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Memorandum

SWEDISH GOVERNMENT

26 June 2007 N2008/4799/E

Ministry of Enterprise, Energy and Communications

Energy

Report pursuant to Directive 2003/30/EC of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport

This is Sweden's fifth report pursuant to Directive 2003/30/EC of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport.

1) Measures taken to promote the use of biofuels

National targets

As stated in previous reports, the national targets for the use of biofuels and other renewable fuels in Sweden were set at 3% for 2005 and 5.75% for 2010, calculated on the basis of energy content.

Promotion of eco-friendly vehicles

The proportion of eco-friendly cars among new car sales increased from 5% in 2005 to 22% in 2007 (eco-friendly cars in this connection are fuel-efficient cars with CO₂ emissions of no more than 120 g/km and vehicles which can run on alternative fuels). This trend has continued in 2008, with eco-friendly vehicles accounting for 29.5% of new cars sold between January and April.

Some of the factors contributing to this development are described below.

Taxation strategy for alternative fuels

The taxation strategy described in previous reports remained in force in 2007.

CO₂-based vehicle tax

A vehicle tax based on carbon dioxide was introduced in 2006 with a view to encouraging the purchase of energy-efficient vehicles, thus reducing emissions in the transport sector.

Obligation to offer renewable fuels

A new legal act on the obligation to offer renewable fuels entered into force on 1 April 2006. It requires the country's larger filling stations to offer a renewable fuel alongside petrol and diesel. The act initially applies to filling stations with a sales volume of more than 3 000 m³ of petrol or diesel, which account for around 15% of

the total of nearly 4 000 filling stations. The aim is for around 60% of all filling stations to sell a renewable vehicle fuel by 2010.

Environmental policy for State-owned vehicles

Vehicles purchased by the State must as a rule be eco-friendly. As from 2007, at least 85% of passenger cars purchased or leased by State authorities must be eco-friendly. In the case of emergency vehicles, the requirement for 2007 is that at least 25% of vehicles purchased by State authorities must be eco-friendly.

Eco-friendly car subsidy

In spring 2007 the Government introduced a subsidy to encourage private individuals to change to eco-friendly vehicles so as to foster the use of fuel-efficient cars and vehicles using environmentally friendly fuels. Cars eligible for the subsidy are fuel-efficient conventional vehicles, vehicles running on alternative fuels, electric hybrids, and electric cars with a certain degree of efficiency.

A private individual who buys a new eco-friendly car between 1 April 2007 and 31 December 2009 will receive a subsidy of SEK 10 000. The Government initially earmarked a total SEK 250 million for subsidies, but this was increased in 2008 as the demand for eco-friendly cars was higher than expected.

Production of biofuels

In 2007 new biofuel production plants started operation in Sweden, and the building of further plants was decided. Most of them involve using established technology to produce ethanol, rapeseed methyl ester (RME) or biogas (including biogas upgrading plants).

As raw material supplies, conversion efficiency and cultivation intensity for today's raw materials are likely, within a few years, to be such as to severely limit the scope for expansion, the Swedish Energy Agency is focusing on research into, and the development of, cellulose-based fuels. Work is concentrating on three areas: ethanol produced from cellulose, biofuel gasification and black liquor gasification.

Miscellaneous

Sustainable development commission

The Government has appointed an advisory commission on sustainable development. Its remit, taking sustainable development as the starting point, is to promote cross-sectoral work, establish an international perspective and consider ecological, social and economic aspects. The commission will work proactively on selected themes identified as essential for creating conditions for sustainable development. It will analyse obstacles and develop cross-sectoral strategies. Its work will have a scientific grounding. It will look at how efficiency gains and modernisation of organisations, regulatory frameworks and policy instruments can facilitate work on sustainable development and environment-driven growth. The commission will be a forum for discussion, analysis and dialogue, and its open working methods will also stimulate a broader dialogue in society. A number of workshops have been held in 2007 and 2008, focusing for example on new technology and its importance for sustainable development.

Scientific council for climate issues and parliamentary climate committee

In January 2007 the Government appointed a scientific council on climate issues, whose task includes proposing objectives for Swedish climate policy and contributing scientific assessments for a climate policy bill to be put to the Swedish Parliament in 2008. The council was due to present its report by 1 September 2007. The Government has also established a parliamentary committee on climate issues to prepare the climate policy bill. This committee has presented its ideas to the Government, which is now analysing the proposals.

Swedish agriculture as a producer of bioenergy

On 21 June 2005 the Government appointed a rapporteur to analyse Swedish agriculture's prospects as a producer of bioenergy. The rapporteur's report was presented on 9 May 2007. The general conclusion is that in many cases the market is capable of efficiently assessing the development potential of business concepts. The report proposes among other things that during the period 2008-2013 a contract bonus should be granted to heating and power companies which sign contracts for newly-planted salix and that temporary investment aid should be granted for manure-based biogas production under the rural development programme.

The Government has circulated the proposal for consultation, and it is now being processed by the Cabinet Office.

2) National resources allocated to the production of biomass for energy uses other than transport

The biofuels market in Sweden

Sweden has a fully commercial biofuels market. In 2007 the country's total supply of biofuels, peat, etc. amounted to around 120 TWh, an increase of 4 TWh on the previous year. Most of these fuels are produced domestically and include ligneous fuels (branches and tops, stumps, firewood, bark, chips, energy wood), spent liquor (by-products of chemical pulp production), peat, waste (industrial and household waste etc.) and a small quantity of agricultural raw materials. These fuels are used mainly in the forestry sector, for heating (district heating and small houses) and for electricity production.

*Efforts to promote the use of biomass for energy purposes**Renewable electricity certificate*

On 1 June 2006 the Swedish Parliament decided to develop the electricity certificate system, which means that a certain proportion of consumers' electricity consumption must come from renewable energy sources (Bill 2005/06:154: Renewable electricity with green certificate). The system is being extended until 2030. Sweden's target for renewable electricity production is to add 17 TWh to the 2002 level by 2016.

Aid for conversion from electric heating and oil-fired heating

Special investment aid for converting from direct-acting electric heating in residential buildings was introduced in January 2006. The total amount set aside for this purpose for the five-year period 2006-2010 is approximately SEK 1.3 billion. As at

31 December 2007, 8 817 applications had been granted aid totalling SEK 417 million. Of this, SEK 153 million has been paid out to recipients. Conversion to district heating accounts for 67% of the applications approved, conversion to heat pumps 26%, and conversion to biofuels 7%.

Similar investment aid for converting from oil-fired heating in residential buildings was also introduced in January 2006 and is granted for converting to district heating, biofuel-fired heating systems, heat pumps (mountain, sea or ground heat) or solar energy. Aid is intended to reduce the use of fossil fuels and increase the use of renewable energy for heating. As at 1 March 2007, 36 952 applications had been granted aid totalling SEK 450 million. Altogether, around 50 000 applications had been received by the county administrative boards. By the end of 2007, SEK 443 million had been paid out to recipients. 43% of aid was for heat pumps, 37% for biofuels and 20% for district heating.

Aid for energy efficiency and renewable energy in public places

Special investment aid for energy efficiency and conversion to renewable energy sources in buildings used for public activity, introduced in 2005, has been extended until 31 December 2008. A total of SEK 2 billion has been set aside for this purpose. Up to and including 31 December 2007, 6 073 applications had been granted aid totalling SEK 1 333 million.

Climate investment programmes

In the context of aid for climate investment programmes ('*Klimp*'), nearly SEK 500 million has been paid out for biogas projects since 2003. In 2007 aid amounting to SEK 56 million was granted to a total of 57 biogas filling stations.

3) Total fuel sales last year, proportion of biofuels, etc.

	2004	2005	2006	2007
Passenger cars, electricity	144	123	118	126
Passenger cars, ethanol	9 604	21 310	46 542	80 931
Passenger cars, gas	3 917	5 847	9 242	11 001
Light commercial vehicles, electricity	260	241	207	188
Light commercial vehicles, ethanol	33	105	223	411
Light commercial vehicles, gas	601	741	1 282	1 926
Buses, electricity	16	13	9	9
Buses, ethanol	379	366	490	491
Buses, gas	553	641	790	799
Heavy goods vehicles, electricity	2	-	-	1
Heavy goods vehicles, ethanol	3	2	2	2
Heavy goods vehicles, gas	225	258	315	356

Vehicles running on biofuels

There are around 4.3 million passenger cars on the roads in Sweden (as at 31 December 2007), of which around 92 000 can run primarily on renewable fuels. The proportion of passenger cars powered by renewable sources increased by 65% compared with the previous year and amounts to 2% of all passenger cars registered.

The use of biofuels has increased by more than the number of biofuel-powered vehicles, as most biofuel use consists of low admixtures of ethanol and FAME in petrol and diesel.

A number of Swedish municipal authorities have started to use biogas for their local buses. In 2007 biogas buses were in use in 16 municipalities, compared with 12 the previous year, and there are more to come. This development has also led to the opening of filling stations for cars, and the improved availability means that numbers are increasing here too. Another positive effect of using biogas for local buses is that the number of heavy vehicles powered by gas is also rising, e.g. refuse collection lorries.

The number of eco-friendly vehicles, including those designed to run on biofuels, continues to rise. At the end of 2006 there were slightly more than 11 000 light biofuel vehicles powered by gas (natural gas and/or biogas). However, the biggest increase was in the number of vehicles using E85, known as 'flexible fuel vehicles' (FFVs). At the end of 2007 there were as many as 80 000 FFVs on the road.

The factors contributing to the increase in the number of biofuel vehicles include the increased availability and the growing interest among consumers in this type of vehicle. The latter has been influenced by the aforementioned instruments and grants for eco-friendly vehicles.

Number of filling stations

Just over 29% of the country's 3 586 filling stations were selling an alternative fuel at the end of 2007, compared with 9% at the end of 2005. E85 filling stations account for the bulk of this increase. In January 2008 there were 1 057 filling stations for ethanol, 16 for RME and 88 for vehicle gas.

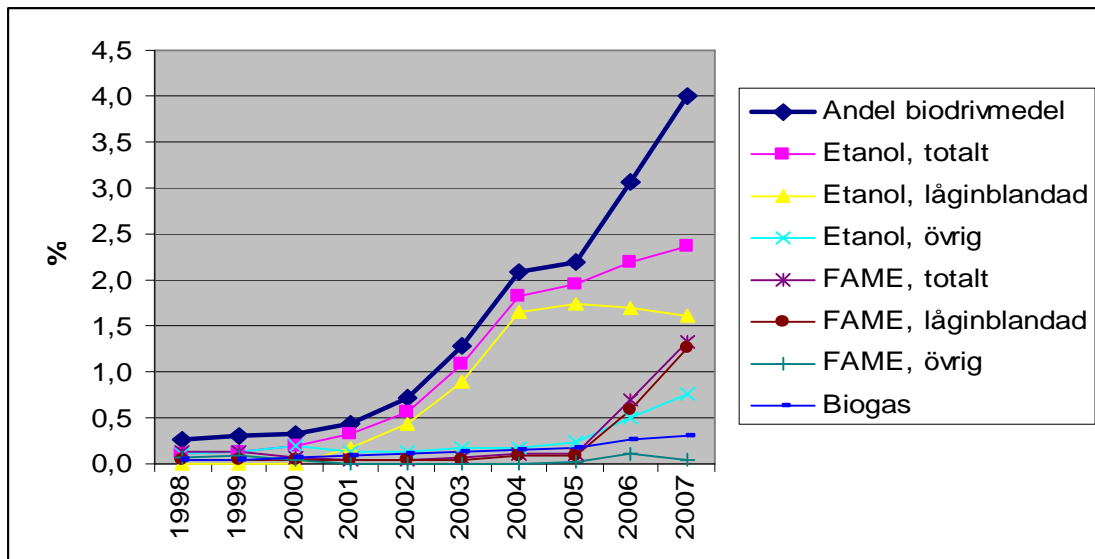
The increase in the number of sales points is explained partly by increased demand for renewable fuels and partly by the aforementioned legislation requiring filling stations of a certain size to sell a renewable fuel.

Use of biofuels in Sweden

The proportion of biofuels in 2007, calculated on the basis of energy content, was 4.0%¹, corresponding to 3.6 TWh, an increase of 0.9 TWh or 0.9 percentage points over the previous year. The renewable fuels widely used in Sweden are bioethanol, FAME² and biogas. The diagram shows the biofuels ethanol, FAME and biogas as a percentage of total petrol, diesel and biofuel use.

¹ Preliminary statistics on transport fuels, *Månadsbränslestatistiken*, SCB. Final statistics on fuel use for transport purposes in 2007 will be published on 22 December 2008. It is mainly diesel figures which tend to change: in 2006 transport diesel use was around 0.1 million m³ lower in the final statistics. This means that the proportion of biofuels becomes slightly higher when final statistics are applied. The difference is due to the fact that diesel use for certain industrial vehicles is included in the preliminary statistics, but not in statistics for transport purposes.

² FAME = fatty acid methyl esters. The most common of these in Europe is rapeseed methyl ester (RME).



Key to graphic on p. 6 of original text	
Original text	Translation
Andel biodrivmedel	Biofuels
Etanol, totalt	Ethanol, total
Etanol, låginblandad	Ethanol, low admixtures
Etanol, övrig	Ethanol, other
FAME, totalt	FAME, total
FAME, låginblandad	FAME, low admixtures
FAME, övrig	FAME, other
Biogas	Biogas

Among the EU-27 countries, only Austria and Germany use a larger proportion of biofuels than Sweden. In other countries the 2006 levels were well below 2%.

Low-admixture FAME has increased sharply during the past two years, now that it is possible to add 5% FAME to diesel³. Also, the proportion of diesel containing a low admixture has risen. In 2007, 67% of all diesel supplied contained a low admixture, as against 29% in 2006 and 11% in 2005. A total of 1.2 TWh of FAME was used in 2007, double the previous year's figure. High-concentrate FAME contributed 0.05 TWh.

93% of all petrol contained a low admixture of ethanol (5%) in 2007, and the percentage is continuing to rise. However, as petrol consumption fell two years in a row, so did the absolute quantity of low-admixture ethanol. In 2007, 1.4 TWh of low-admixture ethanol was used. The Swedish act on motor vehicle emissions control and engine fuels and the EU Directive on the quality of fuels⁴ limit the amount added to 5%, but there is now a proposal to amend the Directive to allow admixtures of up to 10%, which means that the amount of low-admixture ethanol is expected to rise.

³ As from 1 August 2006, 5% by volume of FAME may be added to diesel, compared with 2% previously.

⁴ Directive 98/70/EC.

Total ethanol use in Sweden has grown steadily since 2000, in the last two years mainly as a result of increased use of E85. The use of high-concentrate ethanol has risen by 60% in the past year and amounted to 0.68 TWh in 2007. Total ethanol use rose by 12% to 2.1 TWh.

In 2007 biogas used as fuel amounted to 0.28 TWh, 20% up on the previous year⁵. 19% of total biogas production in 2006 was used as vehicle fuel⁶.

⁵ Swedish Gas Association statistics on sales of vehicle gas, as reported by gas filling stations.

⁶ Production and use of biogas 2006, ER 2008:02.