Temperature & Pressure Optimization in DH with **Demand | Response**
Traditional DH network

- Centralized production
- Highest demand
- High temperatures
- Significant losses
Demand driven DH network

iGRID Temperature Zones increase system efficiency with low-temperature zoning and demand-driven supply for district heating

- De-centralized zones
- Reduced heatloss
- Production effectiveness
- Lower emissions
How does it work?

Free flow solution
- Increased pressure
- High reliability
- Ideal heatloss reduction

Shunt solution
- Cost-effective
- Enough supply pressure
- No distributed pumping

Pressure reduction solution
- Too high pressure
- Pressure reduction valve
- Increased lifetime of pipes
Case study: Gentofte T-Zone

**Annual demand**
- 9,000 MWh
- 300 houses

**BEFORE**
- Temperature range: 79°C - 48°C
- Energy usage: 2,570 MWh
- Heat loss: 0 MWh
- CO2: 195 tonnes

**AFTER**
- Temperature range: 60°C - 38°C
- Energy usage: 1,950 MWh
- Heat loss: 14 MWh
- CO2: 149 tonnes

CO2 reduction: 47 tonnes
Heat loss reduction: 24%
Increased capacity: 620 MWh

https://youtu.be/lW1Sj8I0q6E
iGRID Solutions
iGRID Temperature Optimizer

- Optimal supply temperature
- Weather data
- Reduce heat loss (>20%)
- Peak-shaving algorithm
iGRID Pressure Zone

- Lower pressure in grid
- Reduced pump size
- Extend pipe lifetime
- Distributed pumps
iGRID Pressure Optimization

iGRID Pit Measure Point

Existing pits

TEG

Wireless pressure data
iGRID Pressure Optimization

- Optimized pressure
- Distributed system
- Increase pipes lifetime
Lowering return temperatures
Temperature optimization cycle

1. iGRID Solutions
2. iGRID Building Balancing
3. Data Analytics
Benefits of heat loss reduction in DH networks

480,000 GWh
district heating energy sold in 2017
with only a small amount of the energy based on renewables

800,000 households
European households could be supplied with free energy from a heat loss reduction of 20%
in half of the grid

600,000 GWh
district heating energy sold in 2030?
Most energy based on renewable sources

Source: Euroheat & Power
**Grundfos iGRID | Value proposition**

**Reduced heat loss**
By lowering the supply temperatures in district heating zones, the heat losses from the distribution pipes is reduced significantly (≈15-25%).

**End-to-end security**
Security is one of the most important focuses for Grundfos, our solutions are regularly penetration tested, focus on encrypted, secure data transmission,

**Possibility to utilise renewables**
Lowering the temperatures makes it possible to utilize carbon neutral energy sources effectively – e.g. surplus heat and geothermal.

**Increased production efficiency**
iGRID will contribute to reducing return temperature, which will increase the efficiency of boilers, since flue gas economizers can be utilized effectively.

**Prolonging the lifetime and reducing leakages**
By distributing pumps in the network, the pressures (and temperatures) will be reduced, prolonging the lifetime of pipes and system components.

**Improved system intelligence**
By having more pumps and thereby data points from the network, you will improve the system intelligence and optimization opportunities.

**Szabolcs Nagy**
Product Owner, iGRID
snagy@grundfos.com