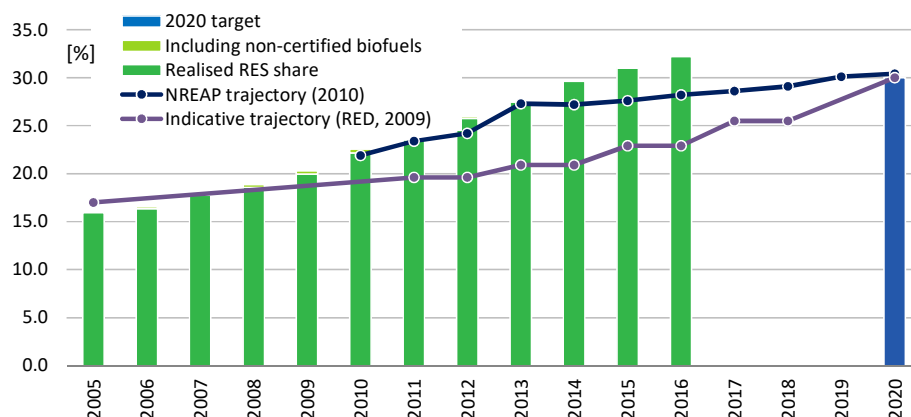


Summary

Denmark surpassed its 2020 nationally binding renewable energy target in 2015. In March 2012 an Energy Agreement was reached in Denmark. The Agreement contains a wide range of ambitious initiatives, which aims at bringing Denmark closer to the target of 100% renewable energy in the energy and transport sectors by 2050. Main support measures to promote renewable energy in Denmark consist of a feed-in premium scheme (combined with tenders for offshore wind), net-metering, a biofuels quota scheme, tax regulation mechanisms and subsidy schemes.



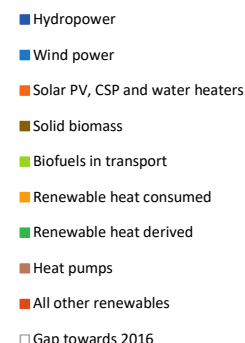
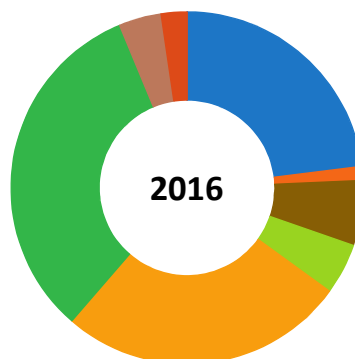
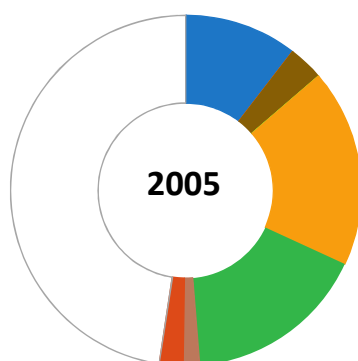
Source: EEA, Eurostat

Abbreviations used:

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

Data for 2016

Overall RES share:	32.2%	Avoided fossil fuels:	10.1 [Mtoe]
Overall RES 2020 target:	30.0%	Avoided fuel expenses:	5.4 [billion euro]
Share RES-E in electricity:	53.7%	RES Turnover:	7370 [MEUR]
Share RES-T in transport:	6.8%	RES Employment:	43000 [jobs]
Share RES-H/C in heating:	41.7%		



Source: Eurostat, 2018.

	2005	2016	2016	2016
	Energy	Energy	Employment	Turnover
Hydropower	2.5 ktoe	1.9 ktoe	> 100 Jobs	< 10 MEUR
Wind power	521.7 ktoe	1157.0 ktoe	26600 Jobs	4600 MEUR
Solar PV, CSP and water heaters	0.2 ktoe	64.0 ktoe	4400 Jobs	730 MEUR
Solid biomass	162.9 ktoe	299.3 ktoe	8500 Jobs	1450 MEUR
Biofuels in transport	0.0 ktoe	235.6 ktoe	200 Jobs	30 MEUR
Renewable heat consumed	914.9 ktoe	1326.2 ktoe		
Renewable heat derived	846.9 ktoe	1626.4 ktoe		
Heat pumps	75.5 ktoe	195.7 ktoe	2100 Jobs	340 MEUR
All other renewables	110.0 ktoe	118.5 ktoe	1200 Jobs	220 MEUR
Gap towards 2016	2390.1 ktoe			

Source: Eurostat, EurObserv'ER, 2018.

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).



The Danish renewables policy in a few words

Denmark surpassed its 2020 nationally binding renewable energy target in 2015. In March 2012 an Energy Agreement was reached in Denmark. The Agreement contains a wide range of ambitious initiatives, which aims at bringing Denmark closer to the target of 100% renewable energy in the energy and transport sectors by 2050. Main support measures to promote renewable energy in Denmark consist of a feed-in premium scheme (combined with tenders for offshore wind), net-metering, a biofuels quota scheme, tax regulation mechanisms and subsidy schemes.

CURRENT RENEWABLE ENERGY POLICY

In March 2012 an Energy Agreement was reached in Denmark. The Agreement contains a wide range of ambitious initiatives, which aims at bringing Denmark closer to the target of 100% renewable energy in the energy and transport sectors by 2050. The Energy Agreement ensures a substantial expansion of wind power in particular, corresponding to the annual electricity consumption of 1½ million households. Currently, the number of households in Denmark is slightly less than 2.7 million.

Highlighted initiatives to expand renewable energy production include:

- 1000 MW offshore wind turbines in bidding rounds with consumer paid subsidies;
- 500 MW offshore wind turbines in coastal areas (also in bidding rounds);
- new planning tools will encourage an increase in net capacity of 500 MW onshore wind power in total an increase of 2000 MW in addition to the current capacity of wind turbines of around 4000 MW.

Denmark entered into a cooperation agreement with Germany in 2016 concerning the mutual opening of tenders for support for solar cells to plants located in the other country. Solar photovoltaic plants in Germany will therefore be able to receive support from Denmark, and solar photovoltaic plants in Denmark will be able to receive support from Germany.

OVERVIEW OF MAIN SUPPORTING POLICIES

Denmark has opted for different supporting policies for promoting renewable energy sources in the electricity, heating and cooling, and transport sectors.

Electricity from renewable sources is mainly promoted through a floating premium tariff. The sum of the market price and the bonus shall not exceed a statutory maximum per kWh, which depends on the source of energy used and the date of connection of a given plant. The applicable premium tariffs for offshore wind parks are awarded through tenders. Prosumers are eligible for net-metering. They are totally or partly exempt from paying Public Service Obligation on this electricity. The Public Service Obligation is a charge levied to support renewable energy. Associations of wind energy plant owners and other local initiatives may apply for guarantees for loans for feasibility studies that are conducted in the run-up to the construction of a wind-energy plant.

Renewable energy sources for heating purposes are exempt from tax obligations on the production, supply and use of energy sources, thereby receiving a tax benefit in comparison to other fuels for heating purposes. Moreover, the use of biogas for heating purposes is supported through a direct premium tariff.

The main incentive for *renewable energy use in transport* is a biofuels quota scheme. Moreover biofuels are eligible to reduced tax obligations on the production, supply and use of energy sources as compared to fossil transport fuels. Framework conditions for biogas development have been improved through the introduction of a direct tariff for use of biogas for heating and transport. Purchase subsidies are granted for electric vehicles up to 2500 DKK/vehicle. No purchase tax is imposed on fuel cell electric vehicles; battery electric vehicles pay 40% compared to 150% for internal combustion vehicles. Companies that supply electric vehicle charging on a commercial basis can receive an electricity tax rebate that amounts to approximately 1 DKK per kWh. Besides a range of local municipal and infrastructural fiscal incentives regarding electric vehicles are in place.

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

	REGULATORY POLICIES					FISCAL INCENTIVE AND PUBLIC FINANCES		
	Feed-in premium	Premium tariff	Quota obligation with certificates system	Tendering	Net-metering/ net-billing	Capital subsidy, grants	Tax regulation mechanism	Direct premium
RES-E								
- Offshore wind	o			o				
- Onshore wind	o				o			
- Solar	o				o			
- Hydro					o			
- Geothermal								
- Solid biomass	o				o			
- Biogas	o				o			
RES-H/C								
- Solar thermal							o	
- Geothermal							o	
- Biomass							o	
- Biogas							o	o
- Large ambient heat application								
- Small scale installations, e.g. solar thermal collects, heat pumps, biomass boilers and pellet stoves								
- Others, i.e. aerothermal, hydrothermal								
RES-T								
- Bio gasoline			o					
- Biodiesel			o					
- Biogas								o

Sources: EurObserv'ER, GSR/REN21, RES-Legal Europe (2017)

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

<i>Instrument</i>	<i>Description</i>
Feed-in premium	Support is provided, in the form of feed-in premiums, for electricity generation based on renewable energy and for the upgraded biogas supplied to the natural gas network. Offshore wind farms installed following a tender process are subject to separate incentives (see below).
Tenders for offshore wind farms	Support for offshore wind farms are subject to tenders. Settlements and subsidies are therefore not fixed until the tenders have been completed. This is to ensure that the lowest possible support costs are achieved through good competition.
Tax benefit	At present there is no energy tax on renewable energy based fuels for heating and cooling purposes. This provides a tax benefit for renewables in comparison to other fuels, which are taxed on the basis of their carbon content.
Loan guarantees for local wind energy initiatives	Denmarks transmission system operator, Energinet.dk, provides loan guarantees for wind turbine owners associations or other local initiative groups meeting certain conditions for loans to finance feasibility studies, e.g. siting studies and technical and financial considerations, as well as to prepare applications, with a view to installing one or more wind turbines. The installed turbines must not be for the owner;s use. A maximum guarantee of DKK 500,000 may be granted per project.
Green scheme	Local authorities can apply for support from Energinet.dk for projects that benefit the landscape and recreational opportunities in the local area and for cultural and information activities. The funding pool that can be made available to the municipal authority amounts to DKK 88 000 per MW of new wind turbines actually erected.
Investment grant scheme for promoting renewable energy and district heating	An investment grant scheme is established for undertakings using process energy that convert from the use of fossil fuels to renewable energy or district heating.

For further information:

EEA, 2017. [1] EEA, 2017, <http://www.eea.europa.eu/data-and-maps/daviz/actual-res-progress-indicative-trajectory-2>

EurObserv'ER 16th annual overview barometer, <https://www.eurobserv-er.org/category/all-annual-overview-barometers>

International Energy Agency (IEA) database on policies and measures ,
<https://www.iea.org/policiesandmeasures/pams/denmark/name-24649-en.php>

Global Status Report by REN21, <http://www.ren21.net/gsr-2017>

Member State Progress Report, available at the Renewable Energy pages of the European Commission, <https://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports>

RES Legal database: <http://www.res-legal.eu/search-by-country/denmark>

https://ec.europa.eu/commission/sites/beta-political/files/energy-union-factsheet-denmark_en.pdf
(European Commission/ DG ENER, Energy Union Factsheet Denmark, November 2017)

European Alternative Fuels Observatory, <http://www.eafo.eu/content/denmark> ;
<http://www.eafo.eu/eu>

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.



This project is funded
by the European Union under
contract n° ENER/C2/2016-487/SI2.742173

Disclaimer

This document was prepared by the EurObserv'ER consortium, which groups together Observ'ER (FR), the Energy research Centre of the Netherlands (ECN, NL), the Renewables Academy (RENAC, 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.