

Annex 3

Climate and energy objectives in
Sweden and the EU (RiR 2013:19)



Annex 3, Climate and energy objectives in Sweden and the EU

The parties to the UN Climate Change Convention have agreed that the average global temperature must not be allowed to rise more than 2 degrees Celsius above pre-industrial levels.¹ This annex gives an outline of the EU's and Sweden's different climate and energy policy objectives.

Climate objectives in Sweden and the EU

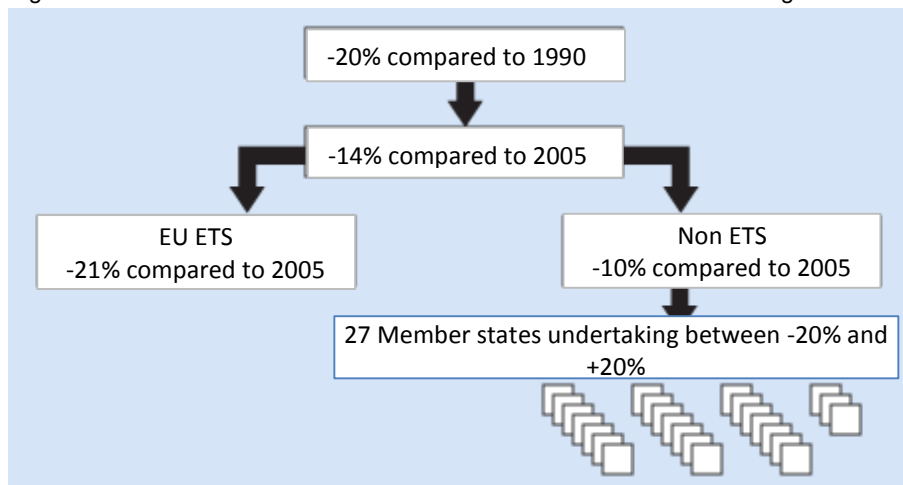
As far as the EU is concerned, the European Parliament and Council have stated that by 2050 global greenhouse emissions should have been reduced by at least 50 per cent compared with 1990 levels, which entails emissions reductions of 80–95 per cent for the industrialised countries.² The cornerstones of EU climate and energy policy are ecological sustainability, competitiveness and security of supply. The EU's overall climate objective of a 20 per cent reduction in emissions by 2020, together with the objectives for energy efficiency and renewable energy, governs the Union's coherent climate and energy policy. Emission reductions will be distributed between the trading and non-trading sectors on the basis of the 2005 emission level. The trading sector is to reduce emissions by 21 per cent by 2020 compared with 2005. The non-trading sector is to reduce emissions by 10 per cent compared with 2005.

¹ Sweden adopted the UN Framework Convention on Climate Change in 1993; see Swedish Treaty Series SÖ 1993:13. The recognition of the two-degree target took place at the United Nations, Conference of the Parties Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010 Addendum Part Two: Action taken by the Conference of the Parties at its sixteenth session, 15 March 2011, FCCC/CP/2010/7/Add.1.

² *Brussels European Council 29/30 October 2009 Presidency Conclusions*, 1 December 2009, 15265/1/09, REV 1, II 7.



Figure A Outline of distribution of emission reductions between the trading and non-trading sector



Distribution of EU objectives of 20 per cent lower emissions of greenhouse gases in 2020 compared with 1990.

Source: Swedish Environmental Protection Agency and European Commission, DG Climate Action presentation for the Climate Change Committee, 19 January 2010.

The emissions cap for the EU Emissions Trading System is determined for the trading period 2013–2020. There is to be a linear decrease in the emissions cap as of 2013 of 1.74 per cent per year, from the middle of the 2008–2012 trading period (that is 2010).³ Unless otherwise determined, the ceiling must decrease at the same rate after 2020.

For sectors outside the EU emissions trading system, the European Parliament and Council decided in 2009 on how emission reductions are to be distributed between member states.⁴ The decision applies to the period from 2013 to 2020. Every member state is to limit its emissions for each separate year from 2013 to 2020 by not exceeding a level defined by a linear trajectory. The starting point for 2013 corresponds to the average of the member states' actual emissions during the period 2008 to 2010. As far as Sweden is concerned emissions reductions in the non-trading sector are to be 17 per cent by 2020 compared with 2005. The member states have an "annual budget" of allowed emissions. To meet each year's requirement each member state must "borrow" a maximum of 5 per cent of the next year's allowed emissions. If the member states do not achieve

³ Art. 9 of the Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Directive 96/61/EC, EUT L 275 25.10.2003. for greenhouse gas emission allowance trading within the Community and amending Directive 96/61/EC, EUT L 275 25.10.2003.

⁴ 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, EUT L 140/136, 5.6.2009.

the emission requirements for a single year they must be met in the next year, multiplied by a factor of 1.8. Sweden among others may, under certain conditions, use flexible mechanisms (CDM/JI), up to 4 per cent of the country's verified emissions in 2005, to fulfil the emission levels under the decision.

The EU's pillars of climate and energy policy also apply to Sweden's climate and energy policy. The premise for Sweden's climate policy is the environmental quality objective *Limited Climate Impact*, which is also based on the UN two-degree limit. The objective has an interim target and a milestone target. The interim target applied to the period 2008–2012 and stated that Swedish emissions of greenhouse gases during the period should be at least 4 per cent lower on average than emissions in 1990. This applied to both the trading and non-trading sectors. The 2020 milestone target for the non-trading sector means that emissions must be 40 per cent lower than emissions in 1990. This means that emissions in 2020 are to be about 20 million tonnes lower in relation to the 1990 level.

In 2009 the Government presented the vision that "By 2050, Sweden will have a sustainable and resource-efficient energy supply and no net emissions of greenhouse gases in the atmosphere."⁵ The vision makes no distinction between the trading and non-trading sectors.

To realise the vision the Government has pointed out a number of long-term priorities. Emissions from activities included in the EU emissions trading system should have been substantially reduced by 2050. Carbon capture and storage is expected to have had considerable impact by the same year. Emissions from industrial combustion and activities outside the EU emissions trading system can be reduced through efficiencies and changed processes. Promoting carbon sinks⁶ and preventing deforestation is a necessary condition for achieving the vision. Heating in buildings will be fossil-free by 2020 and in 2030 Sweden should have a vehicle fleet that is independent of fossil fuels. Better manure management and increased biogas production in agriculture should give valuable contributions. With the right management of agricultural and forest land, their emissions can be minimised. Emissions from refineries, energy production and the pulp and paper industry should also fall. Nuclear power will be an important part of Swedish electricity production for the foreseeable future. It should be possible to reduce the need for fluorinated greenhouse gases considerably within a not too distant future.⁷

⁵ Govt. Bill 2008/09:162 p. 12, see also Govt. Bill. 2010/11:100 p. 58.

⁶ Carbon sinks (vegetation and oceans) absorb carbon from the atmosphere and bind it.

⁷ Govt. Bill 2008/09:162 p. 36 f.

Table B Climate objectives in Sweden and the EU

Trading period	Within the trading system		Outside the trading system	
	Sweden	EU	Sweden	EU
2008–2012	Interim target 2008–2012 (Kyoto commitment)	Emissions determined through total of member states' allocation plans	Interim target 2008–2012 (Kyoto commitment)	
2013–2020		The emission reduction pathway at EU level is governed by pre-determined reductions in the emissions cap. Further emission reductions only if the cap is lowered or the number of emission allowances is otherwise reduced.	Milestone target 2020 (not Kyoto commitment)	Effort sharing requiring at least linear reduction of emissions 2013–2020.
2050	Vision 2050 No distinction between trading and non-trading sectors.		Vision 2050 No distinction between trading and non-trading sectors.	

Source: Swedish National Audit Office 2013:8.

The government's formulation of the milestone target makes comparisons difficult

In Table C below the Swedish National Audit Office compares Sweden's milestone target with its commitment in relation to the EU target on emission reductions in the non-trading sector. For the 1990 target level the EU's target has been restated so that it can be compared with the Swedish milestone target. For the 2005 target level the Swedish milestone target has been restated so that it can be compared with the EU target.

Table C Comparison of emission reductions in the EU Effort Sharing Decision for the Swedish non-trading sector with Sweden's milestone target

Comparison year	Basic level for emissions in Sweden millions of tonnes (non-trading sector as in 2013 classification)*	EU's Effort Sharing Decision for Sweden to 2020: Percentage emission reductions	Sweden's national milestone target to 2020, percentage emission reductions
1990	49,2	about 28	40
2005	43,0	17	about 31

*Emissions of greenhouse gases measured as millions of tonnes carbon dioxide equivalents.

Source: Swedish National Audit Office processing of data from the Swedish Environmental Protection Agency.



The EU's target means that the Swedish non-trading sector is to reduce emissions by 17 per cent compared with 2005. This can be compared with the Swedish milestone target which, restated, entails an emission reduction of about 31 per cent.

The EU's and Sweden's energy efficiency objectives

EU has three different energy efficiency objectives. See Table D below that outlines the EU's and Sweden's energy efficiency objectives, followed by a more detailed description of the objectives. Besides the Swedish objectives in the table there are also objectives concerning a fossil-free vehicle fleet.

Table D The EU's and Sweden's energy efficiency objectives

Year	Energy supply		Final energy consumption		Energy sold
	Multi-sectoral		Multi-sectoral	Buildings	
	Sweden	The EU	Sweden & EU	Sweden	The EU
2016			9 per cent energy saving compared with average 2001–2005.		
2020	-20 per cent energy intensity compared with 2008 level (kWh/GDP unit at fixed prices).	-20 per cent energy supplied to 2020.		-20 per cent (kWh per square metre heated unit area) compared with 1995 level.	Each member state is to implement annual energy efficiency improvement equivalent to 1.5 per cent of the volume of energy sold within its territory in the period 2014–2020.
2050				-50 per cent (kWh per square metre heated unit area) compared with 1995 level.	

Source: *The Swedish National Audit Office RiR 2013:8 and the Government's summary of Sweden's energy efficiency objectives, Ministry of Enterprise, Energy and Communications, Sweden's second national action plan for energy efficiency, 30 June 2011.*

For the purpose of living up to the overall climate objective, in 2007 the European Council adopted an energy action plan including a target of *20 per cent energy efficiency improvement by 2020 at EU level*.⁸ The target refers to energy supplied. Unlike the objectives for reduced

⁸ European Council, Presidency conclusions from meeting of 8–9 March 2007, 7224/1/07 REV 1: The objective was confirmed at the meeting of the European Council in June 2010 (17/6/2010 No: EUCO 13/10). See also Govt. Bill 2008/09:163 p. 18. The 20 per cent target for energy efficiency applies in relation to forecast primary energy consumption to 2020. The forecast primary energy consumption to 2020 is calculated using the PRIMES energy system model. In

greenhouse gas emissions and increased supply of renewable energy, the energy efficiency objective is not binding.⁹

The EU Energy Services Directive of 2006 stipulates *an overall national indicative energy savings target of 9 per cent more efficient energy use by 2016*. The objectives are to be met using energy services and other measures to improve energy efficiency. The national objectives are to apply to the non-trading sector.¹⁰

The Energy Efficiency Directive establishes a common framework for measures to promote energy efficiency in the Union. It is to ensure that the Union's overall objective of 20 per cent energy efficiency improvement by 2020 is achieved and to then pave the way for further improvements in energy efficiency. *The Directive includes a cumulative target requiring 1.5 per cent new and verifiable annual energy savings in relation to average sales of energy to end customers in the period 2010–2012.*¹¹

Sweden's approved energy policy objectives for 2020 mean *20 per cent more effective energy use by 2020*. The objective is expressed as a cross sectoral objective for reduced energy intensity of 20 per cent between 2008 and 2020. The energy supplied per GDP unit in fixed prices is to be reduced by 20 per cent. The objective entails a reduction in energy intensity of about 1.7 per cent per year.¹²

absolute terms a 20 per cent energy efficiency improvement is equivalent to about 15 per cent primary energy savings in relation to the 2010 level. See Nilsson and Stenqvist, *Politik för energieffektivisering*, 2011 p. 8 f.

⁹ Member states must, however, in the framework of the national reform programme for Europe 2020, report every third year on energy efficiency measures and their follow-up to the European Commission. According to the Commission, compulsory requirements may be necessary if member states and the EU are not deemed to have met the target at the Commission's review in 2013. See European Commission, *Energy Efficiency Plan 2011*, COM (2011) 109 final, p. 3. According to the Ministry of Enterprise, Energy and Communications all member states emphasise the significance of energy efficiency, but for various reasons are opposed to binding energy efficiency targets, see Ministry of Enterprise, Energy and Communications, explanatory memorandum 2010/11:FPM92 p. 7.

¹⁰ The national energy savings, expressed in relation to the national indicative energy savings targets, are to be measured as of 1 January 2008. See Art 4.1. Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC. The European Commission proposes that the Directive be repealed when the new energy efficiency directive comes into force – with the exception of the energy savings target. The requirement for 9 per cent more efficient energy use by 2016 applies in relation to the average use 2001–2005, see Govt. Bill. 2008/09:163 p. 24.

¹¹ Art. Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC. Article 3 of the Directive quantifies the reductions required to achieve the indicative target of 20 per cent by 2020; 1 474 Mtoe in primary energy or 1 078 Mtoe in end energy consumption. When the member states set national targets for energy efficiency they are to take this into account.

¹² Committee report 2011/12:NU3 p. 16.



In accordance with the EU Energy Services Directive the Riksdag has decided on *an indicative energy savings target of at least 9 per cent savings by 2016*.¹³ The target applies to the non-trading sector.¹⁴

Renewable energy objectives in the EU and Sweden

According to the EU Renewable Energy Directive the proportion of renewable energy in Sweden must be 49 per cent of *end* energy consumption by 2020. According to the Swedish target established by the Riksdag, the share of renewable energy in 2020 must be at least 50 per cent of *total* energy consumption.¹⁵

Within the framework of the electricity certificate system, the Riksdag set a new target for renewable energy production in 2010, corresponding to an increase of 25 TWh by 2020 compared with 2002.¹⁶ In January 2012 an agreement came into force between Sweden and Norway on a joint market for electricity certificates. During the period between the final negotiation of the agreement and when it came into force the Swedish expansion of renewable electricity production became somewhat greater than had been forecast. This further expansion cannot be counted as part of Sweden's commitment in the agreement with Norway. In practice this means that Sweden has a somewhat more ambitious commitment to renewable electricity production than the target set by the Riksdag states.¹⁷

¹³ The measurement is calculated by the Swedish Energy Agency through an annual consumption average. According to the Agency the target is that energy savings by 2016 will be at least 9 per cent of the average annual end energy consumption in 2001–2005. Total energy savings stipulated in the Directive are a fixed amount and thus independent of future GDP growth and every future increase in energy consumption. The absolute amount of the average end consumption of energy in 2001–2005 is equivalent to 33.2 TWh by 2016. The Swedish Energy Agency has calculated that the savings will be 55.0 TWh by 2016 (15 per cent), which means that Sweden will reach and exceed the target of more efficient energy use before 2016. The Swedish Energy Agency report, ER 2010:32, *Underlag till den andra handlingsplanen, Uppföljning av energibesparingsmålen enligt Energitjänstedirektivet* (Basis for the second action plan, Follow-up of energy saving targets under the Energy Services Directive).

¹⁴ Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC, EUT L 114 27.4.2006, p. 64, Art. 2b. See also Govt. Bill 2008/09:163 p. 24.

¹⁵ Committee report 2008/09:NU25 p. 16, Riksdag Comm. 2008/09:301. Minister for IT and Energy Anna-Karin Hatt, in a response to a question in the Riksdag has returned to the fact that the Swedish targets are based on the EU definition and that it is regrettable that different variants have been used to describe the concept. See reply to written question 2012/13:311 *Utvecklingen av förnybar energy (Development of renewable energy)*, 20 February 2013.

¹⁶ See Government Bill 2009/10:133, Report 2009/10:NU16, Parliamentary communication 2009/10:279, cf. Govt. Bill 2012/13:1 UO 21 p. 38.

¹⁷ Interview, Swedish Energy Agency 7 December 2012 and email from the Swedish Energy Agency 4 March 2013. The agreement between Sweden and Norway on a common electricity certificate market came into force on 1 January 2012, see Govt. Bill. 2012/13:1 UO 21 p. 39.



Table E below gives an outline of the different renewable energy objectives.

Objective	Multi-sectoral	Transport	Renewable electricity generation	
Swedish renewable energy objectives to 2020	The proportion of renewable energy in 2020 must be at least 50 per cent of total energy consumption*	The proportion of renewable energy in 2010 must be at least 10 per cent in the transport sector.	Increase of 25 TWh to 2020 compared with 2002***	Agreement with Norway entailing a total increase of 26.4 TWh between 2012 and 2020. For Sweden this means 13.2 TWh during the period.
EU's renewable energy objectives to 2020	The proportion of renewable energy is to be 20 per cent of end energy consumption in 2020 for the entire EU. The objective for Sweden is 49 per cent renewable energy in 2020.**	The proportion of renewable energy in 2010 must be at least 10 per cent in the transport sector.		

Table E Renewable energy objectives in the EU and Sweden

* Determined through Committee Report 2008/09:NU25, Riksdag Comm. 2008/09:301.

** The objective follows from the Renewable Energy Directive.¹⁸

*** Determined through Committee Report 2009/10:NU16, Riksdag Comm 2009/10:279.

Source: Swedish National Audit Office 2013:8.

¹⁸ Directive 2009/28/EC of the European Parliament and the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, EUT L 140, 5.6.2009, p 16-62.