



REGERINGSKANSLIET

Memorandum

2006-06-30

M2006/2879/E

Ministry of Sustainable Development

DG TREN

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

This Memorandum is Sweden's third 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 target for 2005

As previously reported to the Commission, in the 2005 budget decision (prop. 2004/05:1, utg.omr 21, report 2004/05:NU3, rskr. 2004/05:120) the Swedish Parliament set the indicative target for the use of biofuels and other renewable fuels in Sweden. From 2005 onwards, these fuels must make up at least 3% of total petrol and diesel consumption for transport operations, calculated on the basis of energy content.

By the Swedish Parliament's decision of 16 December 2005 (prop. Prop. 2005/06:16, report 2005/06:TU6, rskr. 2005/06:134) the national target for 2010 has accordingly been set at 5.75 per cent.

Taxation strategy for alternative fuels

The notification of the taxation strategy described in earlier reports has now been concluded. The Commission has approved the part of the taxation strategy concerning the period up to 2008.

Obligation to provide renewable fuels

By the Swedish Parliament's decision of 16 December 2005 (prop. Prop. 2005/06:16, report 2005/06:TU6, rskr. 2005/06:134), Act (2005:1248) on the obligation to provide renewable fuels was introduced.

The Act stipulates that from 1 April 2006 onwards the largest petrol stations must sell renewable fuels such as, for example, ethanol or biogas. The purpose of the decision is to reduce carbon dioxide emissions by improving access to renewable fuels. Petrol stations selling more than 3 000 cubic metres of petrol or diesel per year are covered first. The requirements will then gradually be defined up to 2009 when they will apply to those points of sale that provide 1 000 cubic metres of conventional fuels or more annually. Small enterprises selling less than 1 000 cubic metres of fossil fuels per year will be exempted from the rules.

During the discussion of the government's bill, the Swedish Parliament also requested that the government prepare a long-term strategy for stimulating the supply and demand of several renewable fuels. In order to avoid one-sided support for a particular technical solution, a State aid has also been introduced for measures to promote the distribution of renewable fuels. This aid means that persons who make investments in order to provide renewable fuels, under Act (2005: 1248) concerning the obligation to provide renewable fuels, can receive a subsidy of up to 30 per cent of the total cost of the measure (the investment cost). The subsidy may not, however, exceed the investment cost minus the lowest cost needed to fulfil the requirement (standard cost). The aid was introduced to some extent to facilitate also the more expensive alternatives such as investments in biogas filling stations.

Environmental classification of alternative motor fuels etc.

Under the Swedish Parliament's decision of 2 June 2006 (prop. Prop. 2005/06:181, report 2005/06:MJU28, rskr. 2005/06:345), two Acts will be amended on 1 August 2006 to promote the introduction and the use of alternative motor fuels, in other words fuels that are intended to replace petrol and diesel.

The amendments mean that alternative fuels can be taxed in environmental class 1, the lowest taxation class. The specifications for alkylate petrol and diesel will also be amended. The amendment concerning alkylate petrol means that this fuel is will be easier to handle, which will promote increased usage. The amendment concerning diesel will make it possible to increase the volume of renewable fatty acid methyl esters in diesel fuel from 2 to 5 per cent.

The decision is based on the Swedish Road Administration's account of the tasks regarding the environmental classification of fuels which were indicated in Sweden's report for 2004.

Adjusting the rules regarding tax exemption on ethanol

According to the taxation strategy for alternative fuels, exemption from energy tax and carbon dioxide tax is granted for bio-based ethanol when used as a motor fuel.

A large part of the ethanol used has previously been imported basically free of customs duties since ethanol as a motor fuel is imported under a tariff code that does not include ethanol but instead "other chemical products" with a considerably lower duty rate. When the previous decisions were made, it was intended that the normal duty for ethanol was to be paid.

The government therefore amended the rules in November 2005 so that importers of ethanol for low admixture (5%) in petrol are exempt from tax if they can show that duty has been paid for undenatured ethanol, in other words €0.192 (about SEK 1.79) per litre. E85 (ethanol car fuel) and ethanol bus fuel is not affected by the amendment. The decision applies to ethanol brought into Sweden from 1 January 2006 onwards.

Environmental policy for State-owned cars

In order to increase the proportion of environmentally sound vehicles used by the authorities, in December 2004 the government adopted Ordinance (2004:1364) on local authority purchases and leasing of environmentally sound vehicles, which states that a certain proportion of all State-owned vehicles purchased in 2005 must be environmentally sound. From 2006 onwards, at least 75 per cent of the total number of cars that an authority purchases or that are included in the leasing agreement during a calendar year must be environmentally sound. However, this does not include emergency vehicles, cars with more than four seats in addition to the driver's seat, and cars that are especially adapted for personal safety. This means that around 35 per cent of all State-owned vehicles must be environmentally sound.

Environmentally sound cars include vehicles powered by biofuels.

Congestion charge in Stockholm

The trial run in Stockholm ("Stockholmsförsöket") aims to reduce traffic jams and improve the environment by introducing an environment charge and boosting public transport. A trial congestion charge was introduced on 3 January 2006 in Stockholm.

Some heavy vehicles, including emergency vehicles, taxis, buses weighing at least 14 tonnes, will be exempt from the congestion charge.

In order to promote environmentally sound vehicles, clean cars, i.e. those equipped to run wholly or partly on electricity, alcohol or a gas other than LPG, will also be exempt from the congestion charge.

The Committee against dependence on oil

The government introduced a new policy goal in autumn 2005, namely that Sweden should be the first country to stop being dependent on oil.

The Committee against dependence on oil was set up in December and its mission was to advise and assist the government in identifying ways of significantly reducing Sweden's dependence on oil by 2020.

The Committee is chaired by the Prime Minister and has members from the authorities, representative organisations, enterprise and research.

The work began on 13 December 2005 with a hearing from government official Rosenbad broadcast on TV, with expert lectures and discussions on the subject "Will oil run out – and if so when?". During the hearing, questions on the use of energy and the future climate were discussed.

In spring 2006, the Committee against dependence on oil arranged further hearings on land use planning, more effective techniques, non-fossil fuels and better usage in the transport, housing and industry sectors. One major challenge is to what extent bioenergy from agriculture and forestry can contribute to replacing oil as a fuel and raw material.

A final report is expected before summer 2006.

Swedish agriculture as a producer of bioenergy

The government decided in June 2005 to start an investigation analysing Swedish agriculture's potential to produce bioenergy. The investigation will research what conditions are needed for Swedish agriculture to develop competitive production of bioenergy.

The analysis will be undertaken from both a commercial and a socio-economic point of view. Based on the analysis, the investigator will make an assessment of different production alternatives.

Bioenergy from agriculture is today used above all for heat and to produce electricity as well as a raw material for industrial processes to produce motor fuel. The best-known crop for heating purposes in Sweden today is *Salix*. Other crops which nowadays are interesting for energy recovery are

straw, grain, hemp and reed canary grass (herbage strain). Oats in particular have been identified as an appropriate energy crop.

The investigation will also take into account how crops can be used for producing fuels for vehicles, as well as how animal by-products, residual waste from slaughterhouses, animals subject to emergency slaughter and fallen stock can be used for energy purposes.

The investigation is part of the government's work in achieving sustainable development and promoting an increase in the use of renewable energy sources. The investigation's final report will be submitted at the latest on 28 February 2007.

Environmental tax adjustment

Environmental tax adjustment means that taxes on activities which damage the environment are increased and labour tax is reduced. The purpose of this is to reduce carbon dioxide emissions which contribute to the greenhouse effect.

The 2006 budget includes, among other things, measures for increasing road tax for light buses and light goods vehicles by 60 per cent. Tax on airline tickets was introduced at between SEK 50 and 100 per ticket. The tax increases amount to a total of SEK 3.6 billion. At the same time, tax reductions were implemented to an equivalent amount, namely income tax was reduced by SEK 2.5 billion, above all for low and medium income earners, and also self-employed persons providing employment pay lower employer's contributions.

Investment in energy research

In the 2006 budget, an amount was established for energy research for 2006-2008 corresponding to about SEK 815 million per year. This is a marked increase compared with the amount for 2005. On 22 March, the government presented the Research Bill and a new technique for a future energy system to the Swedish Parliament.

The Bill contains guidelines for continued long-term energy policy contributions concerning research, development, demonstration and marketing in the energy sector.

The proposals submitted are aimed at an increased focus and concentration of resources as well as increasing ambitions as regards converting the results of research and development in the energy sector into commercial products that can contribute both to a move towards a sustainable energy system and to Sweden's economic growth.

The proposals include increasing the efforts made and giving a high level of priority to investments in, among other things, bioenergy, biofuels, and efficient vehicles and engines.

The Swedish Parliament adopted legislation (prop. Prop. 2005/06:127, bet. 2005/06:NU19, rskr. 2005/06:347) on 2 June 2006 in line with the government's proposal.

Low admixture of ethanol in petrol

As stated before, the investigation into renewable fuels recommends the increased addition of ethanol to petrol as a cost-effective way of quickly meeting the requirements of the EU Directive on biofuels.

Under the Directive on the quality of petrol and diesel fuels (98/70/EC, and the accompanying Directive 2003/17/EC), petrol may only contain 5% ethanol.

Sweden has now reached a level of such low admixture that these provisions constitute a major obstacle to the continued rapid introduction of biofuels, see below.

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

The biofuels market in Sweden

Sweden has a fully commercial biofuels market.

In 2005 Sweden's total supply of biofuels, peat, etc. amounted to approx. 112 TWh.

Most of these fuels are produced domestically and include ligneous fuels (wood, bark, chips and wood from short rotation forestry), spent liquor (by-products of chemical pulp production), peat, waste (industrial waste, refuse, etc.) and a smaller quantity of agricultural raw materials.

These fuels are mainly used within the forestry industry for heat (district heating and small houses) and to produce electricity.

Efforts to promote the use of biomass for energy purposes

Renewable electricity certificates

The so-called electricity certificate promotes the production of electricity from renewable sources, including from biomass and waste. The certificate is a market-based system that replaces State aids and subsidies which previously existed to promote the development of renewable energy. The

cost is now paid by the electricity user instead. The idea of having a market-based system is that producers of renewable electricity receive an electricity certificate for each megawatt-hour of electricity produced. All electricity consumers are required to purchase a certain number of certificates in relation to their consumption, a so-called quota requirement. The quota requirement will gradually increase, increasing demand for the certificate and, therefore, the production of renewable electricity. Between 2002 and 2010, the proportion of renewable electricity will have increased by 10 TWh. Since the certificate was introduced, about 5 TWh of renewable electricity per year has already been produced.

As a result of the Swedish Parliament's decision of 14 June 2006, the system of electricity certificates has become more effective and has expanded. The target has been increased to 17 TWh by 2016. The system has also been extended until 2030.

Aid for conversion from electric heating and oil-fired heating systems

In the bill for the 2006 budget the government proposed to introduce two new conversion aids for owner-occupiers of small houses with an oil-fired heating system or direct-acting electric heating. The purpose of the aid is to stimulate the use of renewable energy sources, district heating or individual heating from biofuels, heat pumps and solar heating.

The proposal has now been approved by the Swedish Parliament. Apart from that, the government has passed a resolution on the detailed rules in two Ordinances: Ordinance SFS 2005:1256 on aid for converting from oil-fired heating systems in residential buildings; as well as Ordinance SFS 2005:1255 on aid for converting from direct-acting electric heating in residential buildings.

Aid for energy efficiency and renewable energy in public places

On 14 April 2005, the government approved the new aid for energy investments in public places. The owners of buildings with premises where public activity is undertaken can receive aids of up to 30 per cent of the costs of investing in energy efficiency and converting to renewable energy sources, including bioenergy. To install PV systems, aid is granted for up to 70 per cent of the costs.

In total, the government has directed SEK 2 billion towards the aid, of which SEK 100 million is expected to be used for installing PV systems.

Climate investment programmes

The development of local climate targets is an important part of the work of forming a sustainable society. State aid towards local climate investment

programmes (Klimp) will stimulate districts, companies and other actors to make long-term investments that reduce the greenhouse effect. This effort originated from the bill “Sweden’s climate strategy” (prop. 2001:02/55) in which almost SEK 900 million was allocated for 2002-2005.

With the adoption of the 2006 budget, the investment programme has been reinforced and extended. SEK 350 million was allocated for 2006. SEK 395 million per year is expected to be allocated for 2007-2008.

Klimp will contribute to achieving the Swedish climate target by decreasing the emission of greenhouse gases, strengthening the local climate work and collecting and spreading knowledge and experiences on climate investments. Investments in renewable energy and bioenergy can be included in such local climate investment programmes.

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

Vehicles powered by biofuels

At the end of 2005, there were about 4.1 million private cars on the road in Sweden. Of these, about 94% ran on petrol and about 5% on diesel. Private cars operated using any other kind of fuel represented less than one per cent of the total number of private cars.

During 2005, the number of registered private cars that can be operated using biofuels as a first or second fuel has increased greatly.

There were 23 000 Flexible Fuel Vehicles that can run on petrol or E85 at the end of 2005, which is almost double the number compared to 2004 when there were 13 362 vehicles.

The number of light vehicles equipped to run on biogas/natural gas or petrol is also increasing, reaching 6500 in 2005 compared with 4 519 in 2004.

The number of vehicles weighing over 3.5 tonnes is also increasing.

The number of buses and lorries powered by natural gas or biogas has increased by 120 and now totals 900. However, the number of buses powered by ethanol has, however, fallen by 12 compared with 2004 and now totals 370.

Several Swedish cities have invested in biogas as a fuel for local buses. During 2005, there were biogas buses operating in eleven cities and there will gradually be more. In connection with this, filling stations for private cars have also been established and the increased accessibility is also increasing the number of these vehicles. This can be seen, for example, in Linköping, Kristianstad and Trollhättan where the total number of private

cars powered by vehicle gas has greatly increased over the last few years. Another positive effect of the investments in buses powered by biogas is that the number of heavy vehicles powered by gas is also increasing, for example, refuse collection lorries.

Number of clean vehicles in December of	2003	2004	2005
<i>Light vehicles</i>			
electric cars	450	400	360
electric hybrid cars	620	1.350	3.300
light gas vehicles	3.440	4.500	6.500
light ethanol vehicles	7.980	13.300	23.000
<i>Heavy vehicles</i>			
ethanol buses	400	380	370
gas-powered buses, lorries	680	780	900
heavy electric and fuel cell buses	17	18	13

The statistics refer to vehicles that can be powered by renewable fuels and not the number of vehicles that actually use them. Gas vehicles also include certain vehicles that, for the greater part, are powered by natural gas as well as those that to a great extent run on petrol may be included among the so-called FFV.

Number of filling stations

In 2005, 166 public filling stations for ethanol E85 were created, bringing the total to 297 at the end of the year. In 2005 the number of public filling stations for natural gas and biogas increased from 47 to 75. The number of public filling stations for RME was 21 at the end of the year.

In June 2006, there was a total of 415 filling stations in Sweden that supplied one or more biofuels, namely biogas, Ethanol E85 or RME (see above).

Use of biofuels in Sweden

The biofuels widely used in Sweden are bioethanol, rapeseed methyl ester (RME) and biogas. Very small quantities of some other types of biofuels are also used.

As requested by the Government, the Swedish Energy Agency has drawn up a list of indicators which can be used as the basis for an annual review of energy policy targets. This year's edition gives an indicator which is in line with the national indicative targets for biofuels laid down in Directive 2003/30/EC of 8 May 2003 on the promotion of the use of biofuels and other renewable fuels for transport.

Fuel		1998	1999	2000	2001	2002	2003	2004	2005
Petrol	(energy volume, TWh)	48.96	49.18	48.36	48.63	49.28	48.81	47.75	47.54
Diesel for transport	(energy volume, TWh)	24.79	25.10	24.44	24.84	28.49	29.83	33.99	36.93
Ethanol	(energy volume, TWh)	0.09	0.09	0.16	0.25	0.45	0.88	1.54	1.68
RME	(energy volume, TWh)	0.09	0.11	0.06	0.03	0.04	0.05	0.09	0.10
Biogas	(energy volume, TWh)	0.03	0.04	0.05	0.06	0.09	0.11	0.13	0.16
Proportion of biofuels calculated on the basis of energy content		0.3%	0.3%	0.4%	0.5%	0.7%	1.3%	2.1%	2.2%

The total quantity of biofuels, as regards energy content, which on the market replaced petrol and diesel for transport, amounted to 2.23 per cent in 2005. This means that the proportion has increased somewhat compared with 2004 but that the 3% target has not been reached. (Note that the data in the table above have been adjusted compared with previous reports. The method for calculating the proportion of biofuels has changed under the EU guidelines and also a minor error in the figure has been corrected.) The quantity of biofuels increased more between 2003 and 2004 than between 2004 and 2005 and a contributory cause of this is the fact that the low admixture of ethanol increased more between 2003 and 2004. In 2005, almost 92% of the supplied quantity of petrol contained 5% low admixture of ethanol. The corresponding figure for January 2004 was about 85%.

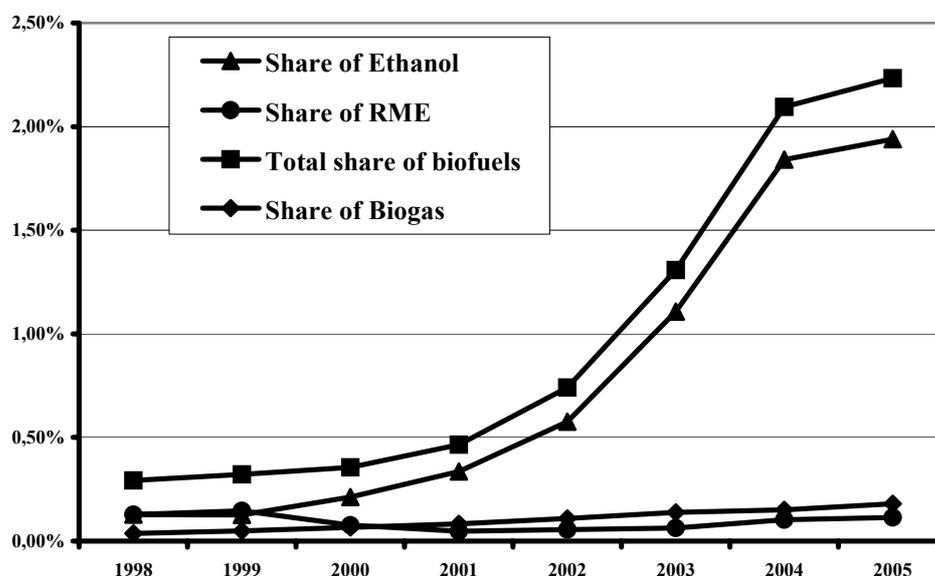
This means that Sweden now finds itself in a situation where almost all supply of petrol (except unleaded 98-octane) contains a low admixture of ethanol.

There are no vehicle-related barriers to having a low admixture of up to 10% ethanol in fuel for cars in the existing vehicle fleet. Instead, it is the EU Directive on fuel quality that is at present limiting the low admixture to 5 per cent. With a possible amendment to this EU Directive and a continued tax exemption for ethanol, the amount of low admixture for ethanol may be expected to rise.

RME is used both as a 2% low admixture in diesel and as pure RME. During 2005, slightly more than 10% of the supplied quantity of diesel contained a low admixture of RME, which is about the same proportion as 2004. The recently implemented amendment to national legislation means

that up to 5 per cent RME can be mixed with diesel from 1 August onwards (see above).

The amount of biogas sold to the transport sector increased in 2005 by about 25% to about 0.16 TWh. The increase in the use of ethanol, RME and biogas is also shown in the diagram below.



As shown above, ethanol is the most widely used biofuel. In 2005 ethanol accounted for almost 87% of biofuel use, calculated in terms of energy volume. Biogas and RME make up most of the remainder, although substances such as hydrogen from renewable electricity are also used.

Most bioethanol, around 90%, is used for admixing with petrol, but the volumes used in pure or almost pure form are also increasing.

In Sweden ethanol is produced from grain by Agroetanol and from by-products of paper pulp production by SEKAB in Örnsköldsvik.

The sharp increase in imported ethanol already noted in 2003 and 2004 has continued. Imported ethanol constitutes about four-fifths of Sweden's total use of ethanol in fuels and in 2005 came mainly in the form of sugar-cane ethanol from Brazil. The price of the imported ethanol is between SEK 3-5 including customs duties. The cost of Swedish production, which is based on cereals, is reported to be about SEK 5 per litre.