

Netherlands Enterprise Agency

*Progress report*

*Energy from renewable sources  
in the Netherlands 2017-2018*

Directive 2009/28/EC

| Commissioned by the Ministry of Economic Affairs and Climate

Sustainable, agricultural, innovative  
and international enterprise

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## **Foreword**

Under Article 22 of Directive 2009/28/EC<sup>1</sup> (hereinafter referred to as ‘the Renewable Energy Directive’), the Minister for Economic Affairs and Climate is required to provide a report every two years on progress in the promotion and use of energy from renewable sources. The present fourth progress report must be sent to the European Commission no later than 31 December 2019.

This report complies with the template established by the European Commission on 30 June 2009 and follows, where possible, the updated template of 30 October 2017, which includes supplementary provisions following the amendments to the 2009 Directive by Directive (EU) 2015/1513 of 9 September 2015.

### **Description of existing or new policy**

This report describes the progress during the years 2017 and 2018. The results are the effect of the policy and measures that applied during that time. This progress report includes details of the effects of the Energy Agreement signed in September 2013.

### **Graphs and tables**

The figures used in this report relating to 2017 and 2018 have been supplied by Statistics Netherlands (*Centraal Bureau voor de Statistiek* – CBS) and the Dutch Emissions Authority (*Nederlandse Emissieautoriteit* – NEa) and are consistent with results of the Eurostat SHARES calculation tool, which is fuelled by data from the official European energy statistics. The figures in this report take account, as far as possible, of supplementary provisions resulting from the amendment of the Renewable Energy Directive in accordance with Directive (EU) 2015/1513.

The figures for the support schemes to promote renewable energy listed under Question 3 were provided by the Ministry of Economic Affairs and Climate and the Netherlands Enterprise Agency (*Rijksdienst voor Ondernemend Nederland*). Where other sources have been used, this is stated in the text or indicated by means of a reference.

The reader is referred to the reporting template for any further explanations of the tables and figures.<sup>2</sup>

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<sup>1</sup> Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

<sup>2</sup> <https://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports#content-heading-2>.

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## Chapter 1. Energy from renewable sources: the situation in 2018

The binding target figure for the share of gross final energy consumption to come from energy from renewable sources in 2020 has been set at 14% for the Netherlands.

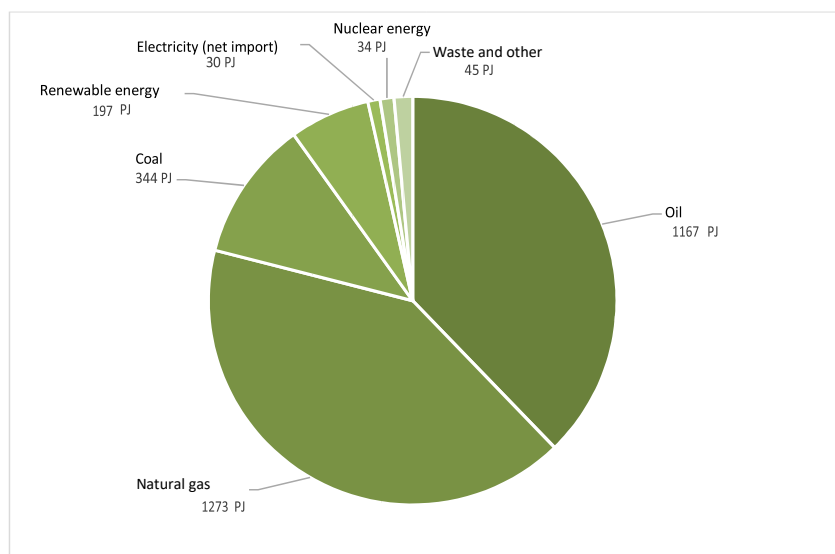
The energy situation in the Netherlands in 2018 was characterised by primary energy consumption of 3 089 petajoules. The country's major sources of energy are natural gas (1 281 petajoules), oil (1 166 petajoules) and coal (344 petajoules). Renewable energy sources contributed 199 petajoules in 2018. Figure 1 shows the distribution of primary energy consumption according to the various sources.

In accordance with the Renewable Energy Directive, the share of renewable energy was based on gross final consumption of energy. In 2018, this was 2 199 petajoules, which was slightly more than the 2 016 petajoules consumed in 2017. The final consumption of renewable energy in 2018 was 157 petajoules, an increase compared to 2017 (140 petajoules) and 2016 (119 petajoules).

With this increase of about 12 per cent in final consumption, the share of renewable energy rose from 6.6 per cent in 2017 to 7.4 per cent in 2018.

The indicative target figure for the Netherlands for the 2017–2018 period was 9.9 per cent. The actual figure achieved in the 2017–2018 period still fell short of the indicative target figure.

**Figure 1:** Primary energy consumption in the Netherlands in 2018: total 3 089 PJ<sup>3</sup>



<sup>3</sup> Source: CBS Statline.

## Chapter 2. An outline of the third Rutte Government's energy policy

The third Rutte Cabinet took up office on 26 October 2017 after the negotiating parties had concluded the Coalition Agreement 'Confidence in the future' (*Vertrouwen in de toekomst*) on 10 October 2017. The Cabinet has four primary objectives, which include tackling climate change. The Netherlands is facing major challenges in the field of sustainability. One of the most important is the transition to a climate-neutral economy. The Coalition Agreement has set the tone for ambitious climate policy and recognises the responsibility for achieving the most ambitious objective of the Paris Climate Agreement. The Netherlands has taken the initiative of forming a leading group of ambitious countries to increase the European climate objectives for 2030 and 2050.

The Netherlands is committed to achieving a 49% reduction in greenhouse gas emissions by 2030 compared to 1990. A number of important measures have been agreed in the Coalition Agreement to achieve this, such as the phasing out of coal-fired power stations. In order to achieve the ambitions of a reduction in greenhouse gas emissions of at least 49%, the Cabinet has also taken the initiative of developing a Climate Agreement in addition to the existing Energy Agreement of 2013. In June 2019, the national Climate Agreement was presented. The parties concerned will jointly develop and implement the agreed measures. The implementation of all climate measures is taking place within the monitoring and assurance cycle under the Climate Act (*Klimawet*). This attributes an important role to the Climate Plan which was drawn up at the end of 2019 and is linked to the Integrated National Energy and Climate Plan (*Integraal Nationaal Energie- en Klimaatplan*, INEK). The progress in the policy, as laid down in the Climate Plan and the INEK, is monitored in October each year from 2020 via the annual Climate Policy Document.

The Cabinet has entered into agreements on this subject with a very large number of parties in the Climate Agreement. The Cabinet's starting point here is that this reduction target is achieved in a way which is feasible and affordable for all. For this reason, the Netherlands commits to the most cost-effective and future-proof approach. The SDE+ scheme (a national incentive scheme for sustainable energy production) is and will continue to form the most important tool in increasing the share of renewable energy in a cost-effective way. This scheme is being extended from 2020 to promote other emission-reducing techniques in addition to renewable energy.

As regards electricity, agreements have been reached by the parties to the Climate Agreement that should lead to more than 70% of electricity generation (84 TWh) coming from renewable sources by 2030. For offshore wind energy, the existing roadmap for 2030 will be implemented and further developed through the North Sea Strategy for 2030. On land too, boosting production from onshore wind energy and solar PV is under consideration. The national programme Regional Energy Strategies will be used by municipalities and provinces to decide how to achieve the 2030 targets for onshore electricity generation from renewable sources (at least 35 TWh). The spatial measures for a large proportion of the regions will be completed by mid-2021.

The energy transition requires amendments to laws and regulations. To this end, two major pieces of legislation will be brought before Parliament in 2020: the Energy Act (*Energiewet*) and the Heating Act 2.0 (*Warmtewet*). The Energy Act has three tasks: 1) clear legislation for electricity and gas, 2) implementation of the fourth EU Electricity Package and 3) conversion of quick gains from the Climate Agreement into legislation. The Energy Act offers the consumer more opportunities to generate and store energy. In addition, the Energy Act also offers more protection for all electricity customers and solutions to grid capacity problems which have arisen in parts of the Netherlands as a result of the rapid increase in renewable energy. The aim of the Heating Act 2.0 is to regulate and facilitate the use of sustainable heat sources as an alternative to natural gas. This includes, for

example, tariff regulation, agreements on investments in district heating systems and regulations for increasing the sustainability of heating systems.

Despite the fact that the Netherlands focuses primarily on greenhouse gas reduction and considers renewable energy as a means to that end, the Netherlands has also set high ambitions for the share of renewable energy in 2030. The Dutch target is for 27% to 33% of energy to be generated from renewable sources by 2030.

### Chapter 3. Answers to questions from the template report

#### Question 1. Sectoral and overall shares of energy from renewable sources in 2017 and 2018

Sectoral and overall shares of energy from renewable sources in 2017 and 2018.

In accordance with the Renewable Energy Directive, the share of renewable energy was based on gross final consumption of energy. Overall, energy consumption in 2018 amounted to 2 199 petajoules, which was slightly more than the 2 016 petajoules consumed in 2017. Final consumption of renewable energy in 2018 was 157 petajoules, an increase compared to 2017 (140 petajoules) and 2016 (119 petajoules).

With this increase of about 12 per cent in final consumption, the share of renewable energy rose from 6.6 per cent in 2017 to 7.4 per cent in 2018.

The indicative target figure for the Netherlands for the 2017–2018 period was 9.9 per cent.<sup>4</sup> The actual figure achieved in the 2017–2018 period still fell short of the indicative target figure.

**Table 1:** The sectoral (electricity, heating and cooling, and transport) and overall shares of gross final consumption of energy from renewable sources<sup>5</sup>

	2017	2018
RES – H&C (%)	5.7	6.1
RES – E (%)	13.8	15.1
RES – T (%)	6.0	9.6
Overall RES share (%)	6.5	7.4
of which from cooperation mechanism (%)	0	0
Surplus for cooperation mechanism (%)	0	0

The production of renewable electricity has increased. Renewable electricity produced from biomass remained more or less stable, while electricity generated from wind and sunlight increased. The production of renewable electricity in 2018 more or less equates to 14.9 per cent of electricity consumption.

In 2018, the share of renewable heat of total consumption of energy for heat amounted to 6.3 per cent, which was slightly higher than in 2017 (5.9%). The share increased because the growth in renewable heat (+5%) was accompanied by more or less unchanged overall consumption of energy for heat.

In 2018, the share of renewable energy for transport was 9.5 per cent and therefore 3.6 per cent more than in 2017. Biofuels for transport are the main component of renewable energy for transport and their consumption rose sharply in 2018, mainly due to the tightening of the national legislative provisions governing the supply of renewable energy for transport. Electricity for rail transport makes a substantial contribution. The contribution of electricity for road transport is still marginal, in spite of the relatively strong growth in the number of electric vehicles and the calculation factor of 5 under the Renewable Energy Directive.

<sup>4</sup> Indicative target figure calculated in accordance with paragraph B of Annex I to the Renewable Energy Directive.

<sup>5</sup> Facilitates comparison with Tables 3 and 4a of the National Renewable Energy Action Plans.



**Table 1a:** Calculation table for the renewable energy contribution of each sector to final energy consumption (PJ and ktoe)<sup>6</sup>

	2017 PJ	2018 PJ	2017 ktoe <sup>7</sup>	2018 ktoe
(A) Gross final consumption of RES for heating and cooling	64	68	1 531	1 629
(B) Gross final consumption of electricity from RES (excluding electricity for transport)	58	64	1 384	1 538
(C) Gross final consumption of energy from RES in transport (without double-counting, including electricity for transport)	15	24	353	561
(D) Gross total RES consumption (without double-counting) <sup>8</sup>	137	156	3 268	3 728
(E) Transfer of RES to other Member States	0	0	0	0
(F) Transfer of RES from other Member States and third countries	0	0	0	0
(G) RES consumption adjusted for target (D)-(E)+(F)	137	156	3 268	3 728

<sup>6</sup> Facilitates comparison with Table 4a of the National Renewable Energy Action Plans.

<sup>7</sup> 1 PJ = 23.8845897 ktoe; 1 ktoe = 0.041868 PJ.

<sup>8</sup> According to Article 5(1) of Directive 2009/28/EC, gas, electricity and hydrogen from renewable energy sources may be considered only once. No double counting is allowed.

**Table 1b:** Total actual contribution (installed capacity, gross electricity generation) from each renewable energy technology in the Netherlands to meet the binding 2020 targets and the indicative interim trajectory for the share of energy from renewable sources in electricity<sup>9</sup>

	2017 MW	2017 GWh	2018 MW	2018 GWh
<b>Hydro:</b> <sup>10</sup>	37	94	37	94
- of which non-pumped <sup>11</sup>	37	94	37	94
- of which pumped	0	0	0	0
- of which mixed	0	0	0	0
<b>Geothermal</b>	0	0	0	0
<b>Solar:</b> <sup>12</sup>	2 911	2 208	4 522	3 693
- of which photovoltaic	2 911	2 208	4 522	3 693
	0	0	0	0
<b>Tide, wave and ocean</b>	0	0	0	0
<b>Total wind:</b> <sup>13</sup>	4 202	9 642	4 393	10 030
- of which onshore wind	3 245	6 267	3 436	6 578
- of which offshore wind	957	3 375	957	3 452
<b>Total biomass</b>	791	4 729	865	4 694
- of which solid biomass <sup>14</sup>	570	3 676	638	3 668
- of which biogas <sup>15</sup>	221	1 053	227	1 026
- of which bioliquids <sup>16</sup>	0	0	0	0
<b>Total</b>	<b>7 941</b>	<b>16 673</b>	<b>9 817</b>	<b>18 511</b>
<b>- of which CHP</b>	<b>659</b>	<b>3 471</b>	<b>808</b>	<b>4 108</b>

<sup>9</sup> Facilitates comparison with Table 10a of the National Renewable Energy Action Plans.

<sup>10</sup> Normalised in accordance with Directive 2009/28/EC.

<sup>11</sup> In the template, hydro power is split into three size classes. CBS only provides totals. In view of the confidentiality of data, CBS is unable to provide an itemisation. CBS is obliged not to provide such information by virtue of statutory obligations.

<sup>12</sup> Electricity from solar energy is fully photovoltaic.

<sup>13</sup> In line with the procedure in accordance with Directive 2009/28/EC, wind energy has been fully normalised. The division into onshore wind and offshore wind was based on (non-standardised) electricity generation from onshore wind and offshore wind.

<sup>14</sup> Including renewable fraction from biogenic household waste.

<sup>15</sup> Including electricity production from green gas.

<sup>16</sup> From 2011 onwards, only bioliquid that demonstrably fulfils the sustainability criteria in the Directive is counted.

**Table 1c:** Total actual contribution (final energy consumption) from each renewable energy technology in the Netherlands to meet the binding 2020 targets and the indicative interim trajectory for the share of energy from renewable sources in heating and cooling (TJ and ktoe)<sup>17</sup>

	2017	2018	2017	2018
	TJ	TJ	ktoe	ktoe
<b>Geothermal</b> (excluding geothermal heat in heat pump applications)	3 047	3 731	73	89
<b>Solar</b>	1 144	1 156	27	28
<b>Biomass:</b>	52 313	54 277	1 249	1 296
- of which solid biomass <sup>18</sup>	44 758	43 197	1 069	1 032
- of which biogas <sup>19</sup>	6 533	7 291	156	174
- of which bioliquids <sup>20</sup>	1 022	3 788	24	90
<b>Renewable energy from heat pumps:</b>	7 610	9 052	182	216
- of which aérothermal (outdoor air)	3 529	4 668	84	111
- of which geothermal (soil) <sup>21</sup>	4 081	4 383	97	105
<b>TOTAL</b>	<b>64 113</b>	<b>68 215</b>	<b>1 531</b>	<b>1 629</b>
- of which district heating <sup>22</sup>	16 107	14 067	385	336
- of which biomass in households	16 432	16 446	392	393

<sup>17</sup> Facilitates comparison with Table 11 from the National Renewable Energy Action Plans.

<sup>18</sup> Including renewable fraction from household waste.

<sup>19</sup> Including final consumption for heat from green gas.

<sup>20</sup> From 2011 onwards, only bioliquid that demonstrably fulfils the sustainability criteria in the Directive is counted.

<sup>21</sup> Including a small portion of hydrothermal (heat from surface water).

<sup>22</sup> Defined as heat sold, i.e. including steam sold to industry.

**Table 1d:** Total actual contribution from each renewable energy technology in the Netherlands to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in the transport sector (TJ and Ktoe)<sup>23, 24</sup>

	2017 TJ	2018 TJ	2017 ktoe	2018 ktoe
Bioethanol	5 365	5 524	128	132
Biodiesel (FAME)	6 986	13 397	167	320
Hydrotreated Vegetable Oil (HVO)	75	391	2	9
Biogas	230	308	5	7
Fischer-Tropsch diesel	0	0	0	0
Bio-ETBE	34	819	1	20
Bio MTBE	0	0	0	0
Bio-DME	0	0	0	0
Bio-TAEE	0	0	0	0
Biobutanol	0	0	0	0
Biomethanol	0	0	0	0
Pure vegetable oil	0	0	0	0
Bio-naphtha	0	803	0	19
<b>Total sustainable biofuels</b>	<b>12 691</b>	<b>21 242</b>	<b>303</b>	<b>507</b>
- of which produced from feedstock listed in Annex IX Part A	268	1 770	6	42
- of which other sustainable biofuels eligible for the target set out in Article 3(4)(e)	0	0	0	0
- of which produced from feedstock listed in Annex IX Part B	7 019	13 095	168	313
- of which sustainable biofuels for which the contribution towards the renewable energy target is limited according to Article 3(4)(d) (biofuels from food crops)	5 403	6 377	129	152
- of which imported	unknown	unknown	unknown	unknown
<b>Hydrogen from renewables</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Renewable electricity</b>	<b>2 071</b>	<b>2 261</b>	<b>49</b>	<b>54</b>
- of which road transport	448	538	11	13
- of which rail transport	1 623	1 723	39	41
- of which other	0	0	0	0
<b>Total<sup>25</sup></b>	<b>26 275</b>	<b>43 103</b>	<b>628</b>	<b>1 030</b>

<sup>23</sup> For biofuels take into account only those compliant with the sustainability criteria, cf. Article 5(1), last subparagraph.

<sup>24</sup> Facilitates comparison with Table 12 of the National Renewable Energy Action Plans.

<sup>25</sup> Including set-off calculation factors for double-counting biofuels and electricity for transport.

**Question 2. Measures taken in 2017 and 2018 and/or planned at national level to promote the growth of energy from renewable sources**

Measures taken in 2017 and 2018 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 the National Renewable Energy Action Plan.

Table 2a provides an overview of the measures currently in place, along with new measures from 2017 and 2018.

**Table 2a:** Overview of all measures and policy (2017 and 2018)

Name of the measure	Type of measure	Expected result	Target group and/or activity	Existing or planned	Start and end dates of the measure
SDE+	Financial	Generated energy	Energy producers	Existing	2011–
SDE (national incentive scheme for sustainable energy production)	Financial	Generated energy	Energy producers (incl. consumers)	Existing	2008–2010 (payment over max. 15 years)
MEP (environmental quality in the electricity production sector)	Financial	Generated energy	Energy producers	Existing	2003–2006 (payment over max. 10 years)
OVMEP (environmental quality in the electricity production sector – transition scheme)	Financial	Generated energy	Energy producers	Existing	2006–2007 (payment over 10 years)
EDS (energy-saving and sustainable energy sports facilities subsidy scheme)	Financial	Installed capacity	End-users sports facilities	Existing	2016–2020
ISDE (investment subsidy sustainable energy)	Financial	Installed capacity	End users/energy producers	Existing	2015–
EIA (energy investment relief scheme)	Financial (tax)	Installed capacity	Energy producers	Existing	2001–
MIA/VAMIL (environmental investment rebate/arbitrary depreciation of environmental investments)	Financial (tax)	Installed capacity	Energy producers	Existing	MIA: 2000– VAMIL: 1991–
<i>Garantieregeling geothermie</i> (geothermal guarantee scheme )	Financial	Installed capacity	Energy producers	Existing	2009–
<i>Groen beleggen</i> (green investment scheme)	Financial (generic, financing)	Installed capacity	Energy producers and investors	Existing	1995–
GO ( <i>Garantie Ondernemingsfinanciering</i> - government-backed large-enterprise loans scheme), <i>Borgstelling MKB kredieten</i> (government-backed SME loan scheme),	Financial (generic, financing)	Installed capacity	Energy producers	Existing	2008–

Name of the measure	Type of measure	Expected result	Target group and/or activity	Existing or planned	Start and end dates of the measure
<i>Innovatiekrediet</i> (innovation loan scheme)					
Topsector Energy	Financial	Installed capacity, generated energy, energy innovation	Industry and research institutions, government	Existing	2011–
<i>Subsidieprogramma proeftuinen intelligente netten</i> (smart-grid pilot areas subsidy programme)	Financial	Energy innovation	Energy transmitters	Existing	2011–2015
<i>Subsidieregeling hernieuwbare energie</i> (renewable energy subsidy scheme)	Financial	Energy innovation	Research institutions, end-users	Existing	2015–
<i>Subsidieregeling demonstratie energie innovaties</i> (demonstration of energy innovations subsidy scheme)	Financial	Energy innovation	Research institutions, end-users	Existing	2015–
Energy tax on electricity and gas (offsetting for electricity, biomass heating)	Financial	Generated energy	End-users	Existing	1996–
Differentiated motor vehicle and motorcycle tax based on CO <sub>2</sub> emissions	Financial	Installed capacity	End-users (vehicles)	Existing	2011–
<i>Verplichting hernieuwbare energie in vervoer</i> (renewable energy for transport obligation)	Regulatory	Generated energy	Suppliers of fuels for transport	Existing	2007–
<i>Structuurvisie wind op land</i> (Structural Concept concerning onshore wind)	Regulatory	Installed capacity	Various	Existing	2014–
<i>Structuurvisie wind op zee</i> (Structural Concept concerning offshore wind)	Regulatory	Installed capacity	Various	Existing	2014–
State Coordination Scheme	Regulatory	Installed capacity	(National) government, energy producers	Existing	2008–
Crisis and Recovery Act (provincial coordination scheme) ( <i>Crisis- en Herstelwet (provinciale coördinatieregeling)</i> )	Regulatory	Installed capacity	(Provincial) government, energy producers	Existing	2010–
(Tightening of) energy performance certificate (EPC) (tightening in 2011 and 2015)	Regulatory	Installed capacity	Government, town and country planners, architects	Existing	1995–
<i>Voorrang voor Duurzaam opgewerkte energie</i> (priority for sustainably generated energy)	Regulatory	Generated energy	Energy producers	Existing	2010–

Name of the measure	Type of measure	Expected result	Target group and/or activity	Existing or planned	Start and end dates of the measure
Gas Act ( <i>Gaswet</i> ) and Electricity Act ( <i>Elektriciteitswet</i> )	Regulatory	Generated energy	Energy producers and transmitters	Existing	Gas: 2000– Electricity: 1998–
Energy Report – transition to sustainable, national energy dialogue, Energy Agenda towards 2050	Soft	Change in behaviour; installed capacity and generated energy	Various	Existing	2016–
National Heat Expertise Centre	Soft	Change in behaviour; installed capacity	Various	Existing	2009–
<i>Nationaal plan bijna energieneutrale gebouwen</i> (national plan for nearly zero-energy buildings)	Soft	Change in behaviour, regulatory	Public authorities, building managers, homeowners	Existing	2012–
<i>Certificerings-regeling en opleidingsstructuur duurzame energie voor installateurs</i> (certification scheme and training in sustainable energy for installers)	Regulatory	Change in behaviour	Installers of sustainable energy systems	Existing	2012–
Action Plan: electric vehicles	Soft and Financial	Change in behaviour	Investors, end-users, government	Existing	2011–2015
Reduced rate on energy tax (postcode catchment area ( <i>postcoderoos</i> ))	Financial (tax)	Citizen participation, Installed capacity	Energy cooperatives and owner associations	Existing	2014–
Reduced VAT rate for labour costs for insulation in the residential market	Financial (tax)	Installed capacity, energy-saving measures	Homeowners	Existing	2013–2015
<i>Nationaal energiebesparings-Fonds</i> (national energy-saving fund), <i>Fonds energiebesparing huursector</i> (loan fund for energy-saving in the rented sector), <i>STEP-regeling</i> (energy performance incentive scheme for the rented sector)	Financial (generic, financing)	Installed capacity, energy-saving measures	Owners of rented properties, property owners' associations	Existing	2013–
Obligation to display energy performance of buildings certificate	Regulatory	Raising awareness, exemplary role of government	All public buildings	Existing	2014–
Energy saving awareness campaign	Soft	Raising awareness	Residential consumers	Existing	2013–2019

Name of the measure	Type of measure	Expected result	Target group and/or activity	Existing or planned	Start and end dates of the measure
Package of measures under the Environmental Management Act ( <i>Wet Milieubeheer</i> )/Activities Decree ( <i>Activiteitenbesluit</i> )	Regulatory	Installed capacity, energy-saving measures	Businesses, property owners	Existing	2014–
Communications plan for the roll-out of smart meters	Soft	Change in behaviour, information	Homeowners, housing corporations, property owners and tenants	Existing	2015–
(Draft) requirements for ‘nearly zero-energy buildings’	Regulatory	Installed capacity, energy-saving measures	Designers and principals (including public authorities) of new buildings	Planned	2019 (public authorities) and 2020 (rest of the market)
<i>Subsidie regeling Energiebesparing en verduurzaming sportaccommodaties</i> (energy-saving and sustainability of sports facilities subsidy scheme)	Financial	Installed capacity, energy-saving measures	Sports associations and sports foundations	Existing	2016–
IP2020 (intensification, acceleration tables)	Soft	Installed capacity, energy-saving measures	Energy producers and end-users	Existing	2016–
Open data including national energy atlas	Soft	Change in behaviour, information	Researchers, energy producers and end-users	Existing	2016–
Energy label C obligation offices	Regulatory	Change in behaviour, installed capacity, energy-saving measures	Office owners	Planned	2023–
Energy efficiency compensation	Financial/legislation	Installed capacity, energy-saving measures	Landlords and tenants	Existing	2016–
<i>Subsidie regeling Energiebesparing en verduurzaming monumenten</i> (energy-saving and sustainability of monuments)	Financial	Change in behaviour, installed capacity, energy-saving measures	Monument owners	Planned	2019–2021



The table below provides an overview of the covenants in place in 2017 and 2018.

**Table 2b:** Overview of covenants (2017 and 2018)

Covenant	Date	Signatories	Objectives
Green Deal	2011–	Private individuals, businesses, other public authorities, civil-society organisations and the national government	To complete local, sustainable projects in areas including energy-saving, sustainable energy, sustainable mobility and sustainable use of raw materials and water
Multi-annual agreements on energy efficiency (MJAs)	Various years	MEE: ETS (emissions trading system) companies MJA3 (2001–2020): municipalities and non-ETS companies	To improve energy efficiency in businesses and institutions; in-house and within the chain
Covenant ‘Clean and Energy-efficient Agricultural Sectors’	2010–	National government and agricultural sectors	30% of 1990 greenhouse gas emissions by 2020

### Question 2a. Progress made in evaluating and improving administrative procedures

Please describe the progress made in evaluating and improving administrative procedures to remove regulatory and non-regulatory barriers to the development of renewable energy.

#### Environment Act

The aim of the Environment Act (*Omgevingswet*) is to speed up (spatial planning) procedures and to package plans and permits. The aim of this packaging is to save costs, limit research costs and provide better possibilities for plans, decisions and research to be drawn up and made available digitally. The Act is due to enter into force in 2021. Work is currently under way on the underlying regulations.

#### Intentions in the Climate Agreement

The draft Climate Agreement was drawn up in 2018 (the Agreement was adopted in 2019). It proposes various measures and studies which are expected to contribute to the improvement of administrative procedures. This includes issues such as bi-directional loading of vehicles, transforming the tax arrangements for energy communities into a subsidy scheme, simplification of creditworthiness assessments for supplementary mortgages for sustainability investments, reconsideration of local authority regulations if they have a restrictive effect on the realisation of onshore wind and solar power and shortening of licensing procedures for offshore wind power. Various studies have also been agreed which will focus on examining regulatory obstacles in specific fields, such as geothermal energy and flexibility options.

**Question 2b. Measures ensuring the transmission and distribution of electricity produced from renewable energy sources and rules for bearing and sharing of costs related to grid connections and grid reinforcements**

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.

Under Article 23(1) of the Dutch 1998 Electricity Act (*Elektriciteitswet 1998*), all types of grid users, including producers of electricity from renewable energy sources, are entitled to a connection. There is no exception to this provision. The connection period is limited to 18 weeks for (a) a connection of up to 10 MVA or (b) a connection for a production installation for generating sustainable electricity or high-efficiency combined heat and power (CHP). This ensures access to the grid for all production installations.

Grid operators are also obliged to transmit the electricity produced, unless there is insufficient grid capacity (Article 24 of the 1998 Electricity Act). If transport capacity appears to be insufficient, congestion management is used. Congestion has occurred relatively infrequently in the Netherlands and is limited to specific regions and specific time periods. The costs of congestion management are borne by all by means of transmission tariffs.

The technical codes based on Article 31 of the Act lay down the procedure to be used in the event of congestion management, which ensures that customers are also treated in a non-discriminatory fashion should congestion management arise. However, certain grid users, including producers of electricity from renewable energy sources, are exempted from mandatory offers in the event of congestion management (Article 9.9 of the Electricity Grid Code (*Netcode elektriciteit*)).

In general terms, grid operators in the Netherlands are obliged by law to take steps to meet the demand for transmission capacity and to resolve structural congestion (Article 16 of the Electricity Act). Grid operators achieve this in principle by investing in grid expansion. In addition, when taking action, grid operators must also consider 'measures with regard to sustainable electricity, energy-saving and demand regulation or decentralised electricity production, as a result of which the need for replacement or expansion of production capacity can be met' (Article 16(1)(c) of the Electricity Act).

### Question 3. Support schemes and other measures for renewable energy

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.

This section describes the following schemes in place to promote the use of renewable energy:

1. ISDE
2. SDE+
3. SDE
4. MEP
5. EIA
6. Green Projects Scheme
7. Topsector Energy
8. Green Deals

#### 1. Investment Subsidy for Sustainable Energy, ISDE

The ISDE Investment Subsidy for Sustainable Energy was announced in the Heat Concept in April 2015. This multi-annual scheme was opened on 1 January 2016 and will run until 31 December 2020. Through the ISDE, the Dutch Government aims to promote the heating of homes and offices less by means of gas and more by means of sustainable heat. Private individuals and business users can therefore obtain a subsidy via the ISDE on the purchase of solar boilers, heat pumps, biomass boilers and pellet stoves. The scheme is currently being evaluated and a decision will be taken on how the scheme will be continued based on the results of this evaluation and the agreements in the Climate Agreement.

#### 2. Incentive Scheme for Sustainable Energy Production, SDE+ (2011-2020)

The SDE+ Incentive Scheme for Sustainable Energy Production was first opened on 1 July 2011. The SDE+ is a technology-neutral scheme and its purpose is to promote the roll-out of renewable energy production in a cost-effective way. The lower the cost price, the greater the likelihood that the project will receive a subsidy. It offers initiators the opportunity to submit their project in the 'free category' for a lower sum than that recommended by the Netherlands Environmental Assessment Agency (*Planbureau voor de Leefomgeving*, PBL) for the technology in question. In this form, the SDE+ scheme fulfils the best-practice principles for feed-in premium systems which were published by the European Commission at the end of 2013.<sup>26</sup>

The SDE+ scheme offers long-term financial security (for up to 15 years) by covering the unprofitable portion of the project costs. The SDE+ is a feed-in premium system: it pays the difference between the cost price of grey energy and that of sustainable energy over a period not exceeding 15 years (base amount – correction amount = subsidy). The base amount is the average cost price of the renewable energy technology, or the sum of investment and operating costs, plus a reasonable profit margin, divided by the quantity of sustainable energy that is expected to be produced. The correction amount is derived from the predicted and actual energy prices (the payment for the energy that the producer is able to receive on the market). For the purpose of paying advances for projects, an expected energy price is set in advance (provisional correction amount). The energy price is established at the end of every calendar year for the preceding calendar year (final

<sup>26</sup> European Commission guidance for the design of renewables support schemes, SWD(2013) 439 final.

correction amount). As the correction amount may vary from year to year, the producer receives a different subsidy amount per unit of produced energy per calendar year. Nevertheless, the producer does have practically constant revenue from grey energy and subsidy in euro per kilowatt hour.

The subsidy is subject to a maximum, and the maximum subsidy per unit of produced energy must not exceed the difference between the base amount and the base energy price (2/3 of the average energy price expected over the long term).

The base amounts and correction amounts are based on independent recommendations by the PBL. The base amounts are revised annually and adapted to developments in the market. The recommendation process features a consultation with market parties, during which stakeholders are given the opportunity to provide their written and/or oral input with regard to content. For the purpose of monitoring the recommendations made by ECN, DNV GL and TNO, their findings are reviewed annually by an external authority. In 2017 and 2018, this review was conducted by Fraunhofer and TU Wien (Technical University of Vienna).

A budget of €12 billion was made available in both 2017 and 2018. The maximum commitments budget has risen very sharply in recent years. This was one of the reasons for working with two opening rounds per year from 2016. The expectation is that the projects submitted in 2017 and 2018 will largely become operational in 2019.

### **3. Incentive Scheme for Sustainable Energy Production, SDE (2008–2010)**

The predecessor of the SDE+ scheme was the Incentive Scheme for Sustainable Energy Production (SDE). Just as SDE+ is, this scheme was a feed-in premium scheme that was opened annually, but unlike the SDE+, a budget ceiling was published and a base amount established for each technology within the SDE scheme. The scheme was launched in 2008 with the opening of various subsidy categories for renewable electricity and green gas; it was opened for the last time in 2010. It is expected that cash payments that were entered into by virtue of commitments up to the end of 2010 under the SDE will be covered by general funds up to the end of 2030.

### **4. Environmental Quality of Electricity Production, MEP (2003–2006)**

Under the Environmental Quality of Electricity Production (MEP) scheme, subsidies were granted between 2003 and 2006 in the form of a fixed feed-in premium for renewable electricity projects. The MEP was an open-ended scheme. The last commitments for MEP were entered into in 2006. The MEP subsidy was a fixed subsidy tariff per produced kilowatt hour and applied for a period of 10 years. The cash payments for MEP up to 2020 are running out rapidly and until that time will still be covered by general funds.

### **5. Energy Investment Relief scheme (EIA)**

The Energy Investment Relief scheme is intended for entrepreneurs who want to invest in energy-saving technologies and the use of renewable energy in their business. Entrepreneurs are able to deduct a percentage of their investment costs from their taxable profits, in addition to the usual write-down. Up to 2015, this percentage was 41.5%; in 2016 it rose to 58%. In 2017, the deduction percentage was reduced slightly to 55% and in 2018 to 54.5%. The EIA is a generic scheme. The operating assets or parts of operating assets that are eligible are included on the EIA Energy list. The list is updated annually and adapted according to the best available alternatives on the market. This tax scheme of the Ministry of Finance and the Ministry of Economic Affairs and Climate is run by the Netherlands Enterprise Agency (RVO.nl) and the Tax Administration. RVO.nl assesses an item that is notified against the technical and administrative requirements of the EIA and issues a

certificate if the requirements have been fulfilled. The Tax Administration determines whether or not an entrepreneur receives an EIA subsidy.

Up to 2013, the EIA promoted both energy-saving and renewable energy projects. The EIA was confined to energy-saving in 2014, in implementation of the Energy Agreement, since the promotion of renewable energy already takes place through the SDE+ subsidy scheme.

In 2018, the available budget for the EIA was established at €147 million. Partly due to the strong economic upturn, this budget was exceeded by about €13 million.

#### **6. Green Projects Scheme**

Consumers are able to purchase green securities (green savings) or shares in a green investment fund (green investment), the intention being that the funds raised are invested in green projects that have been approved by the Dutch government. The scheme offers tax relief.

Banks then lend the contributed funds at a reduced interest rate to projects that offer an obviously greater benefit than usual to the natural world and the environment, and one that far exceeds the statutory minimum requirements. A list has been drawn up of project categories that are eligible for these loans. The benefit to the natural world and the environment is laid down in requirements that are monitored by RVO.nl.

According to the Budget Memorandum for 2020, the tax expenditure relating to the scheme amounted to €71 million in 2017 and €65 million in 2018.

#### **7. Topsector Energy**

In order to promote innovation, the Cabinet designated nine 'top sectors' in 2011; these are sectors in which the Netherlands is excelling at a global level. The basic principle of the approach is that the government no longer just uses rules and subsidies as a guiding mechanism, but Dutch companies are more at the helm and are given the scope to do business, invest, innovate and export. The top sector policy adopts a sector-based, integrated approach, as opportunities and bottlenecks are usually of a sector-specific nature and have an effect on a wide range of factors that determine the climate in which to establish a business. This is the case, for example, with bottlenecks relating to knowledge and innovation, (sector-specific) regulations, tax law, financing new products, linking education to the employment market and entering foreign markets. The specific nature and scope of these bottlenecks varies considerably from sector to sector. Substantive and financial agreements have been laid down in what are known as knowledge and innovation contracts, which consist of a mix of measures in the areas of fundamental research, applied research and valorisation. A 'top team' has been assembled for each top sector, including representatives from SMEs, academia, government and a 'standard bearer' from the sector who is responsible for facilitating the implementation of the knowledge and innovation contracts.

In 2018, the present Cabinet indicated that it wished to focus the nine top sectors more on a number of social topics and the economic opportunities within them, including Energy Transition & Sustainability. To this end, a process has been set in motion to draw up clear missions and from these missions to develop knowledge and innovation agendas which can give substance to these missions and the economic opportunities within them. For Energy Transition & Sustainability, the process to achieve a national Climate Agreement is a guiding principle in the formulation of the missions and the knowledge and innovation assignments.

The top sector energy plays an important role in the field of renewable energy, but also in the development towards mission-driven commitment in the field of Energy Transition & Sustainability.

The top sector energy consists of five ‘top consortia’ for knowledge and innovation (the respective Top Consortia for Knowledge and Innovation in Offshore Wind, Biobased Economy (BBE), Urban Energy (UE), Energy & Industry (E&I) and New Gas). Over 2 400 public and private organisations are participating financially in the top sector energy in more than 2 600 projects, of which over 60% relate to SMEs. In total, in the field of renewable energy sources and generation, energy innovation funding amounting to €61 million in 2017 and €97 million in 2018 was committed<sup>27</sup> for research and pilot projects (via separate tenders for the energy top consortia, innovations in renewable energy, the *Demonstratie Energie Innovatie* (demonstration of energy innovation products) scheme), the *MKB Innovatiestimulering Topsectorenregeling* (top sector scheme for boosting SME innovation) and the PPP supplement for research and innovation and input from TNO (Netherlands Organisation for Applied Scientific Research) and ECN (Energy Research Centre of the Netherlands). On average, approximately 40% of the programmes were funded by companies.

### 8. Green Deals

The Green Deal plan was launched on 3 October 2011. It is an easily accessible plan with which the Cabinet promotes growth in green technologies. The Cabinet facilitates initiatives by companies, civil-society organisations, decentralised authorities and citizens by eliminating obstacles (which may relate to existing legislation and regulations, or access to funding, for example). Social initiatives that have arisen from the bottom up form the basis of the Green Deal plan. The main topics concerned are energy, raw materials, mobility, biodiversity, climate, food, biobased economy, construction and water.

The Green Deal plan forms an important part of the Cabinet’s wider sustainability policy. The Green Deal plan works well in processes where innovations are actually applied because it is at that stage that entrepreneurs often encounter obstacles that they are unable to resolve alone.

By the end of 2018, 227 Green Deals had been concluded, of which 123 contained an energy component. These energy deals were taken out by 1 057 participants, of which more than 560 are companies. The deals concluded in the past period in 2017 and 2018 are characterised by a more strategic and more complex nature and a larger number of participants, as a result of which the potential for upscaling and the spillover effect of the deals are more effectively ensured from the very start. By the end of 2018, a total of 190 of the Green Deals taken out had been completed.

An important side-effect of the Green Deal plan is that it has resulted in a different and innovative way of working in the Dutch government and in interdepartmental cooperation. This way of working is characterised by:

- a focus on eliminating barriers (policy workers are tasked with resolving bottlenecks on behalf of the government);
- ‘opening doors and windows’ (policy workers are accessible to parties to the deal and are encouraged to seek cooperation with industry parties to identify bottlenecks);
- a focus on collaboration and common objectives (a Green Deal always consists of contributions from the Dutch government *and* industry parties);
- a bottom-up approach (industry parties are invited to put forward initiatives);
- a project-based way of working (SMART-formulated results, policy workers provide guidance to one or multiple Green Deals).

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<sup>27</sup> Monitor: Publicly funded energy research 2018.

**Table 3.** Cash payments from MEP, SDE and SDE+ for renewable energy

MEP, SDE and SDE+ support schemes	Support per unit <sup>28</sup> (€/kWh)		Total (× €1 million)	
	2017	2018	2017	2018
MEP Onshore wind	7.7	7.7	0.9	0.2
MEP Offshore wind	9.7	9.7	38.9	4.8
MEP Biomass (incl. waste and landfill gas; incl. transitional MEP)	9.0	9.7	110.1	20.4
MEP Solar	9.7	9.7	0.1	0.0
MEP Hydro	-	-	-	-
<b>Total annual support from MEP<sup>29</sup></b>			<b>150.0</b>	<b>25.5</b>
SDE Onshore wind	6.1	5.4	143.8	150.8
SDE Offshore wind	13.0	12.3	318.0	363.9
SDE Biomass renewable electricity	6.5	5.8	59.5	57.4
SDE Biomass renewable gas	4.3	4.2	17.0	15.2
SDE Solar	33.6	33.2	13.9	13.4
SDE Hydro	8.1	7.2	0.0	0.0
<b>Total annual support from SDE</b>			<b>552.1</b>	<b>600.7</b>
SDE+ Onshore wind	4.4	3.8	62.4	79.1
SDE+ Offshore wind	-	-	-	-
SDE+ Biomass renewable electricity	4.6	3.0	1.6	1.0
SDE+ Biomass from renewable heat and CHP	4.0	4.1	145.1	239.8
SDE+ Biomass renewable gas	4.8	4.8	24.1	28.7
SDE+ Solar	8.9	7.5	36.3	70.1
SDE+ Hydro	5.7	5.5	0.1	0.0
SDE+ Geothermal heat	2.7	2.9	23.8	27.6
<b>Total annual support from SDE+</b>			<b>293.4</b>	<b>446.2</b>

<sup>28</sup> The quantity of energy supported by the per unit support gives an indication of the effectiveness of the support for each type of technology. For the SDE and SDE+ schemes, this table assumes weighted average base amounts and correction amounts each year. This weighted average is determined on the basis of the actual production in the year in question. In the case of wind energy, a correction has been made for the wind factor, and in the case of waste, for the percentage of biogenic waste. For biomass with residual heat level, the table assumes the maximum residual heat level and a cost effectiveness per kWh of electricity and heat combined.

<sup>29</sup> The fixed subsidy contribution per unit is given for the MEP (excl. biomass).



### Question 3.1. How supported electricity is allocated to final customers

Please provide the information on how supported electricity is allocated to final customers.

The Fuel Mix Disclosure Order (*Regeling Stroometikettering*) entered into force on 1 January 2005. This Order requires energy suppliers to inform end-users of how the supplied electricity has been generated. End-users are informed no later than four months after the end of a calendar year of the mix of the electricity supplied in the previous calendar year. Energy suppliers use guarantees of origin to validate the renewable portion of the energy they offer. The remainder of the electricity supply is made up of energy suppliers' trade balances.

In addition, the electricity label is used by energy suppliers to inform customers of the quantity of radioactive waste per kWh that is created in the course of generating the nuclear energy supplied and the quantity of CO<sub>2</sub> emitted as a result of energy generated from fossil fuels.

From 2020, the system of full disclosure will enter into force in the Netherlands. This means that all non-renewable electricity supplies will also have to be certified. As a result, all electricity supplies in the Netherlands will be covered by a green or grey certificate.

In the Netherlands, guarantees of origin can be traded by producers, including the guarantees of origin for which support has been allocated. The basic principle in this respect is that this trading income is included in the business case, thereby reducing the amounts of subsidy applied for.

#### **Question 4. Support schemes taking account of applications of energy from renewable sources that give additional benefits**

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.

As part of the primary instrument to promote renewable energy production (SDE+), subsidies were also paid out during 2017 and 2018 for the production of renewable energy from waste processing (electricity and heat) and for the fermentation, incineration or gasification of biomass for the purpose of supplying electricity, heat or green gas. Under the SDE+ scheme, this method of generating energy competes with other technologies, such as wind turbines and solar PV, in so far as subsidies are granted to the projects that produce renewable energy for the lowest cost price.

In 2017, a separate scheme for mono-manure fermentation was opened on a one-off basis under the SDE+ for (small-scale) fermentation of manure on a farm scale. This scheme focuses on achieving a cost reduction for manure fermentation so that this category becomes competitive within the SDE+. The wishes of water boards diverge when it comes to the application of innovative technologies. In consultation with the water boards, a technology-neutral category was opened for this purpose for sewage treatment plants in 2018 in order to produce at least 25% extra biogas from sewage sludge.

In 2017, the category of auxiliary firing and co-firing of sustainable biomass in coal-fired power stations was opened for the last time. The maximum of 25 PJ per year covered by decisions, agreed in the Energy Agreement, has been reached. In coal-fired power stations, part of the coal will be replaced by biomass. The biomass must meet the sustainability requirements laid down at national level for solid biomass.

In 2018, for the thermal conversion category, a residual heat level was introduced for the solid biomass boiler  $\geq 5$  MWth category. This residual heat level enables applications for between 3 000 and 8 500 full-load hours. The higher the number of full-load hours, the lower the base amount. In this way, it is possible for the producer to gear the business case of the project to the number of full-load hours needed. From this year, the thermal conversion of biomass categories are widened so that the electricity generated is also eligible for the same base amount of subsidy. The electricity may be generated using an existing steam turbine generator. This means that no separate categories for cogeneration will be opened up any more so that the scheme remains simple and efficient and strategic behaviour is limited.

In biomass gasification, gasification of treated wood was authorised in 2018 under technical conditions as the supply of treated wood is increasing. In addition, a new category of direct use of sustainable wood pellets for industrial application was included. In this category, a gas burner can be replaced by a biomass burner, for example for direct heating of an oven or stove. The wood pellets used for this purpose must meet the sustainability requirements for solid biomass.

In 2009, the Ministerial Order on double-counting of better biofuels entered into force. It was amended with effect from 1 January 2011 by the publication of the Dutch legislation transposing the Renewable Energy Directive and the Fuel Quality Directive. The legislation relating to double-

counting was at the time incorporated in the Order on renewable energy for transport (*Regeling hernieuwbare energie vervoer*) (Articles 16 and 17). This Order was amended in 2013 and 2015. The latest legislative amendment of 2015 made no change to the rules on double-counting. Biofuels produced from waste, residues, non-food cellulosic material and ligno-cellulosic material may be double-counted under specific conditions if the annual commitment is fulfilled. Annex 2 to the Order includes tables listing the raw materials that are and are not eligible for double-counting.

The laws and regulations which entered into force in 2018 as a result of the implementation of the Indirect Land Use Change (ILUC) Directive and the Fuel Quality Implementing Directive require the additional reporting by Member States of emissions resulting from indirect land use change. The emissions must be calculated on the basis of standard emission factors per type of feedstock listed in Annex VIII to the Renewable Energy Directive.

### Question 5. System of guarantees of origin

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.

In the Netherlands, guarantees of origin must be issued in order to demonstrate that electricity is generated from renewable sources. Guarantees of origin for electricity are supplied in the Netherlands by CertiQ, which is a wholly-owned subsidiary of TSO TenneT. Some of the tasks undertaken by CertiQ are statutory tasks of TenneT, as laid down in the Electricity Act. CertiQ reports directly to TenneT and its public shareholders. To this end, CertiQ draws up an annual plan and annual report once a year and submits its performance data periodically to ACM (Dutch Authority for Consumers and Markets) and the Ministry of Economic Affairs and Climate.

From 2015, guarantees of origin are also issued for heat (by CertiQ) and gas (by Vertogas, a subsidiary of Gasunie) from renewable sources. Essentially the same conditions apply as for the guarantees of origin for electricity from renewable sources.

CertiQ and Vertogas ensure that the guarantees of origin meet the requirements of the Directive and the Dutch legislation; ACM has a supervisory role in this respect. This means that the guarantees of origin cannot be issued in duplicate and that they contain the correct sustainability information.

## Question 6. Developments in the availability and use of biomass resources for energy purposes

Please describe the developments in 2017 and 2018 in the availability and use of biomass resources for energy purposes.

Table 4 shows the raw materials for domestic production (recovery in terms of the Energy Balance) of biomass for electricity and heat. This includes the biomass recovered in the Netherlands and exported (over PJ in 2017 and 2018). Biomass for domestic production of electricity and heat originates almost entirely from domestic sources of biomass. In addition, the Netherlands also imports biomass which is directly suitable for use as an energy source. In 2017 and 2018, this primarily concerned the renewable fraction of household waste that is burned in waste incineration plants (approximately 10 PJ).

Domestic consumption of solid biomass, mainly woody products from waste streams, can be met entirely from domestic production. On balance, the Netherlands has even been an exporter since 2014. This was not yet the case in 2013, when wood pellets were imported on a large scale. In 2018 co-firing with wood pellets increased again somewhat under the influence of the SDE+ subsidy and about 3 PJ of wood pellets were imported again for domestic consumption.

There are no data available with regard to the quantity, origin and nature of the raw materials for the production of biofuels for transport in the Netherlands, but there are data for the biofuels for transport placed on the market in the Netherlands. These data are contained in the annual reports of the Dutch Emissions Authority.<sup>30,31</sup> In accordance with the European Renewable Energy Directive, the administrative system relating to the blending obligation in the Netherlands focuses on mapping the biofuels placed on the Dutch market. Information is collected about the sustainability, origin and nature of the raw materials, CO<sub>2</sub> emissions, etc., for those biofuel streams. Nearly all biofuels placed on the Dutch market meet the sustainability requirements. According to the aforementioned annual reports of the Dutch Emissions Authority, these biofuels are nearly all certified to ISCC EU. Less than 10% of the biofuels for Dutch transport are produced from raw materials originating from the Netherlands. The lion's share of the raw materials come from abroad and notably from China (15%), Germany (11%) and the US (10%). The raw materials from the Netherlands are in all cases waste streams and residues.

Used cooking oil, the main raw material for biofuels for transport in the Netherlands, largely comes from non-European countries. China (26%) and the United States (17%) make the largest contributions. The Netherlands (13%) and Germany (9%) are the principal European countries of origin.

Wheat and maize, the agricultural crops which made the largest contribution to the production of biofuels in 2018, largely come from European countries. In particular, the United Kingdom and France are major contributors to the share of wheat (33% and 25% respectively) and Hungary and Spain to the share of maize (30% and 14% respectively).

<sup>30</sup> NEa (2018), Rapportage Energie voor vervoer in Nederland 2017 (Report on energy for transport in the Netherlands 2017).

<sup>31</sup> NEa (2019), Rapportage Energie voor vervoer in Nederland 2018 (Report on energy for transport in the Netherlands 2018).

Table 4a shows the total area used for energy crop cultivation in the Netherlands. It is not known which portion thereof was used for energy crops. In the Netherlands, with the exception of maize, no energy crops grown within the country were used for biofuels for transport for the domestic market in 2018. It is possible that primary agricultural crops grown in the Netherlands have been used for biofuels that were placed on the market in other countries. No data are available on this.

Information about the fodder maize cultivation area used in 2017 and 2018 for energy crops was calculated by CBS from the information obtained from surveys of operators of fermentation plants. Domestic use of agricultural land for growing energy crops is minimal compared to the total area of land used for arable farming, namely approximately 516 000 hectares, and for fodder cultivation (including fodder maize), namely approximately 216 000 hectares.

**Table 4:** Biomass supply for energy use<sup>32,33</sup>

Raw materials from within the Netherlands							
Biomass supply for heating and production of electricity	Physical units			PJ <sup>34</sup>		ktoe	
	2017	2018	unit	2017	2018	2017	2018
Direct supply of wood (forests, gardens, parks)	1 980 628	1 982 338	m <sup>3</sup>	13	13	322	322
Indirect supply of wood (waste wood, residues from wood processing)	2 148 199	2 460 131	tonne	27	31	656	743
Residual and by-products from farming and the agricultural industry	5 059 227	4 886 715	tonne	18	16	437	371
Biomass from waste	8 190 830	7 975 143	tonne	55	53	1 319	1 265
Energy crops	23 500	25 899	tonne	0	0	3	4
Other	0	0	tonne	0	0	0	0

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

Domestic agricultural land use for crops dedicated to energy production (ha)	2017	2018
Maize for energy production	500	600
Rape seed <sup>35</sup>	<1 900	<2 000
Short-rotation forestry	14	8
Miscanthus	242	262

<sup>32</sup> Data originate from a combination of data from official energy statistics, data for the RVO.nl *Green Deal Duurzaamheid vaste biomassa* (Green Deal sustainability of solid biomass) report, CBS manure statistics and expert assessments.

<sup>33</sup> The quantity of imported raw materials for the production of biomass for electricity and heat is minimal and has not been recorded separately.

<sup>34</sup> The energy values of the raw materials have been determined on the basis of tonnages/m<sup>3</sup> and the calorific values of the incoming biomass streams. In the case of biogas production, these were determined on the basis of the highest calorific value, and, for the use of solid and liquid biomass, on the basis of the lowest calorific value.

<sup>35</sup> Total area of rape seed cultivation. Rape seed is also grown for purposes other than energy production. It is not known what portion is grown for energy production and what portion for other purposes.

## Question 7. Changes in commodity prices and land use

Please provide information on any changes in commodity prices and land use in 2017 and 2018 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.

### Changes in commodity prices

Since the largest power stations using auxiliary firing and co-firing of biomass were still barely operational in 2017 and 2018, the impact on commodity prices cannot yet be determined. Moreover, concrete information on this subject remains confidential business information.

### Changes in land use

There have been no significant changes in land use in the Netherlands as a result of increased use of biomass and other forms of energy from renewable sources.

The NEa report<sup>36</sup> indicates that in 2018 all maize used for biofuels placed on the market in the Netherlands originates from other countries. In 2018, no biofuels produced from rape seed were placed on the market in the Netherlands.

The ISCC EU sustainability certification system was used for all consignments of liquid biofuels in 2018. The sustainability system Better Biomass (previously NTA8080) was mainly used for the consignments of biogas in 2018.

### Sustainability and voluntary schemes

In the Energy Agreement, it has been agreed to link sustainability criteria to the subsidy for auxiliary firing and co-firing of biomass and other large-scale energy generation from (mainly international) wood pellets. The sustainability criteria are among the most progressive and far-reaching criteria in the world. The sustainability criteria have been drawn up in consultation with the energy companies and environmental organisations in a working group of the Social and Economic Council of the Netherlands (SER) within the framework of the Energy Agreement. In 2017, the core departments worked on transposing these criteria into legislation (Decree and Order on conformity assessment of solid biomass for energy applications (*Besluit en Regeling conformiteitsbeoordeling vaste biomassa voor energietoepassingen*)), which entered into force on 1 January 2018. Companies can use the certification schemes approved by the Minister to demonstrate sustainability.

In 2017 and 2018, the Advisory Committee on Sustainability Assessment for Energy Applications (*Adviescommissie Duurzaamheidsbeoordeling voor Energietoepassingen*, ADBE) assessed six certification schemes and advised the Minister on guaranteeing these schemes. This led at the end of 2018 to the first (partial) approvals of a number of these schemes. In addition, at the end of 2017, RVO.nl (on behalf of the Minister) also made a verification protocol available, which enables companies to demonstrate sustainability of the biomass by other means too and to have it independently verified by a conformity assessment body (CAB).

<sup>36</sup> NEa (2019), Rapportage Energie voor vervoer in Nederland 2018 (Report on energy for transport in the Netherlands 2018).

At the end of 2018, the first CABs were accredited by the Minister for work with approved schemes. In view of the limited availability of approved schemes and accredited CABs, it was decided to extend the transitional period by one more year (during which approval of schemes and accreditation of CABs was not yet compulsory and FSC (Forest Stewardship Council) and PEFC (Programme for the Endorsement of Forest Certification) certification could be used to demonstrate sustainable forest management). This transitional period finally ended at the end of 2018 and the legislation therefore entered into force with effect from 1 January 2019.



**Question 8. Share of biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material**

Please describe the development and share of biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material.

Since 2009, the Netherlands has had legislation in place concerning the double-counting of biofuels from waste, residues, non-food cellulosic material and ligno-cellulose. The Netherlands was the first EU country to have such legislation. During 2017 and 2018, these types of biofuels contributed around 70% and 72% respectively in terms of energy in the end use of renewable energy for transport. Used cooking oil has been the main raw material for biofuels supplied in the Netherlands for years. It is striking though that the share has declined for the first time in years (55.6% in 2018 compared to 61% in 2017). In 2018, in particular waste streams and residues producing advanced biofuels are used to a greater extent. This is the consequence of the secondary objective (minimum share) for advanced biofuels in accordance with Directive (EU) 2015/1513.

**Table 5: Development in biofuels.**

	2017 TJ	2018 TJ	2018 ktoe	2018 ktoe
<b>Feedstock as listed in Annex IX Part A of Directive 2009/28/EC</b>				
(a) Algae if cultivated on land in ponds or photobioreactors	0	0	0	0
(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	148	179	3.54	4.27
(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	17	15	0.40	0.36
(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	10	288	0.24	6.88
(e) Straw	0	0	0	0
(f) Animal manure and sewage sludge	61	96	1.45	2.30
(g) Palm oil mill effluent and empty palm fruit bunches	30	668	0.73	15.95
(h) Tall oil pitch	0	0	0	0
(i) Crude glycerine	0	0	0	0
(j) Bagasse	0	0	0	0
(k) Grape marcs and wine lees	0	0	0	0
(l) Nut shells	0	0	0	0
(m) Husks	0	0	0	0
(n) Cobs cleaned of kernels of corn	0	0	0	0
(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	2	524	0.05	12.50
(p) Other non-food cellulosic material as defined in point (s) of the second paragraph of Article 2	0	1	0	0.03
(q) Other ligno-cellulosic material as defined in point (r) of the second paragraph of Article 2 except saw logs and veneer logs	0	0	0	0
<b>Feedstock as listed in Annex IX Part B of Directive 2009/28/EC</b>				
(a) Used cooking oil	6 320	11 480	150.94	274.20
(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	699	1 615	16.70	38.58

**Question 9. Impacts of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality**

Please provide information on the estimated impacts of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality within the Netherlands in 2017 and 2018. Please provide information on how these impacts were assessed, with references to relevant documentation on these impacts within your country.

Hardly any raw materials for biofuels are grown in the Netherlands. In addition, practically no new agricultural land has been brought into use. For this reason, the impact on biodiversity, water resources, water quality and soil quality as a result of growing crops for the production of biofuels is immaterial in the Netherlands.

**Question 10. Estimate of the greenhouse gas emission savings due to the use of energy from renewable sources**

Please estimate the net greenhouse gas emission savings due to the use of energy from renewable sources.

The application of electricity is relatively important in terms of prevented greenhouse gas emissions compared to the applications of heat and transport. In terms of gross final consumption, the relative contribution of electricity is far smaller. The reason for this is that, in the reference situation, far more primary fossil fuel is required to make 1 joule of electricity than to make 1 joule of heat; this is related to the high conversion losses in the thermal production of electricity. In addition, in the reference situation, the Netherlands uses far more coal with relatively high CO<sub>2</sub> emissions per unit of energy when generating electricity than is the case with heat.

The greenhouse gas emission savings due to the use of electricity and heat from renewable sources have been calculated according to a substitution method in accordance with the *Protocol Monitoring Hernieuwbare Energie*.<sup>37</sup> The reference technology for electricity is a national mix of natural gas, coal and nuclear power stations with an emission of 0.5968 kg of CO<sub>2</sub> per kWh in 2017. Data for 2018 were not yet available and therefore the 2017 data are used for 2018. In the case of heat, the most important reference technology is a natural gas-fired boiler with 90 per cent efficiency, resulting in emissions of 63 kg CO<sub>2</sub> per GJ of useful heat.

The emissions of greenhouse gases that have been prevented as a result of using biogasoline and biodiesel for transport have been calculated from a combination of data from the energy statistics of CBS and data from the Dutch Emissions Authority (NEa) on greenhouse gas performance of biogasoline and biodiesel placed on the market. The NEa received these data from companies that supply biogasoline and biodiesel under the laws and regulations on renewable energy for transport and the laws and regulations on fuels and air pollution.

**Table 6: Estimated GHG emission savings (ktonne CO<sub>2</sub> eq)**

Environmental aspects	2017	2018
<b>Total estimated net GHG emission saving from using renewable energy<sup>38</sup></b>	13 534	15 179
- Estimated net GHG saving from the use of renewable electricity	9 829	10 806
- Estimated net GHG saving from the use of renewable energy in heating and cooling	2 832	2 891
- Estimated net GHG saving from the use of renewable energy in transport	874	1 482

<sup>37</sup> RVO and CBS (2015) *Protocol Monitoring Hernieuwbare Energie* (Protocol on monitoring renewable energy), Revision 2015.

<sup>38</sup> The contribution of gas, electricity and hydrogen from renewable energy sources should be reported depending on the final consumption (electricity, heating and cooling, or transport) and only be counted once towards the total estimated net GHG savings.

**Question 11. Excess/deficit production of energy from renewable sources up to 2020**

Please report on (for 2017 and 2018) and estimate (for the coming 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.

According to the latest estimates, the Climate and Energy Outlook (KEV)<sup>39</sup> of 1 November 2019, a deficit will arise for the Netherlands with regard to the renewable energy targets for 2020. The Netherlands Environmental Assessment Agency (*Planbureau voor de Leefomgeving*, PBL) estimates the share of renewable energy of the Netherlands for 2020 at 11.4% with a range of 10% to 12% based on the European calculation methodology.

The main reason for this lower estimate is the increased gross final consumption of energy expected for 2020. There are in fact delays in the implementation of renewable energy projects. This mainly concerns onshore wind energy projects, which have been held up on account of objection and appeal procedures. On the other hand, the estimated production of renewable energy has not changed compared to earlier estimates because the shortfalls are offset by intensified policy and accelerated measures.

However, this estimate is subject to uncertainties. Not all supplementary measures taken in 2018 have been (fully) included in the analysis. The Netherlands has also taken further acceleration measures in 2019 to increase the share of renewable energy and is currently working hard to implement all possible supplementary measures on time. The final share of renewable energy in 2020 is therefore expected to turn out higher than estimated.

Nevertheless, it is possible that a deficit may remain in relation to the 2020 target. In order to be able to take timely action if this is the case, all possibilities are being mapped to eliminate any remaining deficit, including the use of cooperation mechanisms.

The Netherlands sees no potential for transferring renewable energy produced in the Netherlands to other Member States or for facilitating joint projects within Dutch territory before 2020. In the longer term, under the revised Renewable Energy Directive, it may be of interest to develop joint projects in the Netherlands. These may include, for example, projects in Dutch territorial waters combining the production of renewable energy and market integration.

The table below does not include an estimated excess/deficit because the supplementary measures have not yet been included in the estimate. The final share in 2020 is accordingly still dependent on other uncertainties, such as, for example, weather conditions and economic developments which have an impact on the production of renewable energy and gross final consumption of energy in 2020.

**Table 7:** Excess/deficit in production of renewable energy

	2017	2018	2019	2020
Actual/estimated excess or deficit in production	0	0	-	-

<sup>39</sup> PBL (2019) *Klimaat- en energieverkenning 2019* (Climate and Energy Outlook 2019).

## Question 12. Estimate of share of biodegradable waste in waste used for producing energy

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.

The method of estimating the share of biodegradable waste in waste used for producing energy is described in the 'Methodology report on the calculation of emissions to air from the sectors Energy, Industry and Waste' (ENINA 2019).<sup>40</sup> The model for the calculation of the share of renewable energy is also used to calculate the emissions from waste incineration plants in the framework of the reports for UNFCCC and the Kyoto Protocol. ENINA 2019 also describes the quality control. No adjustments were made to the model for 2017 and 2018.

The estimate of the share of biodegradable waste is made annually by an independent organisation, the Rijkswaterstaat Environment, using various annual reports. The estimate is based on seven stages. The data from the years of research into the composition of waste in the Netherlands are used to form the basis. The data obtained from that are used to determine the energy and carbon content and associated share of biomass of the waste streams burned in waste incineration plants. The biomass share of energy is then used to calculate a 'flat-rate percentage' of renewable energy for all waste incineration plants in the Netherlands. The proportion of renewable energy from waste was 54% in 2017 and 2018.

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<sup>40</sup> <https://english.rvo.nl/sites/default/files/2019/05/ENINA%202019-0018.pdf>

### Question 13. Amounts of biofuels and bioliquids per feedstock group

Please provide the amounts of biofuels and bioliquids in energy units corresponding to each category of feedstock group listed in part A of Annex VIII to Directive 2009/28/EC taken into account by the Netherlands 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).

In the Netherlands, approximately 5 PJ and approximately 6 PJ of biofuels produced from food crops were placed on the Dutch market in 2017 and 2018 respectively (Table 1d). These quantities correspond to just over 1 per cent of the energy consumption for transport. In particular, the biogasoline placed on the market is produced from food crops, mainly maize and wheat and to a lesser extent sugars. In 2017 and 2018, virtually no biofuels from oil crops were placed on the market any more.<sup>41, 42</sup>

Feedstock group	2017	2018	2017	2018
	TJ	TJ	ktoe	ktoe
Cereals and other starch-rich crops	4 329	4 545	103	109
Sugars	1 074	1 312	26	31
Rest (incl. oil crops) <sup>43</sup>	0	520	0	12
<b>Total</b>	<b>5 403</b>	<b>6 377</b>	<b>129</b>	<b>152</b>

<sup>41</sup> NEa (2018), Rapportage Energie voor vervoer in Nederland 2017 (Report on energy for transport in the Netherlands 2017).

<sup>42</sup> NEa (2019), Rapportage Energie voor vervoer in Nederland 2018 (Report on energy for transport in the Netherlands 2018).

<sup>43</sup> Contributions from a residual feedstock group including oil crops, without further breakdown.

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