



# Climate Regulation

in 18 jurisdictions worldwide

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**Law**  
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<b>Introduction and Overview</b> Per Hemmer, Johan Weihe and Rania Kassis <i>Bech-Bruun</i>	<b>3</b>
<b>EU Legislation on Climate Change</b> Adrien Fourmon <i>Huglo Lepage &amp; Associés Conseil</i>	<b>10</b>
<b>Australia</b> Elisa de Wit, Dominic Adams and Samuel Tyrer <i>Norton Rose Australia</i>	<b>17</b>
<b>Austria</b> Thomas Starlinger and Stefan Korab <i>Fiebinger Polak Leon &amp; Partner Rechtsanwälte GmbH</i>	<b>25</b>
<b>Azerbaijan</b> Daniel Matthews and Mahmud Yusifli <i>Baker &amp; McKenzie – CIS, Limited</i>	<b>31</b>
<b>Brazil</b> Antonio Augusto Rebello Reis <i>Bichara, Barata, Costa &amp; Rocha Advogados</i>	<b>35</b>
<b>China</b> Harold van Kooten <i>Baker &amp; McKenzie – CIS, Limited</i>	<b>40</b>
<b>Denmark</b> Per Hemmer, Johan Weihe and Rania Kassis <i>Bech-Bruun</i>	<b>45</b>
<b>France</b> Laurence Lanoy <i>Laurence Lanoy – Avocats</i>	<b>54</b>
<b>Iceland</b> Dýrleif Kristjánsdóttir <i>LEX Law Offices</i>	<b>61</b>
<b>India</b> Aparajit Bhattacharya and Sumedha Dutta <i>HSA Advocates</i>	<b>68</b>
<b>Kazakhstan</b> Zafar Vakhidov and Azamat Kuatbekov <i>Baker &amp; McKenzie – CIS, Limited</i>	<b>81</b>
<b>Mexico</b> Carlos de Icaza Aneiros and Ximena Aguirre Franco <i>Creel, García-Cuellar, Aiza y Enríquez, SC</i>	<b>85</b>
<b>Norway</b> Per Kr Bryng and Eivind Aarnes Nilsen <i>Arntzen de Besche</i>	<b>94</b>
<b>Russia</b> Sergei Sitnikov and Max Gutbrod <i>Baker &amp; McKenzie – CIS, Limited</i>	<b>100</b>
<b>South Africa</b> Sandra Gore and Claire Tucker <i>Bowman Gilfillan</i>	<b>105</b>
<b>Sweden</b> Maria Hagberg, Amanda Starfelt and David Vilhelmsson <i>Von Lode Advokat AB</i>	<b>111</b>
<b>Ukraine</b> Olyana Gordiyenko and Olena Kuchynska <i>Baker &amp; McKenzie – CIS, Limited</i>	<b>117</b>
<b>United Kingdom</b> Stephen Shergold, Helen Bowdren and Ashley Belcher <i>SNR Denton UK LLP</i>	<b>122</b>
<b>United States</b> Robert Wyman, Marc Campopiano, Joshua Bledsoe, Buck Endemann and Aron Potash <i>Latham &amp; Watkins</i>	<b>129</b>

# Sweden

**Maria Hagberg, Amanda Starfelt and David Vilhelmsson**

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## Main climate regulations, policies and authorities

### 1 International agreements

Do any international agreements or regulations on climate matters apply in your country?

Sweden has ratified the United Nations Framework Convention on Climate Change (UNFCCC) as well as its Kyoto Protocol. The comprehensive targets set in both the Convention and the Protocol have been further manifested by the EU's climate change regulations and national Swedish regulatory and policy targets.

The targets and obligations under the UNFCCC and the Kyoto Protocol have effect in Sweden through Sweden's EU membership. The EU allocates the Kyoto obligations between the member states by burden sharing agreements (BSA) (the most recent BSA being Decision 406/2009/EC on the effort of reduction of greenhouse gas emissions) and by legislation (the most recent being Directive 2009/29 EC to improve and extend the greenhouse emission allowance trading scheme of the European Community).

Sweden has also ratified the Convention on Long-Range Transboundary Air Pollution (CLRTAP) and its eight protocols. The most extensive protocol is the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, (the Gothenburg Protocol). The Protocol sets emissions limits for 2010 for sulphur, nitric oxide, volatile organic compounds and ammonia. Sweden has introduced an environmental charge on nitric oxide from energy production by the Environmental Charge on Emissions of Nitrogen Oxide from Energy Production Act, as well as a sulphur tax. EU Directive 2004/42/EC on limitation of emissions of volatile organic compounds due to the use of organic solvents has been implemented by the Swedish Chemicals Agency regulation (KIFS 2008:2).

Moreover, Sweden and the EU have ratified the Vienna Convention for the Protection of the Ozone Layer and the related Montreal Protocol. EU Regulation No. 2027/2000/EC refers to ozone-depleting substances. The Swedish regulation is, however, stricter than the EU Regulation.

The Swedish Environmental Code regulates a vast number of different operations that are considered 'harmful to the environment', which may include various emissions. Such operations may therefore be regulated both by the Environmental Code and the climate conventions mentioned above (see questions 9 to 11).

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### 2 International regulations and national regulatory policies

How are the regulatory policies of your country affected by international regulations on climate matters?

The government has pronounced that Sweden shall show leadership to meet the climate challenge internationally as well as on a national level. The aim is to rapidly decrease Sweden's dependence on fossil fuels and reduce negative impacts on the climate.

The focus on climate issues has led to extensive national climate targets, which generally exceed the EU's climate change regulations and targets.

Swedish policies are generally affected by its EU membership and EU legislation taking precedence over Swedish national law.

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### 3 Main national regulatory policies

Outline recent government policy on climate matters.

The basis for the Swedish regulatory climate policies is above all the assessments made by the Inter-governmental Panel on Climate Change (IPCC). The government has identified the climate issue as a top priority of the government's environmental work as well as an important topic on the EU agenda.

The most recent Swedish Climate Bill (prop 2008/09:162) presents an integrated climate and energy policy. The targets and visions set out in the bill are divided into three periods:

- the national target for the first period, 2008–2012, is a minimum of 4 per cent average reduction of emissions of greenhouse gases compared to 1990 levels;
- the targets set for the second period, 2013–2020 are:
  - the use of fossil fuels for heating should be phased out;
  - at least 20 per cent more efficient energy use;
  - at least 50 per cent renewable energy;
  - at least 10 per cent renewable energy in the transport sector and
  - a 40 per cent emission reduction compared to 1990 levels. The target refers to the non-trading sector, that is, sectors not included in the EU Emission Trading Scheme (EU ETS), including transport, housing, waste disposal, agriculture and forestry, aquaculture and some parts of the industry. To reach the target instruments such as emissions trading, clean development mechanisms (CDMs) as well as economic instruments in the area of taxation are used; and
- by 2050 the vision is not to have any net emissions of greenhouse gases.

The government has already allocated investments of 2.2 billion kronor for the period 2010 to 2014 to promote climate-related operations such as sustainable cities, climate research and energy efficiency. In the Budget Bill for 2012 an additional 600 million kronor was allocated to promote climate related operations.

The Swedish implementation of the EU climate change regulations reaches over a vast area of legislation. Economic tools are often used to direct the development of the energy and climate sector. Traditionally, taxes have been the main tool (see question 17), but recently also market-based instruments have been introduced, such as the electricity certificate system (see questions 9 and 19). Sweden also has a programme for improving energy (see question 17).

Moreover, the government has dedicated funds to different projects on research and development in the clean tech sector. For instance, 1.147 billion kronor has been dedicated to research in renewable energy techniques. In the Budget Bill for 2012 the support was increased by 90 million kronor.

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#### 4 Main national legislation

Identify the main national laws and regulations on climate matters.

The main laws and regulations are:

- the Environmental Code;
- the Energy Taxation Act;
- the Emissions Trading Act;
- the Electricity Certificate Act;
- the Programme for Improving Energy Efficiency Act; and
- the Environmental Charge on Emissions of Nitrogen Oxide from Energy Production Act.

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#### 5 National regulatory authorities

Identify the national regulatory authorities responsible for climate regulation and its implementation and administration. Outline their areas of competence.

The following entities are primarily responsible for climate regulation.

The Ministry of Environment has the main responsibility for climate matters. Climate and energy matters are often closely related, and the Ministry of Enterprise, Energy and Communications is responsible for security of supply, electricity transmission, renewable energy, electricity certificates and improved energy efficiency.

The Swedish Environmental Protection Agency is the national agency for environmental protection and nature conservation. Its key tasks are to present proposals for environmental policies (including climate policies) and legislation to the government, and to ensure that environmental policy decisions are implemented. The Agency also handles parts of the EU ETS system. Moreover, it supports the local councils with grants for long-term greenhouse effect reduction investments. The Agency is responsible for coordinating the Swedish climate report to the UN's climate secretariat.

The Swedish Energy Agency is the national authority for energy policy issues. The Agency is the Swedish expert authority regarding the government's CDM and joint implementation programme (SICLIP). It is responsible for the administration of the emission certificate register (together with the Swedish National Grid authority) as well as the administration of the energy certificate system and the programme for improving energy efficiency.

The county administrative boards are responsible for processing permits needed for the participation in the EU ETS as well as the permits regarding operations harmful to the environment.

The local councils are responsible for various environmental permits. The government's support of the Climate Investment Programme, 'Klimp', enables local councils and other local actors to obtain grants for long-term investments which reduce greenhouse gas emissions. The Climate Investment Programme is no longer granting new investments, but ongoing projects will continue until 2012.

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### General national climate matters

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#### 6 National emissions and limits

What are the main sources of emissions of greenhouse gases (or other regulated emissions) in your country and the quantities of emissions from those sources? Describe any limitation or reduction obligations. Do they apply to private parties in your country?

The information below refers to 2009 – the figures for 2010 have not yet been released – and are based on Sweden's National Inventory Report 2010, submitted under the UNFCCC. The reduction of emis-

sions of greenhouse gases during 2009, approximately 3,500Gg was the largest reduction recorded during a single year since 1996.

The total emission of greenhouse gases was 59 994 CO<sub>2</sub> equivalent (Gg), divided as follows (all data in CO<sub>2</sub> equivalent (Gg)):

- domestic transportation – 20,379;
- industrial combustion – 10,198;
- electric and heat production – 7,253; and
- industrial processing – 5,031.

There are various limitations and reduction obligations that apply to private parties. That includes regimes under the EU ETS (see questions 9 to 15). There are also limitations under the Environmental Code on permits and approval for conducting operations harmful to the environment (see question 10), which emissions may fall under.

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#### 7 National emission projects

Describe any major emission reduction projects implemented or to be implemented in your country. Describe any similar projects in other countries involving the participation of government authorities or private parties from your country.

Sweden is, through the Swedish Energy Agency, involved in emission reduction projects such as CDMs and joint implementation (JI). However, no such projects are implemented in Sweden.

The Agency is part of the Asian Pacific Carbon Fund, a CDM fund administered by the Asian Development Bank. It invests in renewable energy, energy efficiency and methane recovery projects in developing Asian countries. Sweden has also invested in the Bank's Future Carbon Fund, which will use carbon credits generated beyond 2012. Since the Kyoto Protocol's first commitment period ends by 2012, the fund is partly a political statement in favour of a post-Kyoto regime.

Sweden also participates in the Testing Ground Facility, a JI fund in the Baltic Sea Region. Moreover, Sweden is part of the Multilateral Carbon Credit Fund investing in JI and CDM projects in Eastern Europe.

The Swedish Energy Agency participates in CDM projects, for instance in Brazil, India and China. The government has given the Swedish Energy Agency instructions to examine the current CDM projects in an effort to increase the efficiency of the projects. The Swedish Energy Agency shall present its findings in the end of 2011.

In Europe, the Agency is involved in JI projects in Romania and Estonia.

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### Domestic climate sector

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#### 8 Domestic climate sector

Describe the main commercial aspects of the climate sector in your country, including any related government policies.

More or less all regulations described in this chapter have an impact on the commercial aspects of the climate sector, for instance taxes and tax reliefs, subsidies and market-based means of control.

Other main commercial aspects of the climate sector are emissions trading (emission allowances) and electricity certificates (see questions 9 to 15 and 19). Such trading takes place at the Nordic power exchange Nord Pool (see question 15).

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### General emissions regulation

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#### 9 Regulation of emissions

Do any obligations for emission limitation, reduction or removal apply to your country and private parties in your country? If so, describe the main obligations.

The EU ETS, governed by the Emissions Trading Directive (2003/87/EC), applies in Sweden by virtue of Sweden's EU membership. Following the amendments set out in Directive 2009/29/EC the trading

scheme has been expanded, and will from 1 January 2013 include nitrous oxide and perfluorinated hydrocarbons. Directive 2009/29 EC has been implemented in Sweden under the Emissions Trading Act.

Swedish companies included in the trading scheme must have a permit to emit carbon dioxide. Without the permit the operators may not obtain emission allowances. From 1 January 2013 a permit will also be compulsory for emitters of nitrous oxide and perfluorinated hydrocarbons.

To ensure compliance with the emission trading regulations, penalties may be charged. The relevant authority may in some cases publish the names of the operators who are in breach of the emission requirements.

Under the Environmental Charge on Emissions of Nitrogen Oxide from Energy Production Act an environmental charge for the emission of nitrogen oxide from energy generation at combustion plants applies. The charge has been an important tool for reducing emissions of nitrogen oxides.

Operations considered to be harmful to the environment require permits under the Environmental Code. Such operations include emissions that affect the climate and the atmosphere. A permit is administered by the Environmental Court, the county administrative board or the local council depending, inter alia, on the extent of the operations.

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#### 10 Emission permits or approvals

Are there any requirements for obtaining emission permits or approvals? If so, describe the main requirements.

The county administrative boards handle applications for permits to emit carbon dioxide as well as other permits needed to operate activities that may be harmful to the environment under the Environmental Code.

Permits regarding the emission of carbon dioxide can only be obtained if the applicant is able to control and report the emissions.

The requirements for obtaining permits for operations that are harmful to the environment are mainly the following:

- the burden of proof principle – it is the responsibility of the operator to show that the provisions of the Code are adhered to;
- the knowledge requirement – the operator must have knowledge of environmental and health protection to conduct its business;
- the precautionary principle – the operator has a responsibility to take necessary protective measures to minimise hazards;
- the appropriate location principle – the operations shall be located to ensure the least number of risks and inconveniences; and
- the resource management and recycling principles – the operator shall conserve raw materials and energy and reuse and recycle them whenever possible. Preference shall be given to renewable energy sources.

An application for permits under the Environmental Code shall include an environmental impact assessment, describing the operation's impact on the environment. The operator shall also consult with relevant property owners, authorities and environmental groups.

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#### 11 Oversight of emissions

How are emissions monitored, reported and verified?

Under the Swedish Emission Trading Act an operator is obliged to monitor its emissions by calculation or measurement. The monitoring includes an obligation to submit a verified emission report to the Swedish Environmental Protection Agency. Verification is made by an accredited controller. The reporting and verification process is made in an electronic web-based reporting system.

Operations that have been granted a permit under the Environmental Code are obliged to produce a yearly environmental report,

stating the operation's compliance with environmental regulation. These operations are supervised by the relevant county administrative board.

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#### Emission allowances (or similar emission instruments)

##### 12 Regime

Is there an emission allowance regime (or similar regime) in your country? How does it operate?

As described above, Sweden is part of the EU ETS, applied in Sweden by the Emissions Trading Act and its corresponding ordinance.

The Swedish Environmental Protection Agency decides on the allocation of emission allowances after consultation with the Swedish Agency for Economic and Regional Growth and the Swedish Energy Agency. The Environmental Protection Agency also monitors the companies' annual reporting of carbon dioxide emissions.

Companies have been given the opportunity to apply for emission allowances under certain allocation principles, considering each installation's application. Emission allowances have then been allocated to the companies free of charge. As from 2013, the main principle for allocating emission allowances will be by auction. Each member state will be responsible for the auction of emission allowances to entities within its jurisdiction. The member states are allowed to choose whether they will use an EU auction platform or a national auction platform. Sweden has not yet decided whether it will set up a national auction platform.

Moreover, no emission allowances can be allocated unless a permit to emit carbon dioxide is obtained (see question 9).

The number of emission allowances that can be allocated is stated in the Swedish national allocation plan adopted by the government. The European Commission adopted its decision on the Swedish national allocation plan in November 2007. The total number of emission allowances to be allocated was reduced from 24.9 million tonnes to 22.5 million tonnes per year compared with the original allocation plan presented to the European Commission. As from 2013 the total number of emission allowances will be decided by the European Commission for all member states.

All installations covered by the EU ETS are to report their carbon dioxide emissions annually to the Swedish Environmental Protection Agency.

Under the Linking Directive, installations covered by the EU ETS may be credited for emission reductions achieved through measures taken under JI and CDM projects. Companies may be credited for approved reduction units in connection with their annual surrender of emission allowances. The number of reduction units that individual installations may surrender instead of emission allowances is decided by the Swedish Environmental Protection Agency. The total quantity of reduction units used by Swedish companies may not exceed 9,926,645 tonnes of carbon dioxide during the period 2008 to 2012.

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##### 13 Registration

Are there any emission allowance registries in your country? How are they administered?

Emission allowances are accessed electronically via the Swedish Emissions Trading Registry (ETR), in which all participants must have an account to be able to register their transactions. The Swedish registry is linked to the CITL, the EU electronic registry.

The ETR consists of a register of all installations and a national registry. The register of installations covers information on the companies and their installations, their applications for permits to emit carbon dioxide and the allocation of emission allowances. The national registry has an account for each installation to which emission allowances are issued, and enables the transfer of emission allowances between account holders within the EU ETS. The registry

also contains the reporting of emissions and the amount of allowances equivalent to the installation's carbon dioxide emissions.

Except for companies with obligations under the Emissions Trading Directive, individuals and organisations may also open personal holding accounts in the registry to participate in the trading of emission allowances.

The ETR only registers completed transactions between two parties. It is the parties themselves who administer their transaction of emission allowances, where the seller transfers the allowances to the buyer's account.

#### 14 Obtaining, possessing and using emission allowances

What are the requirements for obtaining emission allowances? How are allowances held, cancelled, surrendered and transferred?

In addition to the description above, one year of the EU ETS in Sweden may be summarised as follows:

- no later than 28 February the emission allowances are allocated from Sweden's national account in the Swedish Emissions Trading Registry (ETR) (see question 13 to the companies' transaction accounts);
- 31 March is the last day for companies to hand in verified reports on emissions of carbon dioxide during the past year. It is also the last day for an accounted controller to approve the company's reporting in the ETR;
- on 1 April the accounts are blocked for outgoing transactions for the companies that have not provided a verified emissions report;
- 30 April is the last day for the companies to transfer emission allowances corresponding to the emissions last year;
- on 15 May statistics on fulfilment are published, showing the amount of carbon dioxide each company has reported; and
- on 30 June the government annuls the transferred emission allowances, which are also deleted from the trading system.

#### Trading of emission allowances (or similar emission instruments)

##### 15 Emission allowances trading

What emission trading systems or schemes are applied in your country?

Trade takes place via an emissions trading exchange, a broker or is bilateral between companies. The Nordic power exchange, Nord Pool, provides a market place for trading in physical and financial contracts in the Nordic countries (Finland, Sweden, Denmark and Norway). The Nord Pool trading also provides a carbon market containing trading, clearing and delivery of emission allowances as well as certified emission reductions (CERs).

As described above, individuals, companies and organisations not allocated allowances may also open personal holding accounts in the ETR and participate in emission allowances trading.

##### 16 Trading agreements

Are any standard agreements on emissions trading used in your country? If so, describe their main features and provisions.

There are no Swedish standard agreements in use. Instead the international standard agreements are used, such as the ones provided by the International Emissions Trading Association (IETA), the European Federation of Energy Traders (EFET) and the International Swaps and Derivatives Association (ISDA).

#### Sectoral regulation

##### 17 Energy production, use and efficiency

Give details of (non-renewable) energy production and consumption in your country, including types and quantities of energy, and related emissions. Describe any regulations on emissions in this regard. Describe any obligations and applicable rules for limitation or reduction of energy use or for energy efficiency improvement that apply to your country and private parties in your country. Describe the main features and provisions of any scheme for registration of energy savings or energy efficiency improvements and for trade of related accounting units or credits in your country.

Compared with many other countries Sweden has a relatively low proportion of use of fossil fuels in its energy production. Non-renewable electricity production accounts for 48 per cent of all electricity generation, the main part from nuclear power production. A committee has been set up to review the possibilities and conditions to allow the construction of new nuclear reactors.

Emissions from energy production (production of electricity and district heating) was 7,253 CO<sub>2</sub> equivalent (Gg) in 2008. The emissions of carbon dioxide in electricity production come from combustion of fossil fuels in combined heat and power plants and to some extent from condensing power plants.

The production of energy in the district heating sector has increased significantly since the 1990s (34TWh – 55TWh in 2010). Since mainly biomass has been used there has not been any increased emission of carbon dioxide.

Coal has limited use in Sweden, only 1 million tonnes per year.

Operators of combustion plants included in the EU ETS must have a permit to emit carbon dioxide under the Emissions Trading Act as well as under the Environmental Code (see question 9).

Almost all energy in Sweden is taxed with a general energy tax applicable for both producers and consumers. These taxes have increased during recent years and will probably continue to increase. Energy production is taxed depending on the fuel used and on the basis of energy, carbon dioxide and sulphur content under the Energy Taxation Act (see question 8). Certain fuels are exempted from taxation as well as certain types of consumption. Non-renewable fuels are generally heavily taxed.

Sweden has a 'Programme for Improving Energy Efficiency' (the Programme for Improving Energy Efficiency Act) aiming to promote an efficient use of energy. The programme is voluntary for companies within the energy-intensive manufacturing industry. The legislation is based on the EU's Energy Tax Directive 2003/96/EC, which allows tax reductions for companies improving their energy efficiency. The first term of the programme ended in 2009 but it is possible for applicants to apply for a second term of the programme. The start of the second term has, however, been delayed since the EU Commission has not yet given its decision on Sweden's state aid application of clearance. The government is confident, however, that the EU Commission will approve the second term of the programme.

##### 18 Other sectors

Describe, in general terms, any regulation on emissions in connection with other sectors.

##### Agriculture and forestry

This sector is not part of the EU ETS. It is taxed under the Energy Taxation Act for carbon dioxide emissions. The government has decided to increase the carbon dioxide tax for heating in agriculture and forestry production.

##### Exploration and exploitation of oil, gas and minerals

There are no specific regulations concerning emissions from exploration and exploitation of oil and gas in Sweden. Exploitation of

minerals may be subject to the EU ETS. The sector is taxed under the Energy Taxation Act for carbon dioxide emissions.

### Industrial processes

Many industries are subject to the EU ETS regime (see questions 12 to 15).

The energy-intensive industries are exempted from energy tax for fuel used during combustion for heating and receives tax relief on carbon dioxide tax. Energy intensive industrial companies may also participate in the Programme for Improving Energy Efficiency (see questions 3 and 17).

### Transportation

A vehicle tax applies to all cars, which varies depending on carbon dioxide emissions under the Tax on Vehicles Act. New 'green cars' purchased after 1 July 2009 are exempted from vehicle tax for the first five years. The government has introduced a 'super green car bonus' of 40,000 kronor for new green cars with very low emissions of carbon dioxide.

Fuel used for transportation is subject to energy tax, carbon dioxide tax, sulphur tax and value added tax.

The government subsidises the production of certain types of fuels such as biogas and ethanol (see question 23).

The air transport sector will be included in the EU ETS from 2012.

## Renewable energy and carbon capture

### 19 Renewable energy consumption, policy and general regulation

Give details of the production and consumption of renewable energy in your country. What is the policy on renewable energy? Describe any obligations and applicable rules for renewable energy production or use that apply to your country and private parties in your country. Describe the main features and provisions of any scheme for registration of renewable energy production and use and for trade of related accounting units or credits in your country.

The government has set up a vision for renewable energy production and consumption; in 2020, 50 per cent of all energy consumption in Sweden shall consist of renewable energy (see question 3).

Sweden has the highest percentage of use and consumption of renewable energy in EU. Renewable energy's proportion of final energy has gradually increased and totalled 47.3 per cent in 2009. The largest user of renewable energy is the hydropower electricity production. The second largest user of renewable energy is the industrial sector followed by district heating generation and residential heating.

Renewable electricity generation accounts for 55 per cent of all electricity generation, of which 48 per cent is from large-scale hydropower. The remaining part is mainly from wood fuels and liquors. About 1.5 per cent of the remaining electricity generation is based on wind power, small-scale hydropower and waste to energy.

Renewable energy used in district heating generation amounts to 55 per cent of the total production, where 43 per cent is produced from wood fuels and liquors.

The use of renewable energy in the transportation sector is 5.7 per cent of the total energy use in 2010. The government has announced its ambition to increase renewable energy in the transportation sector. This will be achieved by tax relief on low-emission vehicles, subsidies for filling stations, emission limits for vehicle manufacturers and support for the production of biogas and ethanol.

Sweden has implemented the Directive 2009/28/EC on the promotion of use of energy from renewable sources.

To promote renewable energy production and consumption, Sweden has introduced a market-based method of control for renewable electricity generation, the electricity certificate system. A producer of renewable electricity receives one electricity certificate for every MWh of renewable electricity. All electricity suppliers and certain

electricity users are obliged to have electricity certificates depending on their consumption. This creates a demand for certificates, which promotes the production of renewable electricity. Only certain types of renewable electricity production are entitled to electricity certificates (see questions 20 to 24). The term of the electricity certificate system has recently been prolonged until 2035. Furthermore, the government has raised the target for production of renewable electricity. The current target is to increase renewable electricity production by 25TWh by 2020. The target will be accomplished mainly by an increase in wind energy production. Sweden and Norway have entered into an agreement to set up a joint market for electricity certificates. The government has thereafter presented a bill revising the Electricity Certificate Act, to create the joint market. Electricity certificates will be tradeable and transferable between Sweden and Norway from January 2012.

The government is generally positive towards carbon capture and has awarded funds for such research.

### 20 Wind energy

Describe, in general terms, any regulation of wind energy.

Permits for establishing wind power plants are primarily regulated by the Environmental Code. An operator needs a permit to construct a wind power plant if the total output is a minimum of 25MW. With output less than 25MW, the operator requires a building permit, but has to report the construction to the local council unless the total output is less than 125KW. If the construction requires a permit under the Environmental Code, no building permit is needed.

If the total output of a wind power plant is 25MW or more the application is administered by the relevant county administrative board. If the plant has a total output of 1MW or more and is constructed in water or close to water, the application is administered by the Environmental Court. An applicant needs to submit an environmental impact assessment (see question 10).

Wind energy operators are entitled to receive electricity certificates (see question 19).

Wind energy production is subject to a tax relief regime of 0.09 kronor per kWh.

### 21 Solar energy

Describe, in general terms, any regulation of solar energy.

The construction of solar energy plants requires a building permit from the local council. It is not considered as an 'operation harmful to the environment' and is not regulated by the Environmental Code. A solar energy plant would therefore generally not need a permit under the Environmental Code.

Investments in solar energy may obtain aid up to approximately €200,000, administered by the county administrative board under the Ordinance on Governmental Support of Solar Cells.

Solar energy plant operators are entitled to electricity certificates (see question 19).

### 22 Hydropower, geothermal, wave and tidal energy

Describe, in general terms, any regulation of hydropower, geothermal, wave or tidal energy.

#### Hydropower

Hydropower plants are subject to the Environmental Code and the Act on Water Operations. Some of the large Swedish rivers are protected from exploitation for hydropower generation.

Apart from adhering to the Environmental Code, water operations may only be conducted if:

- the benefits from the point of view of public and private interests are greater than the costs and damages associated with the operation; and

- the operation can be implemented in a way not to be prejudicial to other activities that are likely to involve the same water source in the future and that serve an important public or private purpose.

An operator must take necessary precautions to allow the passage of fish and comply with operations to protect fishing in the area.

Permits for the construction of hydropower plants are generally administered by the Environmental Court. If the total output of the generator exceeds 20MW the application is administered by the government. An applicant must submit an environmental impact assessment (see question 10).

Certain hydropower plant operators are entitled to electricity certificates (see question 19), for instance smaller plants with an installed capacity up to 1,500kW per generating unit, new plants, resumed operations of closed plants and increased generation capacity in existing plants.

#### Geothermal

Geothermal energy is only used in the southern part of Sweden. Smaller geothermal operations designed for residential heating are used to some extent.

The construction of a geothermal energy plant needs to be reported to the local council under the Environmental Code if the total output exceeds 10MW.

Geothermal electricity production operators are entitled to receive electricity certificates (see question 19).

#### Wave and tidal energy

The construction of wave and tidal energy plants requires permits under the Environmental Code and the Act on Water Operations. Applications are handled by the environmental courts. The same restrictions apply as for hydropower plants.

Wave energy electricity production operators are entitled to electricity certificates (see question 19).

#### 23 Waste-to-energy

Describe, in general terms, any regulation of production of energy based on waste.

Waste-to-energy is considered to have the potential to contribute to the reduction of greenhouse gases. The government has decided to increase its support for production of biogas from organic waste.

A recent report from the Swedish Energy Agency, the Swedish Environmental Protection Agency and the Swedish Board of Agriculture presents a Swedish cross-sector strategy for biogas. The report

is currently being reviewed by the government. The production of biogas from household waste has been subsidised by the Klimp programme (see question 5). The government has declared that it will continue to support the production of biogas.

Waste-to-energy plants are considered as 'operations harmful to the environment' and the construction generally requires a permit under the Environmental Code. A permit will be administered by the county administrative board or the Environmental Court depending on the scale of operations, the energy produced, and the amount of waste handled at the facility. An applicant needs to submit an environmental impact assessment (see question 10).

#### 24 Biofuels

Describe, in general terms, any regulation of biofuels.

The construction of a biofuel energy plant requires a permit under the Environmental Code. If the total installed output is higher than 300MW the plant requires a permit from the Environmental Court. Plants with an installed output below 300MW are handled by the county administrative board. An applicant needs to submit an environmental impact assessment (see question 10).

Certain biofuels used for production of electricity are entitled to electricity certificates (see question 19).

The government has granted 875 million kronor for demonstration and commercialisation of new energy technology. This support will mainly go to second generation biofuel plants.

#### 25 Carbon capture and storage

Describe, in general terms, any policy on and regulation of carbon capture and storage.

There are no specific regulations or policy on carbon capture and storage. The government has, however, declared that one of the EU financed pilot plants for CCS should be based in Sweden.

#### Climate matters in transactions

##### 26 Climate matters in M&A transactions

What are the main climate matters and regulations to consider in M&A transactions and other transactions?

There are two main aspects that need to be considered. Under a due diligence procedure it should be checked whether all climate related legal obligations have been fulfilled. In addition, the cost and income related to all climate matters should be estimated.

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