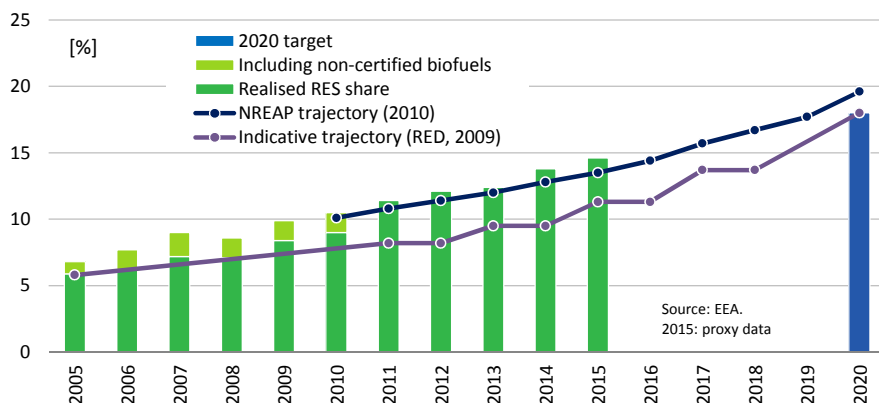


Summary

Main support scheme in Germany: tendering scheme for RES-E, small power plants up to 100 kW are supported by a feed-in tariff. Market Incentive Programme (MAP) for RES-H, Electric Mobility Strategy for the transport sector.

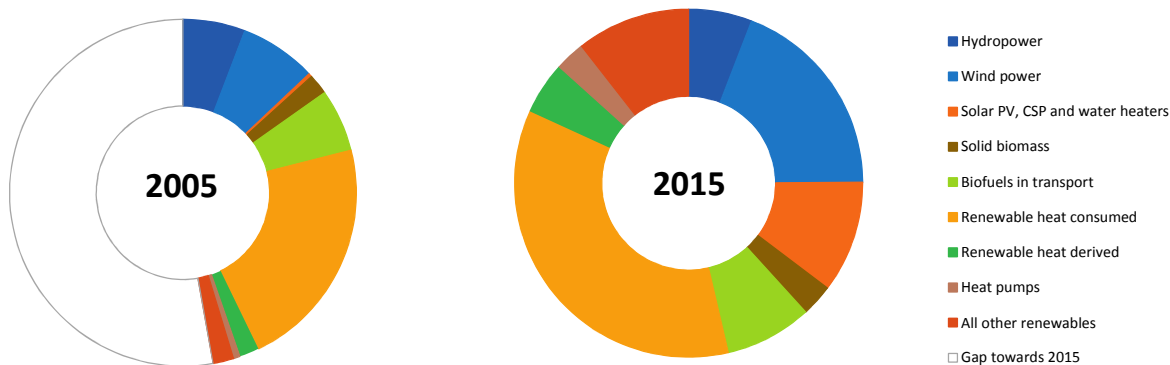


Abbreviations used:

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

Data for 2015

Overall RES share:	14.6%	Avoided fossil fuels:	59.6 [Mtoe]
Overall RES 2020 target:	18.0%	Avoided fuel expenses:	12.7 [billion euro]
Share RES-E in electricity:	30.7%	RES Turnover:	29620 [MEUR]
Share RES-T in transport:	6.8%	RES Employment:	322300 [jobs]
Share RES-H/C in heating:	12.9%		



	2005	2015		
	Energy	Energy	Employment	Turnover
Hydropower	1861.9 ktoe	1890.6 ktoe	6700 Jobs	320 MEUR
Wind power	2290.7 ktoe	6099.2 ktoe	142900 Jobs	11600 MEUR
Solar PV, CSP and water heaters	110.3 ktoe	3329.9 ktoe	42200 Jobs	4000 MEUR
Solid biomass	612.7 ktoe	948.7 ktoe	45400 Jobs	6975 MEUR
Biofuels in transport	1872.7 ktoe	2584.1 ktoe	22800 Jobs	2500 MEUR
Renewable heat consumed	6981.9 ktoe	11380.8 ktoe		
Renewable heat derived	591.6 ktoe	1546.7 ktoe		
Heat pumps	194.2 ktoe	890.0 ktoe	16100 Jobs	1700 MEUR
All other renewables	621.6 ktoe	3388.8 ktoe	52900 Jobs	2845 MEUR
Gap towards 2015	16921.4 ktoe			

Source: Eurostat, EurObserv'ER, 2017.

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 will no longer be fixed by government, but will be determined via a market-based auction scheme – a fundamental change in funding 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, stakeholder diversity.¹

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.² 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 5.3 per cent of the fuel used in the German transport sector in 2015. Electric mobility is low-carbon mobility and helps to bring electricity from renewable sources, such as solar and wind energy, into the transport sector.³ 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 for electric vehicles.⁴

OVERVIEW OF MAIN SUPPORTING POLICIES

Since the EEG 2017, renewable electricity is mainly supported by tendering procedures. Renewable heating and cooling is 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) and low-interest loans offered via the KfW. Numerous support schemes are available for renewable heat on state (Länder) level. Renewable transport fuels are mainly supported by a

¹ BMWi Website, <http://www.bmwi.de/Redaktion/EN/Dossier/renewable-energy.html>

² BMWi Website: <http://www.bmwi.de/Redaktion/EN/Dossier/renewable-energy.html>

³ BMWi Website: <http://www.bmwi.de/Redaktion/EN/Dossier/renewable-energy.html>

⁴ https://www.bmwi.de/Redaktion/EN/Publikationen/renewable-energy-sources-in-figures.pdf?__blob=publicationFile&v=13

quota system (Biofuels Quota Act = Biokraftstoffquotengesetz -BiokraftQuG), and through fiscal regulation.⁵

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

	REGULATORY POLICIES					FISCAL INCENTIVE AND PUBLIC FINANCES			
	Feed-in tariff EEG 2017	Tendering	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	Loans
RES-E									
- Offshore wind	o	o							
- Onshore wind	o	o							
- Solar	o	o							
- Hydro	o								
- Geothermal	o								
- Solid biomass	o	o							
- Biogas	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	

Sources: EurObserv'ER, REN21, RES-Legal (2017)⁶

⁵ EurObserv'ER 2015: <https://www.eurobserv-er.org/pdf/res-policy/EurObservER-RES-Policy-Report-Country-Profile-2015-12-Germany.pdf>

⁶ REN21 Global Status Report 2017, http://www.ren21.net/gsr_2017_full_report_en, page 130.

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

Instrument	Description
EEG 2017	<p>The EEG has promoted renewable energy mainly by stipulating a FiT and by requiring that transmission system operators connect, fully integrate and compensate for the supply of renewable energy fed into the power grid. Transmission system operators do not pay for renewable energy, but rather they fully pass the costs on to consumers. The key elements of the EEG are</p> <p>Grid access</p> <ul style="list-style-type: none"> • Renewables have priority access to the grid • Renewable electricity has priority in transmission and distribution • Transition towards an integrated renewable energy market: <ul style="list-style-type: none"> ○ In addition to the market price, a fixed premium is paid for every kWh from renewables sold on the market ○ With the feed-in premium (FiP) system, renewable energy operators have an incentive to sell electricity on the market when the price is high <p>Payment</p> <ul style="list-style-type: none"> • Tariffs are differentiated by source and size of plant <ul style="list-style-type: none"> ○ Advantages: proportional funding levels for all technologies; support for developing new technologies <p>Financing/budgets</p> <ul style="list-style-type: none"> • Shared costs and independence from government budgets: <ul style="list-style-type: none"> ○ The EEG levy, part of the final electricity paid by consumers, covers the difference between the market price achieved and the tariff (in the FiT system), including the premiums (in the FiP system) ○ Specific electricity-intensive industries which are exposed to international competition pay only a reduced Levy <p>Financing/budgets</p> <ul style="list-style-type: none"> • Annual degression of all tariffs to organise the transition towards a self-sufficient renewables market
EEWG	<p>The Renewable Energy Heat Act (“EEWärmeG”) was enforced in 2009 and 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. <p>Hence the requirements of the Renewable Energy Heat Act are fulfilled if at least 15% of the total heating and cooling demand of a building is delivered by solar thermal energy. In addition, the law requires public buildings to use renewables for heating and cooling when undertaking renovations with lower targets: 25% if biogas is used, and 15% for any other technology.</p>
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)</p>

	<p>and the Federal Office of Economics and Export Control (Bundesamt für Wirtschaft und Ausfuhrkontrolle – BAFA) offer financial support for renovations of heating systems under the MAP. The target of MAP is to increase the renewable heating and cooling share from around 10% to 14% by 2020. Several measures are linked to requirements of the EU Energy Efficiency Directive and were implemented in 2011.</p>
Tenders	<p>After many successful years, the EEG required major reform. The frequent evaluations and adjustments of the EEG in 2000-2014 aimed to create better co-ordination, precision and efficiency, as well as improved market integration to achieve the Energiewende objectives. a major revision of the EEG took place in order to achieve the following objectives:</p> <ul style="list-style-type: none"> • steer development of renewables reduce costs • distribute financial burden, and • improve market integration. <p>The following key areas have been reviewed, and changes have been implemented:</p> <ul style="list-style-type: none"> • Better co-ordination to steer renewable capacity development: The “target corridor” fixes a technology-specific amount of additional capacity to be installed annually. The EEG amendment of 2014 sets those target corridors and flexible degression rates. BNetzA collects and publishes data on monthly capacity additions of all new renewable power plants. The degression rate depends on capacity additions of the past 12 months. The binding target corridors set annual capacity additions for all technologies. If additions exceed these targets, degression rates are increased (= lower FiT); if additions do not reach the targets, degression rates are reduced (= higher FiT). • Planning: Definition of technology-specific target corridors for additional installed capacity, steered through degression of tariffs • Solar-PV: The annual capacity corridor is 2 400 MW to 2 600 MW, with an overall cap of 52 GW of installed capacity. If this capacity is reached, FiT support will expire. The new degression rates started on 1 September 2014, and tariffs can be reduced on a monthly basis. • Onshore wind: As with solar PV, the annual capacity corridor is 2 400 MW to 2 600 MW, but it is based on net capacity additions, i.e., after balancing net capacity growth through repowering of old machines. The new degression rates (BMWi, 2014c) are proposed to start on 1 January 2016; tariffs can be reduced every three months, and the level can be adjusted every three months. • Offshore wind: There is no annual expansion target, but rather an overall target of 6 500 MW by 2020 and 15 000 MW by 2030. • Biomass: The annual capacity addition is 100 MW.

For further information:

BMWi: <http://www.bmwi.de/Redaktion/EN/Dossier/renewable-energy.html>, last accessed June 2017.

EEA 2017: Progress of renewable energy sources, European Environmental Agency (EEA), <https://www.eea.europa.eu/data-and-maps> (European Union), last accessed June 2017.

European Commission: Member State Progress Report, <http://ec.europa.eu/energy/en/topics/renewable-energy>

IRENA 2015: Remap 2030. A renewable Energy Roadmap. Renewable energy prospects: Germany, http://www.irena.org/DocumentDownloads/Publications/IRENA_REmap_Germany_report_2015.pdf, last accessed June 2017.

IRENA 2013: RENEWABLE ENERGY COUNTRY PROFILES, EUROPEAN UNION, <http://www.irena.org/DocumentDownloads/Publications/EU27Complete.pdf>, June 2013, last accessed June 2017.

REN 21: Global Status Report 2017, http://www.ren21.net/gsr_2017_full_report_en, page 130, last accessed June 2017.

RES Legal 2017: Germany, <http://www.res-legal.eu/search-by-country/germany>, last accessed June 2017.

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.



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