COOL DH: A PIONEERING PROJECT TO IMPLEMENT LTDH SYSTEMS AS AN INTEGRATED PART OF SMART ENERGY SYSTEMS

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COOL DH – Abbreviation

• Cool ways of using low grade heat sources from cooling and surplus heat for heating of energy efficient buildings with new low temperature District Heating solutions.

• Cool DH is an EU funded project to enhance the Technology Readiness Level (TRL) of LTDH networks from single components to a real complete demonstration.
Timetable of Project

- 2017: Design and start of the project
- 2018 - 2019: Constructions and transitions
- 2020: Heat recovery process, Partly operation
- 2021: Completely under operation & monitoring
- 2022: Evaluation
Objective

• Demonstrating technologies to utilize low temperature waste heat for implementing LTDH systems.

• Demonstrations:
  – Full scale LTDH grid in Lund (Brunnshög) as the biggest LTDH – 4GDH
  – Full scale LTDH network Høje-Taastrup (Østerby) - 4GDH
  – ULTDH Demo in Lund - 5GDH
Demos

Brunnshög (Sweden)

Østerby (Denmark)

*The project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement n° 787799-COOL DH- H2020-EU.2016-2017/782016-EU-2017-RIA-IA*
Main Characteristics

- Integration of heat pumps for heat recovery and topping hot water
- 2 LTDH networks (4GDH)
- 1 ULTDH demo (5GDH)
- Prosumers role: Shopping, Bank data centers, Hotels
- New Plastic PE-RT pipes
- Flat stations
- Heat recovery pipes
- High RES share
COOL DH – Evaluations

- Energy performance: More efficiency, lower heat losses, higher COP
- Economical impacts: Lower cost and investment
- Emissions: Reduction in CO₂
- Social study: Increasing comfort, safety & customer satisfactions, Experiences & feedback
- Replicability: More than 800 DH utilities in both countries
RES usage

• Higher share of renewables and waste heat can be increased by lowering DH temperatures.
• Heat pumps are used to increase quality of low-grade waste heat.
• Renewable Energy Sources (RES) provide electricity of the network mainly driven by PhotoVoltaic (PV), hydropower and wind.
COOL DH - Challenges

- COVID-19 (Stop & delay)
- Coordination between companies & municipalities in two countries
- Progress is not the same as planned
- Low knowledge & experiences in innovations & new concepts
- Changes in project plans (Demos & fabrication)
- Communication with costumers and partners
COOL DH – Lessons Learned

- Predict unexpected events
- Importance of planning
- Mutual understanding
- Considering practical delays
- Training
- Flexibility for changes
- Having plans B, and C
- Social awareness
Briefly...

• COOL DH as a part of smart thermal energy network can be integrated into a smart energy system to make the cities more efficient in terms of energy consumption, environmental and social impacts regarding economical aspects.

• The replication of this project can be facilitated by experiences and lessons learned of that.
THANK YOU

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