Towards a zero emission city

District Heating and Wind Power Integration

Project Tjæreborg

AGENDA

Introducing SE

Why are we working on this topic

Our plans

What have we done

Whats next

SE IN BRIEF

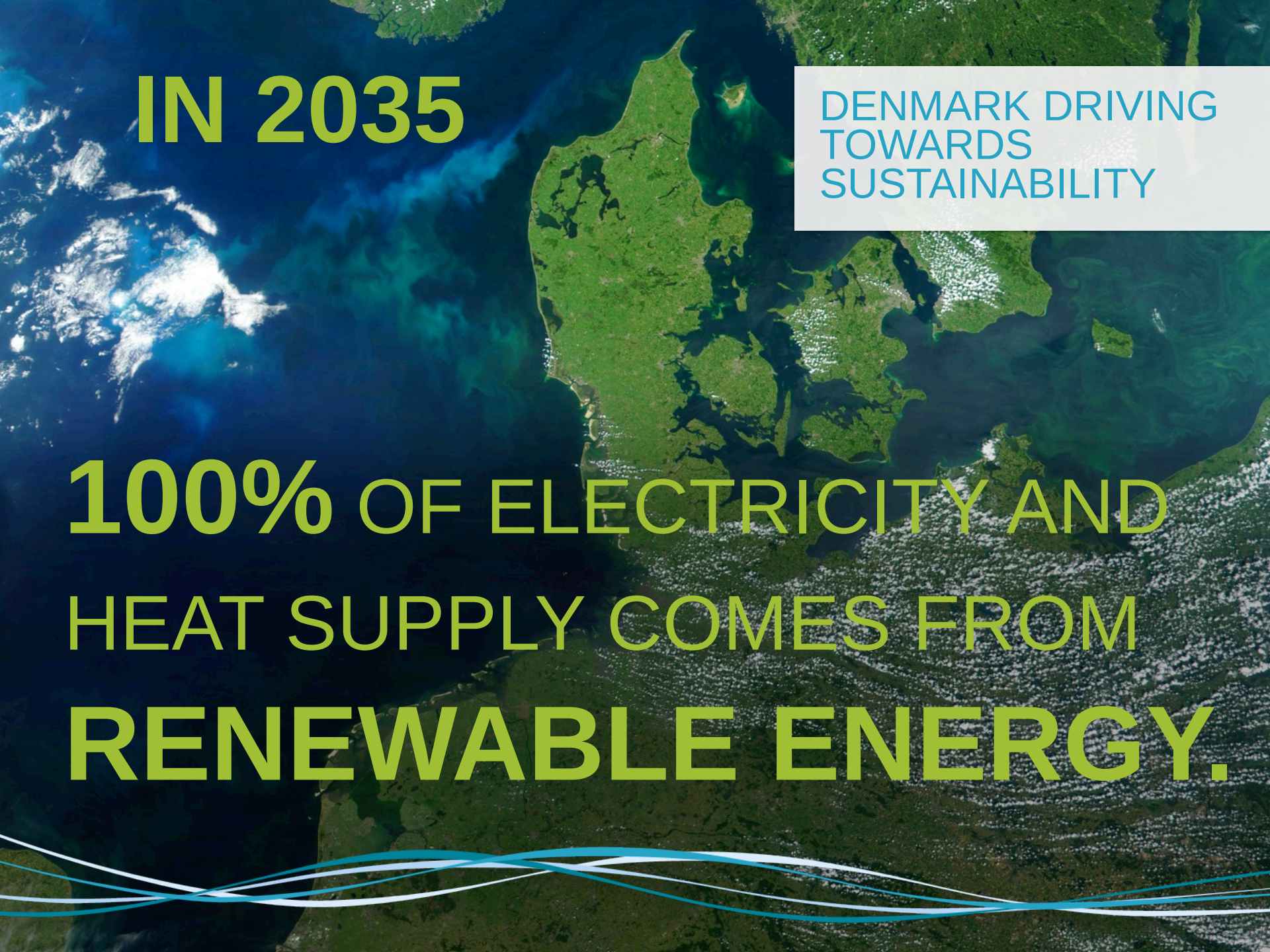
- One of Denmark's largest utility, energy and communications suppliers
  - Our mantra is the total customer experience
  - Our aim is to becoming the most profitable player in the Danish energy sector,
  - and with vision of developing the society that SE is a part of.
- Utility provider to more than 260,000 households and companies
- SE delivers TV and Internet for approx. 435,000 customers
  - 70,000 FTTH customers
  - 365,000 CATV customers
- SE provides energy effeciency solutions
  to approx. 3,000 Danish and foreign companies and institutions
- SE is producer of green energy

DENMARK DRIVING SUSTAINABILITY

DANISH POLICY

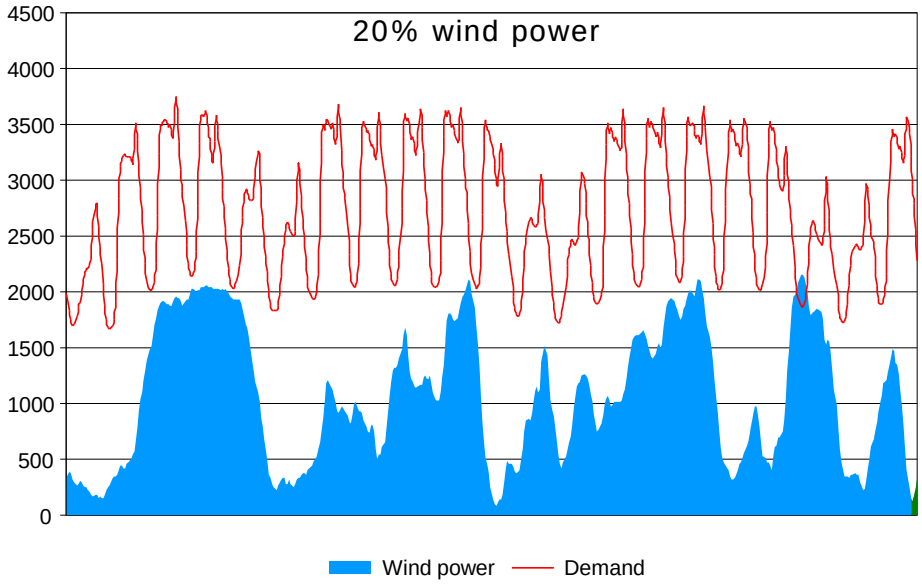
DENMARK DRIVING TOWARDS SUSTAINABILITY

IN 2020
DENMARK DRIVING TOWARDS SUSTAINABILITY
50% OF DENMARK'S TRADITIONAL ELECTRICITY SUPPLY WILL COME FROM WIND.


IN 2035
DENMARK DRIVING TOWARDS SUSTAINABILITY
100% OF ELECTRICITY AND HEAT SUPPLY COMES FROM RENEWABLE ENERGY.

Wind Energy challenge –
with 50 % in 2020
- An illustrative case from Denmark

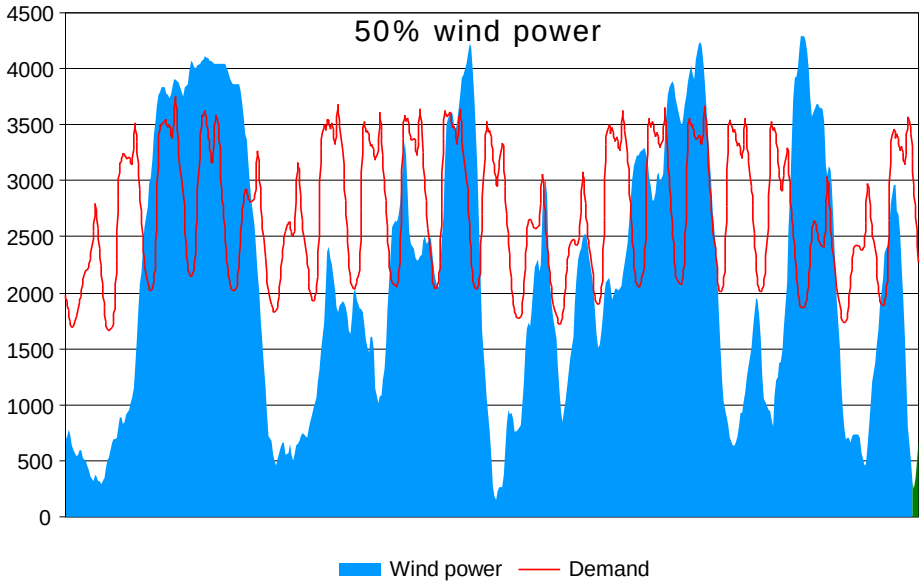
Today (2008)



Wind power covers the entire demand for electricity in 200 hours (West DK)

Wind power in 2010 – 4000 MW

Tomorrow (2020)

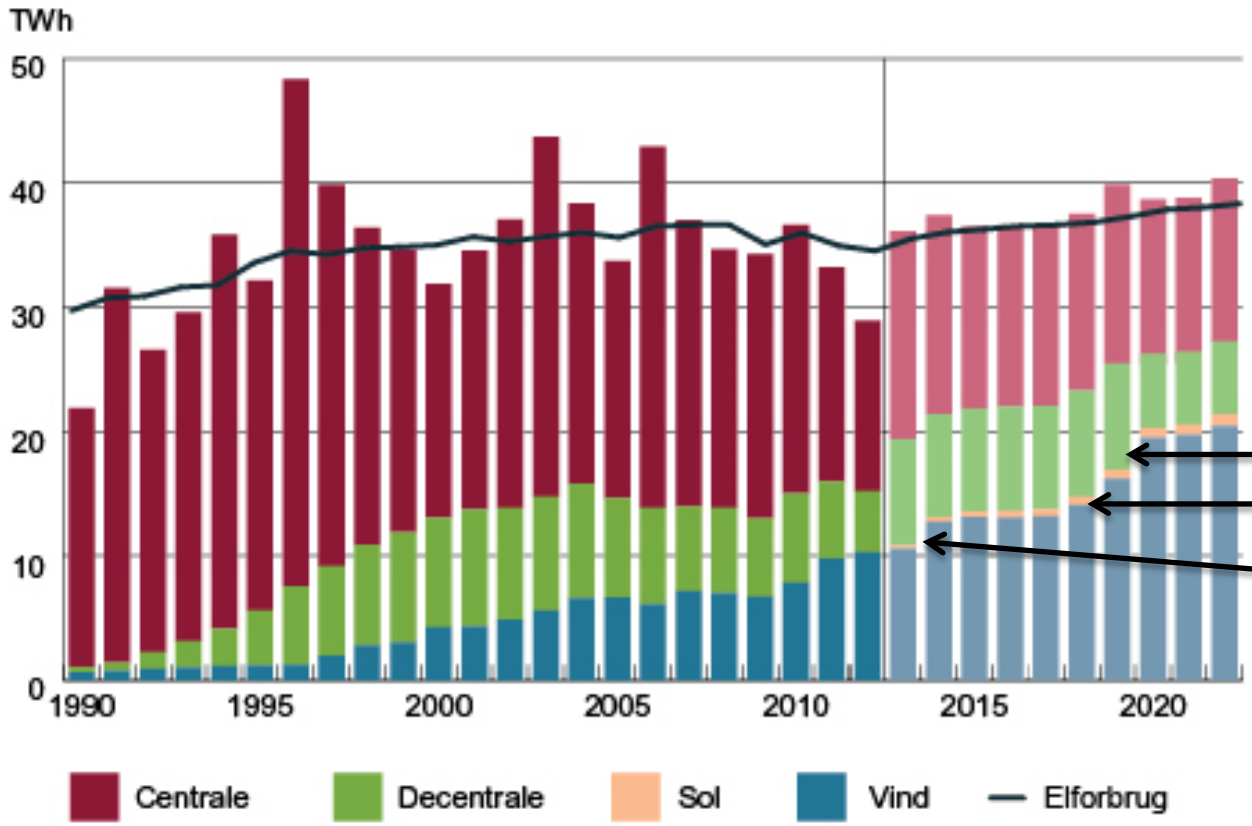


In the future wind power might exceed demand in more than 1,000 hours

Wind power in 2020 – 6000 MW

Kilde: Energinet.dk

Energinet.dk's forecast (DK)



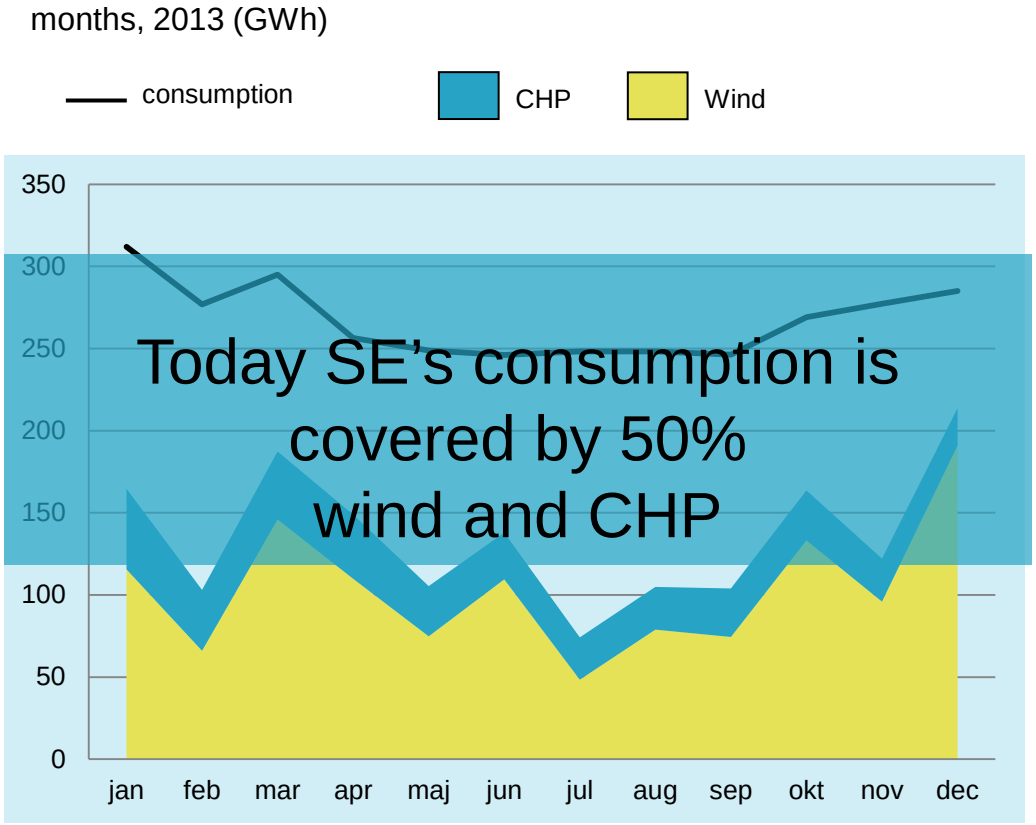
Installed wind power
2013: 4154 MW

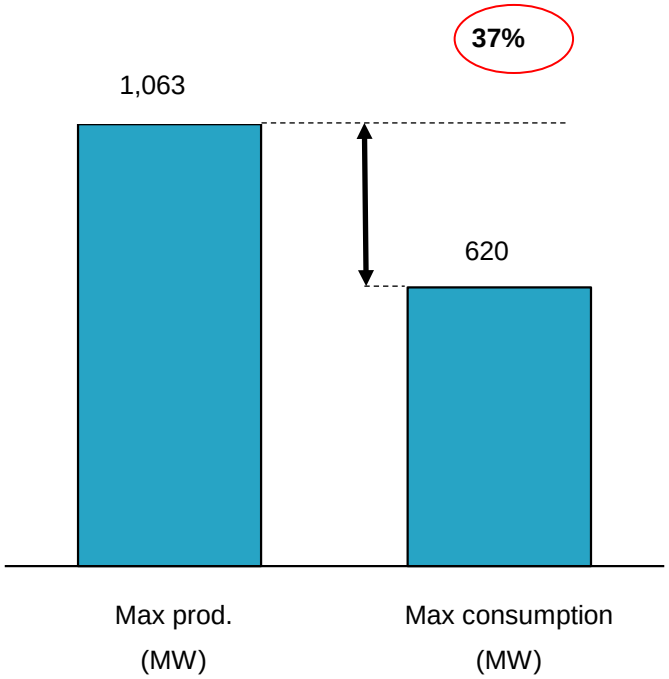
Krigers Flak (600 MW)

Horns Rev 3 (400 MW)

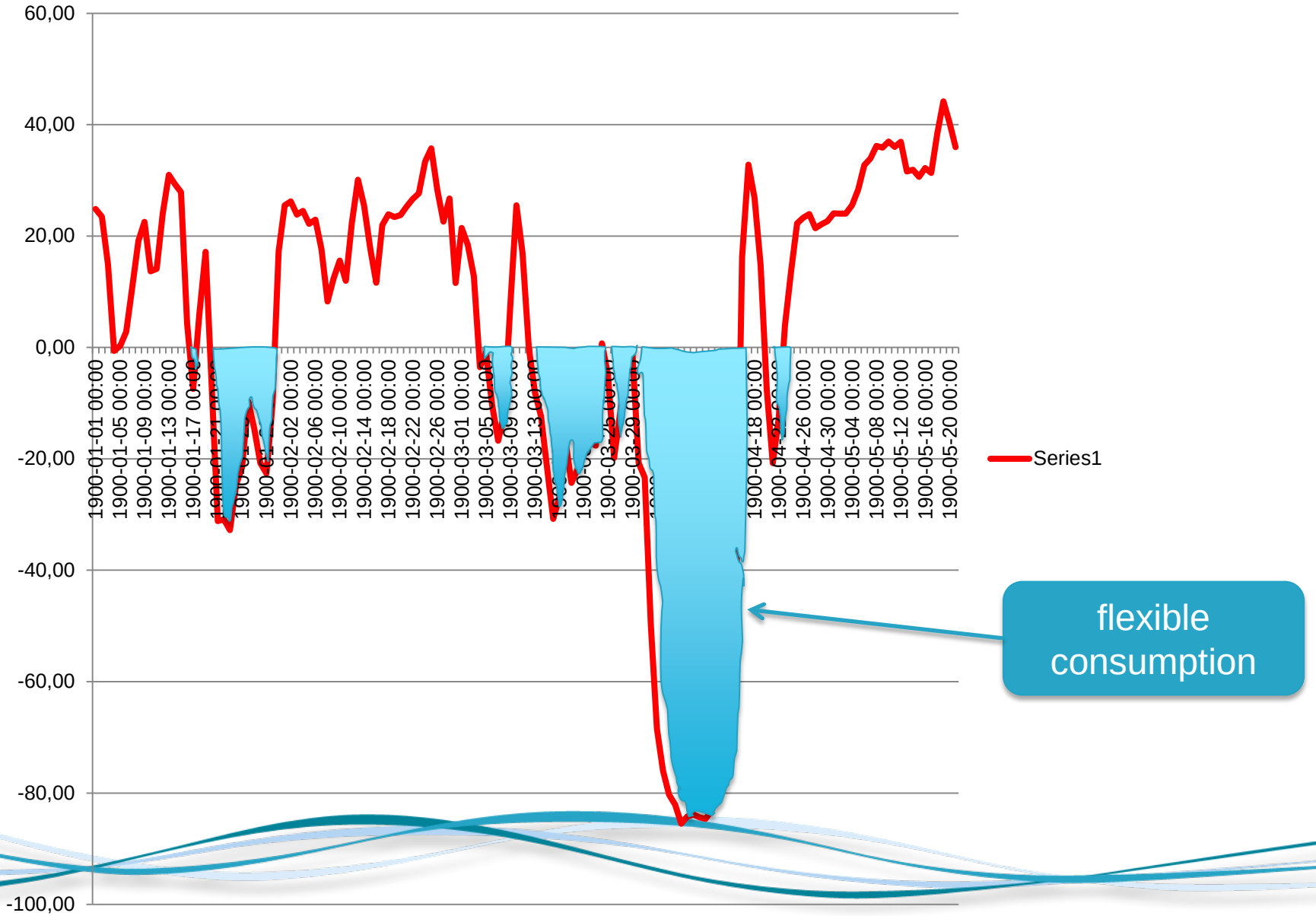
Anholt (400 MW)

Consumption og local production

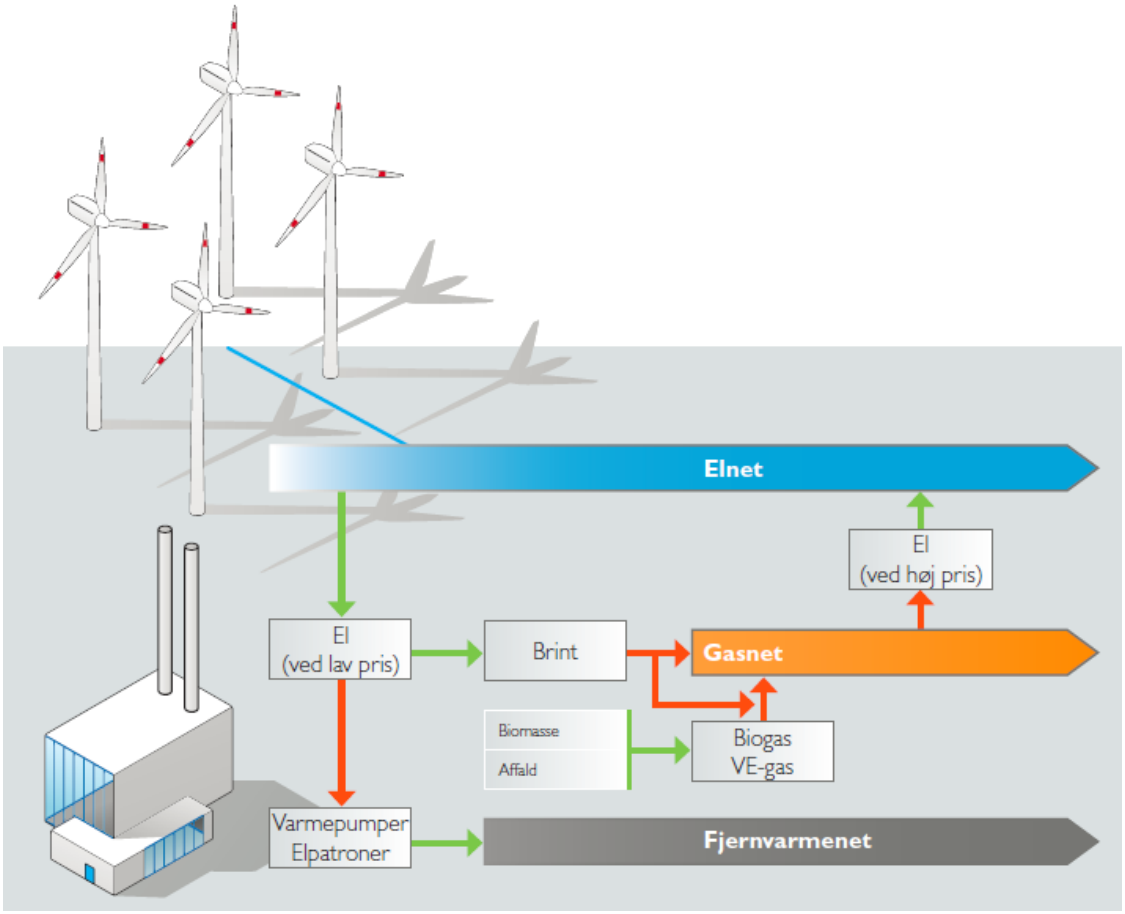




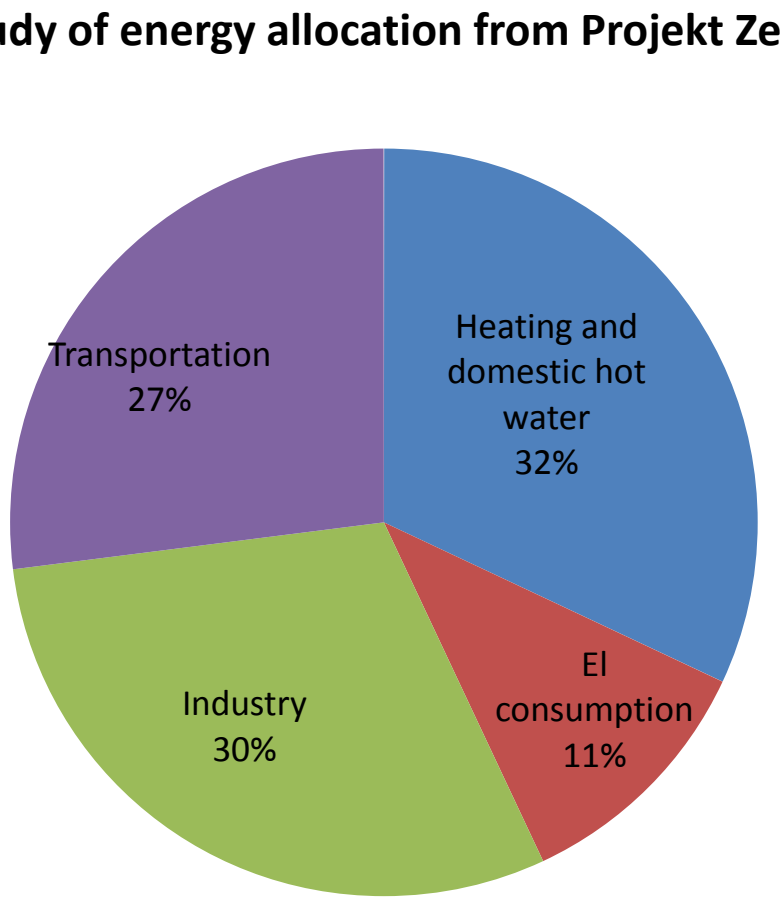
MW flow on a 150/60 kV transformer



Interaction between energy systems

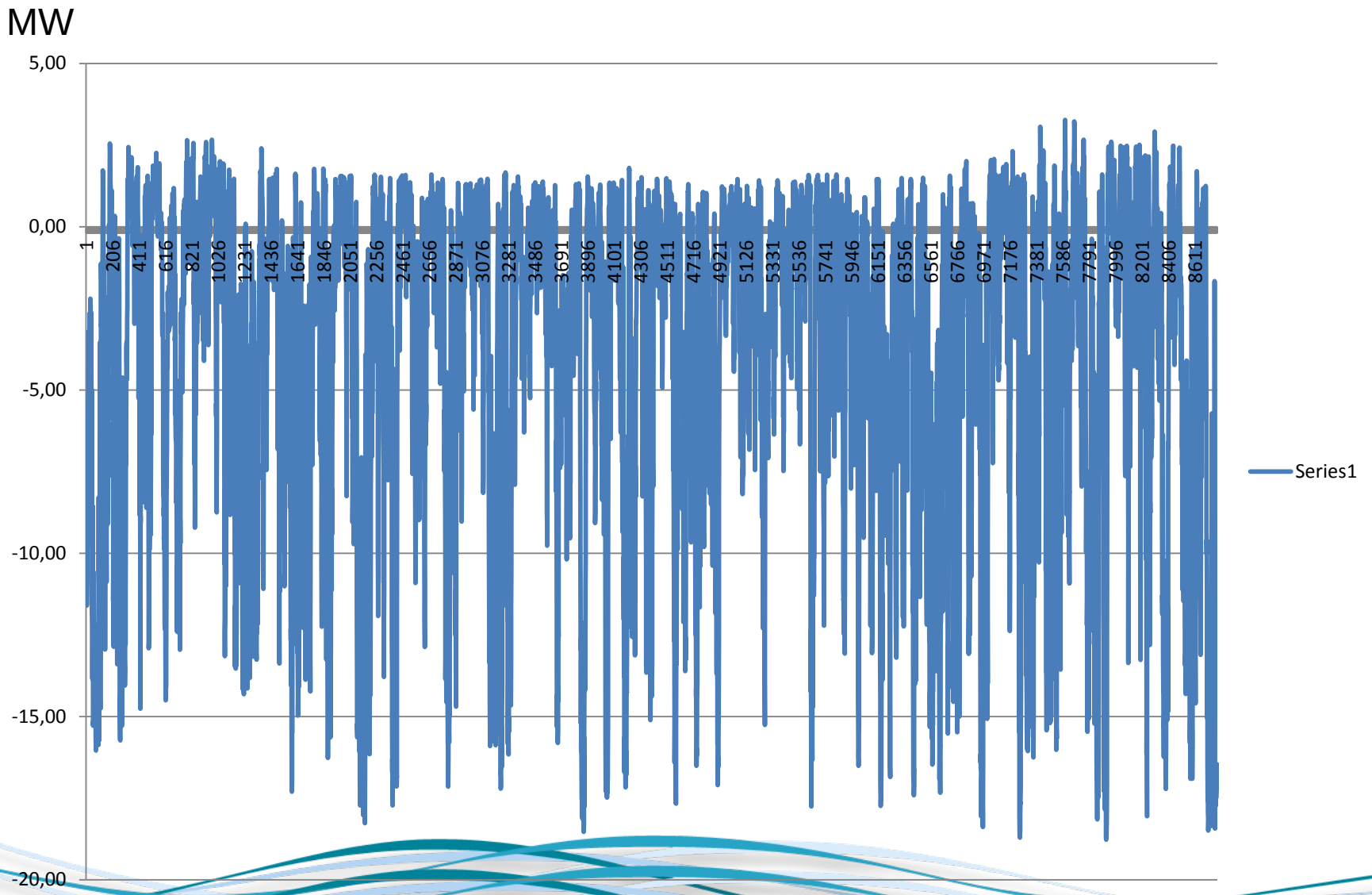


The potential



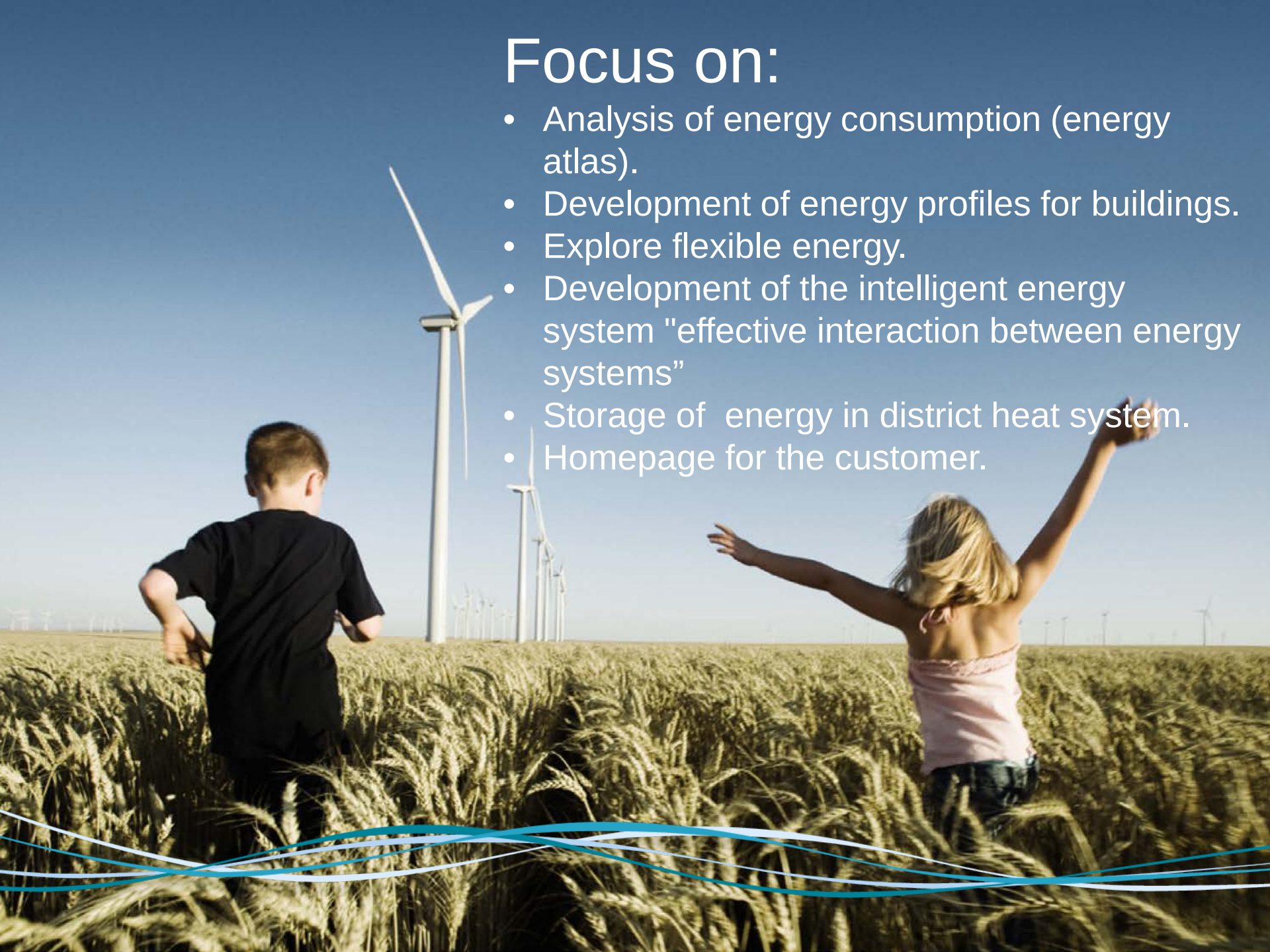
Projekt Tjæreborg

Energy flow on Tjæreborg 60 kV st.

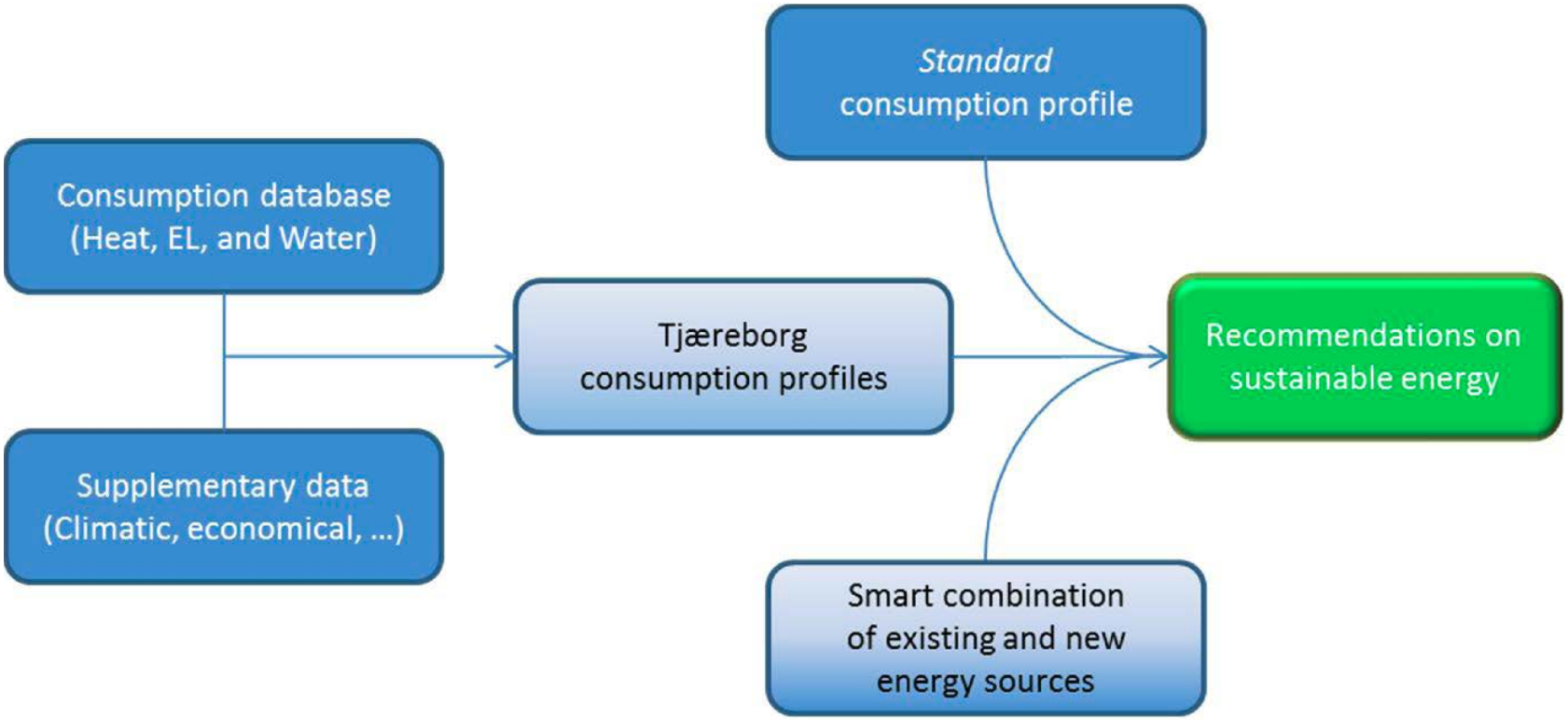


Focus on:

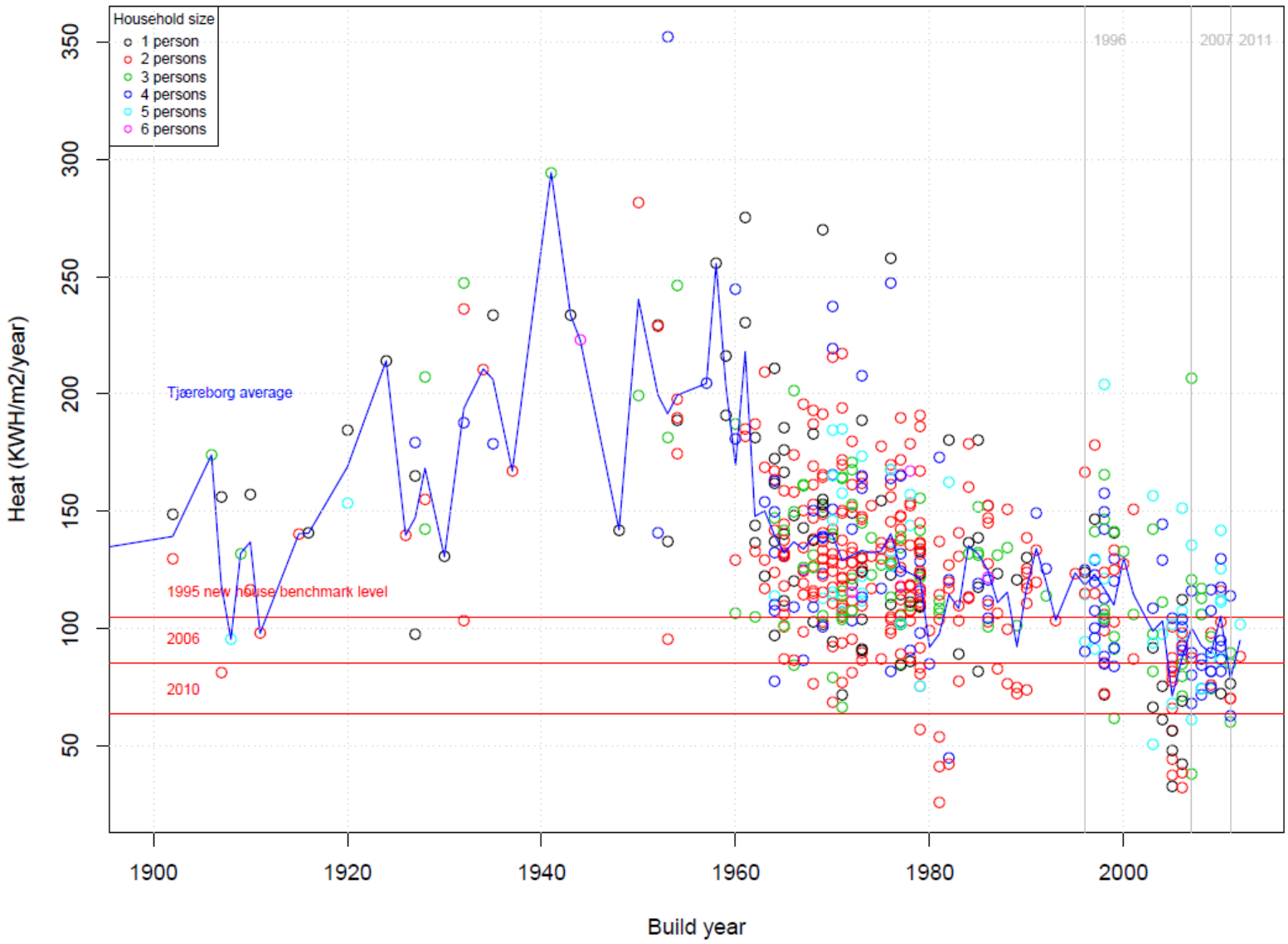
- Analysis of energy consumption (energy atlas).
- Development of energy profiles for buildings.
- Explore flexible energy.
- Development of the intelligent energy system "effective interaction between energy systems”
- Storage of energy in district heat system.
- Homepage for the customer.

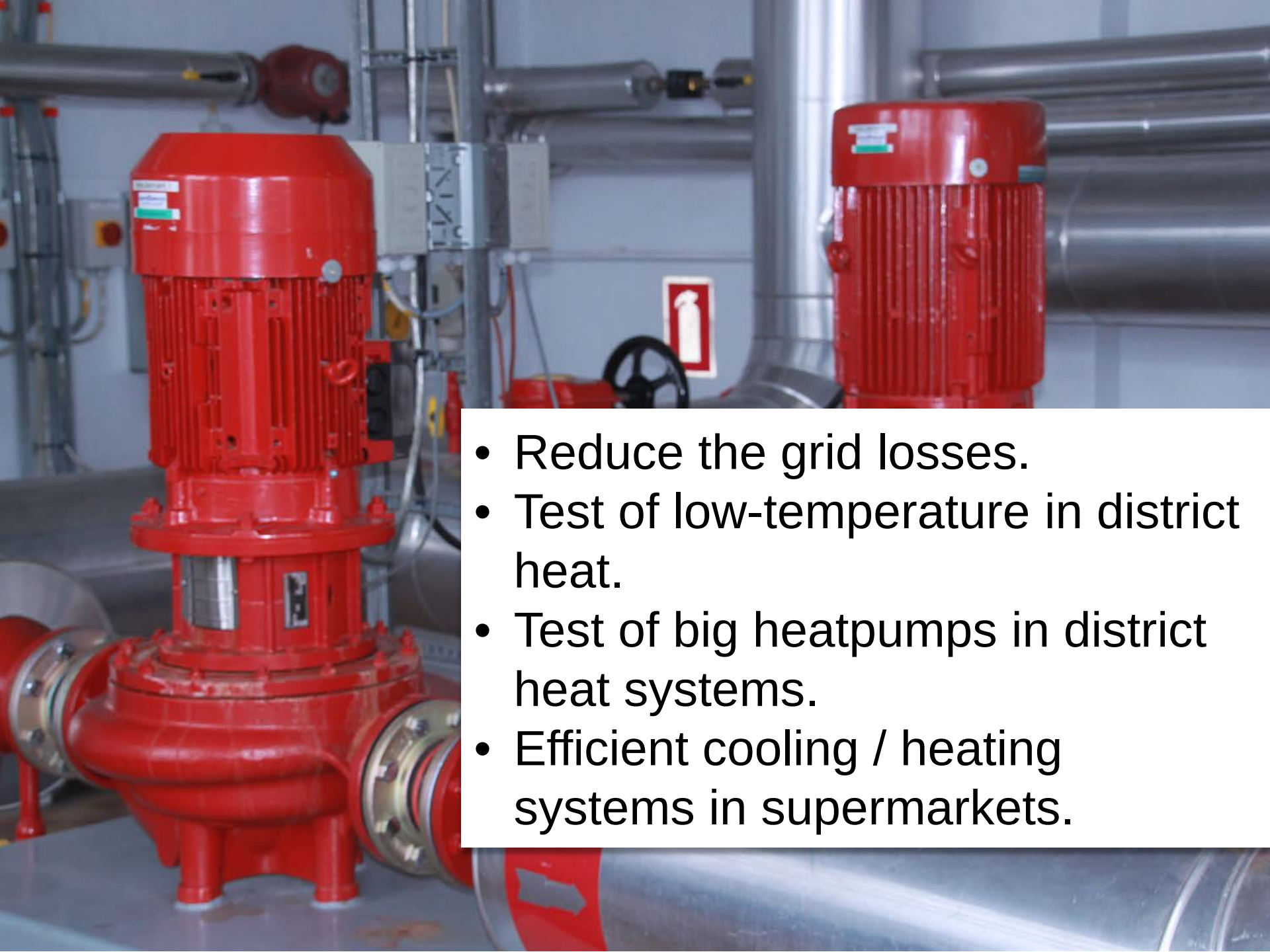


Energy profiles for buildings



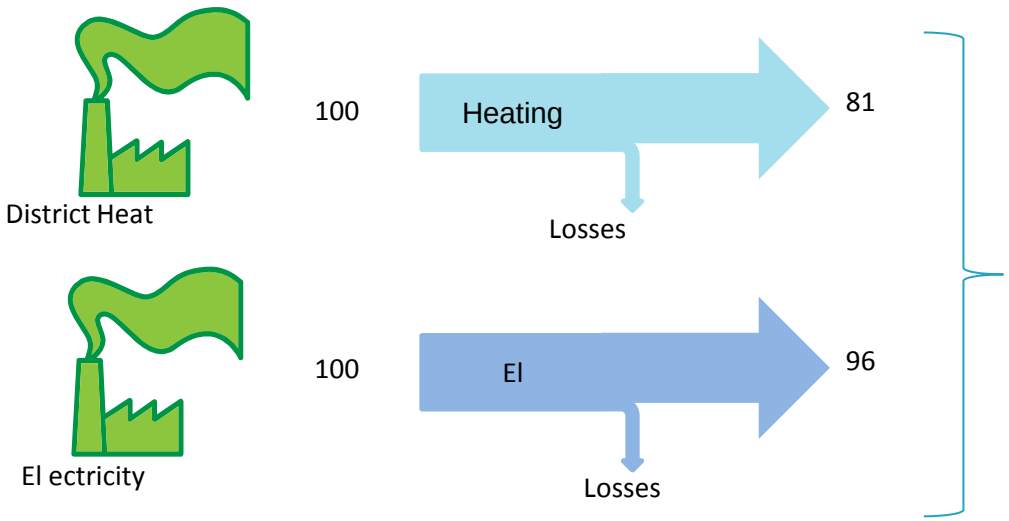
Annual heating consumption(kWh/m^2)





- Reduce the grid losses.
- Test of low-temperature in district heat.
- Test of big heatpumps in district heat systems.
- Efficient cooling / heating systems in supermarkets.

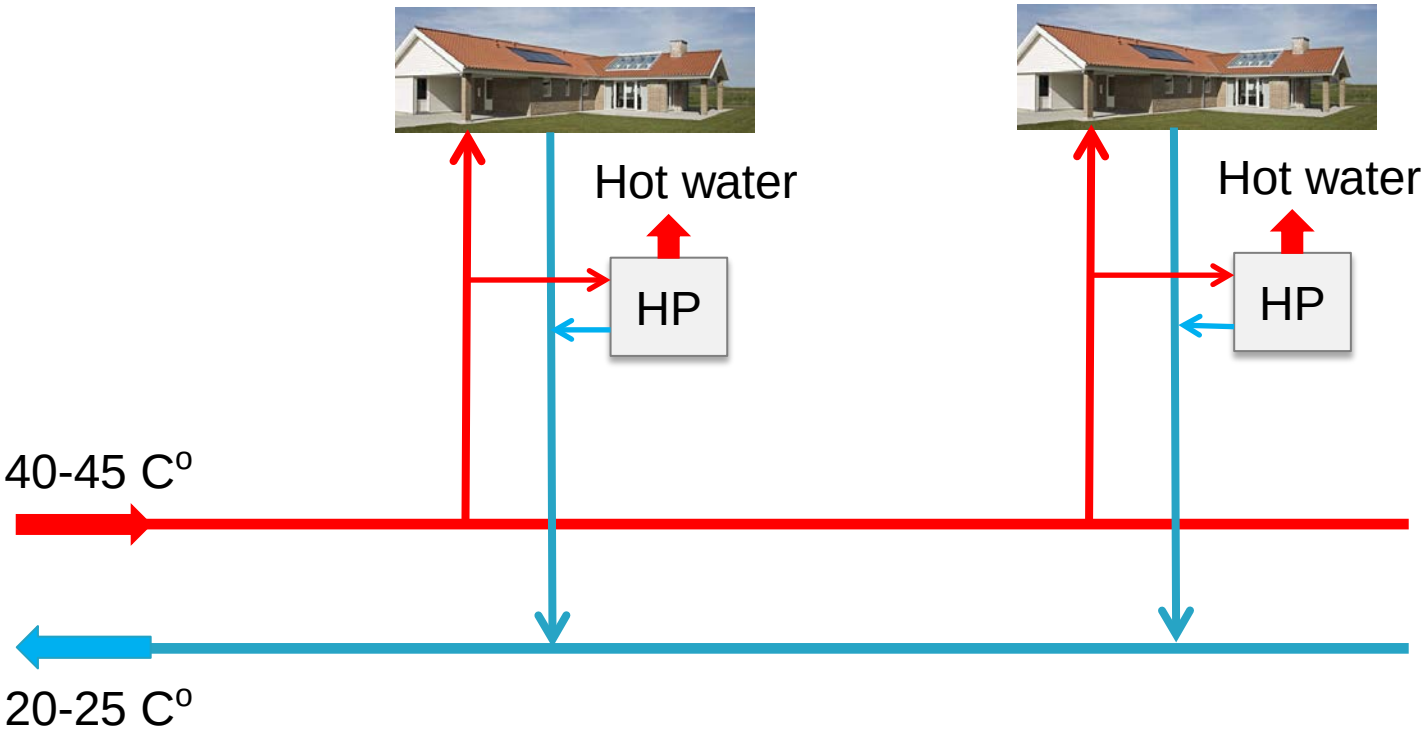
The intelligent energy system



Local houses in Tjæreborg

- We want to show synergies between the district heating network and electricity grid.

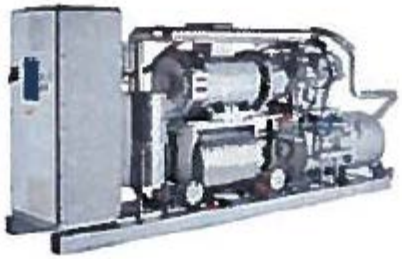
Low Temperature District Heating



Big Heatpumps

CompHEAT (Advansor)

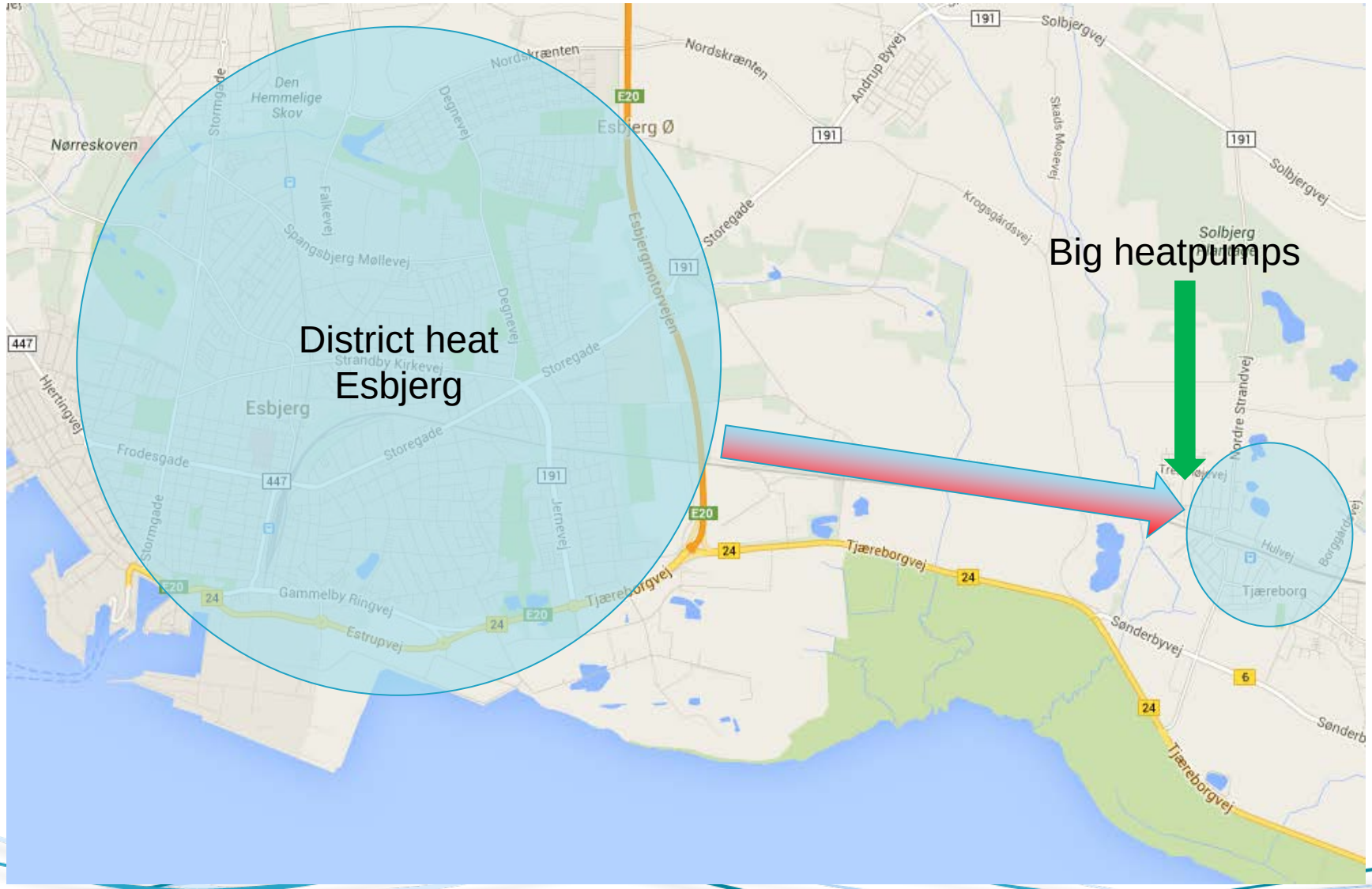
HEATPac (Johnson Controls/Sabroe)



NeatPump (ICS Energy/Star Alliance)

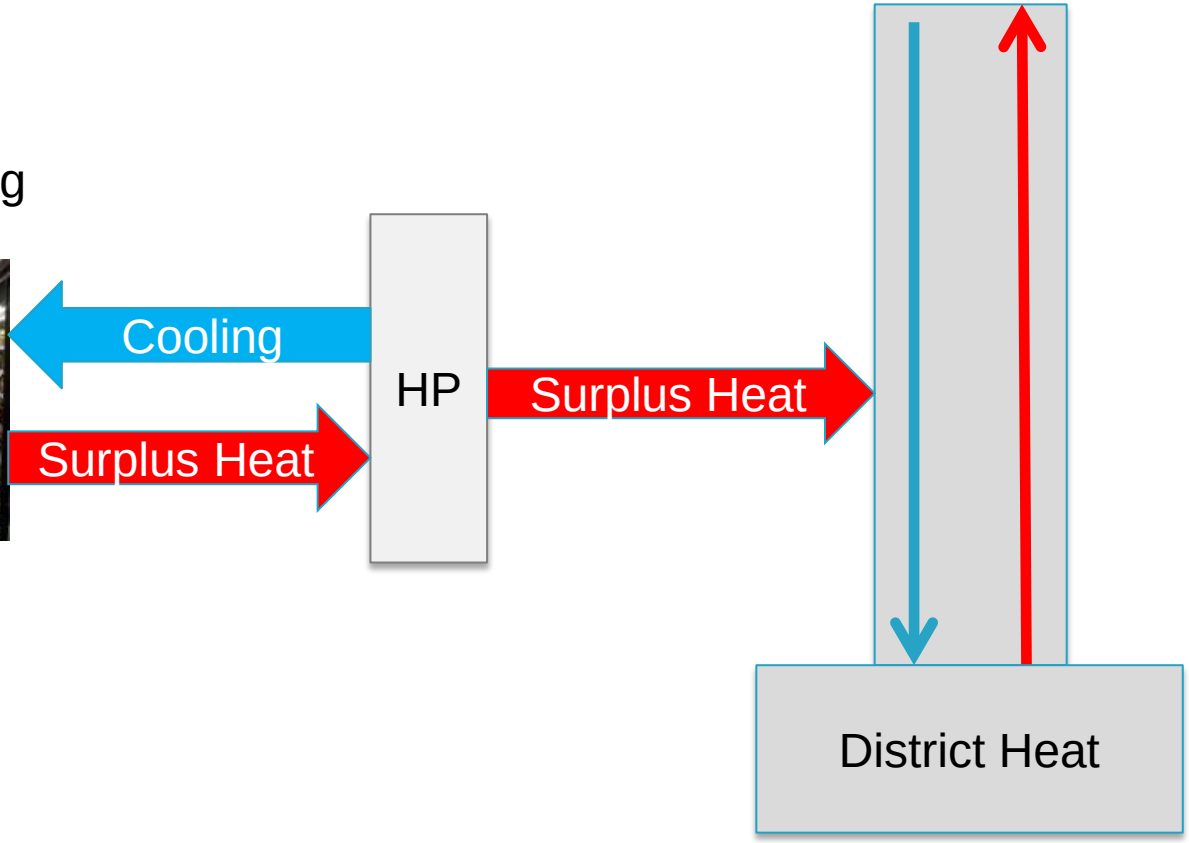
- New solutions
- High temperature
- High COP value
- Lower prices

Big Heatpumps



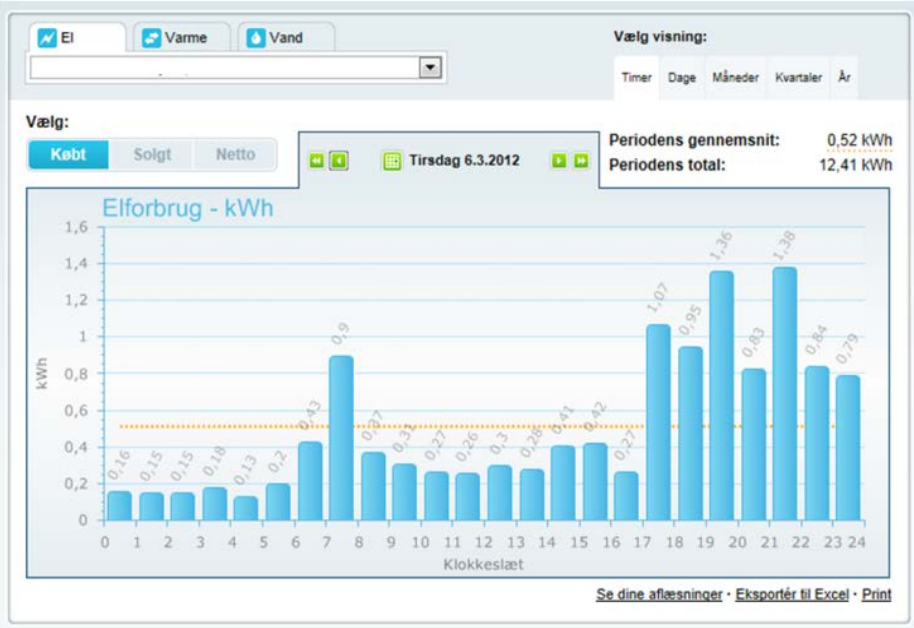
Efficient cooling / heating systems in supermarkets

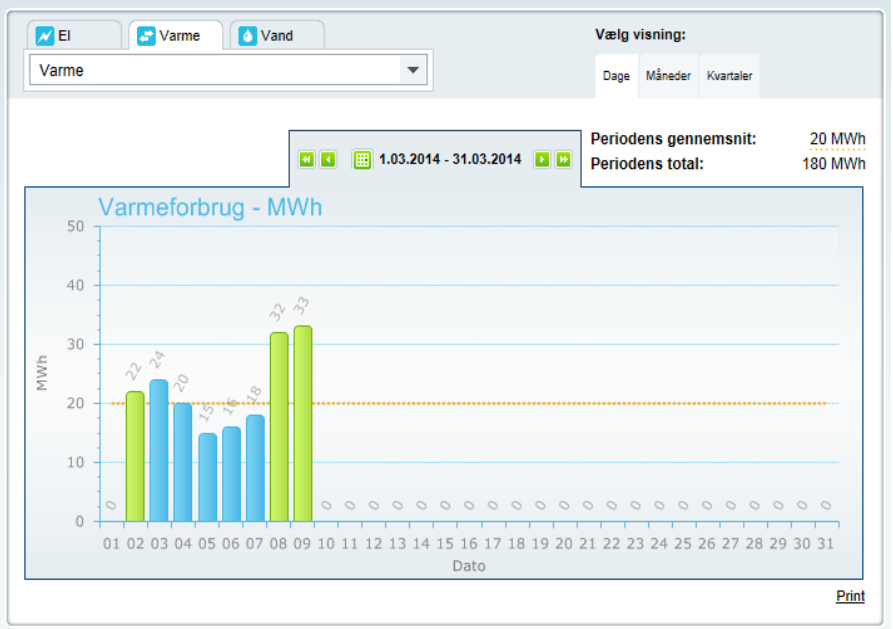
Supermarket in Tjæreborg



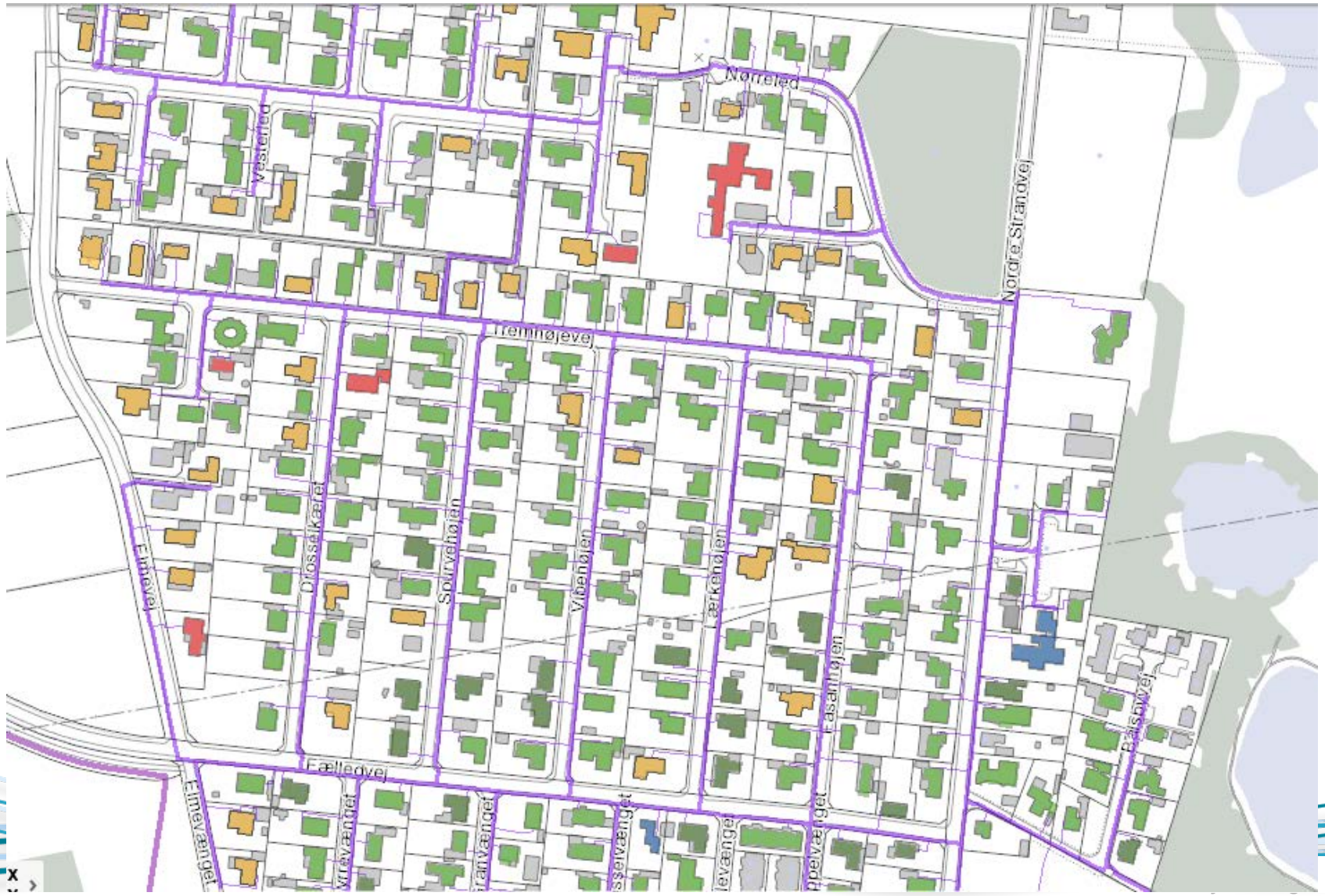
Portal for displaying energy consumption

- Heat, Water, El and maybe Fuel (OK station)





Example of visualization of consumption.



The future is green
Thank you for your attention