



# **SMART DISTRICT HEATING IS ENABLER FOR SECTOR COUPLING**

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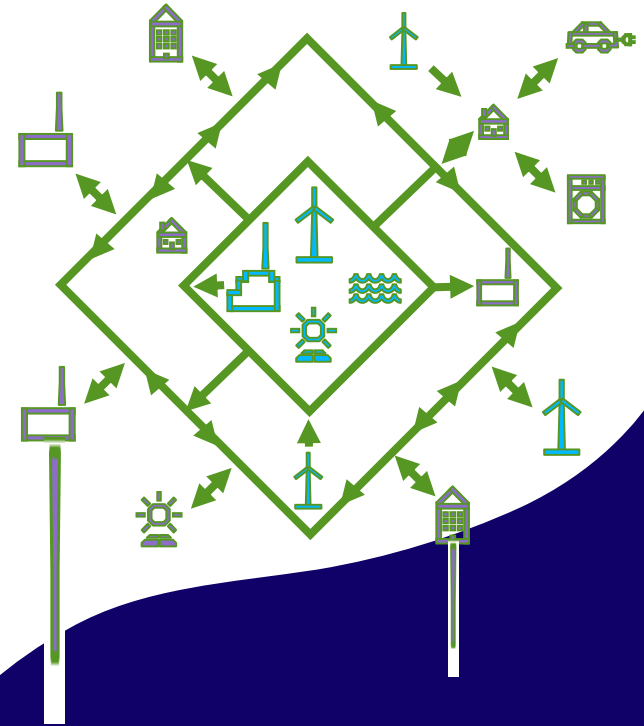
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# Bundling the energy forms

## IT'S NOT ANYMORE QUESTION OF ONLY HEATING, COOLING OR ELECTRICITY

- The significant increase of solar and wind power in the electricity market calls for various flexibilities in the production and use of energy.
- Weatherproof production, such as combined heat and power generation, hydropower and nuclear power, is needed for the coldest periods of the year.
- Energy storage systems and demand response will increase and come more common.
- Demand response bundles customer/end user also into energy system



# Interactive energy community

## IN MODERN CITY, ENERGY INFRASTRUCTURE CONNECTS BUILDINGS TO EACH OTHER

- Energy flows are managed in Bi-Directional energy networks
- Heating-, Cooling-, and Electricity demands are balanced and optimised by energy operator
- Operator controlled Demand response systems enlarges energy systems into building technologies
- Customer satisfaction and value creation is key driver for Service provider – the Operator

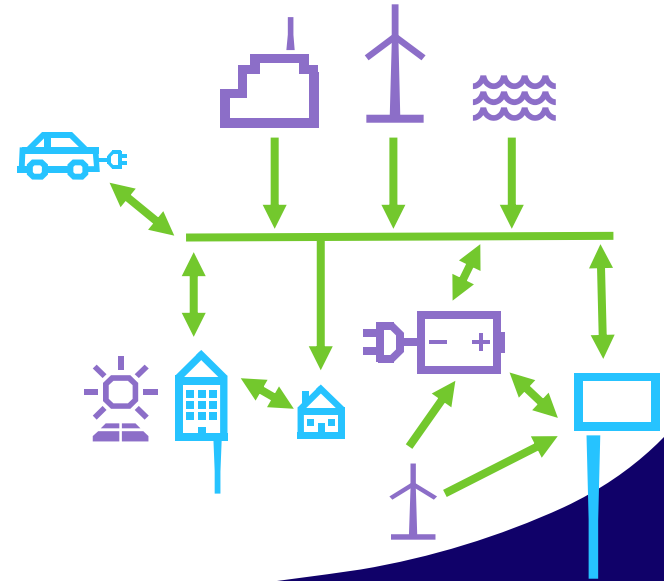


# HELEN Model:

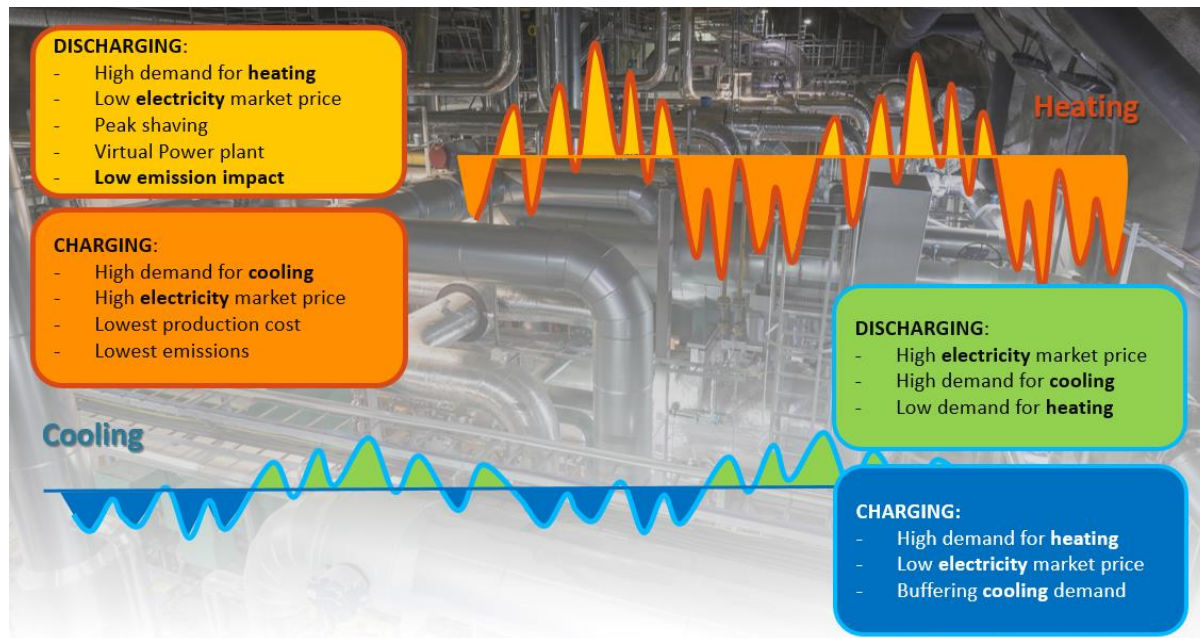
## **HYBRID, INTERCONNECTED, LOW-CARBON**

- Integrating gas, power, heating, cooling – and buildings
  - CHP, CHC and DHC are enablers for intelligent energy system
  - Power-to-heat: Geothermal and Sea Water as heat sources for heatpumps
  - Energy recovery from Condense-energy, Waste Water and industry processes
  - District Cooling network operates as waste heat collection system
- Flexibility with Storages and Demand response systems
- Bidirectional networks
- Prosumers with electricity or heat are most Welcome

**Role of "utility": balancing, managing, optimising  
= energy operator**



# Role and added value of Storages



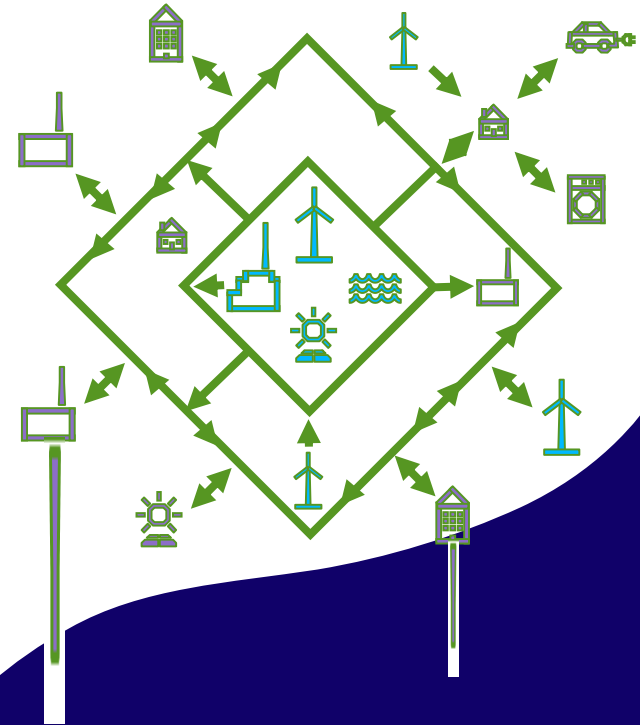
Example, how and when heating and cooling storages are operated DHC system:

- Lowest production costs
- Lowest primary energy need
- Best price for customers

# Energy forms are bundled

## REALLY, IT'S NOT ANYMORE QUESTION OF ONLY HEATING, COOLING OR ELECTRICITY

- It is question of taking the best advantages from each resource all the time in every single moment
  - Market Based Guidance towards bi-directional networks is essential
  - The Operators are the key-role players
- Do not encourage to optimise just one energy form or optimize just building (on-site) solutions
  - Let the operator optimize the entity eg. Emission based production sequence
  - Energy asset boundary is not in the facade - it is deep inside the building





# THANK YOU

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