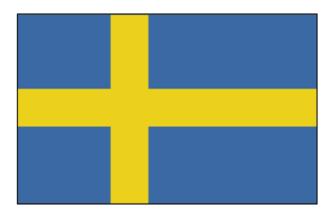
## **CLIMATE CHANGE LEGISLATION IN**

# **SWEDEN**

AN EXCERPT FROM

## The 2015 Global Climate Legislation Study A Review of Climate Change Legislation in 99 Countries



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## Sweden

### **Legislative Process**

The Kingdom of Sweden is a constitutional monarchy with the Monarch serving as the head of State. In practice, however, it is a parliamentary democracy in which the government is constitutionally formed and led by the Prime Minister.

The Prime Minister is appointed by the 349-member Parliament, which is, in turn, elected by popular vote. All members of the Parliament are elected to serve four-year terms and the most recent election was in September 2014. Sweden has had a unicameral parliament since 1971.

Both the Government and private members of the Parliament have the authority to introduce legislation, which is first tabled by the Speaker of the Parliament and assigned to one of 15 Parliamentary Committees for consideration. The specific committee then studies and reports back to the Parliament regarding the legislation in question via a committee report. Following the committee report, the legislation may be subject to a plenary meeting, which involves member debate or debate is forgone in the event of unanimous approval. In order to be approved, legislation must be assented to by a majority of the members of the Parliament. Once approved, legislation is sent to the Government for implementation. Governmental ministries not only implement policies, but also serve as expert bodies throughout the legislative process.

### **Approach to Climate Change**

As a member of the European Union and Annex-1 party to the Kyoto Protocol, Sweden's approach to climate change is predominantly influenced by the commitment to implement international emission reduction targets and corresponding legislation from the EU, which focuses on achieving an overall emission reduction target, a target for renewable energy and improving energy efficiency. The Government introduced no specific legislation to implement the Kyoto Protocol. Instead, different government departments, regions and municipalities implemented the commitments under the Kyoto Protocol via policies, programmes and action plans.

Sweden's approach to climate change is primarily grounded in market-based initiatives that cut across different sectors, integrating climate mitigation via price signals across industries. The climate strategy emphasises economic policy instruments, supplemented with targeted initiatives such as financial support for technological innovation and the introduction of new technologies into the market.

The Environmental Protection Agency, within the Ministry of Environment, is the lead government body responsible for implementing climate change and environmental policies in the country. In addition to UNFCCC reporting, the Environmental Protection Agency ensures the annual release of emissions statistics and tracking data. The Swedish Meteorological and Hydrological Institute is also responsible for collating and disseminating climate change information while the Swedish Energy Agency, within the Ministry of Enterprise, Energy and Communications, annually reviews energy and climate advice services and the impact of such services on kilowatt-hours saved. Both the Swedish Forest Agency and the Swedish Board of Agriculture similarly engage in climate change policy implementation and information dissemination.

The municipalities also play a crucial role in meeting international climate mitigation commitments as they formulate and implement plans for policy measures in all areas including energy management, land use, waste and transportation. Sub-national activity is co-ordinated by the central government, which implements climate legislation mandated by the Parliament. Sub-national activities also include involving citizens in local decision-making and raising public awareness regarding climate change and Sweden's policy frameworks to encourage citizens to conserve energy and invest in renewables.

#### **Energy supply**

According to Sweden's Sixth National Communication (2014), the composition of energy supply has changed markedly since 1970, when crude oil accounted for more than 75% of the energy mix. Crude oil has now been largely replaced by nuclear power and biofuels: in 2012, oil was 21.5% of the energy mix. Nearly 40% of all petroleum products have been replaced by non-fossil energy sources. By 2010 the share of renewable energy increased to 48% of energy use, meaning Sweden is well on its way to achieving 50% renewables by 2020.

In 2011, hydropower accounted for 45% of electricity production, nuclear power made up 40%, wind power 4%, and fossil fuels and biofuels accounted for the remaining 11%.

Several energy-related policies encourage emission reduction in the energy supply sector: the 2003 Electricity Certificates Act represents a quota system, requiring energy suppliers to purchase certificates corresponding to a certain percentage of their electricity sales, subsidies for photovoltaic installations and tax regulation mechanisms such as reductions in the energy/carbon tax for biofuels. In 2009, the provisions of this Act were extended until the end of 2035. Emission reductions in the energy supply sector are seen as a result of the EU ETS, energy and carbon taxes, the electricity certificate system, special support for wind power and targeted energy efficiency measures. Estimates project a business-as-usual surplus of emissions of 15m tonnes in 2007 had the energy supply policies of 1990 been retained. This indicates that emissions (excluding LULUCF) would be about 25-30% higher without the existing policy measures in place, mainly because the profitability of coal would have been high enough to

crowd out lower emission energy sources. The tightening of appropriate policy instruments is the key explanation for the avoided emissions.

#### **Energy demand**

Sweden has a large electricity demand per capita at an average of 15,000kWh per person/year. Industry makes up the largest share of this demand at 39.3%, followed by transportation (24.1%), residential (22.5%), and commercial, public services and agriculture (14.1%). The Swedish Energy Agency has the broad authority to outline and implement plans of action for increased energy efficiency and renewable energy use to offset this demand.

In 2005, Sweden began an industrial energy efficiency programme that engaged with about 180 power-intensive industries and granted tax-relief for the establishment and implementation of plans for reduced energy use. It yielded energy savings of approximately 1.45TWh per year, according to the Swedish Energy Agency, Although the programme ended in 2009, a new one was re-initiated to engage with 90 power-intensive industries that on aggregate account for a fifth of total electricity consumption.

In 2009, following from the Integrated Climate and Energy Policy bills (2008), Sweden began a comprehensive five-year energy efficiency programme for 2010-2014. Aimed at increasing regional and local climate and energy initiatives, this programme encouraged businesses to audit their energy consumption and to invest in energy efficient technologies.

Energy use was also impacted by grants, the expansion of and connection to district heating, energy efficiency building requirements and EU legislation. In particular, the Eco-design Directive, the Energy Labelling Directive and the Energy Performance of Buildings Directive had a positive impact on avoiding and reducing emissions.

Carbon and energy taxes similarly play a significant role in reducing energy demand via price signals that raise the cost of carbon-intensive means of production (through the EU ETS), transportation, and residential use of energy.

#### **Carbon pricing**

Sweden has a more ambitious target than the official commitments accepted under the European burden sharing agreement, which only account for one third of emissions, and requires an emission reduction of 17% outside the European Emission Trading Scheme (EU ETS). Sweden is committed to reducing the remaining two thirds of emissions in the sectors not covered by the EU ETS by 40% in 2020 from 1990 levels and to increase the share of renewable energy to 50% by the same year.

The EU ETS covers the energy sector and energy-intensive industry installations, while the major remaining sectors to which the specific Swedish target applies

include: transportation, agriculture, residential housing, services, waste disposal, forestry, and aquaculture. The target includes non-CO<sub>2</sub> gases such as methane, nitrous oxide and F-gases. Most emissions originate in the energy, industry and transportation sectors. Overall projections of avoided emissions due to introduced policy measures in the energy, transportation, industry, agriculture and waste sectors since 1990 indicate a total of 30-35m tonnes CO<sub>2</sub> will be avoided annually between 2010 and 2020 compared to business-as-usual scenarios which project emissions of about 95-100 MtCO<sub>2</sub>e per year for 2010-2020. Most emission reductions in the non-ETS covered sectors are a result of the energy and CO<sub>2</sub> taxes.

In 1991, as a component of broad tax reforms, Sweden enacted a carbon tax on coal, oil, natural gas, petrol, and aviation fuel used in domestic travel. This new carbon tax complemented existing energy taxes; however, the 1991 tax reform did simultaneously lower the existent energy tax by 50%.

Initially set at USD100 per ton of  $CO_2$  the carbon tax was eventually raised to USD150 per tonne, allowing Sweden to cut its carbon pollution by 9% between 1990 and 2006. Calculated on the basis of a fuel's fossil carbon content, the tax is charged at a volumetric rate. Both peat and biofuels are exempt from the tax, as well as fuels used for electricity production.

Until 2015, minor tax relief was granted for natural gas and liquefied petroleum gas (LPG) used in cars, ships, and aircraft; however, from 2015 the same level of tax will apply to all fossil fuels. Additionally, EU ETS exempt industries such as agriculture, forestry and pisciculture are subject to a  $CO_2$  tax that is 30% of the standard  $CO_2$  tax.

#### Transportation

Sweden predominantly addresses emission growth in the transportation sector via market-based instruments, especially tax increases that reduce demand and encourage more energy- and fuel-efficient vehicles. Sweden implemented the European Biofuels Directive and the European Renewable Energy Directive, thus moving from the indicative 5.75% target for biofuels to a mandatory target of 10% renewable energy sources in transportation.

Sweden links tax incentives to the fuel efficiency of vehicles and their overall climate performance. The biofuels strategy included a temporary exemption for all vehicle biofuels until 2013 from the energy and carbon tax, while at the same time requiring that larger filling stations must sell at least one fuel containing biofuels. This was also linked to the green-car rebate introduced in 2007 that encourages the purchase of vehicles running on biogas or E85, hybrid-electric cars and fuel-efficient vehicles emitting less than 120g CO<sub>2</sub>/km. The annual vehicle tax for passenger cars is differentiated based on CO<sub>2</sub> emissions. Furthermore, the energy efficiency of the car fleet improved due to the higher proportion of vehicles with diesel engines. These measures are expected to

avoid emissions from transportation of 5.4m tonnes  $CO_2$  by 2020 from 1990 levels as compared to business-as-usual scenarios.

#### **REDD+ and LULUCF**

Sweden has a large stock of forests that serve as carbon sinks. About 70% of the area is covered with forests that are predominantly privately owned (77%). The forest area accounts for 28.4m ha, of which 4.4m ha are protected. The land use, land-use change and forestry sector accounted for a net sink of 21-36m tonnes of  $CO_2$  over the period from 1990 until 2007. More recently, the sink was reduced by severe storms that brought down a large quantity of forests and increased logging activities. The use of biofuels from wood products has increased from 40TWh to 100TWh since 1990, which also contributed to a reduction of the carbon sink and partly counteracted the biofuels-based emission reductions in the transportation sector.

#### Adaptation

Sweden's Sixth National Communication identifies the following sectors as at risk from climate change related temperature fluctuations and altered precipitation patterns: infrastructure, communications, drinking water supply, agriculture, forestry, fisheries, and tourism.

There is no central agency responsible for climate change adaptation measures; rather climate change adaptation is spread across different specialised government agencies including: the Swedish National Board of Housing, Building, and Planning, the Swedish Meteorological and Hydrological Institute (SMHI); and the Swedish Civil Contingencies Agency.

Sweden has actively put adaptation measures in place to address the expected adverse effects of climate change. The SMHI disseminates continuously updated climate change scenarios and indicators via its platform on www.smhi.se and in 2012 launched a heatwave warning system. A number of government agencies, including the National Veterinary Institute, National Board of Health and Welfare, Swedish Institute for Communicable Disease and Control, Swedish Board of Agriculture, and National Food Agency, have collaborated on research regarding climate change impacts and infectious diseases, as well as organizational readiness. In regards to infrastructure, since Sweden experienced significant storms in 2005 and 2007, the nation has works to replace overhead power lines with underground wires.

The implementation of adaptation measures largely falls within the remit of the municipalities, which are responsible for contingency planning, emergency services, technical supplies and overall public planning. Recent extreme weather events motivated investments in pumping systems to address flooding and raise minimum standards for construction. The Planning and Building Act (2008) was amended to prevent new buildings from being erected in unsuitable locations. It requires taking into account the risks associated with flooding, erosion and accidents in municipal comprehensive and detailed development plans. It

requires risk assessments and the formulation of adaptation strategies in the public infrastructure sector, particularly concerning the rail networks and roads. Storms pose risks to the energy sector, which is required to analyse its risk exposure to extreme weather events and address its vulnerabilities, for example by replacing overhead power lines with buried cables for electricity distribution. Adaptation is also addressed in the Budget Bill (Autumn 2008) and the Climate and Energy Bill (2009). In the period of 2009-2011, SEK400m (USD54.2m) were earmarked for adaptation measures.

Sweden's climate change research focuses on climate processes and climate modelling to develop regional scenarios that form the basis of adaptation plans, as well as measures on co-benefits for climate mitigation and sectoral policies. Studies are undertaken on changes in water resources and forests as well as the effects of climate change-related effects on ecosystems. Social science research ranges from energy systems to research on climate policy processes and planning tools for adaptation to the impact on biodiversity and land use. Swedish research institutions are involved in numerous international research co-operations with European partners and institutions in developing countries alike, where the focus is on environmental technologies, climate-related agricultural research and environmental policy.

Name of law	Amendment to Act Concerning Energy Tax (a component of the climate and
	energy package) within the 2013 National Budget Bill
Date	1 February 2013
Summary	The law aims to support the uptake of biofuels through the establishment of the
	following tax incentives:
	<ul> <li>All biofuels are exempted from the carbon tax</li> </ul>
	• Fuels that contain hydrogenated vegetable and animal fats and oils
	(HVO) in blends of up to 15% are exempt from the fuel tax
	• E85 and other high-blend biofuels continue to be exempt from the fuel
	tax; and
	• Low-blend biofuels are subject to a reduction of the fuel tax.

### Sweden: Legislative Portfolio

Name of law	Act on Electricity certificates: Act No. 2011:1200 and Regulation on Electricity certificates - Regulation No. 2011:1480
Date	2011; amended 1 January 2012
Summary	Electricity producers whose electricity production meets the requirements of the Electricity Certificates Act receive one electricity certificate unit for each MWh of electricity that they produce. Demand for certificates is created by the fact that all electricity suppliers, and also certain electricity end users, are required to purchase certificates corresponding to a certain proportion (quota) of their electricity sales or electricity use.
	Electricity from the following energy sources entitles its producers to certificates in Sweden: wind power, solar energy, wave energy, geothermal energy, biofuels, peat

Electricity from the following energy sources entitles its producers to certificates in Sweden: wind power, solar energy, wave energy, geothermal energy, biofuels, peat and hydro power.

#### The act applies to:

- Companies that supply electricity to consumers
- Consumers of electricity using self-produced electricity, while the consumption must exceed 60MWh/ year and must have been produced in a plant that has a capacity of more than 50kW
- Registered energy-intensive companies
- Electricity consumers that purchased/imported electricity from the Nordic electricity market

As of 1 January 2012, the Swedish-Norwegian common electricity certificate market started. The producers receive their certificates in the country where the electricity production takes place and can trade their certificates in both Norway and Sweden.

Name of law	Government Bill (2009/2010: 172): Nuclear Power—opening the way for a generation change & Government Bill (2009/2010:173): Nuclear Power – Increased Liability
Date	1 January 2011
Summary	Passed by the Riksdag, these laws originating in government bills regulate the conditions for constructing and operating new nuclear facilities. New units are only permitted when they replace existing units (a maximum of 10), whereby the older reactor must be permanently disabled and the new reactor needs to be built on an existing nuclear facility instead of a new location.
	The laws reverse the phase-out of nuclear power production, repealing the Nuclear Phase-Out Act and the ban on new nuclear power facilities.
	The purpose of the law is to allow old nuclear reactors to be replaced with newer, safer models. It also reflects the recent shift towards new carbon technologies as opposed to a stronger expansion of renewable energies classified as counting towards climate mitigation. The Swedish parliament approved the act under the condition that no direct or indirect public funding may be available for the new nuclear power reactors.
	Parliament also stipulated that operators of nuclear facilities and the owners of nuclear power reactors carry unlimited liability in the event of a nuclear accident. Companies are required to hold insurance against third-party claims up to EUR1.2bn (USD1.51bn).

Name of law	The Building and Planning Act (SFS 2010:900)
Date	13 July 2010
Summary	Outlines the parameters for the sustainable planning and conservation of land, water, and development. Authorises municipalities to issue permits and necessary permissions for construction and development, including the construction of wind turbines.
	<ul> <li>Relative to climate change, this Act requires climate impacts and adaptation be considered in planning and permitting for development. Specifically, the Act requires planning and permitting processes to consider: <ul> <li>The sustainable management of land, water, energy, and raw materials and environmental conditions</li> <li>The conservation of energy and water, as well as climate conditions</li> <li>Chances of preventing water and air pollution</li> </ul></li></ul>

Requires municipalities to have long-term development master plans that include defined areas and limits of public space, land, and water. Authorises municipalities to determine how environmentally valuable public space should be protected. Requires environmental impact assessments for zoning plans and outlines the procedures for the adoption and repeal of zoning plans.

Name of law	An Integrated Climate and Energy Policy [outlined in Government Bills 2008/09: 162 and 2008/09: 163]
Date	30 March 2009
Summary	Passed by the Riksdag in 2009, these laws originating in two government bills form the basis of Sweden's flagship climate policy, known as "an Integrated Climate and Energy Policy.
	The Integrated Climate and Energy Policy specifies targets for reducing GHG emissions and provides a joint action plan to achieve emission reductions. The climate tax package changes to different taxes and subsidies (2MtCO <sub>2</sub> e by 2020) to balance future increases in energy and environmental taxes for enterprises and households against equivalent tax concessions, allows for a tax exemption for green cars (emissions of less than 120g of CO <sub>2</sub> /km) from vehicle tax. Furthermore the bill contains a carbon tax, which increases for heating in industry outside the scope of EU ETS such as agriculture, forestry and aquaculture (30% in 2011, 60% in 2015) and reduces the carbon tax rebate for diesel. It also facilitates green investments in developing countries, climate policy and development co-operation and an increased focus on climate change adaptation (responsibility to co-ordinate climate adaptation is given to country administrative boards; adapt spatial planning to increased risks of landslides; research on how climate change affects the loss of biodiversity and ecosystem services and how negative effects can be limited).
	The Integrated Climate and Energy Policy also contains action plans to promote renewable energy, improve energy efficiency and implement measures leading to a fossil-independent transportation sector.
	<ul> <li>Targets outlined in this legislation include:</li> <li>40% GHGs from non-ETS sectors by 2020 (compared to 1990 levels)</li> <li>50% of energy consumption from renewable energy by 2020</li> <li>20% more efficient energy use (compared to 2008)</li> <li>10% renewable energy in the transportation sector</li> <li>by 2020: a phase out of fossil fuels in heating</li> </ul>

- by 2030: a vehicle fleet that is independent of fossil fuels
- by 2050: zero net emissions of GHGs in Sweden.

Name of law	Environmental Code DS2000:61
Date	1 January 1999
Summary	The Swedish Environmental Code contains 15 separate environmental acts, which have been consolidated into the environmental code.
	These concern the management of land and water areas, environmental quality standards, environmental impact statements and other decision guidance data, protection of nature (animals and plant species), environmentally hazardous activities and health protection, polluted areas, water operations and agriculture, genetic engineering, chemical products and biotechnical organisms as well as waste and producer responsibility.
	The Environmental Code requires permits for major activities that are expected to be environmentally hazardous. Evaluating the impact on GHG emissions forms a part of the procedure for permit appraisal.

## Sweden: Executive Portfolio

Name of Policy	Action Plan for a fossil-fuel independent vehicle fleet
Date	2009/2010
Summary	Following from Sweden's Integrated Climate and Energy Policy Bills, this action plan sets out the specific measures to achieve the objective of a fossil fuel independent vehicle fleet by 2030. Given that one third of emissions occur in the road-based transportation sector, the fossil fuel independent vehicle fleet is a key contribution to Sweden's GHG emission reduction target.
	The key principle is to put a price on the GHG emissions emitted by the transportation sector and thus encouraging a move towards fossil fuel independent fuels as non-fossil fuel based vehicles are becoming cheaper than fossil fuel based vehicles. This is to be achieved through various policy instruments, measures, initiatives and incentives.
	These include carbon pricing (emission trading, energy and especially carbon taxes) in the transportation sector, increasing the dialogue between the government and the automotive cluster to strengthen its long-term competitiveness and promote greener fuel development and vehicle technology, extension of subsidies to establish filling stations for renewable fuels, increasing the share of biofuels in road transportation fuels via implementing the EU fuel quality directive (up to 10% share of biodiesel in the mixture), the requirement that the sustainability criteria must be fulfilled if the biofuels are to count towards the 10% target of fuels from renewable energy sources by 2020; mandating of binding emission standards for automotive manufacturers at 120gCO <sub>2</sub> /km for new passenger cars, which will be gradually reduced to 95gCO <sub>2</sub> /km in 2020; exploring the potential for the use of biogas (e.g. from waste) as transportation fuel, i.e. the development of 2 <sup>nd</sup> generation biofuel via financial support (SEK875m USD118.4m) for biofuel demo-plants and the commercialisation of new energy technology; research and development initiatives to assess the incentives for the emerging electric vehicles and plug-in hybrids market, including appropriate stimulus and raising public awareness via consumer information on vehicle fuel consumption.

Name of Policy	Regulation on State Subsidies for Solar Panels - Regulation No. 2009:689, updated/ amended by Regulation no. 2011:1473
Date	2010
Summary	The Regulation on State Subsidies for Solar Panels provides for financial support to facilitate the uptake of solar installations. This regulation forms the basis of grants for all types of solar/PV installations. The solar/PV market in Sweden is predominantly focused on off-grid installations in homes in remote areas and utilities such as communication stations or lighthouses. Grid-connected facilities with solar/PV are mostly used for research or demonstration purposes. The regulation is aimed at private individuals, companies and municipalities.
	In November 2011 the regulation was amended, which reduced the subsidies from 46% to a maximum of 43% of the eligible costs per installation from 1 February 2013 onwards. The total budget allocated to the 2013-2016 period is SEK210m (USD28.4m).

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