

GRUNDFOS iSOLUTIONS



PUMP · CLOUD · SERVICES

GRUNDFOS iGRID – towards LTDH in city districts

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LowTEMP2.0

be
think
innovate

GRUNDFOS 

Grundfos iGRID | Digitally enabled end-to-end solution

The concept are based on solutions and services for :

Digitally enabled hardware solution

Supply temperature and pressure optimization



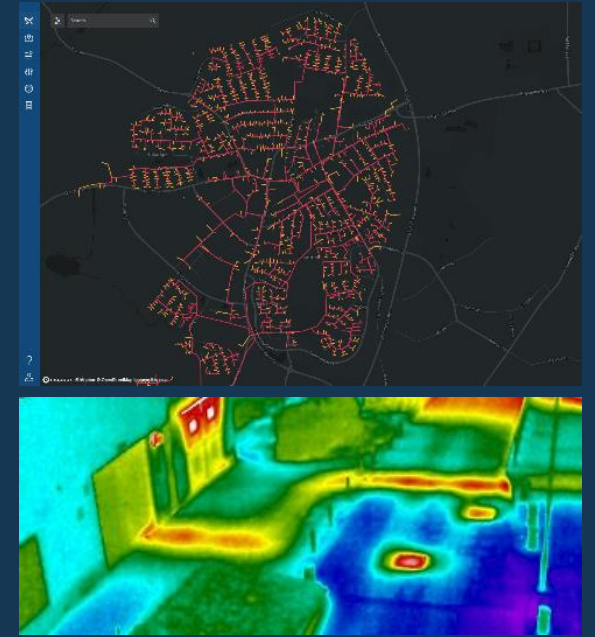
Digitally enabled physical services

Return temperature optimization

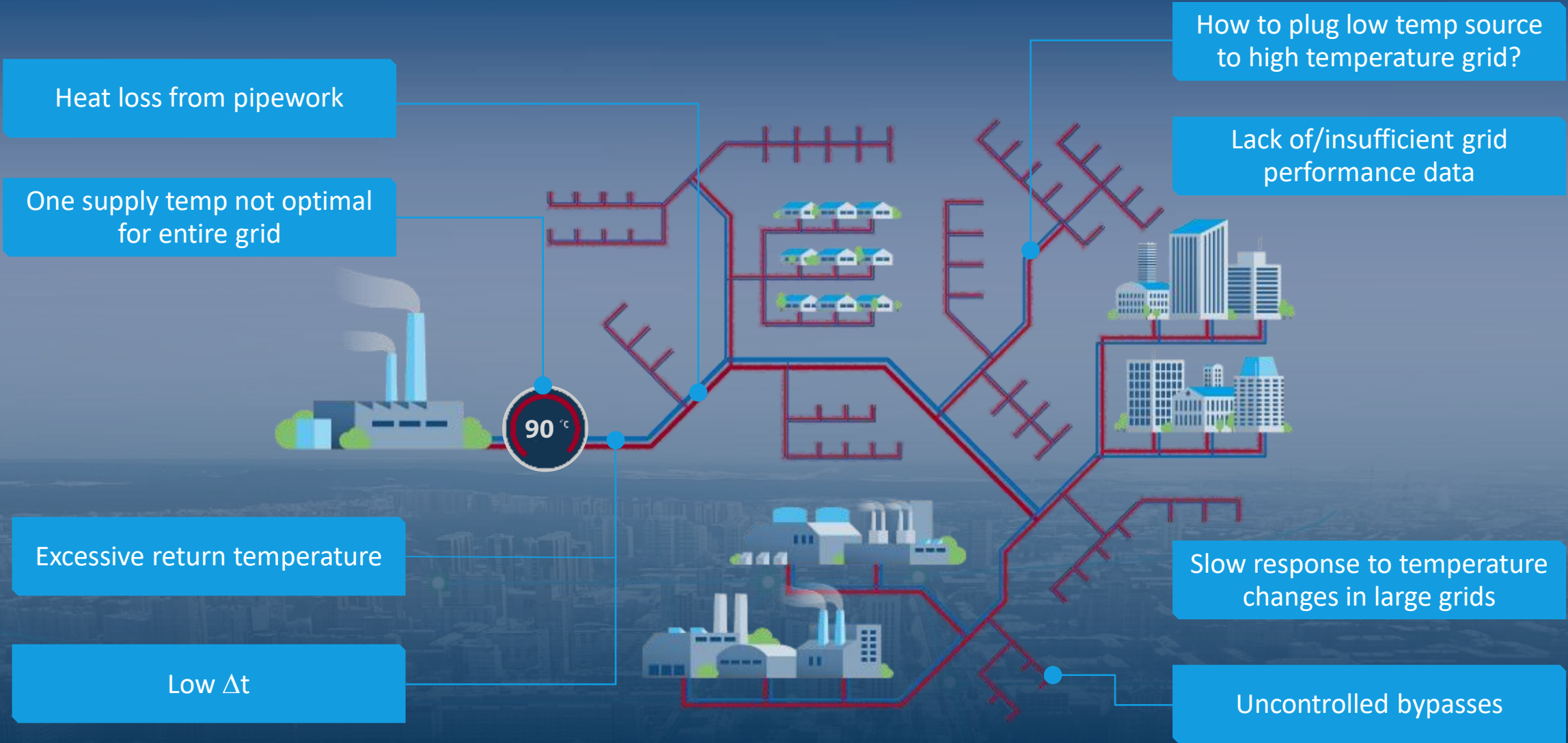


Software and Digital solutions for optimization

Asset Management



Typical issues in district heating grid



The solution - district heating grid divided into zones

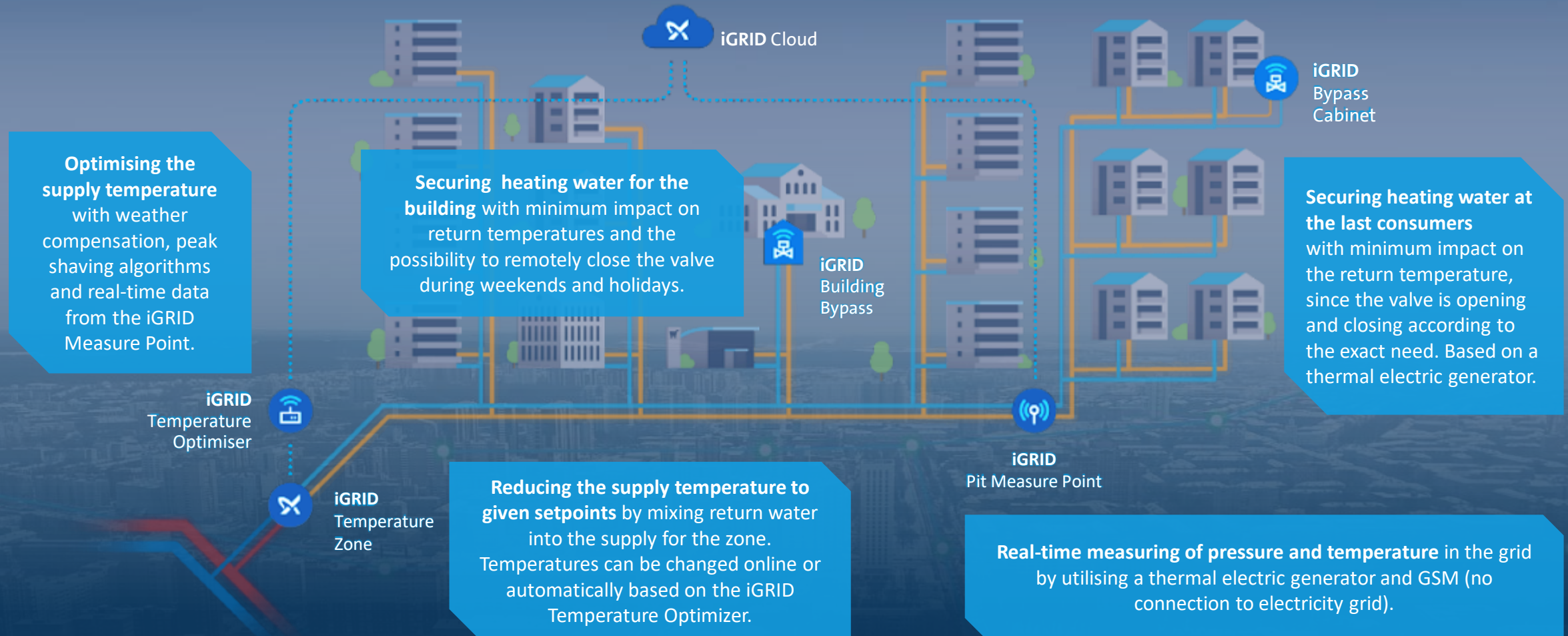
Zoning of the grid can solve problems with excessive heat supplied to the areas with low requirements



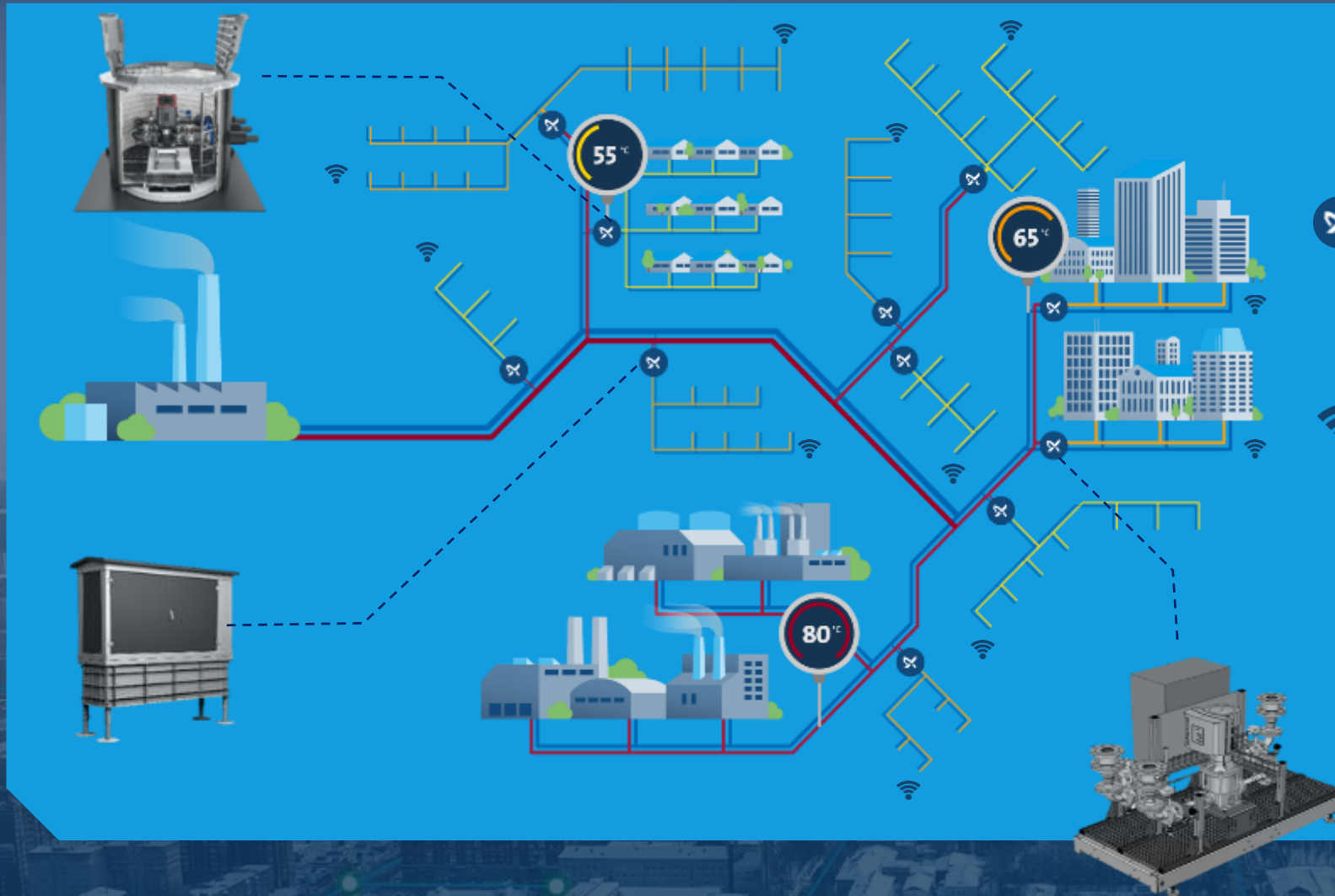
- Demand driven supply
- Temperature adjusted according to real-time data from the grid



Grundfos iGRID - introduction

Grundfos iGRID can help to solve many of the challenges in District Heating distribution grids. Dividing grid into smaller sections (zones) improves performance and enables better overview and controllability.



Grundfos iGRID - zone temperature control by mixing



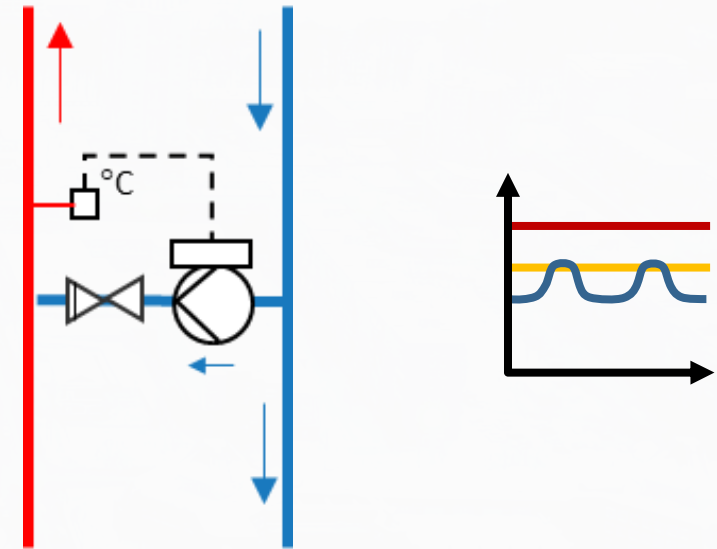
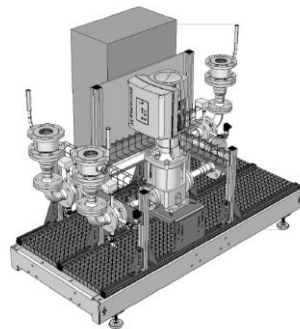
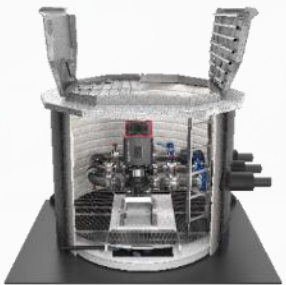
-  **iGRID Temperature Zone**
Mixing of cold return with supply to regulate temperature
-  **iGRID Measure Points and Bypasses**
provide real time data (temp. & pressure) for temperature setpoint optimisation

Grundfos iGRID uses mixing principle in modular solutions

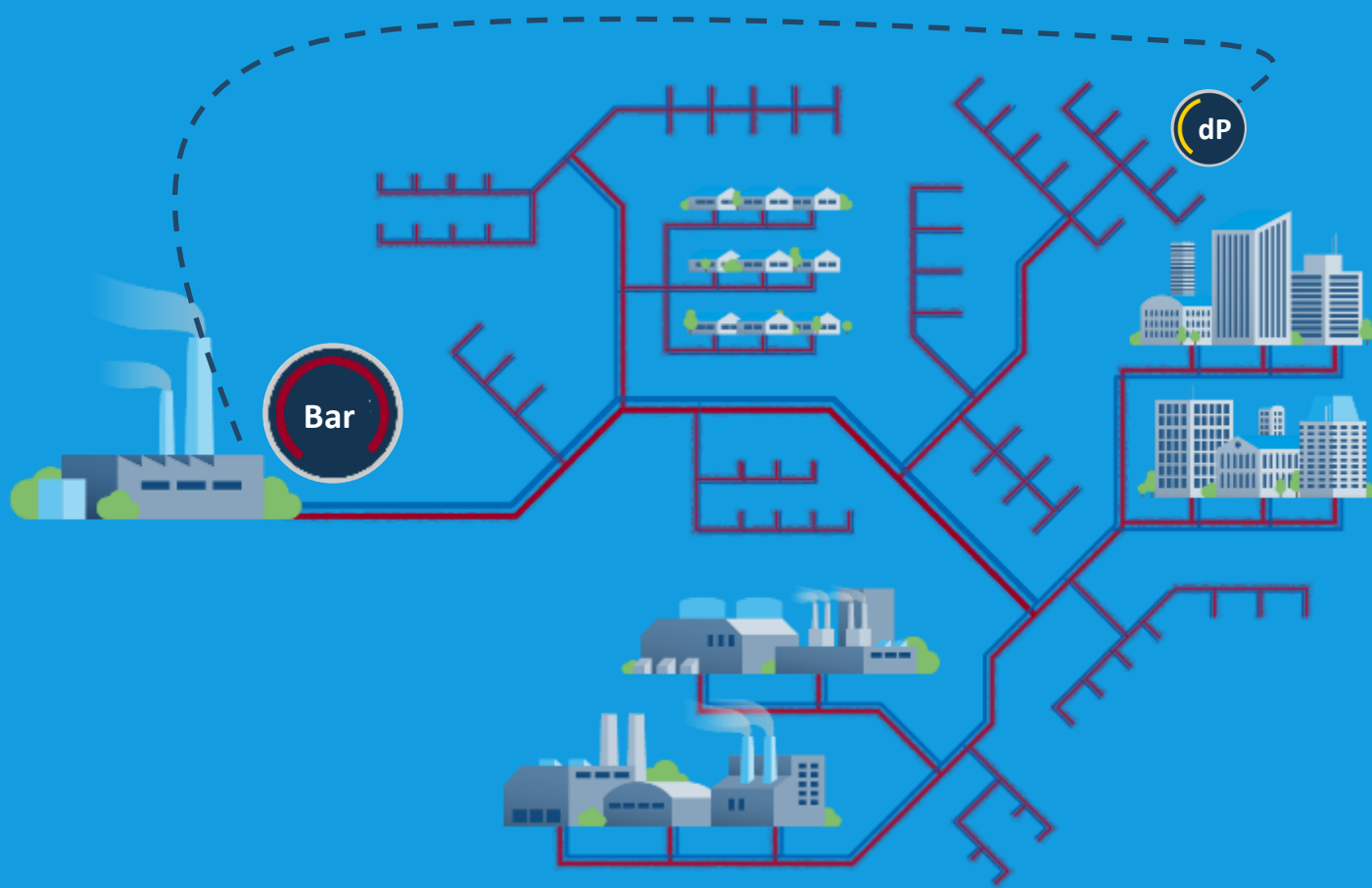
iGRID Temperature Zone - overview

iGRID Temperature Zone enables lowering of the supply temperature to a part of a grid, based either on the actual demand, or pre-set temperature relevant to the controlled zone.

The iGRID Temperature Zone is a prefabricated **mixing loop** supplied ready for installation. To regulate the temperature in the controlled zone, it mixes the **colder return flow into the hot supply flow**.

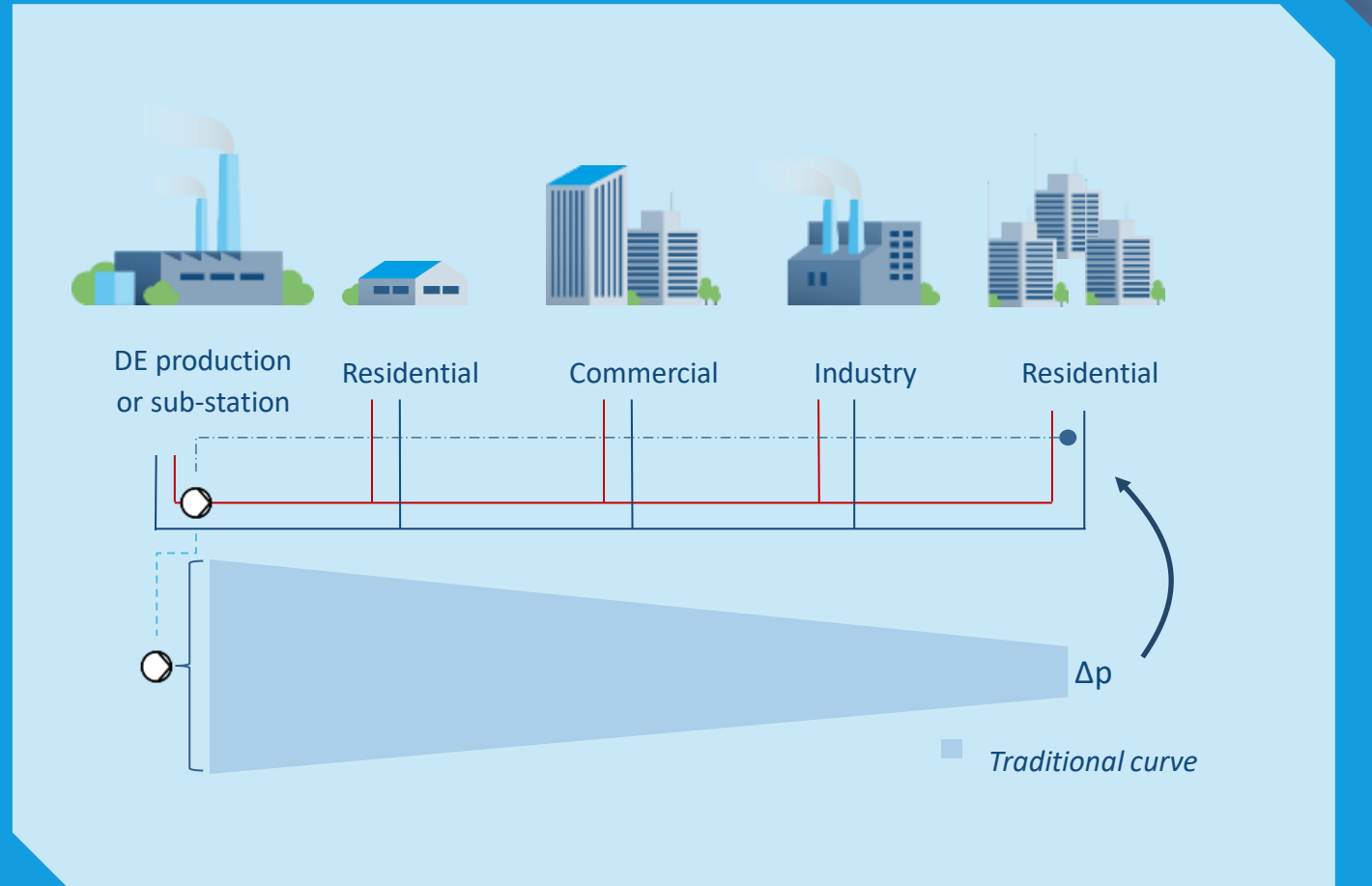


Pressure control in traditional way



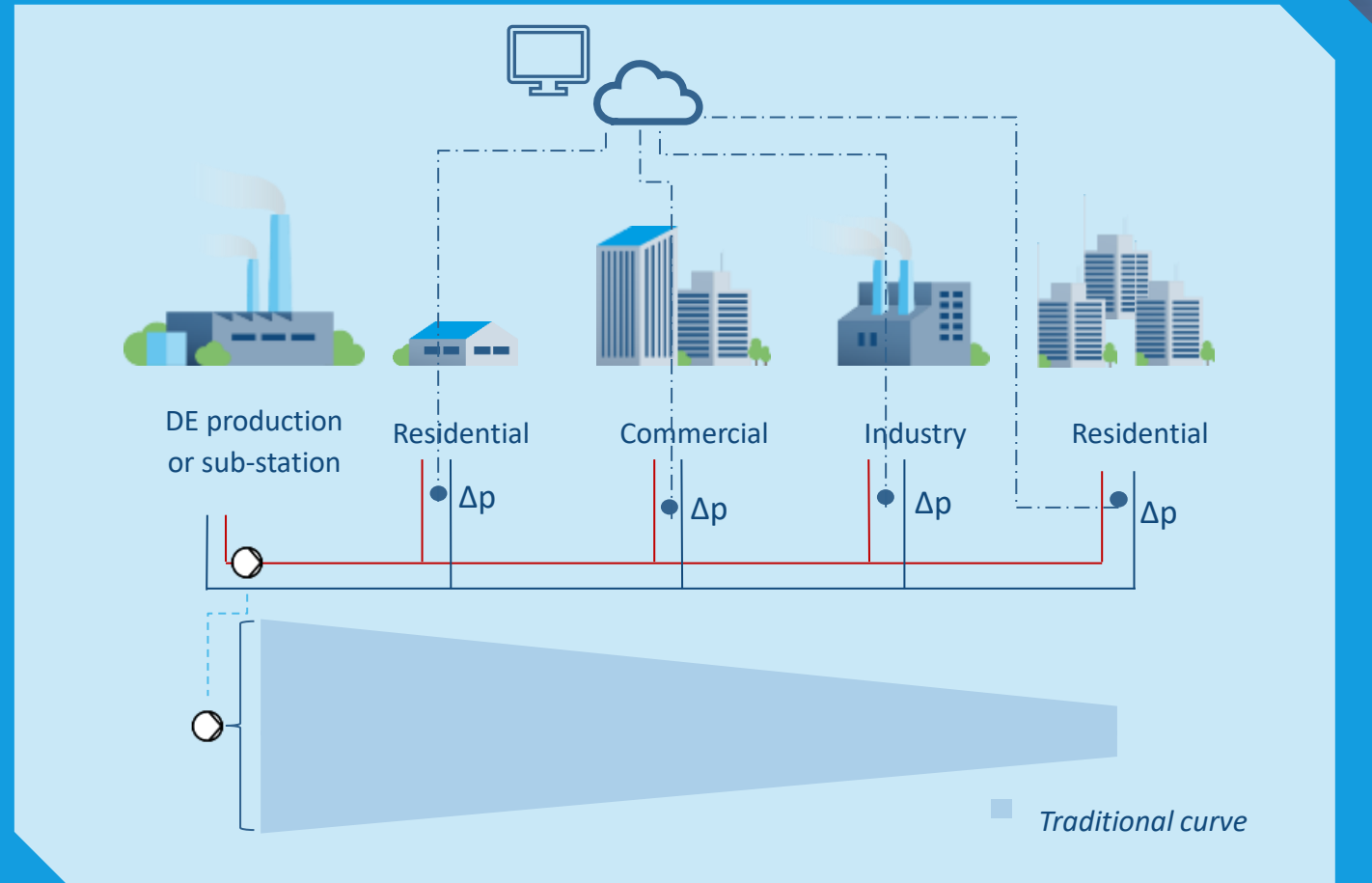
Central pumps - control

- Main pumps delivering all flow and pressure
- Large pressure drops
- High pressure close to main pumps

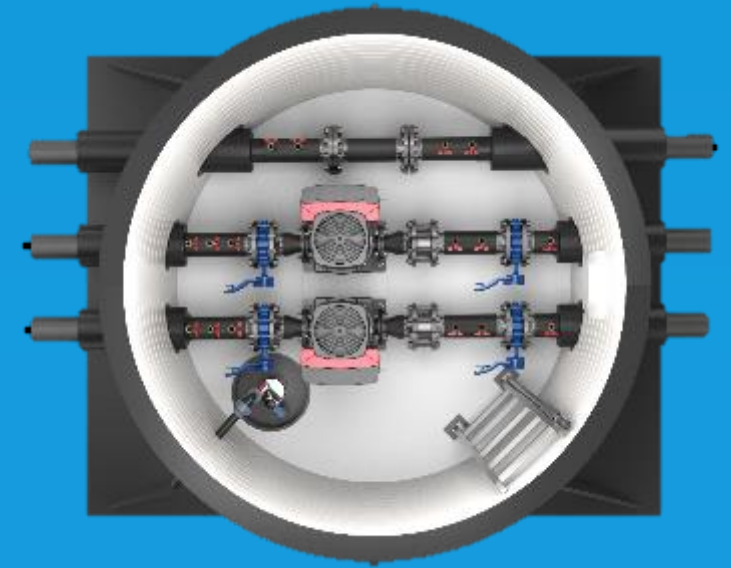
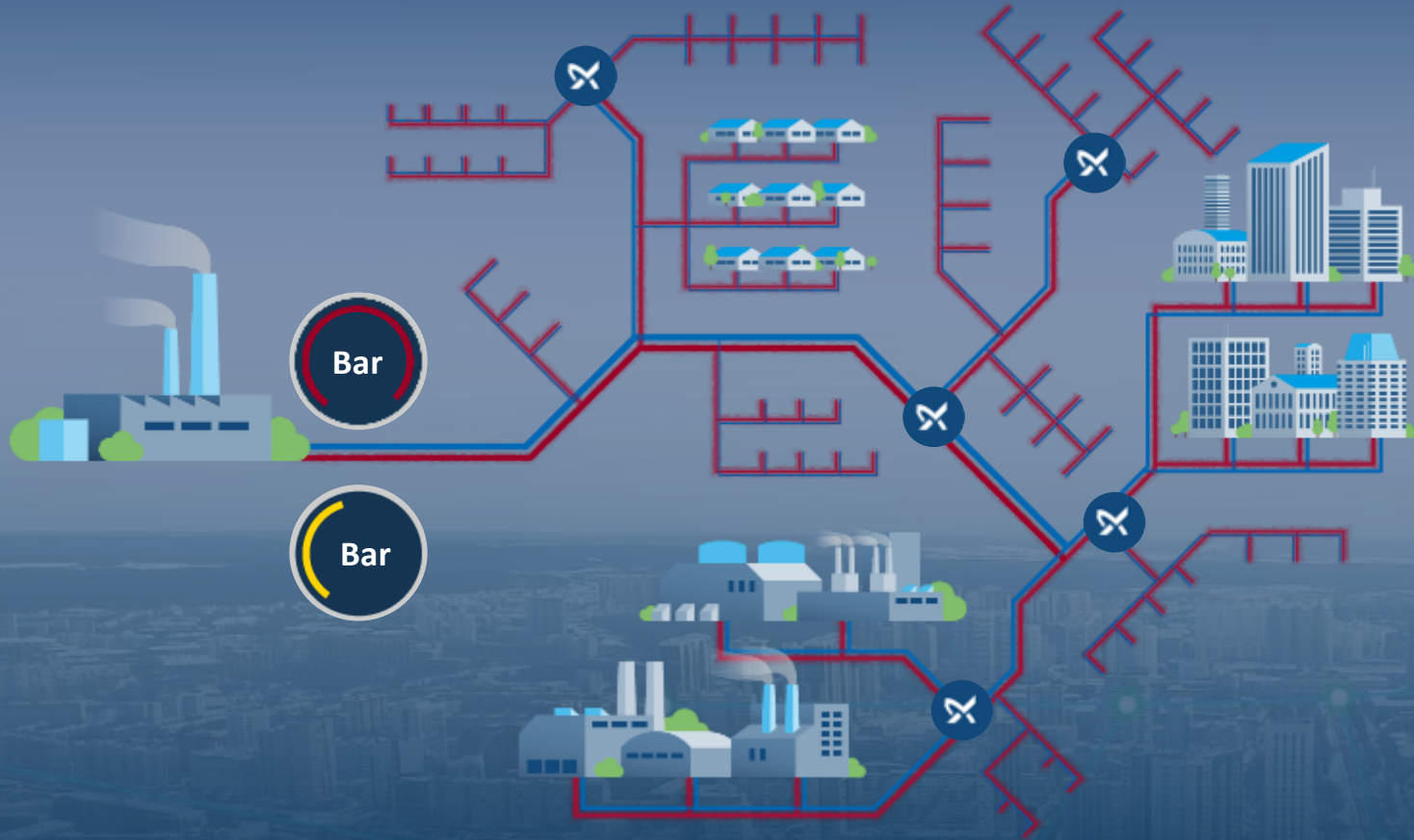


Central pumps - control

- Central pumps with multiple sensors in the grid



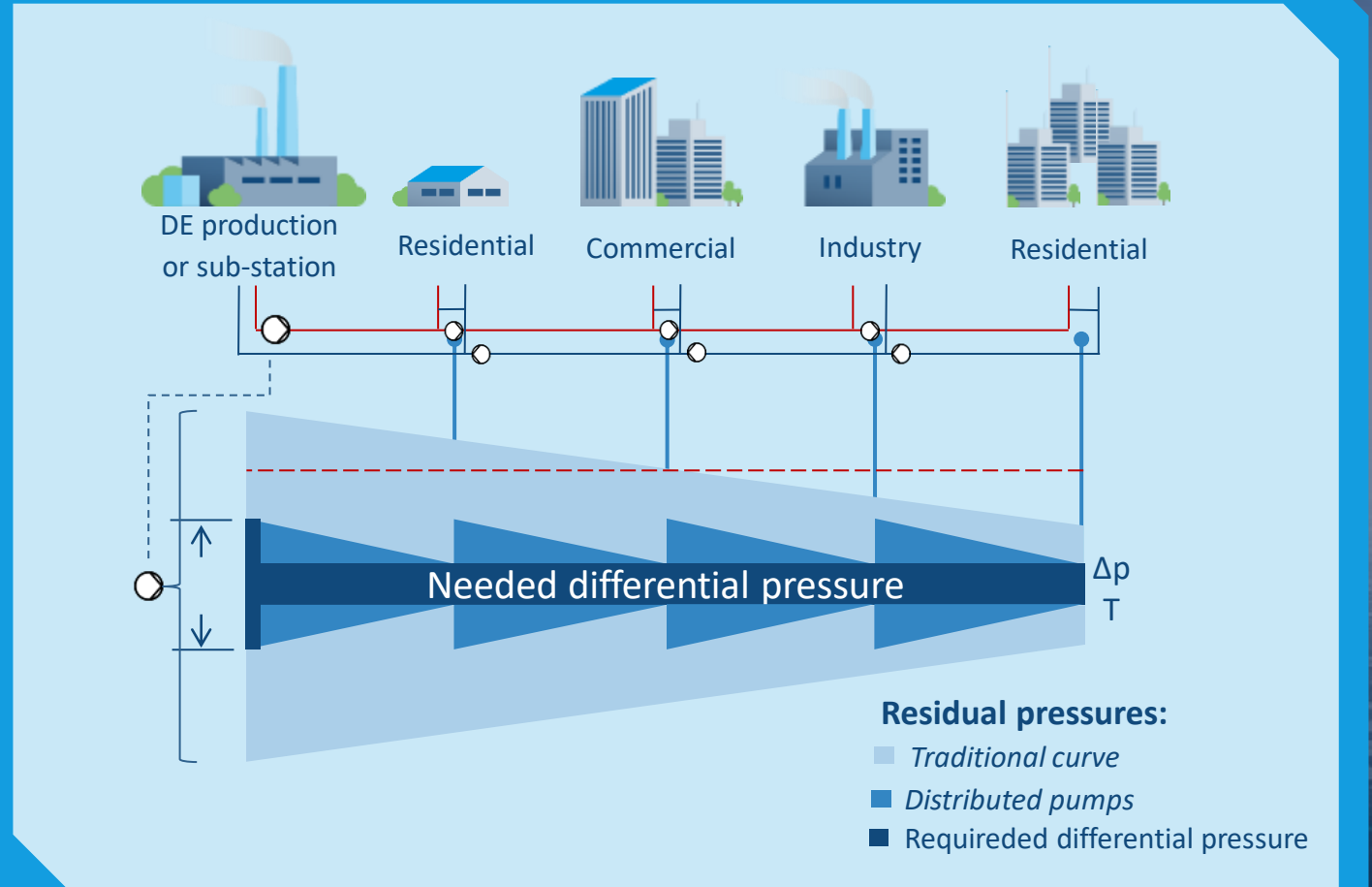
Pressure control in energy efficient way



Grundfos iGRID Pressure Zone is a modular solution which allows for **lower local pressures** in a grid by means of de-centralised pressure controlled high efficiency variable speed pumps located around the grid, **boosting the pressure** at points where it is actually required

De centralized pumps

- multiple pumps in the grid-suitable for boosting pressure at the end of a long branch



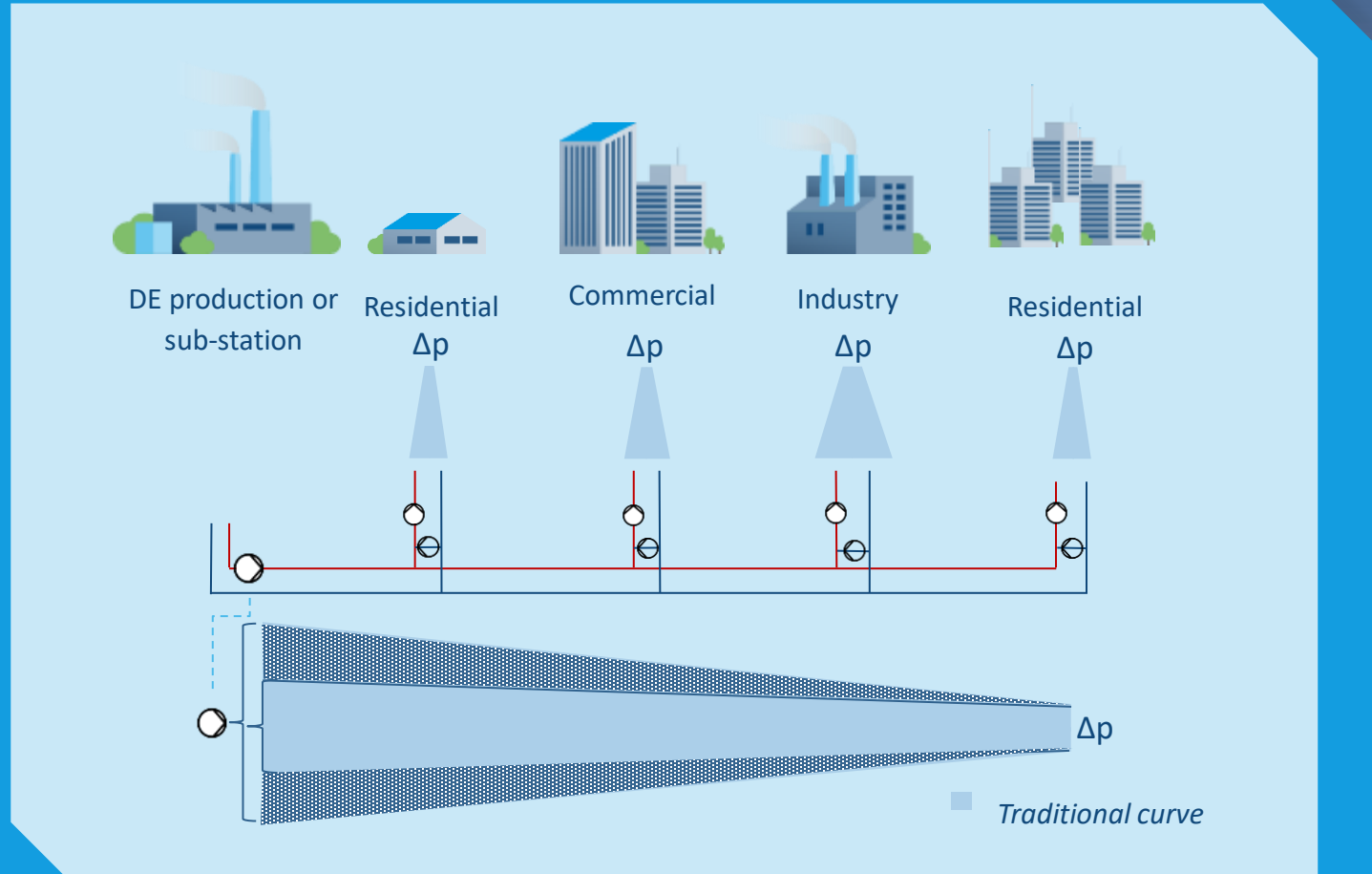
Zoning of the grid

Trend to lower temperatures:

- lower dt
- higher flow requirement
- higher pressure loss
- more power required

Pressure optimisation at mixing point better than increasing size of main pumps

Distributing pumps and adding the pressure where needed





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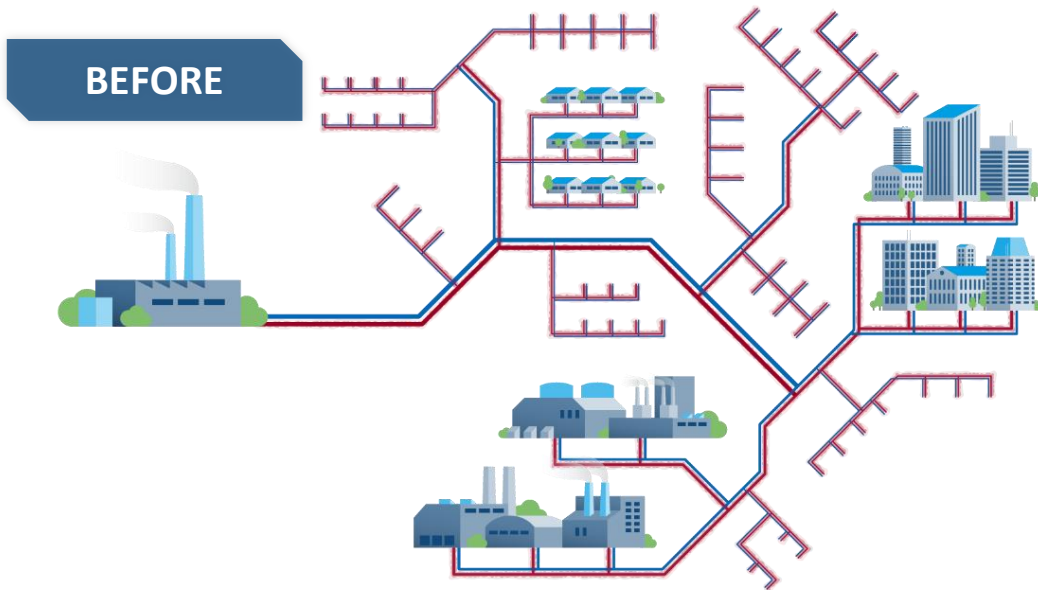
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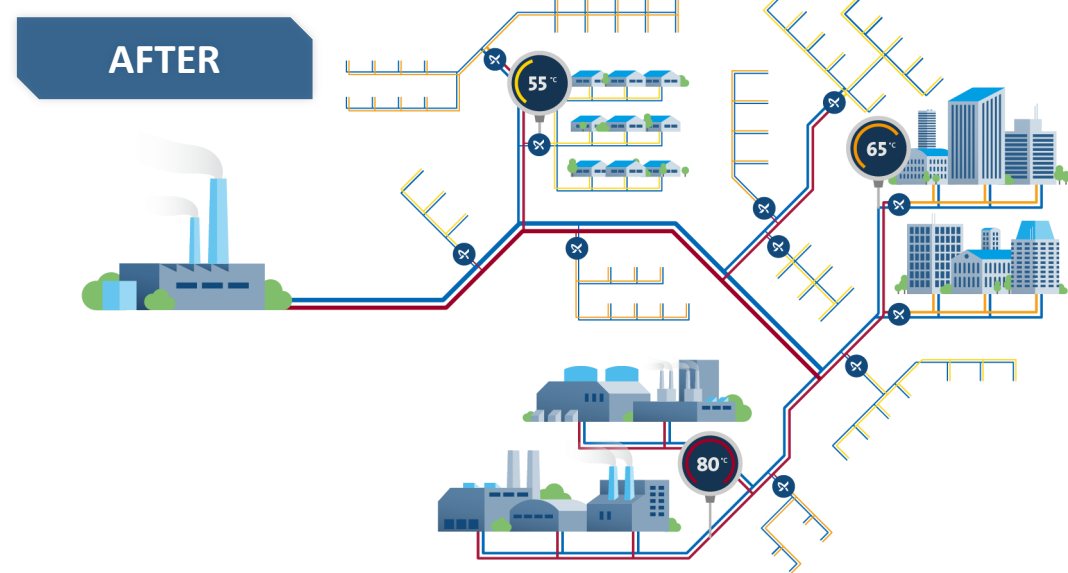
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LOW TEMPERATURES IN DISTRICT HEATING

Reduce heat loss & CO2 emissions and prepare for renewables



- **Excessive supply temperature** – unnecessary heat loss
- **Excessive return, temperature** - inefficient production
- **Low Δt** - insufficient grid capacity for expansion
- **Main pumps delivering all flow and pressure** - large pressure losses, stress on pipework (leaks)
- **Lack of grid performance data**

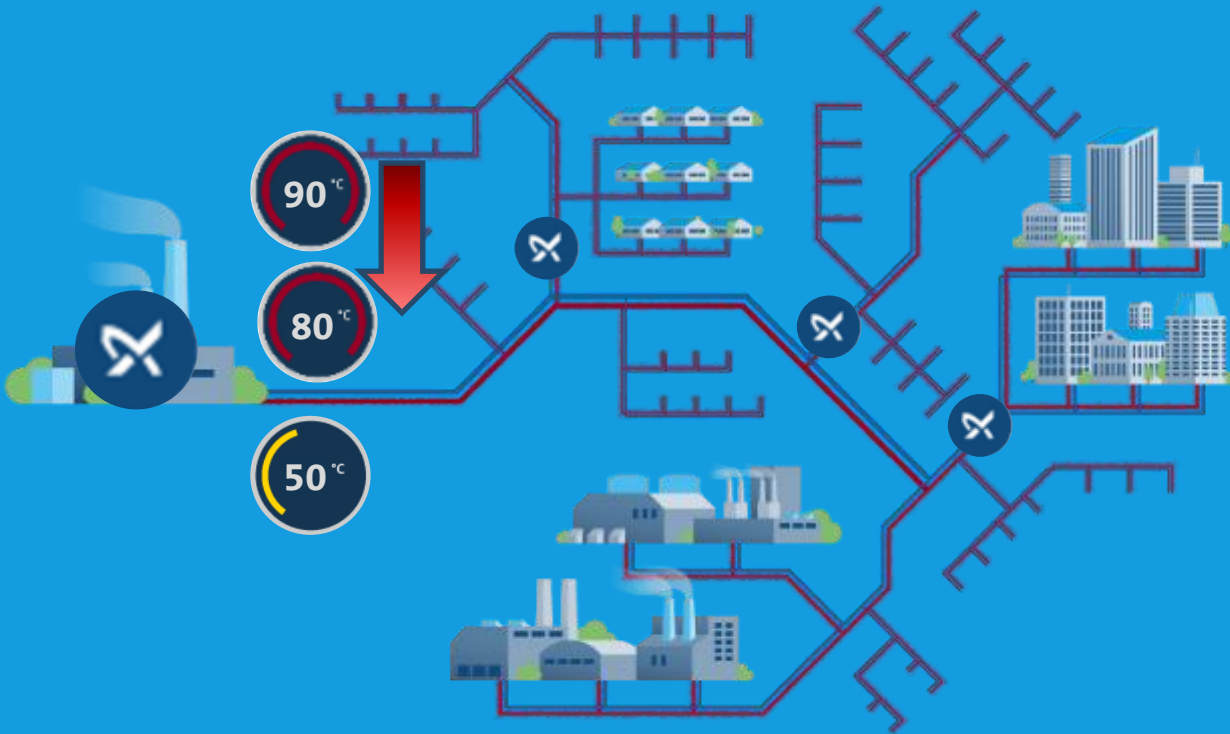


- Lower supply temperature with **Low Temperature Zones** - reduced losses and possibility to connect low temp sources (renewables, surplus heat)
- Lower return temp. and increased Δt with **Controlled Bypasses** and **balanced buildings** – reduced losses and improved grid capacity
- Lower pressure in pipes where not needed with **Pressure Zones** with demand driven distributed pumping
- Grid performance parameters based on real demand with **measure points**

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iGRID Temperature Optimiser

Grundfos developed software to calculate **optimal supply temperature setting** using real-time heat demand and weather data



Weather Station
(weather data)



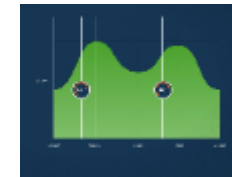
Grundfos iGRID
Cloud (settings,
measured data)



SCADA
(measured data,
weather data)



Weather and
Peak Shaving
algorithms



SCADA



Grundfos
iGRID Cloud



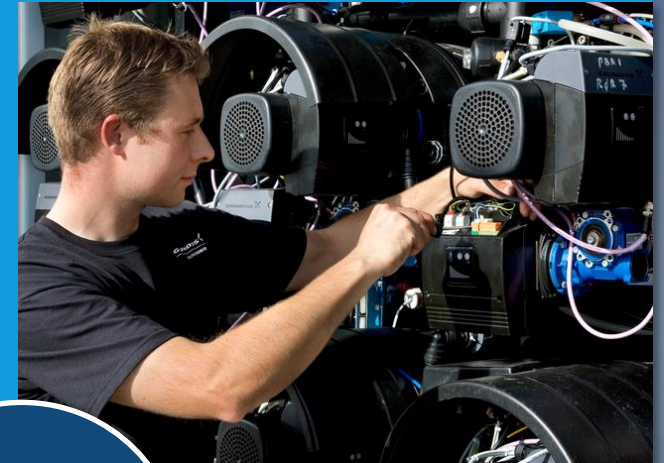
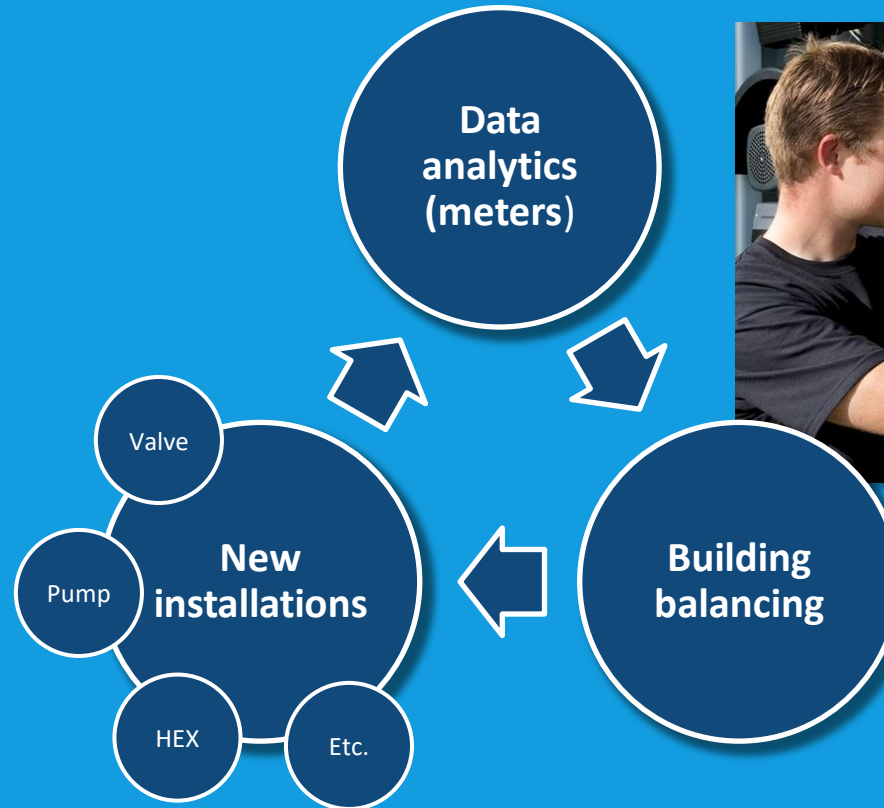
Genibus

iGRID Services – optimising return temperature

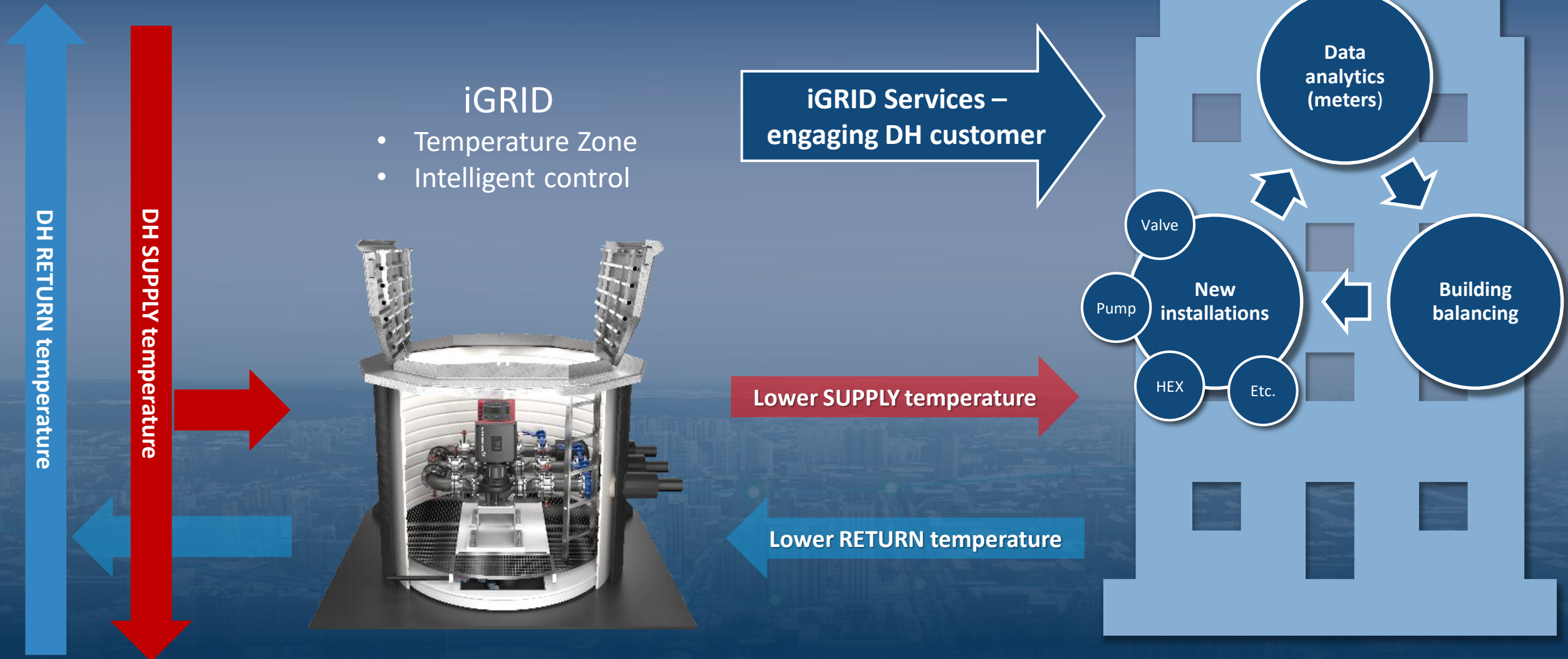
Grundfos iGRID solutions provide the foundation for lowering the temperatures with decentralised low-temperature zones, measure points etc.

It is possible to go even further with:

- **iGRID Data Analytics** – to identify buildings for optimisation with cooperation of building owners regarding performance investments
- **iGRID Building Balancing** – to optimise building installations to ensure lowest possible return temperature



Optimising supply and return temperatures



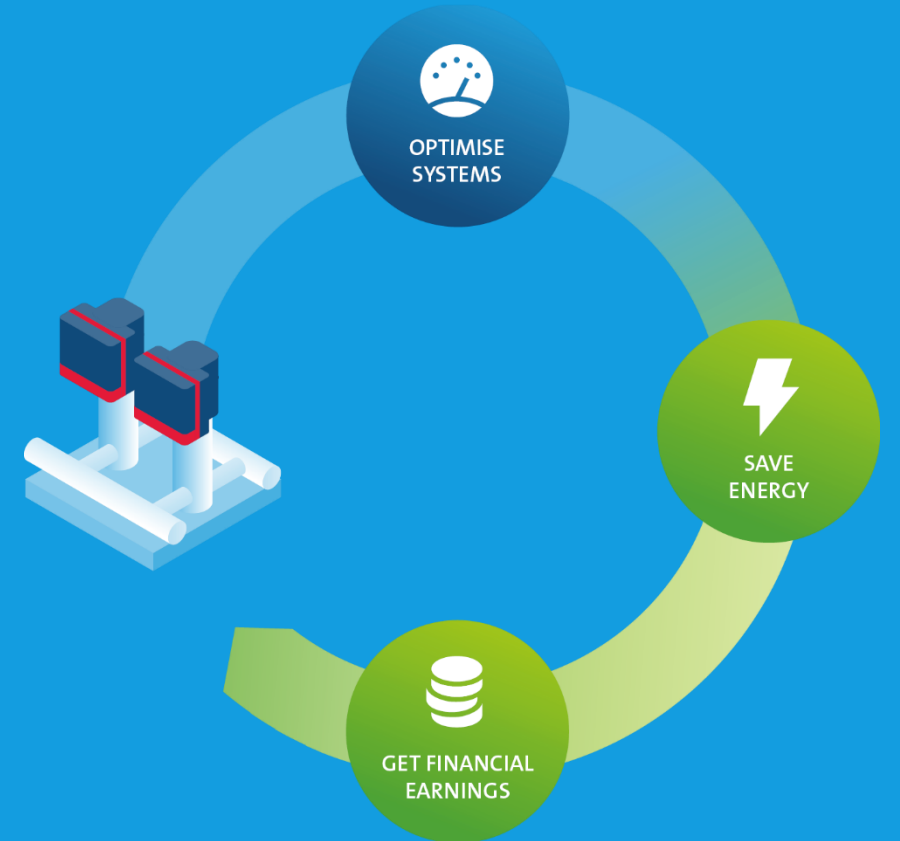
SUMMARY

Heat losses from DH network can be reduced by optimising temperatures

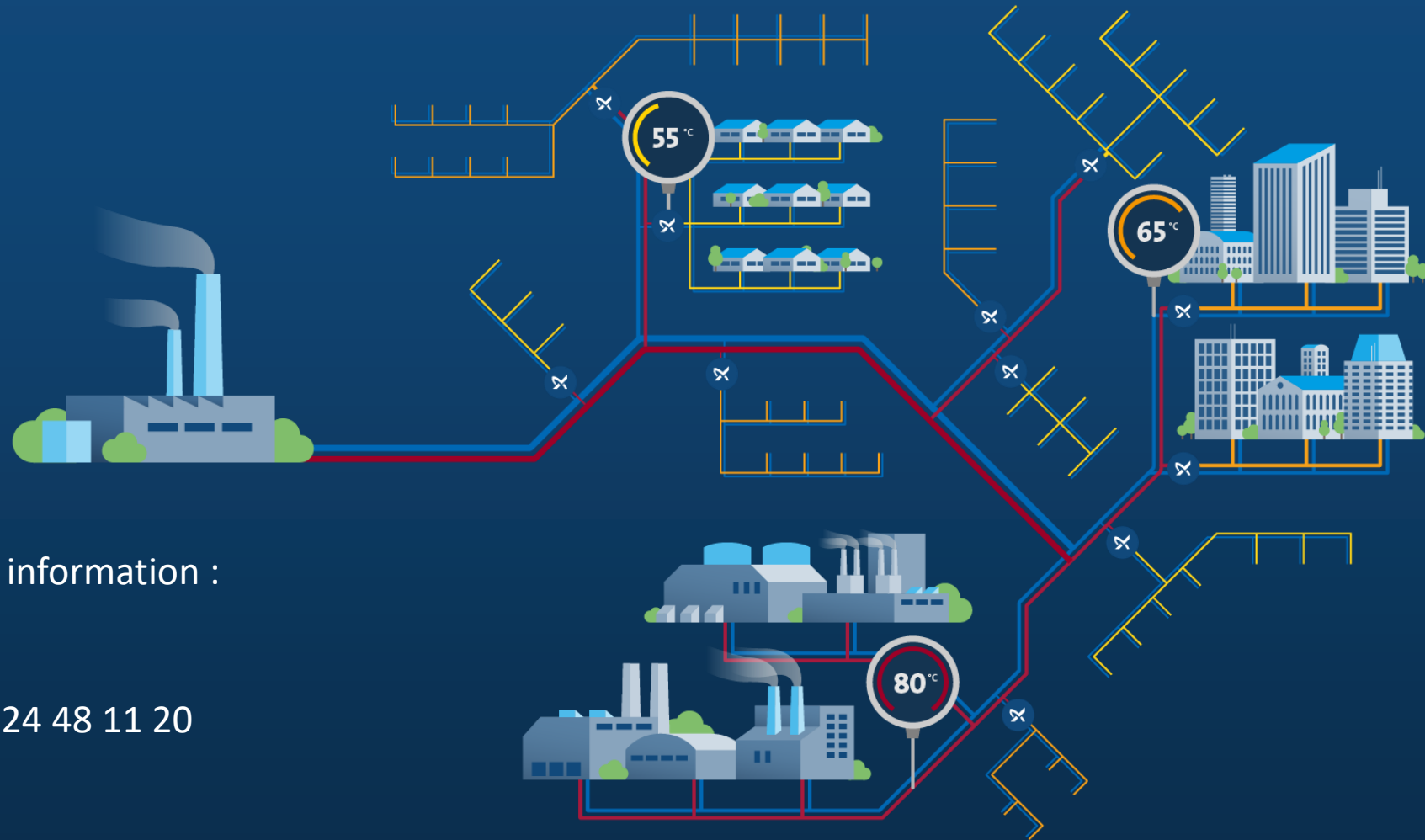
- Zoning of the grid
- Temperature to the zone based on actual demand
- Optimizing heating installations in buildings identified by heat meter data analytics

Additional information :

- We can integrate heatpump solutions together with temperature zones
- We have solutions for replacement of HEX (at substations or large consumers) to integrate low supply temperature
- GRUNDFOS “Energy Savings as a Service” business model can be a part of the agreement to reduce the up front investment.



Which of your zones should we start looking at?



Please feel free to contact us for more information :

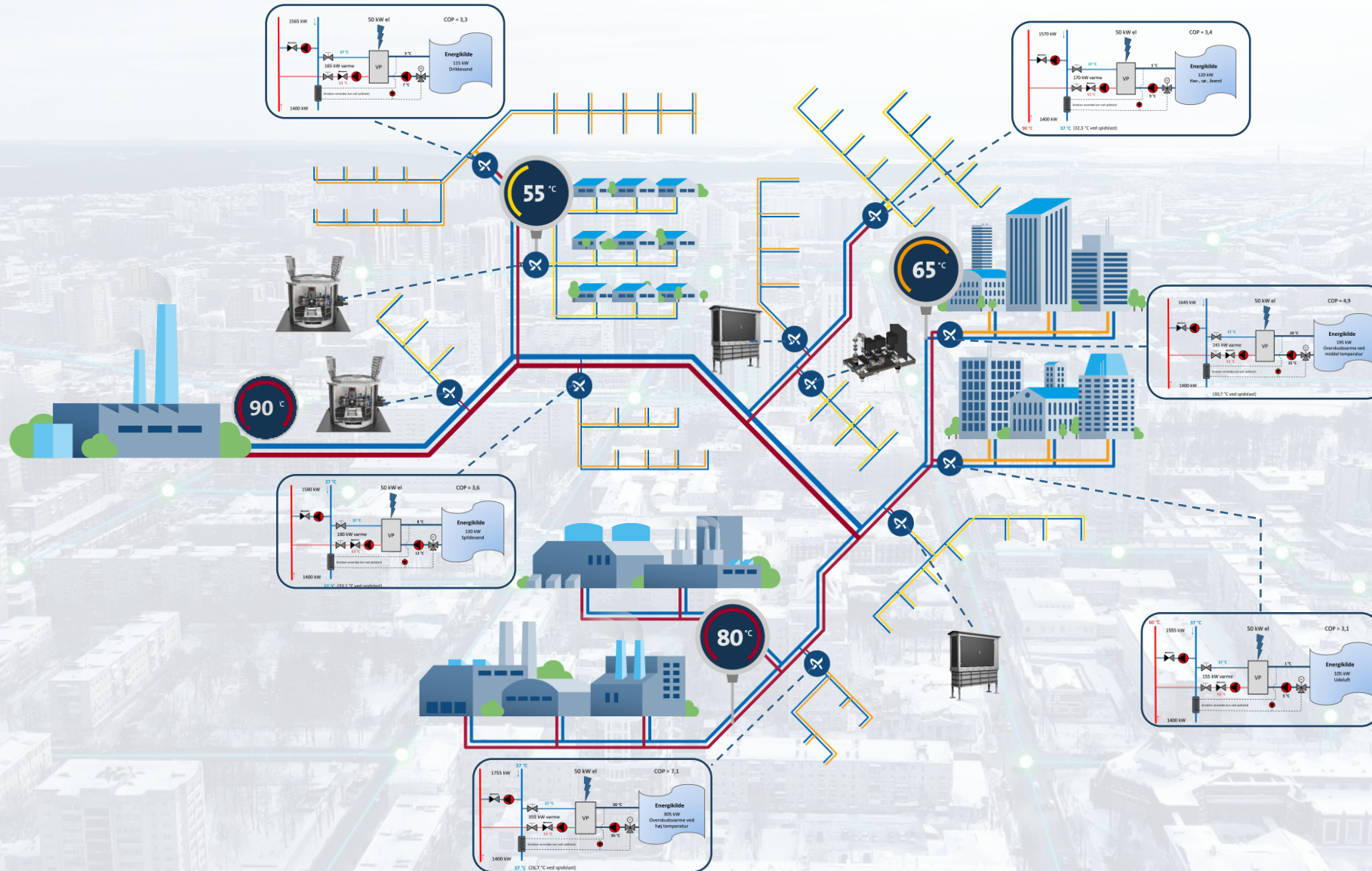
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iGRID Temperatur Zone integrated with heatpump



iGRID with heatpump

