

Best practice: Optimizing district heating and cooling systems in Helsinki

Maiju Westergren, VP

Twitter: @maijuwes

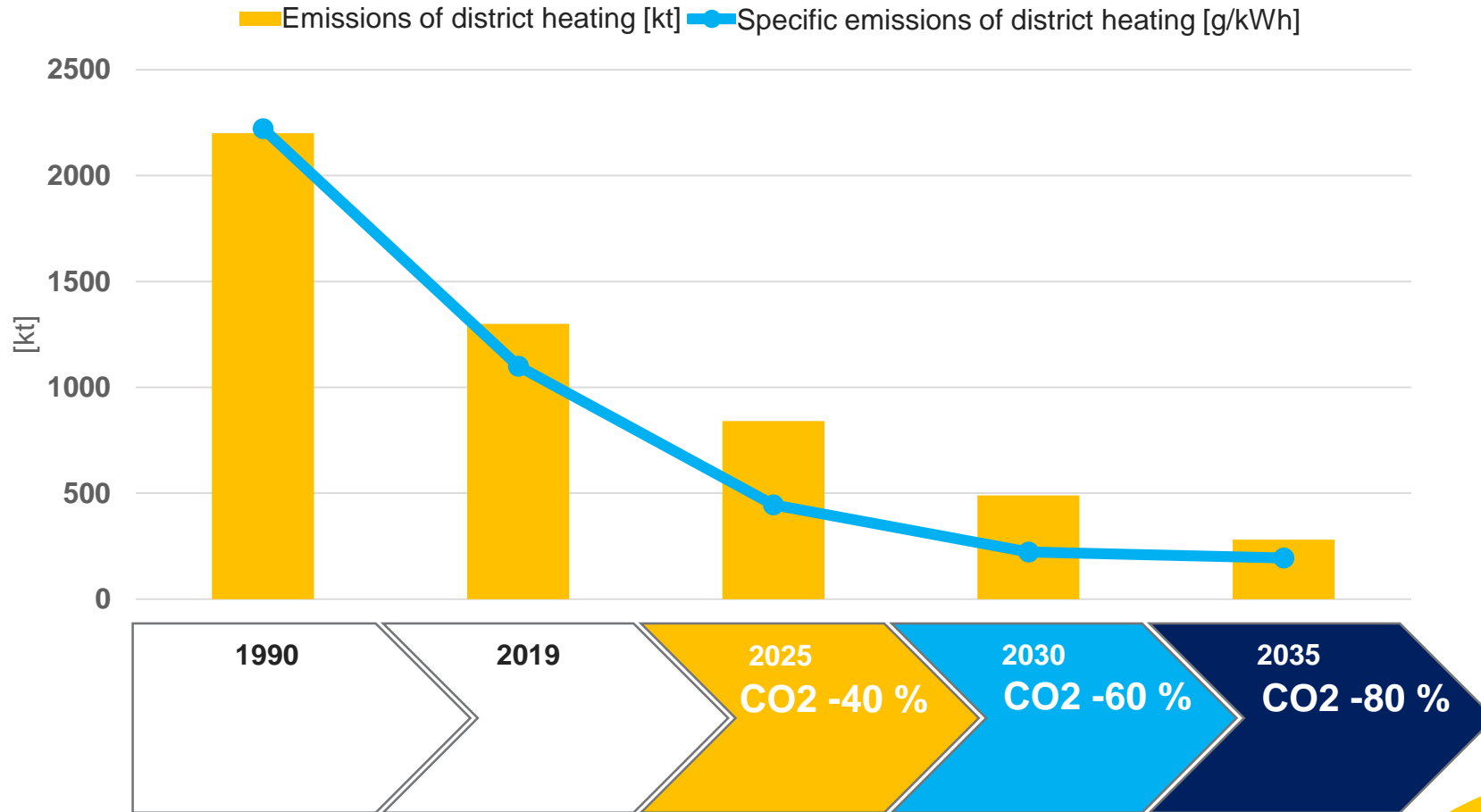


Our vision is to be
**the most customer-driven energy company in
the market.**

**We give everyone the chance to enjoy the
opportunities of the new energy era.**

Climate change | Urbanisation | New technologies

Towards carbon-neutral heating



HOW?

- ✓ CO2 free production
- ✓ Heat storages
- ✓ Optimization
- ✓ Energy Efficiency
- ✓ Customer side solutions

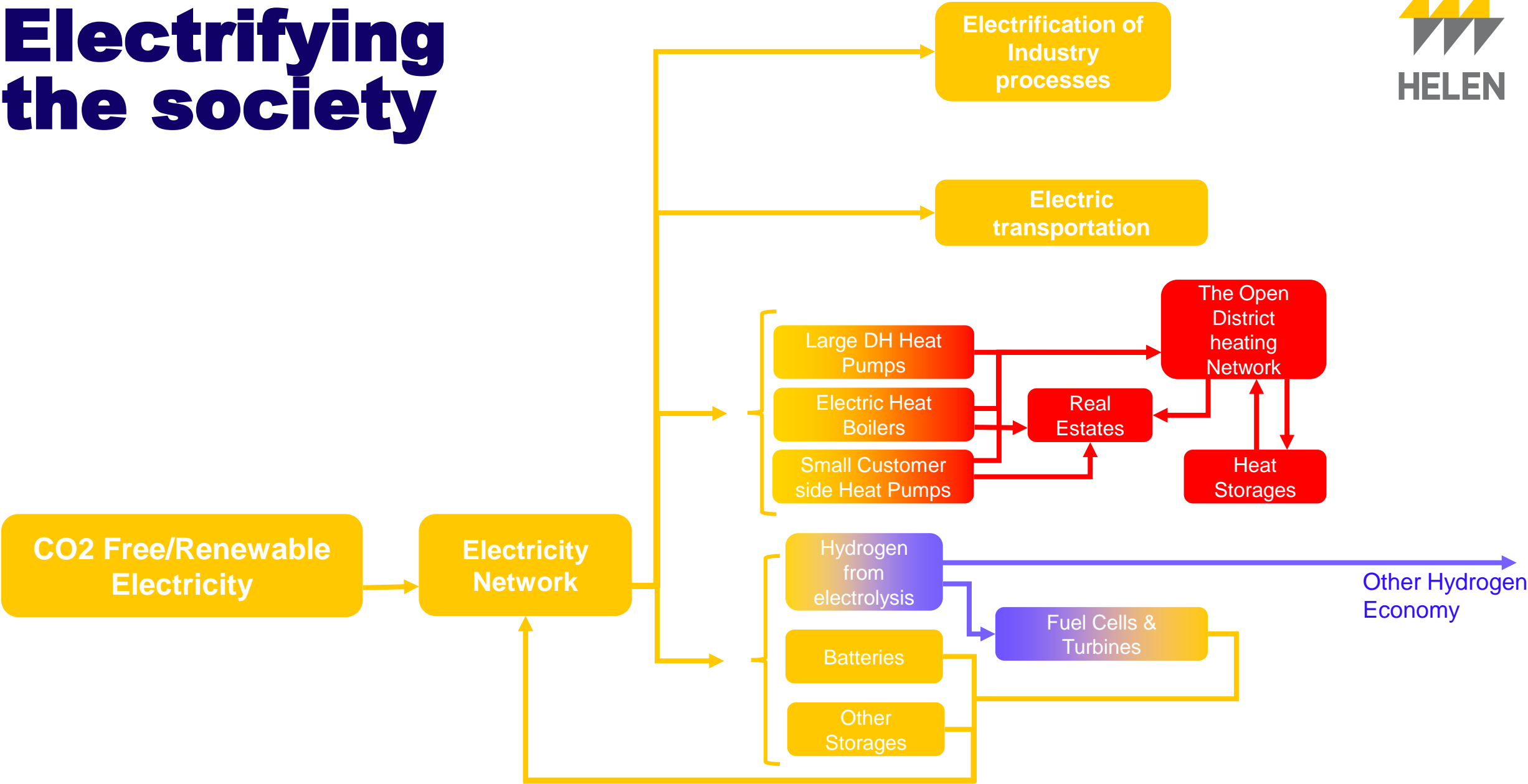
Energy Optimization

A method to reduce primary **energy** consumption which leads to optimize the costs

- **Optimization** in energy production and consumption?
- **Optimization** in energy system?
- **Optimization** in residential buildings



Electrifying the society



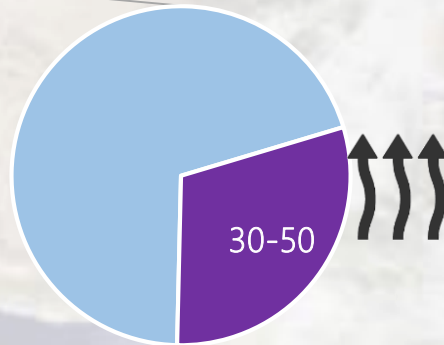
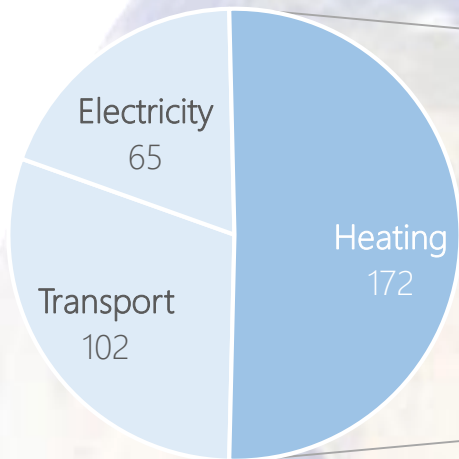
Heat is the dominant energy form

Gradyent is on a mission to reduce losses

Half of the ~340 EJ/year global energy consumption is heat ...

... and almost a third of this is lost

Worldwide Final Energy consumption (IEA)
2014, Exajoule (EJ)

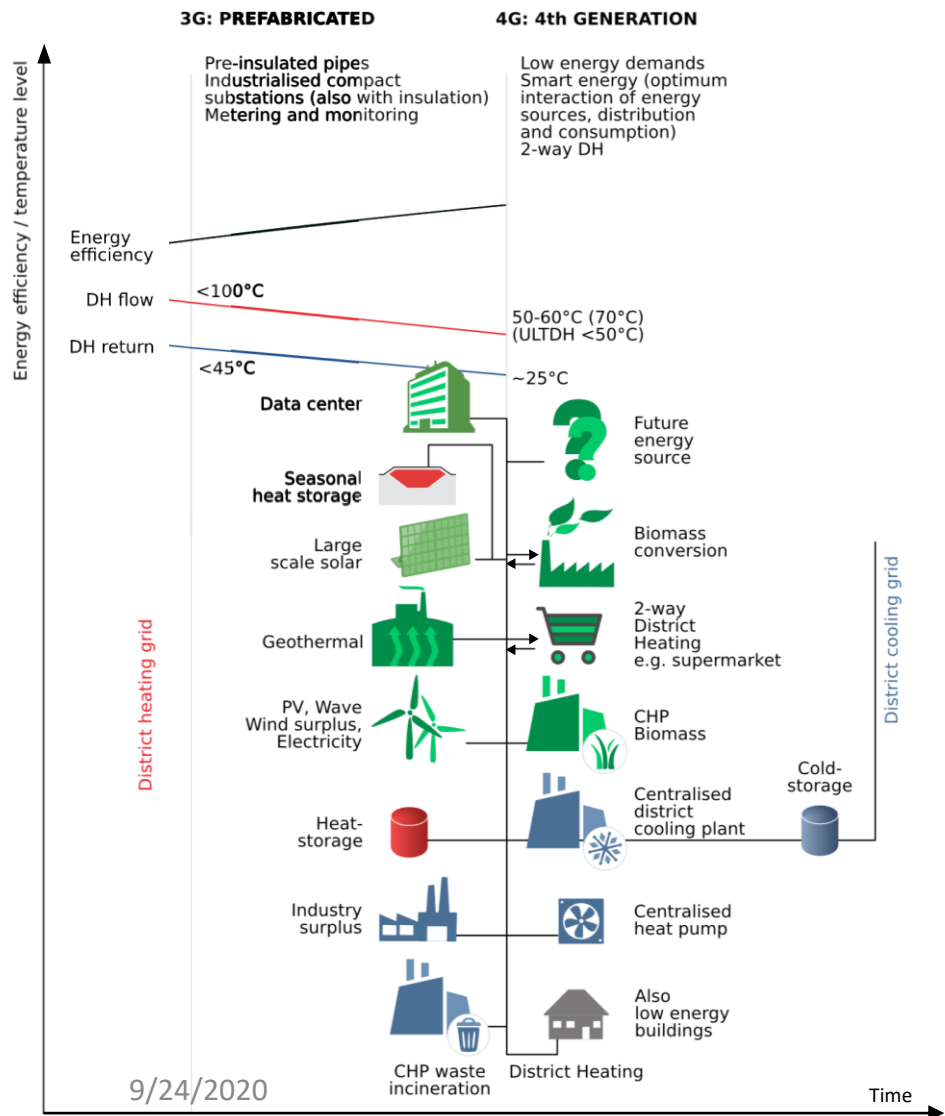


- ✗ Poor insulation
- ✗ Poor process
- ✗ Poor controls

Gradyent°

Enabling more sustainable heating through smart networks powered by data and AI

District heating networks are moving to 3rd and 4th gen which can only work with advanced digital systems



Requirements for digital systems



End-to-end

Integrated modeling of the interplay between sources, network and customers



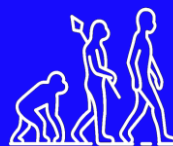
Multi-level control

Control systems that enable optimal interaction between sources and network



Granular and precise

Unnecessary temperature margins limited, while minimizing risks of shortages

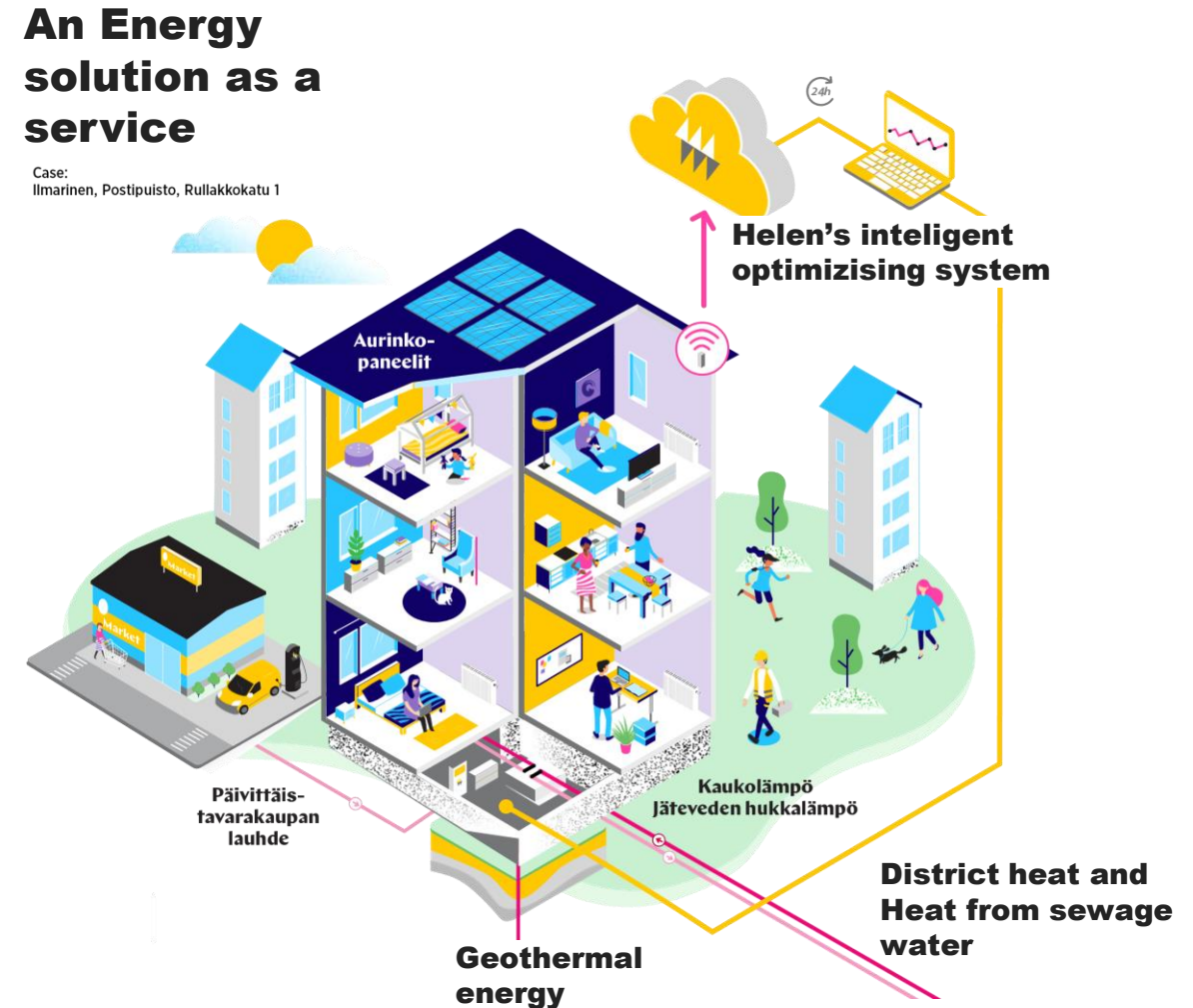


Adaptive

Easy to change and update with the evolution of the network

The customer and Helen developing together

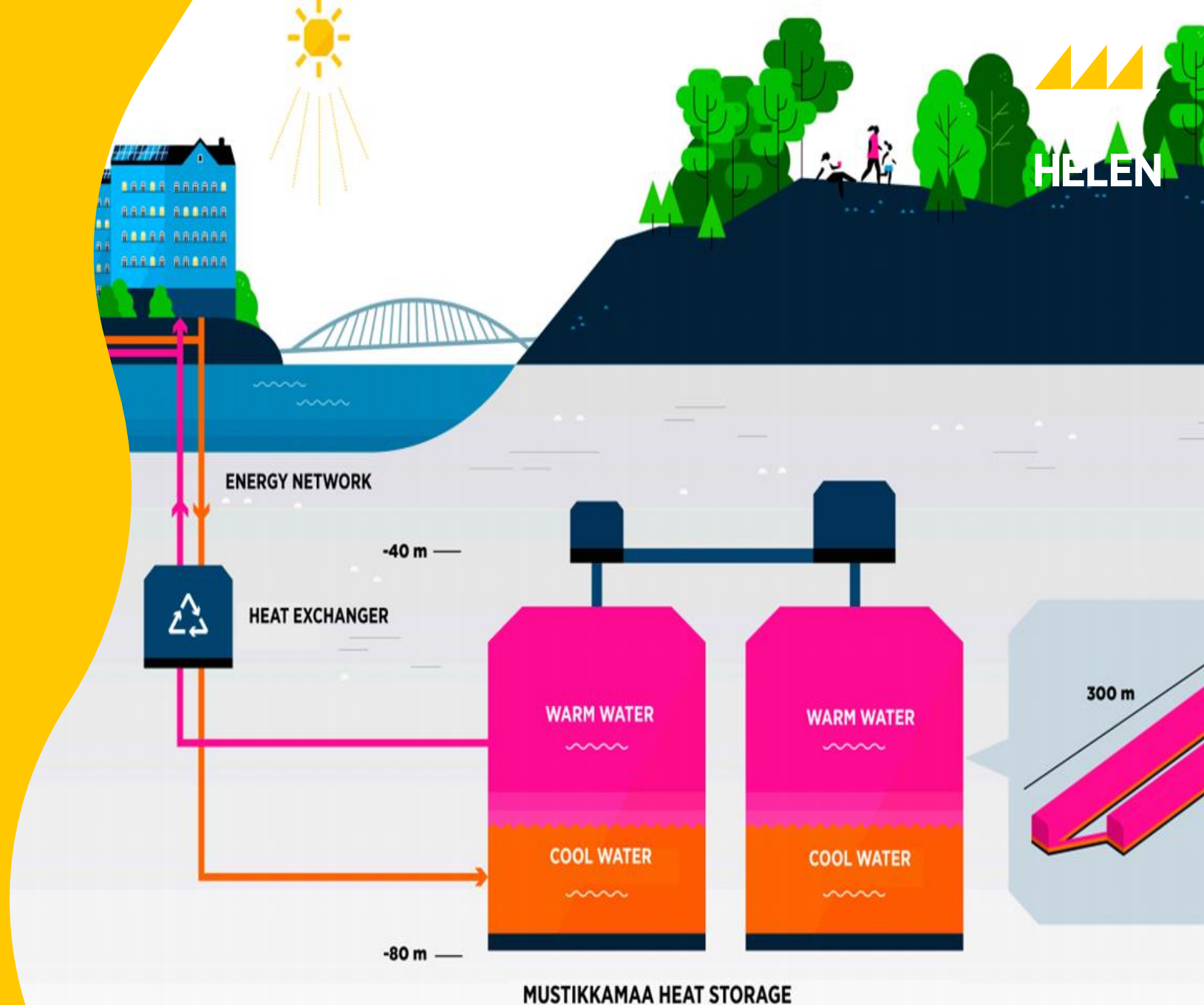
- A new customer solution that utilizes many heat sources
- The Residential house produces itself the most of the heat and cooling that is needed
- The solar panel are minimizing the amount of electricity bought outside
- The diverse heat sources are supplementing the renewable district heating.



CASE: A Giga size Heat Storage

Old oil caverns are transformed as two giant heat storages, 120 MW

A large heat storage enables better optimization the production





HELEN

YHDISTETÄÄN VOIMAT