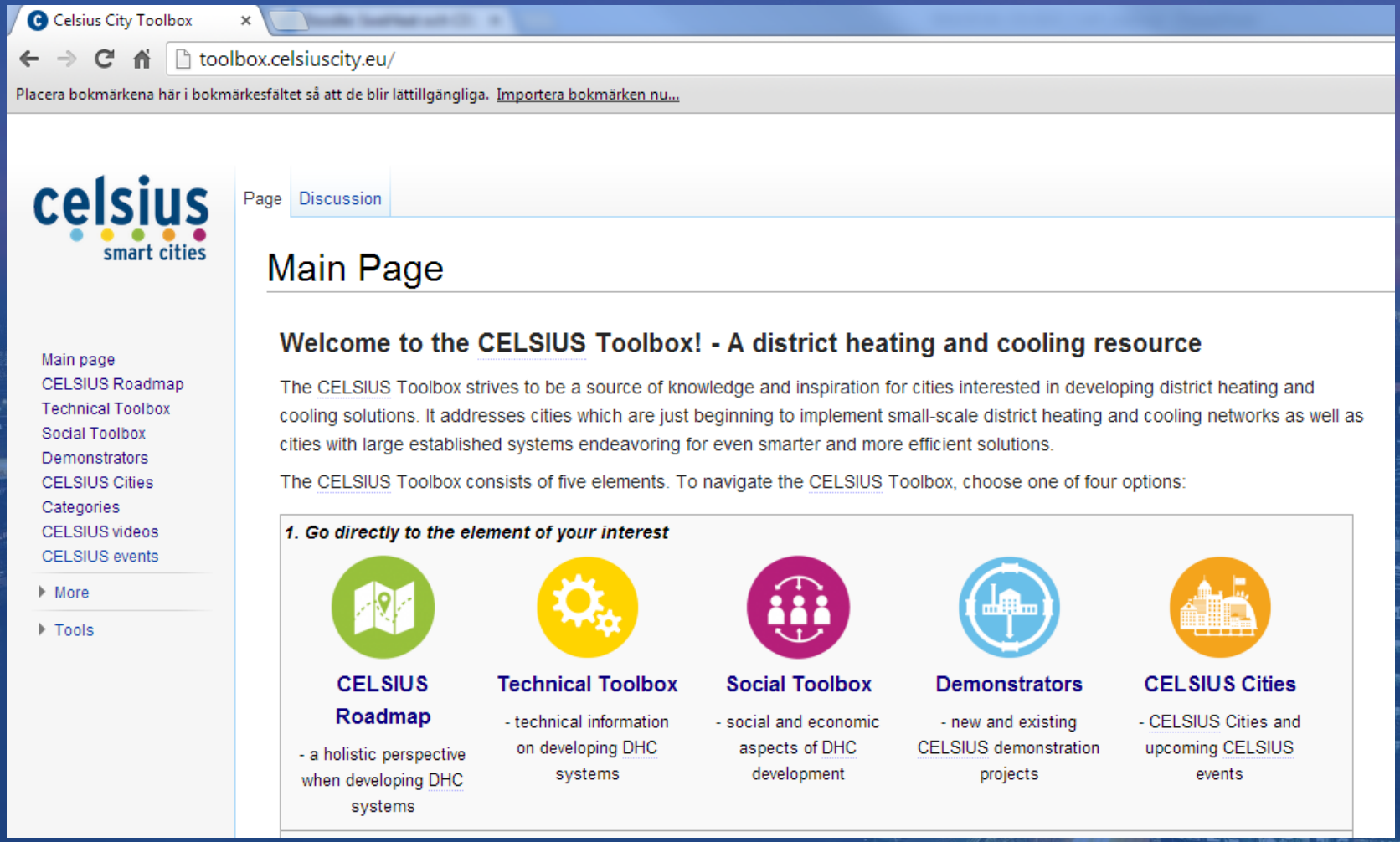
- Specific waste heat supply
- Logistics and presence of waste fuels
- Market size and segments
- Competition

=> But cooperation between cities is possible regarding technology and business models etc

Generating value for CELSIUS Member Cities

1. *CELSIUS Toolbox/ wiki*
2. *CELSIUS Demonstrators*
3. *Workshops and webinars*
4. *Expert group*
5. *Network– Legislation, collaboration*

CELSIUS Wiki – an online resource



CELSIUS-demonstrators

Categories

- Sustainable production
- Storage
- Infrastructure
- System integration
- End-user

Examples

- Waste heat recovery, river cooling
- Heat hub, short-term storage in buildings
- Small, large network
- Integrate systems, municipalities
- Climate agreements, DH to white goods

http://celsiuscity.eu/demonstrator/

Thank you!

ulf.hagman@goteborgenergi.se

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