

These reports have been prepared by an external contractor and do not necessarily represent the Commission's view. They are based on the contractor's own research on information publicly available as of February 2013.

Assessment of climate change policies in the context of the European Semester

Country Report: Sweden



Ecologic Institute

Authors team: Eike Dreblow, Matthias Duwe, Tim Wawer, Lena Donat, Elizabeth Zelljadt, Andrew Ayres

eclareon

Author: Anna Poblocka

Client: DG Climate Action

Service Contract: 071201/2012/635684/SER/CLIMA.A.3

Ecologic Institute

eclareon

Ecologic Institute, Berlin:

Pfalzburger Strasse 43/44
10717 Berlin
Germany
www.ecologic.eu

eclareon GmbH

Giesebrechtstraße 20
10629 Berlin
Germany
www.eclareon.eu

Contact:

Eike Dreblow,
Fellow Climate and Energy
Tel. +49 (30) 86880-165
Fax +49 (30) 86880-100
[eike.dreblow\(at\)ecologic.eu](mailto:eike.dreblow(at)ecologic.eu)

Contact:

Anna Poblocka
Project Manager, Policy Department
Tel. +49 (30) 88 66 74 000
Fax +49 (30) 88 66 74 010
[ap\(at\)eclareon.com](mailto:ap(at)eclareon.com)

This country report has been produced as a joint output by Ecologic Institute and eclareon to support the Directorate General for Climate Action (DG CLIMA) at the European Commission in its work on the European Semester (Service Contract: 071201/2012/635684/SER/CLIMA.A.3).

The report provides an overview of current emission trends and progress towards targets as well as policy developments that took place over the period May 2012 to January 2013.

The content of the report represents the state of knowledge in February 2013, specific updates were made adding the latest official greenhouse gas emission data by the European Environment Agency (EEA).

Please feel free to provide any comments or suggestions to the authors through the contacts listed above.

Short summary

- **Background:** Climate change mitigation is an important component of Swedish policymaking and the country is aiming for net zero GHG emissions in 2050.
- **GHG target:** Non-ETS emissions in 2011 were below the 2013 target and according to the latest national projections the 2020 target is expected to be reached with existing measures.
- **Policy development:** Current policy development focuses on smart grid technology and cutting emissions in the transport sector by promoting and expanding Sweden's electric car fleet. The emphasis within energy policy is on modernisation of nuclear power plants rather than promotion of renewable energies.

I Background on climate and energy policies

Climate change mitigation is an important component of Swedish policymaking, as the country prides itself on being at the forefront of greenhouse gas emissions reduction and seeks to continue its green image and legacy.

Sweden has already reached its EU renewable target under which renewable energy is to account for half of all energy consumption by 2020. In light of this, further promotion of renewable energy focuses less on the electricity sector and rather on sectors with relatively greater greenhouse gas abatement potential such as transport. Sweden is aiming for net zero greenhouse gas emissions by 2050, with part of this target being reached through investments in emissions reduction abroad. Such investment constitutes purchasing Certified Emission Reductions (CERs) from the Kyoto Protocol's clean development mechanism (CDM) – according to data from Thomson Reuters Point Carbon (2013), Sweden has already bought nearly 20 million CERs since 2002 from 66 CDM projects and 2 JI (Joint Implementation) projects. The country has also invested in projects through seven multilateral carbon funds, and expects to purchase credits from potential new market mechanisms if these are developed.

Government officials estimate that Sweden will need to buy around 21 million carbon credits by 2020 to reach its national emission reduction target (see below). The government has earmarked a budget of 1.8 billion Swedish krona (\$283 million) for offset purchases over the period 2009-2014. These funds have not yet been exhausted, and with CER prices currently at all-time lows the remaining money could account for a significant emission reduction volume. However, Sweden is likely to consider offset quality over price when making international offset transactions, and may therefore decide to buy higher-priced credits from projects in least developed countries.

The Swedish Parliament decided in June 2009 on the national climate and energy targets up to 2020 (Climate Bill 2008/09: 162):

- 40% reduction in GHG emissions by 2020, compared to a 1990 baseline (emissions and removals from land use, land-use change, and forestry (LULUCF) are not included)

- 20 million tons less CO₂eq emitted from the non-trading sectors compared to 1990 levels (this results in a much higher reduction obligation compared to the ESD target ⁽¹⁾)
- 50% renewable energy by 2020
- 10% renewable energy in the transport sector by 2020
- 20% increase in energy efficiency by 2020

The new targets are to be reached by:

- strengthening existing policies (e.g. taxes)
- implementing EU decisions
- purchasing international carbon credits under the UNFCCC (CDM) and EU (art 24a), with the aim of achieving 2/3 of the reductions domestically and 1/3 through international investments.

The concept of “green growth” is gaining traction in Swedish policy, media, and society. In autumn 2010 for example, three Swedish regions (Dalarna, Skåne, and Norrbotten) were chosen as pilot areas for implementing local climate and energy measures that promote a green economy through new jobs, growth, and increased competition. The government has set budgetary support for these “green development” pilot counties in the period from 1 September 2010 through 30 June 2013.

2 GHG projections

Background information

In 2011, Sweden emitted 61.4 Mt CO₂eq (UNFCCC inventory 2011) with transport accounting for a third of total emissions. Emissions from that sector increased slightly between 1990 and 2010 but sank between 2010 and 2011 due to the increased use of biofuels, higher fuel prices, and the use of more efficient vehicles. Emissions from energy supply increased by almost 30% from 1990 to 2010 but also declined slightly between 2010 and 2011. Emissions from energy use declined by 43% between 1990 and 2011, mainly because of Sweden’s successful shift from fossil fuels to biomass in district heating that began as early as the 1970s - more than 60% of Sweden’s district heating is now supplied by biofuels such as wood pellets. Emissions from agriculture decreased slightly, due to the reduced number of dairy cows and decrease in fertilizer use (UNFCCC inventory 2011, EEA 2012c, UNFCCC 2012).

Progress on GHG target

There are two sets of targets to evaluate: 1) the Kyoto Protocol targets for the period 2008-12 (which has just ended) and 2) the 2020 targets for emissions not covered by the EU ETS.

¹ In 1990, Sweden emitted about 72.8 Mt CO₂eq. Assuming that around 65% of the emissions can be attributed to the non-trading sectors, the reduction target would result in non-ETS emissions of 28 Mt CO₂eq in 2020 (minus 36% compared to 2005 non-ETS emissions). The ESD target of Sweden is set to minus 17% of non-ETS emissions in 2020 compared to 2005 levels or 36.4 Mt CO₂eq in 2020 (see also Chapter 2).

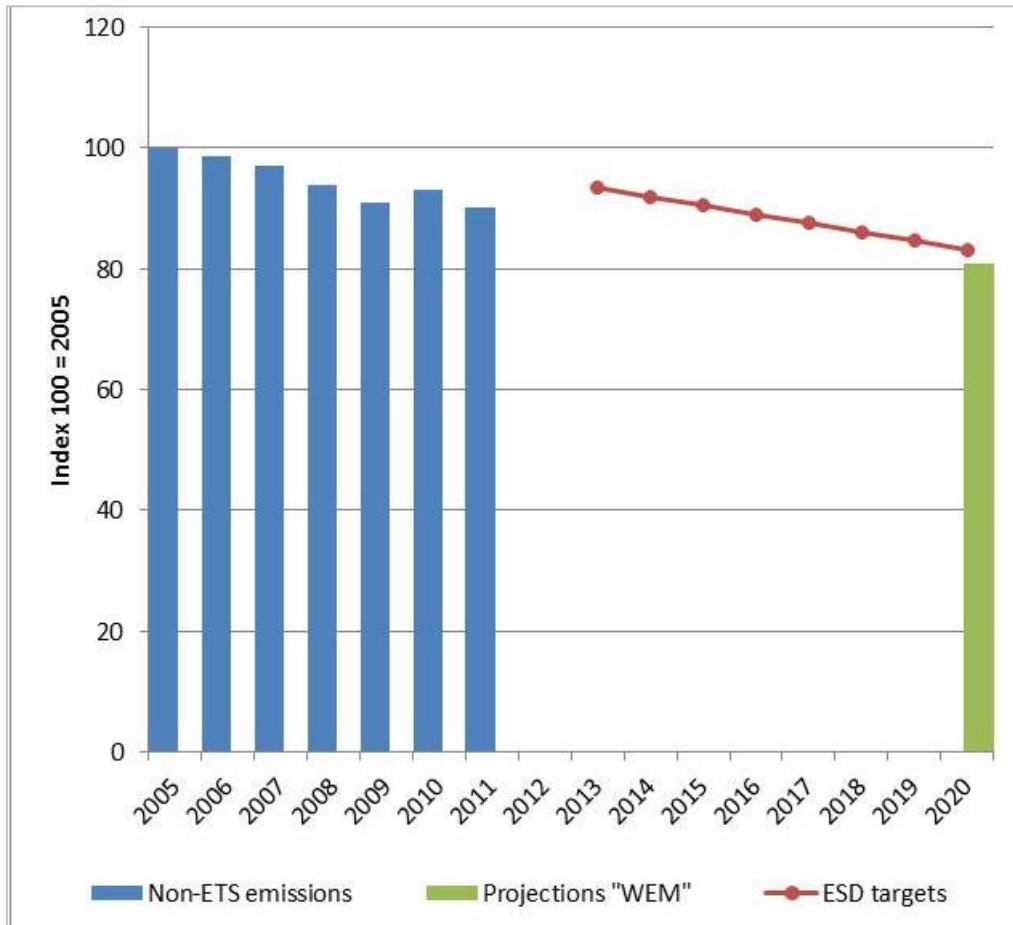
Under the Kyoto-Protocol the emission reduction target for the period 2008-2012 is plus 4% based on 1990 for CO₂, CH₄ and N₂O and on 1995 for F-gases. The latest available greenhouse gas data (for the year 2011) shows that Sweden's emissions have decreased by 14.8% since 1990 (EEA 2013a). The country is thus expected to meet its commitment by a comfortable margin through direct domestic emission reductions.

By 2020, Sweden needs to reduce its emissions not covered by the EU ETS by 17% compared to 2005, according to the Effort Sharing Decision (ESD) ⁽²⁾. The latest data suggest that Sweden is on track to meeting this target. According to the 2011 inventory data, emissions in 2011 were already 3% below the Annual Emissions Allocation (COM 2013) for the year 2013. National projections show Sweden reducing its non-ETS emissions by 19% compared to 2005 in scenarios with existing and additional measures ⁽³⁾ (EEA 2013b). Thus, Sweden is expected to overachieve its target under the ESD by 2%. However, the emissions cuts are not enough to meet the national target for non-EU ETS sectors of around 36% embodied in the legislation (Climate Bill 2008/09: 162) mentioned above (footnote 1).

Figure 1 shows Sweden's non-ETS emissions until 2011, its targets under the ESD for the period 2013-2020 and its projections with existing measures for 2020.

² Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020.

³ Calculations are based on domestic emissions only, without accounting for possible use of flexibility options. The 2020 targets and 2005 non-ETS emissions are all consistent with 2013-2020 ETS scope, i.e. they take into account the extension of the ETS scope in 2013 and the unilateral inclusion of installation in 2008-2012.

Figure I: Non-ETS emission trends and projections compared to the ESD targets

Source: EEA - Based on 15/04/2013 draft GHG inventory submissions under the UNFCCC and MS projections submitted until 17/04/2013

Table I: GHG emission developments, ESD-targets and projections (in Mt CO₂eq)

	1990	2005	2010	2011	ESD target*		2020 Projections**	
					2013	2020	WEM	WAM
Total	72.8	67.3	65.5	61.4				
Non-ETS emissions (% from 2005)		45.6	42.3	41.1	42.5	36.4	35.4	35.4
				-10%	-7%	-17%	-19%	-19%
Energy supply (% share of total)	10.1 14%	10.8 16%	13.1 20%	10.7 17%				
Energy use (w/o transport) (% share of total)	23.0 32%	16.6 25%	14.1 21%	13.2 21%				
Transport (% share of total)	19.3 27%	21.5 32%	20.5 31%	20.0 33%				
Industrial processes (% share of total)	6.3 9%	7.0 10%	6.8 10%	6.7 11%				
Agriculture (% share of total)	9.0 12%	8.0 12%	7.8 12%	7.8 13%				

Source: UNFCCC inventories 2011; EEA (2013b); COM (2013), Calculations provided by the EEA and own calculations.

* The ESD target for 2013 and for 2020 refer to different scopes of the ETS: The 2013 target is compared with 2011 data and is therefore consistent with the scope of the ETS from 2008-2012; the 2020 target is compared to 2020 projections and is therefore consistent with the

scope of the ETS from 2013-2020. Non-ETS emissions in 2005 corresponding to the scope of the ETS from 2013-2020 amounted to 43.9 Mt CO₂eq.

** 2013 projections with existing measures (WEM) and with additional measures (WAM). No specific reductions have been assigned to the additional measures.

Legend for colour coding: green = target is being (over)achieved); orange = not on track to meet the target

Total greenhouse gas emissions (GHG) and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international aviation and international maritime transport.

National projections of GHG emissions up to 2020, summarised by the EEA, need to be prepared by the Member States in accordance with the EU Monitoring Mechanism ⁽⁴⁾ every two years, and the latest submission was in 2013. Projections reflect a scenario estimating emissions reductions in line with policies and measures that have already been implemented (with existing measures, WEM), and an additional scenario that reflects developments with measures and policies that are in the planning phase (with additional measures, WAM).

In the following two tables, these measures - as outlined by Sweden as basis for the projections as of April 2011 ⁽⁵⁾ - have been summarised with a focus on national measures and those EU instruments expected to reduce emissions the most ⁽⁶⁾. An update on the status of the policies and measures is included in order to assess the validity of the scenarios.

Table 2: Existing and additional measures as stated in the 2011 GHG projections

Existing Measures (only important national measures; w/o EU legislation)	Status of policy in January 2013
	Environmental Code: General rules for consideration. Permits required for major activities that are environmentally hazardous. GHG emissions form part of the permit appraisal procedure.
Energy	Published in August 2000
	Electricity certificate system: a certain percentage of electricity used must come from renewable sources; users must purchase certificates to meet this quota.
	Implemented in 2003 through Act on Electricity certificates (Lag om elcertifikat) and Regulation on Electricity certificates (Förordning om elcertifikat).
	Subsidies are granted for installing PV-systems, introduced through Regulation No. 2009:689 on State Subsidies for Solar Panels (Förordning (2009:689) om statligt stöd till solceller); and for research and development in the field of wind energy, introduced through Regulation No. 2003:564 on Grants for Measures Promoting an Effective and Environmentally Sustainable Energy Supply
	Grants for wind power and solar power.

⁴ Decision No 280/2004/EC of the European Parliament and of the Council of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol.

⁵ The respective policies and measures were not available at the time of the preparation of this country report. Thus, policies and measures as outlined in April 2011 are given here.

⁶ The implementation of the EU-ETS has not been included. Other EU Directives have only been considered if they have been outlined in the projections as one of the main instruments to reduce GHG emissions.

		(Förordning (2003:564) om bidrag till åtgärder för en effektiv och miljöanpassad energiförsörjning).
	Subsidies for technology procurement to increase efficient energy use and the use of renewable energy.	No recent information on these subsidies is currently available.
Energy Efficiency	Tax on fossil fuels: Energy taxation is based on energy content; Carbon dioxide tax: Payments according to CO ₂ emissions (per kg carbon dioxide)	Implemented under the act on energy tax from 1994 including. Various taxes: the energy tax, carbon dioxide tax, and nitrous oxide tax.
	Building regulations standards for energy efficiency.	Implemented
	Programme for Energy efficiency in energy-intensive industry: Companies introduce an energy management system to implement efficiency measures with a repayment period of <3 years. Programme participants are exempt from the tax on electricity.	The programme ran until the end of 2012; no longer active.
Transport	Vehicle fuel taxes based on carbon content (differentiated annual vehicle tax by CO ₂ emissions per km).	Implemented since 2011. The vehicle fuel taxes based on carbon content are regulated under the act on energy tax.
	Raised energy tax on diesel in two stages: 2011 and 2013.	The energy tax on diesel was not raised yet (for 2013 stage).
	Biomass fuels exempt from fuel tax.	Implemented (Act on Energy Tax – Lag om skatt på energy from 1994)
	Law on supply of renewable fuels.	Implemented (Act on the Obligation to Supply Renewable Fuels from 2006)
	Annual vehicle tax exemption for cars that are electric, hybrid, or capable of running on biofuels	Tax rebates are available for electric, plug-in hybrids that can be recharged from the electricity grid, and for cars that run on natural gas (excluding LPG).
Other non-ETS sectors	F-gas regulation, including mobile air conditioner directive.	Implemented
	Rules on municipal waste planning; rules on producer responsibility for certain goods; tax on disposal in landfills; prohibition on combustible and organic waste entering landfills 2002 and 2005.	Implemented
	Targeted environmental grants under the rural development programme to create a varied agricultural landscape and reduce eutrophication.	Rural Development Programme runs from 2007 through 2013.

Source: Reporting of MS in accordance with Decision No 280/2004/EC about their GHG emission projections up to 2020, April 2011.

Additional Measures: Still to be implemented (only important national measures; w/o EU legislation)		Status of policy in January 2013
Energy Efficiency	Rising carbon dioxide tax on fossil fuels for heating in industries outside the EU ETS and for agricultural, forestry and water activities (from 21% to 60% of the maximum level by 2015 with a first step of 30% by 2011).	A CO ₂ tax was introduced in Sweden in 1991. The tax rate has been increased over the years, including 2011. There is a reduced tax rate in the industry due to the risk of carbon leakage.
	Raised energy tax on diesel as a vehicle fuel.	The energy tax on diesel has not been raised yet in 2013.
Transport	Increased carbon dioxide differentiation of vehicle tax and extending carbon dioxide-differentiated vehicle tax to all light vehicles.	<p>Since 2013: The carbon dioxide-based vehicle tax covers cars Class I from 2006 or later, cars Class I from before 2006 but which qualify for EURO 2005, Electric or Hybrid passenger cars class II (mobile homes), small buses and vans that have become taxable for the first time after the end of 2010, and light trucks and light buses with the total weight of 3,500 kg.</p> <p>The tax comprises: A basic amount of 360 SEK per year; CO₂ amount is SEK 20 per gCO₂ over 117g/km in mixed driving. For cars that can run on diesel fuel, the sum of the basic amount and the carbon dioxide amount is multiplied by a fuel factor of 2.33.</p>

Source: Reporting of MS in accordance with Decision No 280/2004/EC about their GHG emission projections up to 2020, April 2011.

3 Evaluation of National Reform Programme 2012 (NRP)

In April of each year, Member States are required to prepare their National Reform Programmes (NRPs), which outline the country's progress regarding the targets of the EU 2020 Strategy. The NRPs describe the country's national targets under the Strategy and contain a description of how the country intends to meet these targets. For climate change and energy, three headline targets exist: 1) the reduction of GHG emissions, 2) the increase of renewable energy generation, and 3) an increase in energy efficiency⁽⁷⁾.

In the following table, the main policies and measures as outlined in the NRP of April 2012⁽⁸⁾ have been summarised, and their current status (implemented, amended, abolished, or expired) is given, with specifics on latest developments.

⁷ There are specific targets for all MS by 2020 for non-ETS GHG emission reductions (see section 2) as well as for the renewable energy share in the energy mix by 2020 (see section 4, renewable energies). Specific energy efficiency targets will be defined (or revised) by the MS until the end of April 2013 in line with the methodology laid out in Article 3 (3) of the Energy Efficiency Directive (Directive 2012/27/EU).

⁸ All NRPs are available at: http://ec.europa.eu/europe2020/documents/related-document-type/index_en.htm

Table 3: Main policies and measures as outlined in the NRP, April 2012

Government bill on nuclear power—conditions for a generation change (2009/10:172)	
Status as stated in the NRP	Implemented
Status as per Jan 2013	Continues to be in force
Description of policy or measure	The bill states conditions for developments in the Swedish nuclear industry: a permit to construct and operate a new nuclear facility requires that the new unit replace an existing one, that the older reactor is permanently disabled, and that the new one be built on an existing nuclear facility rather than in a new location.
Fostering biofuel production and trade via changes in tax policy (part of climate and energy package within 2012 Spring Fiscal Policy Bill)	
Status as stated in the NRP	Tax changes announced; intention to introduce biofuel quota system in 2014
Status as per Jan 2013	Tax changes entered into force as of 1 February 2013; still aiming toward quota system in 2014
Description of policy or measure	Fuels that contain hydrogenated vegetable and animal fats and oils (HVO) in blends of up to 15% are exempt from normal fuel taxes; E85 and other high-blend biofuels continue to be exempt from fuel taxes. Low-blend biofuels are exempted from fuel taxes to a lesser extent than they were previously, to ensure compliance with EU state aid rules: gasoline and diesel with biofuel content are subject to 89% and 84%, respectively, of the normal tax on these fuels—formerly both were 100% exempt. All biofuels are exempt from the carbon tax.
Update definition of “green vehicle” as it applies to the existing 5-year initial vehicle tax exemption for green vehicles	
Status as stated in the NRP	New definitions being set; to apply starting 01 January 2013
Status as per Jan 2013	New definition in force as of 01 January 2013
Description of policy or measure	Eligibility for the tax exemption is based on the relative fuel efficiency of the respective car, truck, bus, van, or camper in question compared to others in its class. The equation used to calculate relative ranking that defines ‘best in class’ and thus exempts the vehicle from vehicle taxes for 5 years has been adjusted to reflect the more efficient state of current fleets, i.e., some vehicles that would have received the exemption according to the 2012 definition now do not.
Tax rebate for cars equipped with the most recent and best technology for powering with electricity or gas other than liquefied petroleum gas	
Status as stated in the NRP	Was applied in the tax year 2012; intended to be extended to tax year 2013
Status as per Jan 2013	Has been extended through tax year 2013
Description of policy or measure	Tax rebates are available for electric, plug-in hybrids that can be recharged from the electricity grid, and for cars that run on natural gas (excluding LPG).

Extension of existing energy efficiency initiatives

Status as stated in the NRP	2012 Budget Bill extended these measures
Status as per Jan 2013	The additional money was allocated and is available through 2014
Description of policy or measure	SEK 440 million (€51 million) earmarked for 2013–2014: supports municipal energy and climate advisory services for households and small businesses. Continuation of a 5-year program started in 2010 with SEK 300 annually going toward regional and local energy efficiency support for 2010–2014.

Appropriation of SEK 10 million (€1.16 million) per year during 2012–2014 for a smart grid knowledge platform with independent council

Status as stated in the NRP	Proposed
Status as per Jan 2013	Council was appointed May 2012 and will operate through 2014; temporary website established: http://www.sou.gov.se/smartaelnat/index.htm
Description of policy or measure	The knowledge platform and its coordination council keep and spread relevant research, development and demonstrations of smart grids to all stakeholders.

Ongoing efforts to develop a national innovation strategy and identify national initiatives promoting resource efficiency

Status as stated in the NRP	Intended/foreseen
Status as per Jan 2013	A <i>national innovation strategy</i> (Den nationella innovationsstrategin) was published in October 2012
Description of policy or measure	Effort entails surveying of potentially environmentally harmful subsidies and an assignment for the Swedish Environmental Protection Agency to survey ecosystem services and work on a mineral strategy and a strategy for a bio-economy.

Develop a long-term strategy for sustainable use of land

Status as stated in the NRP	All-Party Committee on Environmental Objective instructed to do this; results to be reported in June 2013 and June 2014
Status as per Jan 2013	First interim report published March 2012; presents a problem analysis as a basis for further work. Second interim report due by June 2013 and final report in June 2014
Description of policy or measure	The complete strategy will include suggestions on milestones, measures, and instruments to achieve sustainable land use.

4 Policy development

This section covers significant developments made in key policy areas between May 2012 and January 2013. It does not attempt to describe every instrument in the given thematic area. The time-frame was chosen based upon the release of the National Reform Programmes (in the section above) in April 2012, which contain the status quo for policy on most topics

Horizontal Issues

The Swedish Environmental Protection Agency (Naturvårdsverket) submitted a report to the government in December 2012 that forms the basis for a roadmap toward zero net greenhouse gas emissions by 2050. The report analyses how Sweden can reach the goal of no net emissions in this timeframe with scenarios and analysis of cost-effective instruments in all sectors, including non-ETS sectors. The final roadmap shall be developed in 2013. Some policies presented as the basis for a roadmap toward zero net greenhouse gas emissions by 2050 include:

- a price on emissions through emissions trading for all sectors
- a CO₂ tax
- research, development, demonstration, and market introduction
- investment in infrastructure and urban planning
- policy instruments in the agricultural and forestry sector.

Environmental Taxation

The energy intensity of Sweden's economy was close to the EU average in 2010. Combined with the third-highest implicit tax rate on energy in the EU (228.3 €/tonne oil equivalent in 2009), this places Sweden among the top ten EU member states in terms of revenue generated from both environmental and energy taxation (Eurostat 2013; 2012).

In addition to Sweden's existing greenhouse gas emission-based taxes, including a carbon tax and various fuel and vehicle taxes, a measure was revised in August 2012 targeted at reducing annual emissions of nitrogen oxides. Firms pay a fee based on annual emissions of nitrogen oxides (NO_x) but can also receive a reimbursement calculated in proportion to electricity produced (Naturvårdsverket 2006). The purpose of this reimbursement is to provide a financial incentive for operators to reduce emissions relative to power production—winners are those plants that have the lowest ratio of emissions to energy output.

Energy Efficiency

The energy intensity of Sweden's economy decreased at a moderate pace (-8.1%) from 2005 to 2010, although it spiked considerably between 2009 and 2010, rising 5.5% during that time. Total energy consumption also rebounded in 2010, reversing a downward trend, and resulted in an increase of 1.4% compared with the 2001–2005 average. These developments reflect rising energy use in the transport sector as well as variable energy use in the iron and steel sector, which declined precipitously (by almost 40%) between 2008 and 2009 only to make a partial recovery in 2010 (Eurostat 2013).

Most of the measures to increase efficiency are related to taxation and have been in force for many years. Recent energy efficiency support actions are extensions of existing initiatives mentioned in the evaluation of Sweden's National Reform Programme above. The funding allocated to these programmes continues to finance regional energy efficiency and energy management consultation, especially for small businesses, on an ongoing basis.

Renewable Energy

Sweden's share of renewable energy in total energy consumption was the highest in the EU in 2010 due to extensive use of biomass for heating and the fact that hydroelectric

power accounts for about one-third of energy consumption. At roughly 47.9% of the total, Sweden has essentially already achieved its goal of obtaining 49% of its energy from renewable sources by 2020. The share of electricity consumed that is generated from renewable sources is likewise very high at over 54% in 2010—it has hovered around this value from 2005 to 2010 (Eurostat 2013).

The main policy to promote renewable power in Sweden is a quota system involving tradable renewable energy certificates introduced a decade ago. A certain amount of the power electricity suppliers provide to end users each year must come from renewable sources—the providers (power companies) must hold a certificate for each megawatt hour (MWh) of renewable electricity generated annually to show they have fulfilled their quota. Producers of renewable power receive a certificate for each MWh they generate, meaning they can sell those to the power providers and get money not only for the actual electricity, but also for the fact that it is renewable. There is a market for the certificates, which are a tradable commodity. In 2012, this market was linked to Norway's market, which has a similar quota programme.

Beyond the certificate programme, Sweden offers investment support for certain types of renewable technologies. A recent development in this area is the new terms for such investment support in photovoltaics. As of 1 February 2013, the Swedish Energy Agency will use the funding allocated for this investment support (SEK 210 million (€24.5 million) over 4 years) to cover 35% of the costs for photovoltaic facilities rather than 45% as before.

The share of employment in the renewable energy sector was above 1% as a percentage of the total employment in 2010 (Green Jobs 2012, p. 3-4).

Energy Networks

An ongoing project called “Smart Grid Gotland” aims at turning an existing distribution grid into a smart grid that can also handle large amounts of electricity from wind power. The project received a new dose of funding (SEK 23 million or €2.7 million) in June 2012.

The effort to establish a knowledge platform on smart grids continues. The council that runs this platform is working on a draft action plan for how the smart grid can and should be developed in Sweden and what barriers exist for such development. The plan will also address the division of responsibilities between different actors, how the smart grid business model might look, and what new services will be required. The final report is due to be published by 1 December 2014.

Transport

Although total energy use in Sweden's transport sector remained approximately constant between 2005 and 2011 (Eurostat 2013), greenhouse gas emissions from this sector declined over the same time period by 7% (see Table 1). Increased efficiency of new vehicles has contributed to this trend: average emissions from newly registered Swedish vehicles improved by about 26% between 2005 and 2011. New vehicles emitted on average 141.8 g CO₂/km which is, however, still 2% above the EU average (EEA 2012e). Transport taxation excluding fuels amounted to 0.5% of GDP in 2010, ranking Sweden 13th highest in the EU for this metric (Eurostat 2012).

Policies aimed at cutting Sweden's transport sector emissions abound. As specific GHG emission levels of vehicles are still high, the focus is on tax measures and pilot

programmes promoting low-carbon vehicles and technologies as well as biofuels. On the tax side, biofuels receive a tax exemption and vehicles ranked as most fuel-efficient in their class are exempted from regular vehicle taxes for five years (see evaluation of National Reform Programme). As for pilot programmes, the Swedish Energy Agency provided a loan of SEK 1 950 000 (€228,000) to Nimbell AB, a company that produces electric vehicles sold under the name Nimbell Trigo, for commercialization in the Swedish market. In May 2012, the agency also put SEK 9 million (€1 million) towards a project testing a road that can supply power to cars while they are driving on it. The project is being carried out in cooperation with various partners, including the construction and road companies Elways and NCC Roads, as well as the Swedish Royal High School of Technology and holding company Arlandastad.

5 Policy progress on past CSRs

As part of the European Semester, Country Specific Recommendations (CSRs) for each Member State are provided by the EU Commission in June of each year for consideration and endorsement by the European Council). The recommendations are designed to address the major challenges facing each country in relation to the targets outlined in the EU 2020 Strategy. In the following table, those CSRs that are relevant for climate change and energy that were adopted in 2012 are listed, and their progress towards their implementation is assessed.

No CSRs related to climate change and energy were issued for Sweden in 2012.

6 References

- Climate policies in Sweden. Workshop on national climate projects. Copenhagen 6 June 2012. Available at: [http://www.ens.dk/da-DK/KlimaOgCO2/NationaleKlimaprojekter/workshop/Documents/Swedish%20Energy%20Agency%20\(Erik%20Eriksson\).pdf](http://www.ens.dk/da-DK/KlimaOgCO2/NationaleKlimaprojekter/workshop/Documents/Swedish%20Energy%20Agency%20(Erik%20Eriksson).pdf)
- COM (2013): Commission decision of 26 March 2013 on determining Member States' annual emission allocations for the period from 2013 to 2020 pursuant to Decision No 406/2009/EC of the European Parliament and of the Council. Online available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:090:0106:0110:EN:PDF>
- EEA (2012a): "Approximated EU GHG inventory: Early estimates for 2011" Technical report No 13/2012, available online at <http://www.eea.europa.eu/pressroom/publications/approximated-eu-ghg-inventory-2011/>
- EEA (2012b): Gap between average non ETS 2008–2011 emissions and Kyoto targets without the use of carbon sinks and flexible mechanisms. Online available: <http://www.eea.europa.eu/data-and-maps/figures/gap-between-average-nonets-200820132011>
- EEA (2012c): Greenhouse gas emission trends and projections in Europe 2012 - Tracking progress towards Kyoto and 2020 targets. EEA Report No 6/2012. Online available: <http://www.eea.europa.eu/publications/ghg-trends-and-projections-2012>
- EEA (2012d): Projected gaps between 2020 GHG emissions and national targets in sectors not covered by the EU ETS. Online available: <http://www.eea.europa.eu/data-and-maps/figures/projected-gaps-between-2020-ghg-1>
- EEA (2012e): Monitoring CO₂ emissions from new passenger cars in the EU: summary of data for 2011. Online available: www.eea.europa.eu/publications/monitoring-co2-emissions-from-new/at_download/file
- EEA (2013a): EEA greenhouse gas - data viewer: Change in emissions by country (%), Kyoto base year - 2011. Online available at: <http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>
- EEA (2013b): Summary of new Member State projections under the Reporting of Member States in accordance with Decision No 280/2004/EC about their GHG emission projections up to 2020, April 2013.
- Energimyndigheten (2012): Kommersialisering av elektriska arbetsfordon stöds av Energimyndigheten med lån på 1 950 000 kronor. Online available: <http://www.energimyndigheten.se/sv/Press/Pressmeddelanden/Kommersialisering-av-elektriska-arbetsfordon-stods-av-Energimyndigheten-med-lan-pa-1-950-000-kronor/>
- Energimyndigheten (2012): 23 miljoner kronor till smart elnät på Gotland. Online available: <http://www.energimyndigheten.se/sv/Press/Pressmeddelanden/Pressmeddelanden-2012/23-miljoner-kronor-till-smart-elnat-pa-Gotland/>
- Energimyndigheten (2012): Ett steg närmare fossilfri fordonsflotta. Online available: <http://www.energimyndigheten.se/sv/Press/Nyheter/Nyhetsarkiv-2012/Ett-steg-narmare-fossilfri-fordonsflotta/>
- Energimyndigheten (2012): Sverige nära att nå förnybartmål i transportsektorn. Online available: <http://www.energimyndigheten.se/sv/Press/Pressmeddelanden/Pressmeddelanden-2012/Sverige-nara-att-na-fornybartmal-i-transportsektorn/>
- Energimyndigheten (2012): Nya villkor för stödet till solceller. Online available: <http://www.energimyndigheten.se/sv/Press/Nyheter/Nya-villkor-for-stodet-till-solceller/>

- Energimyndigheten (2013): Stöd till solceller. Online available:
<http://www.energimyndigheten.se/sv/Hushall/Aktuella-bidrag-och-stod-du-kan-soka/Stod-till-solceller/>
- Eurostat (2012): Source of data is Eurostat "Taxation trends in the European Union 2012".
Collection: Statistical books. 2012. Brussels.
- Eurostat (2013): Source of data is Eurostat using the following tables: Implicit tax rate on energy (tsdcc360). Energy intensity of the economy (tsdec360). Final energy consumption (ten00095). Share of renewable energy in gross final energy consumption (t2020_31). Electricity generated from renewable sources (tsdcc330). Average carbon dioxide emissions per km from new passenger cars (tsdtr450). Final energy consumption, by sector (tsdpc320). Greenhouse gas emissions by sector (tsdcc210)
- MSR (2012): Pilotlän för Grön Utveckling. Online available:
<http://www.msr.se/sv/Informationsmaterial/Goda-exempel/Pilotlan-for-gron-utveckling/>
- Naturvardsverket (2006): The Swedish charge on nitrogen oxides – Cost-effective emission reduction. Fact sheet of the Environmental Protection Agency Sweden, Naturvardsverket.
Online available at: <http://www.naturvardsverket.se/Documents/publikationer/620-8245-0.pdf>
- Naturvardsverket (2012): Stöd till pilotlän för grön utveckling. Online available:
<http://www.naturvardsverket.se/Start/Om-Naturvardsverket/Regeringsuppdrag/Aktuella-regeringsuppdrag/Stod-till-pilotlan-for-gron-utveckling--/>
- Naturvardsverket (2012): Underlag till en färdplan för ett Sverige utan klimatutsläpp 2050. Online available: <http://www.naturvardsverket.se/upload/20-om-naturvardsverket/Regeringsuppdrag/2012/Fardplan2050/6537-syntes.pdf>
- OECD (2012): The Jobs Potential of a Shift Towards a Low-carbon Economy. Final Report for the European Commission - DG Employment. 4th June 2012. Available at:
<http://www.oecd.org/els/employmentpoliciesanddata/50503551.pdf>
- PWC (2012): Förslag i 2013 års budgetproposition inom miljö- och punktskatteområdet. Online available: <http://www.pwc.se/sv/skatteradgivning/artiklar/forslag-i-2013-ars-budgetproposition-inom-miljo-och-punktskatteområdet.jhtml>
- Regeringskansliet (2012): Den nationella innovationsstrategin. Online available:
<http://www.regeringen.se/content/1/c6/20/11/84/7991d65e.pdf>
- Regeringskansliet (2010): Kärnkraften - förutsättningar för generationsskifte. Online available:
<http://www.regeringen.se/sb/d/12166/a/142359>
- Regeringskansliet (2012): Budgetpropositionen för 2013. Online available:
<http://www.regeringen.se/sb/d/15677/a/199189>
- Regeringskansliet (2012): Plan för framtagandet av en strategi för långsiktigt hållbar markanvändning . Online available: <http://www.regeringen.se/sb/d/108/a/189805>
- Regeringskansliet (2012): Sverige - ett land utan klimatutsläpp 2050. Online available:
<http://www.regeringen.se/sb/d/15365/a/179914>
- Regeringskansliet (2012): Miljöminister Lena Ek kommenterar Naturvårdsverkets statistik för de svenska utsläppen av växthusgaser 2011. Online available:
<http://www.regeringen.se/sb/d/8149/a/205327>
- Reporting of Member States in accordance with Decision No 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community GHG emissions and for implementing the Kyoto Protocol. Last submission: April 2011.
- Point Carbon (2013): "Sweden needs 6.7 million CO₂ offsets to meet 2020 target: IEA. 05 February 2013." Available at: <http://www.pointcarbon.com/news/1.2171018>

- Point Carbon (2013): "Sweden to buy 21 million CO₂ credits by 2020: official. 08 February 2013."
Available at: <http://www.pointcarbon.com/news/1.2176669>
- Skatteverket (2013): Ändrade bestämmelser om skattebefrielse för biodrivmedel. Online available:
<http://www.skatteverket.se/foretagorganisationer/skatter/punktskatter/allapunktskatter/energiskatter/skattebefrielseforbiodrivmedel.4.2b543913a42158acf800021393.html>
- SOU (2012): Samordningsråd med kunskapsplattform för smarta elnät. Online available:
<http://www.sou.gov.se/smartaelnat/index.htm>
- SOU (2012): Miljömålsberedningens strategier. Online available:
<http://www.sou.gov.se/mmb/strategier.htm>
- Skatteverket (2013): Svar på vanliga frågor. Online available:
<http://www.skatteverket.se/privat/svarpavanligafragor/inkomstvtjanst/privattjansteinkomsterfaq/jagharenmiljobilsomformansbilhurberaknasformansvardet.5.dfe345a107ebcc9baf800019882.html>
- Skatteverket (2012): Information om bilförmånsberäkning 2012. Online available:
<http://www.skatteverket.se/privat/etjanster/bilformansberakning/2012/informationombilformansberakning2012.4.71004e4c133e23bf6db80008894.html>
- Skatteverket (2013): Fordonsskatt. Online available:
<http://www.skatteverket.se/privat/skatter/biltrafik/fordonsskatt.4.18e1b10334ebe8bc80003864.html>
- Transportstyrelsen (2013): Femårig skattebefrielse. Online available:
<http://www.transportstyrelsen.se/Vag/Fordon/Fordonsskatt/Femarig-skattebefrielse/>
- UNFCCC inventory (1990-2011): National greenhouse gas inventories (IPCC Common Reporting Format sector classification). Online available for the EU: <http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer> (Last modified : May 29, 2013 09:30 AM)
- UNFCCC (2012) Reports on in-depth reviews of the fifth national communications of Annex I Parties. Online available:
http://unfccc.int/national_reports/annex_i_natcom/idr_reports/items/4056.php
- Green Jobs (2012): Green Jobs: Employment Potential and Challenges. Available at:
http://ec.europa.eu/europe2020/pdf/themes/green_jobs.pdf