REGERINGSKANSLIET

Memorandum

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Ministry of Enterprise, Energy and Communications
Ministry of the Environment

Climate and energy policy for a sustainable future

Today, the Swedish Government is presenting two government bills which together constitute *An integrated climate and energy policy* for the period up to 2020. This proposal represents the most ambitious climate and energy policy ever presented by a European country.

The Government proposes objectives and strategies that will lead to: half of Sweden's energy coming from renewable sources in 2020; the country having a vehicle fleet that is independent of fossil fuels in 2030; and Sweden's net emissions of greenhouse gases being equal to zero by the middle of the century. Our climate target for 2020 is to reduce greenhouse gas emissions by 40 percent.

The government bills presented today for *An integrated climate and energy policy* are the result of a long process. As soon as this Government came to power, we began making active endeavours to drive forward work at the European level to formulate ambitious climate and energy objectives across the EU, focusing on the year 2020. The process was completed just before the end of last year, when the EU strengthened its leading position in the world, as regards solving the global climate problem, by reaching a concrete and joint agreement. The Government is now continuing its international work aimed at a far-reaching global climate agreement at the UN Climate Change Conference in Copenhagen in December 2009, where Sweden will have a central position as President of the EU.

Facing up to the climate challenge and creating sustainable energy supply requires cooperation both between all the countries of the world and between all sectors in society. The Government has therefore consulted the whole of Swedish society in different fora to discuss the transition we now face. The Swedish Climate Committee, a parliamentary committee set up to create the right conditions for broad political support, put forward proposals for objectives and measures. Sweden's foremost experts on climate change were appointed to the Scientific

Council on Climate Issues, which put forward scientifically based proposals for Swedish climate targets.

In light of this, the Government submits proposals to the Swedish Riksdag on a combined climate and energy policy for the environment, competitiveness and long-term stability. A concrete strategy is being presented to quickly break Sweden's dependence on fossil energy and drastically reduce our negative impact on the climate. This not only places demands on both enterprises and citizens but also creates new opportunities and a way out of the current economic crisis - towards fair and sustainable global development.

Investment in renewable energy and more efficient energy use are strengthening Sweden's competitiveness and putting Swedish research and Swedish enterprises at the forefront of the global climate transition. We are laying the foundations for new innovations, new enterprises and new jobs in green industries of the future.

A summary of the climate and energy bills

The Government's proposals are being submitted in the form of two government bills. The climate policy bill specifies targets for greenhouse gas emissions and a joint action plan to achieve them. The energy policy bill contains proposals relating to the energy sector.

The action plans proposed for a fossil-independent transport sector and to promote renewable energy and energy efficiency improvements are crucial to the achievement of the climate policy goals. The Government has chosen to present the action plan for a fossil-independent vehicle fleet in the climate policy bill and the action plans for energy efficiency improvements and renewable energy in the energy policy bill.

Climate and energy targets by 2020
The government bills specify a number of targets for climate and energy policy to be achieved by 2020:

- 40 percent reduction in climate emissions. This target relates to the non-trading sector (i.e. activities not included in the EU emissions trading scheme).
- 50 percent renewable energy.
- 20 percent more efficient energy use.
- 10 percent renewable energy in the transport sector.

Three action plans for climate and energy conversion
The bills contain three action plans for climate and energy conversion and a summary of the measures for reducing emissions by 40 percent.

1. Action plan for renewable energy
The Government presents an action plan for renewable energy in order to reach the target of 50 percent renewable energy. The measures include raising the level of ambition in the electricity certificate system, continued efforts to facilitate grid connections for renewable electricity and a planning framework for wind power of 30 TWh.

2. Action plan for energy efficiency
The Government will invest SEK 300 million (ca EUR 27.3 million) per year between 2010 and 2014. A number of measures are presented to ensure Sweden reaches the proposed targets and fulfils the requirement in the EU Energy Services Directive. Efforts will focus primarily on reducing the information and knowledge gaps in order to make households and enterprises aware of the opportunities they have to save money, energy and the environment by improving their energy efficiency. The Government will revisit this in the 2010 Budget Bill and propose a more detailed allocation of funding between the various parts of the energy efficiency programme.

3. Action plan for a fossil-fuel independent vehicle fleet
The target is for Sweden to have a vehicle fleet that is independent of fossil fuels by 2030. General policy instruments that put a price on greenhouse gas emissions coupled with beneficial conditions for cars with a low environmental impact running on alternative fuels will encourage a different choice of fuel. The blend of renewable fuel in petrol and diesel will be increased and initiatives will be taken on plug-in hybrids and electric vehicles.

Measures to reduce emissions by 40 percent

A special action plan is presented to reduce Swedish emissions by 20 million tonnes by 2020. The target will be reached with a combination of measures in Sweden (2/3) and green investments in other EU Member States and in developing countries.

An integrated climate and energy policy

Emission targets for Sweden by 2020

Emissions in Sweden should be 40 percent lower in 2020 than they were in 1990. The target applies to activities not included in the emissions trading scheme. This means that greenhouse gas emissions will be about 20 million tonnes of carbon dioxide equivalents lower for the sectors outside of the EU emissions trading scheme in 2020 compared to the 1990 level. The decrease shall be achieved by reducing emissions in Sweden and in the form of investments in other EU Member States or flexible mechanisms in accordance with the Kyoto Protocol, such as CDM (Clean Development Mechanisms).

The level of ambition for reducing emissions from activities covered by the EU emissions trading scheme is determined jointly at the EU level within the framework of the trading scheme's rules. These emission reductions are hence not included in the national target.

The national target shall make a substantial contribution to a global and overarching climate agreement. Sweden's own targets are expected to be more ambitious than the country's undertaking within the framework of EU cooperation. The Government is also raising the bar compared to the recommendations of the Climate Committee (38 percent) and the Scientific Council (20-25 percent). In its climate bill in the spring of 2006, the previous government came to the conclusion that Sweden's emissions should be 25 percent lower in 2020 than they were in 1990.

Long-term objective

The goal is to limit the global increase in mean temperature to a maximum of 2°C. Sweden's climate policy has been designed to make our contribution to stabilise long-term greenhouse gas concentrations in the atmosphere at a maximum of 400 parts per million carbon dioxide equivalents (ppmv CO2e).

The vision is to reduce Sweden's net emissions to zero by 2050. This focus means that Sweden will take the lead in implementing the necessary long-term global emission reductions.

Measures to reduce emissions by 40 percent

The national target will be achieved through a combination of measures in Sweden and international climate investments, known as "flexible mechanisms", in accordance with the Kyoto Protocol or mechanisms included in any future climate agreement.

Estimated reduction between 1990 and 2020 (ca. millions of tonnes)	
Emission reductions achieved between 1990 and 2007	4
Forecast – previously adopted national measures 2008-2020	5
New environmental taxes and green investments	2
National implementation of the EU climate action and renewable energy package	2
Reduction other measures	0.3
Climate investments within the EU and in developing countries using flexible mechanisms, such as CDM	6.7
Total	20

Emissions decreased by four million tonnes in the non-trading sector between 1990 and 2007. A further reduction of 16 millions of tonnes is still needed in order to reach the target of 40 percent.

According to Swedish Environmental Protection Agency forecasts, existing policy instruments will lead to further emission reductions between 2008 and 2020 of approximately five million tonnes of carbon dioxide equivalents.

The Government has proposed taxation amendments and other economic instruments that are expected to lead to a reduction of two million tonnes by 2020. Environmental taxes put a price on emissions and make it more expensive to use things that are harmful to the climate. Such instruments include increased carbon-related differentiation in vehicle tax, lower tax on alternative fuel vehicles, increased fuel tax on fossil fuels, less reduction in carbon tax for industry and agriculture and a higher carbon tax rate.

The Climate action and renewable energy package agreed by EU leaders in December 2008 is a central component of the Swedish policy to limit emissions even in the non-trading sector. Legislation containing binding vehicle emission control requirements will be introduced gradually as from 2012, starting at 120 grams per kilometre and progressing to 95 grams per kilometre in 2020. Together with the European directive on the promotion of the use of energy from renewable sources, which enables a higher blend of renewable fuel in petrol and diesel, and forthcoming requirements on light commercial vehicles (small trucks, vans), the measures will reduce emissions by a further two million tonnes of carbon dioxide equivalents by 2020.

Other national measures, described in the bill, are expected to reduce emissions by at least 0.3 million tonnes in total.

Green investments in developing countries are crucial to an adequately far-reaching global agreement. A third of Sweden's reduction until 2020, 6.7 million tonnes, will be achieved in the form of investments in other EU Member States or flexible mechanisms like CDM. These emission reductions can be credited to Sweden.

With its integrated action plans, the Government is paving the way towards a 40-percent reduction in Sweden's emissions from the non-trading sector between 1990 and 2020.

Energy policy objectives
The Government proposes that the share of renewable energy should be at least 50 percent of total energy consumption and at least 10 percent in the transport sector by 2020. It is also establishing a target of 20 percent more efficient energy use by 2020.

The EU directive on renewable energy calls on Sweden to achieve a share of at least 49 percent renewable energy by 2020. Sweden is in a position to have a higher level of ambition and a greater share of renewable energy will also help to achieve the overarching objectives of ecological sustainability, competitiveness and security of supply. The Government therefore proposes a higher target for renewable energy than the one established in the EU directive.

The energy efficiency target for 2020 shall apply to all sectors in society and include efficiency improvements at all stages of energy supply. The target involves a reduction in energy use of 20 percent per unit of GDP between 2008 and 2020.

Three action plans for climate and energy conversion

1. Action plan for renewable energy
The level of ambition in the electricity certificate system shall be raised in order to achieve the target of 50 percent renewable energy. The new target for the production of renewable electricity involves an increase of 25 TWh by 2020 compared to the 2002 level. The Swedish Energy Agency shall be tasked with analysing and submitting proposals on how the level of ambition is to be raised.

The Government is continuing its endeavours to facilitate grid connections for renewable electricity. The conditions for sea-based wind power connections shall receive particular attention.

To facilitate the expansion of wind power, a planning framework for wind power of 30 TWh is proposed, 20 TWh of which shall be on land and 10 TWh offshore. According to this planning framework, Swedish

municipalities and county councils will also identify in their comprehensive plans suitable areas where 30 TWh of wind power can be generated.

Biogas can have an important role in the future Swedish energy system. The promising ongoing development in biogas for vehicles in Sweden should therefore continue to be stimulated.

In the Government's opinion, Sweden's rural development programme for 2007-2013 should be utilised to support and improve the production and processing of renewable energy. Agriculture and forestry are important sectors for the production of renewable energy. Increasing renewable energy use also creates a great deal of scope for the development of enterprise in rural areas.

A more detailed action plan to reach the renewable energy target will be presented no later than in June 2010.

2. Action plan for energy efficiency

The Government presents an action plan for energy efficiency, proposing an ambitious target of 20 percent more efficient energy use by 2020. The increased efforts in energy efficiency aim to ensure that Sweden fulfils the requirements in the Energy Services Directive and that the proposed target is reached.

The Government will invest SEK 300 million (ca EUR 27.3 million) per year between 2010 and 2014 - a two-fold increase on the current level. The successful efforts already being made will be strengthened considerably. The focus will be on reducing information and knowledge gaps. It is important to make households and enterprises aware that they have the opportunity to save money, energy and the environment by improving energy efficiency.

The public sector shall lead the way as regards energy efficiency improvements. Higher demands will be placed on authorities to procure more energy-efficient products and identify existing energy efficiency potential. Municipalities and regional county councils will be offered the chance to enter into voluntary energy efficiency agreements. In return, they shall establish energy efficiency targets and place clear requirements on energy efficiency in their procurements.

Efforts will be broadened in industry. Enterprises that are not part of the existing programme for improving energy efficiency in energy-intensive industries will be paid for implementing an "energy audit".

Energy-efficient products must be available to consumers in order to create a more energy-efficient society. The successful investments in

technology procurement and the introduction of energy-efficient technology on the market will be strengthened.

Requirements for individual electricity and hot water metering are to be introduced for new and refurbished buildings. Clarifying the costs of energy use encourages more energy-efficient behaviour.

3. Action plan for a fossil-fuel independent vehicle fleet

In 2030, Sweden should have a vehicle fleet that is independent of fossil fuel. Currently, the transport system is almost completely dependent on fossil fuel and is dominated by road transport. Emissions from domestic transport made up one third of the total emissions in Sweden in 2007. Swedish industry can be in the vanguard of the transition, by e.g. developing hybrid vehicles, electric cars and biofuel.

General instruments that put a price on greenhouse gas emissions should form the basis of the efforts to reduce the impact on the climate caused by the transport sector. These instruments need to be supplemented by more targeted instruments that further promote development towards a fossil-independent transport sector. The Government is now proposing several taxation changes and tighter economic instruments, such as vehicle tax relief for green cars, making it more expensive to use fossil energy and cheaper to use environmentally friendly fuels.

The Government intends to initiate a dialogue with the various sector actors in order to continue developing the action plan by:

Strengthening Sweden's automotive cluster. Long-term efforts strengthen the competitiveness of the Swedish automotive cluster and promote greener vehicle technology and fuel development.

Extended subsidy to establish filling stations for renewable fuel.

Increased admixture (blend) of biofuel. To bring about a rapid increase in biofuel, the Government is keen to implement the new fuel quality directive as early as possible. This directive allows admixtures of up to ten percent of ethanol and seven percent of biodiesel (FAME).

Binding emission standards for automotive manufacturers. The standard will be set at a highest permissible average of 120 grams carbon dioxide per kilometre for new passenger cars. This will be gradually tightened and reduced to 95 grams of carbon dioxide per kilometre in 2020.

Sustainability criteria for the production of biofuel. The production of biofuel and other liquid biomass propellants must fulfil sustainability criteria to be counted towards national renewable energy targets.

Quota requirement for biofuel. The Government has given the Swedish Energy Agency the task of analysing the conditions for and consequences of a quota requirement system to speed up the introduction of renewable fuel in the transport sector.

Continued focus on biogas. The potential for producing biogas from different types of organic waste in society shall be exploited and biogas shall be used as a fuel in the transport sector.

Continued efforts to develop second-generation biofuels. The development of second-generation biofuels will be supported and SEK 875 million (ca EUR 79.4 million) will be earmarked between 2009 and 2011 for the commercialisation of new energy technology, including biofuel demoplants.

Electric vehicles and plug-in hybrids. Assignments to develop an integrated knowledge base on the market for electric vehicles and plug-in hybrids shall provide a better understanding for whether and how this market needs further stimulus.

The Government is also lobbying for better consumer information on vehicle fuel consumption in the EU, to increase knowledge about eco-driving and greater compliance with speed limits.

Aviation should bear more of the costs for its own emissions. As from 2012, aviation will be included in the EU emissions trading scheme, thereby putting a price on its emissions.

Climate tax package

Taxes on energy and emissions are effective instruments to achieve targets within the climate and energy area. By changing taxes and other instruments, we can influence the attitudes and behaviour of both households and enterprises.

In its previous budgets, the Government has implemented extensive tax changes to reduce emissions. *An integrated climate and energy policy* presents changes to different taxes and subsidies in order to reduce greenhouse gas emissions by a further two million tonnes by 2020, in addition to the major reductions which currently applicable instruments are expected to bring about. The aim should be to balance future increases in energy and environmental taxes for enterprises and households against equivalent tax concessions.

To stimulate and quicken the pace of a transition to a more eco-friendly vehicle fleet, the climate bill proposes that new green cars shall be

exempted from vehicle tax for the first five years. The current "green car premium" will be replaced by a long-term tax concession. The change should come into force on 1 January 2010, but will apply retroactively to vehicles taken into service as from 1 July 2009. The current definition of a "green car" will continue to apply and petrol and diesel-powered passenger cars emitting less than an average of 120 grams of carbon dioxide per kilometre will also be exempt from vehicle tax. One difference compared to today's current green car premium is that the tax exemption not only applies to cars bought by private individuals but also to those bought by enterprises, e.g. company cars.

Emissions will be taxed more by increasing the carbon differentiation of the vehicle tax. The carbon component of the vehicle tax will be raised from SEK 15 to SEK 20 (ca EUR 1.36 to EUR 1.81), leading to a tax increase of SEK 5 (EUR 0.45) for each gram of carbon dioxide emitted by a vehicle. New light commercial vehicles (small trucks, vans and small buses) and mobile-homes will be incorporated in the carbon-based vehicle tax. The fuel factor for diesel vehicles will be reduced and the environmental factor will be replaced by a fixed amount. All in all, this will lead to a decrease in the tax on diesel vehicles.

The energy tax on diesel will be raised in two steps by a total of SEK 0.40 (EUR 0.036) per litre. The first increase of SEK 0.20 should be implemented on 1 January 2011 with the second SEK 0.20 increase on 1 January 2013. To compensate heavy goods traffic for the increase in diesel tax, the tax on heavy goods vehicles and heavy-duty buses should be reduced.

The tax on household waste combustion should be abolished from 1 September 2010. This tax was introduced on 1 July 2006, but has had only a negligible effect and led merely to the unnecessary transportation of household waste. This will be balanced by increasing the general carbon tax by SEK 0.01 (EUR 0.0009) per kg of carbon dioxide.

It is proposed that the current reduction in carbon tax for energy-intensive enterprises (known as the "0.8 percent rule") be phased out in two steps. Furthermore, the Government wishes to see economic instruments for facilities included in the EU emissions trading scheme coordinated to a greater extent.

The reduction in carbon tax for heating in agriculture, forestry and aquaculture and in industries not covered by the EU emissions trading scheme will decrease. The tax rate will be raised from 21 percent to 30 percent in 2011 and to 60 percent in 2015. Furthermore, it is proposed that the carbon tax rebate for diesel in agricultural and forestry machinery be reduced.

In addition to the annual adjustment in accordance with the consume price index, the general carbon tax level should be adapted to the necessary extent and at the necessary rate to ensure that it, in combination with other changes to economic instruments, brings about an overall reduction in greenhouse gas emissions of a further two million tonnes by 2020.

Nuclear power

Nuclear power will be an important part of Swedish electricity production for the foreseeable future. With an increased focus on climate change, nuclear power fulfils one of the most important requirements placed on today's energy sources, i.e. that it only leads to low greenhouse gas emissions.

The Government intends to return to the Riksdag soon with a proposal to abolish the Nuclear Phase-Out Act. A commission will be tasked with developing proposals for new legislation governing the public scrutiny of new plants that facilitate controlled generational change in Sweden's nuclear industry. This effectively revokes the ban on new constructions in the Nuclear Activities Act.

A condition governing the design of the new regulatory framework is that permission to build new reactors will only be given if they replace one of the existing ten reactors and are built on existing sites. Government support for nuclear power in the form of direct or indirect subsidies will not be forthcoming, however. Important conditions governing continued nuclear power generation are that safety standards continue to be improved and that the responsibility for accidents is further tightened within the scope of existing international treaties.

Green investments in developing countries

Investments in developing countries are the key to bringing about sufficiently large emission reductions on a global scale. An important condition of a global agreement is the ability of developed countries to demonstrate their fulfilment of undertakings laid down in the existing climate regime. Another key condition is the underpinning of a future regime by efforts to support technology transfer, dissemination, knowledge and capacity building in developing countries as the basis for mitigation and adaptation.

Green investments, in the form of flexible mechanisms, such as CDM, are therefore crucial to bring about an international climate agreement and to mobilise capital to achieve adequate emission reductions. Rapidly growing economies should not have to make investments that lock them

into fossil fuel dependence. It is not just a question of solidarity but also of obtaining the greatest possible climate benefit for every invested Swedish krona.

Climate policy and development cooperation

Climate change is directly linked to development in developing countries, especially in the least developed countries and for the most vulnerable population groups. Many developing countries are particularly exposed and vulnerable to climate effects. Between 2009 and 2011, the Swedish Government will invest over SEK 4 billion (ca EUR 363 million) of its development assistance in climate and development. Efforts to support adaptation to climate change can involve measures aimed at reducing people's vulnerability, e.g. investments in health, sanitation and clean water, as well as projects that are directly related to the climate, e.g. weather forecasts and flood defence construction.

Efficient energy markets

Well-functioning energy markets create better conditions for energy supply, the environment and growth. A Nordic electricity market is necessary for the efficient exploitation of common production resources in the Nordic region. Bottlenecks in the Nordic electricity grid and between the Nordic region and the rest of Europe shall be eliminated.

District heating and combined power/heating make it possible to utilise energy that will otherwise be lost and to exploit society's energy resources as efficiently as possible. The gas market and infrastructure should be developed so that they support a gradual introduction of biogas.

Greater focus on climate change adaptation

Climate change increases the risk of flooding and landslides as a result of an increase in intensive precipitation and rising water levels. A climate change adaptation policy is being developed. The Government has earmarked SEK 300 million (ca EUR 27.3 million) for 2009-2011.

- The county administrative boards will be given the overarching regional responsibility to coordinate climate adaptation. SEK 25 million (ca EUR 2.28 million) a year will be set aside during 2009-2011.

- Lantmäteriet (National Land Survey) will receive SEK 40 million (EUR 3.64 million) per year in 2009-2011 to develop a new altitude database to improve the knowledge base for risk assessment and action planning to minimise the risk of landslides.

- The need to adapt spatial planning to the greater risks of landslides will be dealt with as part of the ongoing review of the Swedish Planning and Building Act.

- The Swedish Environmental Protection Agency will be given the task of investigating the effects of climate change on the loss of biodiversity and ecosystem services and looking into feasible measures to limit the negative effects.