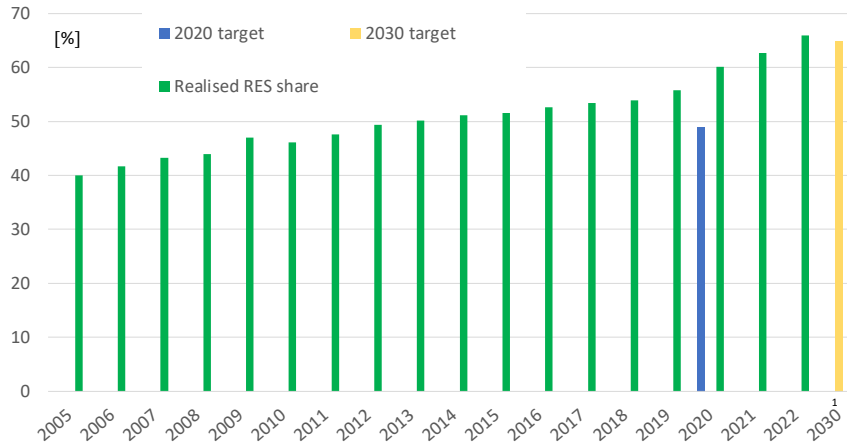


Sweden

Renewable energy status

Share of energy from renewable sources in total gross final energy consumption



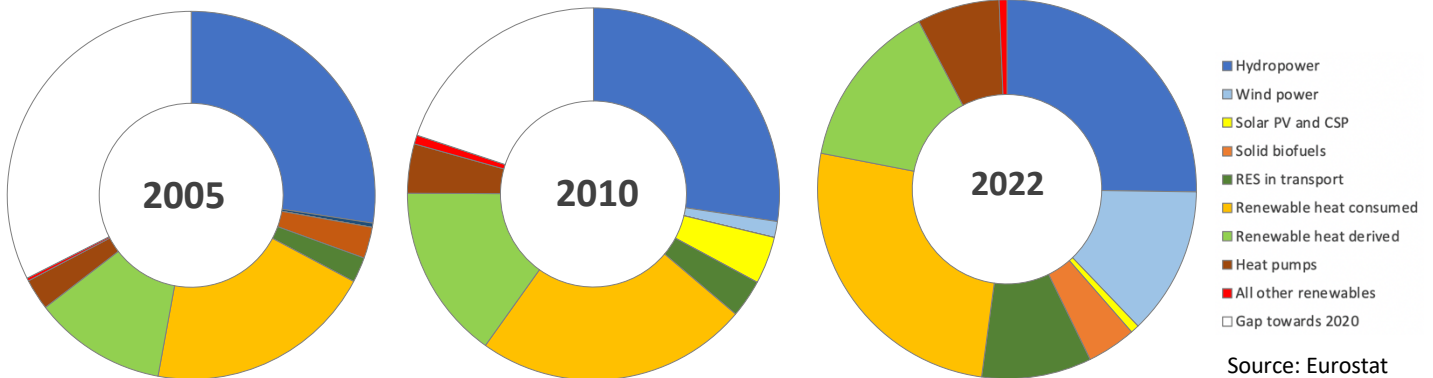
Source: Eurostat

Abbreviations used:

- RES: renewable energy sources
- RES-E: renewable electricity
- RES-H/C: renewable heating/cooling
- RES-T: renewable transport fuels

Data for 2022

Overall RES share:	66.0%	Avoided fossil fuels:	13.1 [Mtoe]
Overall RES 2020 target:	49%	Avoided fuel expenses:	11 426 [MEUR]
Overall RES 2030 target:	65%	RES Turnover:	14 560 [MEUR]
Share RES-E in electricity:	83.3%	RES Employment:	80 300 [jobs]
Share RES-T in transport:	29.2%	RES imports ² :	920 [MEUR]
Share RES-H/C in heating:	69.4%	RES exports ² :	243 [MEUR]



Source: Eurostat

	2005	2010	2022		
	Energy in ktoe	Energy in ktoe	Energy in ktoe	Employment in FTE	Turnover in MEUR
Hydropower	5 883,1	5 871,3	5 817	2 000	380
Wind power	80	297,5	2 910	16 800	3 220
Solar PV, and CSP	0,2	0,7	170	5 000	860
Solid biomass	588,8	882,2	966	29 600	5 840
Ren. energy in transport ³	476,4	707,3	2 161	7 300	450
Renew. heat consumed	4 317,8	5 082,8	5 974		
Renew. heat derived	2 504,8	3 261,1	3 288		
Heat pumps	585,9	918,1	1 621	18 300	3 520
All other renewables	55,2	166,1	154	1 300	290

Source: Eurostat, EurObserv'ER

FTE = Full time equivalent, PV=Photovoltaics, CSP=Concentrated Solar Power. Biofuels in transport only covers compliant fuels (employment and turnover additionally cover the non-compliant biofuels). Derived heat includes heat produced in main activity producer plants and heat sold produced in auto-producer plants. Its counterpart is the final heat consumption in the final consumption sectors (such as households).

¹ From Integrated National Energy Climate Plan

² Referring to the International Trade chapter from the publication: EurObserv'ER - *The State of Renewable Energy in Europe, 2022 edition*

³ Employment and turnover are only referring to biofuels in transport.



CURRENT RENEWABLE ENERGY POLICY

RES-E

The main support measure for the promotion of electricity from renewable energy in Sweden is a renewable electricity quota system. Obligated parties, i.e. electricity suppliers and some large electricity consumers, have to prove that a certain quota of their annual electricity deliveries (electricity suppliers) or consumption (obligated consumers) was generated from a renewable source. This is done by presenting tradeable certificates ("elcrets") allocated to renewable electricity producers. Elcerts are issued to Swedish and Norwegian operators of renewable power plants participating in the Swedish-Norwegian renewable electricity quota scheme, generally during a period of 15 years. All RES technologies are eligible. In Sweden the competent authority is the Swedish Energy Agency. This support scheme met its target ahead of schedule and will therefore be discontinued by 2035.

Multiple tax regulation mechanisms are also applied. Energy produced in power plants with a capacity lower than 100 kW is not taxable. The capacity limit is higher for certain renewable sources, e.g. wind (250 kW) and solar (500 kW). There is also lower real estate tax for wind power plants. Income tax reductions are available for private micro-producers of RES electricity injecting excess electricity into the grid for up to 30MWh per year. A peak installed power limit of 255kW is applied to residential solar PV.

RES H&C

Tax exemptions are the main incentives to support renewable energy for heating. Tax exemptions include income tax deduction of installations using renewable heating sources in apartments and single-family houses when replacing conventional fossil-based heating (only labour costs are deductible), energy and CO₂ tax exemptions for renewable heat producers, and a nitrous oxide tax exemption for heat producers using renewable energy sources.

RES-T

The main support scheme to foster renewable fuels for transport purposes is a biofuel quota scheme for certain diesel and petrol fuel users. Furthermore, biofuels for transport purposes are exempted from energy and CO₂ taxes.

Table 1: Brief description of key policy instruments aimed at promoting RES in Sweden

<i>Instrument</i>	<i>Description</i>
Electricity Certificate Scheme <i>Elcertifikaten</i>	The electricity certificate scheme (elcerts) is a market-based support system which aims to increase the production of renewable electricity in a cost-effective manner. Since 2012, Sweden and Norway have had a common market for electricity certificates and a common target whereby the electricity certificate scheme must contribute to expansion in the order of 28,4 TWh of renewable electricity production by the end of 2020. Each country has to provide half of the financing. The certificate offers 15 years of support. This target was reached in 2019, after which Sweden took the decision to fund an additional 18 TWh for 2030. The new total target of 46,4 TWh was reached in 2021. The electricity certificate system will now end in 2035 instead of 2045. New production devices commissioned after 2021 will not be eligible for electricity certificates.
Investment subsidy for solar PV installations	The investment subsidy scheme covers up to 20% of the installation of solar photovoltaic cell systems. The support is given to all types of actors, both companies and public organizations as well as private individuals. Returns from the <i>elcertifikat</i> system is not based on LCOE, and revenue is dependent on the market value of <i>elcertifikaten</i> . The certificate offers 15 years of support It has been suggested that the solar PV subsidy scheme be replaced by tax reductions.
Carbon tax	The carbon tax has increased to SEK 1330 per tonne of CO ₂ emitted to incentivise the use of renewable energy alternatives.
Investment grant scheme <i>Klimatkliv</i>	The Klimatkliv, an investment grant scheme for which investment proposals are evaluated on the basis of cost efficiency of GHG reductions in terms of SEK / CO ₂ eq. reduction.
Investment grant scheme <i>Industrikliv'</i>	The 'Industrikliv', a state initiative which assists Swedish industry with the development of technologies and processes for reducing process-related greenhouse gas emissions.
Climate premium for environmental vehicles	The Swedish Energy Agency will be distributing a climate premium to companies and municipalities purchasing trucks powered by sustainable sources and electric work machines. The support scheme covers 20% of the vehicle's purchase price. In 2022, the budget for this scheme was SEK 1 440 million.
Network for wind power (Nätverket för vindbruk)	The network for wind power was founded in 2008 by instructions from the Swedish Government. The network aims at fostering the expansion of wind power by means of information activities, educational activities, networking and economic support to wind power projects. The network was developed in light of the national objective of having a preparedness to expand wind power capacity by a corresponding annual electricity production of 30TWh, as decided by the Swedish Riksdag. The Swedish Energy Agency has the formal responsibility for the network, which, among other things, involves decision making about the disbursement of annual funds.
Biofuels quota scheme	The biofuels quota system obliges vendors to ensure that biofuels make up a certain percentage of their total annual sale of fuels. Funding is granted within the framework of an innovation cluster for development and use of liquid biofuels together with obligations to increase the share of biofuels in fuel-mixtures. The quota is 4,2% for petrol and 21% for diesel from 2020 onwards.
Bonus-malus subsidy system for electric vehicles	The scheme provides subsidies for purchasing low-emission vehicles up to 25% of the vehicle's price, while also imposing a higher vehicle tax for the purchasing of high-emitting vehicles.
Climate Leap subsidy	Investments related to transport, industry, and residential sector energy are eligible for funding. The subsidy consists of a general fund for all types of projects and a specific budget for electric vehicle charging networks. 1.9 billion SEK was reserved for the subsidy programme in 2021.
Electric bus premium	Investment support for public transport authorities is made available by the Swedish government for RES transport. The subsidy scheme will run at least until 2023. Applicants can be granted up to 25 million SEK.

For further information:

Swedish Energy Agency, 2023, The Electricity Certificate System

<https://www.energimyndigheten.se/en/sustainability/the-electricity-certificate-system/>

NVE, The Swedish-Norwegian Electricity Certificate Market, 2019

<https://publikasjoner.nve.no/diverse/2020/elsertifikat2020engelsk.pdf>

CEER, 2023. Status Review of Renewable Support Schemes in Europe for 2020 and 2021.

https://www.ceer.eu/wp-content/uploads/2024/04/RES_Status_Review_in_Europe_for_2020-2021.pdf

Government Offices of Sweden, Sweden's carbon tax

[https://www.government.se/government-policy/swedens-carbon-tax/swedens-carbon-tax/#:~:text=Swedish%20carbon%20tax%20rates&text=The%20carbon%20tax%20was%20introduced,of%20SEK%2010.87%20per%20EUR\).](https://www.government.se/government-policy/swedens-carbon-tax/swedens-carbon-tax/#:~:text=Swedish%20carbon%20tax%20rates&text=The%20carbon%20tax%20was%20introduced,of%20SEK%2010.87%20per%20EUR).)

International Energy Agency (IEA) database on policies and measures

<https://www.iea.org/search/policies?q=sweden>

RESLegal database

<http://www.res-legal.eu/search-by-country/sweden/>

European Commission, Clean energy for EU islands – Policies in Sweden

<https://clean-energy-islands.ec.europa.eu/countries/sweden/legal#:~:text=Quota%20system%20is%20the%20single,production%20was%20generated%20by%20RES.&text=Tax%20regulation%20mechanisms%20ensure%20different%20tax%20privileges%20to%20RES%20DE>

What is meant by ...?

Auctions for granting renewable energy support	An auction is a process of granting production or investment support to renewable energy projects based on the lowest bids by eligible project developers.
Feed-in tariff (FiT)	A support scheme which provides for a technology-specific remuneration per unit of renewable energy payable to eligible renewable energy producers. A proper, periodic review of FiT rates is often undertaken with the aim to prevent both too high FiTs so as to minimise regulatory rents, i.e. supra-normal returns and too low FiTs to preclude below-target market uptake because of FiT levels that are perceived by market participants to be less attractive. In addition, feed-in tariffs often include "tariff degression", a mechanism according to which the price (or tariff) ratchets down over time.
Feed-in premium (FiP)	A scheme which provides for a support level per unit of renewable energy to eligible renewable energy producers, typically for a period of 10-20 years, at a pre-set fixed or floating rate. The premium is typically adjusted periodically to exactly offset change in the average energy wholesale market price, based on a pre-specified benchmark market price. A floating FiP may move freely or may only be allowed to move within a pre-set interval.
Grants	Grants are non-repayable funds disbursed by one party (grant makers), often a government department, corporation, foundation or trust, to a recipient, often (but not always) a non-profit entity, educational institution, business or an individual. (Source: Wikipedia.org)
Green public procurement	In Green public procurement contracting authorities take environmental issues into account when tendering for goods or services. The goal is to reduce the impact of the procurement on human health and the environment. (Source: Wikipedia.org)
Renewable quota scheme (RQS)	A RQS mandates certain market actors (typically retail suppliers or large energy end-users) to respect a pre-set minimum share or amount of their total energy procurements from renewable sources of energy. Typically a tradable green certificate (TGC) scheme is operated to enable the obligated parties to prove their compliance with the prevailing renewable quota target by means of TGCs.
Sliding feed-in-tariff	A FiT scheme which pre-sets technology-specific declining feed-in tariffs for certain prospective vintages in line with the technology-specific learning curve, as projected by the National Regulatory Agency (NRA). Often a degression rate is used indicating the %/annum decrease in the rate level.
Soft loans	Loans at concessional (below market-based) terms, for example at sub-market-conform interest rates, made available in several Member States to stimulate certain renewable energy technologies.
Tax credits	These are amounts a tax paying entity is allowed to deduct when declaring payable taxes, for example company tax or income tax, to the tax authorities, for example the producer tax credits (PTCs) used in the United States to stimulate among others wind energy deployment.



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