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OPTIMIZE YOUR NETWORK WITH **LOW TEMPERATURE ZONES** IN DISTRICT HEATING

Solar

Geothermal

Wind

“I NEED TO **LOWER THE TEMPERATURES**
IN MY DISTRICT HEATING NETWORK
TO BE PART OF THE **ENERGY TRANSITION**
AND/OR TO **REDUCE THE HEAT LOSSES**”

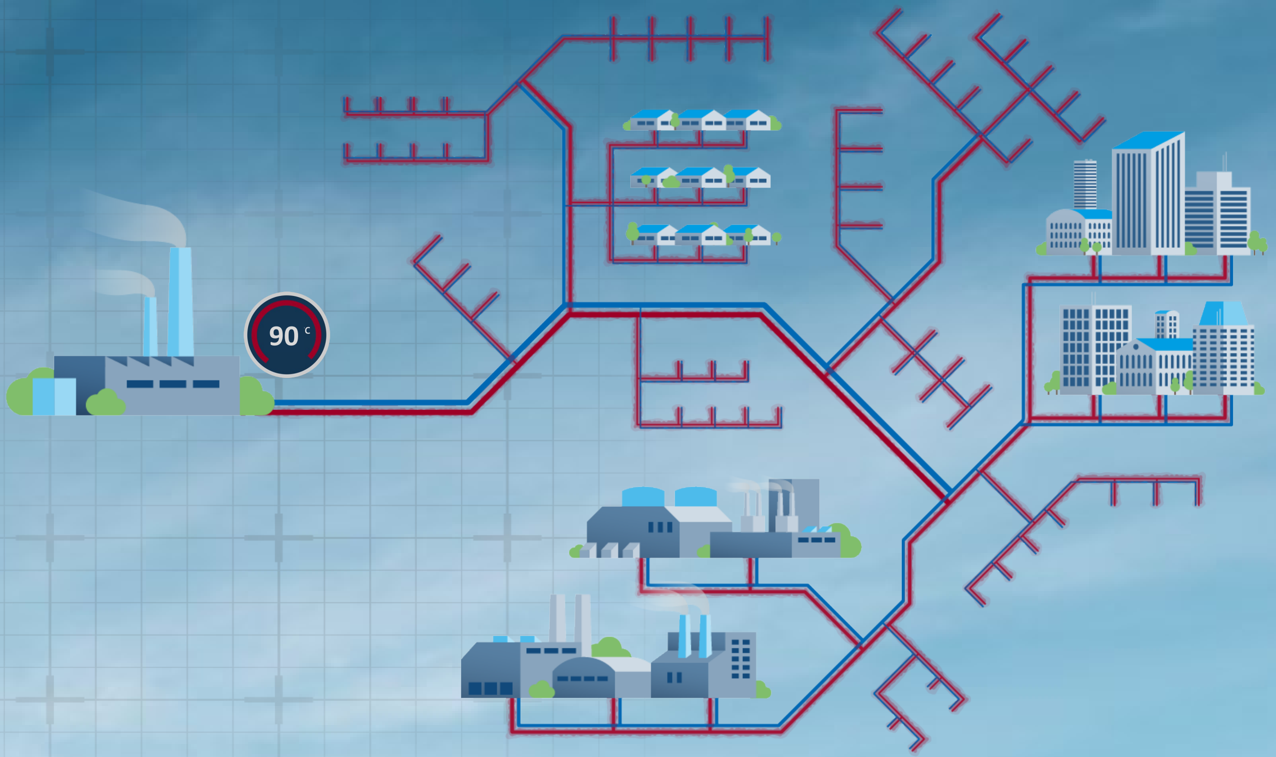
Surplus heat

Thermal storage

"HOW CAN I LOWER TEMPERATURES IN MY DISTRICT HEATING NETWORK??"

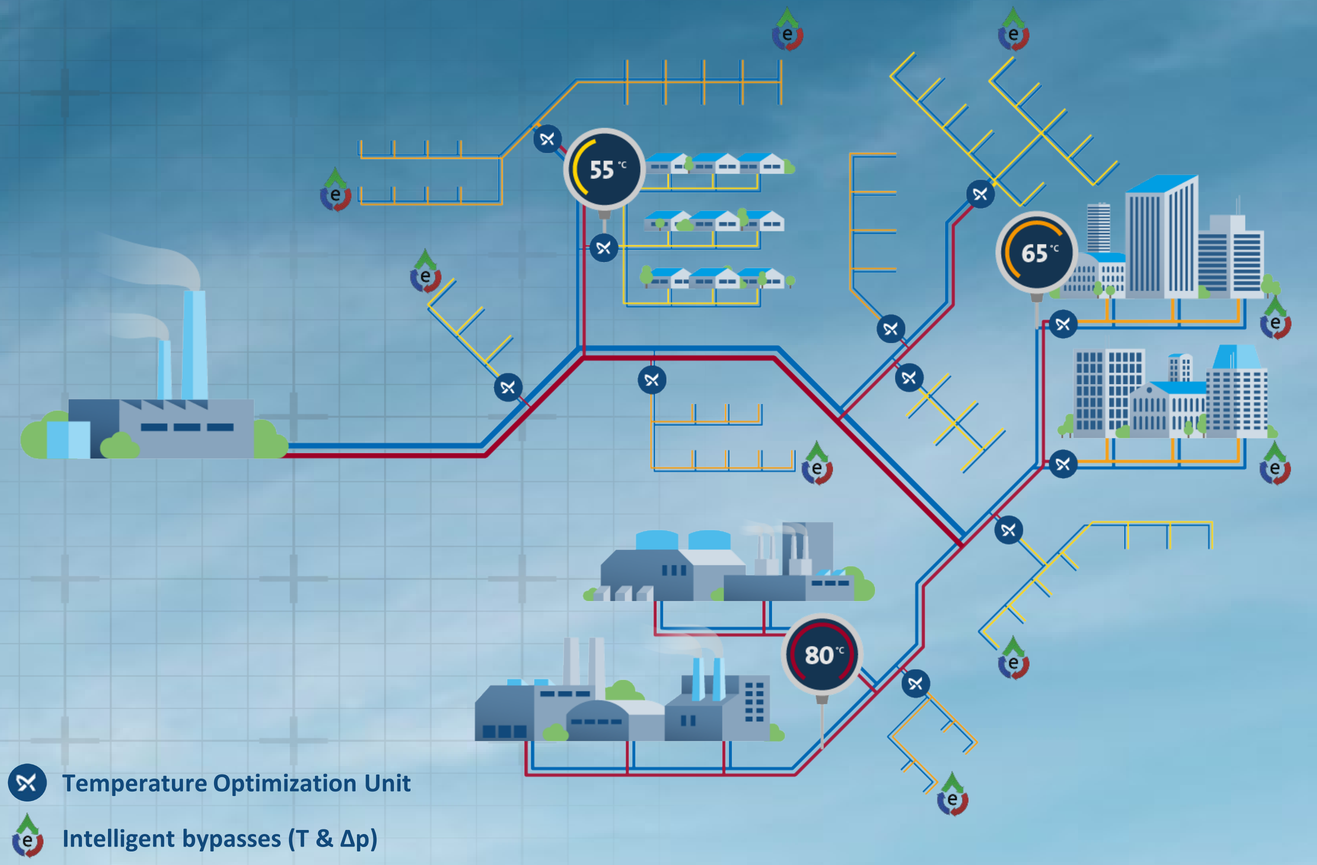
A typical district heating network

- Supply temperature, made to serve the 'worst' customers
- High heat losses
- Main pumps delivering all flow and pressure
- Big pressure drops



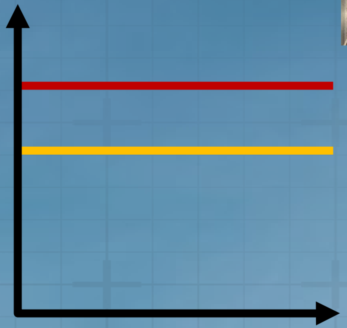
A zone-divided district heating network

- Demand driven supply
- Temperature and pressure adjusted according to consumer, reducing heat losses
- Distributed pumping, reducing pressure and energy consumption



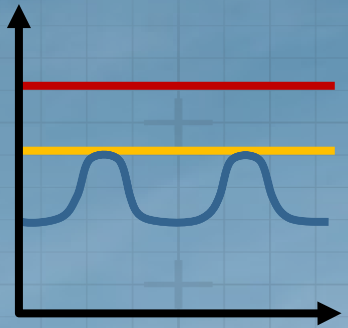
3 levels of temperature optimization

Temp-O unit
(Grundfos)



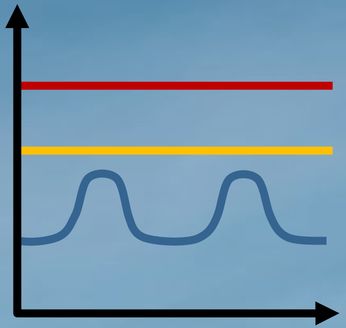
Makes it possible to
lower the temperature
for a specific city zone

IHG controller
(Energy-Service)



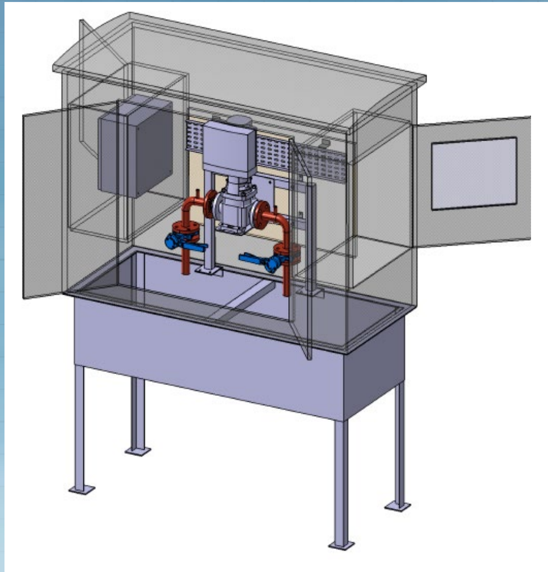
Adjusts the standard
temperature setting based on
weather compensation
and peak shaving

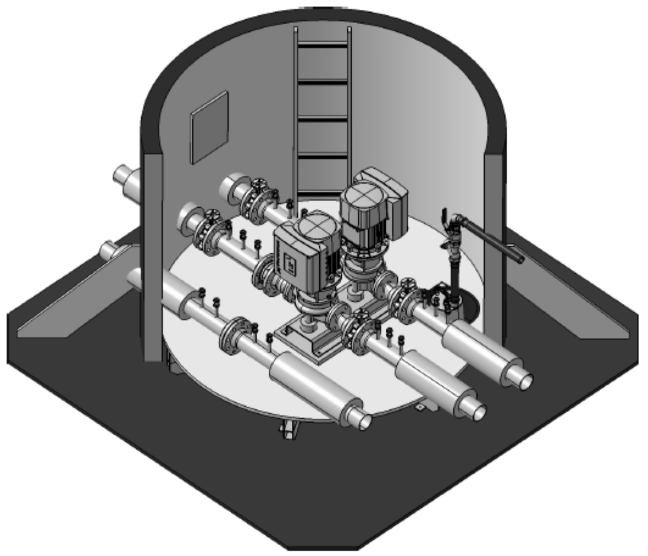
IHG measure points
(Energy-Service)



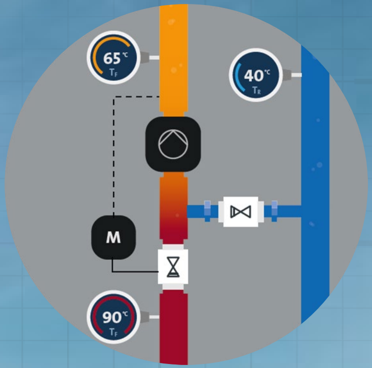
Further optimization based on
the **actual achieved temperature**
in the critical parts of the zone
(wireless and real-time data)

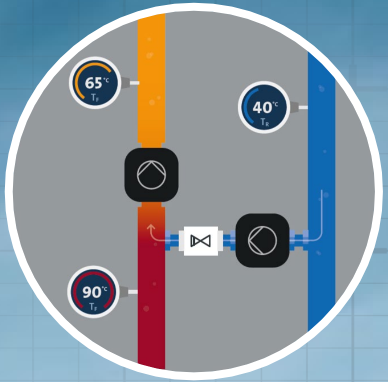
GRUNDFOS **TEMPERATURE OPTIMISATION** UNITS

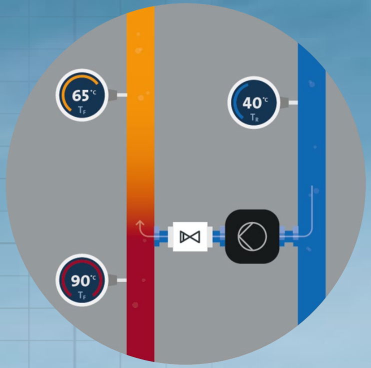




Different temperature optimisation units

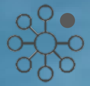






SCADA

OR



STAND-ALONE

Classic solution

Pressure independent
Pressure limitation

Free flow solution

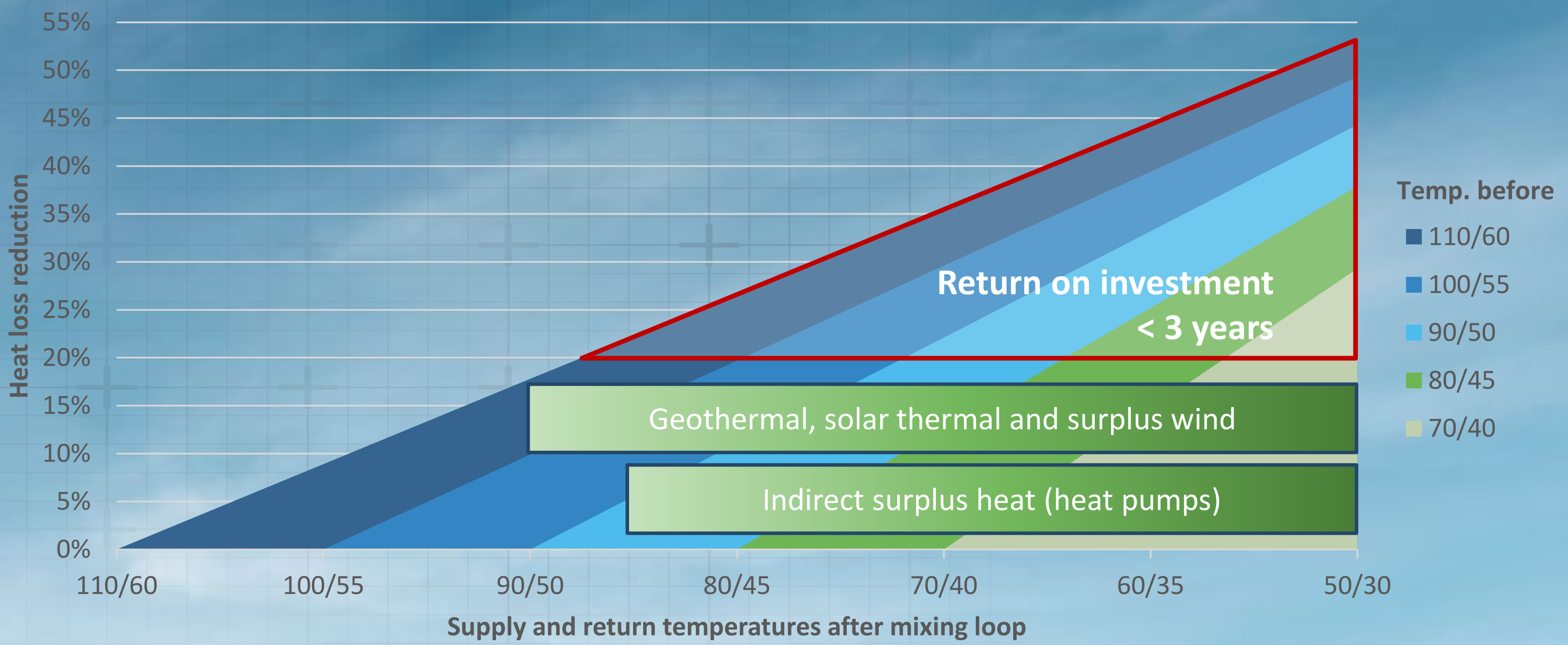
Pressure independent
No loss in valves
Highest reliability

Shunt solution

Pressure dependent
No even-pressure control
Cost-efficient

VERY low ROI when reducing temperatures in zones

Examples: Existing heat loss 20% and avg. T_{out} 9°C



A case from Gentofte, Copenhagen

Savings in an extension area with a low temperature zone
(highly insulated piping)

Annual customer demand:
9,000 MWh for 300 older houses

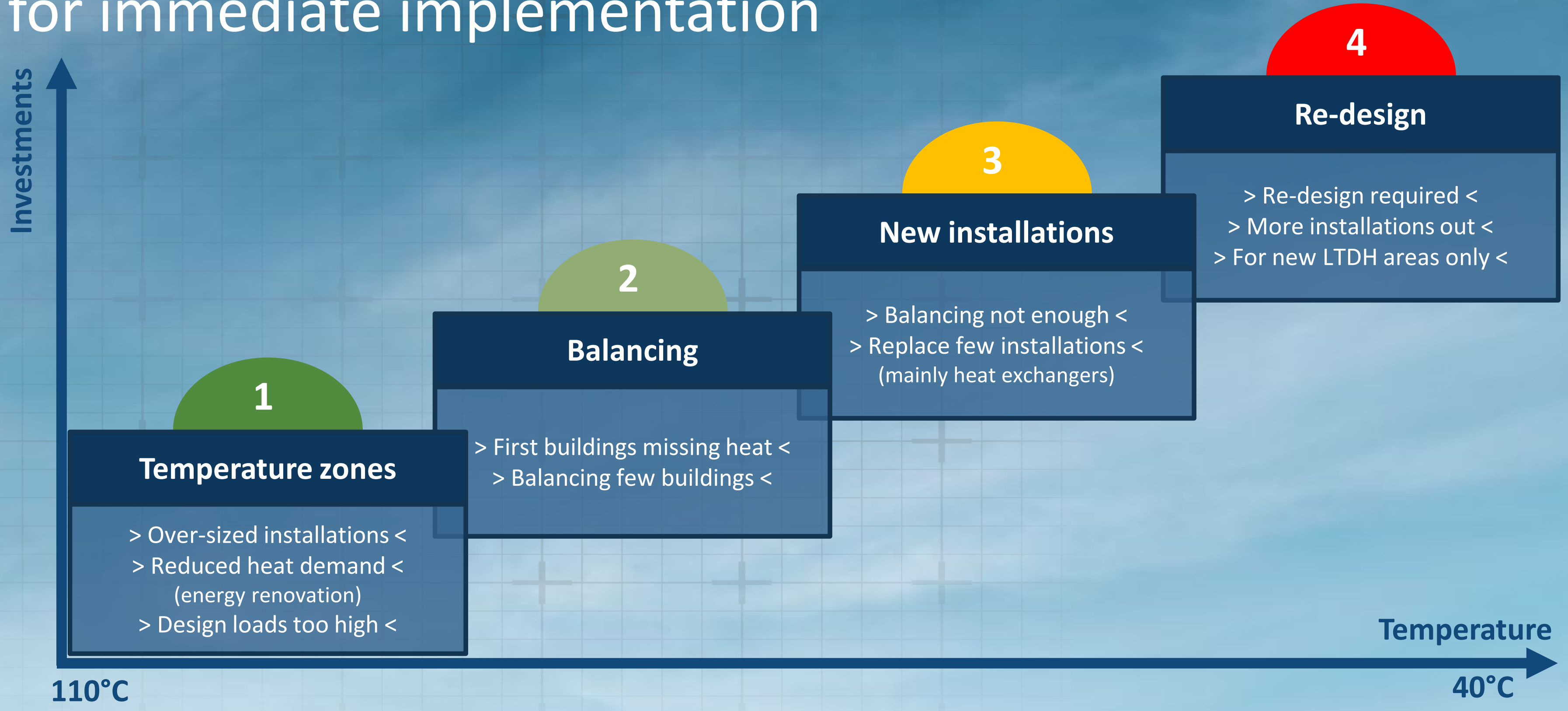
	USUAL DESIGN	EXPECTED NEW TEMPERATURE
Avg. temperatures (flow/return)	79°C - 48°C	60°C - 38°C
Heat loss in pipes per year	2.570 MWh	1.950 MWh
Pump energy per year	0 MWh	14 MWh
Carbon emission due to heat loss	195 tonnes	148 tonnes

Heat loss reduction
24%

CO_2 reduction
47 tonnes

Calculations are based on the calculation principles of the Danish District Heating Association
CTR that is delivering energy to Gentofte with a carbon emission of only 76 g/kWh

Lower temperatures in existing networks
for immediate implementation



The advantages of low temperature zones and real-time control

REDUCED HEAT LOSSES (OFTEN >20%)

- ✓ Improved total capacity
- ✓ Lower return temperature, higher production efficiency
- ✓ Integration of more renewable energy sources

INDUSTRIALISED SOLUTION, ADAPTED TO YOUR NEEDS

- ✓ Plug’n’pump solutions
- ✓ Dimensioning and price estimate within 48 hours
- ✓ Short return on investment

IMPROVED SYSTEM CONTROL

- ✓ Improved asset lifetime due to intelligent control of p and T
- ✓ Peak shaving & weather control
- ✓ Improved system overview and optimisation possibilities

Low pressure pipes

THANK YOU FOR LISTENING!

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Challenges of low temp. heating

PRESSURE LOSS

Solve the challenge of high pressure and loss by distributing pumps and adding the pressure when needed:
$\Phi = Q * \Delta t$