

District Heating Green Solutions

Green Solutions

Frederikshavn, Denmark

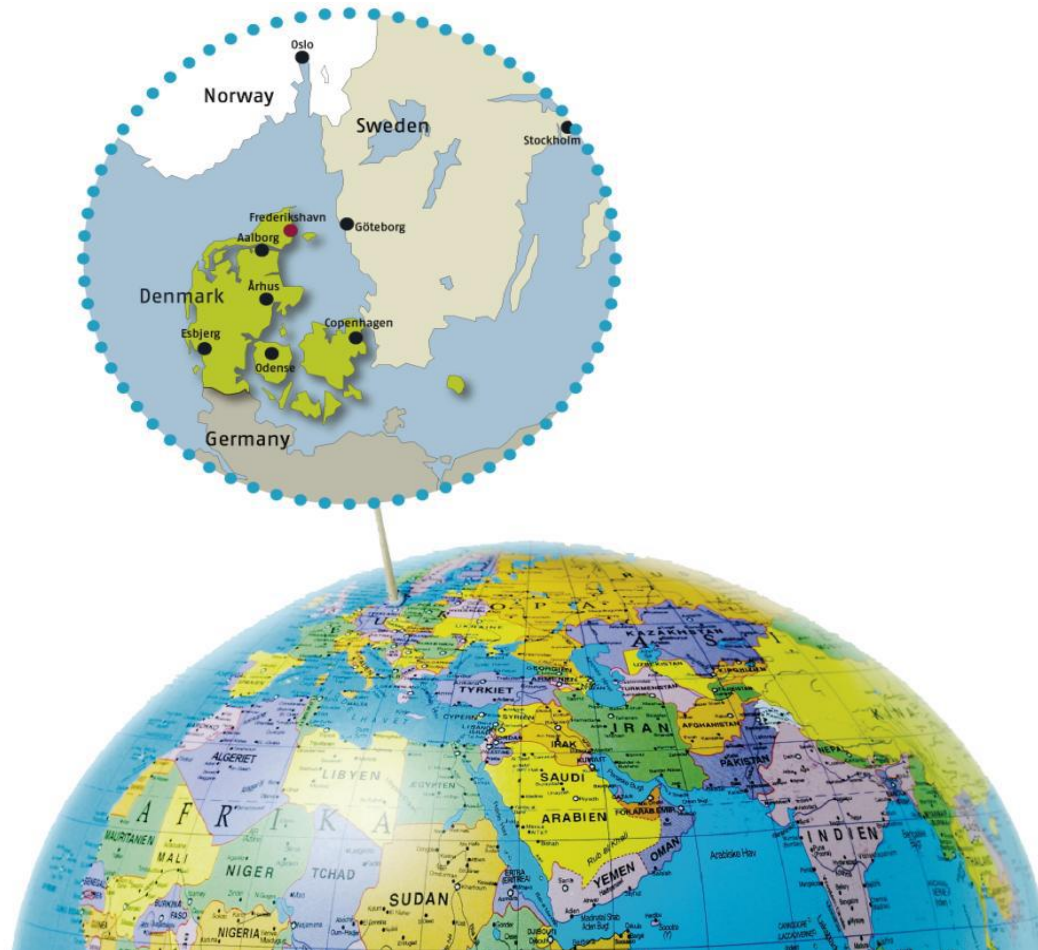
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Mayor Lars M. Møller

**Project manager Poul Rask
Nielsen**



Europe, Denmark, Frederikshavn



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- **Frederikshavn Municipality and renewable energy**
- Climate considerations and transfer to renewable energy and has been an important focus area for the municipality in four decades
- One of the first municipalities in Denmark, who signed the EU's Covenant of Mayors
- Strong citizen commitment for green initiatives
- Strong support from the City Council on sustainable initiatives



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Municipal policies for sustainable community development

- Infrastructure planning in general
- City and landscape planning
- City and community development planning
- Traffic management and public transportation planning
- Settlement planning
- Energy planning
- Waste management planning
- Local trade planning
- Local education planning

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Municipal instruments

- As the owner of the largest utilities in the municipality, prioritizing sustainable policies
- As municipality, placing high demands on energy efficient construction than the national legal requirements
- As municipality, being the “first mover” and become a “role model” for the rest of the community promoting sustainable initiatives

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- **Energy consumption in new buildings in Denmark**
- Requirements for energy consumption in new dwellings in Denmark

Energy frame

- 2008
- 2010
- 2015
- 2020
- Passivhouse

Energy consumption

70 kwh/m ² pr. year	100 %
50 kwh/m ² pr. year	75 %
35 kwh/m ² pr. year	50 %
17 kwh/m ² pr. year	25 %
	5 %

Industrial waste heat

Skagen District Heating - Fisherman Fishing industry
Production relative to annual consumption?

Image of district heating plant + Fisherman Fishing industry + wood pellets



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Waste Combined heat and power

- “Frederikshavn Utility”
30% of the total Heatproduction is based on Waste



- Future Perspective: Household waste used in biogas production

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Solar and Wind Surplus electricity from wind power



Solar plant



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Biomass heated plants

- **Hørby Heating Plant
based on straw**
- **Dybvad Heating Plant
based on pellets**





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Energy reduction by energy counselling

Energy counselling includes:

1. General condition control of the housing
2. Evaluation of the potential savings
3. Report on saving possibilities
4. Financing suggestions/pay-back



Value chain for energy supervision provided by one supervisor in Energy City

500
visits

- 500 visits in a year in private households
- Effect: 1 million. kWh savings / year of heat / power equivalent to the electricity consumption of 220 households

18 new jobs

- Revenue increased in energy retrofit approximately 1.34 million €
- Employment impact: 18 jobs, of which 10 artisans, (according to Danish Construction Association)
- Production – construction market - construction industry

wise
investment

- Property owner's investment in energy renovation gives back payment in relation to tangible energy savings, increased comfort and more marketable housing

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Thank you for your attention

Questions?



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