

DISTRICT HEATING:

GRUNDFOS iGRID

GRUNDFOS iSOLUTIONS



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SERVICES



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GRUNDFOS 

CHANGE TO DEMAND-DRIVEN SUPPLY AND SAVE ENERGY EVERY HOUR OF THE DAY

District heating is about efficiently delivering energy to a network of buildings. However, the typical district heating system is often designed and operated to serve the building with the highest demands, for example a hospital or an industrial facility requiring high temperatures. This means that the rest of the network is supplied with higher temperatures than needed, and this results in significant heat losses.

With Grundfos iGRID your heating system can be highly improved by making use of a demand-driven supply. Including a considerable return on investment, energy is saved every day.

The Grundfos iGRID solutions help you reduce temperatures for decentralised city zones by mixing return water into the supply line of any branch in your grid, ensuring you great benefits:

SIGNIFICANTLY REDUCED HEAT LOSSES

Lower temperatures in the grid mean reduced heat loss through the pipes – which results in savings and increased capacity.

IMPROVED SYSTEM CONTROL

Decentralised and distributed mixing loops ensure that

pressure is only added when needed, which ultimately enables lower system pressure from the district heating plant and reduces leakages in the system.

Moreover, by lowering the return temperatures, you can substantially improve the effectiveness of your production.

Real-time monitoring of temperature and pressure from critical parts of your system provides a great overview and benchmarks for potential optimisation areas.

Lower emissions ensure compliance with the COP21 Paris agreement regarding global carbon emissions and the EU energy efficiency directive.

The Grundfos **iGRID** solutions increase system efficiency with low-temperature zoning and demand-driven supply for district heating

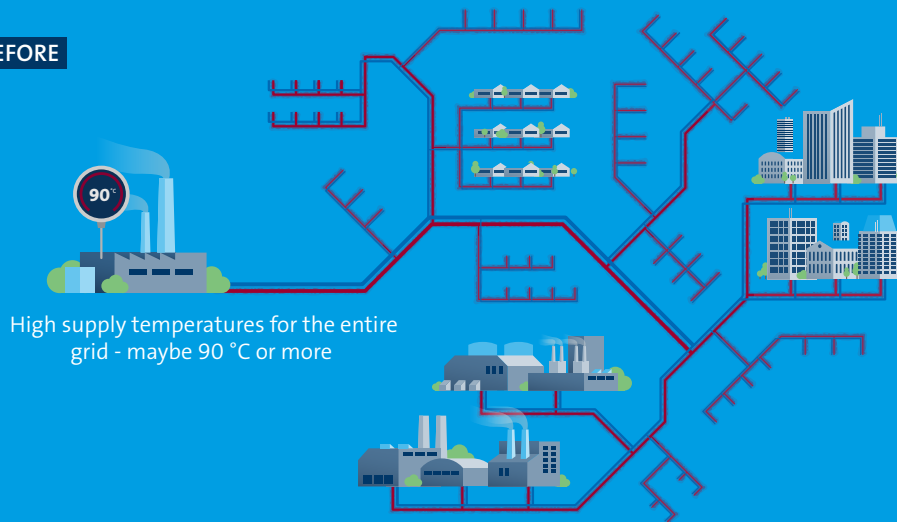


A TYPICAL DISTRICT HEATING GRID

– BEFORE AND AFTER GRUNDFOS iGRID

A typical district heating grid is designed to deliver to the end-user with the greatest need:

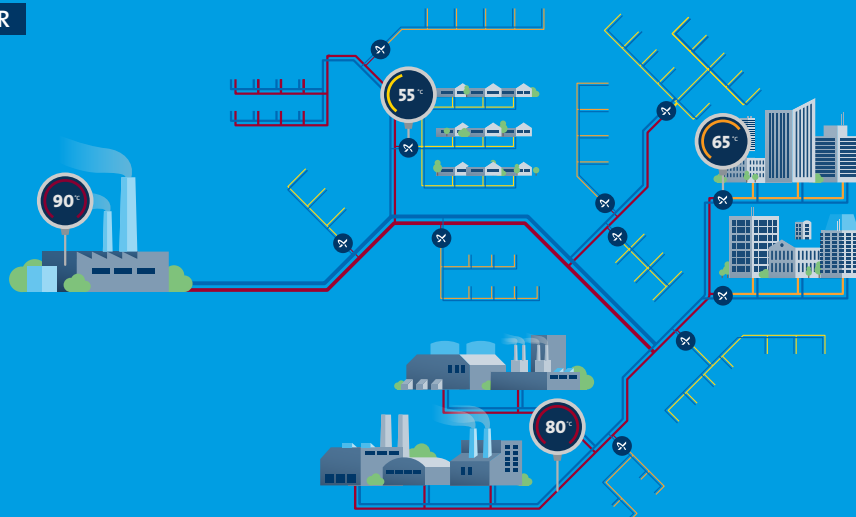
BEFORE



High supply temperatures for the entire grid - maybe 90 °C or more

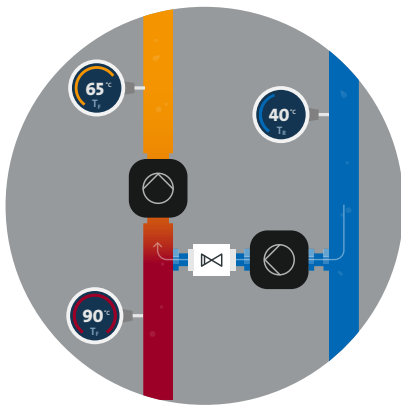
By implementing a solution with Grundfos iGRID Temperature Zone and Grundfos Pressure Zone, you can ensure a lower temperature pressure where required, for example to residential areas. At full implementation, you can effectively integrate renewable energy sources, even at low temperatures:

AFTER



HOW DECENTRALISED LOW TEMPERATURE ZONES WORK

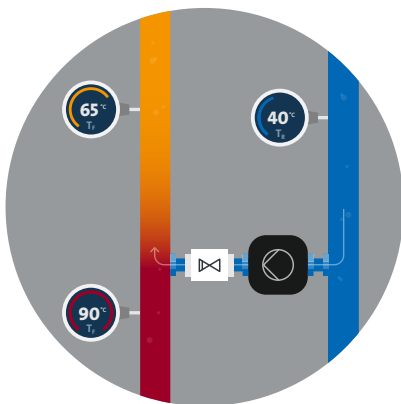
The iGRID Temperature Zone is a pre-fabricated and intelligent mixing loop that takes water from the return line and shunts it into the supply, to lower the temperature to the required level in any given city zones.



THE FREE FLOW SOLUTION

An efficient solution whereby pressure can be increased in the zone. By the use of a pump in the bypass, the pressure from the supply is adjusted in order to add the required return of water. Consequently, a free flow of water is created and a traditional motor valve is no longer necessary. Nonetheless, the need for maintenance is reduced due to a high degree of reliability.

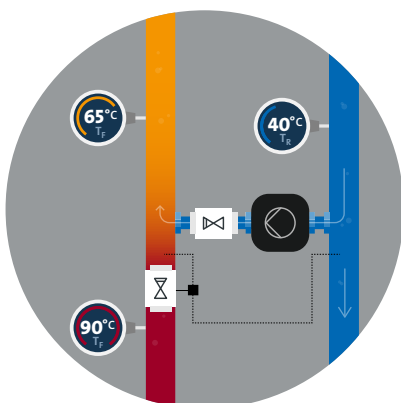
This is the ideal solution for reducing heat losses to a minimum.



THE SHUNT SOLUTION

A cost-effective solution utilising pressure from the main pumps in the existing grid. A pump in the bypass is designed to overcome pressure from the supply to add the needed flow of return water.

This solution is suggested if there is always enough supply pressure for the zone and no ambition to implement the low pressure benefits of distributed pumping.



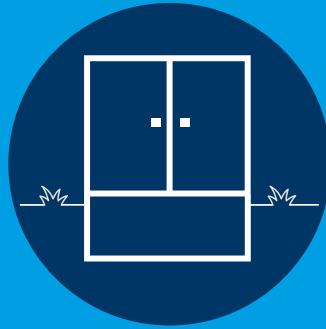
THE PRESSURE REDUCTION SOLUTION

A shunt solution with a pressure control valve utilized when the pressure in the zone is higher than required.

This will reduce the pumping need for mixing and pressure reduction in all buildings will no longer be required. Additionally, it will increase the lifetime of pipes and building installations.

These are the three main solutions, but further variants can be created on request.

DEPENDING ON YOUR NEED, DIFFERENT SOLUTIONS MAY BE REQUIRED



The **cabinet solution** is easy to install and flexible in design



The **pit solution** hides away the installation



The **skid solution** is the most flexible and can be placed in an existing building etc.

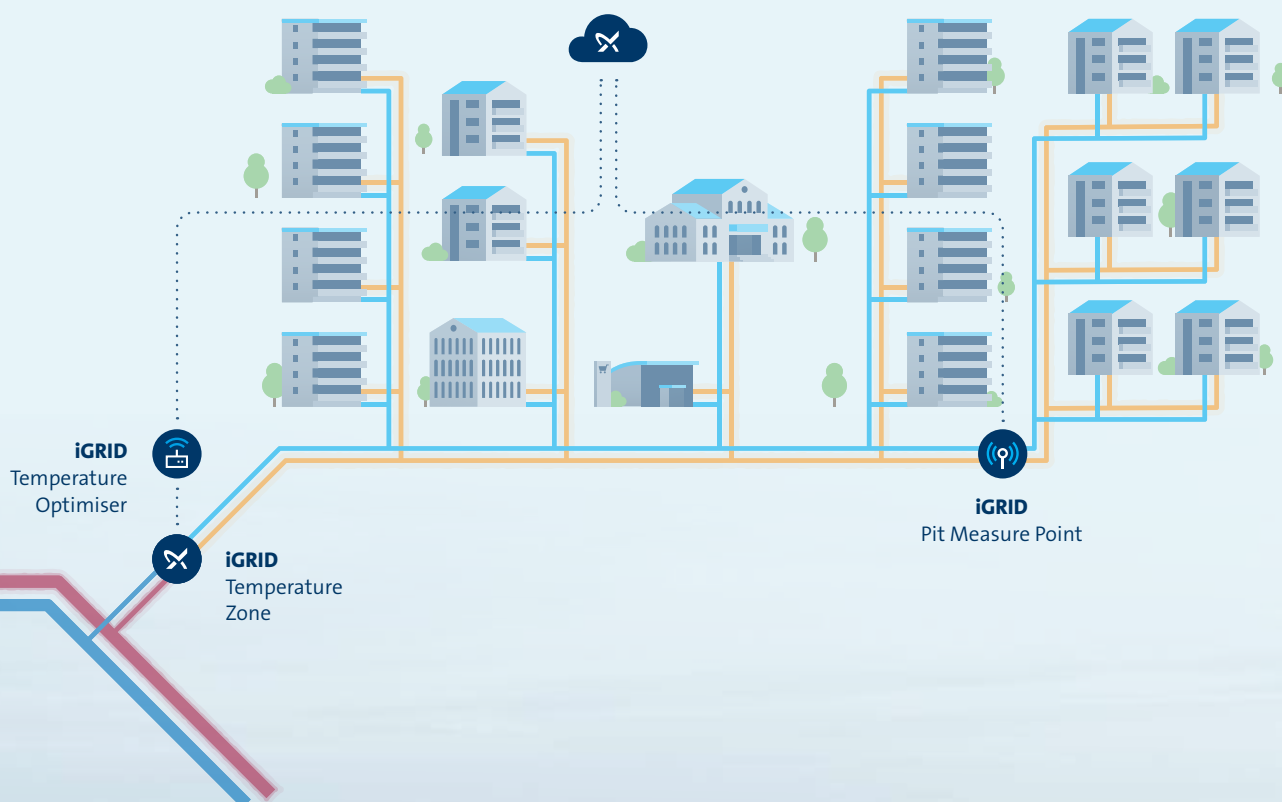
REAL-TIME MONITORING AND USEFUL DATA

For optimal performance, Grundfos iGRID integrated real-time monitoring from the critical parts of the system. Temperature and pressure is measured by installing iGRID Pit Measure Points and iGRID Bypass Cabinets are ensuring instant hot water during summer, in low demand periods.

These units do not need to be connected to the electricity grid, since a thermal electric generator utilises the ΔT to create enough energy to power the devices and transmit the data to your SCADA system and to the Grundfos iGRID Temperature Optimiser that operates the pumps

accordingly. Useful data, available on smart devices, the web and through your SCADA system, gives you a great overview of city zones to reveal potential optimisation areas. The iGRID Temperature Optimiser utilises the data and adjusts the temperature to meet the exact consumer demands on a real-time basis, lowering the heat losses even further and improving comfort.

The iGRID Temperature Optimiser also includes an intelligent weather compensation and peak shaving algorithms to further optimise the operation of your district heating grid.



BUILDING A LOW-TEMPERATURE ZONE IN COPENHAGEN

Gentofte and Gladsaxe District Heating Company serves a mix of housing blocks, public buildings and single-family homes. An iGRID Temperature Zone was installed to reduce the average supply temperature from 79 °C to 60 °C in that zone. Complemented with other iGRID solutions, Gentofte is now able to deliver the exact heat energy required by all the different

buildings in this area, but supplied at much lower temperatures, even during peaks.

This is expected to reduce heat losses by up to 25 %, with a return on investment of the total project in just 3 years.

“This is the future of district heating. Grundfos has prompted us to look at things in a different way.”

Johan Sølvhøj Heinesen, Head of Gentofte and Gladsaxe District Heating.



Customer demand: **9,000 MWh**

	Usual design	Expected new temperature
Avg. temperature (supply/return)	79 °C / 48 °C	60 °C / 38 °C
Heat loss pipes/year MWh	2,570	1,950
Pump energy MWh/year	0	14

Source: Based on calculation tool provided by Danish District Heating Association

Heat loss reduction 24 %



GRUNDFOS iGRID IS A NEW SOLUTION RANGE FOR DISTRICT HEATING

With this range we fight heat losses and prepare for utilisation of renewable energy sources through intelligent temperature control.

By creating city zones with mixing loops, temperatures can be lowered to meet the actual demands in those zones and thereby deliver exactly the heat energy needed – nothing more and nothing less!

Find out more about the Grundfos iGRID concept by contacting your local Grundfos Sales Company or visit grundfos.com form more information.

