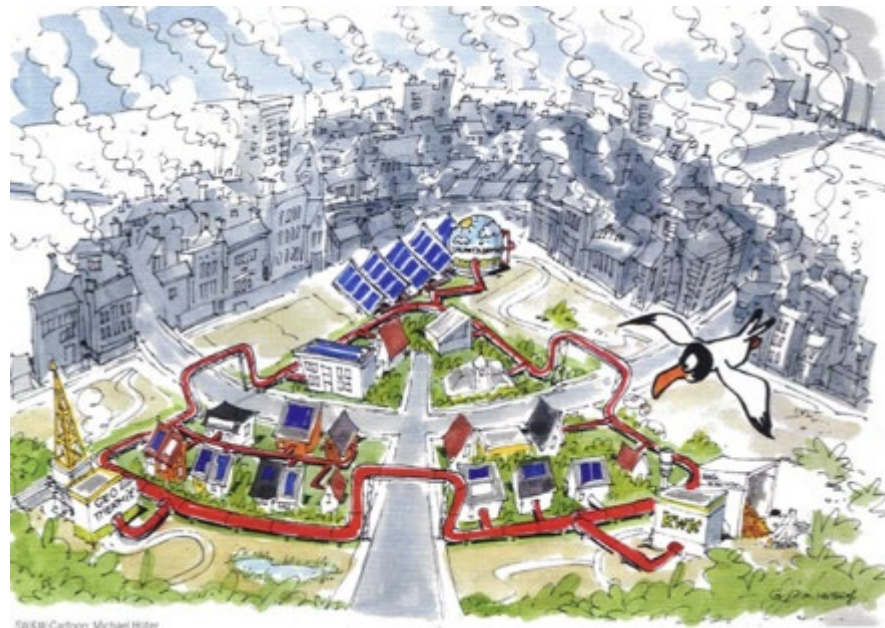


District Energy in Denmark

Jens Birch Jensen, PlanEnergi



PlanEnergi – Company Presentation

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Plan
Community
Energy

Business area

- PlanEnergi specialises in the development and creation of customised environmental solutions within renewable energy, rational energy use and energy planning.
- Main work areas:
 - Energy planning – Heating, cooling, transportation, industrial
 - District heating based on renewable energy
solar thermal, seasonal storage, heat pumps, biogas, biomass, industrial waste heat etc.
 - Combined Heat and Power, heat only production and district heating networks
 - Combined heat and cooling, district cooling
 - Biogas – planning, design, project planning and general consultancy
 - Wind – planning, mapping, installation pattern and EIA with visualisations
 - Technology development
 - Power to heat/heat to power, H₂, Methanization, Energy Storage Technology, Systems for integration of Power, Heating, Cooling by use of RE

References – Energy Planning

Energy planning locally...

- Samsøe – Renewable Energy Island
- Communities – Strategies for Climate Change Mitigation
- District Heating Companies – 20-years Development Master Plans

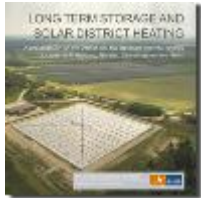
...and in regional scale e.g.

- Heat Roadmap Europe:
 - www.heatroadmap.eu



References, selected items

Solar District Heating – SDH and seasonal Storage



Long Term Storage and Solar District Heating
Marstal DH, Dronninglund DH (front page picture), CPH,
Tibet, Austria, France



District Heating Heat Pumps (selections)

- **Broager:** 4 MW_{th}, heat source: ground water, combined with solar heating and gasfired CHP
- **Roedkaersbro:** 1,6 MW_{th}, heat source: waste water from dairy. Combined with CHP (Natural and biogas)
- **Stoevring CHP Plant:** [YouTube direct video](#): 8,7 MW_{th}, heat source: ambient air.
2 pcs of Mycom Electric driven compressors

Biomass

- **Oester Hornum:** 3,1 MW Heat Only Boiler for straw,
- **Gelsted:** 4 MW, Heat only boiler for wood chips
- **Vegger Biogas Plant:** 5.000.000 m³ biogas/ year. –
CHP and heating for DH and Dairy



Dronninglund SDH

PlanEnergi has provided:

Project management, Approvals etc.
System design, Development of storage
technology,
Tenderproces



Project facilities

- 35.000 m² solar panels
- 60.000 m³ seasonal storage (water pond 5-90 °C)
- District Heating transmission pipe, 2.500 meter
- High Temperature (180 °C) hot water boiler bio-oil / Natural gas and absorption heat pump

• Braedstrup Total Energy

PlanEnergi has provided:

Project management, Approvals etc.
System design, Development of storage
technology,
Tenderproces



Production facilities

Heat production and Power production, Heat Storage, Power cons.

- Solar collector area of approx. 18,600 m²
- Borehole heat storage (BTES) of approx. 19,000 m³ heated soil (~ 8,000 m³ of water equivalent)
- Tank storages (2,000 m³ + 5,500 m³ ~ 400 MWh)
- Electric HeatPump (6 MW_{th})
- Electric Heat Only Boiler (10 MW)
- Natural gas CHP (2x 3,7 MW_{electr.} 2 x 4 MW_{th})
- Natural gas Boilers (13,5 MW_{th})

References – International activities



Energy tools and examples

- ✦ DHAT
- ✦ <https://ens.dk/en/our-responsibilities/global-cooperation/district-heating-assessment-tool-dhat>
- ✦ Hotmaps
- ✦ <https://www.hotmaps-project.eu/>
- ✦ Planning and technoeconomical designing Energy Production Plants
- ✦ <https://www.emd.dk/software/>, EnergyPro, WindPro
- ✦ [**Actual Solar Production at Danish Solar DH Plants**](#)
- ✦ www.solvarmedata.dk



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Thank you for your attention