

**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 2017**

1. Sectoral and overall shares and actual consumption of energy from renewable sources in 2015 and 2016 (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 sources¹

	Year 2015	Year 2016
RES-H&C ² (%)	14.1%	15.3%
RES-E ³ (%)	4.3%	5.6%
RES-T ⁴ (%)	5.0%	5.8%
Overall RES share ⁵ (%)	5.0%	6.1%
<i>Of which from cooperation mechanism⁶ (%)</i>	0.0%	0.0%
<i>Surplus for cooperation mechanism⁷ (%)</i>	0.0%	0.0%

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

	Year 2015	Year 2016
(A) Gross final consumption of RES for heating and cooling	12.0	13.4
(B) Gross final consumption of electricity from RES	8.6	11.5
(C) Gross final consumption of energy from RES in transport	4.7	6.1
(D) Gross total RES consumption ⁹	25.4	31.0
(E) Transfer of RES to other Member States	0.0	0.0
(F) Transfer of RES from other Member States and 3rd countries	0.0	0.0
(G) RES consumption adjusted for target (D)-(E)+(F)	25.4	31.0

The total renewable energy gross consumption shares in 2015 and 2016 were 5.0% and 6.1% respectively. The RES minimum trajectory for 2015-2016 was set at 4.5%. The resulting actual RES share from gross final consumption for 2015 and 2016 was 5.6%. This means that the interim target for 2015-2016 in accordance with the RES Directive 2009/28/EU (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) has been achieved.

¹ Facilitates comparison with Table 3 and Table 4a of the NREAPs.

² 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.

³ 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.

⁴ 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.

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

⁶ In percentage point of overall RES share.

⁷ In percentage point of overall RES share.

⁸ Facilitates comparison with Table 4a of the NREAPs

⁹ 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 electricity¹⁰

	Year 2015		Year 2016	
	MW	GWh	MW	GWh
Hydro ¹¹ :				
non pumped				
<1MW				
1MW–10 MW				
>10MW				
pumped				
mixed ¹²				
Geothermal				
Solar:				
photovoltaic	74.7	94.99	92.6	125.05
concentrated solar power				
Tide, wave, ocean				
Wind:				
onshore	0.10	0.06	0.10	0.06
offshore				
Biomass ¹³ :				
solid biomass				
biogas	3.04	6.64	4.56	8.31
bioliquids				
TOTAL	77.84	101.69	97.26	133.42
of which in CHP	3.04	6.64	4.56	6.58

Notes:

- Malta's current wind energy capacity and generation is limited to a few micro-wind turbines.
- For the years 2015 and 2016, electricity generation by photovoltaic systems has been estimated at 1529 kWh/kWp and 1516 kWh/kWp, respectively. These figures were based on actual readings from a representative sample of photovoltaic systems' meter data.

¹⁰ Facilitates comparison with Table 10a of the NREAPs.

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

¹² In accordance with new Eurostat methodology.

¹³ 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 consumption¹⁴) 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)¹⁵

	Year 2015	Year 2016
Geothermal (excluding low temperature geothermal heat in heat pump applications)		
Solar	4.3	4.4
Biomass ¹⁶ :		
<i>solid biomass</i>	1.2	1.1
<i>biogas</i>	0.7	0.8
<i>bioliquids</i>	0.2	0.3
Renewable energy from heat pumps:		
- of which aerothermal	5.9	7.2
- of which geothermal		
- of which hydrothermal		
TOTAL	12.3	13.2
<i>Of which DH¹⁷</i>		
<i>Of which biomass in households¹⁸</i>	1.2	1.1

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

¹⁵ Facilitates comparison with Table 11 of the NREAPs.

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

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

¹⁸ 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)^{19, 20}

	Year 2015	Year 2016
- Bioethanol		
- Biodiesel (FAME)	4.47	4.64
- Hydrotreated Vegetable Oil (HVO)	0.20	1.47
- Biomethane		
- Fischer-Tropsch diesel		
- Bio-ETBE		
- Bio MTBE		
- Bio-DME		
- Bio-TAEE		
Biobutanol		
- Biomethanol		
- Pure vegetable oil		
Total sustainable biofuels	4.74	6.11
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	4.47	4.64
sustainable biofuels for which the contribution towards the renewable energy target is limited according to Article 3(4)d	0.20	1.47
Imported from third countries		
Hydrogen from renewable		
Renewable electricity	0.0074	0.0105
Of which		
consumed in road transport	0.0074	0.0105
consumed in rail transport	0.0	0.0
consumed in other transport sectors	0.0	0.0
others (Please specify)		
others (Please specify)		

2. Measures taken in 2015 and 2016 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).

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

²⁰ Facilitates comparison with Table 12 of the NREAPs.

Table 2:
Overview of all policies and measures

Name and reference of the measure	Type of measure *	Expected result**	Targeted group and or activity** *	Existing or planned ****	Start and end dates of the measure
GENERAL					
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
RES Electricity & Heating and Cooling					
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 sites that can be used for PV farms	Soft	Facilitates uptake of solar RES	Public	Existing	2017
Financial instruments for financing of energy saving initiatives in enterprises from Operational Programme 2014-2020	Financial	Committed budget for planned measures of 15 million Euro ²¹	Commercial/ industry	Planned	2015-2020
Grant schemes for PV installation in the domestic sector (co-financed through EU funding)	Financial	Over 17.4MWp of PV capacity were installed in 2015 and 2016 in the residential sector. Allocated budget of 15.5 million Euro ²¹	Residential	Existing	Ongoing
Investments by public entities in PV systems on government buildings	Financial	In 2015 and 2016, total installed capacity in public sector was 3.2MWp. Planned capacity to be installed by 2020 is that of	Government entities	Existing	Ongoing

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

Name and reference of the measure	Type of measure *	Expected result**	Targeted group and or activity** *	Existing or planned *****	Start and end dates of the measure
		7MWp.			
Development of PPP models with constituted bodies to develop solar PV farms	Financial	2MWp PV installations on public property	Public + Private Sector	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	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 or larger than 1MWp	Regulatory	Timely deployment of PV installations to remain in line with target	Public	Planned	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 2016 37GWh of energy was generated by SWHs installed in the residential sector. Projected increase in energy generation of 0.8GWh/annum	Residential	Existing	Ongoing
Awareness Campaign on the benefits of Heat pumps for space heating	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

Name and reference of the measure	Type of measure *	Expected result**	Targeted group and or activity** *	Existing or planned *****	Start and end dates of the measure
Setting specifications for approved technologies benefitting from grants	Regulatory	Ensuring quality and positive perception of RES technologies	Consumers	Existing	Ongoing
Implementation of Energy Performance of Buildings Regulation	Regulatory	Low carbon buildings with proposed integration of RES	Public, Private, Residential	Ongoing	2014-2020
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	Planned	2017
RES TRANSPORT					
Promotion of electric vehicles through capital grant scheme and favourable regulation tax; Scheme reviewed from time to time in response to changing conditions	Financial /Regulatory	Behavioural change and cleaner commuting 259 registered electric vehicles by end 2016	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 2016	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 994 registered autogas vehicles by end 2016	Public	Existing	Ongoing
Training & certification of installers of autogas conversion kits.	Soft	Education/regulation	Installers	Existing	Ongoing
Ensure a robust regulatory regime for biofuels to: - Monitor origin of imported biofuels. - Supervise the quality of locally produced biofuel.	Regulatory	Cleaner commuting	Fuel importers/suppliers/producers	Existing	Ongoing
Set biofuel content level in imported fuels to gradually	Regulatory	Framework to reach target of	Fuel importers	Existing	2011 – 2020

Name and reference of the measure	Type of measure *	Expected result**	Targeted group and or activity** *	Existing or planned ****	Start and end dates of the measure
reach 10% by 2020, and monitor compliance	ry	10% renewable energy in transport			
Improve transport efficiency: Successful conclusion of the public transport reform. - CVA frameworks supported by park and ride facilities site in strategic areas. - Road infrastructural development to remove network congestion bottlenecks. - Intelligent transport management systems. - Introduce fiscal measures to reduce fuel consumption. - Scrappage scheme to remove old, polluting vehicles from circulation. -Traffic and congestion management (better accessibility to towns and more efficient roads, vehicle - sharing). - Information and advisory campaign (basic motoring and driving skills).	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 its updated NREAP, published in 2017, Malta presents a revised action plan which identifies a new, more effective roadmap to meet its 2020 renewable energy target. 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. PV capacity as at end of 2016 stood at 92.6MWp whilst the projected annual additional PV capacity is 30MWp. 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. A significant share of the remaining PV potential is expected to consist of relatively larger systems having a capacity of at least 1MWp each. These systems shall be supported through a notified scheme which shall involve a competitive bidding process. This process was 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, (formerly MEPA) 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 (S.L. 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. Payments for electricity generated by PV installations with a capacity larger than 100kWp and exported to the grid are settled by the subsidiary company, ARMS Ltd in intervals of a minimum of two months. Separate meters are installed to meter the generation of PV installations and the use of co-generation systems installed on the same premises.

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 cases when a DNO or a full development 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 TSO) and a single Distribution System Operator (DSO). The electricity network covers 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 the regulator 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 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 Center 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 wholesale electricity market in Malta. Electricity generated from RES is given priority dispatch on the network, subject that it does not impact negatively on system stability and reliability.³⁴ To date no curtailment has been imposed by the DSO. Balancing is carried out by the DSO.

Moreover, the 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 interconnector supplies the Maltese Islands with 200MW of electricity, while also allowing the uptake of renewable energy sources. Due to the transient nature of the solar energy, the interconnector stabilizes the grid whilst maintaining the security of supply.

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

Table 3:
Support schemes for renewable energy

RES support schemes (average support level for new plants starting operation in 2015 and 2016)	Per unit support (€/kWh) over lifetime of technology	Total (M€)* (average annual total support for 2015 and 2016)
Photovoltaic		
Capital grants on Photovoltaic systems in the domestic sector ¹	0.02	3.18
Feed-in tariff for grid-connected photovoltaic systems for systems installed and connected in 2015 and 2016 ²	0.06	1.83
Solar Water Heating		
Capital grants on solar water heating in the domestic sector ³	0.02	0.13

RES support schemes (average support level for new plants starting operation in 2015 and 2016)	Per unit support (€/kWh) over lifetime of technology	Total (M€)* (average annual total support for 2015 and 2016)
Schemes for Electric Vehicles		
Capital grant schemes on electric vehicles ⁴	1.01	0.16
Total annual estimated support in the electricity sector		5.01
Total annual estimated support in the heating sector		0.13
Total annual estimated support in the transport sector		0.16

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

² 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 7.25 cents per kWh; no discounting.

³ Assuming a lifetime of 10 years

⁴ Assuming a lifetime of 10 years

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 local DSO, Enemalta Corporation, provides information on the emissions through interactive requests from the website. The website also indicates flue gas emissions period reports from data collected from Delimara Power Station, 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 systems. 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. RES generators who benefit from any form of support are not eligible for a “guarantee of origin” certificate.

6. Please describe the developments in 2015 and 2016 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 2015	Year 2016	Year 2015	Year 2016	Year 2015	Year 2016	Year 2015	Year 2016	Year 2015	Year 2016	Year 2015	Year 2016
Biomass supply for heating and electricity:												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings etc.)**					732.1	451.0	0.273	0.168	0.0	44.0	0.0	0.016
Indirect supply of wood biomass (residues and co-products from wood industry etc.)**					936.5	869.5	0.349	0.324	1413.2	1552.1	0.526	0.579
Agricultural by-products / processed residues and fishery by-products **	28,087 tons	27,293 tons	-	-								

	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 2015	Year 2016	Year 2015	Year 2016	Year 2015	Year 2016	Year 2015	Year 2016	Year 2015	Year 2016	Year 2015	Year 2016
Biomass from waste (municipal, industrial etc.) **	187,582 tons	159,569 tons	Electricity 0.57 Heat 0.72	Electricity 0.71 Heat 0.80								
Energy crops (grasses, etc.) and short rotation trees (please specify)												
Others (please specify)												
Biomass supply for transport:												
Common arable crops for biofuels (please specify main types)												
Energy crops (grasses, etc.) and short rotation trees for biofuels (please specify main types)												
Others (please specify)												

* 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 significant 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 2015	Year 2016
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 2015 and 2016 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 uses used cooking oil; thus no food and feed crops are used locally for the production of biodiesel. Moreover, no feedstock is produced from forestry or other sources.

**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)

<i>Feedstock as listed in Annex IX Part A of Directive 2009/28/EC</i>	Year 2015	Year 2016
(a) <i>Algae if cultivated on land in ponds or photobioreactors</i>	0.0	0.0
(b) <i>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</i>	0.0	0.0
(c) <i>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</i>	0.0	0.0
(d) <i>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</i>	0.0	0.0
(e) <i>Straw</i>	0.0	0.0
(f) <i>Animal manure and sewage sludge</i>	0.0	0.0
(g) <i>Palm oil mill effluent and empty palm fruit bunches</i>	0.0	0.0
(h) <i>Tall oil pitch</i>	0.0	0.0
(i) <i>Crude glycerine</i>	0.0	0.0
(j) <i>Bagasse</i>	0.0	0.0
(k) <i>Grape marcs and wine lees</i>	0.0	0.0
(l) <i>Nut shells</i>	0.0	0.0
(m) <i>Husks</i>	0.0	0.0
(n) <i>Cobs cleaned of kernels of corn</i>	0.0	0.0
(o) <i>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</i>	0.0	0.0
(p) <i>Other non-food cellulosic material as defined in point (s) of the second paragraph of Article 2</i>	0.0	0.0
(q) <i>Other ligno-cellulosic material as defined in point (r) of the second paragraph of Article 2 except saw logs and veneer logs</i>	0.0	0.0
<i>Feedstock as listed in Annex IX Part B of Directive 2009/28/EC</i>	Year 2015	Year 2016
(a) <i>Used cooking oil</i>	4.47	4.64
(b) <i>Animal fats classified as categories 1 and 2 in accordance with Regulation (EC) No 1069/2009 of the European Parliament and of the Council</i>	0.0	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 2015 and 2016. 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 derives mainly from waste cooking oil waste streams. Thus, there is minimal, if any, negative impact on biodiversity, water resources, water quality and soil quality. The sole local manufacturer of bio-fuels has to abide to Integrated Pollution Prevention and Control regulations. This local production is considered as having a positive impact on the environment as it reuses waste.

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 CO₂eq)

Environmental aspects	Year 2015	Year 2016
<i>Total estimated net GHG emission saving from using renewable energy</i> ²²	96,018	108,014
- Estimated net GHG saving from the use of renewable electricity	55,241	63,335
- Estimated net GHG saving from the use of renewable energy in heating and cooling	28,388	28,711
- Estimated net GHG saving from the use of renewable energy in transport	12,389	15,967

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.

11. Please report on 2015 and 2016 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)^{23, 24}

	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)							3.94	9.54				0

It is expected that no excess production of energy from renewable sources shall be available in 2020. Given the size of Malta when compared to other MS, any excess in 2020 would be insignificant at EU level.

²² 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.

²³ Please use actual figures to report on the excess production in the two years preceding submission of the report, and estimates for the following years up to 2020. In each report Member State may correct the data of the previous reports.

²⁴ When filling in the table, for deficit production please mark the shortage of production using negative numbers (e.g. -x ktoe).

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 that 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 or should the international market develop in such a way as to offer significant net benefits to the local economy.

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%

Figure 1- Percentage Biodegradability of biodegradable waste²⁵

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 2015	Year 2016
Cereals and other starch-rich crops	0.0	0.0
Sugars	0.0	0.0
Oil crops	0.20	1.47

²⁵ 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.

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.

	Share %	Factors for 2015	Factors for 2016
Kerosene	6.8	0.2598	0.2598
LPG	34.5	0.2301	0.2301
Propane	3.2	0.2055	0.2055
Electricity	55.5	0.5432	0.4747
RES Substituted		0.4051	0.3671

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	4.3	0.2698	0.2698
Gas Oil	2.4	0.2854	0.2854
LPG	15.9	0.2301	0.2301
Electricity	77.4	0.5432	0.4747
RES Substituted		0.4763	0.4224

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 ₂ e per MWh)	2015	2016
1	RES-E replacing Electricity	0.5432	0.4747
2	SWH replacing Electricity	0.2716	0.2374
3	Biomass replacing Heating share in Residential	0.4051	0.3671
4	Biogas replacing Gasoil in Industry	0.2955	0.2955
5	Biofuel replacing Gasoil in Industry	0.2955	0.2955
6	CHP heat replacing Gasoil in Industry	0.2955	0.2955
7	HP replacing Heating share in Services and Industry	0.1956	0.1779
8	HP replacing Heating share in Residential	0.1253	0.1226
9	Transport biofuel replacing Diesel	0.5432	0.4747

Table 3: RES substitution factors in MTCO₂e 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 fuel²⁶.

²⁶ RED Article 19(1)(a)