

NET ZERO CITIES Spring school

23.3.2026

The catalyst for BeyondEE pilot

Strategic options
in change mindset



Energy Efficiency

- Low temperature DH-network
- Quality/Production price optimization, network as a battery



Energy sources

- Dynamic energy production
- Multi-source production



Energy storage

- **DEMAND RESPONSE**
- Daily storage
- Seasonal storage

District heating demand response pilot



Key learnings

1. Potential in responsibility
2. Evaluation of outcomes
3. Experimental culture and cooperation

1.

- Supplied together with heating system optimization
- Low investment cost → Suit well for income residential buildings

2.

- Master thesis worker was hired to develop and verify evaluation methods.
- Interim for integrations and compiling of reporting data

3.

- First multi-actor pilot in city DH-system
- Common development portfolio for city consortium actors

Key learnings

4. Implementing a statistical optimizer and forecast model

5. Smart metering is expensive but worth of it

6. Fault identification and tuning

4.

- It is not too complicated, but required specialist for forecasting etc. (interim)
- Would have been very difficult to include in pilot procurement

5.

- Room sensors indicate faults. Possible permanent repair effect. Increase performance, opex and capex significantly

6.

- System is not ready when it's delivered
- Require 3 to 6 month monitoring period (not intense, but systematical) per building to get best result.

Key learnings

7. Business case potential

8. Scalability

7.

- Pilot buildings were chosen randomly
- Optimization was tuned during the 1st pilot phase
- IRR for 8 years for only energy use optimization is -10%
- IRR with demand response is 27%
- Emission reduction correlates with economy

8.

- Average energy savings (Lappeenranta) 7 %
- Viable buildings are detectable by nominal heat demand and weather/power reaction speed.
- Large scada platforms are great (e.g. City of Lappeenranta) as one integration cover future expansions



Elämiseen!