

**PROGRESS REPORT UNDER ARTICLE 22 OF DIRECTIVE 2009/28/EC  
ON THE PROMOTION OF THE USE OF ENERGY FROM  
RENEWABLE SOURCES**

**MINISTRY FOR ENERGY AND WATER MANAGEMENT  
DECEMBER 2019**

**1. Sectoral and overall shares and actual consumption of energy from renewable sources in 2017 and 2018 (Article 22 (1) a of Directive 2009/28/EC).**

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

	Year 2017	Year 2018
RES-H&C <sup>2</sup> (%)	19.7%	23.3%
RES-E <sup>3</sup> (%)	6.8%	7.7%
RES-T <sup>4</sup> (%)	7.2%	8.4%
Overall RES share <sup>5</sup> (%)	7.3%	8.0%
<i>Of which from cooperation mechanism<sup>6</sup> (%)</i>	0.0%	0.0%
<i>Surplus for cooperation mechanism<sup>7</sup> (%)</i>	0.0%	0.0%

**Table 1a:**  
**Calculation table for the renewable energy contribution of each sector to final energy consumption (ktoe)<sup>8</sup>**

	Year 2017	Year 2018
(A) Gross final consumption of RES for heating and cooling	16.9	18.2
(B) Gross final consumption of electricity from RES	14.8	17.1
(C) Gross final consumption of energy from RES in transport	7.3	9.2
(D) Gross total RES consumption <sup>9</sup>	39.0	44.5
(E) Transfer of RES <u>to</u> other Member States	0.0	0.0
(F) Transfer of RES <u>from</u> other Member States and 3rd countries	0.0	0.0
(G) RES consumption adjusted for target (D)-(E)+(F)	39.0	44.5

The total renewable energy gross consumption shares in 2017 and 2018 were 7.3% and 8.0% respectively. The RES minimum trajectory for 2017-2018 was set at 6.5%. The resulting actual RES share from gross final consumption for 2017 and 2018 was 7.7%. This means that Malta has exceeded the interim trajectory for 2017-2018 set out in Annex I of Directive 2009/28/EU on the promotion of the use of energy from renewable sources.

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

<sup>2</sup> Share of renewable energy in heating and cooling: gross final consumption of energy from renewable sources for heating and cooling (as defined in Articles 5(1)b) and 5(4) of Directive 2009/28/EC divided by gross final consumption of energy for heating and cooling. The same methodology as in Table 3 of NREAPs applies.

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

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

<sup>5</sup> Share of renewable energy in gross final energy consumption. The same methodology as in Table 3 of NREAPs applies.

<sup>6</sup> In percentage point of overall RES share.

<sup>7</sup> In percentage point of overall RES share.

<sup>8</sup> Facilitates comparison with Table 4a of the NREAPs

<sup>9</sup> According to Art.5(1) of Directive 2009/28/EC gas, electricity and hydrogen from renewable energy sources shall only be considered once. No double counting is allowed.

**Table 1b:**  
**Total actual contribution (installed capacity, gross electricity generation) from each renewable energy technology in Malta to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity<sup>10</sup>**

	Year 2017		Year 2018	
	MW	GWh	MW	GWh
Hydro <sup>11</sup> :				
non pumped				
<1MW				
1MW–10 MW				
>10MW				
pumped				
mixed <sup>12</sup>				
Geothermal				
Solar:				
<i>photovoltaic</i>	112.3	162.2	131.3	189.6
<i>concentrated solar power</i>				
Tide, wave, ocean				
Wind:				
<i>onshore</i>	0.10	0.06	0.10	0.06
<i>offshore</i>				
Biomass <sup>13</sup> :				
<i>solid biomass</i>				
<i>biogas</i>	4.6	9.7	4.6	9.0
<i>bioliquids</i>				
<b>TOTAL</b>	<b>117.0</b>	<b>172.0</b>	<b>136.0</b>	<b>199.0</b>
<i>of which in CHP</i>	4.6	9.7	4.6	9.0

Notes:

- Malta's current wind energy capacity and generation is limited to a few micro-wind turbines.
- For the years 2017 and 2018, electricity generation by photovoltaic systems has been estimated at 1560 kWh/kWp and 1547 kWh/kWp, respectively. These figures were based on actual readings from a representative sample of photovoltaic systems' meter data.

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

<sup>11</sup> Normalised in accordance with Directive 2009/28/EC and Eurostat methodology.

<sup>12</sup> In accordance with new Eurostat methodology.

<sup>13</sup> Take into account only those complying with applicable sustainability criteria, cf. Article 5(1) of Directive 2009/28/EC last subparagraph.

**Table 1c:**  
**Total actual contribution (final energy consumption<sup>14</sup>) from each renewable energy technology in Malta 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>15</sup>**

	Year 2017	Year 2018
Geothermal (excluding low temperature geothermal heat in heat pump applications)	0.0	0.0
Solar	5.0	5.0
Biomass <sup>16</sup> :		
<i>solid biomass</i>	1.4	1.3
<i>biogas</i>	0.6	0.5
<i>bioliquids</i>	0.2	0.2
Renewable energy from heat pumps:		
- of which aerothermal	9.8	11.1
- of which geothermal	0.0	0.0
- of which hydrothermal	0.0	0.0
<b>TOTAL</b>	16.5	17.8
<i>Of which DH<sup>17</sup></i>	0.0	0.0
<i>Of which biomass in households<sup>18</sup></i>	1.4	1.3

<sup>14</sup> Direct use and district heat as defined in Article 5.4 of Directive 2009/28/EC.

<sup>15</sup> Facilitates comparison with Table 11 of the NREAPs.

<sup>16</sup> Take into account only those complying with applicable sustainability criteria, cf. Article 5(1) last subparagraph of Directive 2009/28/EC.

<sup>17</sup> District heating and / or cooling from total renewable heating and cooling consumption (RES- DH).

<sup>18</sup> From the total renewable heating and cooling consumption.

*Table 1d:*

**Total actual contribution from each renewable energy technology in Malta 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>19, 20</sup>**

	Year 2017	Year 2018
- Bioethanol		
- Biodiesel (FAME)	3.2	2.7
- Hydrotreated Vegetable Oil (HVO)	4.0	6.4
- Biomethane		
- Fischer-Tropsch diesel		
- Bio-ETBE		
- Bio MTBE		
- Bio-DME		
- Bio-TAEE		
Biobutanol		
- Biomethanol		
- Pure vegetable oil		
Total sustainable biofuels	7.2	9.1
Of which		
sustainable biofuels produced from feedstock listed in Annex IX Part A	0.0	0.0
other sustainable biofuels eligible for the target set out in Article 3(4)e	0.0	0.0
sustainable biofuels produced from feedstock listed in Annex IX Part B	6.8	9.0
sustainable biofuels for which the contribution towards the renewable energy target is limited according to Article 3(4)d	0.5	0.1
Imported from third countries		
Hydrogen from renewable		
Renewable electricity	0.02	0.04
Of which		
consumed in road transport	0.02	0.04
consumed in rail transport	0.0	0.0
consumed in other transport sectors	0.0	0.0
others (Please specify)		
others (Please specify)		

<sup>19</sup> For biofuels take into account only those compliant with the sustainability criteria, cf. Article 5(1) last subparagraph.

<sup>20</sup> Facilitates comparison with Table 12 of the NREAPs.

**2. 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 your National Renewable Energy Action Plan (Article 22(1)a) of Directive 2009/28/EC).**

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

<b>Name and reference of the measure</b>	<b>Type of measure*</b>	<b>Expected result**</b>	<b>Targeted group and or activity***</b>	<b>Existing or planned****</b>	<b>Start and end dates of the measure</b>
<b>GENERAL</b>					
Promote and support research in technologies and RES issues relevant to Malta, covering more efficient and cost effective systems that perform best in the Maltese environment, and in development (technical and governance) to meet Malta's specific needs. This with collaboration and participation of industry and relevant entities	Soft	Behavioural change	Public	Existing	Ongoing
<b>RES Electricity &amp; Heating and Cooling</b>					
Revision of the development policy documents to encourage solar technology (PV and SWH) uptake	Soft	Facilitates uptake of solar RES	Public, Private, Residential	Existing	2015
Publishing of Solar Farm Policy which identifies types of sites that can be used for PV farms	Soft	Facilitates uptake of solar RES	Public	Existing	2017
Financial instruments for financing of energy saving and renewable energy sources from Operational Programme 2014-2020	Financial	Committed budget for planned measures of 15 million Euro <sup>21</sup>	Public, Private, Residential	Planned	Ongoing (2015-2020)

<sup>21</sup> Based on a co-financing rate of 80% EU funds and 20% MT funds

Grant schemes for PV installation in the domestic sector (co-financed through EU funding)	Financial	Over 15.3MWp of PV capacity were installed in 2017 and 2018 in the residential sector.	Residential	Existing	Ongoing
Investments by public entities in PV systems on government buildings	Financial	By end 2018, total installed capacity in public sector was 4.3MWp. Planned capacity to be installed by 2020 is that of 5MWp.	Government entities	Existing	Ongoing
Communal medium scale PV projects specifically designed for households who do not have access to a roof top.	Financial	Low carbon buildings Installed capacity of approximately 1MWp	Residential	Complete	Completed (2016-2018)
Feed-in tariffs schemes for PV in line with GBER.	Regulatory	Timely deployment of PV installations to remain in line with target	Public	Existing	Ongoing
Competitive bidding process for PV systems equal to or larger than 1MWp	Regulatory	Timely deployment of PV installations to remain in line with target	Public	Existing	Ongoing (2017-2020)
Option for self-consumption of energy produced by PVs	Regulatory	Promote distributed PV consumption whilst reducing electricity network distribution system losses	Public	Existing	Ongoing

Grant scheme for SWH installation in the residential sector	Financial	By end 2018 58.5GWh of energy was generated by SWHs installed in the residential sector.  Projected increase in energy generation of 0.5GWh/annum	Residential	Existing	Ongoing
Online, interactive website showcasing tips to promote energy efficient behaviours and renewable technology uptake in households	Soft	Behavioural change	Public	Existing	Ongoing
Framework to provide the option to export to the grid excess renewable electricity generated by co-generation units.	Regulatory	Promote CHP installations	Private, public	Existing	Ongoing
Educational campaign on better waste segregation of biodegradable waste	Soft	Biodegradable waste for WtE generation	Residential	Existing	2015 – 2020
Setting specifications for approved technologies benefitting from grants	Regulatory	Ensuring quality and positive perception of RES technologies	Consumers	Existing	Ongoing
Roof Thermal Insulation and Double Glazing Scheme	Financial	To reduce the consumption of energy in households.	Residential	Ongoing	Ongoing
Grant Scheme for Heat Pumps Water Heaters for domestic use	Financial	Increase in the use of renewable sources of energy in the domestic sector	Residential	Existing	Ongoing
<b>RES TRANSPORT</b>					
Promotion of electric vehicles through capital grant scheme and/or favourable regulation tax; Scheme reviewed from time to time in response to changing conditions	Financial/ Regulatory	Behavioural change and cleaner commuting  856 registered electric vehicles by end 2018	Public, Commercial /industry	Existing	Ongoing
Promotion of pedelecs, electric motorcycles/mopeds, quadricycles and tricycles through capital grant scheme.	Financial	Increase in cleaner modes of transport.  256 grants awarded in 2018	Public	Existing	Ongoing

Increase the number of public charging points for Electric Vehicles if and as necessary.	Soft	Behavioural change 102 charging points installed by end 2019	Public	Existing	Ongoing
Promotion of auto-gas in road transport through capital grant scheme for the conversion of vehicles to run on autogas.	Financial	Behavioural change and cleaner commuting 1,472 registered autogas vehicles by end 2018	Public	Existing	Ongoing
Training & certification of installers of autogas conversion kits.	Soft	Education/regulation	Installers	Existing	Ongoing

<p>Ensure a robust regulatory regime for biofuels to:</p> <ul style="list-style-type: none"> <li>- Monitor origin of imported biofuels.</li> <li>- Supervise the quality of locally produced biofuel.</li> </ul>	Regulatory	Cleaner commuting	Fuel importers/ suppliers/ producers	Existing	Ongoing
<p>Set biofuel content level in imported fuels to gradually reach 10% by 2020, and monitor compliance</p>	Regulatory	Legal Framework to reach target of 10% renewable energy in transport	Fuel importers	Existing	Ongoing (2011 – 2020)
<p>Improve transport efficiency: Successful conclusion of the public transport reform.</p> <ul style="list-style-type: none"> <li>- CVA frameworks supported by park and ride facilities site in strategic areas. <ul style="list-style-type: none"> <li>- Road infrastructural development to remove network congestion bottlenecks.</li> <li>- Intelligent transport management systems.</li> </ul> </li> <li>- Scrappage scheme to remove old, polluting vehicles from circulation. <ul style="list-style-type: none"> <li>-Traffic and congestion management (better accessibility to towns and more efficient roads, vehicle - sharing).</li> <li>- Information and advisory campaign (basic motoring and driving skills).</li> </ul> </li> </ul>	Soft	Behavioural change	Public	Existing	Ongoing

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

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

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

\*\*\*\* Does this measure replace or complement measures contained in Table 5 of the NREAP?

In line with the updated NREAP published in 2017, Malta is expecting to achieve its 2020 target through the sustained development of different renewable energy technologies, including solar, heat pumps, biofuels and waste-to-energy.

It is envisaged that a considerable share of the renewable energy target shall be achieved by energy generated from photovoltaic systems. As at end of 2018 PV Capacity stood at 131.3MWp. The projected annual additional PV capacity is of approximately 24MWp till 2020. The Government's policy is to prioritize investment in PV systems installed on rooftops and brown field sites so as to safeguard the limited open spaces and environmentally sensitive areas. Systems larger than 1MWp are supported through a notified scheme which involves a competitive bidding process. This process was first launched in October 2017.

**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).**

In order to facilitate the uptake of small solar photovoltaic systems, the Planning Authority, PA, issued in 2007 a Development Control Policy and Design Guidance document which simplified the installation of small PV systems within the curtilage of buildings, whereby subject to compliance with the guidelines, no planning permits were required. In November 2015, the PA issued a new set of guidelines to further support the uptake of solar technologies within the curtilage of buildings. These new guidelines encourage the introduction of PV and SWHs at ground level within backyards, within the building fabric, and in surface car parks and other open spaces. The requirement to set back PV and SWH units from the front and back edge of rooftops has been removed.

In 2017, the PA published a Solar Farms Policy intended to guide the planning and design of solar farm development. The policy encourages solar farm development which achieves dual or multiple uses of land, such as large rooftops, car parks, industrial areas, disused landfills and quarries. Meanwhile, the policy identifies environmentally and visually sensitive areas as well as agricultural land as unsuitable for the development of photovoltaic installations.

The authorisation and licensing of new generation capacity is regulated by the Electricity Market Regulations (Subsidiary Legislation 545.13) and is granted by the Regulator for Energy and Water Services (REWS). These regulations exempt generators of renewable electricity with a capacity below 16 Amps per phase from the requirement to obtain an authorisation and a license. Instead, a fast track procedure is adopted whereby these generators require only the submission of a notification to the regulator prior to construction. A 'permission for grid connection' report is issued by the regulator. A grid connection study is required for systems larger than 16 Amps per phase. Procedures for different renewable energy technologies are quite similar and are based on capacity. Timeframes for procedures of licensing of RES plants are clearly documented and accessible on the authority's and the distribution system operator (DSO)'s websites.

The Subsidiary Legislation regulating the feed-in tariffs (FITs) for solar photovoltaic systems is updated at regular intervals in order to reduce bureaucratic regulatory procedures. As from 2015 the distinction between ground-mounted and roof-mounted tariffs was removed. Generators are also given the option to consume renewable electricity onsite in real-time (self consumption) and export unused units to the grid. Separate meters are installed to meter the generation of PV installations and the use of co-generation systems installed on the same premises.

Currently REWS does not charge any fees for processing of applications to obtain a license to generate renewable energy. However, there are processing fees related to planning permitting applications in case a permit is required. Should a grid connection study be required by Enemalta, fees based on the installed capacity shall apply. There are also fees charged in relation to the provision of connection and power metering to the electricity grid.

Information and guidance notes on processing of renewable energy system applications are available online on the REWS' website. Incentives such as capital grant schemes and changes to the feed-in tariffs legislation are notified in Government Notices and Legal Notices published in the Government Gazette.

**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*).**

Malta has no transmission network (hence no Transmission System Operator). A single Distribution System Operator (DSO) operates the distribution network. The electricity network spans across both Malta and its sister island, Gozo. High voltage (HV) networks essentially consist of 132kV, 33kV and 11kV underground cables and overhead lines connected to the Power Stations, the European Grid Interconnector, the Distribution Centres (DC's) and the Distribution Substations.

Small domestic PV applications are not required to provide a grid connection study and are handled directly by REWS and connected automatically. In these cases, any relevant grid reinforcement is borne by the DSO.

For larger systems (above 16A per phase), the PV developer has to commission a grid connection study which would identify the necessary infrastructure required to connect to the grid. The costs associated with any necessary grid reinforcement would have to be borne by the PV developer. In general, these would involve either a cable to connect to the nearest Distribution Centre or else a substation to connect the PV installation to either the 11kV or the 33kV lines.

Grid allocation is generally provided on a first come first served basis, provided installation already benefits from support, and is reserved for a period of 1 year. In the case of the larger systems (1MWp or larger), the competitive bidding process used to allocate support is also used to assign grid allocation priority.

There is no liquid wholesale electricity market in Malta. Electricity generated from RES is automatically dispatched, subject that it does not impact negatively on system stability and reliability. To date no curtailment has been imposed by the DSO. Balancing is carried out by the DSO.

Additionally, the DSO has initiated the process of upgrading various substations with transformers incorporating automatic tap-changers. This automatically stabilizes variable output voltage, thus facilitating the possibility of integrating additional PV capacity.

The 200MW connection to the continental European Grid through the interconnector has provided increased grid stability and thus raised the capacity to integrate intermittent energy produced from renewable sources. The fast response available over the interconnector makes up for rapid changes in generation patterns by PV installations (often caused by cloud cover) which would otherwise be difficult to absorb using local conventional generating units. However, additional PV capacity may require new solutions, as the present head room may not be sufficient. In this respect, an assessment is being carried out by the DSO to estimate additional system costs involved to integrate further PV capacity.

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).

*Table 3:*  
Support schemes for renewable energy

<b>RES support schemes (average support level for new plants starting operation in 2017 and 2018)</b>	<b>Per unit support (€/kWh) over lifetime of technology</b>	<b>Total (M€)* (average annual total support for 2017 and 2018)</b>
<b>Photovoltaic</b>		
Capital grants on Photovoltaic systems in the domestic sector <sup>1</sup>	<b>0.02</b>	<b>5.01</b>
Feed-in tariff for grid-connected photovoltaic systems for systems installed and connected in 2017 and 2018 <sup>2</sup>	<b>0.06</b>	<b>1.69</b>
<b>Solar Water Heating</b>		
Capital grants on solar water heating in the domestic sector <sup>3</sup>	<b>0.01</b>	<b>0.09</b>
<b>Schemes for Electric Vehicles</b>		
Capital grant schemes on electric vehicles <sup>4</sup>	<b>0.63</b>	<b>0.85</b>
Total annual estimated support in the electricity sector		<b>6.70</b>
Total annual estimated support in the heating sector		<b>0.09</b>
Total annual estimated support in the transport sector		<b>0.85</b>

<sup>1</sup> Assuming a lifetime of 20 years and an annual generation of 1600kWh/annum with module degradation of 0.89% yearly; no discounting

<sup>2</sup> Assuming a lifetime of 20 years and an annual generation of 1600kWh/annum with module degradation of 0.89% yearly and a marginal cost over the lifetime of 7.27 cents per kWh; no discounting.

<sup>3</sup> Assuming a lifetime of 20 years; no discounting

<sup>4</sup> Assuming a lifetime of 10 years; no discounting

**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 Enemalta plc, as DSO and supplier of electricity, provides a set of energy tips and information on alternative energy as well as information on billing and billing methods for grid connected renewable sources, namely photovoltaic system on its website. Premises that are installed with a renewable energy source, such as a photovoltaic system, are compensated for electricity supplied to the grid. In this case, details of the meter readings, the amount to be refunded and a breakdown of workings are presented in the consumer's bill. Electricity bills sent to consumers currently include CO2 emissions generated by the consumer's usage of electricity. ARMS Ltd, which is the subsidiary of Enemalta plc, responsible for the electricity and water bills, shall publish the overall fuel mix of the electricity supply on their website. REWS, the energy regulator, is closely monitoring this process to ensure that the information provided will be in line with Directive 2009/72/EC Art 3 (9).

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

In view of the limited effective renewable energy resources available in Malta, support is only provided for photovoltaic installations, solar water heaters and as from 2017, heat pump water heaters.

No support is provided for biofuels given that these are subject to a legal substitution obligation as per Subsidiary Legislation 545.17. However, the energy content of biofuels made from wastes, residues, non-food cellulosic material, and lingo-cellulosic material is counted twice towards the achievement of the substitution target.

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

The regulation establishing 'guarantees of origin' came into force by means of the *Guarantees of Origin of Electricity from High Efficiency Cogeneration and Electricity, Heating and/or Cooling from Renewable Energy Sources Regulations* (S.L. 545.23) includes references to 'guarantees of origin' from Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of use of energy from renewable sources.

The legislation defines the conditions required for the issuing of a certificate and establishes the Regulator for Energy and Water Services (REWS) as the competent Authority to issue certificates and to keep and update an electronic register.

No request has yet been received by the REWS to issue a 'guarantees of origin' certificate. PV systems that receive support in the form of a feed-in tariff are not entitled to any tradable green certificate for electricity generated.

**6. Please describe the developments in 2017 and 2018 in the availability and use of biomass resources for energy purposes (Article 22(1)g) of Directive 2009/28/EC).**

**Table 4:**

**Biomass supply for energy use**

	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 2017	Year 2018	Year 2017	Year 2018	Year 2017	Year 2018	Year 2017	Year 2018	Year 2017	Year 2018	Year 2017	Year 2018
<b>Biomass supply for heating and electricity:</b>												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings etc.)**					543.3	566.5	0.355	0.370	216.6	297.5	0.14	0.19
Indirect supply of wood biomass (residues and co-products from wood industry etc.)**					1231.2	1191.9	0.804	0.778	1644.3	1534.7	1.07	1.00
Agricultural by-products / processed residues and fishery by-products **	4,793 tons	4,397 tons	-	-								
Biomass from waste (municipal, industrial etc.) **	193,333.2 tons	209,021.2 tons	Electricity	Electricity								
			Heat	Heat								
			0.84	0.77								
			0.59	0.53								
Energy crops (grasses, etc.) and short rotation trees (please specify)												
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 **tonnes for biomass from agriculture and fishery and biomass from waste**

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

No domestic land is being used for the production of fuel/energy related crops, rotation trees and grasses.

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

Land use	Surface (ha)	
	Year 2017	Year 2018
1. Land used for common arable crops (wheat, sugar beet etc.) and oil seeds (rapeseed, sunflower etc.) (Please specify main types)	Nil	Nil
2. Land used for short rotation trees (willows, poplars). (Please specify main types)	Nil	Nil
3. Land used for other energy crops such as grasses (reed canary grass, switch grass, Miscanthus), sorghum. (Please specify main types)	Nil	Nil

- 7. Please provide information on any changes in commodity prices and land use within your Member State 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 (Article 22(1) h) of Directive 2009/28/EC).**

No fuel/energy crops are grown locally, whilst biodiesel is produced from waste cooking oil and animal fats as feed stocks. There is no influence on commodity prices because of support given to PV systems and solar water heaters as funds are provided from the central government's annual budget.

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

The sole biodiesel manufacturing plant in Malta, which ceased operation in December of 2017, used cooking oil; thus no local food and feed crops were used for the production of biodiesel. Moreover, no feedstock is produced from forestry or other sources. Data reported in Table 5 refers to imported biofuels.

**Table 5:**  
**Development in Biofuels**

*Please provide the total amounts of biofuels made from the feedstocks listed in Annex IX of Directive 2009/28/EC (ktoe)*

Feedstock as listed in Annex IX Part A of Directive 2009/28/EC	Year 2017	Year 2018
(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	0.0	0.0
(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	0.0	0.0
(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	0.0	0.0
(e) Straw	0.0	0.0
(f) Animal manure and sewage sludge	0.0	0.0
(g) Palm oil mill effluent and empty palm fruit bunches	0.0	0.0
(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	0.0	0.0
(p) Other non-food cellulosic material as defined in point (s) of the second paragraph of Article 2	0.0	0.0
(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>	<b>Year 2017</b>	<b>Year 2018</b>
(a) Used cooking oil	6.8	9.1
(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	0.0 <sup>22</sup>	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 2017 and 2018.** 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*).

Local biofuel production derived mainly from waste cooking oil waste streams. Thus, there was minimal, if any, negative impact on biodiversity, water resources, water quality and soil quality. The sole local manufacturer of bio-fuels had to abide to Integrated Pollution Prevention and Control regulations. This local production was considered to have a positive impact on the environment as it reused its waste. The local production ceased its operations in December of 2017, and as of currently, all biofuels contributing to the RES share are being imported.

**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*).**

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

Environmental aspects	Year 2017	Year 2018
<b>Total estimated net GHG emission saving from using renewable energy<sup>23</sup></b>	<b>130,502</b>	<b>138,961</b>
- Estimated net GHG saving from the use of renewable electricity	79,485	79,358
- Estimated net GHG saving from the use of renewable energy in heating and cooling	28,201	30,675
- Estimated net GHG saving from the use of renewable energy in transport	22,816	28,927

The methodology used for calculating the net greenhouse gas emission savings due to the use of renewable energy in the sectors of electricity, heating and cooling and transport is described in Annex I.

<sup>22</sup> Disaggregated figures for Feedstock listed in Annex IX Part B is not available and is therefore included under the heading “used cooking oil” for the scope of this report.

<sup>23</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 2017 and 2018 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 compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Malta (ktoe)<sup>24, 25</sup>**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Actual/estimated excess or deficit production (Please distinguish per type of renewable energy and per origin/destination of import/export)									3.04	3.77		

It is expected that no excess production of energy from renewable sources shall be available in 2020.

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

Malta plans to meet its RES obligations through indigenous production, although it is well aware than the exceptional growth in demand and the steep RES trajectory post 2018 shall make this goal rather challenging. The revised NREAP identifies statistical transfers as a contingency measure should there be a minor shortfall from the planned production.

**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).**

Biodegradable municipal waste is taken to be any fraction of municipal solid waste that is able to undergo anaerobic or aerobic decomposition. Figure 1 shows percentage biodegradability factors applied to determine the biodegradable content of waste.

Waste Stream	Percentage Biodegradability
Biodegradable Waste	100%
Paper and Cardboard	100%
Wood	100%
Mixed MSW	66%
Textiles	50%
Street-cleaning residues	50%
Wastes from markets	50%
RDF	45%
Rejects	23%
Bulky waste	20%

<sup>24</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 2020. In each report Member State may correct the data of the previous reports.

<sup>25</sup> When filling in the table, for deficit production please mark the shortage of production using negative numbers (e.g. -x ktoe).

Figure 1- Percentage Biodegradability of biodegradable waste<sup>26</sup>

Malta's current waste-to-energy plants are based on an anaerobic digestion process and thus all processed waste is biodegradable.

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

Feedstock group	Year 2017	Year 2018
Cereals and other starch-rich crops	0.0	0.0
Sugars	0.0	0.0
Oil crops	0.5	0.1

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<sup>26</sup> Waste Management Plan for the Maltese Islands  
<https://environment.gov.mt/en/document%20repository/waste%20management%20plan%202014%20-%202020%20-%20final%20document.pdf>

## Annex I

This Annex describes the methodology applied for estimating the net greenhouse gas emission saving due to the use of (a) electricity from renewable energy sources, (b) renewable energy sources for heating and cooling and (c) renewable energy sources in transport. This methodology has been amended to reflect more reliable data sources which have been made available since 2017.

Biomass imports are normally attributed with household usage. It is assumed that the use of renewable biomass and other renewable energy sources are contributing to the replacement of a distributed portion from the overall share of fuel in residential heating. Table 1 shows the resulting factor for savings from using RES as calculated from the residential mix. For the purposes of calculating the RES substitution for heat pumps, electricity used for heat pumps have been excluded in both Tables 1 and 2.

	Share %	Factors for 2017	Factors for 2018
Gasoil	2.0	0.2668	0.2668
LPG	47.2	0.2301	0.2301
Electricity	50.8	0.4622	0.3997
RES Substituted		<b>0.3385</b>	<b>0.3246</b>

**Table 1: Residential Heating Mix**

Similarly, a table distributing the heating sources and corresponding emission factors in services and industry is being presented below. A weighted average method has been taken to establish a representative factor which is being used in estimating the greenhouse gas emission savings.

	Share %	Factor for 2015	Factor for 2016
Diesel	2.1	0.2698	0.2698
Gas Oil	89.6	0.2668	0.2668
LPG	8.2	0.2272	0.2272
Electricity	0.0	0.4622	0.3997
RES Substituted		<b>0.4763</b>	<b>0.4224</b>

**Table 2: Services and Industry Heating Mix**

Greenhouse gas avoidance factors used in the calculation for emissions saved are dependable on the final use (electricity, heating or transport). Therefore each category of renewable energy source has been referenced to the source of energy it replaces. This substitution is represented in Table 3.

Ref.	RES Substitution (mT CO <sub>2</sub> e per MWh)	2017	2018
1	RES-E replacing Electricity	0.4662	0.3997
2	SWH replacing Electricity	0.3467	0.2998
3	Biomass replacing Heating share in Residential	0.3385	0.3246
4	Biogas replacing Gasoil in Industry	0.2668	0.2668
5	Biofuel replacing Gasoil in Industry	0.2668	0.2668
6	CHP heat replacing Gasoil in Industry	0.2668	0.2668
7	HP replacing Heating share in Services and Industry	negligible	negligible
8	HP replacing Heating share in Residential	0.0667	0.0895
9	Transport biofuel replacing Diesel	0.2698	0.2698

**Table 3: RES substitution factors in MTCO<sub>2</sub>e per MWh**

Factors for fossil fuels found in the heating mix and Table 3 have been sourced from the IPCC guidelines 2006.

The national GHG avoidance factors are based on the below assumptions:

- For Ref. 1 and 2, a unit of renewable energy produced is replacing one unit of energy ‘sent out’ from the power station;
- For Ref. 4, 5 and 6, it is assumed that one unit of renewable energy from biogas/biofuel/CHP is replacing gasoil in industry;
- The substitution of biomass and heat pumps in residential and industry/services is explained in Tables 1 and 2;
- In the transport sector, savings from a unit of renewable energy from biofuel sourced from waste is equivalent to the default 83% GHG emissions of diesel fuel<sup>27</sup>.
- For Ref 7; fossil fuels are assumed to be burnt at a 100% efficiency, whereas the unit of RES generated from heat pumps is based on a conservative COP (efficiency) value. This results in negligible CO2 savings.

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<sup>27</sup> RED Article 19(1)(a)