

Translator's note: Please be aware that in the original document, in Table 4 on page 19 (page 20 in the translation), a figure in the second column is given as ‘.787’. It appears that a thousands digit is missing from this figure (in Danish a full stop is used for the thousands separator and a comma for the decimal separator). Because it is impossible to know for certain what this digit should be or even whether this assumption is correct, I have left this figure exactly as it appears in the original.

Danish report under Directive 2009/28/EC concerning progress in the promotion and use of energy from renewable sources

Introduction

Article 22 of Directive 2009/28/EC requires Member States to submit a report to the Commission on progress in the promotion and use of energy from renewable sources by 31 December 2011, and every two years thereafter. The sixth report, to be submitted by 31 December 2021, shall be the last report required.

This report is the fourth Danish submission and follows the template prepared by the Commission for this purpose. The template comprises a series of questions numbered from 1 to 12, with accompanying tables and guideline text in italics.

Denmark's Renewable Energy¹ Action Plan was submitted to the Commission in June 2010. This action plan was most recently updated through the Energy Policy Agreement of 2012, which sets out specific energy policy initiatives up until 2020 (see Annex 1).

This progress report contains a description of the situation in 2015 and 2016. The figures have thus been calculated for the 2015 and 2016 calendar years, and the information contained in the report focuses on the period up to and including 2017. This report updates the information in the Renewable Energy Action Plan and its implementation.

All figures have been calculated in the same way as in Denmark's Renewable Energy Action Plan, i.e. in ktoe, MW, GWh, etc., as required by the Commission. In addition, the figures are also presented in TJ.

¹ In Danish: *vedvarende energi*, VE

1. Sectoral and overall shares and actual consumption of energy from renewable sources in the preceding 2 years (n-1; n-2 e.g. 2010 and 2009) (Article 22(1)(a) of Directive 2009/28/EC).

Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources²

	2015	2016
RES-H&C ³ (%)	40.12 %	41.68 %
RES-E ⁴ (%)	51.33 %	53.73 %
RES-T ⁵ (%)	6.66 %	6.76 %
Overall RES share ⁶ (%)	30.98 %	32.18 %
Of which from cooperation mechanism ⁷ (%)		
Surplus for cooperation mechanism ⁸ (%)		

Notes on the figures in Tables 1, 1a, 1d and 4:

The use of biofuels in the transport sector and of bioliquids in the electricity and heating sector must be sustainable within the meaning of the RE Directive in order to be included. It has not been verified whether the use of bioliquids (bio-oil) in the electricity and heating sector is sustainable. Bioliquids are therefore not included in Tables 1, 1a, 1d and 4.

In the case of undertakings that are covered by quotas, if the CO₂ emission factor for bioliquids is to be set to zero, sustainability would have to be documented from 2013 onwards. However, it is believed that the total quantities will be very small.

With regard to biofuels for transport, the sustainability criteria in the RE Directive have been implemented in Danish legislation since 1 January 2010. The companies bound by the legislation have added a minimum of 5.75 % sustainable biofuels in the transport sector since 2012 (based on energy content).

Renewable energy sources for heating include an estimate for RE from heat pumps in Tables 1, 1a, 1c and 1d.

Table 1a: Calculation table for the renewable energy contribution of each sector to final energy consumption (ktoe)⁹

² Facilitates comparison with Table 3 and Table 4a of the NREAPs.

³ Share of renewable energy in heating and cooling: gross final consumption of energy from renewable sources for heating and cooling (as defined in Article 5(1)(b) and (4) of Directive 2009/28/EC divided by gross final consumption of energy for heating and cooling. The same methodology as in Table 3 of NREAPs applies.

⁴ Share of renewable energy in electricity: gross final consumption of electricity from renewable sources for electricity (as defined in Article 5(1)(a) and (3) of Directive 2009/28/EC divided by total gross final consumption of electricity. The same methodology as in Table 3 of NREAPs applies.

⁵ Share of renewable energy in transport: final energy from renewable sources consumed in transport (cf. Article 5(1)(c) and (5) of Directive 2009/28/EC divided by the consumption in transport of 1) petrol; 2) diesel; 3) biofuels used in road and rail transport and 4) electricity in land transport (as reflected in row 3 of Table 1). The same methodology as in Table 3 of NREAPs applies.

⁶ Share of renewable energy in gross final energy consumption. The same methodology as in Table 3 of NREAPs applies.

⁷ In percentage point of overall RES share.

⁸ In percentage point of overall RES share.

⁹ Facilitates comparison with Table 4a of the NREAPs.

Ktoe/year	2015	2016
(A) Gross final consumption of RES for heating and cooling	2 908.4	3 148.4
(B) Gross final consumption of electricity from RES	1 522.9	1 623.3
(C) Gross final consumption of energy from RES in transport	246.7	252.9
(D) Gross total RES consumption ¹⁰	4 678.0	5 024.6
(E) Transfer of RES to other Member States		
(F) Transfer of RES from other Member States and third countries		
(G) RES consumption adjusted for target (D)-(E)+(F)	4 678.0	5 024.6

TJ/year	2015	2016
(A) Gross final consumption of RES for heating and cooling	121 769	131 817
(B) Gross final consumption of electricity from RES	63 761	67 964
(C) Gross final consumption of energy from RES in transport	10 329	10 588
(D) Gross total RES consumption ⁹	195 859	210 370
(E) Transfer of RES to other Member States		
(F) Transfer of RES from other Member States and third countries		
(G) RES consumption adjusted for target (D)-(E)+(F)	195 859	210 370

¹⁰ According to Article 5(1) of Directive 2009/28/EC gas, electricity and hydrogen from renewable energy sources shall only be considered once. No double counting is allowed.

Table 1b: Total actual contribution (installed capacity, gross electricity generation) from each renewable energy technology in Denmark to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity¹¹

	2015		2016	
	MW	GWh	MW	GWh
Hydro ¹² :	7.0	16.0	10.0	22.5
non-pumped	7.0	17.6	10.0	25.0
< 1 MW	3.0	5.0	4.0	6.5
1 MW-10 MW	4.0	12.6	6.0	18.5
> 10 MW	0.0	0.0	0.0	0.0
pumped	0.0		0.0	
mixed ¹³	0.0	0.0	0.0	0.0
Geothermal	0.0	0.0	0.0	0.0
Solar:	782.0	604.3	851.0	743.8
<i>photovoltaic</i>	782.0	604.3	851.0	743.8
<i>concentrated solar power</i>	0.0	0.0	0.0	0.0
Tide, wave, ocean	0.0	0.0	0.0	0.0
Wind:	5 076.0	13 064.5	5 245.0	13 455.4
<i>onshore</i>				
<i>offshore</i>				
Biomass ¹⁴ :	1 078.0	3 278.5	1 140.0	3 996.0
<i>solid biomass</i>	973.0	2 802.6	1 030.0	3 481.1
<i>biogas</i>	104.0	475.9	110.0	514.9
<i>bioliquids</i>	1.0	0.0	0.0	0.0
TOTAL	6 943.0	16 963.2	7 246.0	18 217.7
<i>of which in CHP</i>		3 277.7		3 995.2

¹¹ Facilitates comparison with Table 10a of the NREAPs.

¹² Normalised in accordance with Directive 2009/28/EC and Eurostat methodology.

¹³ In accordance with new Eurostat methodology.

¹⁴ Take into account only those complying with applicable sustainability criteria, cf. the last subparagraph of Article 5(1) of Directive 2009/28/EC.

Table 1c: Total actual contribution (final energy consumption¹⁵) from each renewable energy technology in Denmark to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in heating and cooling (ktoe)¹⁶

Ktoe/year	2015	2016
Geothermal (excluding low temperature geothermal heat in heat pump applications)	1.7	2.7
Solar	36.7	49.5
Biomass ¹⁷ :	2 312.3	2 505.8
<i>solid biomass</i>	2 221.9	2 346.9
<i>biogas</i>	86.2	156.5
<i>bioliquids</i>	4.2	2.4
Renewable energy from heat pumps:	175.0	195.7
- of which aerothermal	97.1	111.2
- of which geothermal	77.9	84.5
- of which hydrothermal	0.0	0.0
TOTAL	2 525.7	2 753.7
<i>Of which DH¹⁸</i>		
<i>Of which biomass in households¹⁹</i>	962.8	1 011.7

NB: Heat pumps at district heating plants etc. are not broken down by type.

NB: Biomass in households excludes biomass included in the households' district heating consumption.

TJ/year	2015	2016
Geothermal (excluding low temperature geothermal heat in heat pump applications)	70	112
Solar	1 537	2 072
Biomass ¹⁶ :	96 812	104 913
<i>solid biomass</i>	93 027	98 259
<i>biogas</i>	3 611	6 554
<i>bioliquids</i>	174	100
Renewable energy from heat pumps:	7 326	8 194
- of which aerothermal	4 063	4 655
- of which geothermal	3 263	3 540
- of which hydrothermal	0	0
TOTAL	105 746	115 291
<i>Of which DH¹⁷</i>		
<i>Of which biomass in households¹⁸</i>	40 311	42 357

Table 1d:

Table 1d:

Total actual contribution from each renewable energy technology in Denmark to meet the binding 2020

¹⁵ Direct use and district heat as defined in Article 5(4) of Directive 2009/28/EC.

¹⁶ Facilitates comparison with Table 11 of the NREAPs.

¹⁷ Take into account only those complying with applicable sustainability criteria, cf. the last subparagraph of Article 5(1) of Directive 2009/28/EC.

¹⁸ District heating and/or cooling from total renewable heating and cooling consumption (RES-DH).

¹⁹ From the total renewable heating and cooling consumption.

targets and the indicative interim trajectory for the shares of energy from renewable resources in the transport sector (ktoe)^{20, 21}

	2015	2016
- Bioethanol	44	44
- Biodiesel (FAME)	170	173
- Hydrotreated Vegetable Oil (HVO)		
- Biomethane		
- Fischer-Tropsch diesel		
- Bio-ETBE		
- Bio-MTBE		
- Bio-DME		
- Bio-TAEE		
- Biobutanol		
- Biomethanol		
- Pure vegetable oil		
Total sustainable biofuels	214	217
Of which:		
sustainable biofuels produced from feedstock listed in Annex IX Part A		2
other sustainable biofuels eligible for the target set out in Article 3(4)(e)		
sustainable biofuels produced from feedstock listed in Annex IX Part B		23
sustainable biofuels for which the contribution towards the renewable energy target is limited according to Article 3(4)(d)		195
Imported from third countries		
Hydrogen from renewables		
Renewable electricity	19	19
Of which:		
consumed in road transport		
consumed in rail transport	19	19
consumed in other transport sectors		
others (please specify)		
others (please specify)		

NB: There is no statistical data on consumption in 2015 broken down into biofuels produced from feedstock listed in Annex IX Part A and Annex IX Part B respectively and biofuels for which the contribution is limited according to Article 3(4)(d).

2. Measures taken in the preceding 2 years and/or planned at national level to promote the growth of energy from renewable sources taking into account the indicative trajectory for achieving the national RES targets as outlined in your National Renewable Energy Action Plan (*Article 22(1)(a) of Directive 2009/28/EC*).

See Table 2 at the end of the report.

²⁰ For biofuels take into account only those compliant with the sustainability criteria, cf. the last subparagraph of Article 5(1).

²¹ Facilitates comparison with Table 12 of the NREAPs.

2.a Please describe the progress made in evaluating and improving administrative procedures to remove regulatory and non-regulatory barriers to the development of renewable energy (Article 22(1)(e) of Directive 2009/28/EC).

One-stop shop for offshore wind turbines

The administrative procedures for licensing offshore wind farms in Denmark have been simplified and are predictable for enterprises wishing to erect offshore wind farms. There is a 'one-stop shop' procedure which means that all the main licences for preliminary surveys, establishment and power generation are issued by the Danish Energy Agency [Energistyrelsen]. The Danish Energy Agency coordinates the licences with all other relevant authorities, so, for example, terms relating to shipping which come under the Danish Maritime Authority [Søfartsstyrelsen] are included in the Danish Energy Agency's licences.

The offshore wind farms that are put out to tender utilise a dialogue-based tendering model, whereby the tenderers provide input regarding the terms of the licences so that the terms can be seen to be as transparent and favourable as possible. Furthermore, the licences for preliminary surveys and establishment are prepared in advance by the Danish Energy Agency (known as 'model licences') so that the licences can be issued as soon as the contract for the offshore wind farm has been signed. This substantially reduces the administrative burden on the enterprises.

The two most recent tenders for offshore wind farms (coastal areas together with Kriegers Flak) were evaluated in an internal evaluation procedure in the spring of 2017, in which the stakeholders were consulted on the terms, process and possible improvements.

2.b Please describe the measures in ensuring the transmission and distribution of electricity produced from renewable energy sources and in improving the framework or rules for bearing and sharing of costs related to grid connections and grid reinforcements (Article 22(1)(f) of Directive 2009/28/EC).

Denmark has a tradition of ensuring transparent and non-discriminatory connection of renewable energy installations to the electricity transmission grid. Danish legislation implements Article 16 of the RE Directive concerning access to and operation of the grids.

Plans for increased connections with neighbouring countries

The growing amount of renewable energy in the electricity system is characterised by fluctuations. RE has to be incorporated into the electricity system by means of domestic electricity generating plants, new electricity consumption (heat pumps and electric vehicles) and exchange opportunities with other countries. Connections with foreign countries are particularly important as a result of a massive reduction in domestic thermal capacity. The following projects have been approved for set-up since 2015:

- Upgrading the connection between eastern Jutland and Germany.
- A connection between western Jutland and Germany.
- A connection to the United Kingdom, known as the 'Viking Link'.
- A political decision has been taken on the connection of offshore turbines at Kriegers Flak and the connection from there to Germany with a view to entry into operation at the end of 2018.
- The Cobra connection to the Netherlands, expected to enter into operation in 2019.

In addition, upgrades to the existing 150 kV OHL between Endrup and Idomlund in western Jutland have been approved, which will enable more renewable energy to be incorporated into the electricity system.

Smart and flexibly priced electricity consumption

Flexible consumption is expected to become increasingly important in the future. The volume is currently very small, primarily because the economic incentives are not big enough to shift consumption. However, there are both socio-economic and financial gains to be had by consumers by shifting consumption from times when the electricity price is high to times when it is low. The electricity price is typically low when a lot of wind power is generated, and because the extent to which power can be stored is limited, consumption should be adapted more to generation. The Danish Ministry of Energy, Utilities and Climate is therefore working to create a better framework for exploiting this potential. Among other benefits, the roll-out of smart meters and the introduction of flexible billing before the end of 2020 will enable continuous settlement of actual consumption per hour for large and small customers, which can thereby make it economically advantageous for individual users to shift part of their electricity consumption to times with ample green energy, inexpensive electricity and low network loads.

Criteria for downward adjustment

Energinet [a subsidiary of the Danish Ministry of Energy, Utilities and Climate which owns the electricity and gas infrastructure in Denmark] is responsible for operating the interconnected electricity supply system and for maintaining balance and supply security in the grid. One of Energinet's tasks is to maintain a balance in the grid by making adjustments (upwards or downwards) to electricity generation at power stations that are connected to the grid.

As noted in point 4.2.7(b) of the RE Action Plan, downward adjustment in the case of power stations that use renewable energy sources can only take place subject to certain special conditions. The authorities are also responsible for the criteria for downward adjustment. In the past, competence was shared between the Danish Energy Regulatory Authority [Energitilsynet] and the Danish Energy Agency. This was changed by Act No 466 of 18 May 2011, so that the Danish Energy Regulatory Authority alone undertakes the task (amendments to the Danish Acts on electricity supply, natural gas supply, heating supply, Energinet and the promotion of renewable energy).

Provisions concerning reporting in the event of important measures to limit renewable energy sources and the specification of rectification measures are set out in Order No 891 of 17 August 2011 on transmission system operation and the use of the electricity transmission grid, etc.

Organisation and distribution of costs in relation to grid connection and grid reinforcement/expansion

The conditions are governed by Order No 1115 of 18 September 2015 on the connection of wind turbines to the grid and premiums for wind-turbine-generated electricity, etc. Owners of wind turbines must pay connection costs through to a certain specified connection point. All costs for grid reinforcement and expansion are covered by the grid and transmission enterprises.

The Order also contains provisions requiring grid and transmission enterprises to give wind turbine owners that request a grid connection all necessary information, including a detailed estimate of all expenses that would be entailed in the connection process, a reasonable and accurate schedule for receipt and processing of the application for grid connection and a reasonable schedule for the grid connection itself.

In the case of power stations that use renewable energy sources other than wind, a similar information provision is laid down in Order No 569 of 2 June 2014 on conditions and procedures for the granting of permission to establish new electricity generation stations and important modifications to existing stations.

Work is currently in progress on the future model for organising costs in relation to grid connection, but the final model is not yet known.

New financial regulation of electricity grid enterprises

Electricity grid enterprises are subject to a new financial regulation as of 1 January 2018. The new regulation is an incentive-based financial regulation with the objective of giving grid enterprises an inducement to efficiently operate, maintain, renovate and expand the distribution network. This will ensure an effective electricity distribution sector with reasonable prices for consumers and continued high supply security.

An important element of the new financial regulation is to ensure that grid enterprises have a high degree of flexibility regarding using their funds to increase the efficiency of operations or investments. This is due in part to considerations of greening, whereby implementing a smart grid can mean that the share of operating costs in grid enterprises' expenses can increase. Therefore the greatest possible care has been taken to avoid the regulation causing any distortion of grid enterprise incentives that promote traditional investments in the physical grid. In addition, a regulation that is neutral regarding investment types is desirable because it supports cost effectiveness.

Another important element of the new financial regulation is ensuring that it has enough flexibility to take into account that the grid enterprises' role in green conversion can result in significant developments in their expenses. This requires on the one hand that the grid enterprises can raise the capital needed for necessary investments by being able to offer market-appropriate, risk-adjusted returns, and on the other hand that the grid enterprises' financial framework is recalibrated on an ongoing basis. Both criteria have been implemented in the new financial regulation. The regulation offers incentives for cost effectiveness for both investments and operations. Therefore it is expected that the regulation will support a cost-effective green conversion, reasonable consumer prices and continued high quality of supply.

3. Please describe the support schemes and other measures currently in place that are applied to promote energy from renewable sources and report on any developments in the measures used with respect to those set out in your National Renewable Energy Action Plan (Article 22(1)(b) of Directive 2009/28/EC).

The requested description of support schemes and other measures can be found below under Section 3.0 (3.0.1-3.0.9).

3.0.1 Financial support

Support is provided for electricity generation based on renewable energy and for the use of biogas for upgrading, processing, transport and heat. Support for upgrading of biogas is laid down in the Danish Natural Gas Supply Act [lov om naturgasforsyning], while the other support schemes are laid down in the Danish Act on the promotion of renewable energy [lov om fremme af vedvarende energi] (the RE Act). The support is provided in the form of premiums for:

- A. wind turbines (Sections 35a to 43 of the RE Act)
- B. biogas etc. (Sections 43a to 43e of the RE Act and Section 35c of the Natural Gas Supply Act)
- C. biomass (Sections 44, 45 and 46 of the RE Act)
- D. photovoltaic cells and other RE plants (Sections 47 and 48 of the RE Act)

A. Premiums for wind turbines

Wind turbines with the exception of offshore turbines put out to tender and domestic turbines:

For wind turbines connected to the grid in the period from 21 February 2008 to 31 December 2013 (inclusive), a premium of DKK 0.25 per kWh is paid for electricity generation corresponding to the first 22 000 hours of generation at the wind turbine's installed power rating (full-load hours) following connection to the grid.

In the case of wind turbines connected to the grid in the period from 1 January 2014 to 20 February 2018 inclusive, a premium of DKK 0.25 per kWh is paid for electricity generation equivalent to the sum of 6 600 hours of electricity generation at the wind turbine's installed power rating (full-load hours) and electricity generation based on 5.6 MWh per square metre of rotor area. The premium is granted from the moment of connection to the grid. The premium of DKK 0.25 and the market price combined must not exceed DKK 0.58 per kWh. The premium will thus be reduced as the market price rises above DKK 0.33 per kWh.

Moreover, compensation for balancing costs for electricity from wind turbines is paid. This follows from the European Commission's authorisation of the fact that the compensation must not exceed the average balancing cost. In this context, the balancing compensation has been adjusted downwards from DKK 0.023 per kWh to DKK 0.018 per kWh as of 1 January 2016 and again from DKK 0.018 per kWh to DKK 0.013 per kWh as of 1 January 2017 in order to fulfil the European Commission's requirement.

Offshore wind turbines put out to tender:

The Danish State completed the tender for establishing the offshore wind farm Horns Rev 3 with 400 MW in 2015 and the tender for the two inshore wind farms Vesterhav Syd and Vesterhav Nord with a total of 350 MW, as well as the offshore wind farm Kriegers Flak with 600 MW, in 2016. The winning price per kWh for the three tenders was DKK 0.77, DKK 0.475 and DKK 0.372, respectively, paid out in the first 50 000 full-load hours, which corresponds to approximately 12 years of generation.

Domestic wind turbines:

A premium is paid for electricity that is supplied to the electricity distribution grid from a wind turbine with an installed power rating of 25 kW or less which is connected to a private

consumer installation. For domestic wind turbines connected to the grid no later than 19 November 2012, the premium is set in such a way that the premium and the market price together amount to DKK 0.60 per kWh. For domestic wind turbines connected to the grid between 20 November 2012 and 31 December 2015 inclusive, the premium is set in such a way that the premium and the market price together amount to DKK 2.50 per kWh for wind turbines with an installed power rating of 10 kW or less, and DKK 1.50 per kWh for wind turbines with an installed power rating above 10 kW and up to 25 kW inclusive. In the period 2016-2019 there is an option to obtain a commitment for a premium on electricity provided to the electricity distribution grid by domestic wind turbines within annual pools of 1 MW. The premium is granted as the difference between feed-in tariffs and the electricity market price, and the tariffs are adjusted downwards annually to accommodate expectations of falling technology costs. To obtain a commitment from the funding pools, at the same time it is required that the domestic wind turbines are installed in the owners' own consumer installation and supply electricity for their private consumption. In 2020 there will be an open scheme without a capacity ceiling for domestic wind turbines, and after 2020 there will be no politically agreed support schemes beyond the possibility of a tax exemption for private use.

Increased premium for offshore pilot projects:

In the context of the application from Nissum Bredning Vindmøllelaug I/S, on 8 February 2016 the Danish Energy Agency communicated its commitment to support for a project to establish and test 28 MW of wind turbines at the Nissum Bredning site. The wind turbines are expected to be completely or partially connected to the grid before the end of 2017. These pilot projects can receive a higher premium which is set in such a way that it and the market price together amount to DKK 0.70 per kWh. It is expected that the grant will be paid out in just under 50 000 full-load hours, which corresponds to approximately 12 years of generation.

B. Premium for biogas etc.

Electricity generation using biogas and gasification gas produced using biomass

For electricity generated using biogas and gasification gas produced using biomass, a premium is paid which, added to the market price, amounts to DKK 0.793/kWh. The sum of the premium and the market price is adjusted annually on the basis of 60 % of the net price index.

In addition to the above-mentioned subsidies, premiums are paid of DKK 0.26/kWh and DKK 0.10/kWh, respectively. The premium of DKK 0.26/kWh is adjusted downwards annually, starting 1 January 2013, by DKK 0.01/kWh for each DKK/GJ of the amount by which the price of natural gas has exceeded a base price of DKK 53.2/GJ in the preceding year. If the price of natural gas falls below the base price, the support is adjusted upwards correspondingly. The premium of DKK 0.10/kWh is being reduced in stages by DKK 0.02/kWh each year between 2016 and 2020, when it will be removed completely.

Electricity generation using biogas and gasification gas produced using biomass and other fuels

For electricity generated using biogas and gasification gas produced using biomass and other fuels, a premium of DKK 0.431/kWh is paid for the portion of the electricity that is generated using biogas and/or gasification gas. The premium is adjusted annually on the basis of 60 % of the net price index.

Owners of biogas plants may choose to receive the premium of DKK 0.431/kWh instead of the premium which, added to the market price, amounts to DKK 0.793/kWh (see above). The choice must be made from the beginning of the year and is binding for one year.

In addition to the above-mentioned subsidies, premiums of DKK 0.26/kWh and DKK 0.10/kWh are also paid for the portion of the electricity that is generated using biogas and/or gasification gas, respectively. The two premiums are adjusted as described above.

Support for upgraded biogas supplied to the natural gas network and cleaned biogas supplied to the town gas network

A premium of DKK 79 per gigajoule (GJ) is paid for upgraded biogas that is supplied to the natural gas network. In addition, premiums are paid of DKK 26 and DKK 10 per GJ of upgraded biogas supplied. The premium of DKK 26/kWh is adjusted downwards annually, starting 1 January 2013, by the amount in DKK/GJ by which the price of natural gas has exceeded a base price of DKK 53.2/GJ in the preceding year. If the price of natural gas falls below the base price, the support is adjusted upwards correspondingly. The premium of DKK 10/GJ is being reduced in stages by DKK 2/GJ each year between 2016 and 2020, when it will be removed completely.

Cleaned biogas supplied to a town gas network receives the same price premium as biogas supplied to the natural gas network. The support is in the form of a price premium, so the producer itself must sell the upgraded gas. The support is provided for in Section 35c of the Danish Natural Gas Supply Act.

Support for biogas for transport

A basic subsidy of DKK 39 per GJ of biogas sold for use in transport is payable as from 1 July 2016. In addition, two premiums are paid in the amounts of DKK 26/GJ and DKK 10/GJ. The two premiums are adjusted as described above for upgraded biogas.

Support for biogas for processing purposes

A basic subsidy of DKK 39 per GJ of biogas sold for use in processing are payable as from 1 July 2016. In addition, two premiums are paid in the amounts of DKK 26/GJ and DKK 10/GJ. The two premiums are adjusted as described above for upgraded biogas.

Support for biogas for heat production

For biogas used in heat production, two premiums are paid in the amounts of DKK 26/GJ and DKK 10/GJ as from 1 July 2016. The two premiums are adjusted as described above for upgraded biogas.

C. Premium for biomass

For electricity generated by burning biomass, a premium of DKK 0.15 per kWh is paid, irrespective of whether the electricity is generated by plants using biomass exclusively or by plants using biomass in combination with other fuels.

D. Premiums for photovoltaic installations and other renewable energy plants

A premium is paid for electricity generated from plants that exclusively use solar power (such as electricity-generating solar thermal, but not photovoltaic installations), wave power or hydro-electricity, or any renewable energy sources other than biogas, biomass or wind power.

The premium is set in such a way that it and the market price together amount to DKK 0.60 per kWh for a period of 10 years following grid connection and DKK 0.40 per kWh for the subsequent 10 years.

For electricity generated by installations with a capacity of 6 kW or less, a premium is paid that, added to the electricity market price, amounts to DKK 1.30/kWh. The premium is reduced by DKK 0.14/kWh each year from 2014, and is paid over a period of 10 years. The same premium is applicable to smaller biogas and gasification gas plants with a capacity of 6 kW or less, along with electricity generated by Stirling engines and other particular energy generation plants of 6 kW or less using biomass as an energy source.

For electricity from RE plants connected to the grid on 1 January 2016 or later, the above premium is only paid if the plant has an installed capacity of less than 500 kW, and the premium is additionally contingent on a commitment from Energinet.

A condition for the above-mentioned premium is the use of energy sources or technologies that are important for the future expansion of RE electricity. For plants that do not fulfil this condition, a premium of DKK 0.10/kWh is paid for 20 years from the moment of connection to the grid.

At present no support is paid for new photovoltaic installations, but photovoltaic installations used for private electricity generation receive indirect support, because the private consumption of electricity from photovoltaic installations is not taxed.

There used to be various support schemes for electricity generation from photovoltaic installations, but these schemes have ceased for new installations.

In addition, there are a few other RE support schemes that were valid until the end of 2017 but that cease in 2018.

Solar pilot tender

A pilot tender for 20 MW of solar photovoltaics was held in December 2016, 2.4 MW of which were open to installations in Germany. Projects with installation locations in Denmark won the entire tender.

The support rate for the winning projects is DKK 0.1289/kWh, which will be granted as a fixed premium above the market price for 20 years.

It is expected that the winning solar photovoltaic projects will be connected to the grid at some point in the second half of 2018.

3.0.2 Funding pool for small RE technologies

Subsidies were paid to promote the spread of electricity generating plants with a smaller capacity comprising solar photovoltaic, wave power and biogas installations and which use technologies that are of significance for the future spread of electricity from renewable sources. Subsidies were dependent on the plant being connected to the grid.

The pool was extended in connection with the Energy Policy Agreement of 2012 (cf. Annex 1, point 2.6). Subsidies amounting to DKK 25 million per year were paid in the period

2008-2015. The pool was administered by Energinet, which invited applications once a year during that period.

3.0.3 Four schemes for promoting onshore wind power

Four new schemes were introduced in the RE Act to promote the expansion of wind turbines. Energinet is responsible for administering the schemes.

Devaluation scheme

The constructor of a wind turbine must pay compensation for the devaluation of residential properties caused by the erection of the wind turbine. The extent of the devaluation is determined by a valuation authority.

Right of purchase scheme

The constructor of a wind turbine measuring at least 25 m is obliged to offer at least 20 % of the shares in the entire turbine project to a group of persons with right of purchase. All citizens over the age of 18 living up to 4.5 km from new wind turbines may buy into local wind turbine projects. Shares not purchased by citizens living within the 4.5-km limit may be offered to citizens elsewhere in the municipality. In the case of offshore wind turbines, the group of citizens with right of purchase is expanded to include citizens in the municipality or municipalities that have coastline within 16 km of the new offshore wind turbines.

Green scheme

Under the green scheme, municipal authorities can apply for grants from Energinet for projects that benefit the landscape and recreational opportunities in the municipality and for cultural and information activities. Municipalities can be awarded grants in the amount of DKK 88 000 per MW of new wind turbines connected to the grid in the municipality. The State aid clearance for the green scheme expires on 21 February 2018, and therefore in 2017 it was proposed to close the scheme in national legislation.

Guarantee Fund

The guarantee fund was established to support the financing of preliminary investigations etc. by local wind turbine committees prior to the erection of wind turbines. Decisions concerning the issuing of guarantees are made by Energinet. Guarantees are given for a maximum of DKK 500 000 per project.

3.0.4 Demonstration programme and heat pump task force

Demonstration programme

The 2015 Finance Act included a pool of DKK 55.2 million, intended for paying grants over a two-year period (2015 and 2016) to promote the use of large electric heat pumps for district heating generation by means of a demonstration programme to document the operational and economic advantages of the district heating plants.

However, the funds were rolled back in the 2016 Finance Act and there was only a single application round held in 2015 with a grant amount of DKK 27.5 million, after which the scheme was terminated on 31 December 2015.

In this single application round, on 14 December 2015 a commitment was made to give support to 10 projects out of 22 applications received, with a total thermal capacity of 18.8 MW and construction costs of DKK 127 million.

Due to the termination of the grant scheme, no financial support will be given in the future for establishing heat pumps under the previously applicable conditions.

Heat pump task force

The heat pump task force's task is to advise power plants of the possibilities for establishing heat pumps and to collect and disseminate experiences with heat pumps, including knowledge gained from the projects that have received support under the demonstration programme. The primary target audience for the task force is the smaller decentralised district heating plants.

Due to the fact that the means for operating the heat pump task force were rolled back by the 2016 Finance Act along with the grant pool for the demonstration programme, the advisory opportunities under the financing in place at that time also ceased as of 31 December 2015.

Using an allocation of funds from the energy reserve, in early 2016 steps were taken to continue an advisory task force on large heat pumps for district heating, central heating and industrial processes for a three-year period from 2016 to 2018. This entails redefining an existing initiative with an expanded target audience and focus area, but without a grant scheme.

The task force will continue to advise plants and industrial enterprises on concrete options for establishing a large heat pump for district heat generation using available energy resources, this time with an additional focus on utilising residual heat from industry.

3.0.5 Grant for investing in electric heat pumps for district heating generation

The Danish Energy Agency is allocating DKK 23.4 million in 2017 and DKK 27.9 million in 2018 to support investments made by power plants receiving the capacity-based basic subsidy in electric heat pumps for generating district heating. All enterprises that currently receive the capacity-based basic subsidy can request support as long as the electric heat pump generates district heating and displaces generation at a non-ETS installation.

Support will be given for up to 15 % of the costs of establishing the electric heat pump. However, support will only be granted to the portion designed to replace generation based on fossil fuels at non-ETS installations. If the heat pump is designed to also replace generation at ETS installations, the extra capacity receives no support. No support is granted for preliminary work already carried out or for expenses that are not directly related to establishing heat pumps. The support can be combined with support from the energy companies' energy savings initiatives.

Requirements for projects eligible for support:

- Heat pumps must be electrically powered.
- The heat source must be from renewable energy or residual heat.
- The heat must replace fossil fuels at installations outside the quota sector.
- The project must be able to be completed within two years of the commitment.

If the total amount requested in support by the applicants exceeds the amount of the pool for that year, the Danish Energy Agency will decide on an order of priority for the projects.

Application rounds:

- First round (2017):
Opens at the beginning of September — application deadline 1 November — response in mid-December
- Second round (2018):
Opens 1 March — application deadline 1 May — response in mid-June

3.0.6 Tax exemption

The use of fossil fuels for heating and cooling is subject to a substantial energy tax. In addition, there are CO₂ taxes which are dependent on the carbon content of the individual fuel. The energy and CO₂ taxes on fossil fuels for heating are around DKK 65 to 70 per GJ in 2017. The rates of energy tax are indexed to the net price index.

At present there is no energy tax on RE fuels. This means that in 2017 there is a tax advantage of around DKK 65 to 70 per GJ for using RE fuels rather than fossil fuels.

3.0.7 Renewable energy in the transport sector

Electric vehicles were exempt from registration tax and green ownership tax up to the end of 2015. Registration tax is subsequently being phased in gradually until 2020, while the exemption from ownership tax ceased in 2016.

Fuel cell vehicles, including hydrogen vehicles, are exempted from registration tax until 1 January 2019.

Renewable energy for transport is additionally promoted by a requirement for the admixture of 5.75 % (energy percent) biofuels in land transport. The admixture requirement applies to fuel suppliers, and in addition the biofuels used must comply with EU sustainability criteria. As from 1 January 2020, 0.9 % must consist of advanced biofuels.

In addition, there used to be various support schemes which have since ceased:

- research schemes for electric vehicles, for which support amounted to DKK 5 million per year in 2010-2015;
- support for infrastructure for electricity, hydrogen and gas for heavy transport with a budget totalling DKK 70 million for the period 2012-2015;
- a support scheme for electric buses, which was valid in 2015 and amounted to DKK 4 million;
- support for a number of trials using alternative fuels for transport under the 'Energy-efficient transport solutions' funding pool.

3.0.9 Renewable energy for processing enterprises

The funding pool for renewable energy for processing was a result of the Energy Policy Agreement of March 2012, and its objective was to promote and support enterprises converting process energy from fossil fuel to renewable energy. The scheme was opened for

applications in August 2013, and until its conclusion in 2016 it committed to grants for a total of 550 projects with a combined value of DKK 1 208.6 million.

Of the 550 projects, 40 were subsequently annulled. The remaining 510 projects aim to bring about a fossil fuel displacement totalling approximately 6.8 PJ per year and a CO₂ reduction of approximately 500 000 tonnes, assuming the projects are achieved as planned.

The commitments are largely given to conversions to biomass and the concomitant energy efficiency improvements. In most cases it is oil that the applicant enterprises plan to replace with renewable energy. The vast majority of applications (83 % of the total) are received from agricultural enterprises.

3.0.9 Energy saving initiatives

The energy companies' energy savings initiatives, also known as the energy savings scheme, oblige grid and transmission enterprises working with electricity, gas, district heating and oil to achieve energy savings in their final energy consumption each year. The energy savings projects can include improvements, replacements and new installations, such as improved building envelopes or building systems in private households, projects in industries that reduce process energy consumption, or projects for solar thermal installations in district heating plants. The energy savings scheme implements Article 7 of the Energy Efficiency Directive. Grid and transmission enterprises must achieve annual savings of 10.1 PJ in final energy consumption. In some cases the efforts have had an indirect effect on conversions from fossil fuels to renewable energy.

3.1. Please provide the information on how supported electricity is allocated to final customers for purposes of Article 3(6) of Directive 2003/54/EC (Article 22(1)(b) of Directive 2009/28/EC).

The declaration of electricity to consumers (final customers) is governed by Order No 1322 of 16 November 2010 on the declaration of electricity to consumers (the Electricity Labelling Order), as amended by Order No 403 of 28 April 2011 amending the Order on the labelling of electricity to consumers.

The Electricity Labelling Order states that the electricity trading company must use either a general declaration or an individual declaration. The general declaration is drawn up by Energinet on the basis of the average fuel consumption and environmental impact. The individual declaration must be supported by guarantees of origin for RE electricity or high-efficiency cogenerated heat that are cancelled by the electricity trading company. Energinet is in charge of issuing and cancelling guarantees of origin.

4. Please provide information on how, where applicable, the support schemes have been structured to take into account RES applications that give additional benefits, but may also have higher costs, including biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material (Article 22(1)(c) of Directive 2009/28/EC).

No support is granted for biofuels other than research and development support from the Energy Technology Development and Demonstration Programme [Energiteknologiske Udviklings- og Demonstrationsprogram, EUDP]. However, biofuels are exempt from CO₂ tax. Biofuels based on waste, waste products, non-food cellulosic material and ligno-

cellulosic material count double with respect to the Danish blending requirement described in section 8.

Support for the use of biogas can partly be justified through its environmental advantages in terms of improved aquatic environment, reduced greenhouse gas emissions from agriculture, reduced odour nuisance, increased fertiliser value of degasified slurry from livestock manure, etc.

5. Please provide information on the functioning of the system of guarantees of origin for electricity and heating and cooling from RES, and the measures taken to ensure reliability and protection against fraud of the system (Article 22(1)(d) of Directive 2009/28/EC).

Denmark only operates with guarantees of origin for electricity (not heating or cooling) from renewable energy sources (see Order No 1323 of 30 November 2010 on guarantees of origin for electricity from renewable energy sources and Order No 1322 of 30 November 2010 on the declaration of electricity to consumers).

In Denmark, guarantees of origin can only be issued by Energinet. It is therefore Energinet that registers and monitors guarantees of origin that have been issued and their transfer or cancellation.

To eliminate the risk of VAT fraud, Energinet sends a request to the Danish Customs and Tax Administration (SKAT) when accounts are to be created by new market players. SKAT then investigates whether the player is known to the European tax cooperation for offences such as carousel fraud.

Energinet must ensure that registrations are correct, reliable and protected against fraud. Guarantees of origin are issued electronically in Denmark, in accordance with the European Energy Certificate System (EECS), the voluntary common European standard. The standard prescribes how guarantees of origin are to be issued, traded and used. Furthermore, all users of the EECS are contractually obliged to refrain from repeatedly using guarantees of origin. Energinet is a member of the Association of Issuing Bodies (AIB), which drew up the standard. Energinet was audited in 2015 to ensure that its processes comply with the requirements of the standard.

In addition, Energinet uses the CMO.grexel system to administer guarantees of origin. This system is also used by a number of other European countries. Information in the CMO.grexel system can be checked, just like Energinet uses a national register of master data to check information.

Energinet states that the number of guarantees of origin for RE electricity issued and transferred in Denmark and sold to other Member States has risen considerably over the years. The table below shows the trend over the period 2011-2015.

Table: Developments in issuing, transfer and cancellation
(one guarantee of origin corresponds to one MWh)

1.1. Year	2013	2014	2015	2016	2017 (to 16 Oct.)
Issued	12 688 731	15 686 465	16 391 987	16 037 121	15 674 381
Cancelled*	3 998 285	8 330 499	14 228 931	8 187 816	6 234 518

Exported	8 787 604	7 176 803	8 392 034	12 395 134	10 811 450
Imported	1 708 800	2 363 459	5 413 381	6 974 355	4 724 549

Source: www.grexel.com

* The data does not include guarantees of origin cancelled by Energinet because they are older than 12 months (see Section 15(3) of the Directive). The data includes cancellations in the Danish registry for consumption in other countries ('ex-domain cancellation'). Cancellations for consumption (sales to end customers) in Denmark have been reasonably consistent at around 2 000 000 per year since 2011.

Please see Annex 1 to the 2011 progress report for a more detailed description of the system of guarantees of origin in Denmark.

6. Please describe the developments in the preceding 2 years in the availability and use of biomass resources for energy purposes (Article 22(1)(g) of Directive 2009/28/EC).

Table 4: Biomass supply for energy use

Ktoe/year etc.	Amount of domestic raw material* in tonnes		Primary energy in domestic raw material (ktoe)		Amount of imported raw material from EU* in tonnes		Primary energy in amount of imported raw material from EU (ktoe)		Amount of imported raw material from non EU* in tonnes		Primary energy in amount of imported raw material from non EU (ktoe)	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Biomass supply for heating and electricity:												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings etc.)**	2 627	2 648	856	868	464	701	132	183	41	134	12	35
Indirect supply of wood biomass (residues and co-products from wood industry etc.)**	793	668	289	245	1 555	1 896	650	793	381	465	159	194
Energy crops (grasses, etc.) and short rotation trees (please specify)	-	-	-	-								
Agricultural by-products / processed residues and fishery by-products**	1 360	1 355	471	469								
Biomass from waste (municipal, industrial, etc.)**	.787 [sic]	1 815	452	460	7	7	69	72				
Others (please specify)												
Biomass supply for transport:												
Common arable crops for biofuels (please specify main types)												
Energy crops (grasses, etc.) and short rotation trees for biofuels (please specify main types)												
Others (please specify)												

NB: EU/non-EU and biodegradable share of imported waste are assumptions.

* Amount of raw material if possible in m³ for biomass from forestry and in tonnes for biomass from agriculture and fishery and biomass from waste

** The definition of this biomass category should be understood in line with table 7 of part 4.6.1 of Commission Decision C (2009) 5174 final establishing a template for National Renewable Energy Action Plans under Directive 2009/28/EC

Table 4: Biomass supply for energy use

TJ/year etc.	Amount of domestic raw material* in tonnes		Primary energy in domestic raw material (TJ)		Amount of imported raw material from EU* in tonnes		Primary energy in amount of imported raw material from EU (TJ)		Amount of imported raw material from non EU* in tonnes		Primary energy in amount of imported raw material from non EU (TJ)	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Biomass supply for heating and electricity:												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings etc.)**	2 627	2 648	35 858	36 333	464	701	5 538	7 664	41	134	488	1 460
Indirect supply of wood biomass (residues and co-products from wood industry etc.)**	793	668	12 080	10 244	1 555	1 896	27 213	33 183	381	465	6 676	8 141
Energy crops (grasses, etc.) and short rotation trees (please specify)												
Agricultural by-products / processed residues and fishery by-products**	1 360	1 355	19 716	19 647								
Biomass from waste (municipal, industrial, etc.)**	1 787	1 815	18 944	19 239	272	285	2 886	3 020				
Others (please specify)												
Biomass supply for transport:												
Common arable crops for biofuels (please specify main types)												
Energy crops (grasses, etc.) and short rotation trees for biofuels (please specify main types)												
Others (please specify)												

NB: EU/non-EU and biodegradable share of imported waste are assumptions.

In the Energy Policy Agreement of 22 March 2012, it was agreed that the Government would prepare a study of bioenergy in Denmark. The study was presented in May 2014 and it indicated, among other things, that there could be increasing challenges in ensuring the environmental sustainability of imported wood for energy purposes, in particular in the period after 2020. As a follow-up to the study, and owing to a lack of requirements at EU level, the former Minister for Climate, Energy and Building called upon the Danish energy industry to present sustainability criteria for solid biomass in a voluntary agreement.

In December 2014, the Danish Energy Association [Dansk Energi] and the Danish District Heating Association [Dansk Fjernvarme] published the 'Brancheaftale om sikring af

bæredygtig biomasse' [Industry agreement to ensure sustainable biomass]. The agreement contains requirements and criteria that the energy companies will comply with when they use wood biomass for generating electricity or heating. The agreement specifies, among other things, that biomass must satisfy the following criteria.

1. Legality — The biomass resources must be harvested in a legal way under applicable local and national forest legislation.
2. Protection of ecosystems — Exploitation of wood resources must not adversely affect the functions of forests in relation to conserving biodiversity.
3. Maintaining productivity — Forestry and harvesting of biomass must not adversely affect the productivity of the forest, i.e. there are requirements to replant areas with trees.
4. Health — Forests must be managed in such a way that they are healthy and function well; this includes implementing protective measures against fire, disease, illegal logging, etc.
5. Biodiversity — Endangered animals and plants must be protected, and areas designated as valuable habitats must be conserved.
6. Social rights — The forest usage rights of indigenous peoples must be respected and complaint mechanisms etc. must be established. Workers must have the right to organise, and child labour is not permitted. The health and safety of employees must be protected.
7. The CO₂ displacement chain (cultivation, transport, power station efficiency, etc.) must be reduced by at least 70 % compared to the fossil fuel reference for energy production in the EU.

For plants with an input capacity of more than 20 MW, the energy companies must annually present documentation reports explaining how they are complying with the sustainability requirements of the industry-level agreement. The requirements are being phased in during the period from 2016 to 2019, so they gradually cover an increasingly larger share of biomass consumption. The first documentation reports were submitted in spring 2016, and they show that 56 % of the wood biomass used for energy generation have been certified as sustainable through recognised certification schemes such as SBP, FSC and PEFC. The documentation reports also show that the average amount of greenhouse gas reduction is 91 % as compared to the fossil reference (calculated using the BioGrace-II tool), which bears witness to a reduction rate that is generally higher than the European Commission's guiding recommendations on a minimum 70 % reduction of greenhouse gases from the supply chain (see SWD(2014) 259).

Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (ha)

Land use	Surface (ha)	
	2015	2016
1. Land used for common arable crops (wheat, sugar beet, etc.) and oilseeds (rapeseed, sunflower, etc.) (Please specify main types) <i>Rapeseed</i>	150 000	130 000
2. Land used for short rotation trees (willows, poplars) (Please specify main types) <i>Willow, poplar and coppice.</i>	9 088	8 896
3. Land used for other energy crops such as grasses (reed canary grass, switch grass, Miscanthus), sorghum (Please specify main types) <i>Miscanthus, reed canary grass.</i>	78	66

NB: Land used for common arable crops is self-assessed on the basis of the biogas census and Statistics Denmark (yield per ha.)

Sources: Row 1 Beet and maize: Report under the Order on sustainable production of biogas (Danish Energy Agency). Rapeseed: Statistics Denmark [Danmarks Statistik] (Tables hst6 and afg07), *Energi fra biomasse – Ressourcer og teknologier vurderet i et regionalt perspektiv* [Energy from biomass – Resources and technologies assessed from a regional perspective] by Jørgensen U., Sørensen P., Adamsen A.P. and Kristensen I.T. (2008), p. 47, in which it is estimated that 70-80 % of rapeseed production is for biodiesel with simultaneous production of rapeseed cake and glycerine.

Rows 2 and 3 source: The Danish Agricultural Agency [Landbrugstyrelsen]

7. Please provide information on any changes in commodity prices and land use within Denmark in the preceding 2 years associated with increased use of biomass and other forms of energy from renewable sources. Please provide where available references to relevant documentation on these impacts in your country (Article 22(1)(h) of Directive 2009/28/EC).

It is considered that the change in demand for biomass for energy in the previous two years was relatively small, so there is no measurable effect on raw material prices and land use in Denmark. This is supported by the fact that an increasing share of the biomass consumed in Denmark is imported from abroad.

8. Please describe the development and share of biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material (Article 22(1)(i) of Directive 2009/28/EC).

Table 5: Development of consumption of biofuels (ktoe)

Feedstock as listed in Annex IX Part A of Directive 2009/28/EC	2015	2016
(a) Algae if cultivated on land in ponds or photobioreactors		
(b) Biomass fraction of mixed municipal waste, but not separated household waste subject to recycling targets under point (a) of Article 11(2) of Directive 2008/98/EC		
(c) Bio-waste as defined in Article 3(4) of Directive 2008/98/EC from private households subject to separate collection as defined in Article 3(11) of that Directive.		
(d) Biomass fraction of industrial waste not fit for use in the food or feed chain, including material from retail and wholesale and the agro-food and fish and aquaculture industry, and excluding feedstocks listed in part B of this Annex		2
(e) Straw		
(f) Animal manure and sewage sludge		
(g) Palm oil mill effluent and empty palm fruit bunches		
(h) Tall oil pitch		
(i) Crude glycerine		
(j) Cane bagasse		
(k) Grape marcs and wine lees		
(l) Nut shells		
(m) Husks		
(n) Cobs cleaned of kernels of corn		
(o) Biomass fraction of wastes and residues from forestry and forest-based industries, i.e. bark, branches, pre-commercial thinnings, leaves, needles, tree tops, saw dust, cutter shavings, black liquor, brown liquor, fibre sludge, lignin and tall oil		
(p) Other non-food cellulosic material as defined in point (s) of the second paragraph of Article 2		
(q) Other ligno-cellulosic material as defined in point (r) of the second paragraph of Article 2 except saw logs and veneer logs		
Feedstock as listed in Annex IX Part B of Directive 2009/28/EC	2015	2016
(a) Used cooking oil		
(b) Animal fats classified as categories 1 and 2 in accordance with Regulation (EC) No 1069/2009 of the European Parliament and of the Council		23

NB: There is no statistical data on consumption in 2015 broken down into biofuels produced from feedstock listed in Annex IX Part A and Annex IX Part B respectively.

Resource assessment

Please provide a resource assessment of the feedstock listed in Annex IX of Directive 2009/28/EC focusing on the sustainability aspects relating to the effect of the replacement of food and feed products for biofuel production, taking due account of the principles of the waste hierarchy established in Directive 2008/98/EC and the biomass cascading principle, taking into consideration the regional and local economic and technological circumstances, the maintenance of the necessary carbon stock in the soil and the quality of the soil and the ecosystems.

9. Please provide information on the estimated impacts of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality within Denmark in the preceding 2 years. Please provide information on how these impacts were assessed, with references to relevant documentation on these impacts within Denmark (*Article 22(1)(j) of Directive 2009/28/EEC*).

Production has been so limited that, in the opinion of the Danish Energy Agency, there has not been a significant impact.

10. Please estimate the net greenhouse gas emission savings due to the use of energy from renewable sources (Article 22(1)(k) of Directive 2009/28/EC).

For the calculation of net greenhouse gas emission savings from the use of renewable energy, the following methodology is suggested:

- *For biofuels: In accordance with Article 22(2) of Directive 2009/28/EC.*
- *For electricity and heat it is suggested to use the EU-wide fossil fuel comparators for electricity and heat as set out in the report on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling²², if no later estimates are available.*

If a Member State chooses not to use the suggested methodology for estimating the net greenhouse gas emission savings, please describe what other methodology has been used to estimate these savings.

Table 6: Estimated GHG emission savings from the use of renewable energy (t CO₂eq)²³

Environmental aspects	2015	2016
<i>Total estimated net GHG emission saving from using renewable energy²⁴</i>	<i>Million tonnes</i>	<i>Million tonnes</i>
- Estimated net saving from the use of renewable energy for electricity	10.4	11.0
- Estimated net saving from the use of renewable energy for heating and cooling	6.9	7.5
- Estimated net saving from the use of renewable energy for transport	0.7	0.7

²² Report available at:

http://ec.europa.eu/energy/renewables/transparency_platform/doc/2010_report/com_2010_0011_3_report.pdf.

²³ The calculation of greenhouse gas savings for renewable energy for heating and cooling has been adjusted relative to the RE progress report for 2013.

²⁴ The contribution of gas, electricity and hydrogen from renewable energy sources should be reported depending on the final use (electricity, heating and cooling or transport) and only be counted once towards the total estimated net GHG savings.

11. Please report on (for the preceding 2 years) and estimate (for the following years up to 2020) the excess/deficit production of energy from renewable sources compared to the indicative trajectory which could be transferred to/imported from other Member States and/or third countries, as well as estimated potential for joint projects until 2020 (Article 22(1)(l) and (m) of Directive 2009/28/EC).

Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy in Denmark compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries (ktoe)

Ktoe/year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimated excess in NREAP	-	694	834	1 123	1 106	833	928	552	619	-	63
Estimated deficit in NREAP	-	0	0	0	0	0	0	0	0	-	0
Total gross consumption of energy (H)	-	-	-	-	-	15 100	15 616	-	-	-	-
Proportion of gross consumption of energy from renewable energy sources ([Table 1a D])/[H](%)	-	-	-	-	-	31.0	32.2	-	-	-	-
Indicative trajectory for renewable energy sources relative to the 2020 target (%) ²⁵	-	19.6	19.6	20.9	20.9	22.9	22.9	25.4	25.5	30.1	30
Actual excess production relative to indicative trajectory	-	-	-	-	-	1 223	1 452	-	-	-	-

²⁵ The indicative trajectory for the proportion of renewable energy sources is presented in Table 3 of the RE Action Plan of June 2010 and was most recently updated in a memorandum sent to the Commission in April 2011.

Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy in Denmark compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries (PJ)

PJ/year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimated excess in NREAP	-	29	35	47	46	35	39	23	26	-	3
Estimated deficit in NREAP	-	0	0	0	0	0	0	0	0	-	0
Total gross consumption of energy (H)	-	-	-	-	-	632	654	-	-	-	-
Proportion of gross consumption of energy from renewable energy sources ([Table 1a D])/[H](%)	-	-	-	-	-	31.0	32.2	-	-	-	-
Indicative trajectory for renewable energy sources relative to the 2020 target (%) ²⁹	-	19.6	19.6	20.9	20.9	22.9	22.9	25.4	25.5	30.1	30
Actual excess production relative to indicative trajectory	-	-	-	-	-	51	61	-	-	-	-

11.1. Please provide details of statistical transfers, joint projects and joint support scheme decision rules.

As stated in the RE Action Plan of June 2010, the Danish Government expects to be able to fulfil its commitments for expansion of renewable energy up to 2020 through national measures. On this basis, it will probably not be necessary to use the RE Directive's cooperation mechanisms for statistical transfers between countries in order to ensure Danish compliance with the objectives.

However, the Danish Government is prepared to make the expected excess of renewable energy available to other countries in the period up to 2020, during which time the share of renewable energy is expected to be above the indicative trajectory every year.

In March 2017 the Danish Energy Agency projected Denmark's energy consumption up to 2030²⁶. According to this projection, the share of RE in 2020 is expected to be around 40 %, so Denmark will exceed its binding 2020 RE target of 30 % by around 10 percentage points.

Denmark entered into a cooperation agreement with Germany in July 2016 concerning the mutual opening of tenders for support for energy from photovoltaic installations located in the other country (two cross-border tenders)²⁷. Projects with planned installation locations in Denmark subsequently won both tenders. It is therefore expected that photovoltaic installations in Denmark will receive support from Germany. As a consequence of the cooperation agreement, it is subsequently expected that, under Article 6 of the RE Directive,

²⁶ *Basisfremskrivning 2017* [2017 Basic projections], Danish Energy Agency, March 2017.

²⁷ Agreement between the Government of the Federal Republic of Germany and the Government of the Kingdom of Denmark on the establishment of a framework for the partial opening of national support schemes to support the generation of energy from solar photovoltaic projects and for the cross-border administration of such projects in the context of a single pilot run in 2016, United Nations Treaty Collection, Registration No I-54273.

the energy from the plants concerned will be transferred statistically from Denmark (the country in which the energy is produced) to Germany (the country providing the support).

12. Please provide information on how the share for biodegradable waste in waste used for producing energy has been estimated, and what steps have been taken to improve and verify such estimates (*Article 22(1)(n) of Directive 2009/28/EC*).

In the energy and CO₂ emission statistics, waste is divided into two categories: biodegradable and non-biodegradable. In accordance with international conventions, and including the definition in Article 2 of the RE Directive, the biodegradable component is counted as renewable energy. In Danish energy statistics it is expected that 55.0 % of consumption of waste is biodegradable. This proportion is determined on the basis of a study carried out in 2012.

From 1 January 2013 Denmark has decided to include 21 of the largest waste incineration plants in the CO₂ quota adjustment. Incineration plants with CO₂ emissions above 50 000 tonnes per year must measure their CO₂ emissions, while other plants apply standard national factors.

There are nine waste incineration plants that emit more than 50 000 tonnes of fossil CO₂ per year. These plants determine their annual emission of fossil CO₂ by measuring the CO₂ content of the flue gas. Two different methods are used for these measurements. These are a 14C method and a mass balance method (Bioma), which is based on a number of balances set up for the plant. The results of the measurements for the first two years show that the measurement uncertainties of the methods of measurement are relatively high.

13. Please provide the amounts of biofuels and bioliquids in energy units (ktoe) corresponding to each category of feedstock group listed in part A of Annex VIII taken into account by that Member State for the purpose of complying with the targets set out in Article 3(1) and (2), and in the first subparagraph of Article 3(4).

Feedstock group	2015	2016
Cereals and other starch-rich crops		26
Sugars		16
Oil crops		153

NB: there is no statistical data for amounts of biofuels in the categories indicated for 2015.

Table 2: Overview of all policies and measures

Where relevant, reference is made to sections in the RE Action Plan (abbreviated to REAP) and the Energy Policy Agreement of 2012 (abbreviated to EPA).

Name and reference of the measure	Type of measure*	Expected result**	Targeted group and/or activity***	Existing or planned	Start and end dates of the measure	Reference
Tendering of offshore wind farms	Economic	Establishment of 1 350 MW of offshore wind turbines. 400 MW at Horns Rev, 600 MW at Kriegers Flak and 350 MW of inshore wind farms.	RE electricity generation, investors.	Planned	Contract for Horns Rev 3 was entered into in 2015 and contract for Kriegers Flak and the inshore wind farms was entered into in 2016.	REAP: 4.2.1 and 4.3. EPA: 2.1 and 2.2
Premium for wind turbines (DKK 0.25/kWh for approximately 8-9 years)	Economic	Erection of more efficient types of wind turbine.	Investors, RE electricity generation	Existing	Entered into force 1 January 2014 and effective until 20 February 2018 inclusive.	
Increase in premium for domestic wind turbines	Economic	Large expansion of small domestic wind turbines	Autoproducers, investors, RE electricity generation	Existing	Decided January 2013. Entered into force February 2015.	
Increased premium for offshore pilot projects	Economic	Commitments have been given for support for 28 MW of offshore wind turbines.	Development, RE electricity generation	Existing	The 28 MW of offshore wind turbines are expected to be connected to the grid in late 2017.	
New premiums for the use of biogas for transport, processing and heat	Economic, regulation	Promoting biogas production and consumption	Enterprises and others that use biogas	Existing	July 2016 →	EPA: 5.1-5.5
Flexible billing for electricity consumption	Regulatory	Promoting smart electricity consumption	Electricity consumers, grid enterprises and electricity trading companies	Existing/planned	2017-2020	
International electricity exchange capacity, establishing Viking Link and West Coast connection	Political approval	Promoting interconnection of electricity markets	Energinet DK (TCO)	Planned	Viking Link and West Coast connection put into operation in late 2022	

Name and reference of the measure	Type of measure*	Expected result**	Targeted group and/or activity***	Existing or planned	Start and end dates of the measure	Reference
Energy-saving efforts	Regulation	The total savings objective for the efforts are 10.1 PJ per year during the period 2016-2020.	Grid and transmission enterprises	Existing	2016→2020	
Grants for electric buses	Economic	Promoting electric buses	Transport companies	Existing (expired)	2015	
Tendering of solar photovoltaics (pilot tender)	Economic	Establishing 20 MW of solar photovoltaics	RE electricity generation, investors.	Planned	Contracts took effect in 2016, expected connection to the grid in 2018.	
Demonstration programme for large electric heat pumps for district heating generation	Financial measure	Around 18 MW of thermal output expected to be installed	Decentralised district heating plants	Existing	From 1 July 2015 to 15 September 2016	
Grants for investing in electric heat pumps for district heating generation	Financial measure	Around 70 MW of thermal output expected to be installed	Decentralised CHP plants that receive the capacity-based basic subsidy	Existing	From 14 August 2017 to 31 December 2018	
Technology-neutral tenders (wind turbines on land, solar photovoltaics and offshore wind turbines under the participation scheme [åben-dør-ordning])	Economic	Expected electricity generation based on 8 TWh in the first 20 years of the plants' lifetime.	Wind turbines and solar photovoltaics	Planned	Tender expected in 2018/2019	
Tender specifically for solar	Economic	Expected electricity generation based on 8 TWh in the first 20 years of the plants' lifetime.	Solar photovoltaics	Planned	Tender expected in 2018	

* Indicate if the measure is (predominantly) regulatory, financial or soft (i.e. information campaign).

** Is the expected result behavioural change, installed capacity (MW; t/year), energy generated (ktoe)?

*** Who are the targeted persons: investors, end users, public administration, planners, architects, installers, etc.? What is the targeted activity/sector: biofuel production, energetic use of animal manure, etc.?

Annex 1

Agreement

between the Government (the Danish Social Democrats, Danish Social-Liberal Party and the Danish Socialist People's Party) and the Liberal Party of Denmark, Danish People's Party, Danish Red-Green Alliance and Danish Conservative People's Party

concerning the Danish Energy Policy for 2012-2020

The parties are in agreement that the conversion of Denmark to an energy supply met by renewable energy is dependent on a reliable, stable and long-term framework concerning the Danish Energy Policy. This agreement establishes specific energy policy initiatives for the period 2012-2020. The agreement will support joint EU targets.

Duration of the agreement:

- The agreement covers the period 2012-2020.
- The parties will prepare an annual status report of agreed new initiatives and analyses and any continuation of initiatives that expire.
- The Government will prepare an annual status report of savings that are realised (see agreed cost reduction measures). If the anticipated savings resulting from the regulatory supervision are not realised, the parties undertake to provide alternative financing. The energy efficiency initiative will be adjusted correspondingly in the event that this is not possible.
- The parties will meet in 2015 to discuss the continuation of initiatives and financing for the agreement, including the distribution of DKK 60 million annually from the energy efficiency package in the period after 2015.
- The parties undertake to enter into discussions by the end of 2018 regarding specific supplementary initiatives for the period after 2020.

The parties have agreed to implement the following initiatives with a view to fulfilling the purpose of the agreement:

An energy-efficient society with less energy wastage

Realising the goal of an energy supply met by renewable energy requires an increase in energy efficiency that minimises energy wastage and energy consumption in all sectors. The parties note that it was decided in the Danish Finance Act to introduce a subsidy pool for energy refurbishments in residential properties in 2013 and 2014. The parties are furthermore in agreement regarding the following:

- The savings obligations incumbent on energy companies are to be increased in relation to the initiative for the period 2010-2012 by 75 %, corresponding to 10.7 PJ per year, for the period 2013-2014; and by 100 %, corresponding to 12.2 PJ per year, for the period 2015-2020.
- In connection with the increased savings obligations, the energy companies' initiatives are to be targeted at existing buildings and industries. It will be an aim to enter into a

cost-effective agreement with the energy companies to strengthen the exposure to competition of the initiative. A total of DKK 12 million will be allocated to support energy saving initiatives in the period 2012-2015.

- An overarching strategy for the energy renovation of the existing building stock, including an investigation of the scope to tighten up requirements concerning building components, will be drawn up; and a comprehensive analysis of the area, including initiatives to ensure better compliance with the requirements of the building regulations and the use of ESCO models, will be carried out. The minimum requirements for building components in the building regulations will be future-proofed to reflect future challenges and anticipated energy prices. The strategy will be discussed by the parties to the agreement by the end of 2013. The strategy will be based on an overall analysis of the existing building stock, including the possible potential with the aim of ensuring that the strategy is targeted at the most cost-effective initiatives.
- A total of DKK 30 million will be allocated to support the energy renovation of the existing building stock in the period 2012-2015.
- A total of DKK 20 million will be allocated for the continuation of the initiative in the Knowledge Centre for Energy Savings in the period 2012-2015.
- The municipal CO₂ calculator for the municipalities' annual CO₂ statements will be further developed and updated. A total of DKK 2 million will be allocated for this in the period 2012-2015.
- Given the significant reinforcement of the energy companies' energy savings obligations, the current campaign and information activities of the Go' Energi advisory body will be wound up. The remaining activities will be transferred to the Danish Energy Agency, which will then assess which of these activities are to be continued. This will release funds amounting to DKK 60 million annually. From 2012 to 2015, these funds will be allocated to other energy efficiency measures, as described in Annex 3. The parties will meet in 2015 to discuss the distribution of the remaining funds available for the energy efficiency package.
- As a follow-up to the Energy Policy Agreement of 2008 and the strategy to reduce energy consumption in buildings, the parties have agreed to implement an energy-saving package, which will promote energy savings in private rental homes. The energy saving package will, among other things, include the following initiatives under the remit of the Ministry of Housing, Urban and Rural Affairs:
 - Opportunity to demand a larger increase in rent following energy renovation than is the case under the applicable rules, provided the requirement concerning total financial profitability has been fulfilled.
 - New model for agreed green urban renewal.
 - Increase in the amount that can be claimed by tenants for improvements, provision for the prior approval of rent increases in connection with improvements to premises, energy requirements as a condition for landlords being able to apply Section 5(2) of the Danish Housing Regulation Act, and the right to require the installation of water meters.
 - The package will involve indirect tax revenue losses, which in 2020 will amount to DKK 1 million. These revenue losses will be financed by the security of supply charge.

A green and sustainable energy supply based on renewable energy

The parties are in agreement regarding the following:

Development of wind power and other renewable energy technologies

- By 2020, offshore wind power will be expanded by 1 000 MW of offshore wind turbines and 500 MW of inshore wind turbines.
 - 600 MW at Kriegers Flak and 400 MW at Horns Rev will be put out to tender between 2013 and 2015, with commissioning anticipated in the period 2017-2020. The development at Horns Rev will be initiated first.
 - Screening of areas will be carried out during the first half of 2012 with a view to establishing 500 MW of inshore wind turbines by 2020. The detailed settlement model will be determined by the parties following the screening.
- It is critical that thorough preparations are carried out for putting offshore wind farms out to tender and that the wind farms are marketed to potential tenderers and implemented with flexibility in order to ensure the greatest possible level of competition and lowest prices. A total of DKK 12 million will be allocated in the period 2012-2015 to strengthen the initiative with regard to putting offshore wind turbines out to tender.
- The construction of new onshore wind turbines with a total capacity of 1 800 MW is anticipated by 2020. The dismantling of 1 300 MW of capacity is also anticipated during the same period. Support for this will be sought via measures such as new planning tools, strategic environmental assessments and the adaptation of the framework conditions as a result of technological developments. A proposal for this will be drawn up and submitted during the first half of 2013, and the parties to this agreement will reach agreement on any new initiatives. The proposal will partly be based on the evaluation of the four schemes in the RE Act (the green scheme, the right of purchase scheme, the devaluation scheme and the guarantee fund) and will include an assessment of the scope to further cut premiums for investments where the full premium is not necessary.
- A change will be made to the settlement for new wind turbines connected to the grid from 1 January 2014, such that the fixed premium, which is nominally DKK 0.25/kWh for the first 22 000 full-load hours, will in future be reduced by DKK 0.01 for each DKK 0.01 by which the electricity market price exceeds DKK 0.33/kWh nominally, and thus be removed completely if the electricity price reaches or exceeds DKK 0.58/kWh at current prices. At the same time, the calculation basis will be changed for the supported production, so that it is weighted by 30 % of the turbine power and 70 % of the rotor area.
- To safeguard future investment opportunities etc. concerning wind turbines, the existing Danish Wind Turbine Secretariat will continue to perform this task within the Danish Ministry of the Environment. A pool of DKK 13.2 million will be allocated for the period 2012-2015 in order to finance the secretariat.
- There will be an extension of the existing PSO-financed pool for new renewable energy technologies for electricity generation (solar, wave, etc.) amounting to a total of DKK 100 million over four years.
- A total of DKK 25 million will be allocated for the period 2014-2015 to support the construction and demonstration of wave power projects.

Promotion of CHP, district heating and biomass, etc.

- Changes will be made to the Danish Heat Supply Act with a view to promoting the conversion of central CHP plants to biomass. Electricity and heating generators and heating customers will be given the opportunity to enter into voluntary agreements,

according to which the tax benefits of switching from fossil fuels to biomass for heat generation may be split between the two parties.

- To assist the smaller and troubled open-field plants struggling with high heat prices, changes will be made to the rules so that the 35 CHP plants with the highest heat prices may, with a dispensation application, be given permission to install a biomass-powered boiler up to a maximum of 1 MW to be used solely for heat generation.
- A funding pool will be set up with a total of DKK 19 million in the period 2013-2015 to promote partnerships for strategic energy planning between municipalities, local businesses and energy companies, and to improve the interaction between government, regional and municipal initiatives and to support municipal planning and citizen-focused initiatives. Government involvement will be supported with a total of DKK 4.8 million.
- An analysis of the role of district heating in the energy supply of the future will be prepared and submitted by the end of 2013. DKK 3 million will be allocated for the analysis.
- An analysis of the use of bioenergy in Denmark will be carried out. This analysis will focus on whether the right conditions exist for the efficient and environmentally sustainable use of biomass resources in Danish energy supply. The analysis will also look at CO₂ displacement. A total of DKK 7.5 million will be allocated for the period 2012-2015. The analysis will be submitted by the end of 2013.
- A funding pool amounting to a total of DKK 35 million for the period 2012-2015 will be set up for the promotion of renewable energy in district heating (geothermal, large heat pumps, etc.).

Conversion to renewable energy in buildings and industry

The parties have agreed to support phasing out oil-fired boilers in existing buildings in cases where there are financially viable alternatives. On the basis of this, the following initiatives will be implemented:

- From 2013, a ban will be introduced on the installation of boilers fired by oil or natural gas in new buildings. There will be provision for exemptions from this ban in cases where no suitable alternatives exist.
- The parties are in agreement that from 2016 it will no longer be possible to install oil-fired boilers in existing buildings in areas where district heating or natural gas is an alternative, and that it will still be possible to install oil-fired boilers in existing buildings in areas without these alternatives.
- In order to support the conversion from boilers fired by oil or natural gas boilers in existing buildings to forms of heating based on renewable energy, a funding pool totalling DKK 42 million will be allocated for the period 2012-2015 to promote initiatives for and the preparation of analyses of energy-efficient alternatives, including heat pumps, solar and solar thermal. The scheme will subsequently be evaluated.
- An analysis of the future use of the gas infrastructure will be carried out by the end of 2013 – both during a transition phase with the continued use of natural gas and in a future where biogas and other renewable energy gases take over. DKK 2 million will be allocated for the analysis.
- A funding pool will be set up with DKK 250 million available in 2013, and DKK 500 million per year as of 2014, which will be maintained until 2020. The pool will promote the energy-efficient use of renewable energy in company production processes. The support will be given as a construction subsidy for projects that replace fossil fuels with renewable energy or district heating, and energy efficiency measures

directly associated with these conversion projects. Enterprises that currently use district heating for processing may instead choose to receive a subsidy on an ongoing basis for their additional costs, up to a maximum of DKK 42 per GJ, provided that the CHP production is converted to biomass and that the scheme is approved by the EU under the State aid rules. An evaluation of the scheme will be carried out during the first half of 2015.

- An annual grant of DKK 30 million is being introduced from 2013 until 2020 to maintain and promote industrial CHP in industry and horticulture, which will be financed by the security of supply charge.
- A general basic allowance will be introduced for coal, coke and petroleum coke used for heavy processing. This relief will amount to around DKK 3 million in both 2013 and 2014, and will thereafter amount to around DKK 10 million per year in the period 2015-2020. The new allowance will be formulated on the basis of sulphur content per GJ of coal fuel.
- An analysis will be carried out concerning the potential for better exploitation of surplus heat from industry. The issue will be discussed by the parties to this agreement before the middle of 2013. This will include a discussion of the issue of the unequal scope for passing on tax changes.

Smart grids, etc.

Realising the goal of phasing out fossil fuels will require the further expansion of the electricity system in an intelligent manner. Therefore, the parties are in agreement regarding the following:

- New international electricity exchange capacity will be established in connection with the construction of Kriegers Flak. The EU is providing around DKK 1.1 billion in support for the interconnection of the Danish and German electricity markets.
- An overarching strategy for the establishment of smart electricity grids in Denmark will be drawn up in 2012. The parties will discuss possible new initiatives on the basis of the strategy.
- Efforts will be made to establish an agreement with the grid enterprises concerning the roll-out of remotely readable hourly electricity meters.
- An analysis will be carried out concerning the scope for maintaining the high functionality of the electricity network in a situation with steadily rising wind strengths, with particular emphasis on the period after 2020. DKK 2 million will be provided to support the analysis and subsequent work. The analysis will be completed in 2013.
- An analysis will be carried out concerning the opportunities and effects of exchange connections, including connections to developments in neighbouring countries. The analysis will be submitted by the end of 2014.
- A 'wholesale model' will be established to promote competition in the electricity market, partly by ensuring that electricity consumers receive a single invoice from electricity trading companies. The wholesale model will not require any changes to consumer prices or payment terms which are parameters for competition. A compulsory insurance scheme will be set up to safeguard the maintenance of government tax revenue.
- A detailed review will be carried out of the regulation of the Danish electricity supply sector with a view to providing incentives for green conversion, cost effectiveness, competition and consumer protection. The regulatory review will be concluded in 2014. A total of DKK 13 million will be allocated for this in the period 2012-2014.

Better framework conditions for biogas developments

An ambitious expansion of biogas will be implemented. The financial conditions for biogas production will be improved with a view to facilitating progress in this field, and it will be possible to use biogas outside the CHP sector to a greater extent than at present. The parties have therefore agreed, among other things, that overall support for biogas used for CHP or distributed via the natural gas network should be able to amount to DKK 115/GJ in 2012. This will be achieved through the following:

- A new combined support model for biogas, whereby:
 - The existing support of DKK 79/GJ for biogas used in CHP plants will continue as a basic subsidy.
 - Subsidy equalisation will be implemented for biogas supplied to the natural gas network relative to biogas used for CHP generation, so that biogas supplied to the natural gas network will also receive the basic subsidy of DKK 79/GJ.
 - A new basic subsidy will be introduced of DKK 39/GJ net for biogas for processes in undertakings and transport.

- The start-up support from the construction pool will be increased from 20 % to 30 % in 2012.
- A subsidy of DKK 26/GJ will be introduced for all biogas users. The subsidy will be reduced in line with increases in natural gas prices. The subsidy will be reduced by DKK 0.01/GJ when the natural gas price rises by DKK 0.01/GJ.
- A further supplement of DKK 10/GJ will be introduced for all biogas users. From 2016 the subsidy will be gradually reduced by DKK 2/GJ at a time until it reaches DKK 0/GJ in 2020.
- The regulations will be amended with a view to facilitating a voluntarily transition from fixed electricity prices to electricity price premiums for purely biogas-based plants.
- Municipal natural gas companies will be given the opportunity to become involved in biogas production as an associated activity along with their commercial activities.
- A task force will be set up to investigate and support specific biogas projects with a view to ensuring the expected biogas expansion up until 2020. If the necessary development of new projects does not occur in 2012-2013, the parties are in agreement that discussions will take place in 2014 concerning other options to promote biogas development, including specific proposals involving purchase obligations. DKK 9.6 million will be allocated to the task force in the period 2012-2015 to support the expansion of biogas.
- The biogas task force will be continued. DKK 13.2 million will be allocated to this in the period 2012-2015.

Electricity and biomass in the transport sector

In the longer term, the transport sector must undergo radical conversion from fossil fuels to new fuels such as electricity and biomass. The parties are in agreement regarding the following initial steps in this conversion:

- A strategy will be drawn up to promote energy-efficient vehicles such as hybrid plug-ins, electric vehicles, etc., for which a funding pool of DKK 70 million will be distributed in the period 2013-2015 to support the roll-out of charging points for electric vehicles, the infrastructure for hydrogen and the infrastructure for gas in heavy goods transport. The strategy will be discussed by the parties to the agreement in 2013.
- Amendments will be made to the Danish Biofuels Act with a view to ensuring the admixture of 10 % biofuels by 2020. However, implementation awaits an analysis of alternative initiatives to comply with the EU's obligations in relation to renewable energy in transport. The analysis will be completed in 2015.
- A funding pool with a total of DKK 9 million will be allocated in the period 2013-2015 for a model to develop an analysis of the climate and energy-related conditions related to the use of alternative fuels. The work will support the reduction of CO₂ emissions from the transport sector. One element of this work will be the interaction between the fuels and the energy system.
- A total of DKK 15 million will be allocated in the period 2013-2015 for the continuation of the electric vehicle research scheme.

Increased research, development and demonstration activities

Investments in research, development and demonstration activities are also prerequisites for Danish enterprises to develop and sell green solutions and create green jobs in Denmark in the longer term. The parties are in agreement regarding the following:

- The parties will strive to continue the high level of research, development and demonstration in energy technology to support continued efficiency improvements in the use of energy and promote cost-effective renewable energy technologies that also have commercial and export potential.
- A total of DKK 9.5 million will be allocated in the period 2012-2015 to support the ongoing work on the island of Samsø to demonstrate solutions for the creation of a fossil-fuel-free island.

The parties note that the framework for receiving support from the PSO-financed ForskEL programme is broad, but subject to the restriction that individual research projects must have a significant link to the electricity system.

Financing of the agreement's energy policy initiatives

The agreement's new energy policy initiatives up until 2020 require financing. At the same time, there is a need to ensure the long-term sustainability of government finances, which includes ensuring that the system of taxes and subsidies can also help to support the green conversion going forward. The framework conditions must support green investments and make it attractive for consumers to make green choices. The parties are in agreement regarding the following:

- The agreement will be implemented in a cost-effective manner and give consideration to customers and the competitiveness of companies.
- The additional costs for energy companies as a result of the increased energy savings obligations will be financed through the companies' tariffs.
- Support costs in connection with the expansion of renewable energy supplied to the electricity grid will be financed through PSO schemes.
- Support for renewable energy supplied to the gas network will be financed via a PSO scheme for gas consumption corresponding to the existing PSO scheme for electricity.
- Other support will be financed via the Danish Finance Act (cf. the initiatives in Annex 3).
- Government subsidies for renewable energy for processing, biogas (for transport and processing), industrial CHP, energy savings packages for private rental homes and the government tax revenue losses that will result from the displacement of fossil fuel will be financed via a security of supply charge.
- The security of supply charge will be imposed on all heating, i.e. heating generated by both fossil fuels and biomass, and will enter into force in 2013. However, this will require a new tax base with regard to biomass; hence this must be formulated with due consideration for the EU's anti-discrimination and State aid rules and will enter into force no later than 2014.
- To ease the burden of the security of supply charge on consumers of fossil fuels, who already pay high taxes, the tax increase in respect of fossil fuels already taxed will be reduced by DKK 7.5/GJ by 2020 at the latest (2010 level).

- With a view to shielding trade and industry from the funding by tax of the energy policy initiatives of the agreement, energy taxes on electricity and fuel for processing will be reduced. The reduction is to be financed via the security of supply charge, ensuring that the total burden on trade and industry from the security of supply charge and the processing energy reduction is reduced to DKK 75 million in 2020. The reduction in energy taxes on electricity and fuel for processing will be introduced gradually until 2020, in parallel with the other financing measures for the agreement.
- The security of supply charge will generate DKK 600 million in 2013 for financing the agreement's energy policy initiatives, rising to DKK 2.8 billion in 2020 in immediate revenue following the deduction for compensating trade and industry (see Table 1).

Table 1. Security of supply charge contribution to financing

2011 prices, DKK billions	2013	2014	2015	2016	2017	2018	2019	2020
Direct revenue less compensation for trade and industry	0.6	1.4	1.7	1.9	2.2	2.4	2.5	2.8

- The remaining proposed expenditure relating to the Finance Act will be financed within the allocated reserves for energy negotiations for the 2012 Finance Act and through winding up the campaign and information activities in Go' Energi.
- With a view to assessing the need for adjustments, the existing subsidy and taxation system will be reviewed, including the scope for providing the right incentives for conversion to a green, cost-effective and flexible energy system. The terms of reference for the analysis will be approved by the parties to the agreement. The analysis will be completed by 2014.
- With a view to reducing the costs of the agreed initiatives for citizens and enterprises, a number of cost-reducing measures will be implemented, such as increased competition, efficiency measures, etc., relating to the monopoly-regulated companies in the electricity sector, including grid enterprises and Energinet.dk's activities, a summary of which is set out in Annex 2. The Government is obliged to report annually on the status of any savings realised, so there will be continuous monitoring to ensure that the agreement is not built on erroneous economic foundations.

Overview of analyses and studies for the conversion of the overall energy supply to clean renewable energy

The conversion of the energy supply to clean renewable energy is a very extensive task. It is critical that the various subsystems of the energy sector operate optimally together during the conversion, while at the same time the requisite infrastructure must be continuously developed. To ensure an adequate knowledge base that supports the most economical and effective solutions, the agreed initiatives and decisions on new initiatives for the next phase of the conversion process, there will be a need to initiate a number of analyses and studies in the period 2012-2015, for which funds will be allocated.

The parties will meet and discuss the analyses and studies when they have been drawn up. The parties are in agreement regarding the implementation of the following initiatives:

<i>Topics in the Energy Policy Agreement</i>	<i>Analyses, etc.</i>
<i>An energy-efficient society with less energy wastage</i>	<ul style="list-style-type: none">• Analysis of the role of district heating in the future energy supply by the end of 2013.• The municipal CO₂ calculator for the municipalities' annual CO₂ statements will be further developed and updated. A total of DKK 2 million will be allocated for this in the period 2012-2015.• Strategy for the energy renovation of the existing building stock, including the scope for tightening up requirements concerning building components, and a comprehensive analysis of the area, including initiatives to ensure better compliance with the requirements of the building regulations and the use of ESCO models. The minimum requirements for building components in the building regulations will be future-proofed to reflect future challenges and anticipated energy prices. The strategy will be discussed by the parties to the agreement by the end of 2013. A total of DKK 30 million will be allocated for this in the period 2012-2015.
<i>A green and sustainable energy supply based on renewable energy</i>	<ul style="list-style-type: none">• Analysis of the future use of the gas infrastructure – both during a transition phase with the continued use of natural gas and in a future where biogas and other renewable energy gases take over – by the end of 2013.• Analysis of the use of bioenergy in Denmark. This analysis will focus on whether the right conditions exist for the efficient and environmentally sustainable use of biomass resources in Danish energy supply, including CO₂ displacement. The analysis will be submitted by the end of 2013.

	<ul style="list-style-type: none"> • Analysis of the potential for maintaining the high level of functionality of the electricity network in a situation with steadily rising wind strengths. • Analysis of and plan for expanding exchange connections. • Analysis of models of support for solar energy.
<i>Smart grids</i>	Strategy for establishing smart electricity grids in Denmark.
<i>Transport</i>	<ul style="list-style-type: none"> • Recurring technology assessments for the transport sector. • Strategy for the promotion of energy-efficient vehicles such as hybrid plug-ins, electric vehicles, etc., which will be discussed in 2013.
<i>Other</i>	<ul style="list-style-type: none"> • Detailed review of the regulation of the Danish electricity supply sector with a view to providing incentives for green conversion, cost effectiveness, competition and consumer protection. The regulatory review will be concluded in 2014. A total of DKK 13 million will be allocated for this in the period 2012-2014. • Review of the subsidy and taxation system with the aim of assessing the need for adjustments to the existing system, so that, in economic terms, it provides appropriate incentives for conversion to a green and flexible energy system. The terms of reference for the analysis will be approved by the parties to the agreement. • Development of a general equilibrium model for modelling energy systems and the economy to identify effective policy measures and future regulatory measures. A total of DKK 15.2 million will be allocated for this in the period 2012-2015. • Analysis of the overall energy initiative and possible new initiatives to identify the pivotal preconditions and strategic choices to ensure the conversion of the overall energy supply to clean renewable energy in 2050, and to identify how the sub-elements of the energy system (electricity, heating and transport) can interact. The analysis will be prepared in advance of the parties' meeting in 2018 to discuss initiatives after 2020. • Analysis and underlying data concerning the energy-related conditions of trade and industry, in particular the effect of competitiveness in relation to other countries in both the short and the long term for different industries. The analyses will incorporate new knowledge concerning the scope for energy efficiency, the scope for passing on costs and the identification of rural/urban problems, in addition to the development of energy efficiency under different assumptions regarding developments in energy prices, CO₂ prices, technological development, etc. A total of DKK 10 million will be allocated for this in the period 2013-2015.

Annex 1 concerning the financing and phase-in profile for the security of supply charge, PSO and tariffs

Table: Annual financing broken down by PSO, tariffs and security of supply charge, rounded to the nearest DKK 100 million

DKK millions	2012	2013	2014	2015	2016	2017	2018	2019	2020
Energy Policy Agreement ¹	-300	700	1 400	1 800	1 800	2 500	2 900	3 400	3 500
PSO	100	100	200	200	300	800	1 100	1 500	1 400
Tariffs	-300	100	-200	-100	-300	-400	-500	-600	-600
Security of supply charge ²	0	600	1 400	1 700	1 900	2 200	2 400	2 500	2 800

1) Due to rounding, the total of the sub-contributions does not necessarily equal the overall rounded total for the financing.

2) The security of supply charge is not expected to generate revenue until 2013, and it is expected that the loss in revenue of around DKK 100 million in 2012 will be financed in 2013.

Annex 2

The initiatives in the agreement will result in a number of investments and expenses of significance for citizens and trade and industry. Therefore, a number of measures will be implemented in parallel during the agreement period, which will reduce energy costs for consumers compared with the developments that would take place without these measures. Measures will be implemented which are estimated to result in savings totalling around DKK 1.8 billion in 2020.

Table: Measures to reduce the burden on consumers

DKK millions in 2020	PSO (electricity & gas)	Network tariffs (electricity, gas, oil, district heating) etc.	Treasury (heating)	Total
Cost-reduction measure				
Inshore wind turbine model	-200			-200
Efficiency improvements to Energinet.dk etc.		-755		-755
Energinet.dk's acquisition of regional transmission networks		-200		-200
Energy efficiency		-110		-110
Regulatory review — altered economic regulation of network companies		-300		-300
Deferment of aspects of the cable action plan		-130		-130
Wholesale model		-75		-75
Total				-1 770

Reduced costs for the erection of inshore wind turbines: Reassessment of the need for support based on a reduced requirement for test turbines and the scope for distributing support over a longer period. The establishment of 400 MW at DKK 0.70/kWh will generate savings in relation to the amount assumed in the strategy document *Vores energi* [Our future energy] of around DKK 200 million by 2020 (2011 prices)¹.

Cost reductions in the energy companies' savings initiatives: A ceiling will be established for the total cost of the energy companies' savings initiatives, which will generate savings of DKK 110 million by 2020 (2011 prices) compared to the amount anticipated in *Vores energi*. If it transpires that the anticipated energy savings cannot be achieved within this ceiling, the parties will discuss how to deal with this.

Energinet.dk's acquisition of regional networks: It is anticipated that Energinet.dk will acquire the regional transmission networks in 2012. The takeover of these regional networks is anticipated to generate benefits in the form of lower operating costs amounting to DKK 200 million by 2020.

Efficiency improvements to Energinet.dk etc.: Energinet.dk will initiate savings and efficiency measures, amend the depreciation of electricity activities and pay any excess bottleneck income faster than previously assumed, so that in 2020 costs will be reduced by DKK 775 million in total, benefiting energy consumers through lower tariffs for using Energinet.dk's network.

¹ The parties to the agreement subsequently agreed to establish a further 100 MW via inshore wind turbines, for a total of 500 MW.

Cable action plan: In 2009, the parties to the Energy Policy Agreement agreed on the cable action plan, which included total investments of DKK 15.2 billion (at 2011 prices) for laying cables and aesthetic projects. Parts of the projects have been postponed, which will save costs totalling DKK 130 million in 2020.

Benefits associated with the amended regulation of the electricity sector: According to Vores energi, the regulation of the electricity sector is to be reviewed. Benefits associated with changes to the economic regulation of the network companies are expected to produce savings of DKK 300 million.

Wholesale model: The mere introduction of the wholesale model to the electricity sector is expected to help reduce total consumer-related costs for network companies and electricity trading companies by DKK 100 million. The gain relates to the direct saving from not having to issue two invoices. In addition, the wholesale model will open up a number of tasks to competition, which on one hand is expected to lead to efficiency gains, but on the other hand will entail a loss for consumers as a result of a greater risk of loss of tax revenues, PSO and network tariffs.

Annex 3: Funding pools under the Energy Policy Agreement

Table 1: Initiatives related to the Finance Act

DKK millions	2012	2013	2014	2015	Total 2012-2015
Initiatives that have been or are being implemented:	9.0	9.2	6.5	3.5	28.2
Detailed review of electricity supply legislation	5.0	5.0	3.0	-	13.0
Equilibrium model (CGE model)	4.0	4.2	3.5	3.5	15.2
Prioritised initiatives not yet implemented:	25.5	31.5	54.0	54.8	165.8
Support for biogas expansion	5.7	5.7	5.7	5.7	22.8
Analysis of bioenergy use	1.5	2.0	2.0	2.0	7.5
Support for wind development	6.3	6.3	6.3	6.3	25.2
Energy planning and smart grids	3.0	3.0	12.0	12.8	30.8
Promotion of new RE technology	5.0	10.0	22.5	22.5	60.0
Business analyses of energy usage	2.0	2.0	3.0	3.0	10.0
Support for fossil-fuel-free island (Samsø)	2.0	2.5	2.5	2.5	9.5

Table 2: Energy efficiency packages

DKK millions	2012	2013	2014	2015	Total 2012-2015
Prioritised energy efficiency initiatives	20.0	60.0	60.0	60.0	200.0
Promotion of alternatives to oil-fired boilers	3.0	13.0	13.0	13.0	42.0
Support for energy-saving initiatives	3.0	3.0	3.0	3.0	12.0
Energy renovation of the existing building stock	7.5	7.5	7.5	7.5	30.0
Continuation of Knowledge Centre for Energy Savings in Buildings	5.0	5.0	5.0	5.0	20.0
Transport infrastructure	1.0	23.0	23.0	23.0	70.0
Continuation of the electric vehicle research scheme	0.0	5.0	5.0	5.0	15.0
Climate and energy issues of alternative fuels	0.0	3.0	3.0	3.0	9.0
CO ₂ calculator	0.5	0.5	0.5	0.5	2.0