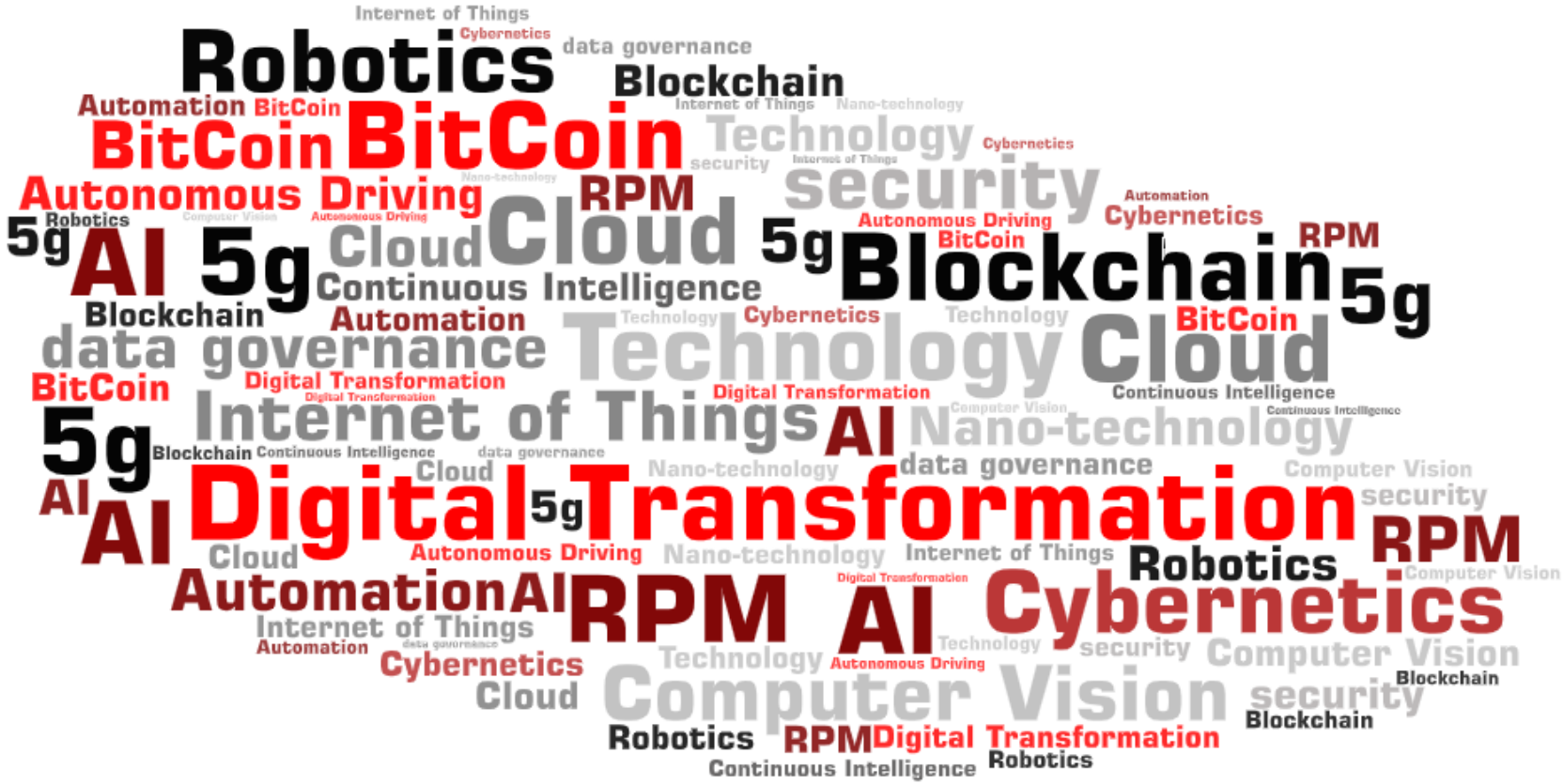
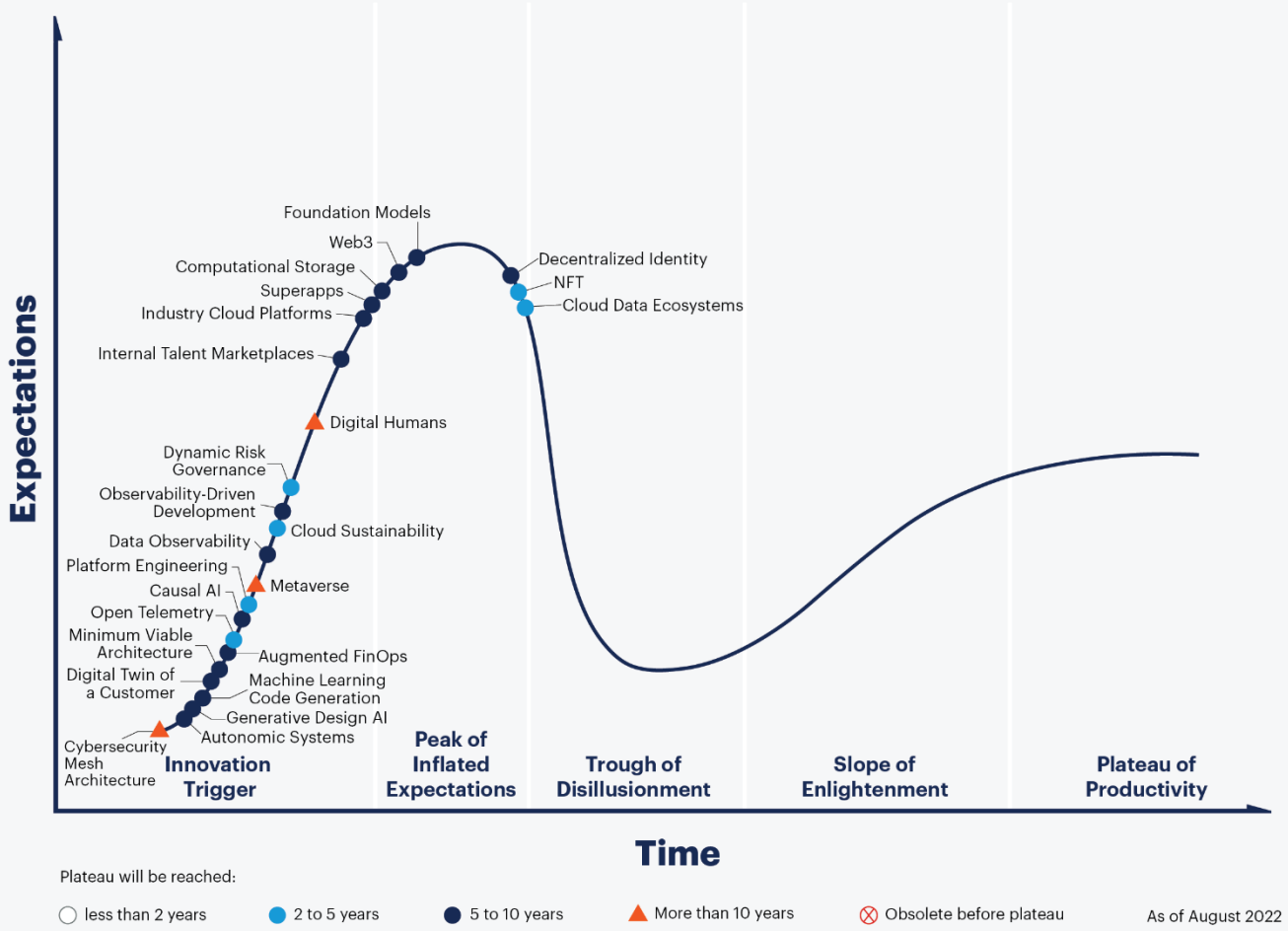


https://www.intellective.com/is-digital-transformation-being-replaced/

Hype Cycle for Emerging Tech, 2022

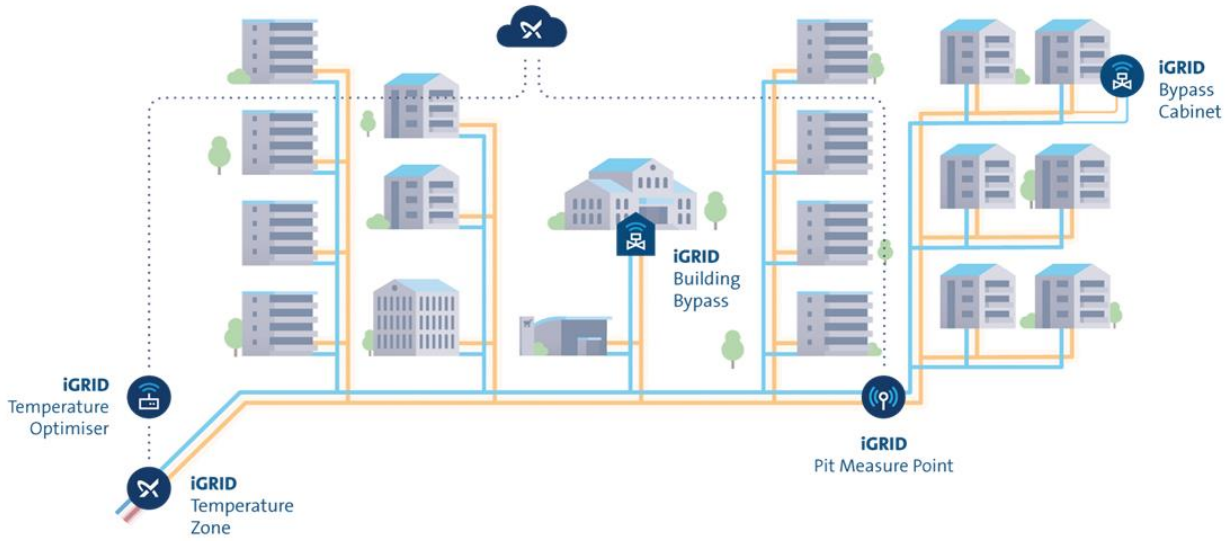


gartner.com

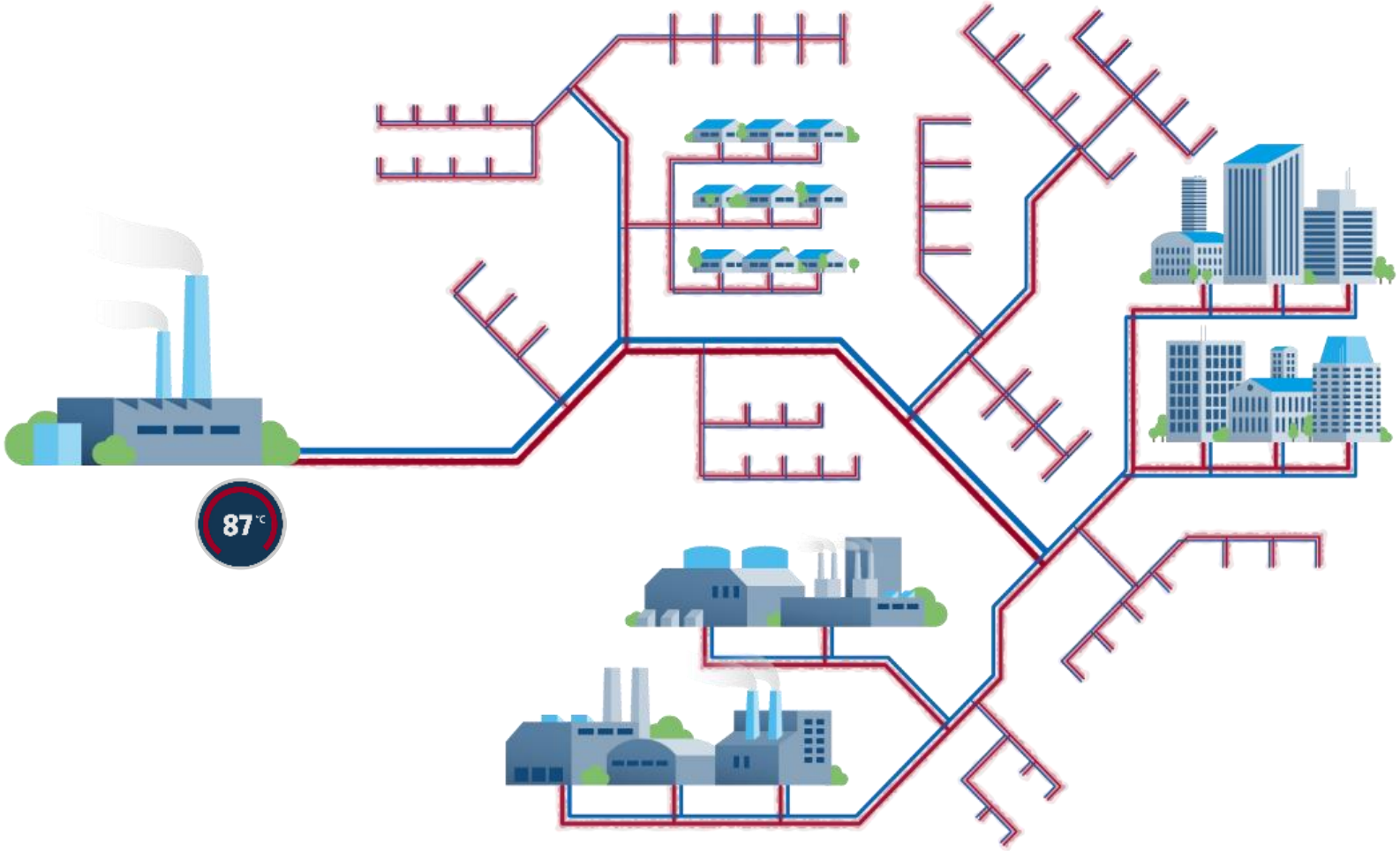
Source: Gartner

Gartner

Temperature & Pressure Optimization in DH with Demand|Response



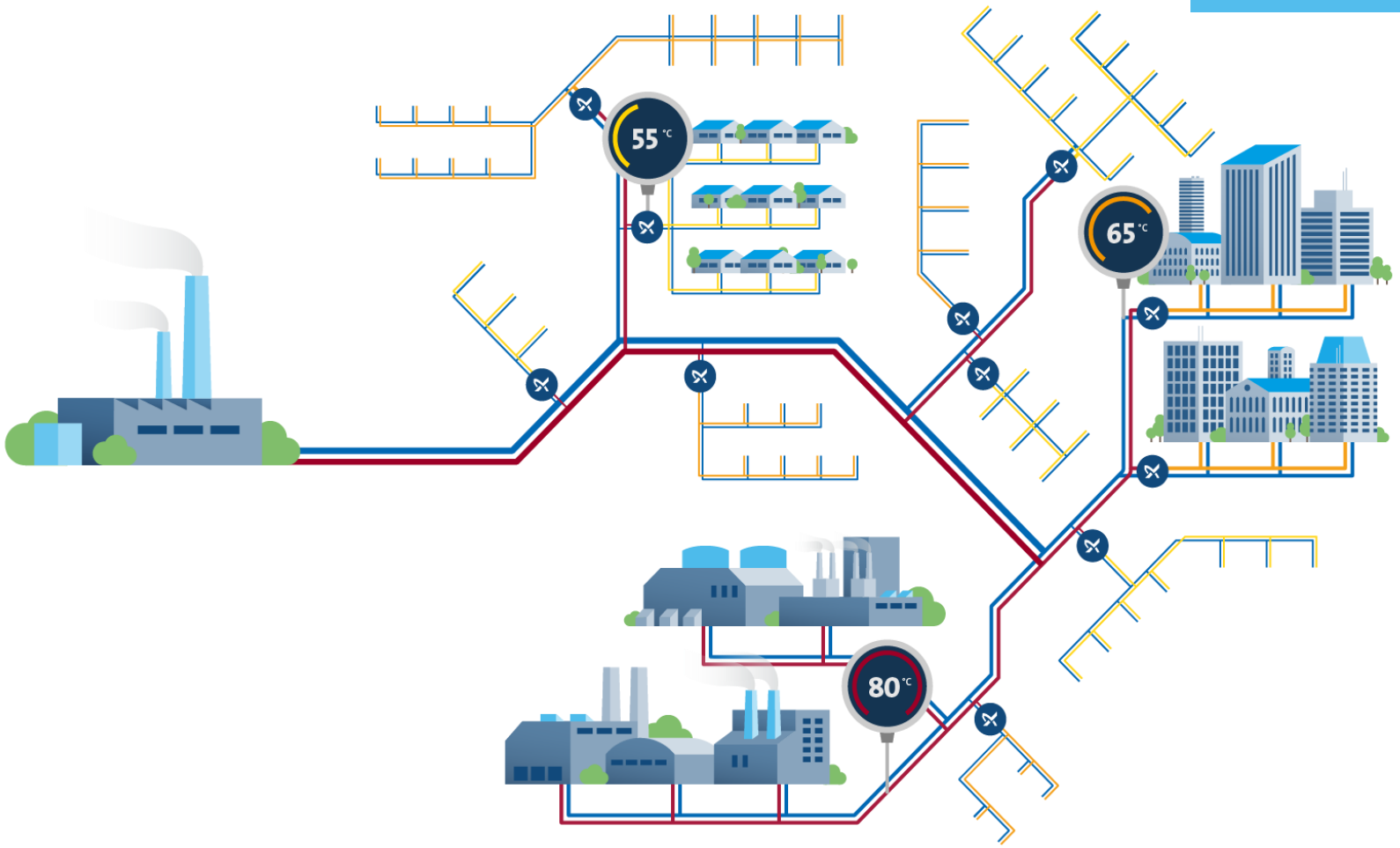
Traditional DH network



- 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

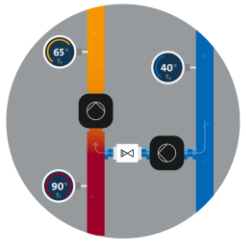
Reduced heatloss

Production effectiveness

Lower emissions

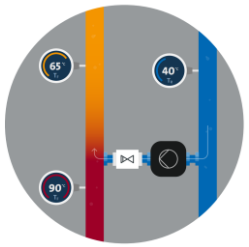
How does it work?

Free flow solution



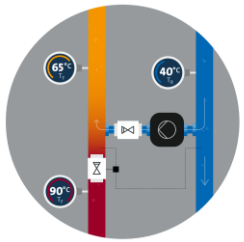
- Increased pressure
- High reliability
- Ideal heatloss reduction

Shunt solution

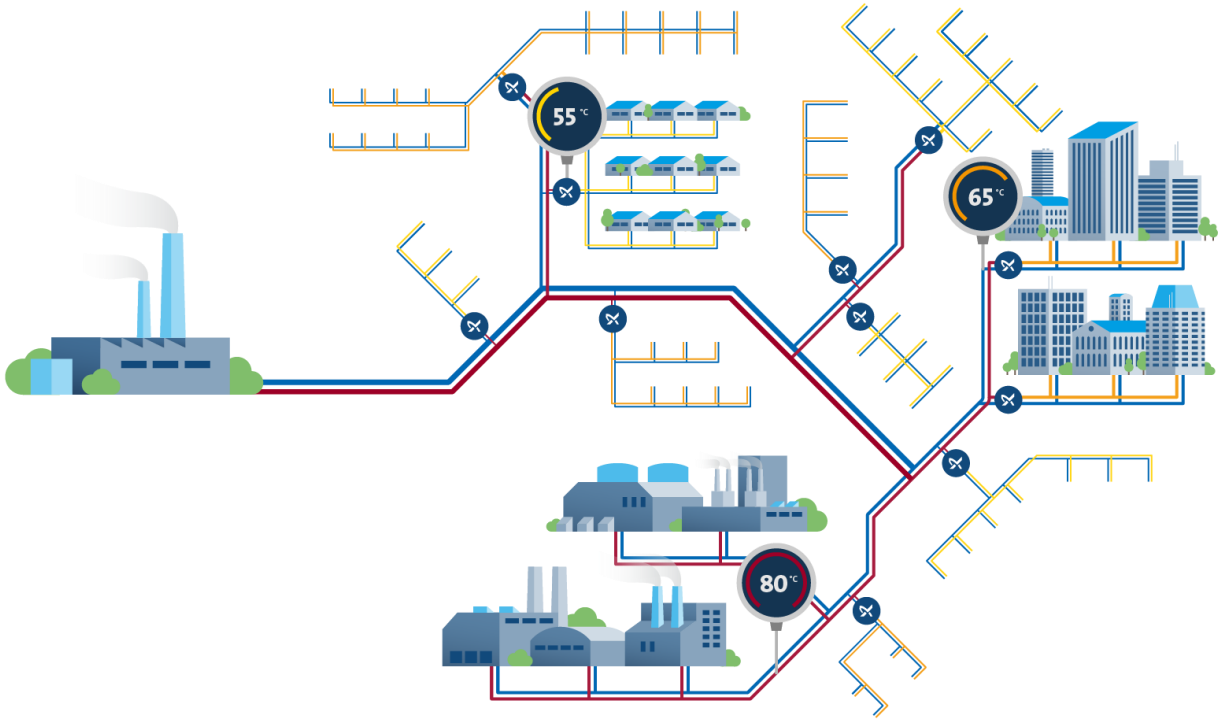


- Cost-effective
- Enough supply pressure
- No distributed pumping

Pressure reduction solution



- Too high pressure
- Pressure reduction valve
- Increased lifetime of pipes



Case study: Gentofte T-Zone

Annual demand
9.000 MWh

Annual demand
300 houses

https://youtu.be/lW1Sj8I0q6E

BEFORE

79°C - 48°C

2.570 MWh

0 MWh

195 tonnes CO2

AFTER

60°C - 38°C

1950 MWh

14 MWh

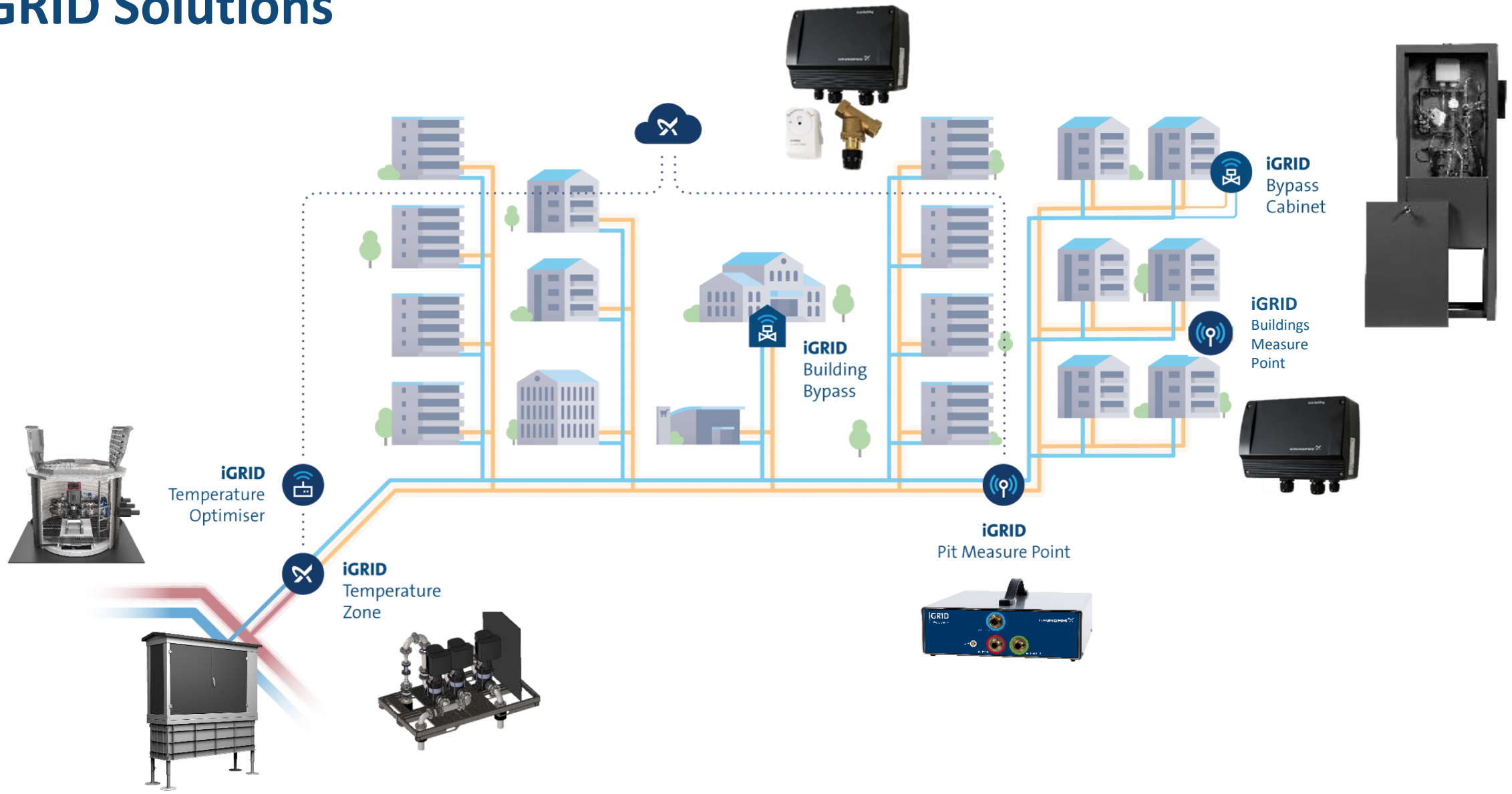
149 tonnes CO2

CO2 reduction
47 tonnes

Heat loss reduction
24%

Increased capacity
620 MWh

iGRID Solutions



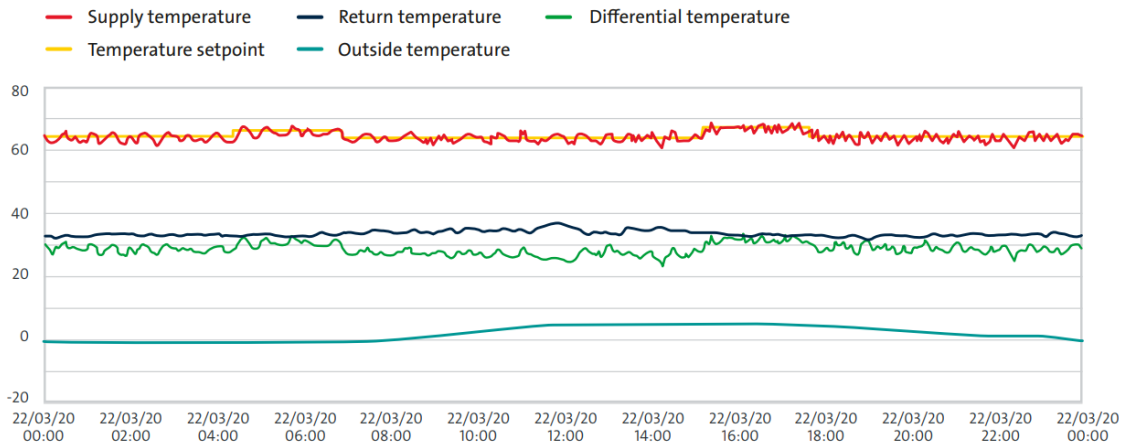
iGRID Temperature Optimizer

Optimal supply temperature

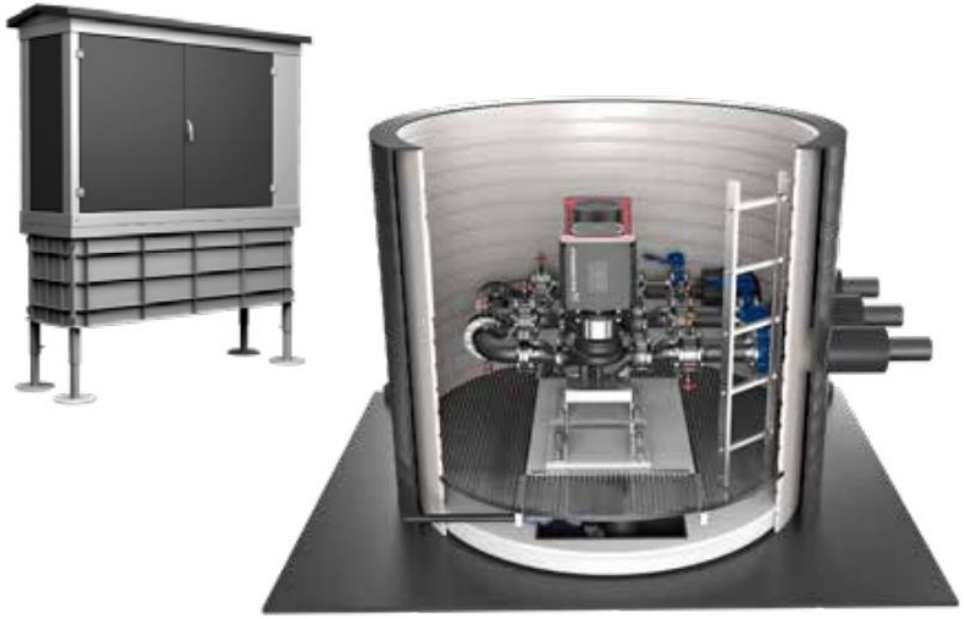
Weather data

Reduce heat loss (>20%)

Peak-shaving algorithm



iGRID Pressure Zone

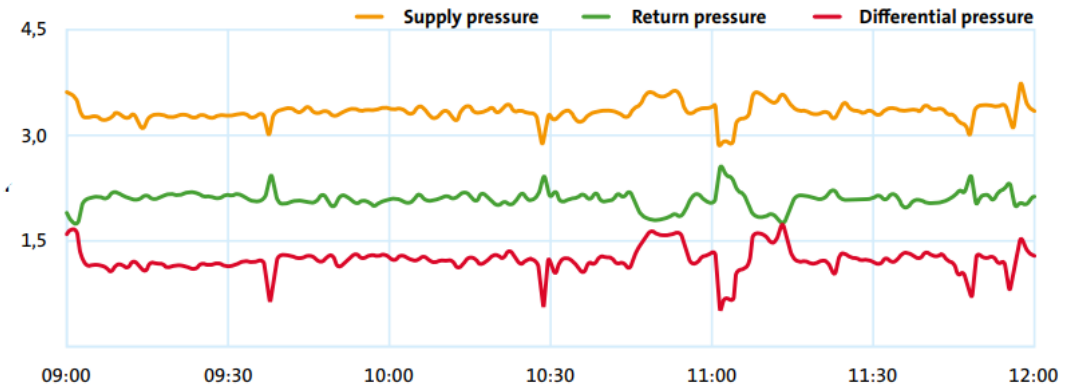


Lower pressure in grid

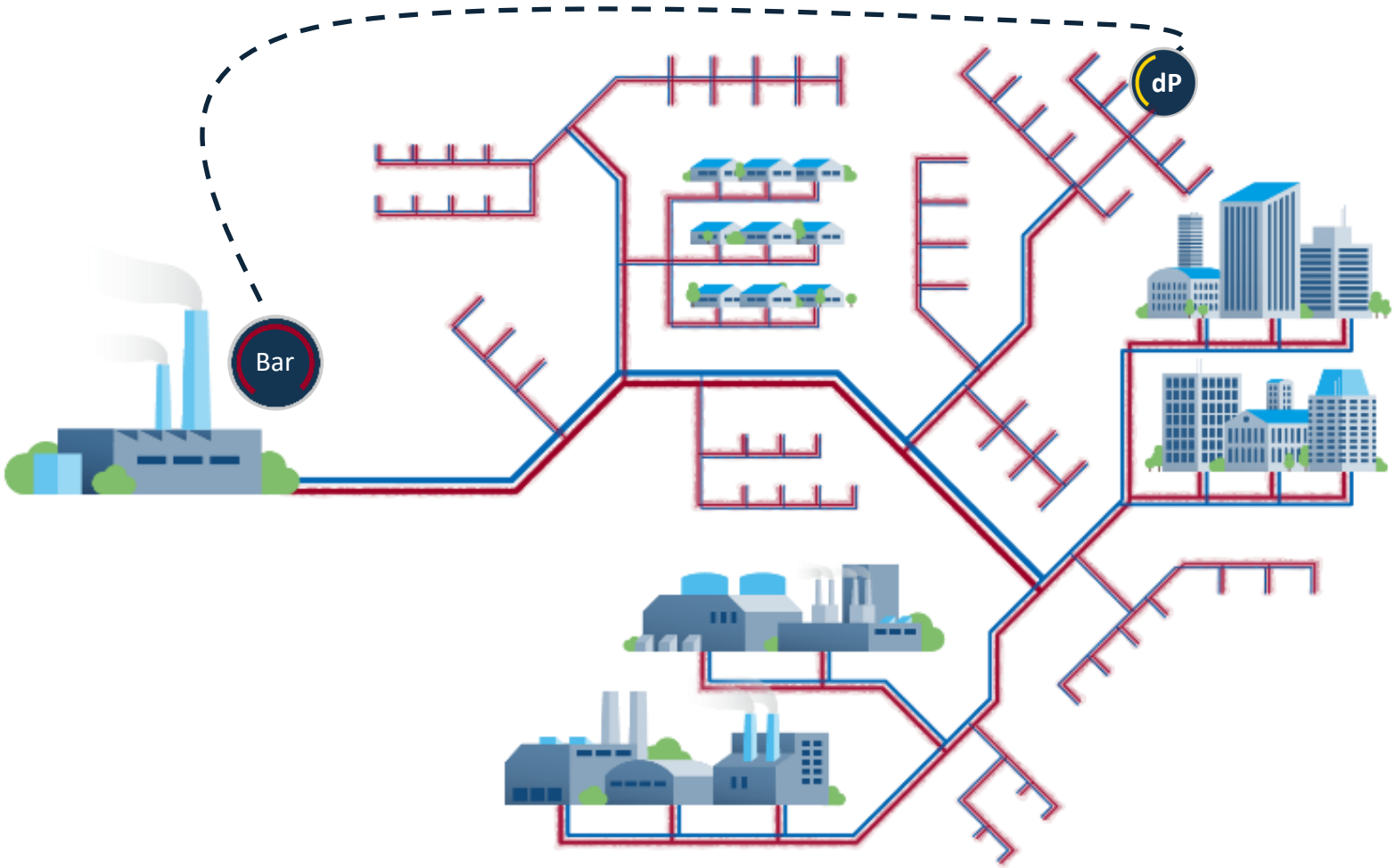
Reduced pump size

Extend pipe lifetime

Distributed pumps



iGRID Pressure Optimization



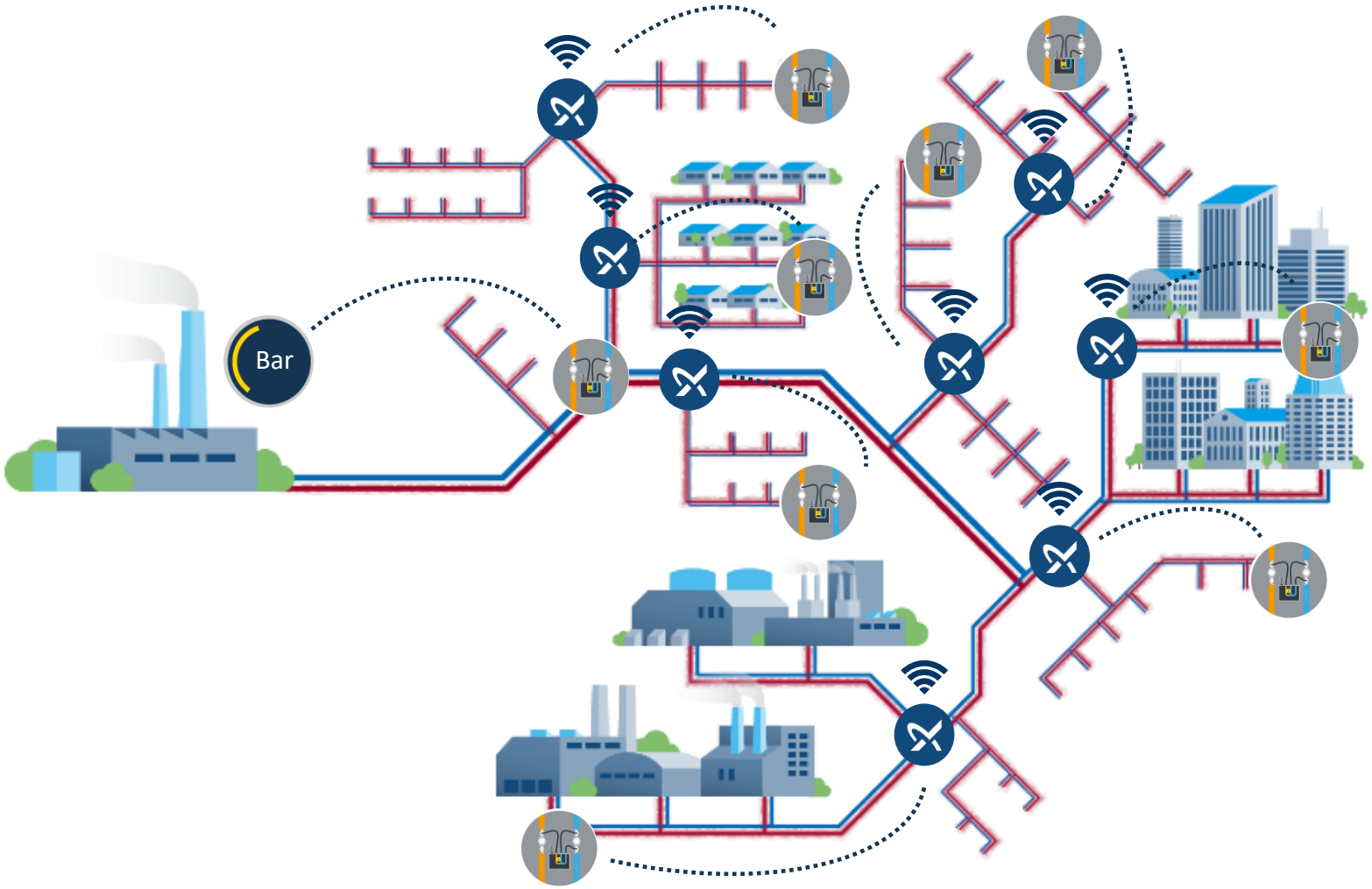
iGRID Pit Measure Point

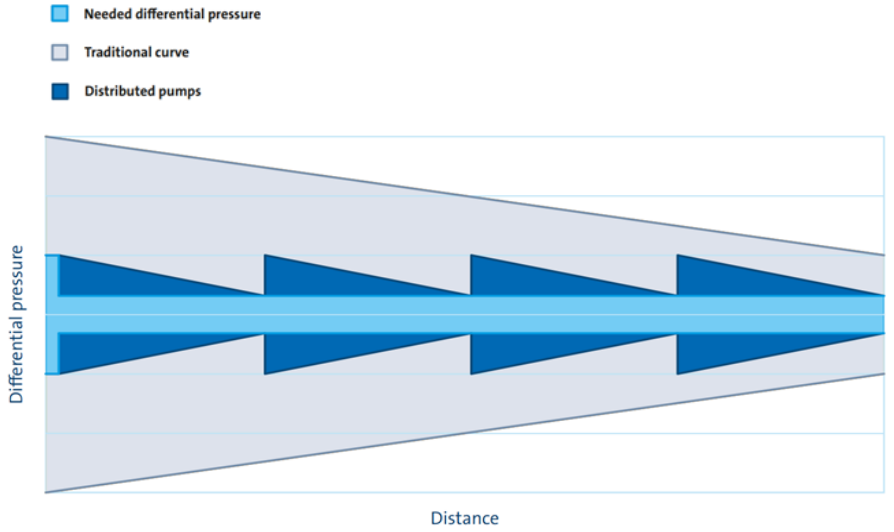
Existing pits

TEG

Wireless pressure data

iGRID Pressure Optimization

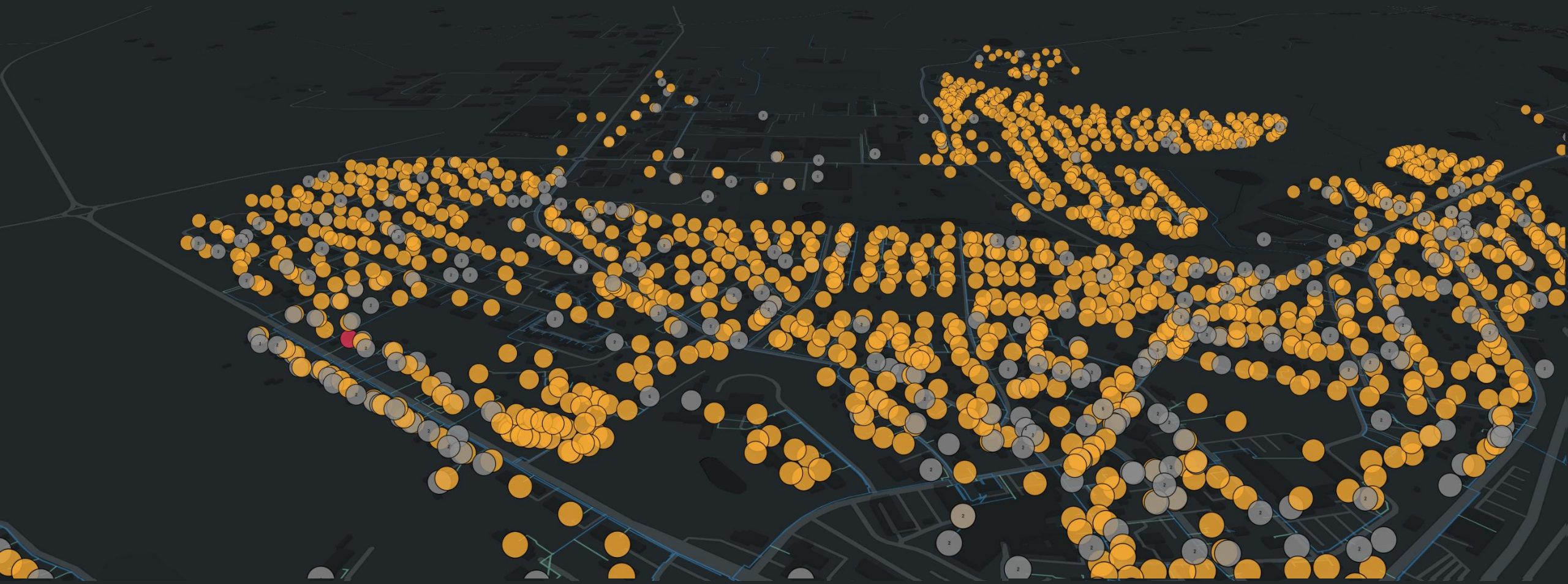




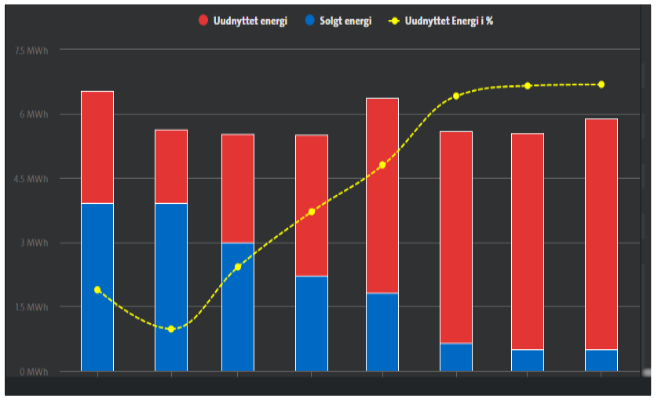
Optimized pressure

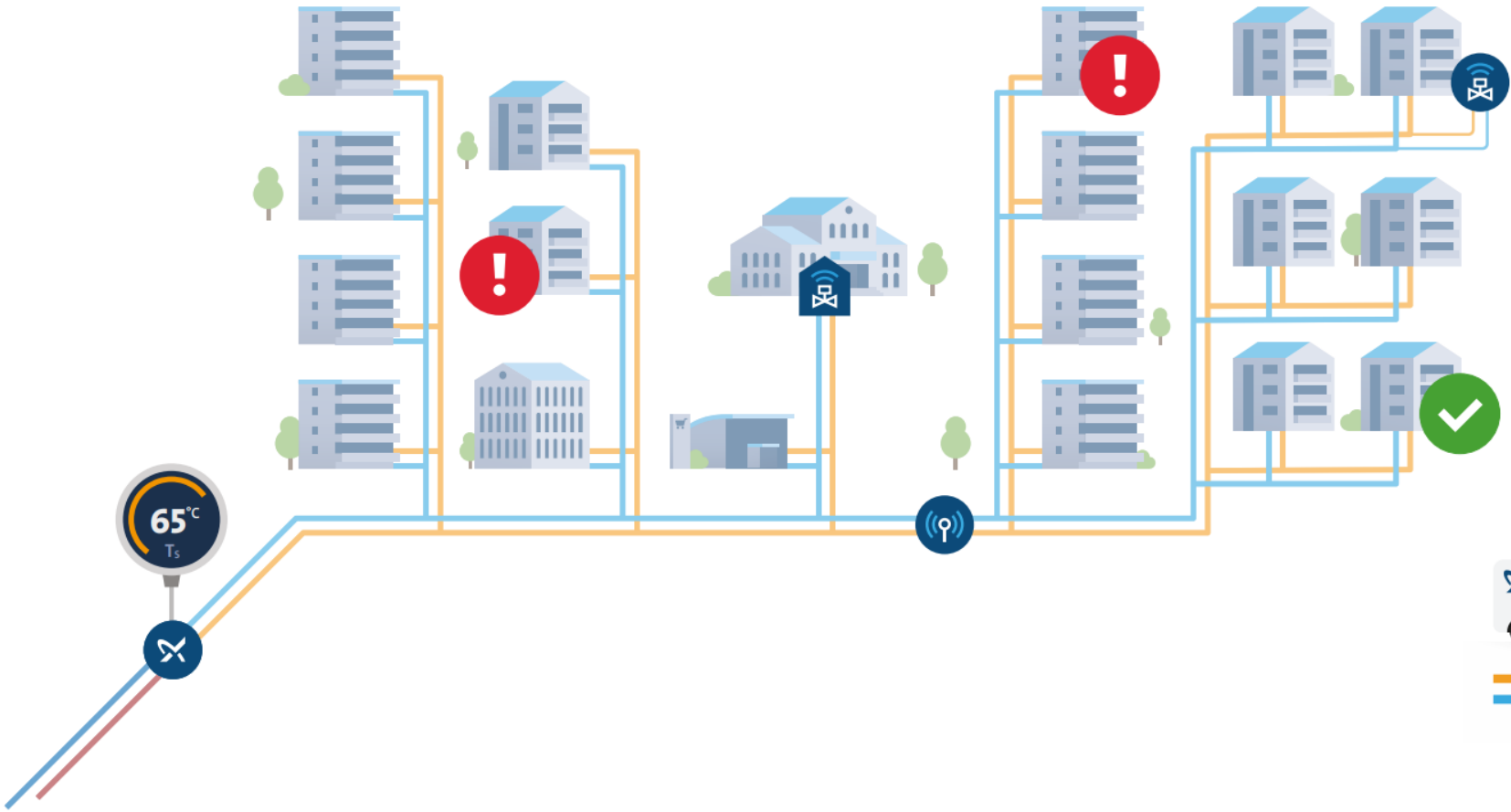
Distributed system

Increase pipes lifetime

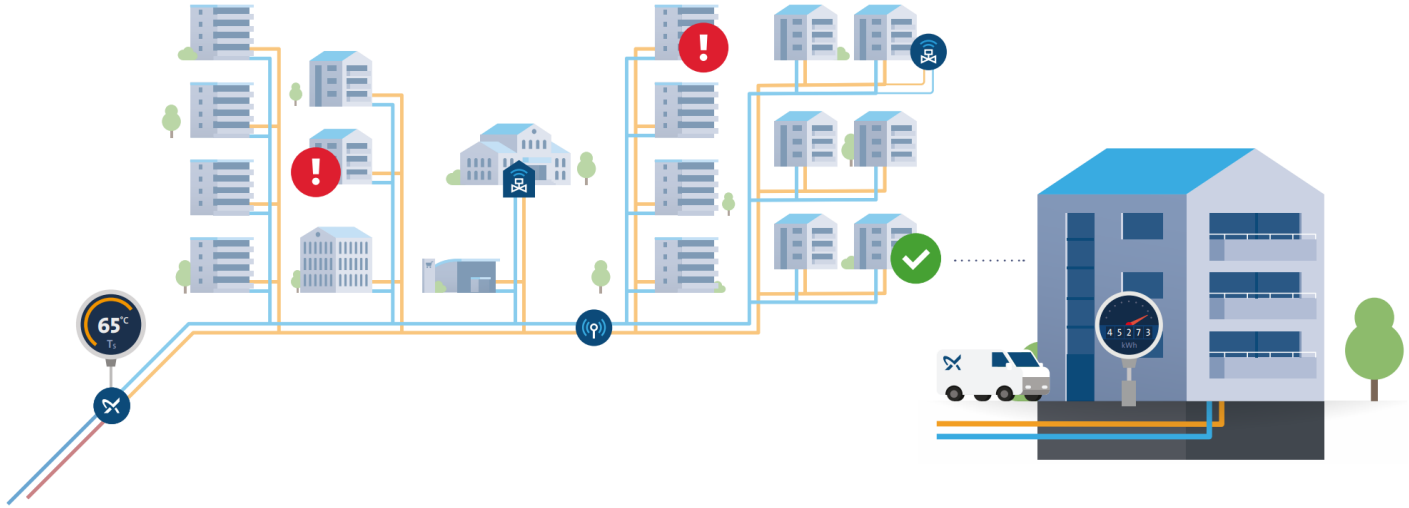


Lowering return temperatures





Temperature optimization cycle



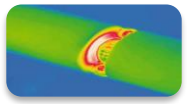
Benefits of heat loss reduction in DH networks

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**

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%).

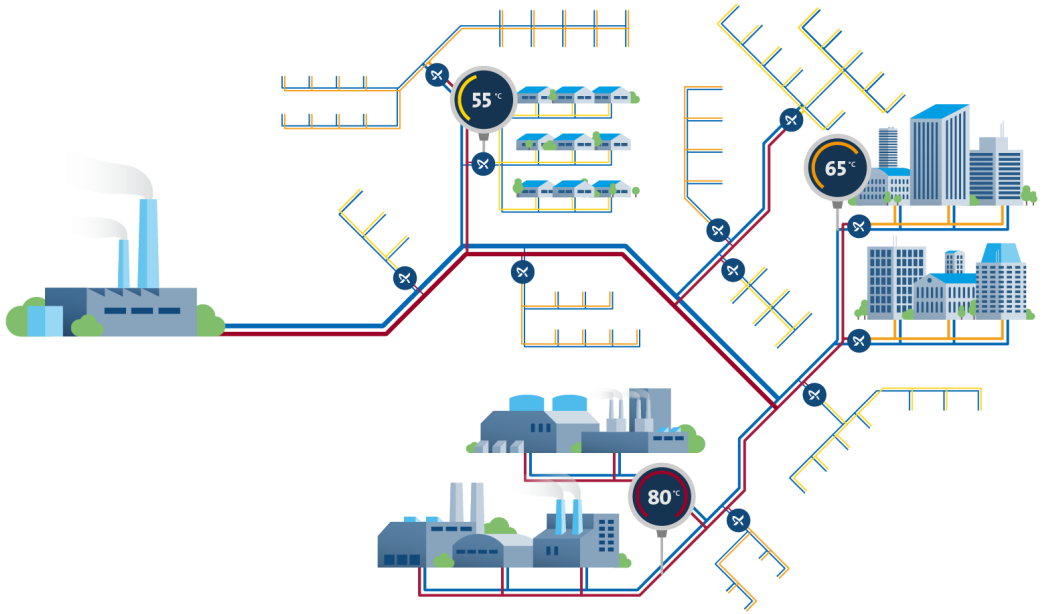
End-to-end security
Security is one of the most important focuses for Grundfos, our solutions are regularly penetration tested, focus on encrypted, secure data transmission,

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.



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