

December 2011

## **Danish report under Directive 2009/28/EC on progress in the use and promotion 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.

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

The Danish Renewable Energy Action Plan was submitted to the Commission in June 2010. This progress report contains a description of the situation in 2009 and 2010. The figures have thus been calculated for the 2009 and 2010 calendar years, and the information contained in the report focuses on the period up to and including 2010. This report updates the Renewable Energy Action Plan in a number of areas for the second half of 2010.

In its report "Our Future Energy", the Danish Government presents suggestions for a series of new initiatives that form the basis for the establishment of an energy agreement for the period after 2010. The Danish Parliament (Folketinget) is currently (December 2011) debating this report. The Government's suggestions are not a part of the progress report.

All figures have been calculated in the same way as in the Danish Renewable Energy Action Plan, i.e. Ktoe, MW, GWh etc., as required by the Commission. In addition, the figures are also presented in TJ, with a conversion factor of 41.868 Ktoe/TJ (0.041868 Ktoe/PJ)

**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).**

Please fill in the actual shares and actual consumption of renewable energy **for the preceding 2 years** in the suggested tables.

**Table 1: The sectoral (electricity, heating and cooling and transport) and overall shares of energy from renewable sources<sup>1</sup>**

	2009	2010
Renewable energy sources for heating and cooling <sup>1</sup> %	29.56	30.64
Renewable energy sources for electricity <sup>2</sup> %	28.87	31.04
Renewable energy sources for transport <sup>3</sup> %	0.24	0.26
Total renewable energy sources <sup>4</sup> %	19.86	21.78
Of which from cooperation mechanism <sup>5</sup> %		
Surplus for cooperation mechanism <sup>6</sup> %		

**Notes to figures in tables 1, 1a, 1d and 4**

In accordance with RE Directive regulations, the use of biofuels in the transport sector and liquid biofuels in the electricity and heating sector must be sustainable. It has not yet been verified whether the use of liquid biofuels (fish oil, rapeseed oil etc.) in the electricity and heating sector is sustainable. Liquid biofuel is therefore not included in tables 1, 1a 1d and 4.

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 introduced a minimum of 0.55 % sustainable biofuels into the transport sector in 2010. The companies in question have submitted this information to the Danish Energy Agency, which is currently in the process of completing an audit on it. As the information had not been finally verified, biofuels are not included in tables 1, 1a, 1d, 4 and 5.

If liquid biofuels had been included in table 1, the total RE share would have been around 0.3 % percentage points higher.

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<sup>1</sup> Facilitates comparison with Tables 3 and 4a of the NREAPs

**Table 1a: Calculation table for the renewable energy contribution of each sector to final energy consumption (Ktoe)<sup>2</sup>**

Ktoe/year	2009	2010
A) The gross final energy consumption of renewable energy sources for heating and cooling	2 296	2 262
B) Gross final consumption of electricity from RES	895	1 065
C) Gross final consumption of energy from RES in transport <sup>3</sup>	9.8	10.8
D) Gross total RES consumption <sup>3</sup>	3 191	3 692
E) Transfer of RES <u>to</u> other Member States		
F) Transfer of RES <u>from</u> other Member States and 3rd countries		
G) RES consumption adjusted for target (D)-(E)+(F)		

PJ/year	2009	2010
A) The gross final energy consumption of renewable energy sources for heating and cooling	96.1	109.9
B) Gross final consumption of electricity from RES	37.5	44.6
C) Gross final consumption of energy from RES in transport	0.4	0.5
D) Gross total RES consumption	133.6	154.6
E) Transfer of RES <u>to</u> other Member States		
F) Transfer of RES <u>from</u> other Member States and 3rd countries		
G) RES consumption adjusted for target (D)-(E)+(F)		

<sup>2</sup> Facilitates comparison with Table 4a of the NREAPs.

<sup>3</sup> In accordance with Article 5(1) of Directive 2009/28/EC, gas, electricity and hydrogen from renewable energy sources are only taken into consideration once. Double counting is thus not allowed.

**Table 1.b: 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 electricity<sup>4</sup>**

	2009		2010	
	MW	GWh	MW	GWh
Hydro[1]:	<b>9</b>	<b>22</b>	<b>9</b>	<b>22</b>
- Non-pumped	9	22	9	22
- < 1MW	5	13	5	13
- 1MW-10MW	4	10	4	10
- > 10MW	-	-	-	-
- pumped	-	-	-	-
- mixed[2]	-	-	-	-
Geothermal	-	-	-	-
Solar:	<b>5</b>	<b>4</b>	<b>7</b>	<b>6</b>
- photovoltaic	5	4	7	6
- concentrated solar power	-	-	-	-
Tide, wave, ocean	-	-	-	-
Wind	<b>3,322</b>	<b>7,029</b>	<b>3,642</b>	<b>7,729</b>
- onshore	2,780	5,883	2,877	6,106
- offshore	542	1,147	765	1,622
Biomass[3]	<b>1,094</b>	<b>3,352</b>	<b>1,248</b>	<b>4,632</b>
- solid, biomass	1,017	3,031	1,168	4,299
- biogas	77	320	80	333
- bioliquids	-	-	-	-
<b>TOTAL</b>	<b>4,430</b>	<b>10,407</b>	<b>4,906</b>	<b>12,389</b>
- Of which in CHP	1,094	3,352	1,248	4,632

<sup>4</sup> Facilitates comparison with Table 10a of the NREAP.

**Table 1c: Total actual contribution (final energy consumption<sup>5</sup>) 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)<sup>6</sup>**

<b>Ktoe/year</b>	<b>2009</b>	<b>2010</b>
Geothermal (excluding low temperature geothermal heat in heat pump applications)	6	5
Solar	14	15
Biomass 18:	2,123	2,436
- Solid biomass	2,075	2,387
- biogas	48	49
- Liquid biogas	-	-
Renewable energy from heat pumps:	<b>153</b>	<b>170</b>
- of which aerothermal		
- of which geothermal		
- of which hydrothermal		
<b>TOTAL</b>	<b>2,296</b>	<b>2,626</b>
- Of which DH 19	967	1 217
- Of which biomass in households 20	1,625	1,867

<b>PJ/year</b>	<b>2009</b>	<b>2010</b>
Geothermal (excluding low temperature geothermal heat in heat pump applications)	0.3	0.2
Solar	0.6	0.6
Biomass 18:	88.9	102.0
- Solid biomass	86.9	99.9
- biogas	2.0	2.1
- Liquid biogas	-	-
Renewable energy from heat pumps:	<b>6.4</b>	<b>7.1</b>
- of which aerothermal		
- of which geothermal		
- of which hydrothermal		
<b>TOTAL</b>	<b>96.1</b>	<b>109.9</b>
- Of which DH 19	40.5	51.0
- Of which biomass in households 20	68.0	78.2

<sup>5</sup> Direct use of district heating as defined in Article 5(4) of Directive 2009/28/EC

<sup>6</sup> Facilitates comparison with Table 11 of the NREAPs

**Table 1.d: Total actual contribution 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 the transport sector (Ktoe)<sup>7, 8</sup>**

<b>Ktoe/year</b>	<b>2009</b>	<b>2010</b>
Bioethanol /bio-ETBE	-	-
- of which biofuels [1], cf. Article 21(2)	-	-
- of which imported [2]	-	-
Biodiesel	-	-
- of which biofuels [3], cf. Article 21(2)	-	-
- of which imported [4]	-	-
Hydrogen from renewable sources	-	-
Electricity from renewable sources	<b>9.8</b>	<b>10.8</b>
- of which road transport	-	-
- of which other forms of transport	9.8	10.8
Others (as biogas, vegetable oils, etc.) – further specified	-	-
- of which biofuels [5] cf. Article 21(2)	-	-
<b>Total</b>	<b>9.8</b>	<b>10.8</b>

<b>PJ/year</b>	<b>2009</b>	<b>2010</b>
Bioethanol /bio-ETBE	-	-
- of which biofuels [1], cf. Article 21(2)	-	-
- of which imported [2]	-	-
Biodiesel	-	-
- of which biofuels [3], cf. Article 21(2)	-	-
- of which imported [4]	-	-
Hydrogen from renewable sources	-	-
Electricity from renewable sources	<b>0.4</b>	<b>0.5</b>
- of which road transport	-	-
- of which other forms of transport	0.4	0.5
Others (as biogas, vegetable oils, etc.) – further specified	-	-
- of which biofuels [5] cf. Article 21(2)	-	-
<b>Total</b>	<b>0.4</b>	<b>0.5</b>

<sup>7</sup> With regard to biofuels and liquid biofuels, only those that comply with the criteria for sustainability cf. Article 5(1) of Directive 2009/28/EC have been taken into consideration

<sup>8</sup> Facilitates comparison with Table 12 of the NREAPs

**2. Measures taken and/or planned in the preceding 2 years 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

**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).**

Following the submission of the Danish Renewable Energy Action Plan in June 2010, the Danish energy authorities have examined existing rules that could be a hindrance to the development of energy from renewable sources. On the basis of this, the Danish Government has decided to repeal the requirement for special approval by the central energy authorities for larger wind turbine installations on land.

Under the previous rules, wind turbine installations on land of over 10 MW were required to undergo a special approval procedure in the Danish Energy Agency, part of the Danish Ministry of Climate and Energy. The rules for this are to be found in Order No 493 of 2003 (bekendtgørelse nr. 493 af 2003), which contains the objective approval criteria for larger electricity production installations.

The central authorities' approval requirements have now been repealed. With the appropriate municipality permissions, following the planning process, land-based wind farms can now be established without the prior consent of the energy authorities, on condition that the turbines meet the technical standards for the specific type of wind turbine. These objective standards can be found in the Order issued by the Government. Compliance with these requirements is normally checked in connection with the certification of the wind turbine in question

The Danish energy authorities are still aware of possible legislative issues with regard to the development of renewable energy. In this regard, information campaigns have been carried out to create awareness of the increased use of renewable energy. These information campaigns are often combined with a subsidy scheme. This was the case with a campaign to scrap old oil-fired boilers and receive subsidies for the installation of heat pump systems, solar panels etc., outside areas of collective supply and subsidies for connection to district heating in areas designated for district heating supply.

**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).**

Plans for an increased coupling with neighbouring countries

- The 600 MW Great Belt connection, connecting east and west Denmark. This connection became operational in September 2010
- The 700 MW Skagerrak 4 connection to Norway is under construction and is expected to be operational in 2014

Speeding up procedures for the approval of grid infrastructures

During the second half of 2010, a working group with the participation of the Danish Energy Agency, Energinet.dk and the regional transmission companies looked at the possibility of optimising existing procedures for investment in the electricity transmission grid with a view to the connection of electricity production facilities, including those based on renewable energy. Among other things, the group concluded that:

- 1) awareness of administration times has generally persuaded all actors to focus on use of time in all phases of a transmission project where time was a factor,
- 2) a change in practice was not necessary in this area. The regional transmission companies' planning takes greater amounts of wind into account – around 3 200 MW of land wind in the cable action plan for west Denmark in 2025 and
- 3) administration time in both the Danish Energy Agency and the Danish Energy Regulatory Authority has become shorter.

However, the working group also noted that investments in the transmission grid are large and complex projects and that even though there was a focus on use of time by all concerned, this would not necessarily mean that all projects could be carried out more quickly in the future. For example, there might be some doubt concerning a project in the approval phase, or the need for expropriation might arise during the establishment phase. It was generally agreed that use of time for the various planning and approval processes has become shorter in recent years.

Intelligent and flexibly priced electricity consumption

On 29 July 2011, the Danish Energy Agency published an Order on the final metering of electricity consumption (Bekendtgørelse om måling af elektricitet i slutforbruget). The Order lays down minimum technical requirements for smart meters that can register consumption and delivery of electricity at predetermined intervals. The minimum requirements concern both the measurement and dissemination of data. The use of intelligent electricity meters is voluntary. The intention of the Order is thus to ensure that those meters that are actually installed, support and promote the development of intelligent and flexible electricity consumption.

DONG Energy Elnet has initiated studies using sales-neutral dynamic tariffs, intended to establish how much electricity consumption can be moved from peak periods.

In 2010 the Minister for Climate and Energy at the time established a smart grid Network with representatives from the authorities, the electricity industry, the components industry, and with the participation of researchers, to provide input for policy in the field. The Network has arrived at 35 concrete recommendations, and in particular a third billing model in which consumers with an annual electricity consumption of below 100 MWh can voluntarily be offered hourly meter readings, even though the legal requirements for this are aimed at larger consumers. The policy of the new government includes the formulation of a smart grid strategy. This is expected to be primarily based on the Network's recommendations.



### Criteria for deregulation

Energinet.dk has responsibility for the operation of the combined electricity supply system and for maintaining balance and supply stability of the grid. Energinet.dk is also responsible for maintaining balance in the grid by restructuring (upwards and downwards regulation) electricity generation from plants connected to it.

As noted in Section 4.2.7 b of the Danish National Action Plan for Renewable Energy, deregulation of plants using renewable energy can only take place under certain conditions. The criteria for deregulation are also monitored by the authorities. Formerly, competence was shared between the Danish Energy Regulatory Authority and the Danish Energy Agency. However, as mentioned in Section 4.2.7.d of the RE action plan, this is expected to change so that it will solely become the responsibility of the Danish Energy Regulatory Authority. This has now become a reality with lov nr. 466 af 18 maj 2011 om ændring af lov om elforsyning, lov om naturgasforsyning, lov om varmforsyning, lov om Energinet.dk og lov om fremme af vedvarende energi [Act No 466 of 18 May 2011 amending the Electricity Supply Act, the Natural Gas Supply Act, the Heating Supply Act, the Act on Energinet.dk and the Act on the Promotion of Renewable Energy].

The RE Action Plan also states that at the time of writing, rules for reporting had yet to be established in the event of significant measures being introduced to limit renewable energy sources and also on the notification of improvement measures. These have now been introduced in bekendtgørelse nr. 891 af 17 august 2011 om systemansvarlig virksomhed og anvendelse af el-transmissionsnettet m.v. [Order No 891 of 17 August 2011 on the system responsible company and the use of the electricity transmission grid etc.].

### Responsibility for and distribution of costs in connection with grid connection and grid reinforcement/expansion

Since the middle of 2010 a new Order has been published: bekendtgørelse nr. 1063 af 7 september 2010 om nettilslutning af vindmøller og pristillæg for vindmølleproduceret elektricitet m.m. [Order No 1063 of 7 September 2010 on the grid connection of wind turbines and the feed-in premiums for wind turbine-produced electricity etc.], (replacing Order No 1365 of 15 December 2004 with the same title). As before, the wind turbine owner is solely responsible for connection costs up to a further specified connection point. All costs for grid reinforcement and expansion are the responsibility of the grid and transmission companies.

In addition, the new Order also contains rules stating that grid and transmission companies must supply wind turbine owners requesting a grid connection with all the necessary information, including a detailed estimate of all costs other than connection costs, a reasonable time frame for receiving and considering the application for grid connection and a reasonable time frame for the connection itself.

With regard to facilities other than wind turbines using other renewable energy sources, there is an information provision in bekendtgørelse nr. 1335 af 2 december 2010 om ændring af bekendtgørelse om betingelser og procedurer for meddelelse af tilladelse til etablering af nye el-produktionsanlæg samt væsentlige ændringer i bestående anlæg [Order No 1335 of 2 December 2010 on the amendment to the Order on conditions and procedures for the notification of authorisation for the establishment of new electricity generating plants and significant alterations to current plants].

The Danish Energy Agency has furthermore also reconsidered the frameworks and rules for responsibility for and distribution of costs in connection with grid connection and grid reinforcement and expansion, cf. also Article 16(4) of the RE Directive and has found no grounds for further amendments.

**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 Commission reminds Member States that all national support schemes must respect the state aid rules as foreseen in Articles 107 and 108 of the Treaty on the Functioning of the EU. The notification of the report in accordance with Article 22 of Directive 2009/28/EC does not replace a state aid notification in accordance with Articles 107 and 108 of the Treaty on the Functioning of the EU.

It is suggested that **Table 3** is used to provide more detailed information on the support schemes in place and the support levels applied to various renewable energy technologies. Member States are encouraged to provide information on the methodology used to determine the level and design of support schemes for renewable energy.

**Table 3: Support schemes for renewable energy**

RES support schemes year n (e.g. 2011)		Per unit support	Total (MEUR)*
[(sub) category of specific technology or fuel]			
Instrument (provide data as relevant)	Obligation/quota (%)		
	Penalty/Buy out option/ Buy out price (EUR/unit)		
	Average certificate price		
	Tax exemption/refund		
	Investment subsidies (capital grants or loans) (EUR/unit)		
	Production incentives		
	Feed-in tariff		
	Feed-in premiums		
	Tendering		
Total annual estimated support in the electricity sector			
Total annual estimated support in the heating sector			
Total annual estimated support in the transport sector			

\* The quantity of energy supported by the per unit support gives an indication of the effectiveness of the support for each type of technology

The requested description of support schemes and other measures can be found in the following, under Section 3.0 (3.01.-3.08.).

### 3.0.1 Financial support

The financial support for electricity generation based on renewable energy is laid down in Act No 1392 of 27 December 2008 on the Promotion of Renewable Energy (the Promotion of Renewable Energy Act). Support is in the form of feed-in premiums for:

- A. wind turbines (Sections 36-43)
- B. biogas (Section 44)
- C. biomass (Sections 45-46)
- D. other RE plants (Sections 47-48)

There have been no changes to premiums during the period 2009-2010.

### **A. Premiums for wind-turbines**

#### Wind turbines apart from offshore turbines according to tender and domestic turbines:

There is a premium of DKK 0.25 kWh for electricity generation corresponding to generation at the turbine's installed effect (full-load hours) for the first 22 000 hours following grid connection, There is a further compensation of DKK 2.3 per kWh for balancing costs for electricity from wind turbines.

An extra premium is available for electricity produced by a wind turbine connected from 1 January 2005 and up to and including 31 December 2011 on presentation of a scrappage certificate which is issued for the dismantling of wind turbines with an effect of 459 kW or lower, up to and including 15 December 2011. Scrappage certificates can only be issued from a pool corresponding to the same effect in dismantled wind turbines of 175 MW. The premium is DKK 0.008 per kWh for an electricity generation corresponding to 12 000 full load hours for double the installed effect of the dismantled wind turbine.

#### Off-shore wind turbines according to tender:

Areas for the erection of off-shore wind turbines are offered for tender according to political agreement. The most recent tender was in 2009, for an off-shore wind farm near Anholt. When added to the market price, the premium ensures a feed-in for a given amount of generated electricity.

#### Domestic wind turbines

There is a premium for electricity supplied to an electricity supply grid from a wind turbine with an installed effect of 25 kW or below, which is connected to its own consumer installation. The premium is irrespective of connection date and is determined so that it and the market price together make up DKK 0.060 per kWh.

### **B. Premium for biogas etc.**

For electricity generated by plants run exclusively on biogas, gasification gas produced using biomass, Stirling engines and other special electricity generation plants which use biomass as an energy source, the premium is determined so that it and the market price are DKK 0.0745 per kWh.

For electricity generated using biogas, gasification gas produced using biomass, Stirling engines and other special electricity generation plants which use biomass as an energy source alongside other forms of fuel, there is a premium of DKK 0.045 per kWh for the proportion of the electricity produced using biogas etc.

The sum of the premium and the market price plus premium will be index-regulated from 1 January each year from 2009, on the basis of 60 % of the increases in the retail price index the previous year in relation to 2007.

### **C. Premium for biomass**

For electricity generated from the burning of biomass, the premium is DKK 0.015 per kWh, 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 other renewable energy plants**

There is a premium for electricity generated from plants that exclusively use solar power, wave power or hydro-electricity, or any renewable energy sources other than biogas or biomass. The premium is determined so that it and the market price together make up DKK 0.060 per kWh for 10 years following grid connection and DKK 0.040 per kWh the following 10 years.

For electricity generated by other energy sources than those mentioned above, a premium of DKK 0.10 per kWh is given for 20 years from connection date.

For electricity generated by plants using the abovementioned renewable energy sources in combination with other energy sources, there is a premium of DKK 0.026 per kWh for 10 years and DKK 0.006 per kWh for the following 10 years.

### **3.0.2 The Energy Technology Development and Demonstration Programme (ETDDP)**

The Energy Technology Development and Demonstration Programme (ETDDP) was established in Act No. 555 of 6 June 2007.

The aim of the ETDDP is to support the aims of the energy policy via the promotion of new energy technologies. The ETDDP is intended to:

- provide support for *development and/or demonstration programmes*
- provide support for *research projects* in connection with this
- provide support for the establishment of partnerships and international cooperation
- create commercial successes for new energy technology and work closely with energy sector actors to put together strong consortiums for ambitious and realisable projects

The aims of the EDTP are broader than merely promoting the use of renewable energy for electricity generation. The EDTP also provides support for projects using wind power, biomass, solar energy and wave energy and through these, contributing to the increase in the use of renewable energy. Funding will be allocated via an application process. The final decision on allocation of funds will be made by an independent committee appointed by the minister.

### **3.0.3 Funding for small RE technologies**

Funding will be allocated for promoting the spread of smaller capacity electricity generating plants comprising solar cells, wave power and biogas installations that use technologies that have significance for the future propagation of the use of electricity from renewable sources. The funding requires the plant to be grid connected.

The support comes from a fund which accounts for DKK 25 million annually over four years from 2008 to 2011. The fund is administered by Energinet.dk, which issues annual calls for applications.

### **3.0.4 Support for the production and sale of biogas**

A series of initiatives has been planned for the promotion of biogas in connection with the Green Growth agreement. These include an implementation fund of DKK 85 million annually for the establishment of new combined biogas plants, and operational investment with regard to connection to the combined plant from 2010 to 2012. An installation subsidy of 20 % of the investment has been allocated as part of this scheme. An implementation fund of DKK 15 million annually has been allocated for the period from 2010 to 2012 for the establishment of organic biogas plants. Under this scheme, establishment support can be granted for 20 % of the investment.

### **3.0.5 Four schemes for the promotion of onshore wind power**

Four new schemes have been introduced in the RE Act for promoting expansion with wind turbines. The schemes are administered by Energinet.dk.

#### The value loss scheme

The constructor of a wind turbine must compensate for value loss to a property as a result of its erection. The value loss is determined by an assessment agency.

#### The purchasing rights scheme

The constructor of a wind turbine is obliged to offer at least 20 % of shares in the turbine to a group of persons with purchasing rights. All residents over the age of 18 living up to 4.5 km from new wind turbines can buy into local wind turbine projects. Shares not purchased by residents living within the 4.5 km limit may be offered to those in the rest of the municipal area.

#### The green scheme

With the green scheme, local authorities can apply for support from Energinet.dk for projects that benefit the landscape, recreational opportunities in the local area and for cultural and information activities. The amount that can be made available to the municipal authority is DKK 88 000 per MW of new wind turbines actually erected.

#### The 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 on the issuing of guarantees are made by Energinet.dk. Guarantees are for a maximum of DKK 500 000 per project.

### **3.0.6 Tax relief**

The use of fossil fuels for heating and cooling attracts a considerable energy tax (around DKK 50 per GJ). Heat generated by the incineration of waste has a corresponding tax. Duties were increased by 15 % in Spring Package 2.0 in 2009 and will be index regulated in the future. Conversely, energy tax is not levied on either the use of pure biomass or biomass waste.

### **3.0.7 Scrappage scheme for oil fired boilers**

To ensure a reduction in CO<sub>2</sub> emissions from domestic housing, DKK 400 million has been allocated for subsidies to replace inefficient oil-fired boilers with more energy efficient heating systems. In areas with district heating, subsidies are only granted for the installation of district heating. Outside district heating areas, subsidies are available for replacing an oil-fired boiler with either a heat pump or solar panels, in combination with, for example, a new oil/natural gas/wood pellet boiler. For single-unit houses, a subsidy of DKK 20 000 is available for the installation of liquid-water heat pumps, DKK 15 000 for air-water heat pumps, DKK 10 000 for district heating and 25 % of the investment costs for solar panels.

This scheme is being phased out. Final date for applications was 1 July 2011.

### **3.0.8 Support schemes in the transport sector**

Support is available via research schemes for electric vehicles. From 2008-2009, support amounted to DKK 10 million and DKK 5 million from 2010-2012.

In addition, electric and hydrogen-driven vehicles are exempted from registration tax and green ownership tax up to the end of 2012. Exemption for electric vehicles is planned to continue up to the end of 2015.

#### **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 Disclosure of Electricity to Consumers (final customers) is regulated by the Bekendtgørelse om deklARATION af elektricitet til forbrugerne (El-mærkningsbekendtgørelse) BEK 1322 af 16 november 2010 som ændret ved Bekendtgørelse om ændring af bekendtgørelse om deklARATION af elektricitet til forbrugerne BEK 403 af 28 april 2011 [the Order on the Disclosure of Electricity to Consumers (the Electricity Labelling Order) Order No 1322 of 16 November 2010, amended by the Order on the amendment of the Order on the Disclosure of Electricity to Consumers Order No 403 of 28 April 2011].

The Order specifies that trade in electricity requires either general or individual disclosure. General disclosure is calculated by Energinet.dk on the basis of average fuel consumption and environmental impact. Individual disclosure must be supported by Certificates of Origin for renewable energy-generated electricity, or highly efficient cogenerated heat which the electricity trading activity cancels out. The issuing and cancellation of Certificates of Origin is undertaken by Energinet.dk

#### **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 lignocellulosic material? (Article 22(1)c of Directive 2009/28/EC).**

There is no support for biofuels (other than research and development support from the ETDDP)

Support for the use of biogas can be justified in terms of its environmental advantages in terms of improved aquatic environment, reduced greenhouse gas emissions from agriculture, reduced inconvenience caused by unpleasant smells, increased fertiliser value from de-gassified slurry from livestock manure etc.

#### **5. Please provide information on the functioning of the system of Certificates 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 Certificates of Origin for electricity (not heating or cooling) from renewable energy sources, cf. bekendtgørelse nr. 1323 af 30 november 2010 om oprindelsesgarantier for VE- elektricitet og bekendtgørelse nr. 1322 af 30 november 2010 om deklARATION af elektricitet til forbrugerne [Order No 1323 of 30 November 2010 on Certificates of Origin for Electricity from Renewable Energy Sources and Order No 1322 of 30 November 2010 on the Disclosure of Electricity to Consumers].

In Denmark, Certificates of Origin can only be issued by Energinet.dk. It is therefore Energinet.dk that registers and monitors issued Certificates of Origin and their transfer or cancellation.

Energinet.dk must ensure that registration is correct, reliable and secured against fraud. Certificates of Origin are issued electronically in Denmark, in accordance with the EECS (European Energy Certification System), the voluntary common European standard. The standard describes how Certificates of Origin are issued, traded and used. Furthermore, all users of the EECS are contractually obliged to refrain from repeated use of Certificates of Origin. Energinet.dk is a member of the AIB (the Association of Issuing Bodies), which has written the standard. Energinet.dk was audited in 2011 to ensure that the processes comply with the requirements of the standard.

Energinet.dk uses the cmo.grexel system, also used by a number of other countries, to administer Certificates of Origin. The cmo.grexel system makes it possible to control information. Energinet.dk also uses a national data register for this.

Energinet.dk states that the number of Certificates of Origin issued and transferred in Denmark and sold to other Member States has risen considerably since 2009. This is the same with cancellation of Certificates, not counting Certificates cancelled by Energinet.dk following their expiry. See Annex 1, which contains a short description by Energinet.dk of the Danish system for Certificates of Origin.

**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).**

In accordance with the RE Directive, the use of biofuels in the transport sector and the use of liquid biofuels in the electricity and heating sector must be sustainable. It has not yet been verified whether the use of liquid biofuels (fish oil, rapeseed oil, etc) in the electricity and heating sector is sustainable. Liquid biofuels are therefore not included in tables 1, 1a, 1d and 4.

The sustainability criteria in the RE Directive for biofuels in the transport sector have been implemented in Danish legislation since 1 January 2010. The legally obliged companies have introduced a minimum of 0.55 % of sustainable biofuels into the transport sector in 2010. These companies have submitted this information to the Danish Energy Agency which is currently completing an audit. As the information is not yet verified, biofuels are not included in table 1, 1a, 1d, 4 and 5.

Tables 4 and 4a provide more detailed information on the biomass supply.

**Table 4: Biomass supply for energy use**

Ktoe/year, etc. See notes for Table 4	Amount of domestic raw material (*)		Primary energy in domestic raw material (Ktoe)		Amount of imported raw material from EU (*)		Primary energy in amount of imported raw material from EU (Ktoe)		Amount of imported raw material from non-EU(*)		Primary energy in amount of imported raw material from non-EU (Ktoe)	
	Year n-2	Year n-1	Year n-2	Year n-2	Year n-2	Year n-1	Year n-2	Year n-1	Year n-1	Year n-1	Year n-2	Year n-1
<b>Biomass supply for heating and electricity:</b>												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings etc.)**	2190	2409	785	854	958	1416	372	510	122	187	51	78
Indirect supply of wood biomass (residues and co- products from wood industry etc.)**	608	655	223	239	302	464	126	194	68	105	29	44
Energy crops (grasses, etc.) and short rotation trees (please specify)												
Agricultural by- products / processed residues and fishery by- products **	1197	1626	414	563								
Biomass from waste (municipal, industrial etc.) **	2200	2131	552	534								
Others (please specify)												
<b>Biomass supply for transport:</b>												
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)												

\* Amount of raw material if possible in **m3** for biomass from forestry and in **tons** 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**

Ktoe/year, etc. See notes for Table 4	Amount of domestic raw material * (ton)		Primary energy in domestic raw material (TJ)		Amount of imported raw material from EU* (ton)		Primary energy in amount of imported raw material from EU (TJ)		Amount of imported raw material from non-EU*(ton)		Primary energy in amount of imported raw material from non-EU (TJ)	
	Year n-2	Year n-1	Year n-2	Year n-2	Year n-2	Year n-1	Year n-2	Year n-1	Year n-1	Year n-1	Year n-2	Year n-1
<b>Biomass supply for heating and electricity:</b>												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings etc.)**	2190	2409	32,852	35,764	958	1416	15,585	21,366	122	187	2,129	3,277
Indirect supply of wood biomass (residues and co-products from wood industry etc.)**	608	655	9,331	10,010	302	464	5,277	8,120	68	105	1,198	1,843
Energy crops (grasses, etc.) and short rotation trees (please specify)												
Agricultural by-products / processed residues and fishery by-products **	1197	1626	17,354	23,581								
Biomass from waste (municipal, industrial etc.) **	2200	2131	23,095	22,377								
Others (please specify)												
<b>Biomass supply for transport:</b>												
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)												

\* Amount of raw material if possible in **m3** for biomass from forestry and in **tons** 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 4a. Current domestic agricultural land use for production of crops dedicated to energy production (ha)**

Land use	Surface (ha)	
	Year n-1	Year n-2
1. Land used for common arable crops (wheat, sugar beet etc.) and oilseeds (rapeseed, sunflower etc.) (Please specify main types)	Around 70,000	Around 70,000
2. Land used for short rotation trees (willows, poplars). (Please specify main types)	Around 4,000	Around 4,000
3. Land used for other energy crops such as grasses (reed canary grass, switch grass, Miscanthus), sorghum. (Please specify main types)	Maximum 50	Maximum 50

**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 Denmark. (Article 22(1) h) of Directive 2009/28/EC).**

*When assessing commodity price impacts, it is suggested to consider at least the following commodities: common food and feed crops, energy wood, wood pellets.*

Most biomass use in Denmark is based on waste and subsidiary products from other production. As noted in Section 6 (Table 4), the greatest increase in biomass use has been due to imported wood-based biomass (especially shavings and wood pellets), which is why this increase has not had an effect on land use. The price of wood pellets has remained constant throughout the period.

Another significant increase in the use of biomass is from waste and subsidiary products from agriculture. There has been an improvement in the use of existing waste and subsidiary products from agricultural production which has not resulted in altered land use. The price of hay has been relatively constant.

Generally, there has been no significant change in land use in Denmark over the preceding two years.

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

In recent years, Danish manufacturers have had the following annual production of biodiesel and bioethanol:

- Emmelev produces around 100 million litres of biodiesel (1.g.) based on rapeseed oil
- DAKA produces around 55 million litres of biodiesel (2.g.) based on abattoir waste etc.
- Inbicon produces around 5 million litres of bioethanol (2.g.) based on hay. Much of this fuel was exported between 2009 and 2010.

The sustainability criteria in the RE Directive for biofuels in the transport sector have been implemented in Danish legislation since 1 January 2010. The legally obliged companies have introduced a minimum of 0.55 % of sustainable biofuels into the transport sector in 2010. These companies have submitted this information to the Danish Energy Agency which is currently completing an audit. As the information is not yet verified, biofuels are not included in table 5.

**Table 5: Production and consumption of biofuels, cf. Article 21(2) (Ktoe)**

Article 21(2) biofuels <sup>9</sup>	Year n-2	Year n-1
Production – Fuel type X (Please specify)	0	0
Consumption – Fuel type X (Please specify)	0	0
Total production Art.21.2.biofuels	0	0
Total consumption Art.21.2. biofuels	0	0
% share of 21.2. fuels from total RES-T	0	0

**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 your country in the preceding 2 years.**

Please provide information on how these impacts were assessed, with references to relevant documentation on these impacts within your country. (**Article 22(1) j) of Directive 2009/28/EC**).

Production has been so limited that it is the opinion of the Danish Energy Agency that it has had limited 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 cooling<sup>10</sup>, 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.*

It is assumed that:

- With renewable energy used for heating, the calculated net savings is 0.065 Mt CO<sub>2</sub> per PJ renewable energy used, corresponding to the renewable energy replacing a mixture of gas and oil.
- With renewable energy used for electricity, it is assumed that electricity generation by wind, water and solar panels phases out 2.4 units of fossil fuel, while 1 unit of biomass/biogas phases out 1 unit of fossil fuel. It is estimated that the amount of fuel phased out would have resulted in CO<sub>2</sub> emissions of 0.08 Mt per PJ, suggesting that coal is the dominating fuel type.
- With transport, an average CO<sub>2</sub> replacement of 70 % from the biofuels used can be estimated, correspond to a net saving of 0.03 Mt CO<sub>2</sub> in 2010. As previously mentioned, as biofuels are not included in this report, the figure in Table 6 is 0.

**Table 6: Estimated GHG emission savings from the use of renewable energy (t CO<sub>2</sub>eq)**

Environmental aspects	Year n-2	Year n-1
<b>Total estimated net GHG emission saving from using renewable energy<sup>11</sup></b>		
- Estimated net saving from the use of renewable energy for electricity	5.8 Mt	6.7 Mt
- Estimated net saving from the use of renewable energy in heating and cooling	6.2 Mt	7.1 Mt
- Estimated net saving from the use of renewable energy in transport	-	-

<sup>9</sup> Biofuels made from wastes, residues, non-food cellulosic material, and lignocellulosic material.

<sup>10</sup> Report available on: [http://ec.europa.eu/energy/renewables/transparency\\_platform/doc/2010\\_report/com\\_2010\\_0011\\_3\\_report.pdf](http://ec.europa.eu/energy/renewables/transparency_platform/doc/2010_report/com_2010_0011_3_report.pdf)

<sup>11</sup> 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, 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)<sup>12, 13</sup>**

Ktoe/year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimated excess as stated in the prognosis document	-	613	809	769	784	473	657	333	366	-	0
<b>Estimated excess as stated in the National Renewable Energy Action Plan</b>	-	694	834	1 123	1 106	833	928	552	619	-	63
Estimated deficit as stated in the prognosis document	0	0	0	0	0	0	0	0	0	-	337
<b>Estimated deficit as stated in the National Renewable Energy Action Plan</b>	-	0	0	0	0	0	0	0	0	-	0

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

PJ/year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimated excess as stated in the prognosis document	-	26	34	32	33	20	28	14	15	-	0
Estimated excess as stated in the National Renewable Energy Action Plan	-	29	35	47	46	35	39	23	26	-	3
Estimated deficit as stated in the prognosis document	0	0	0	0	0	0	0	0	0	-	14
Estimated deficit as stated in the National Renewable Energy Action Plan	-	0	0	0	0	0	0	0	0	-	0

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

As also stated in the RE Action Plan of June 2010, the Danish Government expects to be able to fulfil its commitments for expansion with renewable energy up to 2020 via national action. 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.

The Danish Government is also prepared to make the expected excess of renewable energy available to other countries for the period up to 2020, during which the share of renewable energy is expected to be above the recommended level.

With regard to the provisions in the cooperation mechanisms on statistical transfers and common projects, within the framework of the Nordic energy cooperation, Denmark has initiated a clarification of the procedure and agreement processes, including how different types of national support schemes can be included in common projects. This includes a Nordic action entitled "Nordic Testing Ground" and a three-year EU initiative "Concerted Action – Renewable Energy", in which Denmark is an active participant and which is focused on the further development of the concept. It is expected that the above trans-national projects will contribute to establishing how Denmark, at least, will be able to determine rules and procedures for the use of the cooperation mechanisms.

<sup>12</sup> Please use actual figures to report on the excess production in the two years preceding submission of the report, and estimates for the following years up to 2020. In each report Member State may correct the data of the previous reports.

<sup>13</sup> When filling in the table, for deficit production please mark the shortage of production using negative numbers (e.g. -x Ktoe).

**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 Energy and CO<sub>2</sub> emission statistics, waste is divided into two categories, biodegradable and non-biodegradable. In accordance with international conventions, including the RE Directive's definition in Article 2, the biodegradable part is counted as renewable energy. Danish energy statistics assumes that up to and including 2007, 77.7 % of waste consumption is biodegradable. A study undertaken by the National Environmental Research Institute on behalf of the Ministry of the Environment assumes a lower share of 58.8 %. This lower share has now been corrected historically in all calculations in Danish energy statistics. The 58.8 share has also been taken into account in all calculations of shares of renewable energy up to 2020 in both the Action Plan and in the predictions in this progress report.

The development in the share of biodegradable waste used in energy generation is monitored closely by both the National Environmental Research Institute and the Danish Energy Agency with regard to possible adjustments to the energy statistics.

*Please note that in the first progress report (2011 report) Member States are invited to outline their intentions with regard to the questions addressed in Article 22(3 a-c). In addition, Member States are also welcome to provide any other information considered relevant to the specific situation of developing renewable energy of each Member State.*

With regard to Article 22(3) a)

The Danish government has no plans to establish a single administrative body to be responsible for applications for approval etc. of RE plants as mentioned in the provision. However, it remains the intention to attempt to minimise the administrative approval criteria. The approval rules have already been revoked with regard to government approval with the central energy authorities. Electricity and heat generation plants under 25 MW, including biogas and biomass plants, may now be established on the basis of municipality approval alone. As noted in the reply to question 2a, the establishment of wind farms no longer requires specific government approval.

The Danish government has furthermore approved funding for a continuation of the Wind Turbine Secretariat which supports local authorities and contractors during the planning phase in relation to the erection of wind turbines. This service body, which is mentioned in 4.2.1 of the RE Action Plan is a free service.

With regard to Article 22(3) b)

The Danish government has no plans to introduce rules for the automatic approval of applications for planning and permission to build RE plants if the approving body does not reply within a given time frame, cf. the provision.

Long administration time is not thought to be a problem for the Danish administration with regard to approvals or rules for the promotion of renewable energy. Both the government and the local authorities are obliged to process applications in compliance with the Danish Public Administration Act, which may account for the fact that there are few complaints of slow administration times in the Danish administration.

With regard to Article 22(3) c)

The Wind Turbine Secretariat contributes to a great extent in servicing a process in which areas of land are prepared for the erection of onshore wind farms. This includes recommending geographical areas that are suitable for use for renewable energy. Furthermore, the Danish government has recently carried out a tendering process for state-owned areas for the construction of a large wind farm near a prison. A winner of the tender has been selected and this project is now at the planning stage. A new tender near another prison is under preparation.

In June 2010, the Danish Parliament (Folketinget) passed an Act approving the establishment of a test centre for larger wind turbines near Østerild in Northern Jutland. The Act came into force on 1 October 2010 and ensures the necessary areas for the development and testing of large modern wind turbines.

Furthermore, a number of areas have been identified for the siting of O series and prototype models, in compliance with the general principles for local authority planning as stated in the Planning Act.

The Danish government has recently proposed a new Bill that allows for the reservation of marine areas for tender for large offshore wind farms. These areas have been selected in cooperation with the Danish environmental authorities. Once an area is reserved, it will no longer be possible to apply for approval for the area under the so-called "open door" procedure. The areas will be reserved for large integrated projects which will be the most appropriate from both socio-economic and environmental viewpoints.

**Table 2: Overview of all policies and measures**

<b>Measure name and reference</b>	<b>Measure type*</b>	<b>Expected result**</b>	<b>Target group and/or target activity***</b>	<b>Existing or planned</b>	<b>Measure start and end dates</b>	<b>Section in Action Plan</b>
Premium for RE electricity generation plants (RE Act)	Economic	Increased RE electricity generation	Investors, RE electricity generation	Existing	Latest amendment, May 2011	4.3
Tendering of offshore wind farms (RE Act and political agreement)	Economic	Increased wind power capacity	Investors, wind power	Existing	Latest amendment, Jan 2009	4.2.1 and 4.3
Four schemes to promote expansion by onshore wind power: value loss scheme, purchasing rights scheme, the green scheme and the guarantee fund (RE Act)	Economic, regulation	Increased wind power capacity	Producers of and neighbours to onshore wind turbines	Existing	Jan 2009 →	4.2.1
Scrappage scheme for wind turbines	Economic	Increased wind power generation	Producers and investors in wind power	Existing	2004 → 2011	4.3
Fund for small RE technologies (RE Act)	Economic	To promote electricity generation using solar power, wave power, etc.	Investors and producers	Existing	2008 → 2011	4.3
Prioritised access for RE electricity to the grid (ESA and RE Act)	Regulation	To ensure the transport of RE electricity	RE electricity producers	Existing	1999 →	4.2.6. and 4.4.7
Municipal planning for the scrappage scheme with effects of 75 MW in 2010 and 2011 (Agreement between the Minister of the Environment and the chairperson of Local Government Denmark)	Political agreement	Increased wind power electricity generation	Municipalities	Existing		4.2.1
National test centre for large wind turbines in Østerild and planning of areas for test turbines up to 2020	Political agreement	Testing of new wind power facilities	Industry and research	Planned	2010 →	4.2.1
Biomass agreement	Regulation	To promote the use of biomass in power plants	Power plants	Existing	1993 →	4.6.2
Various initiatives to promote biogas production (Green Growth)	Economic regulation, information	To promote biogas production	Agriculture and producers of biogas	Planned		4.2.8, 4.3, and 4.6
Various initiatives to promote the production of energy crops (Green Growth)	Economic, regulation	To promote the production of energy crops	Agriculture and producers of biogas	Planned		4.6

<b>Measure name and reference</b>	<b>Measure type*</b>	<b>Expected result**</b>	<b>Target group and/or target activity***</b>	<b>Existing or planned</b>	<b>Measure start and end dates</b>	<b>Section in Action Plan</b>
Free choice of fuel for small power plants (Green Growth)	Regulation	To promote the use of biomass	Power plants < 2 MW	Planned		4.2.9 and 4.6
Tax relief for RE used for heating and cooling	Economic	To promote use of RE for heating and cooling	Producers of heating and cooling	Existing		4.2.9 and 4.4
Lov om Kommunal fjernkøling [The Act on Municipal District Cooling]	Economic	To promote energy efficient cooling of buildings	Municipalities	Existing	July 2008 →	4.2.1, 4.2.9 and 4.4
Scrappage scheme for oil-fired boilers (The Finance Act 2010)	Economic	To reduce CO <sub>2</sub> emissions and increase the installation of RE plants/district heating connection	End-users with oil-fired boilers	The scheme is being phased-out. Applications for support ceased from 1 July 2011	March 2010 → 1 July 2011	4.2.3 and 4.4
Roll-out plan for smart electricity consumption (various initiatives)	Regulation, analyses	To promote smart electricity consumption	Electricity producers and consumers	Existing/planned	2008 →	4.2.6
Building regulations	Regulation	To promote energy savings	The building industry and consumers	Existing	Latest amendment, Feb 2008	4.2.3
Lov om fremme af energibesparelser i bygninger [The Act to Promote Energy Savings in Buildings]	Regulation	To promote energy savings	The building industry and consumers	Existing	2005 →	4.2.3
Center for Energibesparelser [The Centre for Energy Savings]	Information	To promote energy savings	Consumers	Existing	March 2010 →	4.2.4
The Centre for Energy Savings in Buildings	Information	To promote energy savings	The building industry	Existing	2008 →	4.2.4
Agreements concerning public buildings	Regulation	Reduction of energy consumption in public buildings	Government authorities	Existing	2009 →	4.2.3
Voluntary agreements on energy savings in municipalities and counties	Political agreement	Reduction of energy consumption in public buildings	Local and regional authorities	Existing	2007/2009 →	4.2.3
Tax relief for electric vehicles	Economic	To promote the use of electric vehicles	Manufacturers and consumers	Existing scheme to the end of 2012. Planned extension to 2015	→ 2015	4.5



<b>Measure name and reference</b>	<b>Measure type*</b>	<b>Expected result**</b>	<b>Target group and/or target activity***</b>	<b>Existing or planned</b>	<b>Measure start and end dates</b>	<b>Section in Action Plan</b>
Research scheme for electric vehicles (Bekendtgørelse om statstilskud til forsøgsordning for elbiler) [the Order on state support for a research scheme for electric vehicles]	Economic, information	Acquire experience and knowledge on the use of electric vehicles and their relationship with the electricity system	Businesses, authorities, institutions and organisations	Existing	2008-2012	4.5
Sustainable fuels [the Act on Sustainable Fuels]	Regulation	The mixture of biofuels with petrol and diesel	Wholesalers and retailers of petrol and diesel	Existing	Jan 2010	4.2.10 and 4.5
Tax exemption for CO2 emissions from biofuels	Economic	Increased production and use of biofuels	Producers and consumers of biofuels	Existing		4.5
The Energy Technology Development and Demonstration Programme (EUDP) (Loven om EUDP) [the Act on the EUDP]	Economic, information	Research into biofuels and smart electricity consumption		Existing	Jan 2008 →	4.5
Reform of road tax that promotes energy efficient cars and encourages more people to use public transport	Economic	Reduction of greenhouse gas emissions and increased use of renewable energy in the transport sector	Consumers and manufacturers	Planned		4.5

\* State (as far as possible) whether this is a legislative measure, an economic measure or a “soft” measure (information campaign)

\*\* Is the expected result changed behaviour, installed capacity (MW or t/year) or produced energy (Ktoe)?

\*\*\* What is the target group: investors, end-users, public authorities, planners, architects, installers etc? Which activity/sector is the measure aimed at: production of biofuels, use of manure for energy production etc?

## **Agreements in relation to public buildings” and “Voluntary agreements on energy savings in municipalities and counties”.**

In 2008, with regard to compliance with the requirement in Article 13(5) of the RE Directive for the public authorities to lead the way, the Danish government decided that it would reduce its total energy consumption by 10 % in 2011 in relation to 2006. The decision resulted in Circular No 9787 of 1 October 2009 on energy efficiency in government institutions.

In regard to the municipalities, in 2007, Local Government Denmark entered into a voluntary agreement with the Minister of Transport and Energy on energy saving in the municipalities. The agreement states that the municipalities must comply with the same rules that applied to the government at the time. This meant that, among other things, the municipalities would introduce systematic energy management, ensure energy-efficient procuring and carry out profitable energy savings, as recommended in the energy certification of buildings, which have a repayment period of up to five years. In the regions, the Dansk Regioner (Danish Regions) entered into a cooperation with the Ministry of Climate and Energy at the beginning of 2009. Depending on the type of recommendation, the implementation of these profitable energy savings proposals will either directly or indirectly result in an increase in the use of energy from renewable sources.

As the increased use of energy from renewable sources is closely connected with the improvement of energy efficiency, these measures in the government, municipalities and regions give an indirect incentive for the introduction of an increased share of renewable energy in public buildings. The agreements with both Local Government Denmark and the Danish Regions will be assessed in 2012 and a decision taken as to whether they will continue and with what content.

Furthermore, in 2008 and 2009, the Minister of Climate and Energy appointed six Danish municipalities as ‘Energy Towns’. This initiative was an example of how the municipalities can work locally with climate and energy challenges. The initiative has also resulted in an increase in the use of renewable energy in public buildings and continues to be a Nordic municipal energy project that is contributing to emphasise energy efficiency and renewable energy in Nordic municipalities.

### **Annex 1**

#### **The system of Certificates of Origin in Denmark**

##### **1. THE AIM OF CERTIFICATES OF ORIGIN**

The aim of Certificates of Origin is to be able to document to a specific customer, that a particular share or amount of energy has been produced from renewable sources in pursuit of the RE Directive.

Certificates of Origin are issued in compliance with Directive 2009/28/EC of the European Parliament and of the Council (the RE Directive) on the promotion of electricity from renewable sources within the electricity market and the Ministry of Climate and Energy’s Bekendtgørelse om oprindelsesgaranti for VE-elektricitet (nr. 1323 af 30 november 2012), [the Order on Certificates of Origin of energy from renewable sources (No 1323 of 30 November 2012)].

## **2. THE MARKET FOR CERTIFICATES OF ORIGIN**

In Denmark, only Energinet.dk is allowed to issue Certificates of Origin. Energinet.dk issues Certificates of Origin for electricity generation from renewable sources<sup>14</sup>.

The market for Certificates of Origin is separate from the actual electricity market, which means that the certificate need not be connected to the sale of the electricity, but can be sold independently. A Certificate of Origin is equal to 1 MWh.

## **3. THE STANDARD FOR ELECTRONIC CERTIFICATES OF ORIGIN**

Certificates of Origin are issued electronically in Denmark in accordance with the EECS (the European Energy Certificate System) – the voluntary common European standard. The standard stipulates how Certificates of Origin are issued, traded and used. All users of the EECS are also obliged to refrain from repeated use of Certificates of Origin (double counting).

The rules of the EECS standard have been drawn up by the voluntary cooperation organisation AIB (Association of Issuing Bodies) and can be found on [www.aib-net.org](http://www.aib-net.org). Energinet.dk is a member of the AIB and complies with organisation rules. The Danish rules for the electronic issuing of Certificates of Origin are described in a domain protocol. “GoO RES-E Certificates, RECS Certificates and Cog-GO Certificates Domain Protocol for Denmark” can be found on [www.energinet.dk/oprindelsesgarantier-ve](http://www.energinet.dk/oprindelsesgarantier-ve).

The AIB is the organisation in the Member States appointed to issue Certificates of Origin. Members are audited every five years to ensure that their processes comply with the requirements of the EECS standard.

## **4. ADMINISTRATION OF CERTIFICATES OF ORIGIN**

Denmark uses the cmo.grexel system to administrate Certificates of Origin. The electricity producer or person appointed to represent them must have an account in the cmo.grexel electronic register in order to receive certificates of Origin.

Cmo.grexel has been developed by Grexel, which is a Finnish company that also administers Certificates of Origin for a number of Member States. Grexel has a database that makes it possible for electricity actors – producers, traders and grid companies -. To buy, sell, export, import and finally cancel Certificates of Origin.

As trading of certificates is international, communication happens through a common “Hub” (an electronic centre point that facilitates communication between all the participating registers). It is therefore possible to transfer electronic Certificates of Origin between registers (import/export) and also between accounts in the same register (transfer). Certificates of Origin that are not part of the EECS may not be transferred to a register operating under the EECS standard.

The Order also makes it possible for an actor to import or export Certificates of Origin to Member States outside the EECS standard. This is done as a manual process, according to agreement with the competent body for Certificates of Origin of the country in question. In these cases, Energinet.dk must assess the accuracy, reliability and correctness of the Certificate of Origin. If Energinet.dk does not recognise the Certificate of Origin, it informs the Danish Energy Agency, which then informs the European Commission of the rejection and the reasons for the decision.

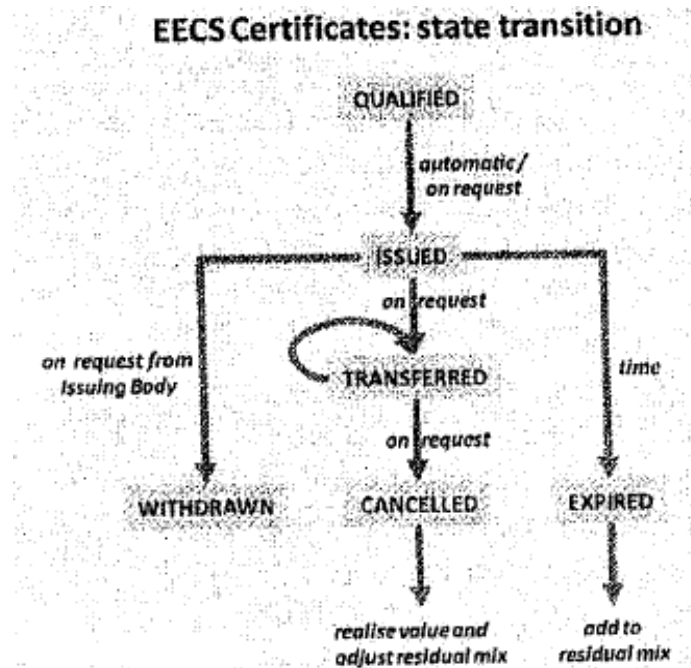
Certificates of Origin are thus accepted as valid documentation in all Member States, just as all Certificates of Origin from these States are valid in Denmark.

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<sup>14</sup> Wind power, solar energy, aerothermal energy, geothermal energy, hydrothermal energy, and wave energy, hydro-electricity, biomass, waste site gas, gas from waste water plants or biogas.

Certificates of Origin undergo three phases: issue, transfer and cancellation, as shown in Figure 1 below. For a further explanation of the rules, guidelines can be found on [www.energinet.dk/oprindelsesgarantier-ve](http://www.energinet.dk/oprindelsesgarantier-ve).

Figure 1. The life cycle of a Certificate of Origin



Source: EECS rules

### *Issued*

The issue of the Certificate itself takes place following a request by the electricity producer or the person appointed to represent them.

All data received by Enreginet.dk from the applicant is first checked in the key data register (Panda) before registration in cmo.grexel. This is to ensure that no incorrect information is registered in cmo.grexel.

### *Transferred*

Once the Certificate of Origin is issued, the owner or person appointed to represent them is free to sell the Certificate for production to an electricity trader, who may then sell the Certificate on to other actors, or use the Certificate as proof for their customers that the electricity they receive comes from a specific environmentally-friendly generation. The producer can, however, also decide to sell the Certificates to either another electricity trader in Denmark, an end-user, or a foreign electricity trader.

### *Cancelled*

A trader who wishes to document the environmental credentials of a product with Certificates of Origin must cancel the Certificates of Origin. This is a process which the owner of the Certificate initiates themselves and which means that the Certificate of Origin may no longer be sold, as it is being used as documentation for the consumption of a specific amount of electricity.

No matter how many stages the Certificate may have been through, it is only the actor that is in possession of the Certificate when it is cancelled that can prove that “electricity with climate options” has been delivered.

Ideally, cancellation must be carried out in the register of the country where the consumption covered by the certificate takes place. Once the Certificate is cancelled in the grexel system, it can be declared. Read more about individual disclosures on [www.energinet.dk/eldeklaration](http://www.energinet.dk/eldeklaration).

Energinet.dk checks that the cancellation is registered in cmo.grexel so that it corresponds to the sold amount of electricity declared. Similarly, Energinet.dk can also ask another register to check the information if cancellation has not taken place.

The Certificate of Origin must be used at the latest, 12 months from the calendar month in which generation of the electricity in question has taken place. Energinet.dk deletes issued Certificates of Origin for RE, which are held in an account in the Danish register and which are not used within the 12 month validity period. These Certificates of Origin are registered as expired.

## **5. ENSURING AGAINST FRAUD AND DOUBLE COUNTING**

An important reason for the use and propagation of Certificates of Origin is that the system is safeguarded against the risk of fraud and double counting. There are a number of conditions, also partly described above, that contribute to ensuring that fraud and double counting does not take place.

Energinet.dk is a member of the AIB. In this capacity, a common set of rules and an EECS standard have been developed which comply with the requirements of the Directive. An important condition for ensuring against fraud and double counting is that the members are obliged to comply with these rules and this refrain from repeated use of Certificates of Origin (double counting).

A new account holder must be approved by Energinet.dk before permission to access the register can be given. Account holders must sign a standard contract in which they promise to abide by the rules in the Domain protocol in Denmark. In connection with opening an account, Energinet.dk will check for a Danish Business Registration Number (CVR) and if the account holder is not registered, will then make an enquiry to SKAT (the Danish taxation authority) to check if the electricity trader is known within the European tax cooperation in relation to, for example, VAT fraud. If the account holder wishes to have RECS certificates issued, the account holder must also be a member of RECS International.

When an electricity producer or person appointed to represent them wished to have Certificates of Origin issued, they must contact Energinet.dk. Energinet.dk will then check the information on the applicant in their key database (PANDA). The data<sup>15</sup> to be checked is:

- GSRN number – each generation plant is identified by its unique GSRN number
- Owner information (the applicant must either be the owner of the plant or have permission from the owner of the plant)
- CVR/CPR numbers (Danish Business Registration and Personal Identification numbers)
- Electricity trader
- If they have received support and the type of support granted
- Operation start date
- Capacity

These data are transferred to Grexel. In connection with this, the GSRN number is checked to make sure that the plant is not registered twice. Once Grexel has entered Certificate of Origin into the actor's account, the account holder can then trade with Certificates of Origin.

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<sup>15</sup> Grid companies are responsible for ensuring that all key data and measurement data for each generation plant in Denmark are correct

Account holders can trade with Certificates of Origin both inside and outside of Danish borders. When trading with an account holder who complies with the EECS standards from AIB, trade/transfer happens electronically

When a Certificate of Origin is taken out, Energinet.dk registers a start date in accordance with the application.

Energinet.dk is responsible for preparing the general disclosure in accordance with Elmærkningsbekendtgørelsen (BEK nr. 1322 af 30/11/2010) [The Electricity Labelling Order (Order No 1322 of 30/11/2010 on the Disclosure of Electricity for Consumers)] and associated guidelines for the preparation of, respectively, individual disclosures and the general disclosure. Energinet.dk corrects the general disclosure of electricity sales according to special supply agreements (individual disclosures).

Energinet.dk stipulates guidelines for how electricity traders must prepare and document individual disclosures, and also monitors them. Electricity traders must document information in their individual disclosures which also shows that the number of cancelled Certificates of Origin matches the amount of electricity sold to their end-users. This ensures that the Certificates of Origin are not being used to document electricity sold to other customers.

## 6. THE DEVELOPMENT IN THE ISSUING OF CERTIFICATES OF ORIGIN

**Table 1: The development in issuing transferring and cancellation**

(A certificate of Origin corresponds to 1 MWh)

	2011 (up to and including 17 November 2011)	2010	2009
Issued	5,572,381	5,168,116	2,804,642
Transferred	1,946,563	974,379	502,261
Exported	4,970,918	2,442,046	896,209
Imported	1,274,461	1,240,885	1,303,168
Cancelled	1,803,612	921,875	
Expired	2,305,856		

Source: [www.grexel.com](http://www.grexel.com)

As can be seen in the above table, the number of Certificates of Origin issued and transferred in Denmark has risen significantly since 2009. This may be due to an increased interest in the market, especially from other countries. Cancellation has also increased significantly, which would suggest that there are more and more people that require documentation that the electricity they buy is environmentally-friendly.

The issuing of Certificates of Origin for renewable energy from 1 January – 17 November 2011 is distributed as follows:

**Table 2: Distribution of Certificates of Origin issued in 2011**

(A certificate of Origin corresponds to 1 MWh)

Type of generation	Number of Certificates of Origin
Forestry products	54,625
Municipal waste sites	197,203
Offshore wind	1,354,436
Onshore wind	3,966,117

Source: [www.grexel.com](http://www.grexel.com)