

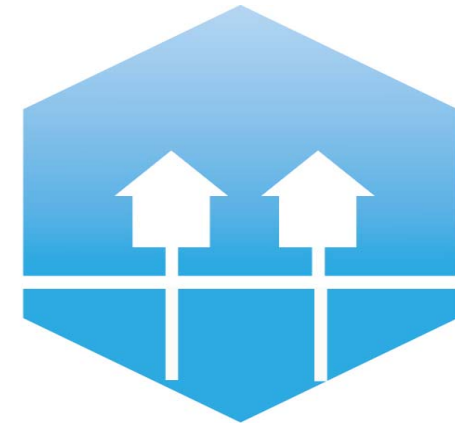
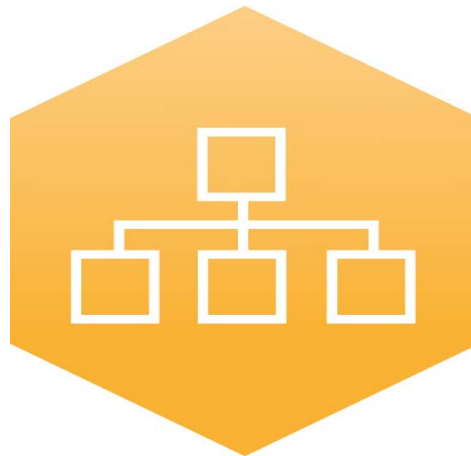
3rd International Conference on Smart Energy Systems and 4th Generation District Heating
Copenhagen, 12-14 September 2017

End consumer engagement as a key to successful implementation of 4th Gen DH

Christian Engel



AALBORG UNIVERSITY
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4DH

4th Generation District Heating
Technologies and Systems

How would you feel?

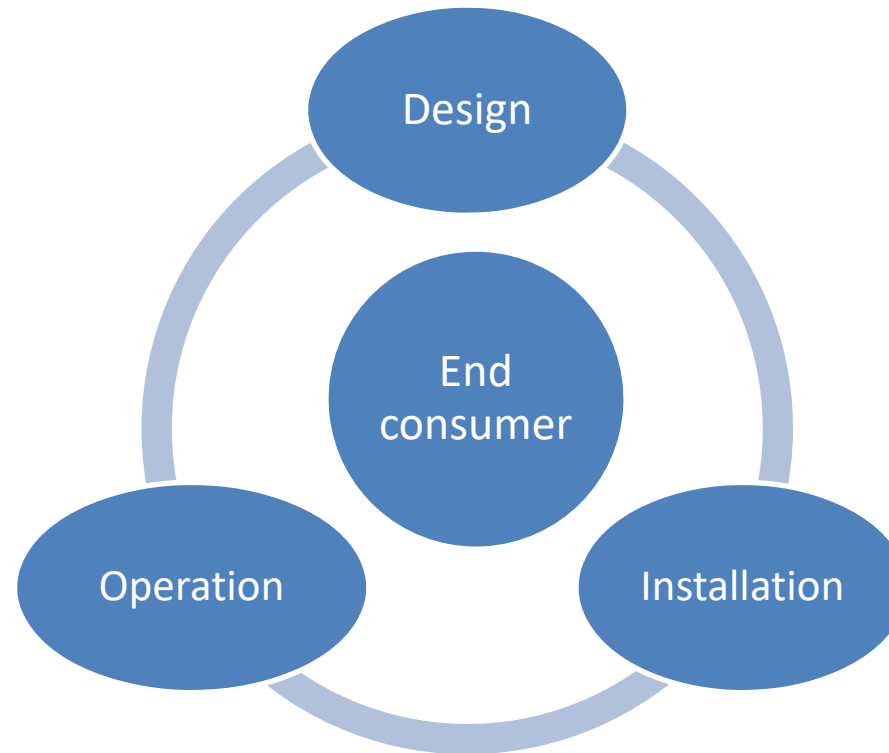


Key challenges during the installation

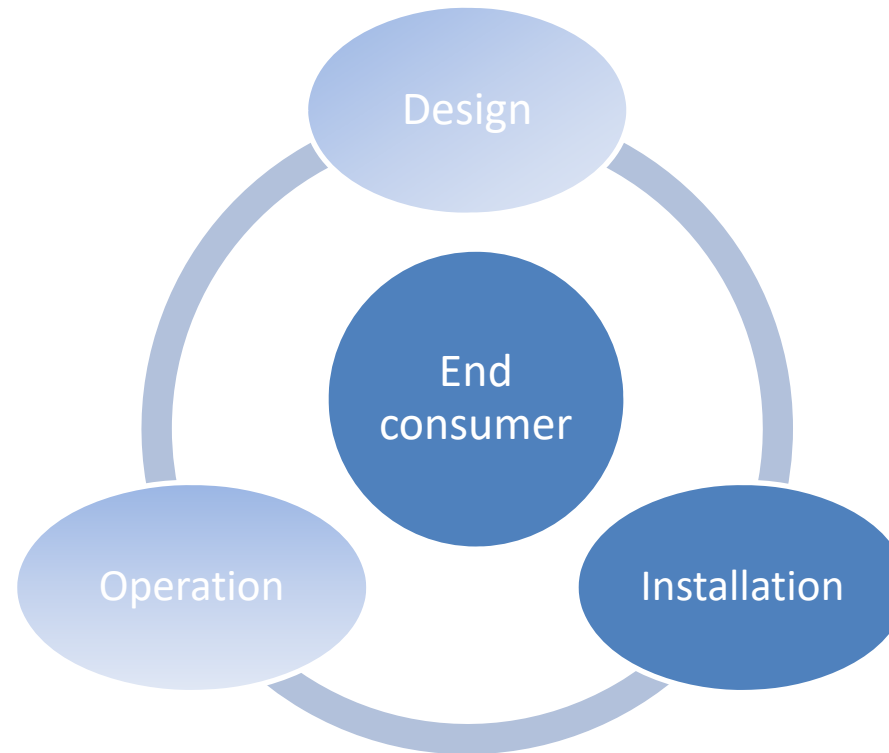
- minimum disturbance for the citizens (parking, access to their houses, noise, dirt)
- maximum safety for the installed systems (cables, pipes, etc)
- maximum saving of plants and trees



Involved in key Phases



Involved in key Phases



Purmerend District Heating



City north of Amsterdam
Serving 25.000 customer



Renovation of 4.000 house connections



Veolia Romania in Otopeni - a green city



Veolia (Dalkia) – Otopeni RO

All main streets untouched
30% installed into the existing ducts
Installation times reduced by 75%



Aarhus example



Low Energy houses: Wörgl in Tyrol/Austria

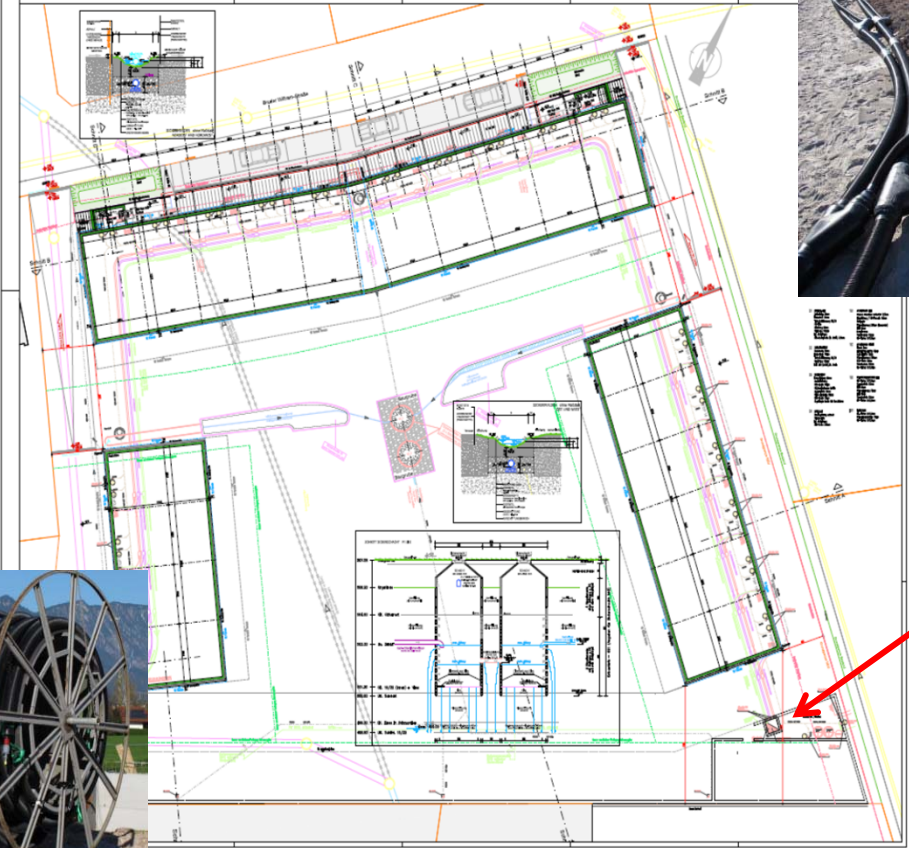
Carefree Heat for low
temperature
Houses 60 / 40 °C

Biomass/ Industrial waste
heat

Affordable houses
Designed for a social
housing developer



Low Energy houses



Connection to
DH Wörgl



Ready for young families



The technical solution proposed for Wörgl

The houses were made with a wooden construction based on a low-energy concept. A smart and sustainable heat and sanitary water supply was vital to secure an affordable comfort level for the residents of Wörgl.



Conclusions



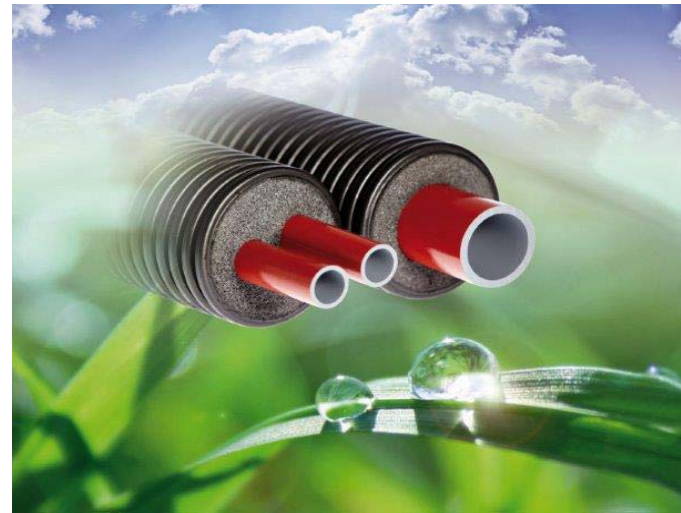
- ❖ **End consumer play a key role in 4th DH projects**
- ❖ **During Design, Installation and Operation, depending on the project**
- ❖ **Motivation factors for cooperation:**
 - ❖ **Good communication from the start**
 - ❖ **Minimum disturbance during installation**
 - ❖ **Care free & cheap heating/hot water/cooling**
 - ❖ **Getting rewarded on energy saving behaviour**





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Partners in over 45 countries
5 Thermaflex plants in Netherlands,
Poland, Russia, Thailand and Turkey



**DISTRICT ENERGY
IN CITIES
INITIATIVE**



Thank you!
Please share your comments.



Lets connect!

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