NORTH SEA
SUSTAINABLE
ENERGY
PLANNING

Baseline Paper turned in June 2011

Baseline
North Sea – Sustainable Energy Planning

Period of publishing
June 2011

Organization
EMC – The Coalition for Energy and Environment
Municipality of Varberg - Campus Varberg

Translated excerpts from "Energiläget Halland 2010"
– a publication by Halland County Administrative Board

Confirmation of publishing permission

Varberg 9 June 2011

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The Interreg IVB North Sea Region Programme
Investing in the future by working together for a sustainable and competitive region

European Community
European Regional Development Fund

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1 Summary

The total energy use in the county of Halland has decreased slightly between 2006 and 2008. The largest energy form is electricity followed by different by-products from the paper pulp industry, followed by different kinds of fuels for transportation.

The two biggest sectors when it comes to energy consumption are industry and transport.

The largest cause of emissions of carbon dioxide is transport which stands for almost 50 % of all carbon dioxide emissions. The average amount of carbon dioxide emitted per capita in the county is 5 ton per year.

This paper is only a short summary of the Swedish version of the energy balance for The County of Halland. The Swedish report can be downloaded from the County Administrative Board's official home page http://www.lansstyrelsen.se/halland/ .

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2 Swedish – English dictionary

Användning	Use
Avfall	Waste
Avlutar och restprodukter	Spent liquor & waste material (paper pulp production)
Bensin	Gasoline
Biobränslen	Bio fuel
Biogas	Biogas
Bostäder	Houses for living
Diesel	Diesel
El	Electricity
Eldningsolja	Heating oil
Energianvändning	Energy use
Energislag	Energy source
Etanol	Ethanol
Fjärrvärme	District heat
Gasol	Calor gas/LPG
Hallands län	County of Halland
Industri	Industry
Invånare	Inhabitant
Jordbruk	Agriculture
Jordbruk, skogsbruk och fiske	Agriculture, forestry and fishery
Kol	Coal
Koldioxid	Carbon dioxide
Koldioxidutsläpp	Emission of carbon dioxide
Kommun	Municipality
Kraftvärme avfall	Combined power and heat from waste
Kraftvärme i industrin	Combined power & heat from industry
Lokaler	Buildings, not for living
Naturgas	Natural gas
Olja	Oil
Sektor	Sector
Sol	Solar energy
Spillvärme	Waste heat
Sverige	Sweden
Tallbeckolja	Pine oil pitch
Tillförsel	Supply
Transporter	Transport
Trädbränsle	Wood fuel
Vattenkraft	Hydro power
Vindkraft	Wind power
Värmepump	Heat pump
Överförings- och omvandlingsförluster fjärrvärme	Losses in district heating
Överföringsförluster	Losses in distribution

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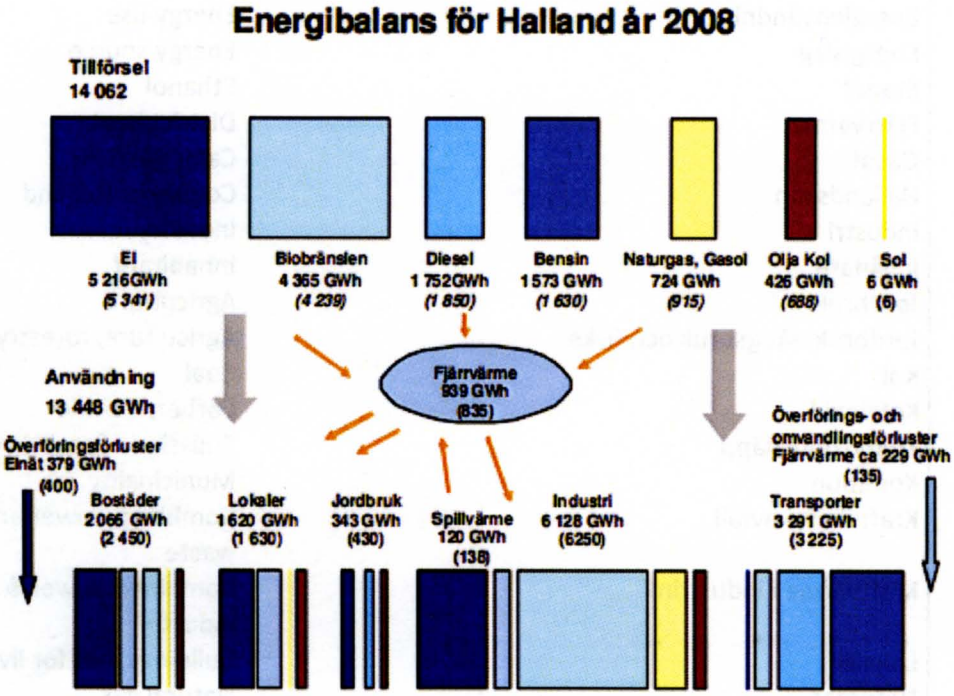
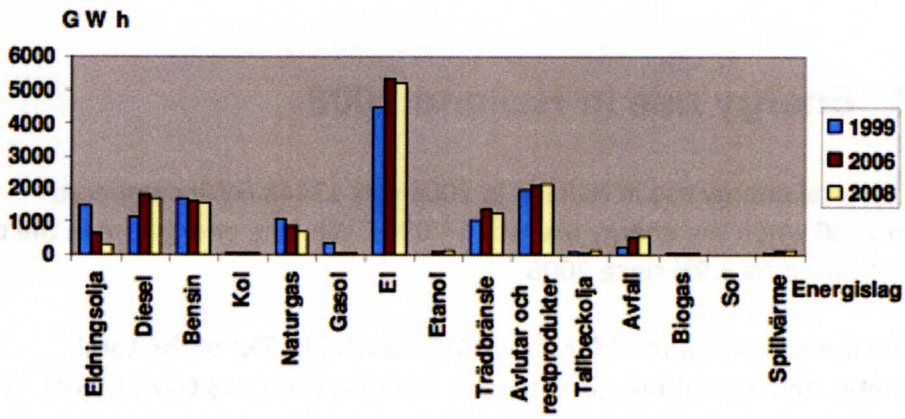
3 The Halland County Energy balance 2008

An energy balance uses the first law of thermo dynamics that says that energy can neither be created nor destroyed but only change form. Within a system this means that inflowing energy is equal to the sum of the accumulated energy in the system and the outflowing energy:

In the Halland county energy balance it can be seen how the flow of energy appeared in 2008. In the picture below one can see the balance between the total energy supply and energy use in Halland.
The values in parentheses are the figures for 2006.



Figur 8. Energibalans för Halland 2008. I biobränsle ingår 554 GWh avfall samt 146 GWh etanol och FAME. Ringhals elproduktion på 25,2 TWh är inte inräknad i balansen för Hallands län.



Figur 9. Energitillförseln fördelat på bränslen till Halland 2008 – totalt 14 172 GWh

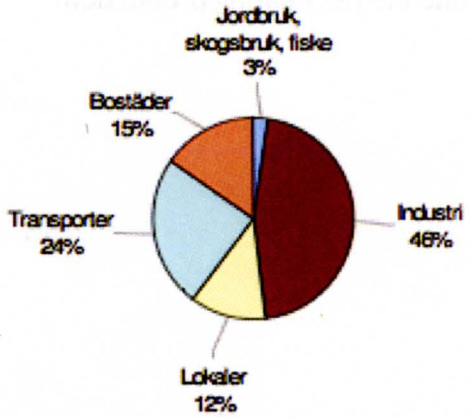
Källa: SCB, de kommunala energibolagen i Halland samt de stora industrierna i länet

The added energy in 2008 consisted of 5216 GWh (37%), electricity, 4465 GWh (31.5%) fossil fuels 4491 GWh (31.5%) and bio fuels (including waste). Clearly, biofuels and electricity continues to increase as energy sources in the added energy, both in households and district heating production.

4 Energy use in Halland 2008

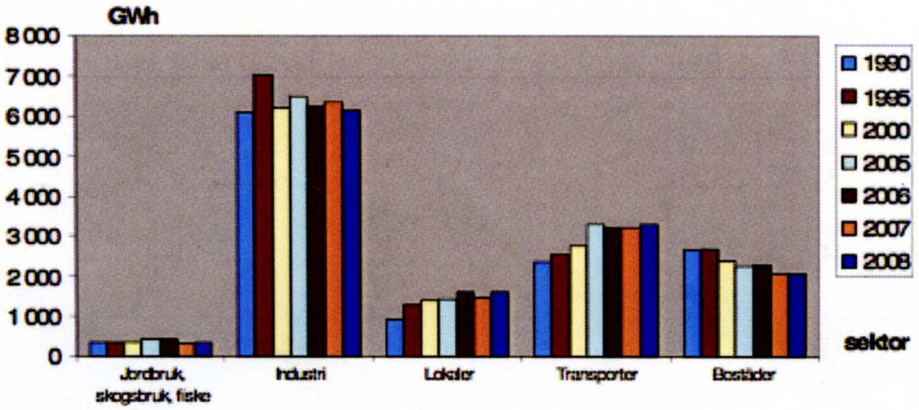
The total energy use in Halland in 2008 was 13448 GWh compared to 2006 when the energy use was 14 000 GWh. The energy use in the county has decreased by 3.9% since 2006.

The industry accounted for about 6130 GWh (45.5%) of the total energy and agriculture, forestry and fisheries used 343 GWh (2.5%). Within the residential sector 2066 GWh (15.5%) were used and in the case of premises 1620 GWh (12%) were used. The transport sector used 3291 GWh (24.5%).
Halland proportionally has a larger share of their energy use in the transport sector in comparison with national statistics. One reason may be the E6, which is a great thoroughfare between Scania (southern part of Sweden), Gothenburg and Norway. Even in agriculture, forestry and fisheries the energy use is slightly higher than the national average, this can sometimes be due to large arable land.



Figur 10. Fördelning över energianvändningen i Halland 2008

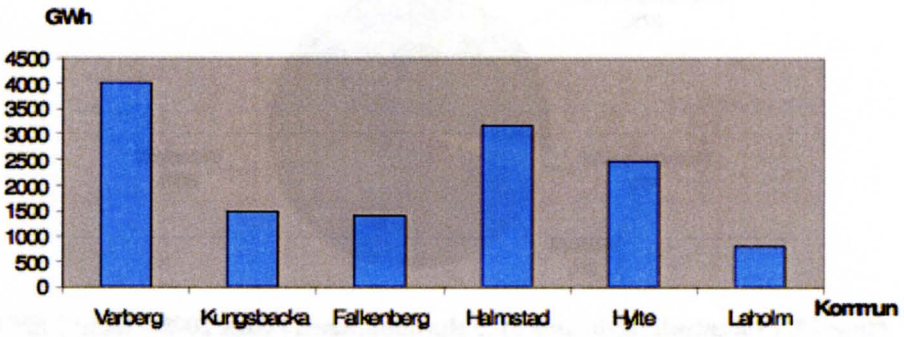
Källa: SCB samt Värö Bruk och Stora Enso



Figur 11. Energianvändning uppdelat på sektor

Källa: SCB samt Värö Bruk och Stora Enso

In Halland, there are two major industries (Södra Cell Värö in Varberg and Stora Enso in Hyltebruk), in these municipalities the energy use is higher than in the other municipalities with regards to the population. Varberg had an energy use amounting to over 4000 GWh and Hylte almost 2500 GWh in 2008. Halmstad, which is Halland County's largest municipality had an energy use of less than 3 200 GWh . In Kungsbacka and Falkenberg was
the energy use was less than 2500 GWh and in Laholm approximately 800 GWh.



Figur 12. Energianvändning 2008 per kommun i Halland - totalt 13 448 GWh

Källa: SCB samt Värö Bruk och Stora Enso

The energy use in Halland is dominated by the paper mill Stora Enso and the Södra Cell Värö paper pulp mill. These two industries together used 4749 GWh in 2008 (4890 GWh in 2009). Overall, these two industries account for 79.5% of the total industrial energy use of about 6130 GWh in Halland. In the pulp and paper industry a lot of bio energy is used in the form of waste and residues from the manufacturing process, hence the large bio fuel share of over 50%. Both these industries are very energy-intensive and Stora Enso
uses nearly 29% of the total amount of electricity delivered to the county, and 62% of the industrial electricity.

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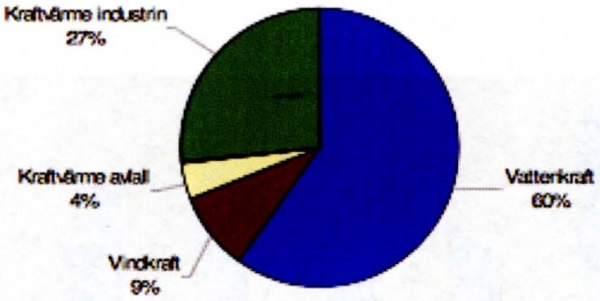
5 Production of electricity 2008

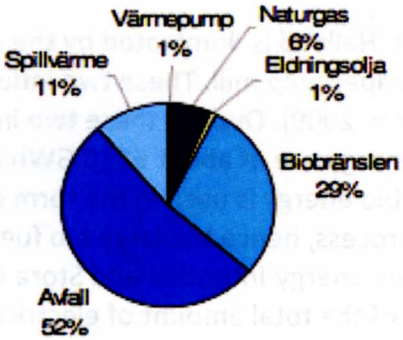
Most of the electricity produced in the county comes from hydro power (60 %), followed by combined power and heat from the industry (27 %), wind power (9 %) and combined power and heat from waste (4 %) (Figure 22). Electricity from the nuclear power plant Vattenfall Ringhals is not included as it is a national power producer.



Figur 22. Procentuell fördelning över elproduktionen i länet 2008 – totalt 1 625 GWh

Källa: Energibolagen i Hallands län, Energimyndigheten, samt Statkraft och EON

The heat supplied to the district heating systems comes from waste (52 %), bio fuels (29 %), waste heat (11 %), natural gas (6 %), fossil oil (1 %) and heat pump (1 %) (Figure 26).

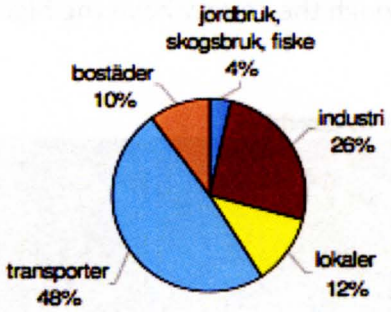


Figur 26. Fördelning av energislagen i fjärrvärmeproduktionen 2008 – totalt 1 060 GWh

Källa: De kommunala energibolagen i Hallands län

6 Carbon dioxide emissions 2008

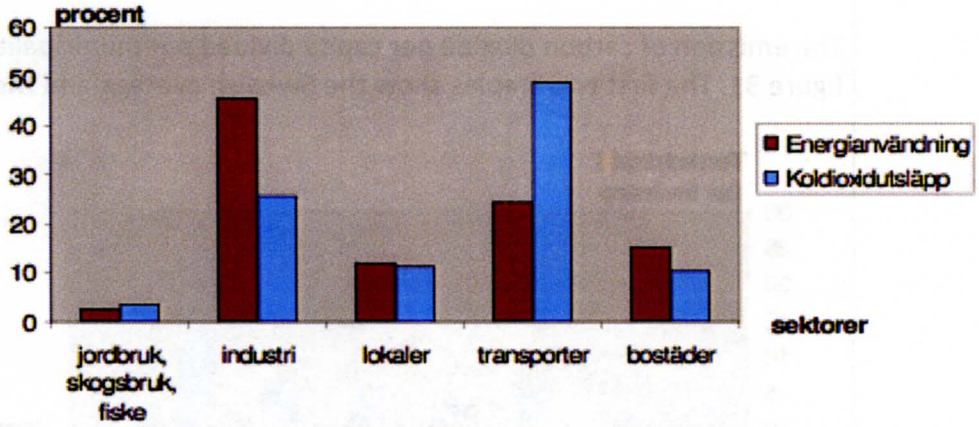
The emissions of carbon dioxide comes from transport (48 %), industry (26 %), buildings other than living (12 %), homes (10 %) and agriculture, forestry and fishery (4 %) (Figure 28).



Figur 28. Koldioxidutsläpp från energianvändning Halland fördelat sektorer – totalt 1 706 000 ton

Källa: SCB samt Värö Bruk, Stora Enso och de kommunala energibolagen

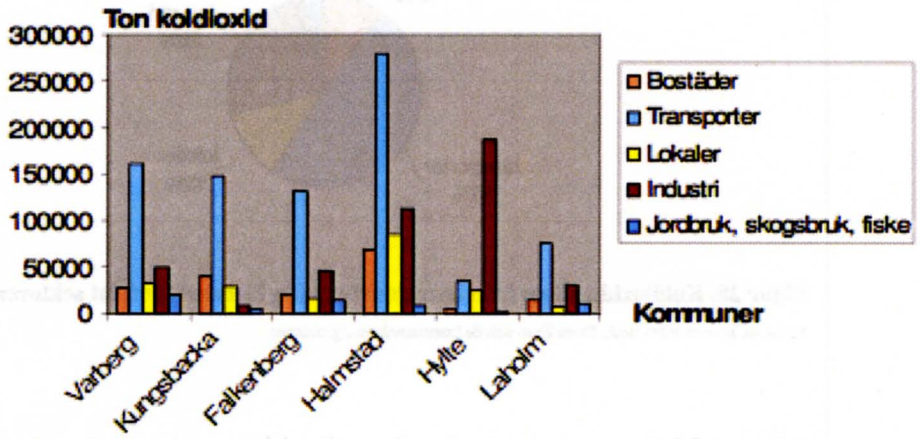
In figure 29 the emissions of carbon dioxide are shown in comparison to the energy use per sector (agriculture, forestry and fishery; industry; buildings other than for living; transport and homes).



Figur 29. Procentuell fördelning mellan sektorerna, energianvändning och växthusgasutsläpp i Halland år 2008

Källa: SCB samt Värö Bruk, Stora Enso och de kommunala energibolagen

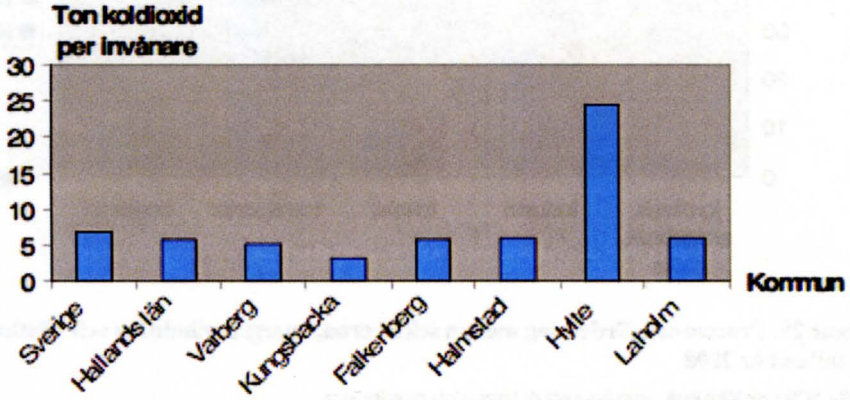
In figure 30 the emissions of carbon dioxide per municipality are shown divided per sector (homes; transport; buildings other than for living; industry and agriculture, forestry and fishery). The four municipalities that lie along the road E6 that goes along the coast through the county have the highest emissions of carbon dioxide from transport.



Figur 30. Sektorernas koldioxidutsläpp 2008 fördelat på kommunerna i Halland

Källa: SCB samt Värö Bruk, Stora Enso och de kommunala energibolagen

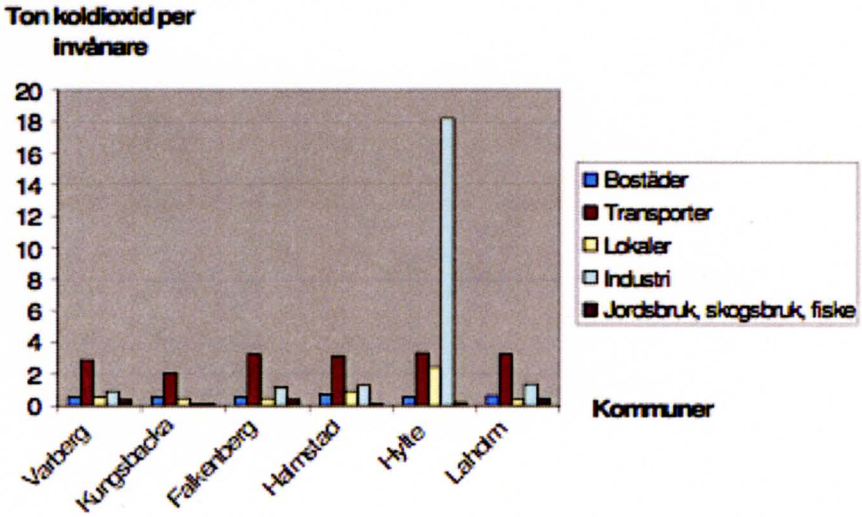
The emission of carbon dioxide per capita divided per municipality, are shown in figure 31. The first two staples show the Swedish average and the county average.



Figur 31. Koldioxidutsläpp 2008 fördelat på ton per invånare i Sverige, Halland samt kommunerna

Källa: SCB samt Värö Bruk, Stora Enso och de kommunala energibolagen

In figure 32 the emissions of carbon dioxide per capita divided per sector and municipality are shown. Except for the municipality of Hylte, transport is the largest source of carbon dioxide.



Figur 32. Koldioxidutsläpp 2008 totalt fördelat på ton per invånare för respektive kommun och sektor i Halland

Källa: SCB samt Värö Bruk, Stora Enso och de kommunala energibolagen