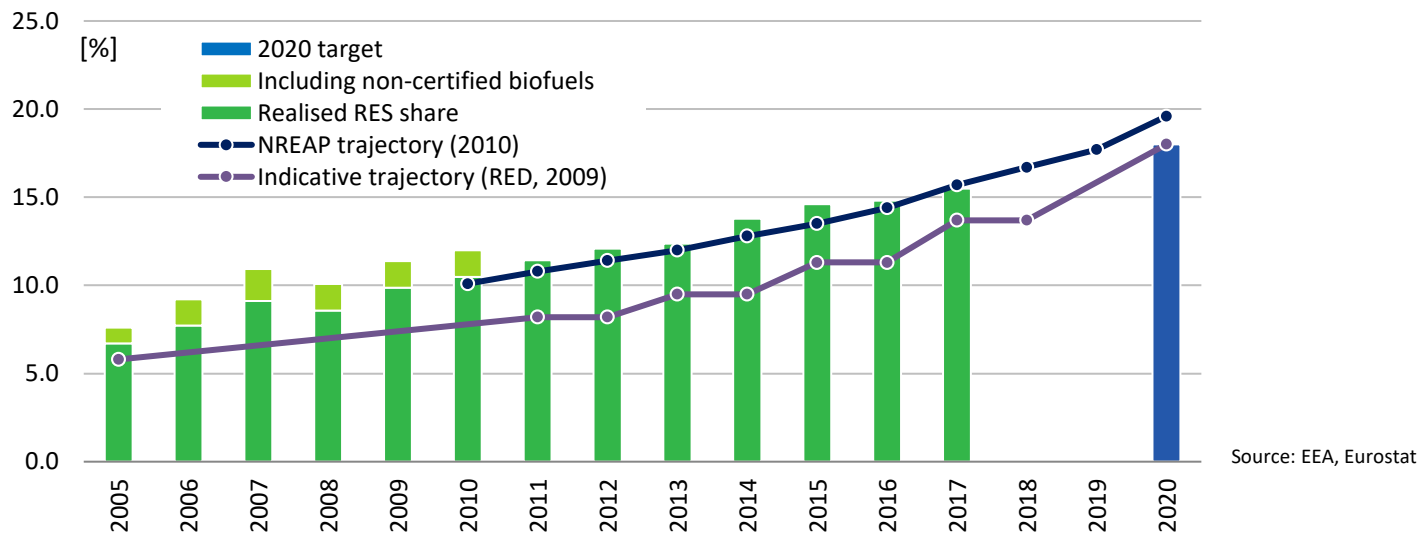


Summary

Renewable electricity systems up to 100 kW are supported through a feed-in tariff. Since 2017 tenders (sliding feed-in premiums) are in place for PV, on- and offshore wind and for biomass larger than 750 kW. KfW loans (for offshore wind, deep geothermal, battery storage), BMU loans and investment subsidies, flexibility premiums (biogas), and a tenant electricity surcharge are further support mechanisms for RES-E. The Market Incentive Programme (MAP) is the main promotion instrument for renewable heat. A greenhouse gas reduction quota is in place for the transport sector. Beyond, KfW loans are available for purchase of hydrogen, hybrid and electric vehicles. Private individuals can benefit from buyer's premium when buying such vehicles.

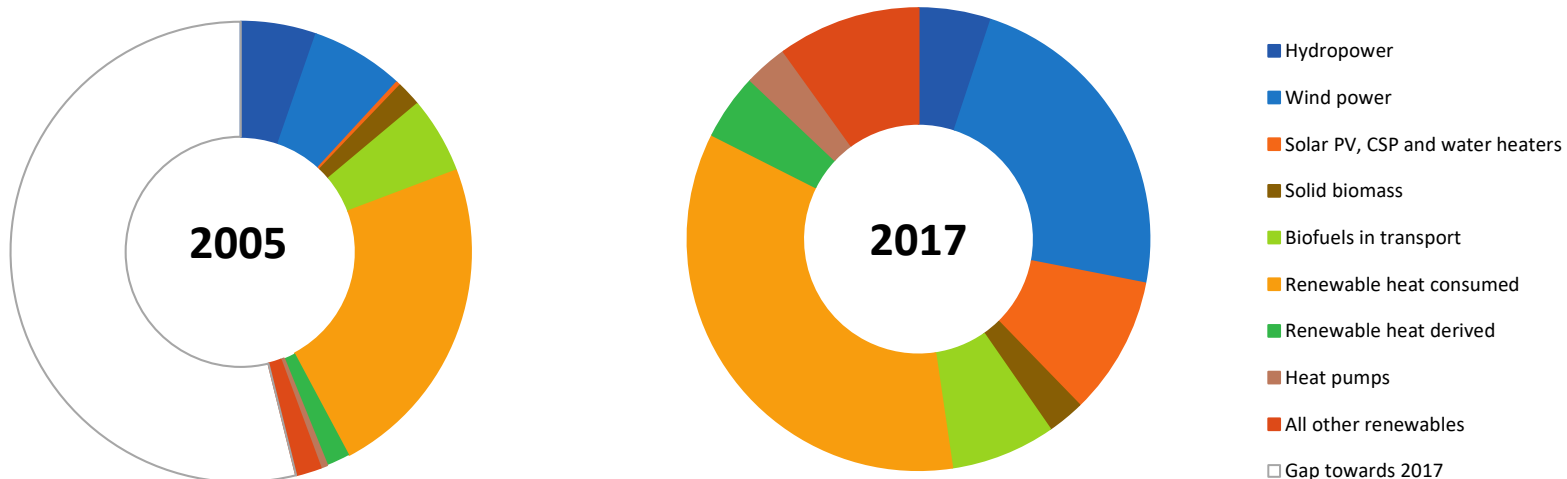


Abbreviations used:

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

Data for 2017

Overall RES share:	15.5%	Avoided fossil fuels:	63.9 [Mtoe]
Overall RES 2020 target:	18.0%	Avoided fuel expenses:	12.8 [billion euro]
Share RES-E in electricity:	34.4%	RES Turnover:	39180 [MEUR]
Share RES-T in transport:	7.0%	RES Employment:	290700 [jobs]
Share RES-H/C in heating:	13.4%		



Source: Eurostat, 2019.

	2005		2017	
	Energy		Energy	Employment / Turnover
Hydropower	1861.9 ktoe		1784.6 ktoe	4600 Jobs / 650 MEUR
Wind power	2286.4 ktoe		8047.2 ktoe	140800 Jobs / 20040 MEUR
Solar PV, CSP and water heaters	110.2 ktoe		3387.9 ktoe	33800 Jobs / 4590 MEUR
Solid biomass	612.8 ktoe		916.3 ktoe	44900 Jobs / 5630 MEUR
Biofuels in transport	1872.3 ktoe		2561.9 ktoe	15500 Jobs / 1640 MEUR
Renewable heat consumed	8033.7 ktoe		12179.6 ktoe	
Renewable heat derived	591.6 ktoe		1615.6 ktoe	
Heat pumps	168.5 ktoe		1060.0 ktoe	9300 Jobs / 1350 MEUR
All other renewables	621.6 ktoe		3474.0 ktoe	
Gap towards 2017	18868.0 ktoe			

Source: Eurostat, EurObserv'ER, 2019.

Hydropower jobs & turnover only covers 'small hydropower'. 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 autoproducer plants. Its counterpart is the final heat consumption in the final consumption sectors (such as households).



CURRENT RENEWABLE ENERGY POLICY

RES-E: The 2014 Renewable Energy Sources Act paved the way for making the energy transition a success. The 2017 revision of the Renewable Energy Sources Act rings in the next phase of the energy transition: from 2017 onwards, funding rates for renewable electricity systems with an installed capacity larger than 1 MW will no longer be fixed by government but will be determined via a market-based auction scheme – representing a fundamental change in funding of renewable energy in Germany. The expansion of renewable energy continues to be one of the key pillars of the energy transition. Germany intends to increase the share of renewable energy from its present level of around 33% up to 40-45% in 2025 and to 55-60% in 2035. The next phase of the energy transition will focus on bringing about more competition, a continuous expansion with effective steering, restrictions on costs, and stakeholder diversity.

RES-H: Within the heat market, the use of renewable energies is regulated by the Renewable Energies Heat Act. Under this law, builders of new buildings are required to generate a percentage of their heating requirements from renewable sources of energy, to undertake certain compensatory measures such as installing additional insulation, or to use combined heat and power systems or district heating. In addition to the Renewable Energies Heat Act, the Federal Government uses the Market Incentive Programme (MAP) to increase the proportion of heat generated from renewable sources. Under this programme, assistance is provided primarily for existing buildings to promote the use of renewable energy technology in the heat market, such as solar thermal installations, wood pellet heating systems and efficient heat pumps. A major instrument for heating/cooling is also the Renewable Energies Heat Act (EEWärmeG), the funding details of which are fleshed out in the Market Incentive Programme (MAP).

RES-T: In the transport sector, biofuels like bioethanol, biodiesel and biogas have been helping to cover the energy supply and to mitigate climate change for several years now. Renewables accounted for 5.2 per cent of the fuel used in the German transport sector in 2017. Electric mobility is low-carbon mobility and helps to bring electricity from renewable sources, such as solar and wind energy, into the transport sector. The use of renewable energy in the transport sector is largely determined by the Biofuel Quota Act. When it comes to the use of electricity in transport, mention should also be made of the Electric Mobility Strategy and, from 2016, the purchase premium of €4000 for electric vehicles.

OVERVIEW OF MAIN SUPPORTING POLICIES

Since the EEG 2017, renewable electricity is mainly supported by auctions. Further, concessional long-term funding is offered by Germany's Bank for Reconstruction (KfW) via its low-interest-rate Renewable Energies Loan Programme (no. 270). Renewable heating and cooling are supported by the regulations in the Renewable Energies Heat Act (EEWärmeG), the Market Incentive Programme (MAP) governed by the Federal Office of Economics and Export Control (BAFA), as well as the mentioned low-interest loans offered by KfW. Numerous support schemes are available for renewable heat on state (Länder) level. Renewable transport fuels are mainly supported by a quota system (Biofuels Quota Act = Biokraftstoffquotengesetz - BiokraftQuG), and through fiscal regulation.

Table 1: Overview of support schemes to promote renewable energy in the Germany¹

	REGULATORY POLICIES					FISCAL INCENTIVE AND PUBLIC FINANCES			
	Feed-in tariff EEG 2017	Tendering / auctions	Quota obligation with Tradable Green certificates	Quota obligation without Tradable Green certificates	Net-metering/ net-billing	Capital subsidy, grants	Tax regulation mechanism I (EIA)	Tax regulation mechanism II	Concessionary loans
RES-E									
- Offshore wind	o	o							o
- Onshore wind	o	o							o
- Solar	o	o							o
- Hydro	o								o
- Geothermal	o								o
- Solid biomass	o	o							o
- Biogas	o								o
RES-H/C									
- Solar thermal	o			o					o
- Geothermal	o			o					o
- Biomass	o			o			o		o
- Biogas	o			o			o		
- Small scale installations, e.g. solar thermal collects, heat pumps, biomass boilers and pellet stoves				o		o	o		o
- Others, i.e. aerothermal, hydrothermal heat pumps				o			o		o
RES-T									
- Bio gasoline			o					o	
- Biodiesel			o					o	
- Electric mobility						o			

¹ Sources : EurObserv'ER, GSR/REN21 2018, RES-Legal Europe (2018)

Table 2: Brief description of key policy instruments aimed at promoting RES in Germany

Instrument	Description
EEG 2017	<p>Small RES-E plants up to 100 kW are eligible for feed-in tariff. The tariff payment period is 20 years from the day of commissioning. For most technologies, there is an annual degression. The level of the feed-in tariff is defined by law and varies according to specificities of the technologies.²</p> <ul style="list-style-type: none"> • Wind Onshore: €ct 4.66 – 8.38 per kWh • Wind offshore: €ct 3.90 – 1.40 per kWh (until 2020) • Solar PV: €ct 7.74 – 11.04 per kWh (market premium) • Solar PV: €ct 7.34 – 10.64 per kWh (fixed feed-in tariff) • Geothermal: €ct 25.2 per kWh • Biogas from bio-waste: €ct 13.05 – 14.88 per kWh • Biogas from manure: €ct 23.14 kWh • Landfill gas: €ct 5.66 – 8.17 per kWh • Sewage gas: €ct 5.66 – 6.49 per kWh • Hydro power €ct 3.47 – 12.40 per kWh • Biomass: €ct 5.71 – 13.32 per kWh
Tenders	<p>After the latest revisions of the EEG (2014 and 2017) tenders were introduced as RE support instruments with the objectives to</p> <ul style="list-style-type: none"> • better steer development of renewables • reduce costs and distribute financial burden, and • improve market integration. <p>PV, wind onshore, wind offshore and biomass are the eligible renewable energy technologies for tenders. For each technology target corridors have been defined:</p> <ul style="list-style-type: none"> • For onshore wind and solar-PV the annual capacity corridor is 2 400 MW to 2 600 MW, • Offshore wind: There is no annual expansion target, but an overall target of 6 500 MW by 2020 and 15 000 MW by 2030. <p>Biomass: The annual capacity addition is 100 MW. These auction processes are carried out by the relevant appointed regulatory authority (Bundesnetzagentur).</p>
EEWG	<p>The Renewable Energy Heat Act (“EEWärmeG”) requires new buildings to source a share of their total energy demand for heating and cooling systems from renewables, such as geothermal heat pumps, solar PV or solar thermal installations. The proportion varies by technology:</p> <ul style="list-style-type: none"> • Minimum 15% of total heating and cooling demand must be met by solar thermal energy, or • Minimum 30% of the total demand when biogas is used, or • Minimum 50% of the total demand when solid biomass, geothermal, district heating, waste heat or co-generation is used.
MAP	<p>The Market Incentive Program (MAP) supports installations of renewable heating and cooling technologies in existing industrial and commercial buildings and thus complements the Renewable Energy Heat Act, which considers only new buildings. Both the German Development Bank (KfW) and the Federal Office of Economics and Export Control (BAFA) offer financial support for renovations of heating systems under the MAP.</p>

² RES Legal 2019: Germany, <http://www.res-legal.eu/search-by-country/germany/single/s/res-e/t/promotion/aid/feed-in-tariff-eeg-feed-in-tariff/lastp/135>

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- [Overview Heat Pumps \(Basic, Innovation, additional support\)](#)
- [Overview Biomass \(Basic, Innovation, additional support\)](#)
- [Overview Solar thermal \(Basic, Innovation, additional support\)](#)

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Details (German only): [https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/F%C3%B6rderprodukte/Erneuerbare-Energien-Standard-\(270\)/](https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/F%C3%B6rderprodukte/Erneuerbare-Energien-Standard-(270)/), last accessed May 2019.

RES Legal 2019: Germany, <http://www.res-legal.eu/search-by-country/germany/single/s/res-e/t/promotion/aid/feed-in-tariff-eeg-feed-in-tariff/lastp/135> , last accessed May 2019.

RES Legal 2018: Germany, <http://www.res-legal.eu/search-by-country/germany> , last accessed June 2018.

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 depression", 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 depression 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.



Disclaimer

This document was prepared by the EurObserv'ER consortium, which groups together Observ'ER (FR), the Energy research Centre of the Netherlands (ECN part of TNO, NL), the Renewables Academy (DE), Frankfurt School of Finance and Management (DE), Fraunhofer-ISI (DE) and Statistics Netherlands (CBS, NL). The information and views set out in this publication are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this study. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use which may be made of the information contained therein.