

Call for oil independence – highlights the need for energy efficiency

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Abstract

In December 2005, the Swedish Government appointed a commission to draw up a programme to reduce Sweden's dependence on oil. The main reason for this was the climate change. Other reasons were the effect of oil prices on Sweden's growth and employment and the fact that oil still plays a major role for peace and security throughout the world.

Members of the commission, besides the prime minister, were experts from industry, agriculture, forestry, science and experts on energy efficiency and district heating. The aim of the commission was to propose a number of measures to end the oil dependence by the year of 2020 and also to reduce the use of oil products.

Although there is a great potential for Swedish raw materials (bio fuels) as alternatives to oil it was soon obvious that oil independence could not be reached without a great contribution from energy efficiency. Energy efficiency was proposed as the first of five strategies of the Commission. The Commission proposed measures for energy efficiency both on policy level and on concrete actions.

Interest in the Commission's work is and has been enormous, both in Sweden and abroad. Many people took part in the hearings which were the start of the Commission's work. In Sweden the Commission has for sure increased the interest in energy related issues and also very much highlighted the need for energy efficiency.

The paper will present the results of the Commission's work with a specific focus on measures on energy efficiency.

Now Sweden has a new government, with a new prime minister, so the Commission does no longer exist. The new government will start a new Commission which hopefully will continue the work started by the Commission on Oil independence.

Introduction

Declining access to conventional oil, in combination with our joint responsibility to stop global warming, will be a test of the world community's readiness to switch to energy systems that are more sustainable in the long term. Basically, it is a question of the will to show solidarity with present and future generations.

The Swedish Commission on oil independence proposed a number of far-reaching, concrete measures that can end our dependence on oil by the year 2020 and tangibly reduce our use of oil products. Our ambitious objectives are as follows:

- Through more efficient use of fuel and new fuels, consumption of oil in road transport shall be reduced by 40-50 per cent.
- In principle no oil shall be used for heating residential and commercial buildings
- Industry shall reduce its consumption of oil by 25-40 per cent

All this means that we can not only reduce emissions of greenhouse gases. We can also secure our supply of energy, strengthen our economy and promote the development of sound growth driven by technology and environment, with new business opportunities for Swedish industry. In short: the phase-out of oil

Sector	Oil Use		Major Purpose of Use
	% of energy use in that sector	TWh	
Transport	97	95	Motor operation
Agriculture, forestry, fisheries	70	7	Tractors, drying, contractors' equipment, fish processing
Building sector	67	2	Contractors' equipment, heating, drying
Residential and commercial sector	11	10	Private heating (i.e. not district heating plants) and hot water
Industry	8	18	Heating and process energy
District heating	8	4	Peak load, etc.
Service sector	6	3	Heating and motor operation, etc.
Power plants	1	3	Power in industry and district heating plants

Figure 1. Use of oil in 2004, in percentage terms and absolute terms for each sector:

can further strengthen our position as one of the world's leading nations in sustainable development.

We would also like to underscore the need for partly new values and a way of life based to a greater extent on solidarity, at both national and individual levels. The role of homes and schools is therefore important, and we need to support the bearers of ideas, the popular movements, in their ambition to encourage new thinking and a deeper understanding of our world. Democracy can and must therefore be intensified and politics renewed. Sweden sure is a small neighbourhood in the global village. But we have great and growing opportunities to contribute to a positive change.

Composition of the Commission

The Prime Minister, Göran Persson, chaired the Commission which comprised the following eight members from the research world, industry and social life: Professor Christian Azar, Chalmers University of Technology, Lars Andersson, government investigator into bioenergy, Lotta Bångens, Chairman of Sweden's Energy Advisers, Birgitta Johansson-Hedberg, CEO, Lantmännen, Leif Johansson, CEO, AB Volvo, Göran Johansson, former chairman of the Swedish Metalworkers Union, Christer Segersteen, Chairman of the Federation of Swedish Forest Owners, Lisa Sennerby-Forsse, Secretary-General, Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning.

The Commission's Staff comprised Stefan Edman, biologist, writer, former Political Adviser to the Prime Minister and Anders Nylander, architect and expert on energy.

Working methods

The Commission worked openly and together with experts in order to spread current knowledge to the media and those interested in the general public. Four public hearings broadcast on television were arranged on different themes and attracted considerable interest in Sweden and around the world:

- Will oil run out – and, if so, when?
- Sweden's green gold – what potential do forestry and agriculture offer for bio energy now and in the future?
- How can we reduce our dependence on petrol and other fossil fuels in the transport sector?
- How can we reduce our dependence on oil and other fossil fuels for heating and power production?

Material in preparation for and after the hearings was presented on the Government website. During the spring, the Staff held many meetings with the actors concerned, the media and other interested parties.

How dependent on oil is Sweden today?

Sweden's dependency on oil has varied over time. Use of fuel oil for heating, for example, has decreased dramatically from top levels in the 1970s while the use of petrol has remained stable for the last ten, fifteen years. How dependent Sweden is in different sectors can be seen in Figure 1.

The Commission's points of departure

The Commission presented five strong reasons for phasing out Sweden's dependency on oil, improving the efficiency of energy use and in the long term replacing fossil energy sources with renewable energy. We will:

1. reduce Sweden's climate impact
2. secure Sweden's supply of energy in the long term
3. strengthen our international economic competitiveness
4. use and develop the energy resources from forests and fields, "Sweden's green gold"

and thereby become a leading nation in the development of new technology for sustainable use of energy and more efficient use of energy.

We wish to stress that "use of oil" is not the same as "dependence on oil". Our measures certainly aim to reduce as far as possible actual consumption of oil by the year 2020. We also want to reduce the one-sided dependence on oil in areas where total independence from oil will take much longer to achieve, for example in the transport sector.

Our analyses and proposals

The Commission proposes the following national objectives for more efficient use of energy and reduced dependence on oil by the year 2020:

- Swedish society as a whole should be able to make 20 per cent more efficient use of energy by 2020 and thereby at the same time create intensified, cost-effective prosperity that is sustainable in the long term
- By 2020 in principle no oil should be used for heating residential and commercial buildings
- Road transport, including transport in the agricultural, forestry, fisheries and building sectors, should reduce use of petrol and diesel by 40-50 per cent by 2020
- Industry should reduce its use of oil by 25-40 per cent by 2020

The Commission's proposals are based on five overall strategies.

1. RADICALLY MORE EFFECTIVE USE OF ENERGY BY THE WHOLE OF SOCIETY

The Commission proposes that a "council" or "energy conservation centre" be created. Its task will be to be proactive for a more offensive development with sector objectives, a duty to report to the Swedish Riksdag and Government on developments as well as follow-up and continually raised targets.

The Commission proposes an energy efficiency objective for Sweden that means Swedish society as a whole should improve energy efficiency by 20 per cent by 2020. This implies an average annual 1.5 per cent increase in energy efficiency.

2. HISTORIC INVESTMENT IN FOREST FUELS AND ENERGY CROPS

The Commission proposes the following long-term strategies, and assumes that they be implemented so that the objectives for nature conservation, outdoor life and recreation are not jeopardised:

- Forest growth to be increased in the long term by 15-20 per cent through more efficient management in the form of clearing, thinning out, refined plant material, ditch clearing and fertilisation as well as through more intensive cultivation of spruce and broad-leaf trees on a few per cent of the acreage.
- Energy crops and energy broad-leaf trees be cultivated on arable land and disused, nonafforested farmland on a scale of 300 000 – 500 000 hectares.
- The Government invests funds to stimulate education, plant support, procurement of technology as well as production facilities for the manufacture of fuels.

3. ELECTRICITY FOR A SUSTAINABLE SUPPLY OF ENERGY

Electricity is an efficient and valuable energy carrier. Use of electricity has increased in Sweden over several decades and is, per capita, remarkably high compared with other industrial countries in the developed world. It is uncertain how consumption of electricity will develop in Sweden in the future when historically low Swedish electricity prices are levelled out to the European level.

Very little electricity is produced in Sweden using oil or other fossil fuels. However, the common European electricity market, to which we nowadays belong, is largely supplied by fossil condensing power with a very low degree of efficiency and fuelled by coal. If, by improving efficiency, we reduce our consumption of electricity in Sweden we will be able to reduce emissions of carbon dioxide. The Commission wishes to stress that inter alia industry's need of electricity for specific purposes in industrial processes must be accommodated in a secure way.

The Commission proposes that the Government and industry cooperate to achieve the following:

1. **More efficient use of electricity in industry.** It is assessed that non-energy-intensive industry can in many cases improve electricity efficiency by 40 per cent and residential and commercial buildings by 20 per cent.
2. **Increased production of domestic renewable electricity.** There are plans to extend wind power by about 10 TWh by 2015. According to Svensk Fjärrvärme AB, the potential for district-heating-based electricity is about 25 TWh, based on the data for district heating plants that may apply around 2010; with gasification technology it will further increase.
3. **Reduced consumption of electricity for heating buildings.** This should be achieved by more efficient climate shells and installations, increased use of IT-based systems for more efficient use of energy and by switching above all to biofuel-fired district heating, environmentally approved wood boilers, pellet burners and pellet stoves.

4. THE ROLE OF ENERGY GASES

The Commission is dubious about a large-scale extension of the natural gas network and, hence, about the Russian natural gas planned to be distributed to Germany in a pipeline on the bottom of the Baltic Sea. Interested parties want to link this fossil gas to our country. We are aware that natural gas can replace a certain proportion of coal and oil in industrial processes and thereby contribute to reduced emissions of carbon dioxide from individual plants. And we can also see the positive synergy effects of renewable biogas for vehicle propulsion that may arise in the context of the gas pipeline.

To us the overriding problem is, however – along with the danger of reduced security of energy supply – that a large-scale supply of natural gas could replace and thus risks crowding out domestic biofuels used in many heating and district-heating power plants. In this way, the historically unique investment in bioenergy which we propose in this programme would be obstructed. The large-scale introduction of natural gas will thereby probably also lead to a total increase rather than a reduction in emissions of greenhouse gases in Sweden.

The Commission proposes that the Government does not actively commit itself to increased use of natural gas in Sweden in the future. On the other hand, the Government should support local and regional infrastructures for biogas from retting and gasifying of biomass, for use in both vehicles and industrial processes.

5. CONTROL INSTRUMENTS AT EU LEVEL

The Commission proposes that Sweden contribute to a gradual tightening of the EU emission trading system. A reasonable objective is that distribution of emission rights decreases in the next ten to fifteen years so that total emissions in the trading sector will be 25 per cent lower in 2020 compared with 1990. This would give considerable impetus to reducing emissions of carbon dioxide and thereby consumption of oil.

Measures for energy efficiency in residential and commercial buildings

The Commission proposes the following measures that should constitute the frame for national efforts to achieve more efficient use of energy in residential and commercial buildings:

ENHANCED EFFICIENCY IN CONNECTION WITH THE CONSTRUCTION OF NEW BUILDINGS

- Low energy housing with little or no external heat supply

By 2020 the share in new housing could be at least 75 per cent.

- Tightened building regulations

Building regulations relating to energy conservation should be tightened. Notification of planned and new tightened regulations should be given early so that the market has time to adjust to the new requirements. Weighting factors should be introduced for different types of energy.

- Energy-related deductions on real estate tax

At present all new buildings are entitled to a real estate tax deduction for the first five years. We propose that the size of the

deduction be linked to the building's energy performance, related to the weighting factors (see above), and that a similar arrangement also be considered in connection with investments to enhance energy efficiency in existing buildings.

IMPROVING ENERGY EFFICIENCY IN CONNECTION WITH RECONSTRUCTION

Requirements should be introduced for improvement of energy efficiency in the respective sub-systems, including tightened requirements for follow-up and observance of the framework of regulations.

IMPROVING EFFICIENCY IN EXISTING RESIDENTIAL AND COMMERCIAL BUILDINGS

- “The million programme” and other older properties

Special efforts are needed to achieve energy efficiency improvements in connection with the extensive renovation and modernisation that will need to be carried out in the years ahead in the large housing stock built in the decades after the Second World War. These include, among others, the apartment blocks in what is known as the million programme which started in 1965.

- Buildings with direct electric heating

Reduction of direct electric heating of buildings should be accelerated. This must be effected by more efficient climate shells and installations and by switching over to heating methods that do not use electricity. A good alternative may, for example, be to provide a well insulated house heated by direct electricity with biofuel heating. Increased efforts should be made to reduce the cost of changing to waterborne systems, for example by joint local/regional procurement of technology for cost-effective, waterborne systems.

- Property owners and managers

Start a Programme for Improving Energy Efficiency (PIEE) for property owners. The participants carry out measures in accordance with the Energy Declaration and in exchange receive financial stimulants, for example a temporary tax reduction or, alternatively, a tax reduction for certain environmentally sound installations (ROT).

- State leads the way

State-built, state-owned and state-administered buildings must reduce their energy consumption, inter alia on the basis of the measures proposed in the Energy Declaration. Good examples and models should be set by, for example, ministries and authorities. A similar aim should apply for other public premises, among others schools and hospitals. The state must also set a good example and promote growth and development of the market for the best products/applications, through public procurement and support to research and development in the area. Procurement should only be from the best performer quartile in energy efficiency.

References

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