

Nearby heating in the county of Kronoberg

Energikontor Sydost, Sweden

Summary

One of the most successful projects of the energy agency is called “Nearby Heating Kronoberg”. It’s a purposeful venture aiming to replacing oil and electricity for heat production. The project contains 26 plants which have been built or are under construction during the period of 1999-2002. The total heating effect is 100 MW and out of the produced 220 GWh/y, is 180 GWh/y or nearly 80 % coming from biomass instead of oil and electricity. In addition to that, most of the plants are also prepared for the production of electricity, but it’s not yet profitable. The decrease of CO₂-emissions is significant, and as most of the biomass comes from local or regional suppliers, we have also managed to increase the employment in remote areas. For a short summary of the different plants see Appendix 1.

End-user area	Target Audience	Technical
<input type="checkbox"/> New buildings	<input type="checkbox"/> Citizens	<input type="checkbox"/> Energy efficiency
<input type="checkbox"/> Refurbishment of buildings	<input type="checkbox"/> Households	<input type="checkbox"/> Heating
<input type="checkbox"/> Transport and mobility	<input type="checkbox"/> Property owners	<input type="checkbox"/> Cooling
<input type="checkbox"/> Financial instruments	<input checked="" type="checkbox"/> Schools and universities	<input type="checkbox"/> Appliances
<input checked="" type="checkbox"/> Industry	<input type="checkbox"/> Decision makers	<input type="checkbox"/> Lighting
<input type="checkbox"/> Legal initiatives (municipal regulations, directives, etc)	<input checked="" type="checkbox"/> Local and regional authorities	<input checked="" type="checkbox"/> CHP
<input type="checkbox"/> Planning issues	<input type="checkbox"/> Transport companies	<input checked="" type="checkbox"/> District Heating
<input type="checkbox"/> Sustainable communities	<input type="checkbox"/> Utilities	<input type="checkbox"/> Solar energy
<input type="checkbox"/> User behaviour	<input checked="" type="checkbox"/> ESCOs	<input checked="" type="checkbox"/> Biomass
<input type="checkbox"/> Education	<input type="checkbox"/> Architects and engineers	<input type="checkbox"/> Wind
<input type="checkbox"/> Other	<input type="checkbox"/> Financial institutions	<input type="checkbox"/> Geothermal
	<input type="checkbox"/> Other	<input type="checkbox"/> Hydro power
		<input type="checkbox"/> Other

Context

- Regional venture
- Started about 20 years ago – in 1980 the first biofuel-fired district heating plant in Sweden, in 2001: 98% bioenergy
- on the BioEnergy Group’s initiative – a joint effort between companies
- a build-up knowledge
- Commercially viable
- Political acceptance in the early 90s
- in 1996 CHP wood chips-fired CFB-boiler
- Professorship in bioenergy technique in the late 90s
- Middle-sized segment: 200 kW-10 MW
- the University has access to all plants for research

The Energy Agency for Southeast Sweden project is supported by the EC via the Save II-program and is co-ordinated with La Mancha, Albacete, Spain. Responsible organization for Energy Agency for Southeast Sweden's is the Kronoberg County Association of Local Authorities together with the Regional Council in Kalmar County who partly are financing the project together with the Save II-program, the municipalities in the area, the county administrative board of Kronoberg, the county council of Kronoberg and Delegation of Energy matters in South Sweden.

One of the main issues for the agency is to promote Local Actions for Global Climate Protection, and the most important tools is energy efficiency and increased use of renewable energy sources. When it comes to renewable energy we try concentrate on biomass in small and middle scale, for example small scale district heating between 0.5 – 10 MW. We have identified this sector as a hidden and some times foreseen potential.

The project has been located in two counties: Kalmar and Kronoberg in the south-east of Sweden with 20 municipalities and 420 000 inhabitants. The region has two universities: Växjö and Kalmar.



Fig 1: Kronoberg county

Objectives

Nearby heating Kronoberg aims to reduce the use of fossil fuel and electricity for heating by replacing the fuel with pellets and wood chips.

- Locally produced fuel
- Increased number of employments

Process

Technologies demonstrated and reasons for choice, with brief details of any competitive cost/benefit studies carried out in selecting the given approach over alternatives.



Fig 2 9 MW plant in Braås, one of the largest plants in the project Nearby heating Kronoberg.

Financial resources and partners

The total investment cost for the project was € 45 000 000

Results

Energy produced by renewables: 275 GWh; Number of plants: about 35, out of which 25 is in Kronoberg and 10 in Kalmar; Environmental benefits: CO₂ –reduction 0,3 – 1,0 tonne/MWh; Jobs created: employs 1 person per 2000 MWh/year (pellets) and 3000 MWh/year (chips), 2 professorships and 10 doctoral students.

Lessons learned and repeatability

The positive aspects of project implementation were cooperation between the universities, industry and the municipality; commercially viable; supportive public; collaborative city council; government subsidy for capital investments and a few real enthusiasts who persevere!

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Printed reports or other literature available:

Title: “Miljökrav biobränsle” available at: www.energikontor-so.com (also available in English)

Appendix 1

NEARBY DISTRICT HEATING KRONOBERG, Current status
November 2001

Plant	Current power		Current energy		Future energy		INVEST.		Note
	MW		MWh/year		MWh/year		MSEK	Fuel	
	oil	el	oil	el	oil/el	Bioenergy			
Alvesta community									
Alvesta center+ east	10	3	30 000	10 000	5 000	35 000	40	Wood chip	Ready running, Alvesta Energi
Moheda	6	2	20 000	5 000	3 000	22 000	30	Wood chip	Ready, running: Alvesta Energi
Vislanda	4	2	10 000	3 000	2 000	11 000	20	Wood chip	Under constctction , VIDA/ Alvesta Energi
Grimslöv	2	0,5	5 000	500	500	5 000	9	Dry chip	Under constctction, local wood ind., 2003
Ljungby community									
Lagan	4	1	8 000	1 000	500	8 000	12	Briquettes	Ready, running, Sydkraft Värme 7 under construccion 2003
Lidhult	4	1							
Lessebo community									
Not decided yet									
Markaryds community									
Strömsnäsbruk	1,5	0,5	3000	1 000	500	3 500	3	Briquettes	Ready, running, Sydkraft Värme
Markaryd	1,5		3 000			3 000	3	Dry chips	Ready, running, Plymex AB
Tingsryds community									
Linneryd	1,3		2 500			2500	5	Wood chip	Ready, running Tingsryds Energi/Local sawmill
Urshult	1,5	0,5	4 500	500		5 000	18	Wood chip	Ready, running Tingsryds Energi/Local sawmill
Tingsryd	10	2	13000	2 500	2500	13 000	25	Wood chip	Ready, running, Tingsryds energi
Ryd	4,5	1,5	10 000	3000	2 500	10 500	15	Briquettes	Ready, running Sydkraft
Rävemåla	0,8	0,2	1700	400	500	1 600	2,5	Pellets	Not decided yet
Växjö community									
Lammhult	4	1	9 000	2 000	2 000	9 000	5	Briquettes	Ready, running, Sydkraft Värme
Bergsnäs	1	0,5	3 000	500	500	3 000	2	Pellets	Veab(local energy comp.)
Gemla	2	0,5	4000	600	500	4 000	6	Wood chip	Not decided
Braås	8	1,5	17 000	4 000	3000	17 000	23	Wood chip	Ready, running, Veab
Rottne	3	1	5 000	1500	1000	5000	15	Wood chip	Ready, running, Veab
St. Sigfrids FH	0,8	0,2	1 500	300	300	1400	1	Pellets	Ready, running, Local school/ Veab
Växjö Flygplats	1	0,2	2000	300	300	2000	2	Pellets	Ready, running, Local comp./ Veab
Ingelstad	1,5	0,7	2500	1200	300	3 400	3	Wood chip	Ready, running, Veab
Uppvidinge kommun									
Lenhovda	7	1	10 000	2500	1500	11 000	22	Wood chip	Ready, running, Local comp./ Lenhovda energi
Norrhult	2	0,5	2000	600	2400	200	6	Wood chip	Start 2001, KG List
Åseda	5	2	11 000	3 000	13 000	2000	10	Briquettes/Heat pump	Ready, running, Sydkraft Värme
Älhult			1000		1000		1	Wood chip	increase a running plant
TOTAL	82,4	22,3	178700	43400	42800	178100	278,5		

Some power (MW), energy (MWh/y) and cost are estimated. Total installed power for the biomass furnaces are about 70 MW of total 105 MW.