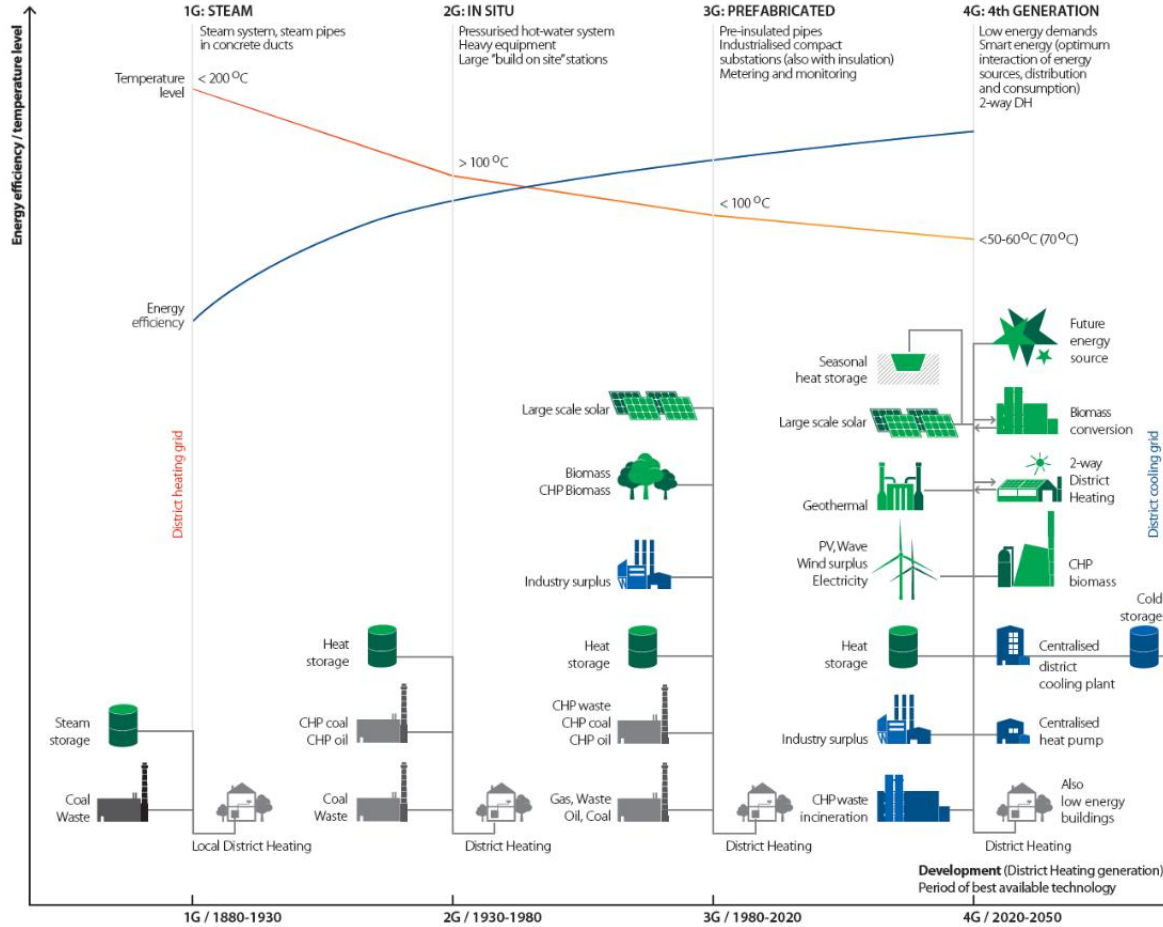


# Consumer Substations for Future DH

Jan Eric Thorsen, Director DHS-TA Application Centre , Danfoss Heating Segment

A large, faint, semi-transparent watermark of the Danfoss logo in a script font, oriented diagonally across the lower half of the slide.

# The Generations of DH

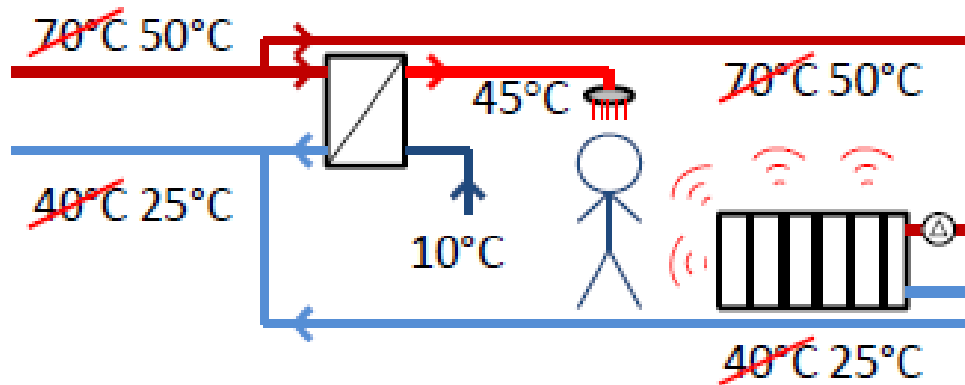


## Trends for energy system:

- Renewable energy
- Surplus energy
- Conversion energy
- Low quality energy (°C)
- Fluctuating energy
- Less demands in buildings

# The Low Temperature DH concept

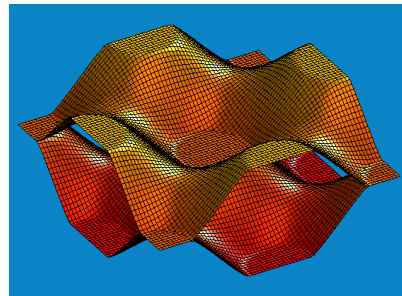
Trends for DH substations:  
LTDH / 50-60°C (70°C)



Dimensioning of Heat exchangers

Radiator dimensioning

Floor heating



MPHE

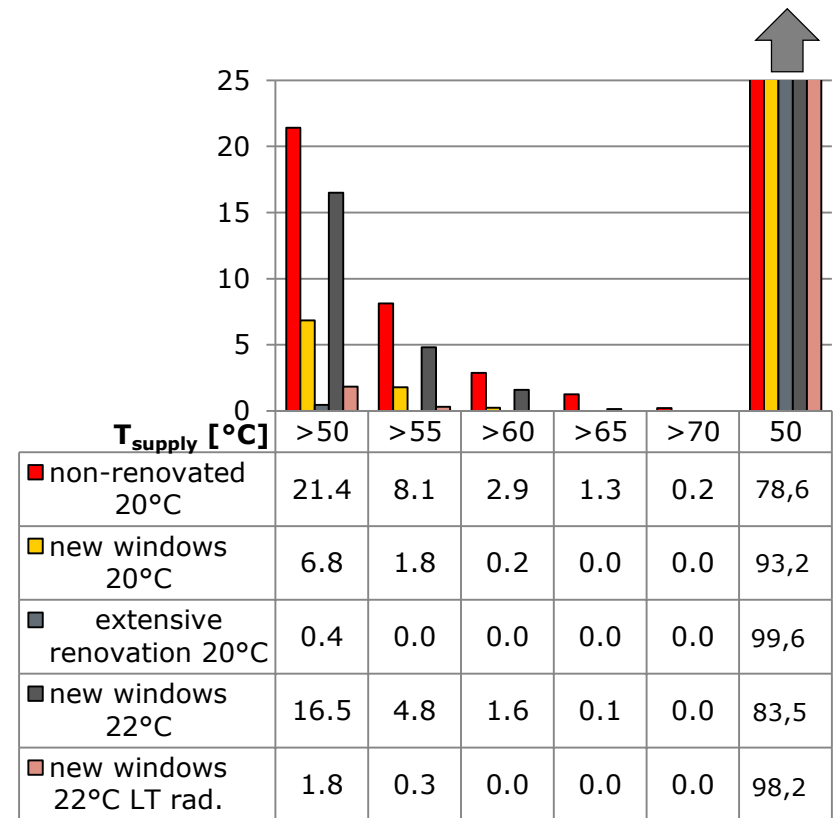
# The Low Temperature DH concept

Duration of minimum DH supply temperature in dependence of:

- Degree of renovation
- Indoor temperature



Typical Danish one family house from 1970, results based on dynamic simulations.

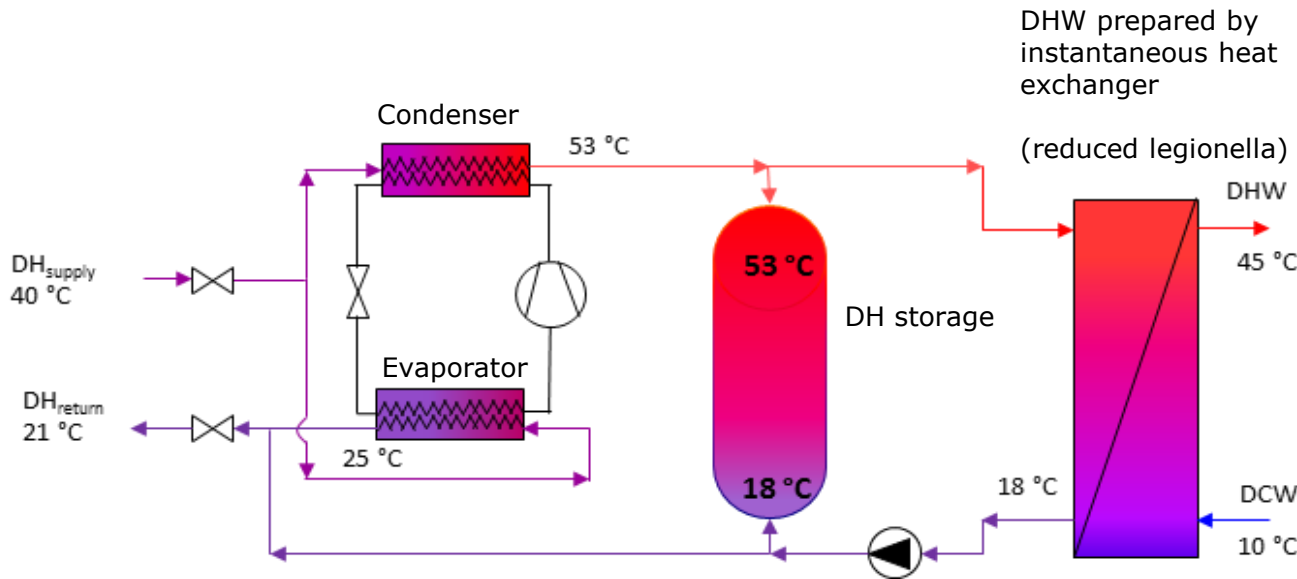


\*Extensive renovation = low energy windows + insulation of roof

# Examples of products and Solutions

Trends for DH substations:

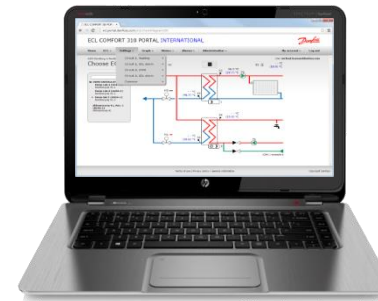
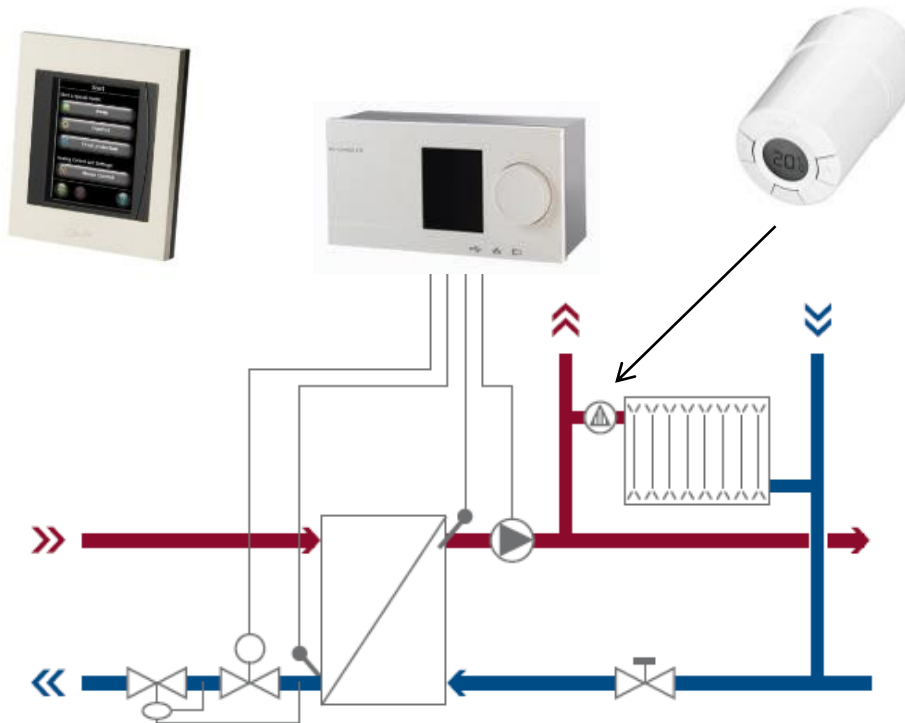
- ULTDH / 35-45°C (70°C)
- For DHW preparation the temperature is boosted by HP



# Examples of products and Solutions

Trends for DH substations:

- Fluctuating energy supply



- Intelligent control of components
- Control based on system level
- Utilization of passive thermal capacities in buildings

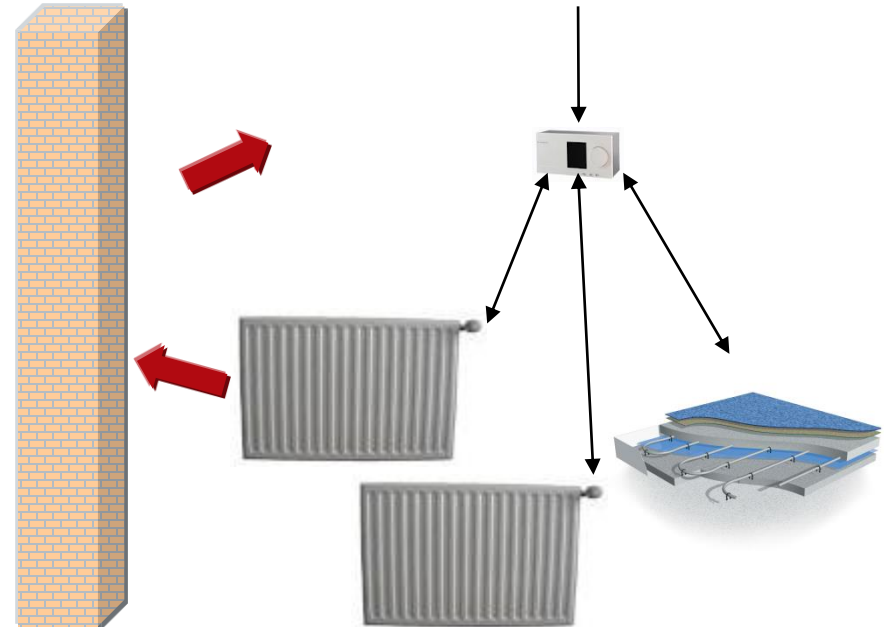


# Future functions

## Electric spot price



## DH spot price



- Comfort level is set by consumer (cost/comfort trade-off)
- Potentially 2-10 hours of load can be shifted, depending on heat load and building type

# Concluding Remarks

## Outlook:

- DH has a great role to play in the future energy system
- BUT: DH has to be developed to meet future demands
- For consumer substations, future low temperature DH operation and intelligent control is important
- Low temperature DH is demonstrated and is working and also spreading
- Intelligent control of building substations should be developed more
- This calls for cooperation across the value chain of DH/Energy system





**ENGINEERING  
TOMORROW**

THANK YOU FOR THE ATTENTION

Jan Eric Thorsen,  
Director DHS-TA Application Centre  
[jet@danfoss.com](mailto:jet@danfoss.com)  
Danfoss Heating Segment