

The story of Braedstrup District Heating Company

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Former director of Braedstrup District Heating Company



Where is Braedstrup Heating Company?

Where is
Denmark?



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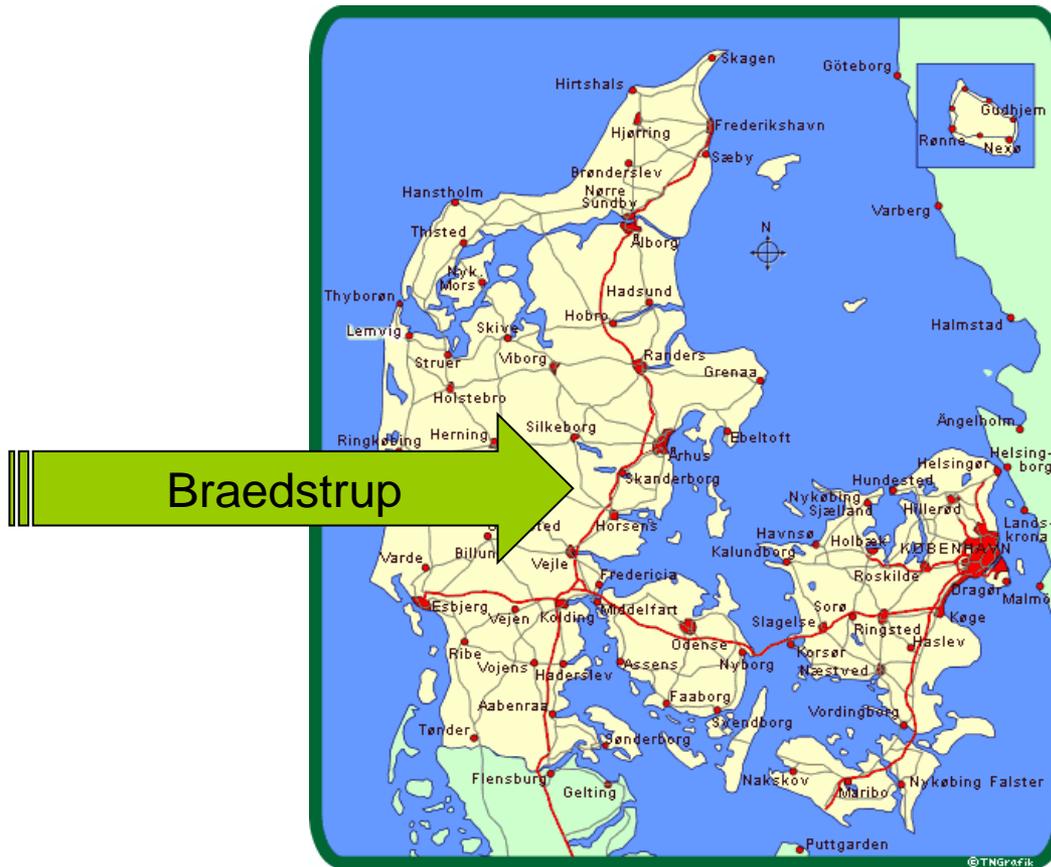
EUROPE



Denmark

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Denmark



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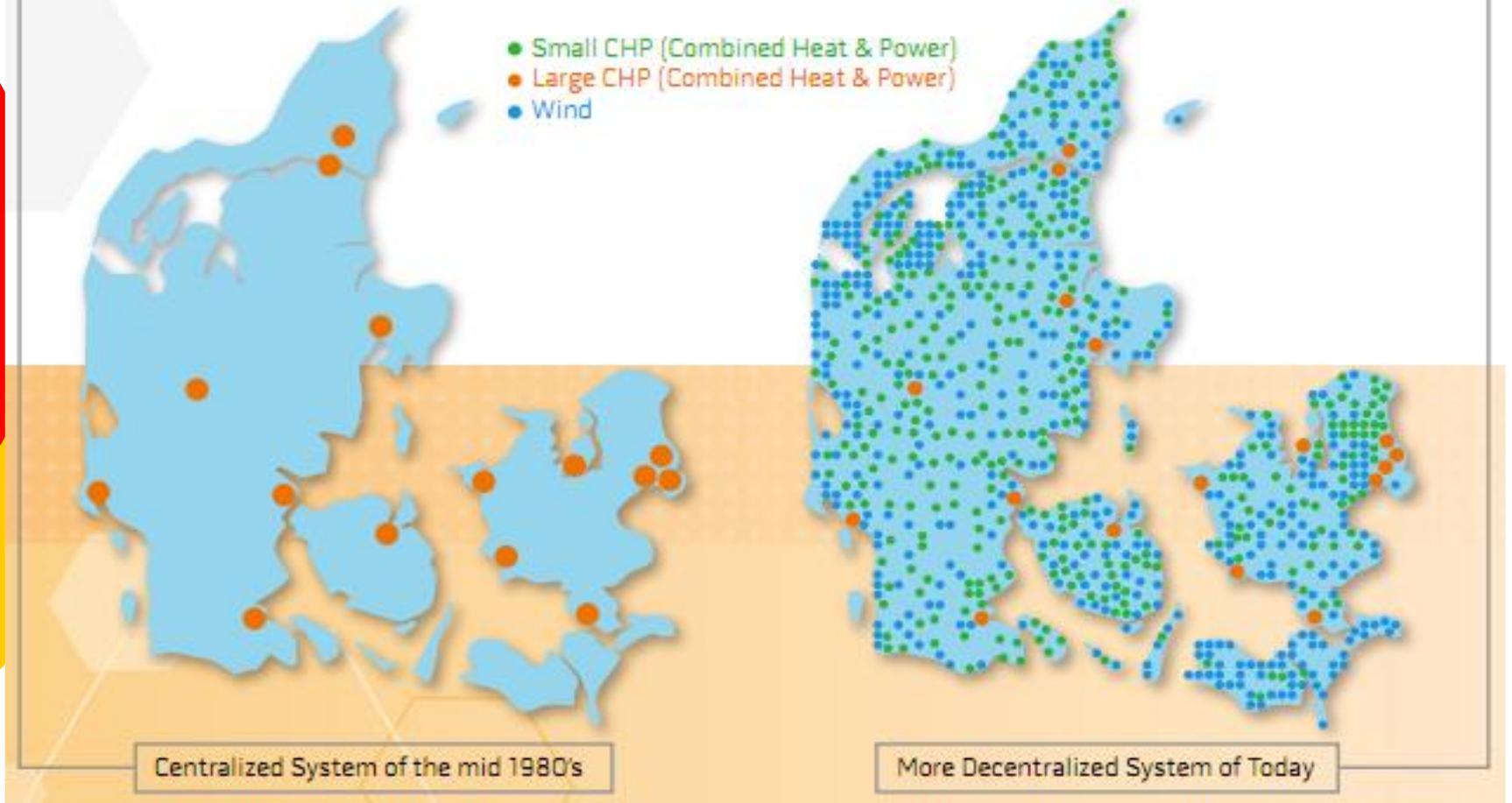
The municipality of Horsens



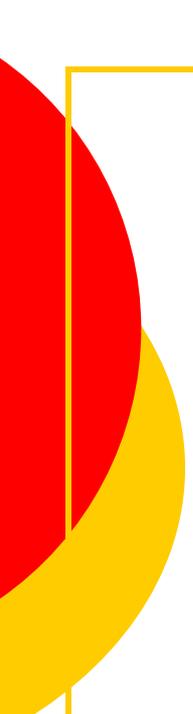
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DENMARK'S PROGRESS OVER THE PAST TWO DECADES

- Small CHP (Combined Heat & Power)
- Large CHP (Combined Heat & Power)
- Wind



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An example from Denmark: Braedstrup District Heating

- A cooperative owned by 1.550 consumers
- The consumer, the customer and the owner is one and the same person
- Annual production:
Approx. 50.000 MWh heat – 22.000 MWh electricity
- Administration of approx. 5.000 water consumers

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graph TD; A[All costumers] --- B[The General Assembly  
All costumers have access]; B --- C["The Board  
(4 members are elected by  
the General Assembly 1 from  
the mucipality)"]; C --- D[Management and  
staff];
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All costumers

The General Assembly
All costumers have access

The Board
(4 members are elected by
the General Assembly 1 from
the mucipality)

Management and
staff

An example from Denmark: Braedstrup District Heating

- The highest authority: The General Meeting (all consumers have access and the right to vote)
- A General Meeting at least once a year
- Information meetings through the introduction of new technologies
- Example:
The approval of the first solar plant from 2007:
122 votes for the proposal - 5 against
- The approval of the next solar plant from 2010 (Braedstrup SolarPark):
199 votes for the proposal - 0 against

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Braedstrup District Heating

199 votes for the proposal - 0 against!!!



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Braedstrup District Heating - The 2006-strategy

The costs must be kept down

Production costs:

Natural gas and other fossil fuels must be phased out - also due environmental concerns

Long-term investments in renewable energy technologies, linking the electricity and the district heating technologies (Smart Grids)

The Braedstrup-plans:

50.000 m² solar which corresponds to 50% of the heat production

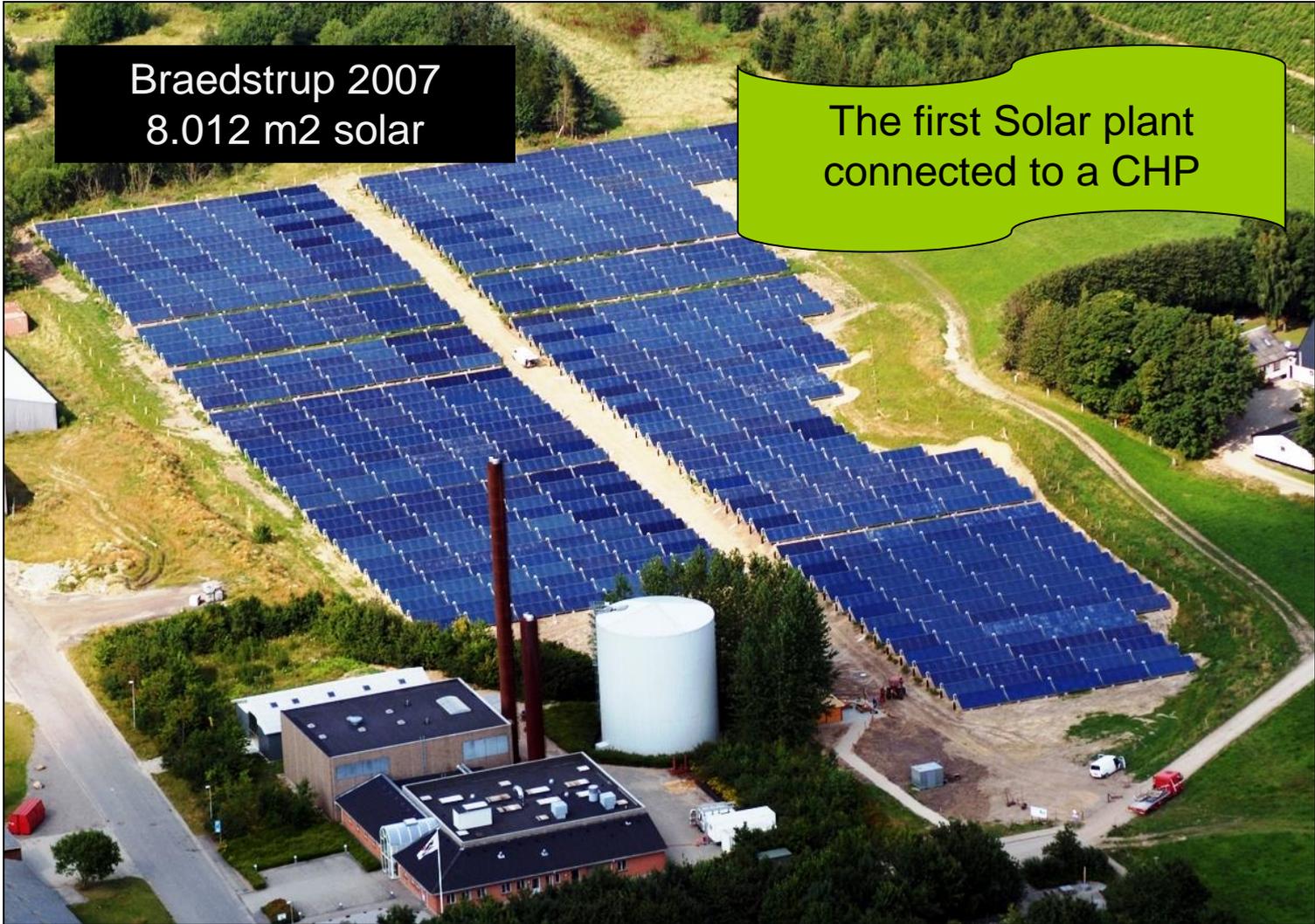
Rest: For example biogas

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Braedstrup 2007
8.012 m² solar

The first Solar plant
connected to a CHP



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Braedstrup 2007



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Braedstrup "in bricks"
Legoland

LEGO®



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Data - the 2007-project

Production: 3.600 MWh heat/year
(9 % of the production demand)

Invest: 1,6 mill. Euro

Grants: 0,4 mill. Euro

Nt. invest: 1,1 mill. Euro

Pay back time: 6,5 years

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Braedstrup 2012

10.600 m² solar (2012)

Borehole storage

8.012 m² solar (2007)

Steel tank
5.500 m³

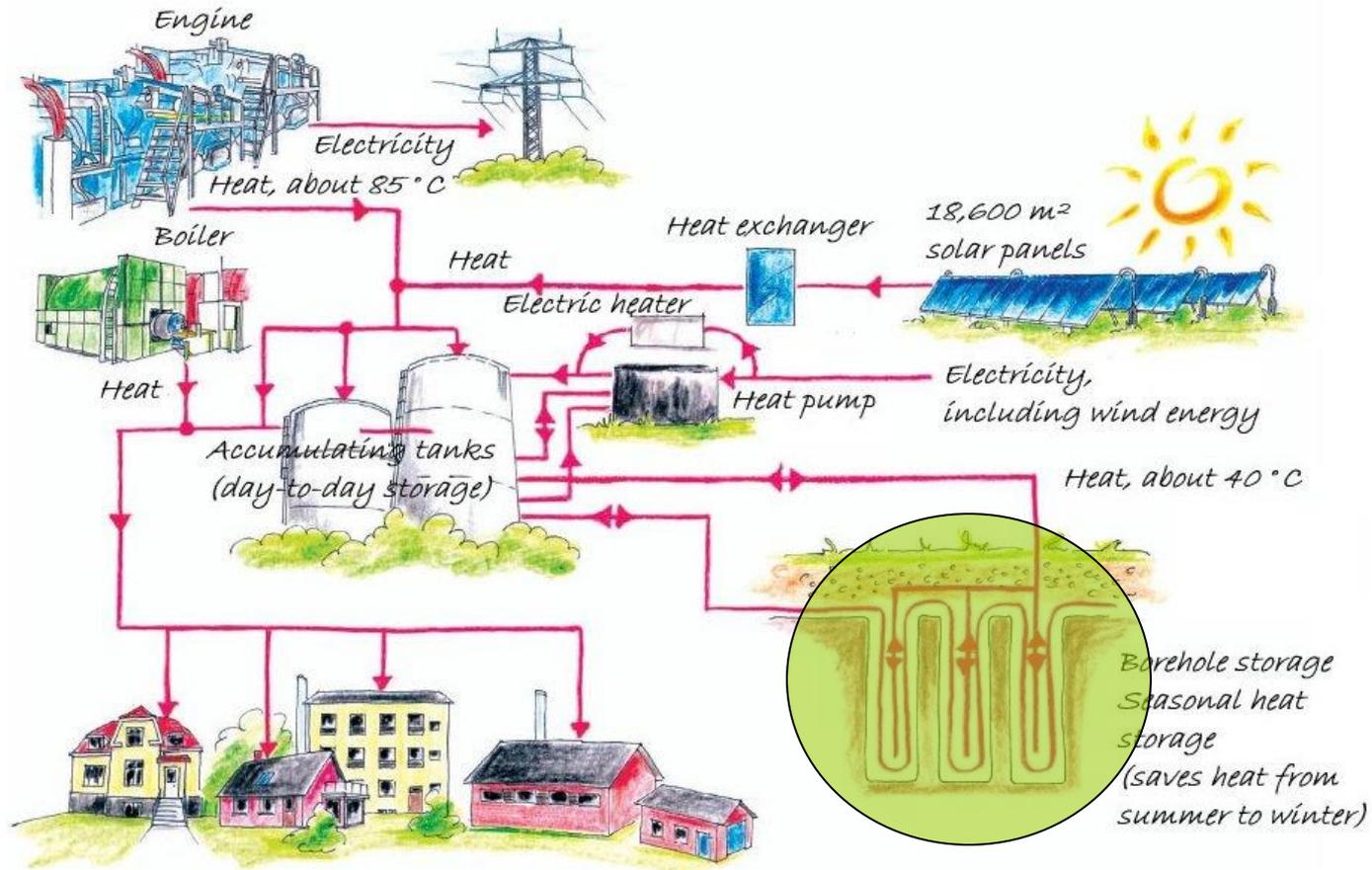
Steel tank
2.000 m³

Heatpump and el boiler

Generator-systems and gas boilers

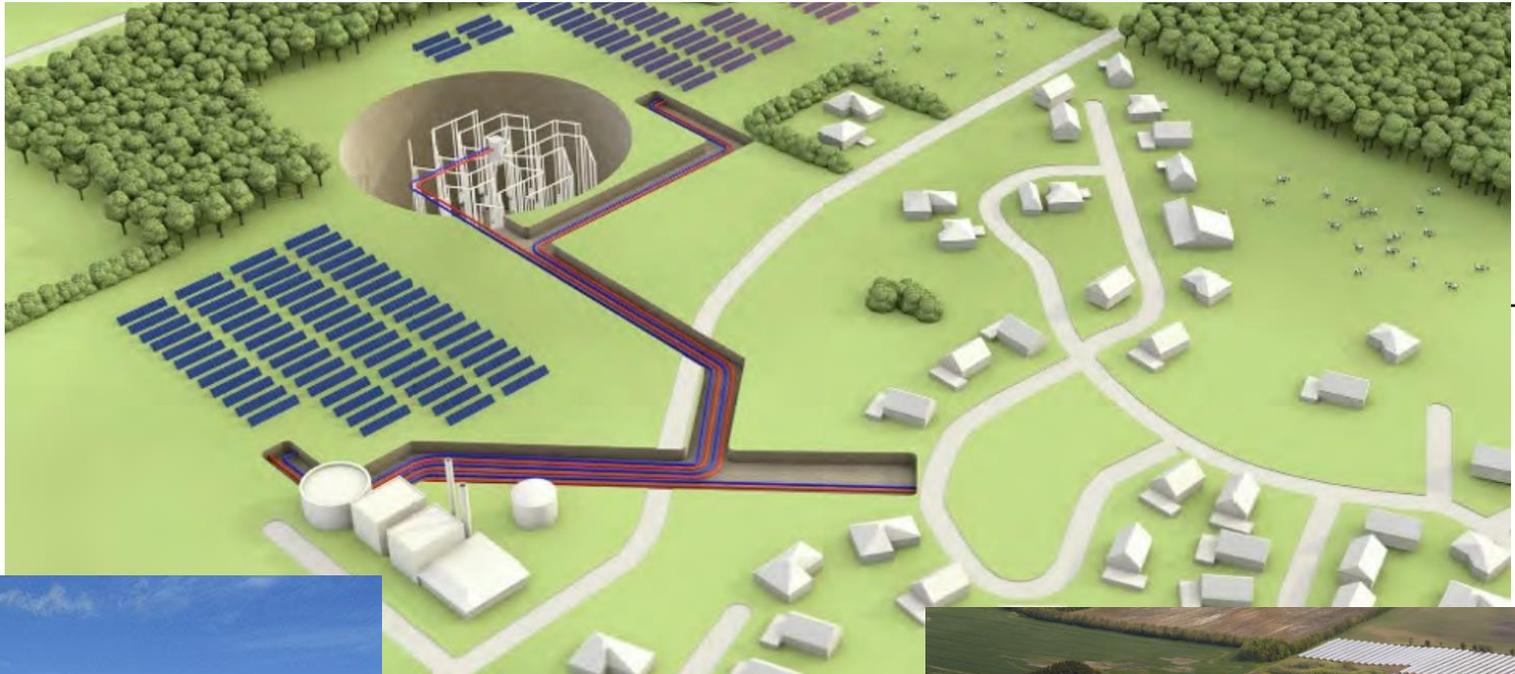
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Braedstrup District Heating 2012



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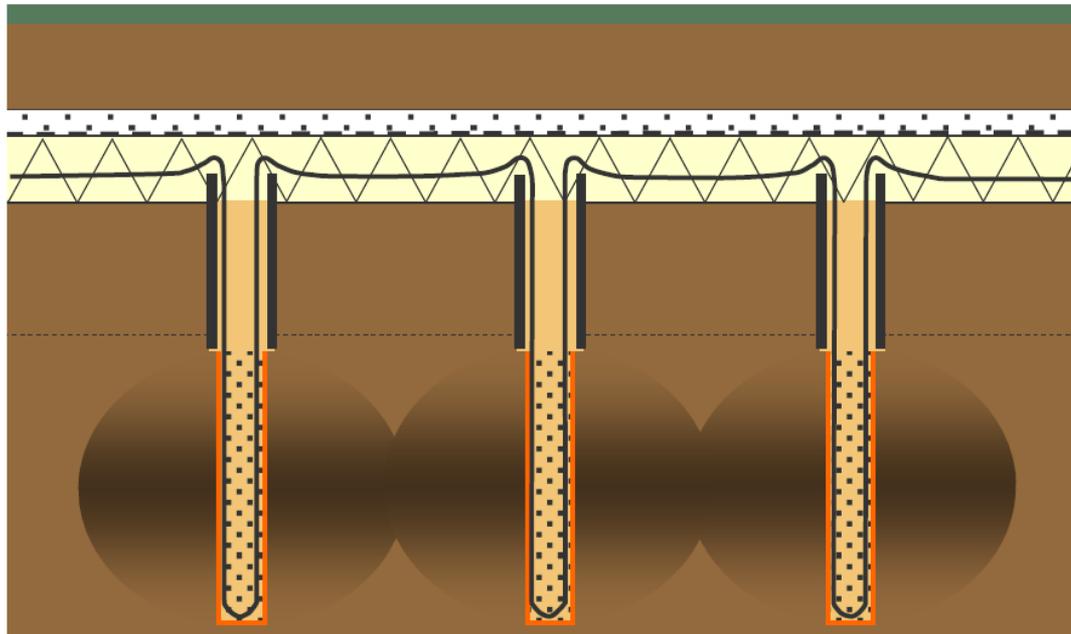
Braedstrup BTES



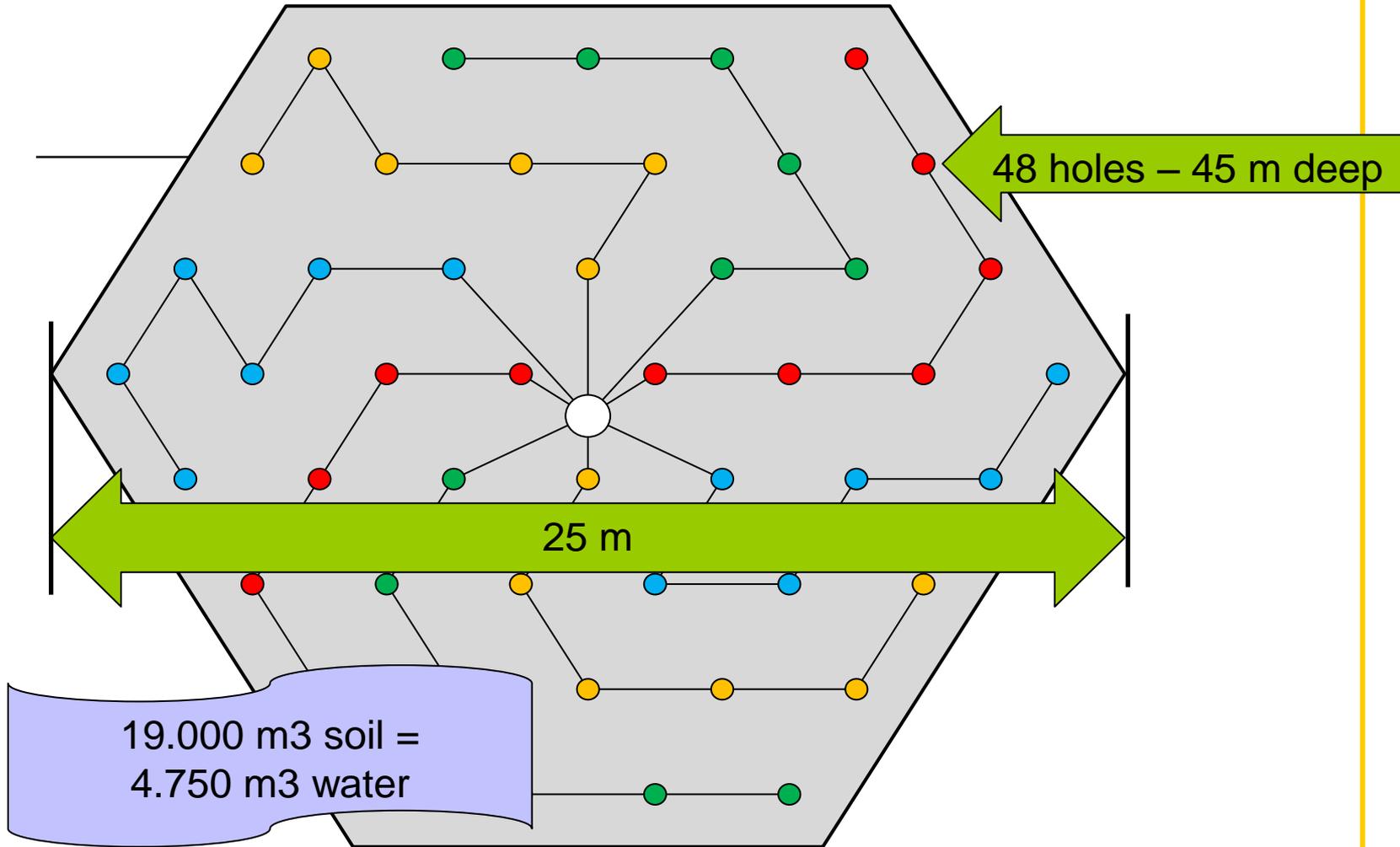
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Borehole thermal energy storage (BTES)

(15 to 30 kWh/m³)

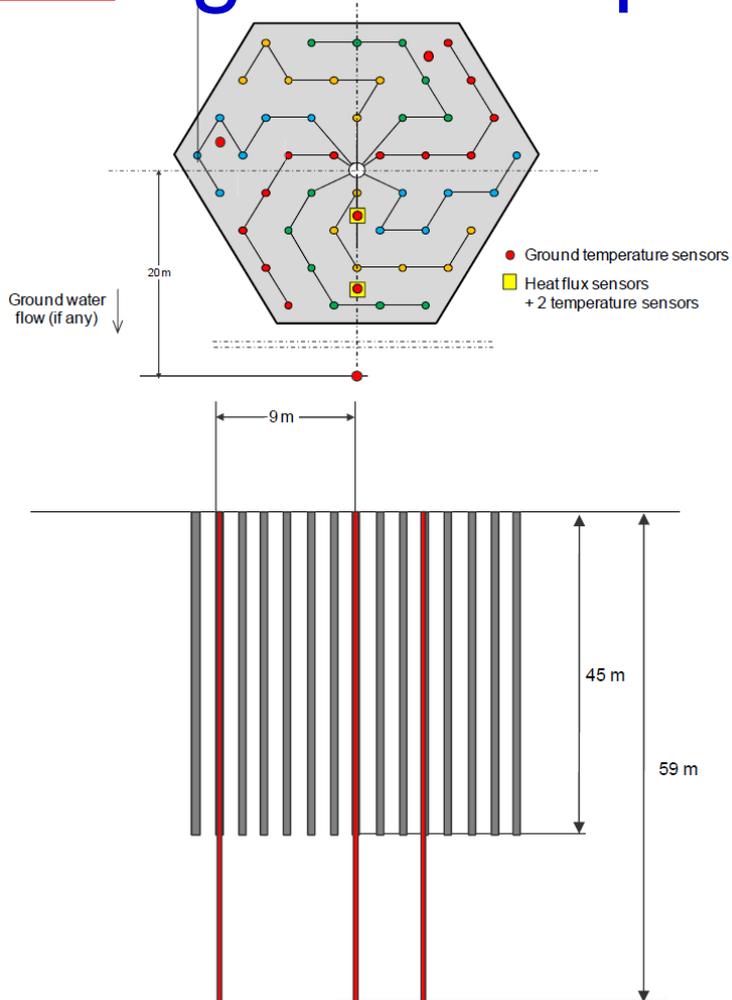


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Design and implementation, Braedstrup



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Data - the 2012-project

Production: 4.800 MWh heat/year
(Total: 20 % of the production demand)

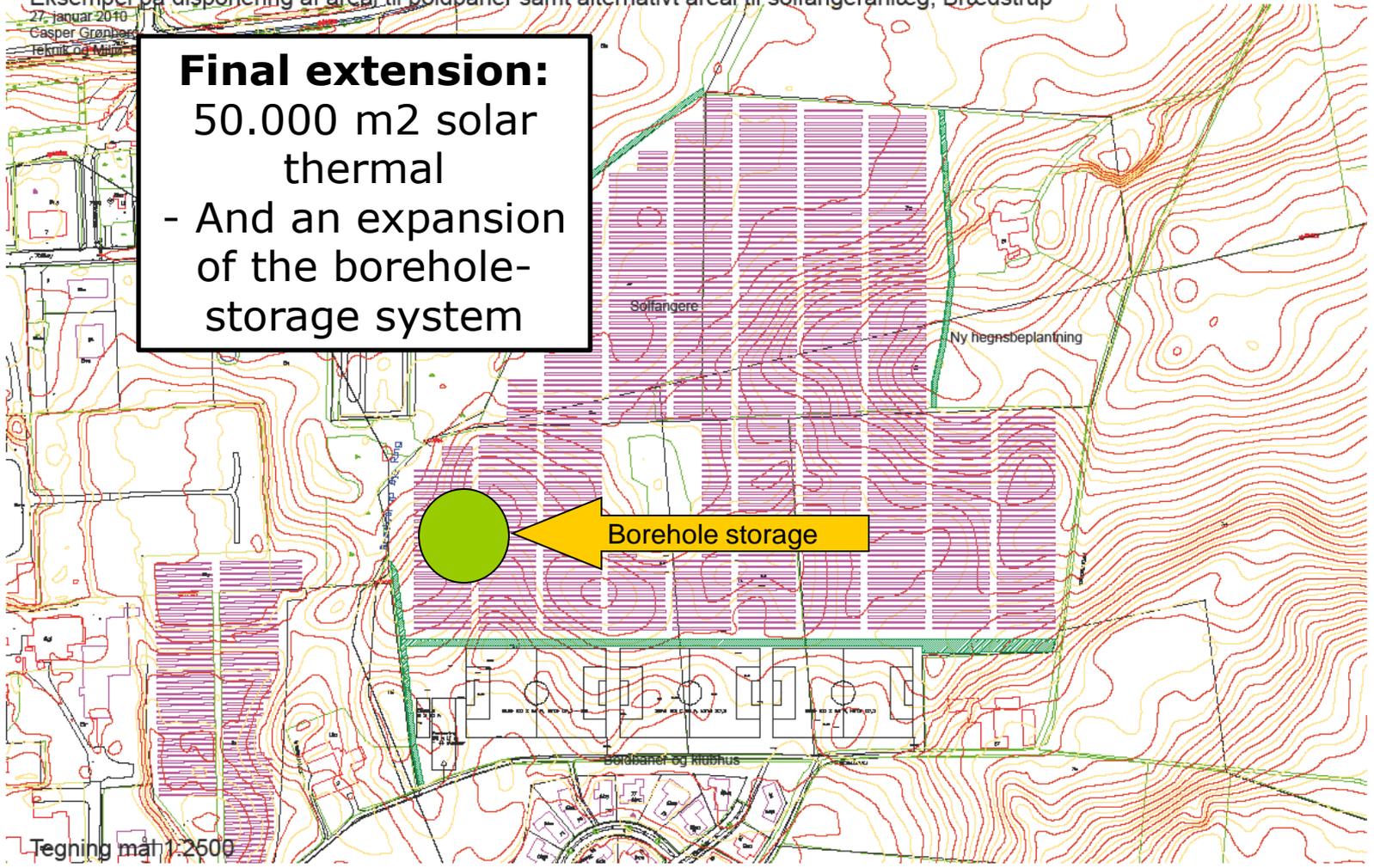
Invest: 3,6 mill. Euro
Grants: 0,9 mill. Euro
Nt. invest: 2,7 mill. Euro

Pay back time: 10 years

Eksempel på disponering af areal til boldbaner samt alternativt areal til solfangeranlæg, Brædstrup

27. januar 2010
Casper Grønberg
teknik og miljø

Final extension:
50.000 m² solar
thermal
- And an expansion
of the borehole-
storage system

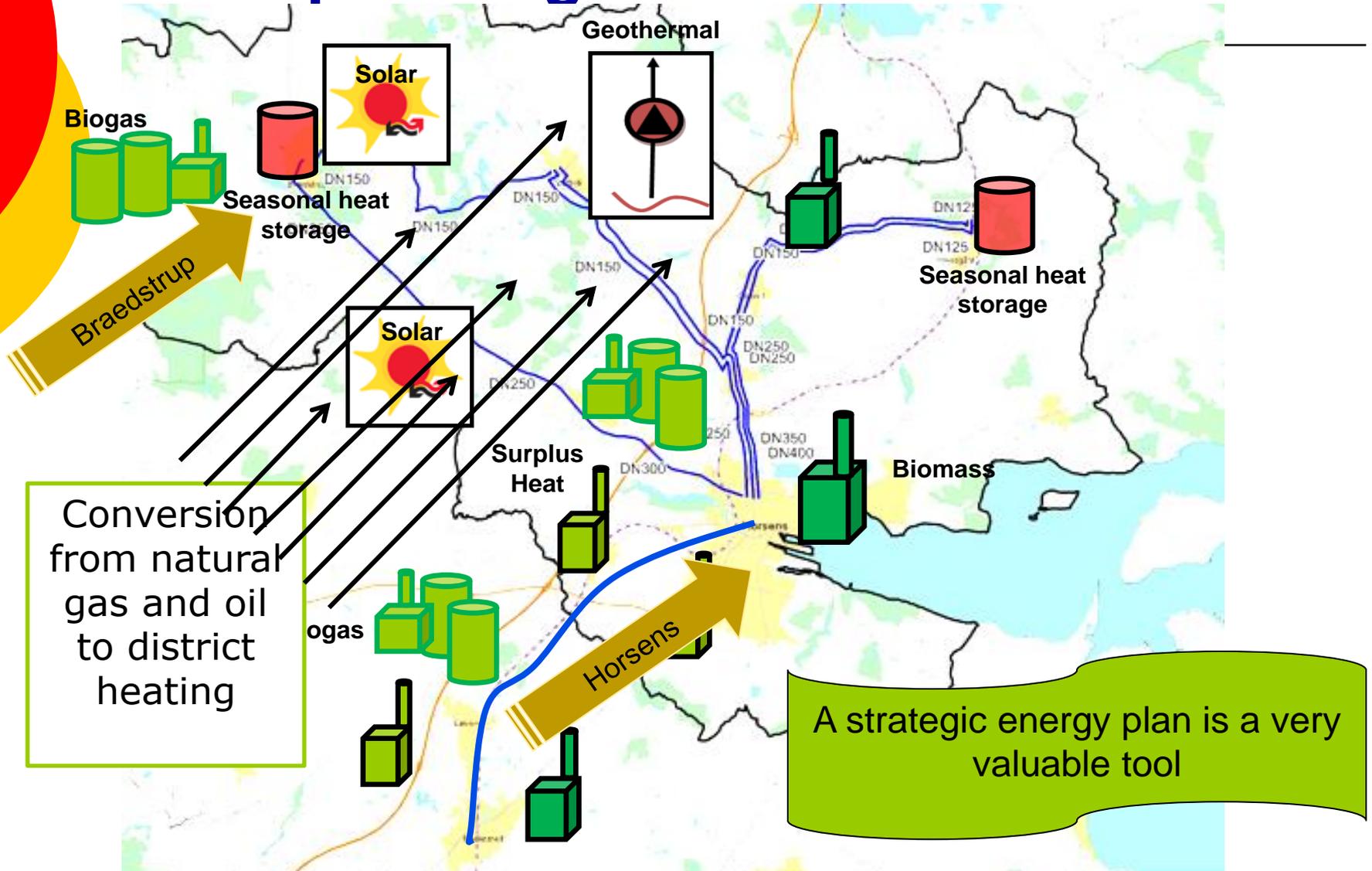


Business - models

Typical example (DK): Solar Area: 10.000 m²

Purchase of land (30.000 m ²):	50.000 Euro
Solar modules, pipes, heat exchangers, pumps, heat transfer fluid, etc.:	1.850.000 Euro
Fencing, soil processing, etc.:	50.000 Euro
Transmission pipe (1.000 m):	300.000 Euro
Control-systems:	100.000 Euro
Counseling, case processing, etc.:	40.000 Euro
Total:	2.390.000 Euro
Calculated production:	5.000 MWh/year
Annual capital costs: 2.375.000 Euro x 5%/year:	119.000 Euro/year
Maintenance: 1,0 Euro/MWh:	5.000 Euro/year
Total production costs: $\frac{124.000 \text{ Euro/year}}{5.000 \text{ MWh/year}}$	= 24,8 Euro/MWh

Very important with local/regional planning and coordination





Thank you for your attention
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