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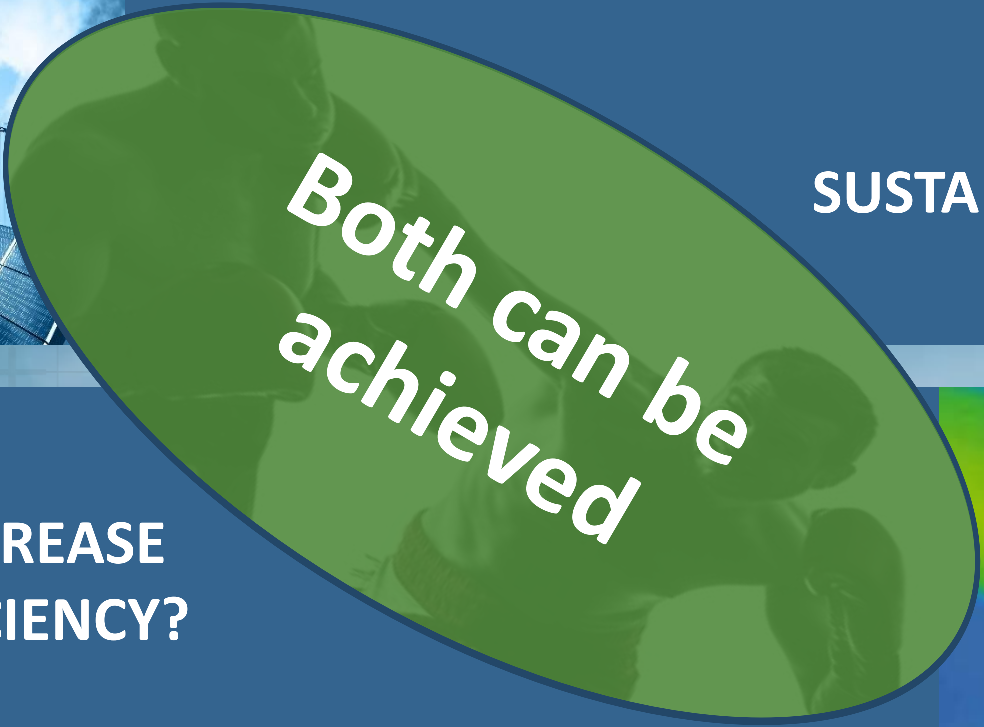
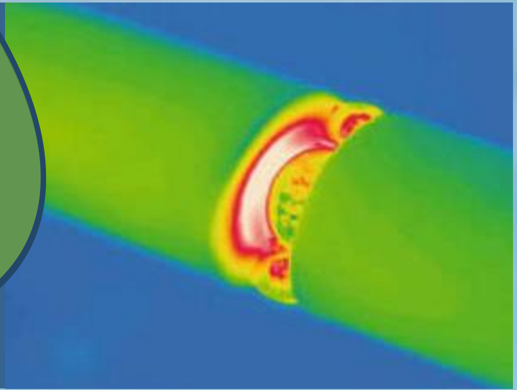
Intelligent utilization of pumps
in low temperature district heating

INTERESTED IN A SUSTAINABLE FUTURE?



WANT TO INCREASE SYSTEM EFFICIENCY?



Political support to lower carbon emissions
with district heating as a key element

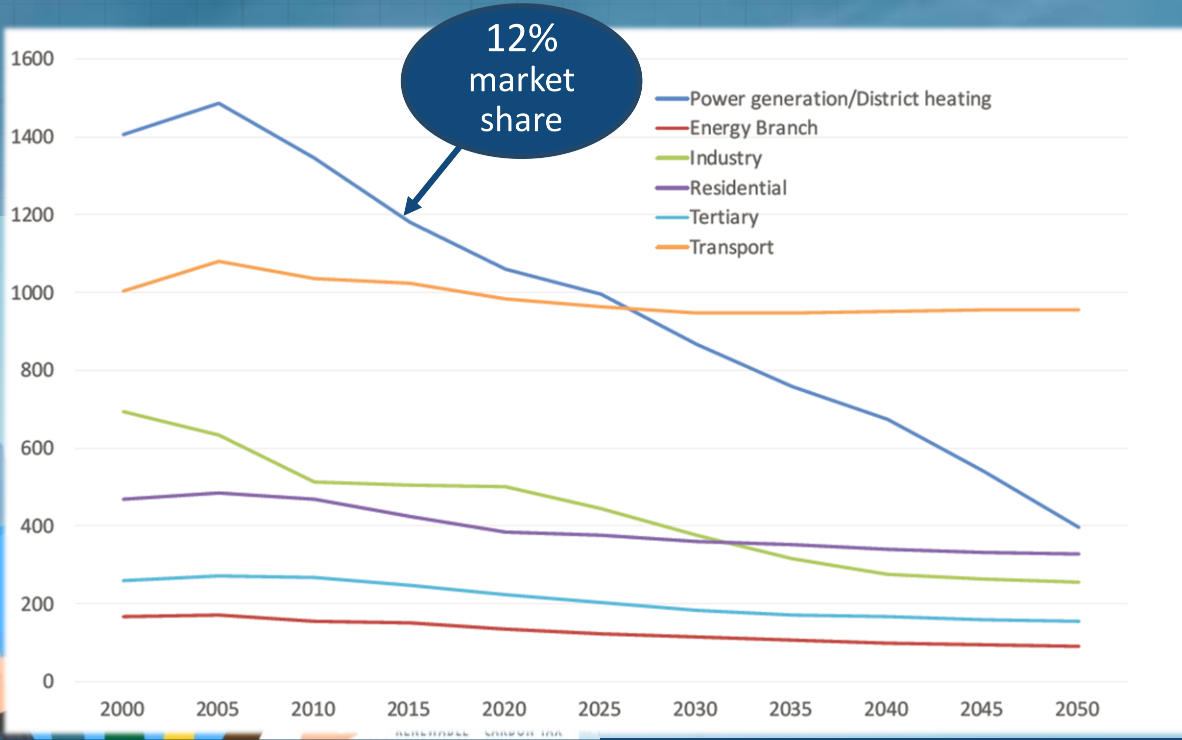
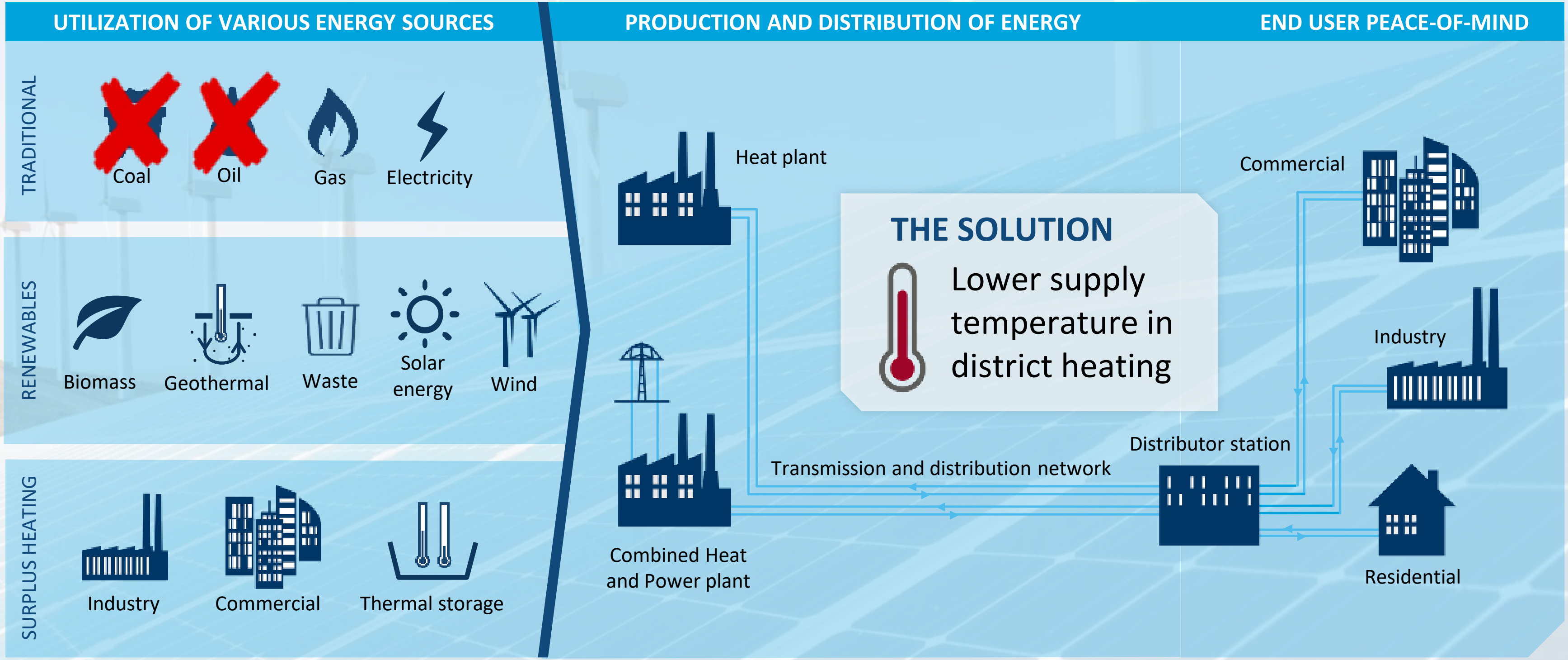


Figure 2-6: Development GHG emission per sector (in Mt) in the European Union until 2050. [6]

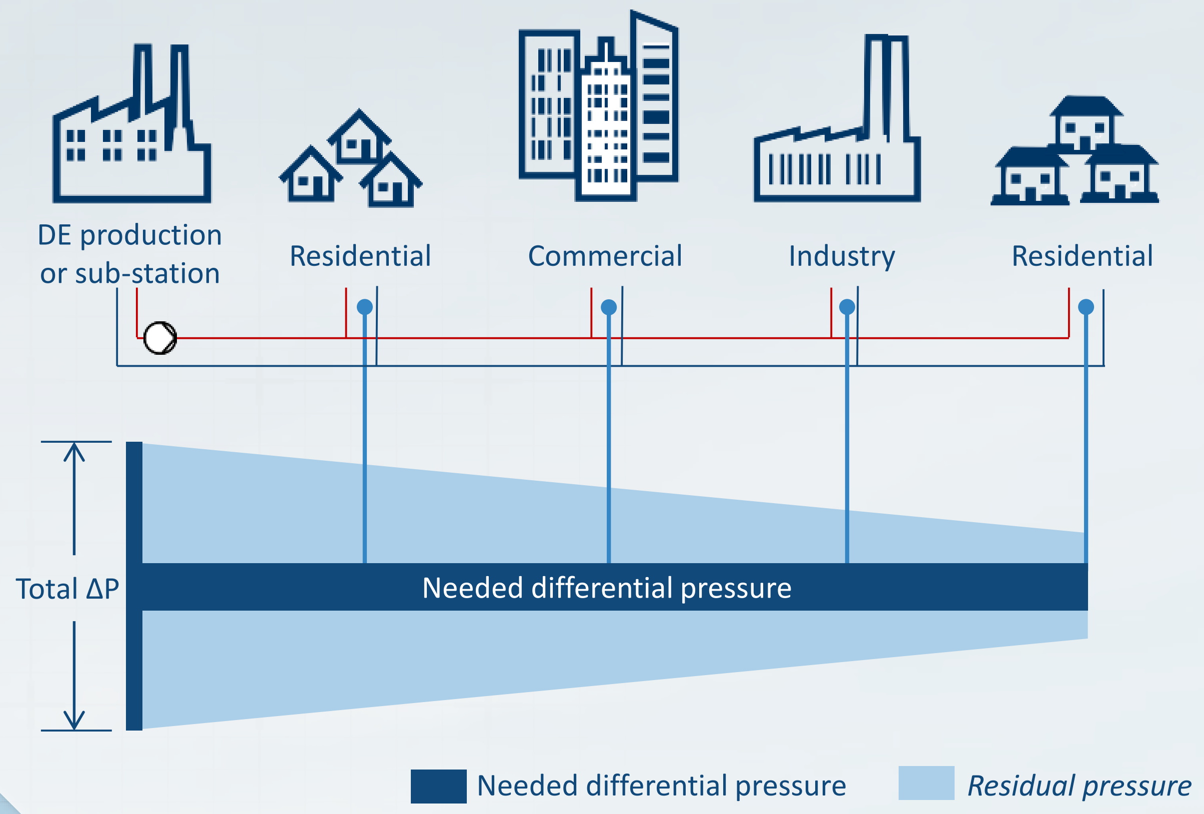
Clean energy calls for intelligent heat grids



The challenge of low temperature heating

PRESSURE LOSS

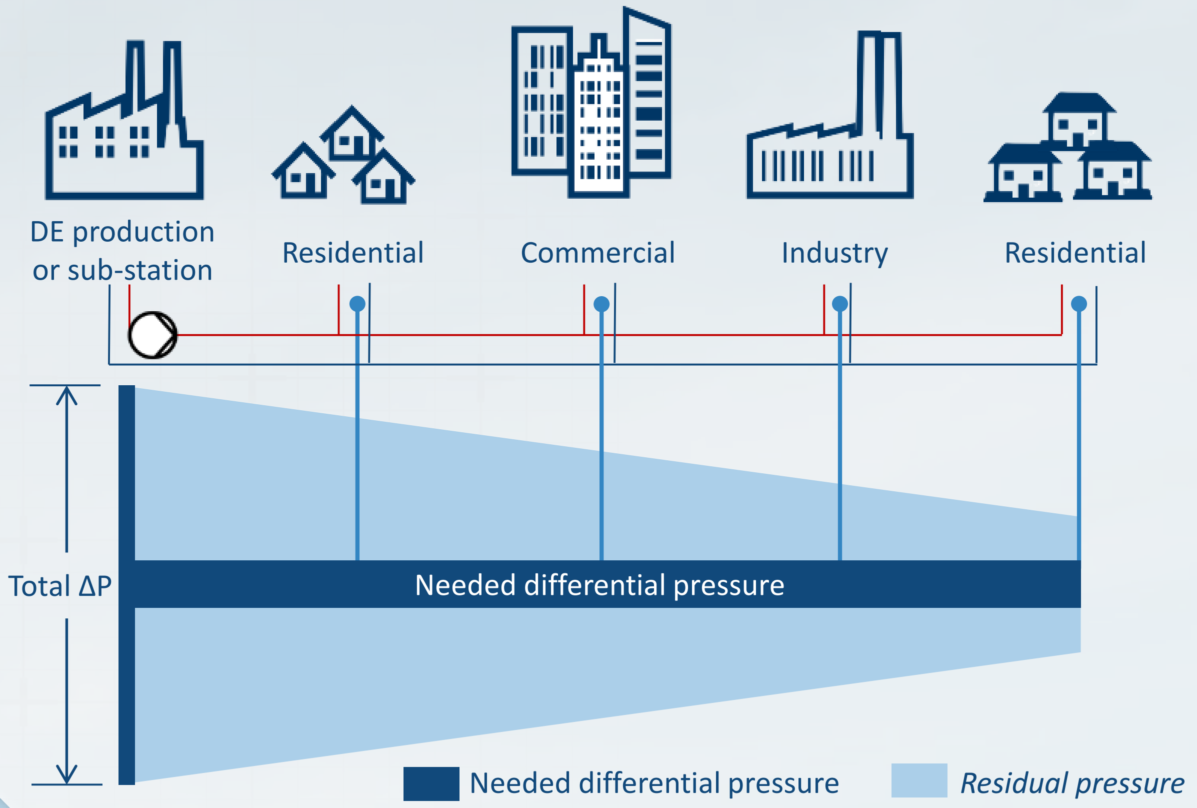
The traditional district heating system



The challenge of low temperature heating

PRESSURE LOSS

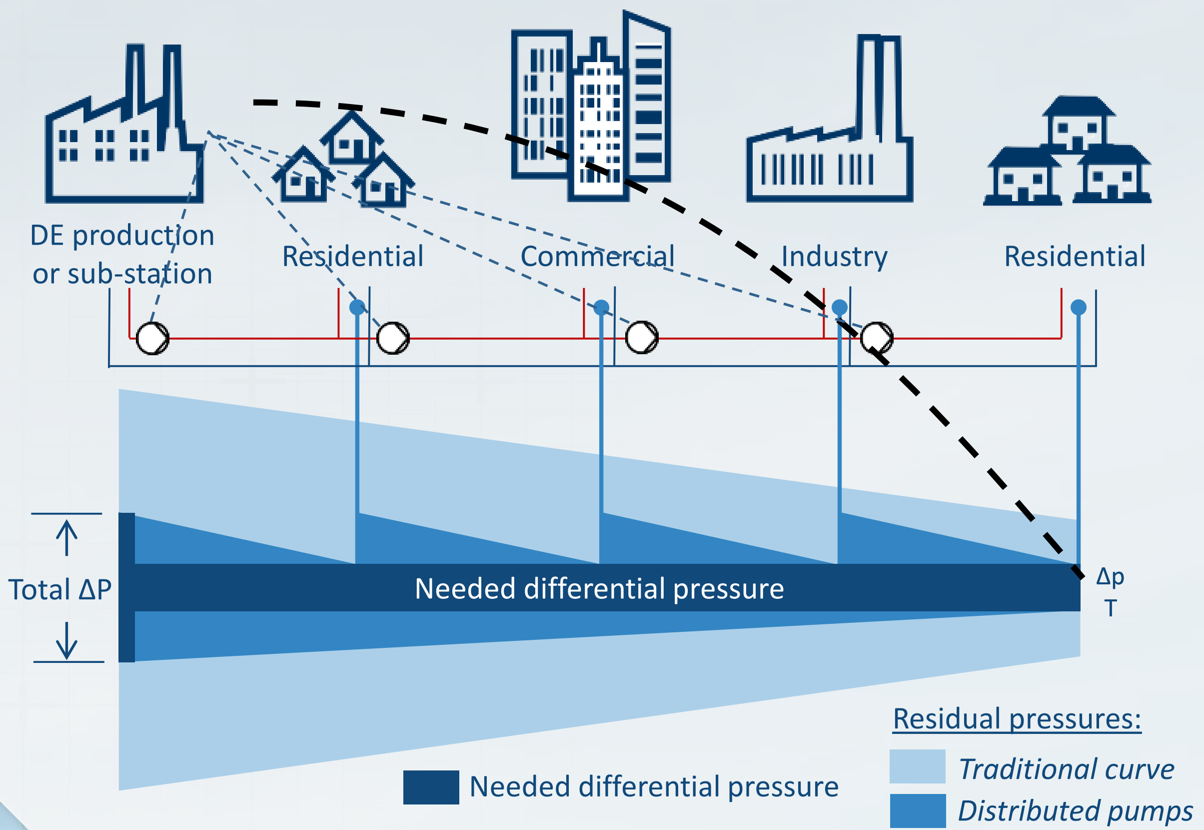
A lower forward temperature require more flow (and pressure) to deliver the same energy in the system:
$\Phi = Q * \Delta t$



The challenge of low temperature heating

PRESSURE LOSS

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



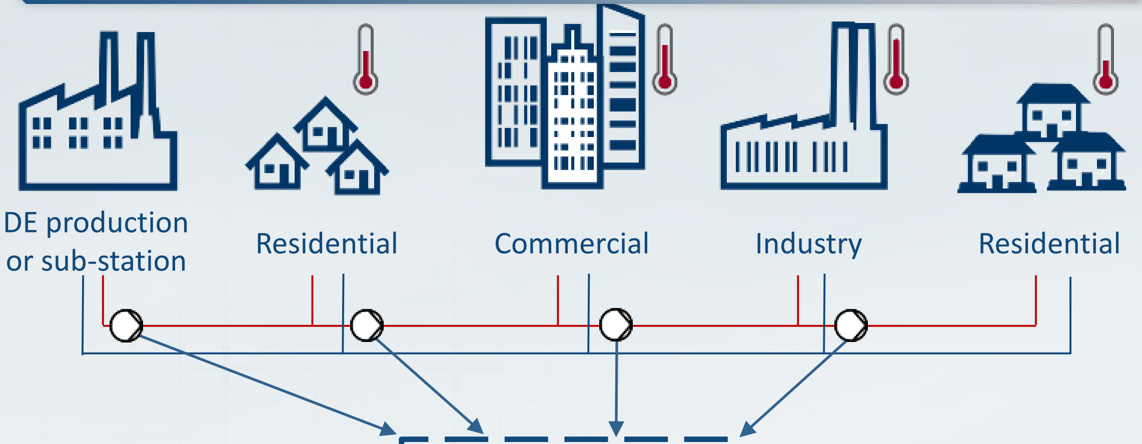
The challenge of low temperature heating

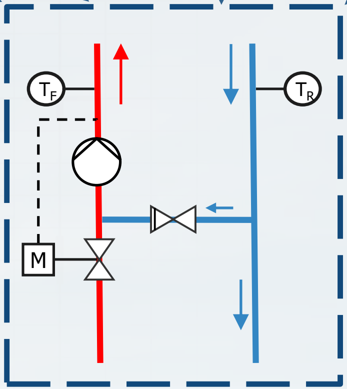
PRESSURE LOSS

Solve the challenge of high pressure and loss by distributing pumps and adding the pressure when needed:

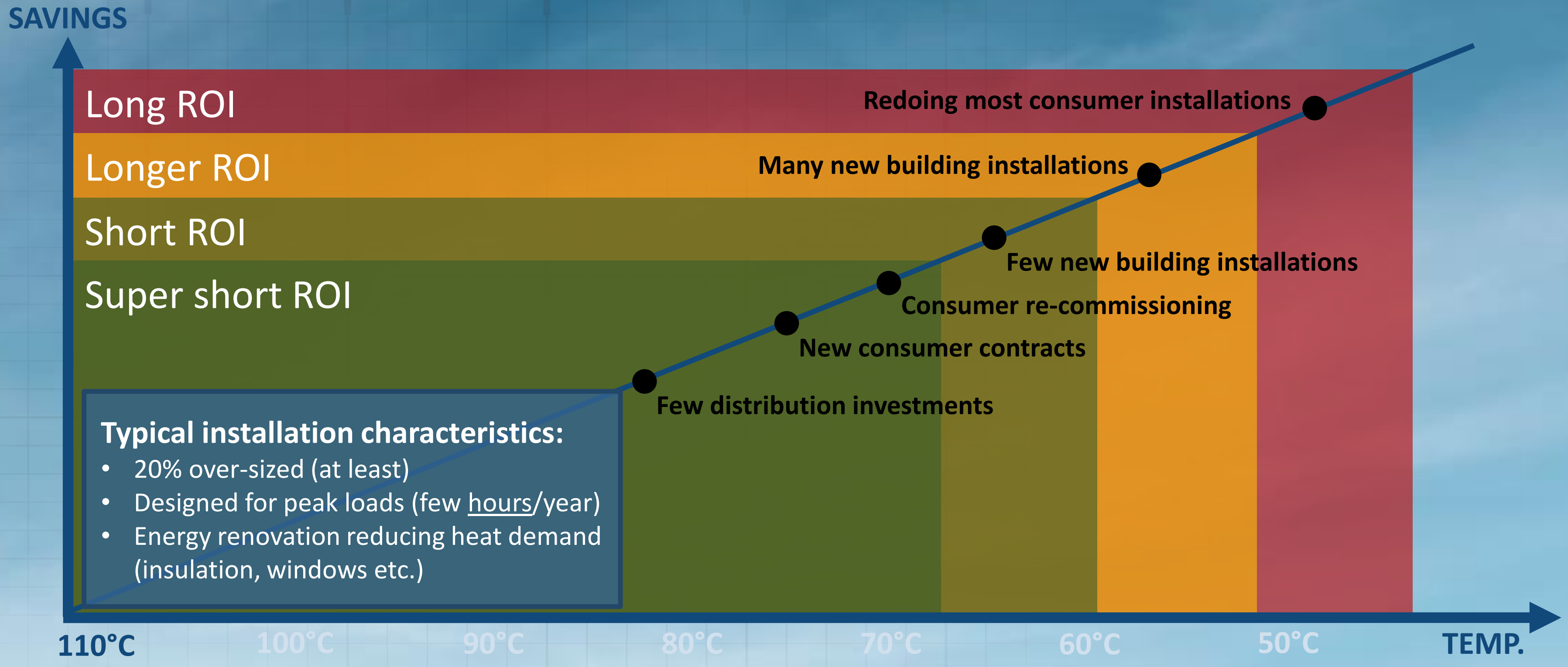
$\Phi = Q * \Delta t$

Temperature zoning to further reduce heat losses

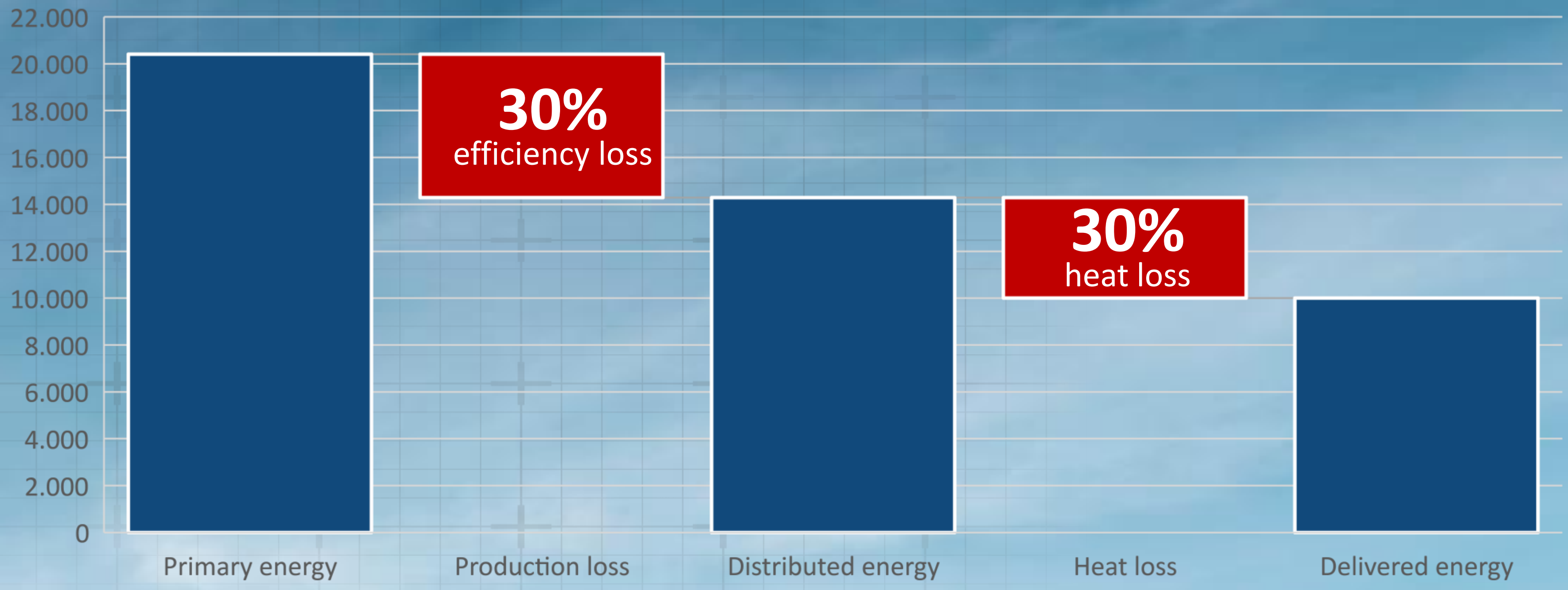




Savings when changing to low temperature district heating

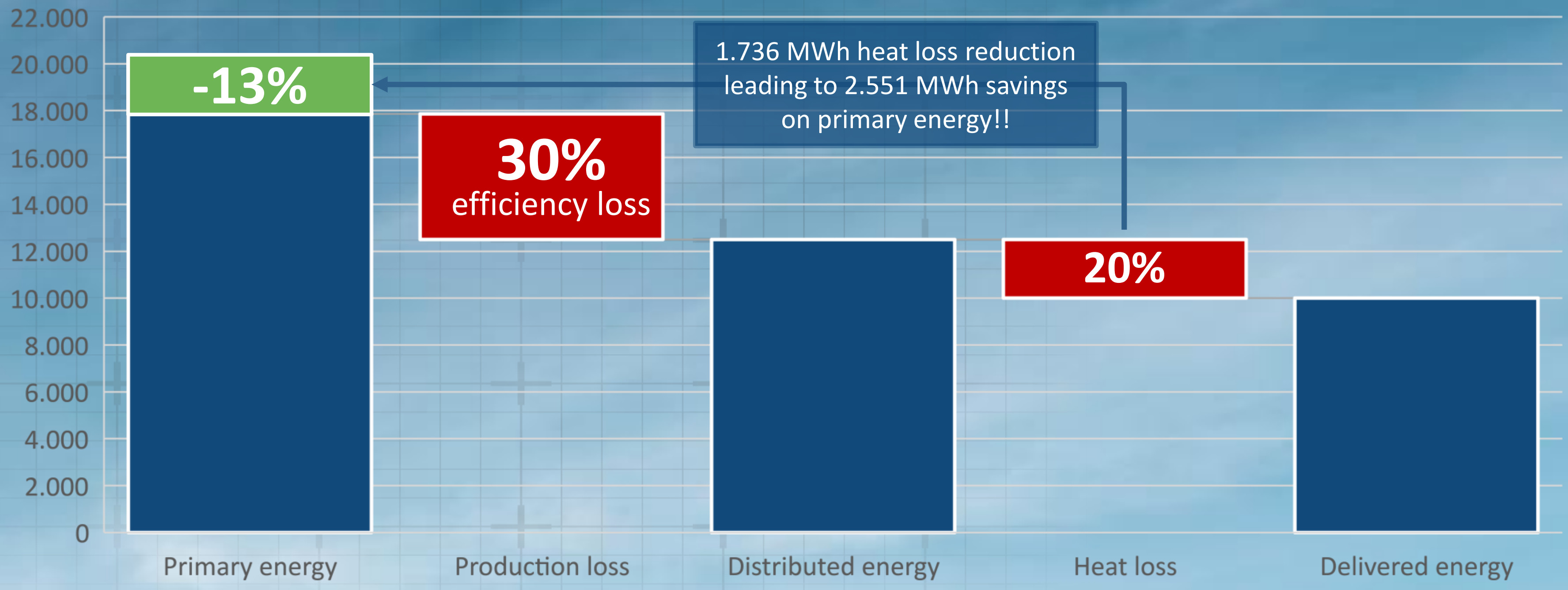


Energy losses in traditional District Heating



Source: Anders Nielsen & Carsten Pedersen, BS Segment

Energy losses in Low Temperature District Heating



Source: Anders Nielsen & Carsten Pedersen, BS Segment

CASE: Savings in an extension area with mixing loop (highly insulated piping)

Payback < 4 years

	USUAL DESIGN	NEW TEMPERATURE DESIGN	DIFFERENCE
Temperatures (flow/return)	90°C - 58°C	69°C - 37°C	
Heat loss pipes/year MWh	2.573 MWh (22%)	2.021 MWh (18%)	552 MWh
Primary energy MWh/year	16.533 MWh	15.744 MWh	789 MWh
Pump energy MWh/year	0 MWh	14 MWh	14 MWh

THANK YOU FOR LISTENING!