



OFFICE OF THE PRIME MINISTER  
(ENERGY AND PROJECTS)

# Malta's National Energy Efficiency Action Plan

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**April 2017**

## Table of Contents

1	Introduction.....	4
1.1	The national economic background.....	4
1.2	State of play of Malta’s energy roadmap .....	8
1.3	Improved governance.....	10
2	Overview of National Energy Targets and Achieved Savings.....	12
2.1	Review of national 2020 energy efficiency targets .....	12
2.2	Significant savings in primary energy consumption .....	14
2.3	Final energy savings.....	15
3	Policy Measures implementing the Energy Efficiency Directive .....	16
3.1	Horizontal Measures .....	16
3.1.1	Energy efficiency obligation schemes and alternative policy measures 16	
3.1.2	Energy audit and management systems .....	29
3.1.3	Metering and Billing .....	33
3.1.4	Consumer Information Programmes and Training .....	35
3.1.5	Availability of qualification, accreditation and certification schemes	42
3.1.6	Energy Services .....	45
3.1.7	Other energy efficiency measures of a horizontal nature .....	46
3.2	Energy efficiency measures in buildings .....	47
3.2.1	Nearly Zero Energy Buildings Plan (NZEB) for Malta.....	47
3.2.2	Minimum requirements for building services in Malta .....	49
3.3	Energy efficiency measures in public bodies .....	50
3.3.1	Energy savings investment in public buildings.....	50
3.3.2	Energy improvements of buildings owned and occupied by Central Government .....	50
3.3.3	Purchasing by public bodies .....	50
3.4	Energy efficiency measures in the economic sectors.....	52
3.4.1	Main policy measures addressing energy efficiency .....	52
3.5	Energy efficiency measures in transport.....	55
3.5.1	Policy measures focused at increasing energy efficiency in public transport.....	55
3.5.2	Policy measures focussed at increasing energy efficiency in private transport.....	56
3.6	Promotion of efficient heating and cooling .....	57

3.6.1	Comprehensive assessment.....	57
3.7	Energy transformation, transmission, distribution, and demand response	60
3.7.1	Energy efficiency criteria in network tariffs and regulations.....	62
3.7.2	System services and network tariffs and regulations.....	63
3.7.3	Network regulations and tariffs to fulfil the criteria in Annex XI of the Directive .....	64
Annex I	.....	68

# 1 Introduction

Directive 2012/27/EU on Energy Efficiency (the “Directive”) requires Member States to submit, by 30 April 2014, and every three years thereafter, their respective National Energy Efficiency Action Plans (NEEAP). The Plan covers significant energy efficiency improvement measures, and expected and/or achieved energy savings, including those in the supply and distribution of energy as well as energy end-use, in view of achieving the national energy efficiency targets.

Article 3(1) requires Member States to set an indicative national energy efficiency target. This document reviews and presents the primary energy consumption for 2020 as the target under Article 3(1), takes stock of the achieved savings and the progress towards achieving the indicative target since 2014. It also considers measures that are being implemented now and proposed for the immediate future.

This NEEAP (hereafter referred to as the NEEAP 2017) is the second one being submitted by Malta to the European Commission in terms of the Directive and builds upon the 2014 version. The document is modelled upon the general guidelines in the Commission’s working document SWD (2013) 180 Final ‘Guidance for National Energy Efficiency Action Plans’.

## 1.1 The national economic background

The Maltese economy has shown remarkable resilience in the face of unstable external economic environment. Despite the slowdown in 2009 principally triggered by the global financial crisis, the economy rebounded in the following years, registering an average real economic growth rate equal to 1.9%<sup>1</sup> between 2009 and 2013.

This economic growth continued to increase, peaking in 2014 with a growth rate equal to 8.4%. In 2015, growth in Gross Domestic Product (GDP) amounted to 7.4%, the main impetus coming from strong private investment and consumption. In 2016, the economic expansion continued at a more moderate pace with real GDP growth estimated to have settled at 4.0%<sup>2</sup>. Between 2017 and 2020, the economy is expected to continue growing. Projected annual real GDP growth rates for 2017 and 2018 are estimated at 3.7%<sup>3</sup>. Table 1 below indicates the contributors to GDP growth between 2009 and 2015.

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<sup>1</sup> Eurostat Data (GDP and main components - Chain Linked Volumes 2010)

<sup>2</sup> European Economic Forecast (Winter 2017) - page 94

<sup>3</sup> European Economic Forecast (Winter 2017) - page 95

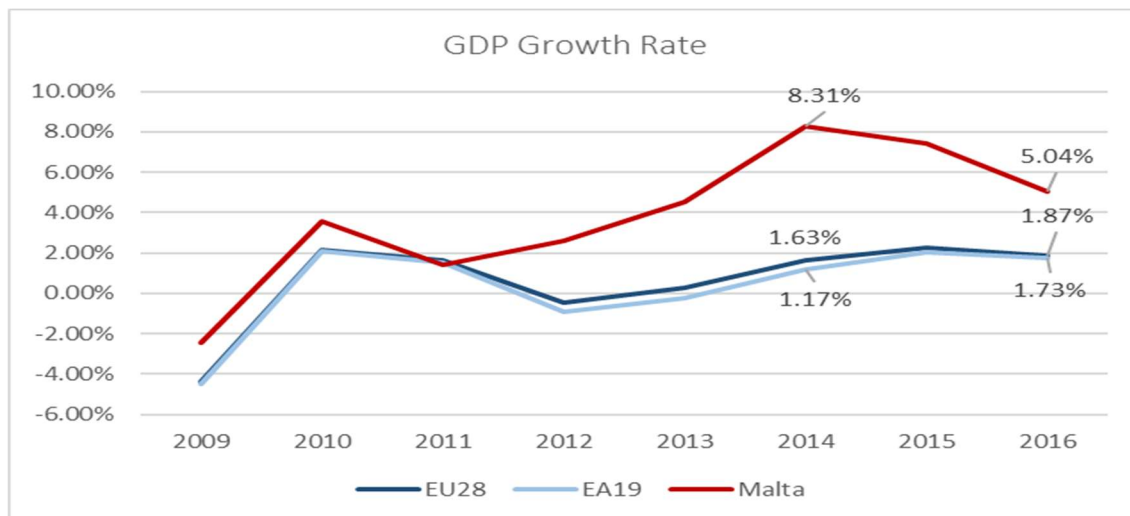
**Table 1 - Contributions to GDP growth**

	2009	2010	2011	2012	2013	2014	2015
<b>GDP Growth</b>	-2.5%	3.5%	1.4%	2.7%	4.6%	8.4%	7.4%
<b>Contribution to GDP Growth:</b>							
<b>Final Consumption</b>	0.4%	0.2%	2.6%	1.1%	1.3%	2.8%	3.8%
<b>Gross Capital Formation</b>	-1.8%	4.6%	-4.7%	-1.3%	1.3%	-0.1%	7.7%
<b>Net Exports</b>	-1.1%	-1.2%	3.5%	2.9%	2.0%	5.7%	-4.0%

Source: Estimates based on Eurostat data

Despite the degree of uncertainty which persists within the region, the European economic recovery is set to continue at a moderate pace. Figure 1 below indicates that Malta has been registering economic growth rates which are well above the EU and Euro Area averages. In 2016, the EU average economic growth rate stood at 1.87% whereas the Euro Area average was equal to 1.73%, significantly lower than the 5.04% growth rate registered in Malta. The European Commission's forecasts indicate that Malta's GDP growth rates are projected to continue exceeding the average EU growth rates in the foreseeable future.

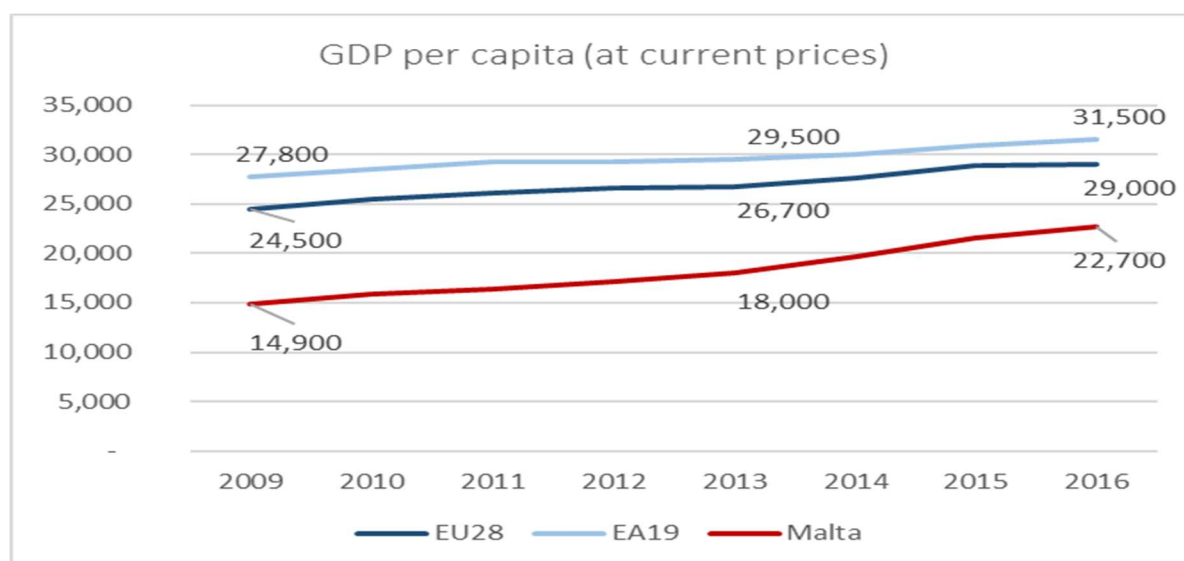
**Figure 1: GDP growth rate for Malta, the EU and the Euro Area**



Source: Based on Eurostat data

The positive economic performance of Malta has been contributing to the convergence of Malta's GDP per capita levels to the average levels recorded in the EU and Euro area. Figure 2 below indicates that the GDP per capita in Malta during 2016 stood at €22,700, relatively lower to the €29,000 registered in the EU and €31,500 in the Euro Area. Nevertheless, between 2009 and 2016, Malta's GDP per capita level increased by 52%, contrasting the growth rate of the GDP per capita registered in the EU equal to 18% and that in the Euro Area standing at 13%.

**Figure 2: GDP per capita (at current prices) in Malta, the EU and the Euro Area**



Source: Eurostat Data, Main GDP aggregates per capita

Following the austerity measures undertaken in response to the European debt crisis, a prolonged period of low inflation characterised the EU region. This has been counteracted by a monetary expansionary policy through the European Central Bank (ECB)'s asset-purchase programme. The local economy is considered to have performed relatively better in terms of consumer price inflation. The inflation rate in Malta has exceeded EU and Euro Area averages in recent years but remained below the 2% optimal inflation rate target.

In 2016, the annual average rate of change in the Harmonised Index of Consumer Prices (HICP) was equal to 0.9% in Malta, higher than that registered in the EU (0.3%) and the Euro Area (0.2%). Between 2009 and 2013, the annual average inflation rate in Malta exceeded the 2% target marginally to amount to 2.1%. The inflation rate declined over the next years but remained above EU and Euro Area averages. The EU Commission forecasts the inflation rate to increase to 1.6% in 2017 and to 1.8% in 2018.

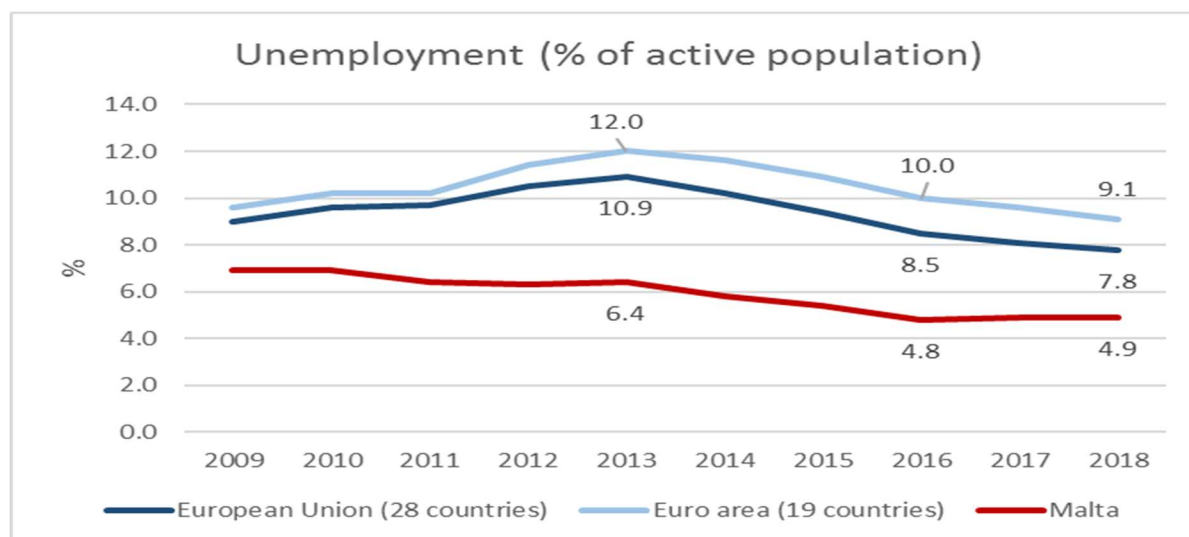
On the fiscal side, public finances have been registering marked improvements. The general government gross debt as a percentage of GDP is estimated to have declined by 0.6 percentage points over the period 2009 to 2013. The European Commission forecasts a further reduction from 64.3% to 55.6% between 2014 and 2018. From 2009 to 2013, the deficit-to-GDP ratio was brought below -3% to amount to -2.6% in 2013. In 2016, it is estimated to amount to -0.7% and is expected to reach -0.6% by 2018.

Buoyant economic activity over the period 2014 to 2017 was reflected in further growth in employment. Employment expanded by an annual average rate of 3.6%<sup>4</sup> over this period as opposed to an annual average employment growth of

<sup>4</sup> Based on employment growth rates of the European Economic Forecast (Winter 2017) - page 95

2.2%<sup>5</sup> during the period 2009 to 2013. The EU Commission's latest projections are indicative of the positive economic outlook for Malta, with employment being one of the main economic variables expected to register further growth.

**Figure 3 - Unemployment as a percentage of the total active population**



Source: Eurostat Data, GDP and main components (Based on Chain Linked Volumes (2010))<sup>6</sup>

Despite the surge in the active population registered over the past years, the unemployment rate continued its downward trend. In 2016, the unemployed persons as a percentage of the total active population amounted to 4.8% as against 8.5% unemployment registered in the EU and 10% in the Euro Area. The unemployment rate is expected to remain broadly unchanged over the forecast horizon.

The population of the Maltese islands has in the past years been continuously on the increase<sup>7</sup>. Figure 4 shows the increase in the growth of the total Maltese population, where a tenfold increase in the growth rate is observed between 2006 to 2015. The country's buoyant economy and stability have driven migration. Such population growth is reflected in an increase of the island's energy demand. This effect became especially visible in the period 2013 to 2015 where the percentage growth rate exceeded 1%. Eurostat's population and population change statistics confirm that Malta recorded one of the highest population growth rates in the EU<sup>8</sup>.

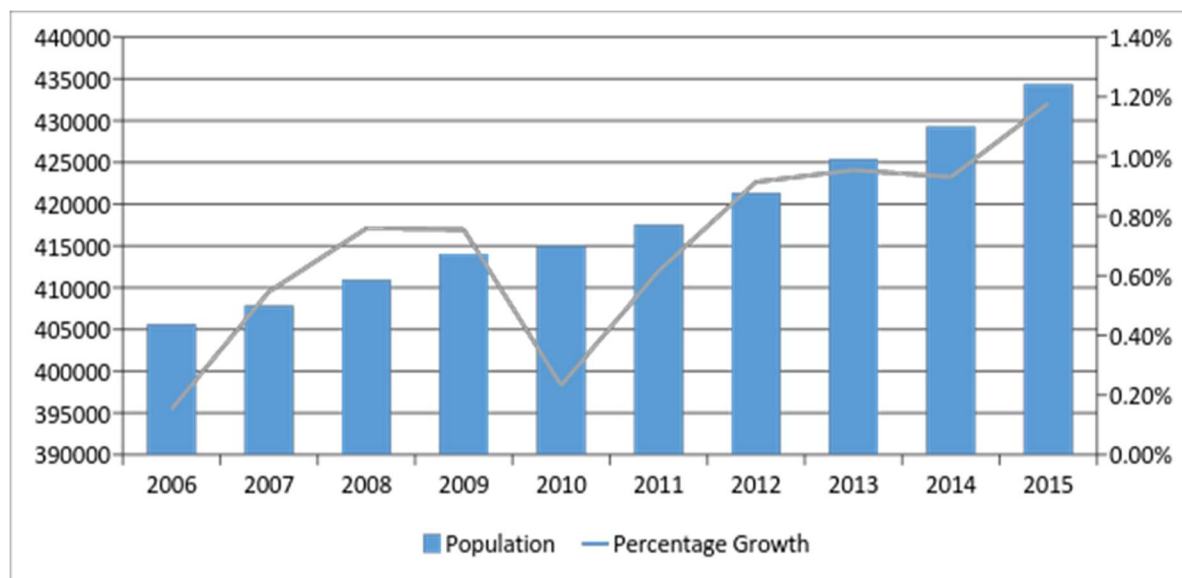
<sup>5</sup> Eurostat Data (Employment growth and activity branches - annual averages)

<sup>6</sup> The unemployment rate for 2016, 2017 and 2018 is based on the figures presented in the European Economic Forecast (Winter 2017)

<sup>7</sup> [https://nso.gov.mt/en/News\\_Releases/View\\_by\\_Unit/Unit\\_C3/Population\\_and\\_Tourism\\_Statistics/Documents/2016/News2016\\_108.pdf](https://nso.gov.mt/en/News_Releases/View_by_Unit/Unit_C3/Population_and_Tourism_Statistics/Documents/2016/News2016_108.pdf)

<sup>8</sup> [http://ec.europa.eu/eurostat/statistics-explained/index.php/Population\\_and\\_population\\_change\\_statistics#Population\\_change\\_at\\_a\\_national\\_level](http://ec.europa.eu/eurostat/statistics-explained/index.php/Population_and_population_change_statistics#Population_change_at_a_national_level)

**Figure 4 – Malta’s population growth**



Source: National Statistics Office and Eurostat Data

## 1.2 State of play of Malta’s energy roadmap

The period since the coming into force of the Directive 2012/27/EU was a period of rapid enhancement of the energy sector in Malta.

The European Council’s Malta-specific Recommendations on energy for 2014 emphasised the need to continue efforts to diversify the energy mix and energy sources and the timely completion of the electricity link with Sicily as well as to maintain efforts to promote energy efficiency. The recommendations for 2015 similarly highlighted the need to diversify the energy mix in the economy. The National Reform Programmes for these years detail policies to comply with the Council’s recommendations.

The need for a reform of the energy system was long felt by stakeholders who were faced by above average energy prices which were having their toll on the economy, environment and society at large. This was creating significant difficulties in competitiveness particularly in the manufacturing industry where the cost of energy generation is a major component of the total cost of operations. The beneficial impact of the reform on the residential sector is further accentuated given that heating and especially cooling in Malta is highly dependent on electricity.

The new energy roadmap reflects the overarching policy fundamentals as expressed both by Malta’s energy policy and at EU level and which are now



supported through the five dimensions of the Energy Union. The policy's fundamental objectives are the following:

- Diversifying Malta's dependence on the importation of oil through the achievement of a diversified energy mix;
- Reducing the carbon footprint and greenhouse gas emissions of the country through improved efficiency in generation capacity - replacement of heavy fuel oil with natural gas and gas oil, and renewable sources;
- Enhancing and strengthening the security of supply of the country whilst ensuring the availability of appropriate back up capacity;
- Stimulating investment in renewable energy sources through the provision of appropriate incentives;
- Achieving a degree of interconnection for electricity supply; and
- Overhauling the generation capacity of the country with a view to achieving higher efficiency gains whilst stimulating investment in natural gas infrastructures.

A number of these objectives have been successfully addressed. Malta has closed down the inefficient Marsa Power Station; completed and placed in operation the 200MW interconnector with the European grid; and is expected to commission a new 215MW Gas-Fired high efficiency combined cycle gas turbine (CCGT) power plant as well as infrastructure for the provision of natural gas (LNG) by 2017. In addition, the recently built 144MW power plant has been converted to run on natural gas instead of on heavy fuel oil. The Distribution System Operator (DSO) executed a number of upgrades in its Distribution Centres to consolidate the national electricity distribution grid. It also plans to invest €80 million to upgrade and expand major nodes of the national electricity network and improve the quality of service.

The additional generation capacity earmarked for completion in 2017 shall not only provide for the desired level of energy security, but shall also ensure that Malta will have sufficient capacity to match the forecasted growth in electricity demand until 2030, through a combination of renewables, interconnection capacity and high efficiency generators.

The energy roadmap also focuses on maximizing Malta's effective renewable energy potential. The Government has increased its efforts to support the deployment of renewable energy, especially photovoltaics (which are particularly well suited to Malta's geographic location), and whilst acknowledging the challenges ahead, has a clear plan which would ensure that Malta meets its 10% renewable energy share target in 2020.

The developments in the generation sector that have been, and continue to take place, have been given highest priority as these will result into significant primary energy savings and in substantial reductions in GHG emissions for the energy sector. These developments will also ensure security of supply, sustainability and affordability of energy supply in Malta. Notwithstanding the overhaul of the energy sector, Malta is also committed to achieve energy savings by final consumers.

The achievement of new end use savings in several of Malta's economic sectors, as considered in Article 7 of the Directive, is challenging, mainly due to the following:

- There is no district heating infrastructure in Malta. The results of the comprehensive assessment show that it is not cost-effective because of the low heating demand reflecting the mild climate. As such, no large meaningful application of 'waste' low-temperature heat is possible. The comprehensive assessment carried out also demonstrated the limited possibility for co-generation.
- There are no mass-transport facilities, except for a public bus network powered by diesel engines; private cars still are the most popular means of transport. While very significant improvement in the type of engines for these buses has been made, there is currently no electrified mass transport that could take advantage of efficient electrification.

The NEEAP 2017 reports on the implementation of measures that were proposed in the previous plan. Reflecting a dynamic approach, several new initiatives and measures have been introduced to replace others that did not materialise, thus still leading to the achievement of the national target.

The new measures include:

- the inclusion of renewable energy sources for own use;
- new measures that focus on specific consumer groups, including households and SMEs;
- small projects for which funding was secured after the compilation of the NEEAP 2014; and
- Voluntary agreements with non-SMEs to implement energy measures.

### **1.3 Improved governance**

The establishment of the Energy and Water Agency<sup>9</sup> (the "Agency"), as per Legal Notice 340 of 2016, created a focal point on energy matters that is clear to stakeholders and the civil society. The Agency is thus assigned to carry the responsibility for the design, development and cohesive coordination of conventional and alternative energy policies and measures. The separation of policy from regulation created the framework for better governance focussing efforts and facilitating dialogue with stakeholders and civil society.

The division of responsibilities also brought about the creation of the Regulator's office through the setting up of the Regulator for Energy and Water Services (REWS). REWS (the "Regulator") regulates practices, operations and activities in the energy and water sectors. This may be broadly considered to incorporate the

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<sup>9</sup> In 2014, the Energy and Water Agency was referred to as Sustainable Energy and Water Conservation Unit.

regulation of:

- the national utilities and service providers for energy and water namely Enemalta plc and the Water Services Corporation and their subsidiary companies;
- retailers and operators in the regulated sectors including: operators of petrol stations, suppliers and delivery operators of gas and kerosene, offshore bunkering companies, private operators of desalination plants and operators of road tankers; and
- tradesmen and service providers such as electricians, installers of renewable energy systems and competent persons in the regulated sectors.

## 2 Overview of National Energy Targets and Achieved Savings

### 2.1 Review of national 2020 energy efficiency targets

This plan reviews the projections submitted in Malta's NEEAP 2014.

Specifically it:

- Compares the actual and projected primary energy conversion efficiency for thermal plants with that of PRIMES 2007 business-as-usual scenario. The latter assumed improvements in thermal plant efficiency from 34.1% in 2010 to 42.3% by 2020; and
- Includes all fuels consumed by the aviation sector in the primary energy consumption.

These actions will provide projections and an indicative target using methodologies in line with international reporting such as those prepared by the Eurostat, PRIMES and the European Environment Agency. Malta has not lowered its ambitions; the methodologies used in NEEAP 2014 increased the potential primary energy savings leading Malta to commit to a larger energy savings target. The indicative target for Malta, under Article 3 of the Directive is hence revised to cater for the above referred reporting inconsistencies and notified as:

#### **Primary Energy Consumption in 2020: 822,903 toe<sup>10</sup>**

The primary energy consumption in 2020 is calculated in accordance with the table below.<sup>11</sup>

**Table 2 - Projected primary energy consumption in 2020**

		toe
A	Fuels consumed by the thermal plants	332,807
B	Electricity imported through the interconnector	39,481
C	Electricity generated by renewable energy sources	25,446
D	Projected non-electricity final energy demand	443,396
E	Savings electricity (referred to primary energy) and non-electricity end use post 2015	18,227
A+B+C+D-E	Projected primary energy consumption in 2020	822,903

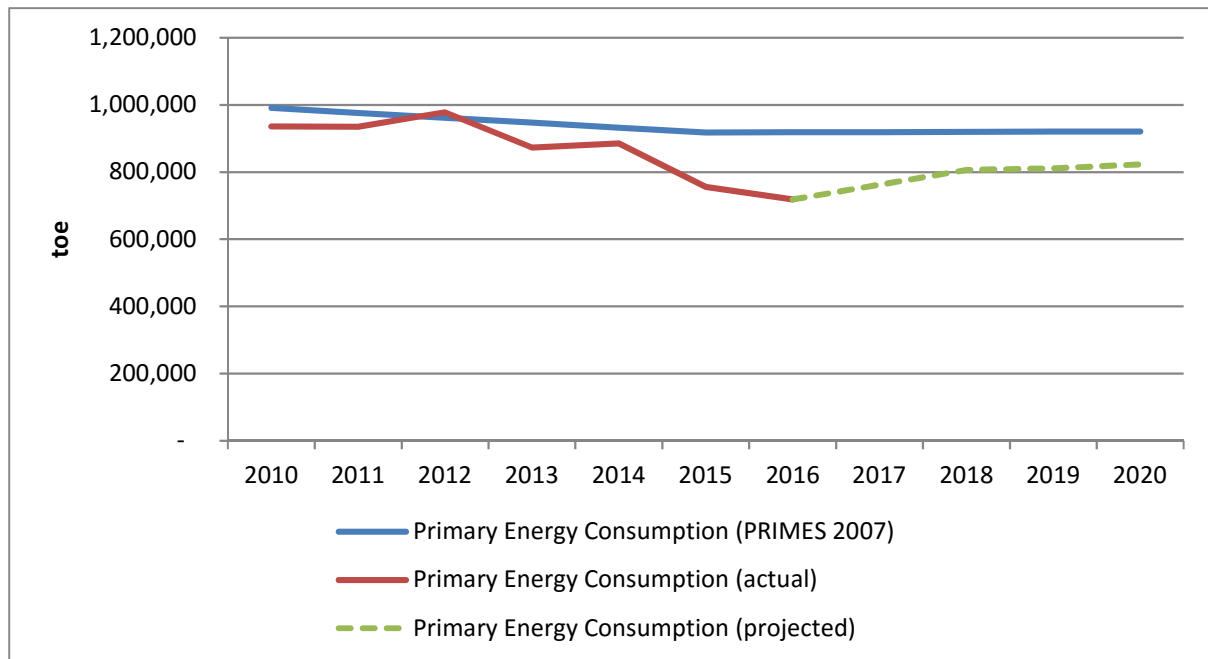
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<sup>10</sup> NEEAP 2014 reported a capped primary energy consumption for 2020 of 726,119 toe which included a reduction due to the aviation fuels capping of 79,366 toe

<sup>11</sup> As explained in the introductory chapter, all of Malta's electricity demand in 2020 will be covered by one 200MW interconnector, two power plants running on natural gas having a capacity of 144MW and 215MW and renewable electricity capacity of around 185MW. The generation efficiency of the thermal plants is based on plant loading and thus is highly sensitive to dispatch of the other generators. In this respect, a sensitivity analysis was carried out on the primary energy consumption projections to account for different dispatch scenarios. The analysis resulted in a variation of  $\pm 3.4\%$ .

Figure 5 summarises the progress achieved towards meeting the target for primary energy consumption set in terms of Article 3 of the Directive, relative to PRIMES 2007 reference scenario. It shows actual and projected primary energy consumption to 2020.

**Figure 5 - Primary energy consumption**



Source: Actual primary energy consumption 2010-2015 – Eurostat; 2016 – provisional figure

As explained in Section 1.1, in recent years Malta has experienced a remarkable growth in terms of both economy and population. These can be summarised in:

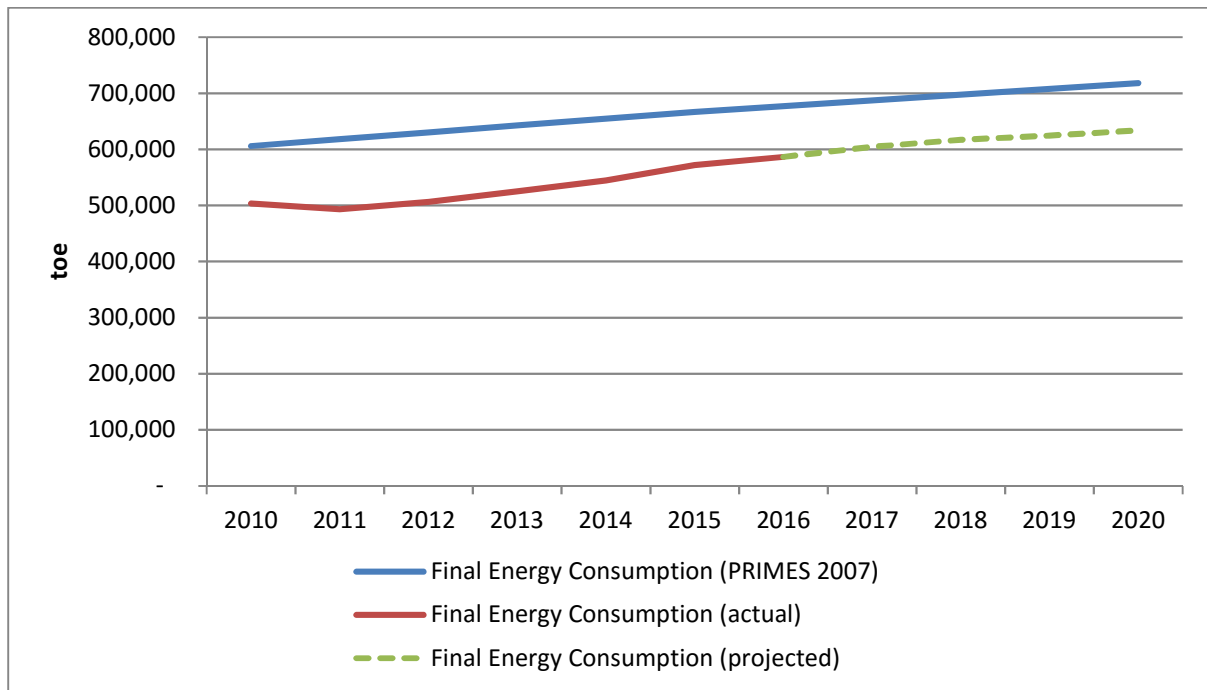
- A higher than average GDP of 8.4% and 7.4% for 2014 and 2015 respectively; and
- A higher than average population growth rate of approximately 1% annually between 2013 and 2015 (excluding effect of increase in tourist arrivals).

The upcoming chapters will detail the numerous actions taken by the Government and the private sectors to improve their energy saving and energy efficiency in their effort to achieve sustainable growth, keeping, as far as possible, energy demand in check.

As with the projected primary energy consumption, changes to the NEEAP 2014 projections for final energy consumption are necessary to align the reporting methodology to international norms. NEEAP 2017, in line with Eurostat statistics, includes renewable generation as part of the final energy consumption. The

projected final energy consumption is **633,875 toe**<sup>12</sup> by 2020. Figure 6 shows the PRIMES 2007 reference scenario and the actual and projected final energy consumption by 2020.

**Figure 6 – Final energy consumption<sup>13</sup>**



Source: Actual final energy consumption 2010-2015: Eurostat; 2016: provisional figure

## 2.2 Significant savings in primary energy consumption

As indicated in Section 1.2 of the Plan significant measures were taken in the electricity generation sector achieving considerable primary energy savings in the period under consideration. Forecasted electricity demand in 2020 is estimated at 223,676 GWh of which 25,446 GWh would be generated via Renewable Electricity. Excluding RES electricity generation, a no-action scenario<sup>14</sup> would have resulted in an electricity generation demand of 654,224 GWh. However, with the introduction of efficient electricity generation plant and the commissioning of the Sicily-Malta interconnector, non-RES electricity demand would be 372,288 GWh.

<sup>12</sup> NEEAP 2014 reported Final Energy Consumption of 547,716 toe using a 2009 baseline with a GDP growth between 1.13% to 2.79% and the exclusion of 71,865 toe RES

<sup>13</sup> Note: The GDP growth rates for the period 2016-2018 are set at the rates indicated by the European Economic Forecast for Malta published by the European Commission. The growth rates for 2019 and 2020 are assumed to stand at 2.5%.

<sup>14</sup> Assuming a no-action electricity generation efficiency as indicated in NEEAP 2014 of 30.3%.

### **2.3 Final energy savings**

With regards to final energy savings in fulfilment of the target set out in Article 4(1) and (2) of Directive 2006/32/EC Malta confirms that it is on track. The target set in the 2008 NEEAP, was to achieve in 2016 378 GWh of energy savings, equivalent to 9% of a five year average final energy consumption between 2002 and 2006. The target will include energy savings from RES fiscal incentive schemes, Co-generation, Transport related schemes and taxes, and actions in Industry and the Public Sector.

## **3 Policy Measures implementing the Energy Efficiency Directive**

### **3.1 Horizontal Measures**

#### **3.1.1 Energy efficiency obligation schemes and alternative policy measures**

##### *3.1.1.1 Determining the target*

This section provides information on the overall amount of energy savings that are required over the obligation period in order to meet the target set in accordance with Article 7(1), and details on the calculation, measurement and monitoring of the savings. NEEAP 2017 introduces a series of measures that re-shape the plan, by replacing measures that were considered as challenging to verify with others that are achievable and verifiable by the various Maltese market players and Authorities.

As with the NEEAP 2014, NEEAP 2017 makes use of various possibilities provided for under Article 7 to reach the target. These include: The target is met by combining an Energy Efficiency Obligation with the use of Alternative measures;

- Malta is using the options under Article 7(2a) and 7(2d) to reduce its target by 25% as allowed by Article 7(3);

The sales of energy in the transport sector shall be excluded from the calculation.

As a result of a revision of energy consumption data for Malta for the years 2010 to 2012, the target set by Article 7(1) had to be revised. The average energy sales over the reference period, excluding the transport sector, is given in Table 3. Table 4 shows the required cumulative annual savings between 2014 and 2020, equivalent to 1.5% per year of the annual energy sales to final customers, for a total of 1,032 GWh (over the period 2014-2020). This figure is adjusted downwards to 774GWh, by applying the provisions available under Articles 7(2)(a), 7(2)(d) and 7(3). Table 5 shows the application of Article 7(2)(a) to recalculate the Target.



**Table 3 - Final energy consumption 2010-2012**

	2010	2011	2012
<b>Total Final Energy Consumption:</b> Final energy consumption includes all energy delivered to the final consumer's door (in the industry, transport, households and other sectors) for all energy uses. It excludes deliveries for transformation and/or own use of the energy producing industries, as well as network losses <sup>15</sup> .(ktoe)	499.5	488.9	501.2
<b>Final Energy Consumption by Transport:</b> Final energy consumption by transport covers the consumption of energy products in all types of transportation, i.e. rail, road, international and domestic air transport and inland navigation/coastal shipping, with the exception of maritime shipping. (ktoe)	286.9	288.0	280.8
<b>Final Energy Consumption excluding Transport</b>	212.6	200.9	220.4
Average Final Energy Consumption excluding Transport 2010-2012 (ktoe)	211.3		
Average Final Energy Consumption excluding Transport 2010-2012 (GWh)	2,457.4		

**Table 4- Energy savings calculation as in Article 7(1)**

	Percentage Savings	Percentage Cumulative Savings	Savings per annum (GWh)
2014	1.50	1.50	36.86
2015	1.50	3.00	73.72
2016	1.50	4.50	110.58
2017	1.50	6.00	147.45
2018	1.50	7.50	184.31
2019	1.50	9.00	221.17
2020	1.50	10.50	258.03
Total Savings 2014 to 2020			1,032.12

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<sup>15</sup> In line with point 10 of Guidance Note on Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EC, and repealing Directives 2004/8/EC and 2006/32/EC, energy for own use is not included.

**Table 5 - Energy Savings calculation as in Article 7(2) (a)**

	Percentage Savings	Percentage Cumulative Savings	Savings per Annum (GWh)
2014	1.00	1.00	24.57
2015	1.00	2.00	49.15
2016	1.25	3.25	79.87
2017	1.25	4.50	110.58
2018	1.50	6.00	147.45
2019	1.50	7.50	184.31
2020	1.50	9.00	221.17
Total Savings 2014 to 2020			817.09

The remaining 43 GWh<sup>16</sup> is achieved by the various initiatives to promote energy efficiency undertaken post-2008 and which qualify under Article 7(2)(d). Estimated savings from eligible early measures is 79 GWh achieved through new savings calculated between 2010 and 2013.

**Thus, the target to be achieved in cumulative end use energy savings from 2014 until 2020 is 774 GWh.**

### *3.1.1.2 Meeting the target*

Table 6 groups the measures in four categories:

- Energy Efficiency Obligation;
- Financing Schemes/Instruments and Fiscal Incentives;
- Regulations and Voluntary Agreements; and
- Public Sector leading by example.

Table 7 summarizes the savings in 2020 for the four main categories. The estimated total cumulative savings is 935 GWh.

Below are the main contributors towards the achievement of Article 7 target. Only main changes from the original NEEAP 2014 are being highlighted.

Annex I lists down all measures under each category intended to achieve the Article 7 target.

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<sup>16</sup> 43GWh is the difference between the energy savings as in calculation 7(2)(a) (817.09GWh) and the target taking into account the 25% allowable reduction (774.09GWh).

### Energy Efficiency Obligation

The Energy Efficiency Obligation (EEO) has been re-dimensioned. Electricity smart meter installation is slowly nearing completion. Malta was one of the first Member States in the EU to proceed with the implementation of this measure, even before the Directive was drafted. However, determining the resulting behavioural changes is proving to be rather difficult. In this regard efforts are being made by the obligated party, through its billing partner ARMS Ltd, to provide information to the customer via a web interface. The portal shall be known as "My Consumption". For the revised target no savings are being attributed to this measure until a more robust assessment is carried out.

### Energy Efficiency for vulnerable households

A measure was introduced whereby technical personnel from the Agency visit vulnerable households to raise awareness on energy usage and provide energy saving tips. The visit shall determine whether key appliances are in need of replacement with more energy efficient appliances.

The target is to replace appliances in a number of vulnerable households annually, achieving cumulative savings of 973 MWh.

### Information technology power saving initiative for the public sector

The Government Desktops Power Management Initiative was set up in collaboration with Malta Information Technology Agency and the Information Management Unit at Office of the Prime Minister - Energy and Projects. The initiative has embarked upon a phased implementation of computer power settings optimization across all public sector and has so far been deployed on over eight thousand computers. Energy savings following the streamlining of computer management settings have been conservatively estimated in the range of 5-10%. To improve its energy rating, Government is replacing desktop-based systems by laptops. Desktop-based systems are calculated to consume over 4 times more energy than laptops. These actions are estimated to achieve 970MWh in cumulative energy savings.

### Energy efficiency measures at the National Pool Complex

The introduction of energy efficient measures at the Tal-Qroqq National Pool, partly funded by European Regional Development Funds (ERDF), promotes resource efficiency and the reduction of carbon-footprint. It includes the installation of new heat-pump technology in conjunction with solar collector panels and a VRF air-conditioning system. The project includes the installation of a pool cover that would better maintain the physical and hygiene properties of the water,

reduce evaporation and heat loss. These actions are expected to achieve 15GWh in cumulative energy savings.

### The Energy Efficiency Partner Initiative (EEPI)

This initiative was set up to encourage non-SMEs to invest further in energy efficiency. Through the initiative, organisations are being encouraged to sign a voluntary agreement with the Agency, committing to implement measures that increase energy efficiency on an annual basis. The cumulative savings expected to be achieved through this measure are 149GWh.

### Renewable energy technologies

Malta, with its typically warm Mediterranean climate has limited scope for heating technologies such as boilers or central heating in households and even less so for district heating. Cooling requirements are in general, met through highly efficient air conditioners employing heat pump technology. Studies have also shown that thermal insulation such as double-glazing have typically long payback periods (even with government support), and have to be installed with caution as they could result in increased cooling load in summer. Fuel consumption in households is limited to liquefied petroleum gas (LPG), which is typically used for cooking and occasionally heating. It is therefore evident that the most effective way for households in Malta to reduce energy purchases (and hence reduce the consumption of conventional fuels as required by Article 7) is by generating onsite renewable energy. This measure will consider only the onsite energy generated which is strictly used for own consumption and which is effectively replacing energy sales. The cumulative savings expected to be achieved through this measure are 401GWh.

### Energy efficiency scheme for industry

A scheme is being designed to support energy efficiency measures in various categories within the service and industrial sectors in the form of financial instruments based on tax rebates. The scheme, to be administered by Malta Enterprise with the technical support of the Energy and Water Agency, will reward those actions that achieve most energy savings. Projected cumulative savings till 2020 are 100GWh.

### Support for co-generation

Whilst support for co-generation units shall continue, as these contribute towards primary energy savings, no such savings shall be counted towards Malta's main target under Article 7 or as part of the 25% allowable reduction.

### Energy efficiency in public buildings

Notwithstanding the ongoing efforts towards energy efficiency within the public sector, an effective plan has yet to be developed, as studies have shown that only

limited measures can be economically feasible, given the limited heating requirements and typically low consumption.

Actions addressing the transport sector are managed by the competent Ministry and Authority (refer to section 3.5). A number of new measures are under consideration. The Government has commissioned studies, which are still in progress, in order to assess energy savings triggered by taxation measures (exceeding the minimum levels of taxation applicable to fuels as required in Council Directive 2003/96/EC).

**Table 6 – Summary of actions/measures considered for Article 7 target**

<b>Policy Measures:</b>	<b>Energy Efficiency Obligation</b>	<b>Financing schemes/instruments and fiscal incentives</b>	<b>Regulations and voluntary agreements</b>	<b>Public sector leading by example</b>
<b>Description</b>	<p>The EEO will consist of:</p> <ul style="list-style-type: none"> <li>- the progressiveness of the domestic residential household tariff system and the incentive towards energy efficiency in the tariff structure (eco-reduction)</li> </ul>	<p>Different schemes including 'access to finance' arrangements shall be set up and published from time to time to incentivise the target sectors to adopt more energy efficient technologies.</p> <p>Financial instruments will address energy efficiency measures within industrial processes, transport and buildings.</p> <p>A flexible approach shall be adopted. Particular schemes shall be set up from time to time to address specific issues such as influencing market behaviour and addressing shortcomings in energy efficiency observed in the target sectors.</p> <p>The financial benefit to final participants shall be tied to</p>	<p>Operators in the target sectors are relatively heavy consumers of energy and are encouraged to adopt more energy efficient techniques.</p> <p>The national voluntary agreement scheme, the Energy Efficiency Partnership Initiative, has been set up to foster, improve and create a roundtable for improved relations between Government and large enterprises with the aim of resulting in the uptake of energy</p>	<p>The central government's efforts to promote energy efficiency in the country would gain greater credibility if Government were seen to be practicing what it advocates, in addition to yielding economic benefits.</p> <p>The Government and public entities undertake measures and projects to increase energy efficiency in their spheres of activity, particularly in industry, services and buildings and showcase results.</p>

		<p>results achieved.</p> <p>Consultation with various competent bodies including Malta Enterprise, the Malta Competition and Consumer Affairs Authority, the Regulator for Energy and Water Services, the Environment Resources Authority, the Malta Hotels and Restaurants Association, the Malta Chamber of Commerce and Industry and the Malta Business Bureau is done during the development of financial schemes/ instruments and incentives.</p>	<p>efficiency practices.</p> <p>Within this partnership, energy efficiency improvement measures are voluntary implemented by the industry and services sectors.</p>	
<b>Target sectors</b>	Residential sector,	The residential, industrial and commercial and transport sectors.	Services and industry sectors	Central Government, Public Service Corporations and Public Companies
<b>Duration</b>	Till 2020	This varies according to the particular financial scheme/instrument/incentive. Some schemes are renewed annually while other run for a short span of years. Nonetheless, schemes/instruments/incentives	Voluntary Agreements last for three years and are expected to be renewed thereafter. Nonetheless the implemented measures are	Actions normally relate to intervention in buildings and investments to achieve energy savings at the Water Services Corporation or in the WasteServ (both public companies) which are themselves final-end

		will promote measures that will have lifetime expectancy beyond 2020.	expected to have a lifetime beyond 2020	consumers as regards electricity.
<b>Participating or entrusted parties or implementing public authorities</b>	Enemalta Plc	<p>Funding and funding support is decided and provided by the Ministry of Finance and/or Managing Authority in the case of the European Regional Development Funds.</p> <p>Administration depends upon both the entity contributing to its finance, as well as the sector targeted by the financial instrument (industrial schemes are administered by the Malta Enterprise). In order to improve the administration of such schemes/instruments/incentives, steps are being taken to introduce a representative of the relevant sector as a main partner.</p> <p>The Agency will be responsible for monitoring the overall implementation of such policies and collating data on energy savings.</p>	<p>The Agency has spearheaded the formation of the Energy Efficiency Partnership Initiative. It will continue to work with the Malta Business Bureau to monitor the implementation of this policy and take further action as necessary from time to time including expanding the Energy Efficiency Partnership Initiative to include medium sized enterprises.</p> <p>Participating parties are those economic operators in the relevant sectors who have entered into voluntary agreements</p>	<p>Actions in the building framework are driven by National Funds, whilst intervention by the Public Corporations and the companies are by own and ERDF funds.</p> <p>Similar to financing schemes the role of The Energy and Water Agency is to monitor and report on the overall implementation progress.</p>



			They are indicated in detail in the 'individual measures' section.	
<b>Eligible category of measures</b>	Savings resulting from both measures are considered eligible in view that they incentivise and result in direct reduction of electricity consumption.	All measures that incentivise the target sectors to adopt more efficient technology to meet their energy needs, are considered eligible. Due to Malta's particular geographical nature, the main measures will include, more generation of energy for own use especially in the residential sector, improving the transport fleet, and supporting the industrial and commercial enterprises in improving the achieving further energy savings.	All measures that encourage, and where necessary require operators in the target sectors to adopt more energy efficient techniques are encouraged.	Measures and projects by the central Government authorities and national entities to upgrade to high levels of energy efficiency infrastructure and other assets.
<b>Quality standards</b>	<p>As a minimum, all individual measures will be required to comply with applicable European and/or International standards.</p> <p>Malta as a Member State observes the rules and regulations for quality standards for products, services and installation established in the Community. Products that are not covered by harmonisation legislation are covered by the General Product Safety Directive (2001/95/EC) that was transposed into Maltese legislation by means of the Product Safety Act (CAP. 427).</p>			

<p><b>Monitoring and verification protocols</b></p>	<p>The Regulator for Energy and Water Services will verify the savings resulting from the EEO.</p>	<p>Individual measures contributing more than 1.5% of the total savings as required by Article 7 will require individual monitoring and verification.</p> <p>Schemes/incentives/instruments that involve large number of applicants will be monitored and verified by the 'Entrusted party' or 'implementing public authority' through sampling. Verification of actions which benefit from financial schemes/incentives/instruments is done a priori since the granting of a financial benefit is only done once the required action has been verified that it has been implemented. For example in funding building elements for the residential</p>	<p>Annual reports, endorsed by a warranted engineer, are required from enterprises that participate in the Initiative.</p> <p>Energy savings stemming from enterprises which are ISO 14001, ISO50001 and EMAS certified will not be re-verified. Other savings will be randomly checked by the Agency.</p>	<p>The investment by the public sector varies. Investments by Central Government which are minor and/or building related will require only reporting certified by the project-responsible officer in the respective building. Others where the public sector heavily invests in major infrastructure will be audited.</p> <p>Where actions contribute to less than 1.5% of the total savings required to meet the Article 7 target annual verification of savings by warranted engineer would be</p>

		<p>sector, present guidelines explain that scheme applications are split in two parts - the Regulator must first approve Part A of the application; equipment cannot be purchased and installed before approval. A Regulator official or its representative may inspect the site of installation. Part B is the request for reimbursement. The Regulator will assess the request for reimbursement and the details of the installed product against information provided in the original pre-purchase application. Payments of grant schemes will be processed after receipt of a fully and correctly completed Part B request for reimbursement including all required attachments.</p> <p>All schemes emphasise the Regulator's and other national authorities' right to verify, if need be, that any grants paid were used for the purposes intended by the grant scheme, and that the installation is in operation.</p>		sufficient .
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		<p>Depending on the measure, the Agency will request annual energy savings reports endorsed by a warranted engineer. The Agency may commission further inspections to ensure adequate verification.</p> <p>Depending on the scheme, the 'entrusted' or 'implementing public authority' will arrange for independent verification and auditing of its procedures and calculations or the Energy and Water Agency will verify the numbers provided.</p>		
<b>Penalties</b>	<p><u>Obligated parties</u></p> <p>Regulation 15 of the Energy Efficiency and Cogeneration Regulations, authorises the regulator to impose an administrative fine not exceeding one hundred thousand euro (€100,000) for each contravention and, or six hundred euro (€600) for each day of non-compliance, from the date of the decision given by the Regulator upon any person who infringes any provision of the regulations or who fails to comply with any directive or decision given by the authority in ensuring compliance with the regulations. This enforcement procedure will also be applied to obligated, entrusted and participating parties or public authorities involved in the implementation of this regulation.</p>			

**Table 7 – Summary of savings for Article 7**

<b>Cluster</b>	<b>Cumulative end use energy savings in year 2017 (kWh)</b>	<b>Cumulative end use energy savings in year 2020 (kWh)</b>
<b>Energy Efficiency Obligation</b>	16,352,000	28,616,000
<b>Financing Schemes and Instruments and Fiscal Incentives</b>	235,652,079	691,748,336
<b>Public Sector Leading by Example</b>	14,955,996	64,816,493
<b>Regulations and Voluntary Agreements</b>	74,498,728	149,498,728
<b>Total</b>	<b>341,458,803</b>	<b>934,679,557</b>

### **3.1.2 Energy audit and management systems**

#### *3.1.2.1 Introduction*

Government entrusts the Energy and Water Agency with the promotion of energy audits, managing support for enterprises in performing these audits, and build the necessary framework to ensure compliance with the national obligations under the Directive related to energy audits.

Apart from ensuring legal compliance, the Agency is analysing information contained in the audit reports as well as data collected from different sources to design new measures/initiatives for the various sectors :- non-SMEs, SMEs and households. This is done in consultation and cooperation with business associations and consumer organisations.

Building upon the work reported in the NEEAP 2014, further energy audits have been carried out in households, public buildings and industry. The Agency has records of around 1,110 energy audits and energy awareness assessments that have been carried out between 2014 and 2016.

#### *3.1.2.2 Energy audits in non-SMEs*

A total of 96 non-SMEs complied with their obligation to carry out a mandatory energy audit. Given the relatively low number of non-SMEs that qualify for a mandatory energy audit, the Agency has followed up with the non-SMEs on an individual basis to ensure that the obligation to deliver the energy audit is fulfilled.

This interaction with the obligated parties should ensure that future audits are carried out in a timely manner and in line with the provisions of the Directive and the National Guidelines.

The minimum criteria of the energy audit have been reproduced in the Fifth Schedule Part B of L.N. 196 of 2014 as part of the transposition of the Directive. The Agency in conjunction with the Regulator has also issued a guidance note that refers to these minimum criteria.

In order to ensure that the minimum criteria as specified in legislation has been achieved, the Agency is currently carrying out independent verification of the submitted energy audits. Energy audits that do not meet these minimum criteria would need to be corrected/updated. In fact, the Agency has already communicated shortcomings in the first batch of energy audit reports that have been verified. Further details on the quality control arrangements in place are given in section 3.1.2.4.

The list of 96 non-SMEs energy audits are categorised as follows:

- 64 non-SMEs were required to carry out the mandatory energy audit by 2015. To date, 60 large enterprises submitted their energy audit report to the Agency. Assessment of information submitted to the Agency by the enterprises which have not submitted an energy audit by the stipulated deadline is still underway. A small number of enterprises have engaged with the authorities with specific issues at this first-time exercise.
- 28 non-SMEs were exempted because they are relatively small offices with low energy consumption. They were classified under the category of non-SMEs in view of the shareholding by the mother company, which is not established or registered in Malta. The established threshold of energy consumption for exemption is based on the cost-optimal consumption levels for offices as per analysis carried out by the Building Regulation Office.
- 4 non-SMEs were exempted based on the energy/environmental management system that they have in place.

Non-SMEs implementing an energy or environmental management system and applying for an exemption from carrying out mandatory energy audits must have their energy or environmental management system certified to relevant European and International Standards by an independent entity. The energy or environmental management system has to include an energy audit in line with the minimum criteria in the Legal Notice. Furthermore, the enterprise has to provide evidence that management of energy consumption is a significant element within the management system, and that targets to reduce energy consumption are in place. If the Agency does not consider the certification as satisfactory, it shall refrain from issuing an exemption, and the entity shall be deemed to be in default of its obligation to submit an energy audit. Enforcement procedures would apply.

### 3.1.2.3 *Going beyond the obligatory energy audits*

The energy audits carried out by large enterprises have been commissioned by the companies themselves in response to the transposition of the Directive and are not part of any voluntary agreement programme.

Nonetheless, with the local transposition of the Directive in 2014, the economic sectors including all categories (SMEs and non-SMEs) were informed of the provisions of Article 8 of the Directive in terms of the impact of energy efficiency on enterprise performance and on Government's commitments to support all economic sectors to boost competitiveness.

In 2014, the Agency approached the Malta Business Bureau<sup>17</sup> to facilitate the implementation of the obligations arising from Article 8 by non-SMEs where applicable, and proceeded to negotiate voluntary agreements with non-SMEs to promote the implementation of energy efficiency measures. A number of voluntary agreements were signed covering energy saving measures implemented from 2014 onwards. In view of the success of this programme for voluntary agreements, it is expected that it will be extended to SMEs as well.

Furthermore, in recent years, various information-disseminating activities and consultations were carried out designed to inform energy consumers of the benefits of energy audits in general and of related obligations where energy audits are mandatory. The main activities and consultations are listed below.

#### Non-SMEs

Extensive promotion efforts and consultations were carried out by the Agency together with the Malta Business Bureau, who in turn effectively communicated with their members.

In 2014, the Agency together with the Regulator, published a guidance note<sup>18</sup> addressed to non-SMEs with the primary objective of ensuring that the required standards and the criteria set for mandatory energy audits are met. Also in 2014, a specific half-day seminar was organised by the Agency addressing non-SMEs. The seminar highlighted the implications of L.N. 196 of 2014, especially the obligation that non-SMEs are required to carry out an energy audit, the benefits of energy management systems as well as case studies showcasing energy saving solutions. Energy service providers were also given the opportunity to display their

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<sup>17</sup> The Malta Business Bureau is the European Affairs Office of the Malta Chamber of Commerce and Enterprise (MCCE) and the Malta Federation of Industry (FOI)

<sup>18</sup> This note can be accessed at: <http://opm.gov.mt/en/energyprojects/Pages/Guidance-Note-on-the-carrying-out-of-mandatory-energy-audits-by-non-SMEs.aspx>

products during the seminar.

Furthermore, the Agency published multiple newspaper adverts and sent out individual letters to non-SMEs highlighting the obligation of carrying out an energy audit. The Agency's website provides more detailed information on energy auditing.<sup>19</sup>

### SMEs

Malta Enterprise, with the technical support of the Agency, is supporting small enterprises with the provision of energy audits (Energy Audit Voucher Scheme) in line with the *de minimis* regulation and remuneration for achieved energy efficiency savings by enterprises<sup>20</sup>.

The Agency has also teamed up with the Malta Business Bureau, whereby through the project 'Investing in Energy' a series of energy audits shall be carried out in medium-sized enterprises falling within the manufacturing, wholesale and retail categories. This project is expected to facilitate the exchange of best practice relating to energy management systems in SMEs. In fact, one of the deliverables of the project is to demonstrate examples of available technology and achieved results in implemented projects. This project will also propose voluntary agreements with SMEs in order to implement energy conservation measures stemming from the energy audit report.

### Households

The Agency is leading a programme to raise awareness among households on energy usage. Flyers are being mailed to all households whereby they are being offered a free-of-charge visit by technical personnel who engage in discussions in order to understand energy usage and thus provide energy conservation tips. Households are also given a booklet highlighting energy efficiency tips for future reference. The programme is ongoing.

#### *3.1.2.4 Quality of energy auditors and energy audits*

As already indicated above, the Agency is implementing an 'Independent Quality Control System' (IQCS) through a private company, which is currently checking the submitted energy audit reports.

The details of training programmes available for the qualification of energy auditors can be found in Government Notice 1302 of 2014 (amended by GN 87 of 27 January 2015)<sup>21</sup>. The list of training courses that are currently approved are

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<sup>19</sup> <http://energywateragency.gov.mt/en/Pages/Energy-Auditing.aspx>

<sup>20</sup> <http://www.maltaenterprise.com/support/energy-audit-voucher-scheme>

<sup>21</sup> [http://downloads.rews.org.mt/files/59b98640-c048-4b04-992a-7d5aea097268\\_dc49ce2e-f384-4435-80c9-](http://downloads.rews.org.mt/files/59b98640-c048-4b04-992a-7d5aea097268_dc49ce2e-f384-4435-80c9-)



published<sup>22</sup> by the Regulator.

In view that there were requests to carry out energy audits by auditors based in other Member States, the Agency has liaised with counterparts in these other Member States in order to confirm the eligibility of the proposed auditors.

In order to qualify as an energy auditor, as per Government Notice, an individual should at least have a Bachelor's degree in engineering or in a related applied science, attend an appropriate energy auditor course as registered with the Regulator and pass the end of course examination'. An in-house enterprise expert can carry out energy audits obligatory under the Directive if s/he has suitable experience and training for carrying out energy audits, is not directly engaged in the activity being audited and acts in an independent manner in the performance of the audit. Quality control of in-house experts or energy auditors is also ensured by having their work assessed by the Independent Quality Control System service provider.

### **3.1.3 Metering and Billing**

Article 9(3) of the Directive requires that:

*Where heating and cooling or hot water are supplied to a building from a district heating network or from a central source servicing multiple buildings, a heat or hot water meter shall be installed at the heating exchanger or point of delivery.*

*In multi-apartment and multi-purpose buildings with a central heating/cooling source or supplied from a district heating network or from a central source serving multiple buildings, individual consumption meters shall also be installed by 31 December 2016 to measure the consumption of heat or cooling or hot water for each unit where technically feasible and cost-efficient. Where the use of individual meters is not technically feasible or not cost-efficient, to measure heating, individual heat cost allocators shall be used for measuring heat consumption at each radiator, unless it is shown by the Member State in question that the installation of such heat cost allocators would not be cost-efficient. In those cases, alternative cost-efficient methods of heat consumption measurement may be considered.*

The Directive requires the introduction of consumption-based cost allocation and sub-annual informative, consumption based billing of heating, cooling and hot water in multi-unit buildings, subject to certain conditions. The general idea is to

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[8eab7e0b9cc2.pdf](http://downloads.rews.org.mt/files/d2fc7eb8-f918-4e3a-9d71-c0f87c36841a_aa278db9-4702-41f2-8eb4-1ad0e4fc0fc3.pdf); [http://downloads.rews.org.mt/files/d2fc7eb8-f918-4e3a-9d71-c0f87c36841a\\_aa278db9-4702-41f2-8eb4-1ad0e4fc0fc3.pdf](http://downloads.rews.org.mt/files/d2fc7eb8-f918-4e3a-9d71-c0f87c36841a_aa278db9-4702-41f2-8eb4-1ad0e4fc0fc3.pdf)

<sup>22</sup> [http://downloads.rews.org.mt/files/bacede9c-edda-49ee-8050-931a98594fa8\\_6ce7635f-8982-4e66-b19a-77c9c7b1eb6b.pdf](http://downloads.rews.org.mt/files/bacede9c-edda-49ee-8050-931a98594fa8_6ce7635f-8982-4e66-b19a-77c9c7b1eb6b.pdf)

ensure that users of such buildings have the right incentives and sufficient information to adopt energy-efficient practices. Inducing energy-efficient behaviour among building users should be seen as a complement rather than an alternative to actions aimed to improve energy efficiency at building level, such as improvements in the envelope or the central heating system.

In Malta, all electricity services have been individually metered for a very long time. Billing was traditionally based on frequent actual meter readings and a 'rising block' tariff. This was further consolidated with the implementation of smart metering of electricity consumption. There are no other national network-based energy services other than electricity, and the potential for developing natural gas or district heating/cooling networks on a national scale is technically and economically not feasible as indicated in the introductory chapter and in the obligatory Article 14 report.

The other major fuel that is generally available and consumed in Malta is LPG sold in cylinders to households and in bulk to industry and commercial entities. This in itself provides a means of measuring one's energy consumption. In these circumstances, the potential of new savings which could be brought about through metering of LPG gas cylinders or bulk storage is deemed negligible.

Notwithstanding the fact that Malta's building stock is changing and small multi-apartment buildings are replacing single family residential units, the provision of common energy sources for heating and cooling, and hot water remains unattractive as this is deemed economically unfeasible.

The new multi-apartment buildings are energetically more efficient due to improved building materials and regulations. The heating and cooling requirements for the typically mild, short winters and rather long summers can be efficiently provided by small individual air-conditioners employing heat-pump technology. These meet both heating and cooling demands, thereby rendering communal supply of utilities complex and not cost effective.

There is only one high-end property development, consisting of residential units and a multi-purpose building, which has very high aesthetic standards and energy efficiency performance, in which units share common sources for heating and cooling, and hot water. In this particular case, monitoring of energy consumption is integrated in a Building Management System (BMS) which is read remotely.

Nonetheless the options as explained in the "Guidelines on good practice in cost allocation and billing of individual consumption of heating, cooling and domestic hot water in multi- apartment and multi-purpose buildings", namely:

- Owners of existing and new multi-unit buildings are to install individual consumption measurement for heating in building, unconditionally. This approach is referred to as declaring a viable building class;
- Owners of such buildings are required to install individual consumption

measurement for heating in building, but only where technically feasible and cost effective. This approach is referred to as declaring an open building class whereby the obligated actor (owner, building management etc.) shall be obliged to make an assessment for each building;

- No regulation is introduced with the effect that no building owner is required to install individual consumption measurement for heating in the building. This approach is referred to as a declaration for an exempted building class, whereby an assessment must be made which is valid for the entire class.

shall be taken into account. However, given the small number of multi-apartment and multi-purpose buildings served with common sources of heating, cooling, and hot water, it is not expected that such a measure shall contribute significantly to energy savings from heating and cooling demand in the residential and commercial sector in Malta.

### **3.1.4 Consumer Information Programmes and Training**

#### *3.1.4.1 Introduction*

Malta has one of the lowest energy intensity figures within the EU<sup>23</sup>. Even so, Government, public and private entities have, over the last decade, invested heavily in promoting and fostering energy efficiency. In the case of household and other small consumers, this investment was directed at incentivising the uptake of new technology, as well as fostering behavioural change where necessary. The building envelope was also given attention mainly through the introduction of appropriate building codes. These initiatives were supported by information programmes and consumers are now very much aware of the relevance of energy use efficiency.

#### *3.1.4.2 Measures promoting behavioural change among small energy consumers*

The tools to promote behavioural change in the past years have been various, as indicated hereunder and vary from financial incentives to information campaigns, with the latter being the main tool to promote energy efficiency among small energy consumers<sup>24</sup>.

#### Fiscal incentives

Electricity tariffs in Malta are designed on the 'rising block' tariff, which itself is conducive to efficiency and avoidance of waste. Over and above, an eco-mechanism reduction is superimposed on the tariff. The eco-reduction on

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<sup>23</sup> <http://www.indicators.odyssee-mure.eu/>

<sup>24</sup> <http://energywateragency.gov.mt/en/Pages/Energy-efficiency-support.aspx>

electricity bills is applicable to all residential consumers of electricity and is a driver for energy savings. The electricity bill for the primary residence over a period of one year is eligible for an eco-reduction (or discount) in accordance with established rates and thresholds<sup>25</sup> provided that a pre-set threshold is not exceeded.

#### Access to finance, grants or subsidies

The local banks have been pro-active in providing financing of energy efficiency improvement measures. Details of the financing products on offer are available online<sup>26</sup>. Banks offer loan packages addressing investments in green solutions and energy savings products (including double-glazing, solar film, passive infrared sensors, thermal insulation, external shading and energy efficient appliances). These packages have been advertised in the various local media channels. Access to such packages is open to all consumers, subject to the banks' due diligence processes. Various grant/subsidy schemes have been put in place from time to time to incentivise energy efficiency.

A number of Government funded schemes were also run. These were directed at:

- Encouraging adoption of new technology delivering energy efficiency (e.g. new efficient vehicles to replace older models, use of heat pumps in lieu of direct fuel heaters, higher energy rating white goods);
- Promoting behavioural change (e.g. transport card top-ups to incentive shift to public transport, purchase of less polluting vehicles, and better use of electricity);
- Improving the building envelope, mainly through regulation but also through some minor grant schemes such as roof thermal insulation material and double glazed windows or doors; and
- Incentivising the purchase and installation of renewable energy harvesting systems.

These schemes were administered by public entities. They were notified in the Government Gazette, described in detail with all relevant conditions in the websites of the administering public authority and advertised in the press. Access was open to all consumers, except for a specific scheme directed at vulnerable consumers.

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<sup>25</sup> Single person households: 25% discount on all consumption, if less than 2,000 units (per year) are consumed.

Two or more person households: Subject that consumption does not exceed 1,750 units per person per year, the following discounts will apply: 25% on the first 1,000 units and 15% on the remaining 750 units or part thereof.

<sup>26</sup> [http://www.banif.com.mt/banif\\_green\\_energy\\_loan;](http://www.banif.com.mt/banif_green_energy_loan;)

<https://www.apsbank.com.mt/en/green-loans;>

<https://www.bov.com/content/bov-eco-loan--special-scheme;>

<https://www.hsbc.com.mt/1/2/mt/en/personal/borrowing/products/personal-loans/green-loan-overview>

## Energy awareness visits in households

The Agency has been administering a scheme whereby households are being offered a free-of-charge service whereby technical personnel visit households, hold discussions in order to understand energy usage and as a result provide tailored energy conservation tips. Households are also given a booklet with energy efficiency tips. It is the intention of the Agency to follow up on the owners of households visited to quantify the effect of the 'home visit'.

In parallel to the home energy awareness visits, representatives from Agency and service providers also take part in TV programmes where they promote energy efficiency and reply to queries raised by viewers. Information is also provided online<sup>27</sup>.

## Exemplary projects and activities

- Government buildings are frequently featured in the media when retrofitting measures are implemented, with an emphasis on energy issues. Projects in schools<sup>28</sup> are particularly effective from this perspective. They provide a direct example and educational opportunity to schoolchildren – the best guarantee of attitude change in consumers.
- A major initiative has been undertaken by the national hospital. Employees at Malta's general hospital are being incentivized to commute to/from work by bus. This is a good energy efficiency exercise and has a positive impact on the environment. Employees are credited when they give up their hospital-parking permit. Those who sign up receive a credit on their public transport card at the beginning of each month for the duration of one year.
- The University Students Council (KSU) in conjunction with Malta Public Transport launched the KSU Transport Fund for 2017. The fund serves the role of incentivising and strengthening the use of public transport as an alternative means of transport to and from University Campus, rather than the use of private cars.

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<sup>27</sup> Examples:

<http://www.enemalta.com.mt/index.aspx?cat=5&art=21&art1=73>  
<http://www.enemalta.com.mt/index.aspx?cat=7&art=15>  
<http://energycalculator.enemalta.com.mt/>  
<http://miema.org/wp-content/uploads/2015/03/ELIHMed-brochure.pdf>  
<http://www.appliance-energy-costs.eu/mt/tips-to-save-energy-mt/>  
<http://energyefficiency.org.mt/home-and-office/>  
<http://energywateragency.gov.mt/en/Pages/Energy-efficiency-support.aspx#>

<sup>28</sup> Example - Siggiewi Primary School – Energy retro-fitting

The aim of this pilot project was to implement a holistic energy retrofitting solution to a typical primary school building in Malta while improving thermal and visual comfort for the students. Implemented energy retrofitting measures included Building Management System controlled external shading (Louvers and PV overhangs); movement of warmer corridor air to class-rooms in winter, CO<sub>2</sub>-controlled ventilation, infra-red panel heating instead of resistance heating, intelligent lighting, a Building Energy Management System (BEMS), Photovoltaics and an unglazed solar thermal system for the pool. For hot water, instant water heaters were used instead of storage water heaters. The project is continually monitored and optimized.

- Energy Audits schemes for micro and small enterprises are available free of charge through a scheme operated by Malta Enterprise. This assistance is further consolidated with other schemes in order to include the implementation of recommendations stemming from energy audits thus improving the energy efficiency in SMEs

#### 3.1.4.3 *Measures facilitating the engagement of consumers during the rollout of smart meters*

The rollout of smart meters for electricity is practically complete. An information campaign, comprising billboards, explanatory leaflets, delivery of a 'smart meter' manual including guidelines for use, as well as specific instructions provided by the installer to the consumer was conducted during the rollout<sup>29</sup>.

Details on smart metering and the related functions and benefits can also be found on the ARMS Ltd and Enemalta plc websites. Enemalta plc provides access to a freephone number in case of any queries.<sup>30 31</sup>

#### 3.1.4.4 *Dissemination of information*

Malta is a community of just over 400,000 people in a relatively small geographical space, with all communication services operating on a national scale. Numerous information dissemination, awareness-raising campaigns and training initiatives were designed to respond to the needs of the specific sector or category of consumer.

There is continual contact between institutions – both governmental and private on a national scale – that guarantees that market actors, including specialised professional institutions are informed and consulted on all developments.

Energy efficiency is now an established selling point for products and services. There is a high degree of competition between local traders and retailers of energy products and services (and RES hardware). This ensures that information is readily disseminated and available to all consumers.

A specific action that is of importance is the action taken by the Building Industry Consultative Council (BICC)<sup>32</sup> that is to monitor the building industry and to advise policy makers on ways to enhance it as a strong social and economic contributor to improve sustainable development.

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<sup>29</sup> See NEEAP 2014-2016

<sup>30</sup>[https://www.smartutilities.com.mt/wps/portal/Public%20Area/Services/SmartMeters!/ut/p/b1/04\\_Sj9CPykssy0xPLMnMz0vMAFgJzOKd3Y0CzYzdfMw8DQLcDBxNfN0DnRydDQ0MzIAKIsEKHD1MzH0MDCx83E0NPB09QoMsA42NDRyNidNvgAM4GkD1Yzfe1ZyA\\_UAFBOWP14\\_CawXIB2AFeJzo55Gfm6pfbBsaGmGQZQIAU3qDbg!!/dl4/d5/L2dJQSEvUUt3QS80SmtFL1o2X0NHMIE2M0ZMNkkwUEYwQTRNR1FCQUMxMDEz/](https://www.smartutilities.com.mt/wps/portal/Public%20Area/Services/SmartMeters!/ut/p/b1/04_Sj9CPykssy0xPLMnMz0vMAFgJzOKd3Y0CzYzdfMw8DQLcDBxNfN0DnRydDQ0MzIAKIsEKHD1MzH0MDCx83E0NPB09QoMsA42NDRyNidNvgAM4GkD1Yzfe1ZyA_UAFBOWP14_CawXIB2AFeJzo55Gfm6pfbBsaGmGQZQIAU3qDbg!!/dl4/d5/L2dJQSEvUUt3QS80SmtFL1o2X0NHMIE2M0ZMNkkwUEYwQTRNR1FCQUMxMDEz/)

<sup>31</sup> <http://www.enemalta.com.mt/index.aspx?cat=2&art=5&art1=11>

<sup>32</sup> The BICC is made up of representatives of Operators, Professionals, Educational Institutions, Financing Institutions, Workers, and, Policy and Regulating Authorities

The BICC embarked on a project<sup>33</sup> with the purpose of informing the public about different types of building interventions, increasing product visibility and therefore competition, and providing building industry professionals with a wider range of information and tools to implement better performing buildings. The project provides information that will enable the building industry to adopt construction practices which are themselves energy efficient, or which lead to an improvement in the energy efficiency of both new-build and existing buildings.

The project responds to the following demands:

- The need for an organised list of locally available green products related to buildings with an easy access and possibility of technical comparison;
- Easily accessible information about best use and correct application of different products and technologies within the local context;
- Studies providing technical information about the performance of green building products under local conditions;
- Increase public awareness about the range of green building products available;
- Encourage more competition in the green building product market;
- Access to advice addressing all aspects of the implementation of green building technologies in both new build and retrofit markets.

Further information can be found on the BICC website<sup>34</sup>.

Energy efficiency targeted information is also handled by industry representatives, namely the Malta Chamber of Commerce, the Malta Hotels and Restaurants Association and the General Retailers and Traders Union (Malta Chamber of SMEs). The main initiatives taken up by each is included below.

#### The Malta Chamber of Commerce

Malta Business Bureau (MBB) on behalf of the Malta Chamber of Commerce acts as the lead partner in two Projects; 'Investing in Water' and 'Investing in Energy'. This apart from the fact that the MBB in the past years has been continuously liaising with the Agency to support both industry and policy maker in the implementation of energy audit obligation on non-SMEs and the setting up of the Energy Efficiency Partner Initiative.

Water production is a considerable energy consumer in Malta, as the Water Services Corporation utilizes reverse osmosis desalination plants to meet a significant share of Malta's potable water demand. Hence reduction of water consumption, not only results in financial savings, but also energy saving at the 'primary' level i.e. production level. The *Investing in Water* Project facilitated the implementation of water saving best practices amongst businesses and hotels.

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<sup>33</sup> <http://ecobuild.gov.mt/en/Pages/default.aspx>

<sup>34</sup> <http://bicc.gov.mt/en/Pages/HOME.aspx>

The project carried out water audits in 136 enterprises, of which 11 were already established best practice case studies, while a further 28 had limited opportunity for water saving interventions, mainly due to low potential savings. Of the remaining 97 enterprises, 14 adopted water saving best practice project recommendations, while a further four were in the process of implementing recommendations at the project's conclusion. The interventions carried out by the enterprises at the project's recommendations resulted in a 28% overall average savings for these enterprises. Considering an additional two enterprises which were in the process of examining water saving interventions at the time of project audit, and which carried out upgrades over the project lifespan, the total amount of saved water is 145,047 cubic metres per annum, with 'power' savings from 14 enterprises approximated at 249MWh per annum.

The water audits were also promoted at the project's National Water Conference and water saving workshops. Additionally, stakeholders such as the Malta Tourism Authority and Chamber of Engineers also promoted the workshops amongst their networks.

The EU LIFE+ Investing in Water Project has published several reports covering water saving interventions for businesses and hotels, all of which are downloadable from the project website<sup>35</sup>.

Through another project, 'Investing in Energy', the Malta Business Bureau and the Agency intends to disseminate the importance of Energy Audits to medium sized SMEs. The project will perform 35 Level 1 energy audits and will facilitate the adoption of measures that shall be proposed by the energy auditor.

The project will also deliver four workshops and an international conference. The workshops will be the main method to disseminate best practices to other interested SMEs that were not shortlisted to be audited through this project, encourage networking and adopt recommendations. This action is intended to demonstrate the reproduction and transferability of best practice examples from audited SMEs to SMEs with similar operations. The companies participating in implementing best practices will provide the necessary data to enable verification of savings. The project will identify SMEs that have adopted best practice in energy efficiency who will have the option to join the project's Role Model Programme. The main aim of this programme is to share best practice amongst enterprises, while also promoting those that implemented energy efficiency measures successfully.

#### Malta Hotels and Restaurants Association (MHRA)

The MHRA has been at the forefront of launching energy efficiency initiatives aimed at increasing the awareness and assisting its member hotels in achieving best-in-class energy efficiency. To this effect, MHRA has organised a number of

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<sup>35</sup> [www.investinginwater.org](http://www.investinginwater.org)



seminars in recent years as follows:

- Seminar on dealing with Maximum Demand which focussed on best practices in adopting operating procedures and the use of Building Management Systems to control and curb peak usage of electrical power;
- Seminar on Energy Efficiency Technologies, which focussed on applicable energy efficiency technologies and their proven benefits by presenting case studies within the local hotel sector. The technologies presented included heat pumps, LED, energy recovery systems, room energy management systems, building management systems, IE4 motor technology and inverter technology.
- Seminar on Study of Energy Use within the Hotel Sector and ESCO Funding: A study carried out in 2014/2015 was presented to the Hotel sector which showed the status of energy efficiency. Hotels were presented with analysed data which indicated where intervention could be made by the adoption of technology that would benefit in increased energy efficiency and lower utility costs. The concept of ESCO funding for energy efficiency projects was also launched and explained.

Furthermore, MHRA in conjunction with OPM (Energy and Projects) and the Agency has just launched BEST (Benchmarking Energy Sustainability Targets) - a programme aimed at establishing the local hotel sector as a leader in energy efficiency in the Mediterranean. The project will include a Reward Scheme that will allocate funds for future Energy Efficiency Projects undertaken by hotels based on a points system accrued by achieving benchmarking targets of energy key-performance indicators. The project will set off with a study to establish benchmarking categories for like hotels and to establish the KPI criteria. A software will be created to allow the hotels to upload and monitor their performance which will also be normalised to take into account environmental parameters such that year on year analysis will be relevant. The software will also provide information that can be downloaded from the project website which will assist in drawing up energy efficiency policies and create awareness training. A software technology tool will be included that will assist hotels to analyse the return on investment of applying different energy efficiency technology projects.

#### General Retailers and Traders Union

GRTU has been active in the RES sector in the past years promoting and lobbying in favour of renewable energy leading to energy savings at consumer level. In the last three years, the main achievements were the following:

- The number of certified GRTU APPROVED retailers grew to 20. GRTU APPROVED is a certificate which ensures that approved retailers meet a certain level of quality in installations. Apart from the certification process, random checks are carried out to ensure quality is maintained at all times

- The launch of PVPFS (PV Purchase Facilitation Scheme) where a tri-partite initiative (GRTU as the main promoter, Retailers and a local bank) made it possible for low-income families to purchase a PV system. The scheme was very successful; in fact, over 2,300 households purchased a PV system through the scheme. GRTU is currently seeking to reach a new agreement with a bank in order to re-activate the scheme.
- Together with the Malta Competition and Consumers Affairs Authority and various other stakeholders, two Standards on the installation of Renewables were published by the Authority resulting in Malta having its own Standards for PV installations, tailor made for Malta's specific conditions. The standards clearly lay out best practices for improved quality, safety and aesthetics in PV installations.
- Various meetings and information sessions were held with various stakeholders, including the Planning Authority, REWS, OHSA, MCCA, Malta Enterprise and others. Regular meetings with ministries are also held to lobby for funding for various schemes such as domestic PV grant scheme and feed in tariffs for larger installations.

The GRTU is now expanding its promotion strictly beyond renewable energy savings to address other possible action for instance:

- With financial assistance from the Ministry responsible for energy, GRTU organized a series of events during various trade fairs whereby retailers participated in a joint effort to promote the sector;
- Has given assistance in laying out conditions for the Energy Audit Voucher Scheme as well as assistance in the promotion of it.

### **3.1.5 Availability of qualification, accreditation and certification schemes**

Malta has always considered its workforce as its most important resource. Over the years, a holistic robust system, spanning tertiary education (including post-graduate) down to technical school level has been developed. This has ensured the availability of a technical workforce that is basically capable of meeting the requirements arising out of the implementation of the EED, with only limited amount of informative training, focussed on specific demands of the Directive being necessary in most cases.

Malta's existing certification scheme, administered by the Regulator, covers the certification of renewable energy systems installers, energy auditors and energy managers.

During consultations leading to the establishment of mandatory energy audits, defining the best possible assistance to SMEs and household advisory programmes, it was evident that the public authorities had to make available a good number of competent auditors in a relatively short time to meet the demand

for auditors and energy managers. Practicing professional engineers needed to be informed and assisted to be able to conduct energy audits in a structured way to the standards set in the Directive and otherwise manage energy. Training energy auditors and energy managers in line with the requirements of ISO 50002 and ISO 50001 was considered as the best way forward.

Government Notice GN 1302 (amended by GN 87 of 27 January 2015)<sup>36</sup> is the official Government Notice setting up the scheme. This GN includes:

- The scheme criteria;
- The criteria for registration of training courses (the training provider, adequate technical facilities, theoretical and practical parts, refresher courses);
- Eligibility (qualifications) of trainees;
- Course contents; and
- Publication of official list of certified candidates.

Relevant public authorities and entities, as well as associations in industry cooperate and where necessary complement each other’s work such that robust certification schemes are in place, while ensuring that conflicts of interest do not arise. Furthermore, before registering a course, the Regulator verifies that the proposed course complies with the specified requirements in the Government Gazette.

Transparency to consumers is ensured through the publication of all relevant certification details in the Government Gazette. The Regulator also keeps a list of certification/accreditation schemes together with the corresponding registered course providers published on its website.

A list of the existing certifications/accreditations is available in Table 8.

**Table 8 – List of Certifications/Accreditations**

	Energy Auditors	Energy Managers	Photovoltaic (Single and Three phase) technicians	Solar Thermal Installers
Who identified need	The Agency	The Agency	The Regulator	The Regulator

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<sup>36</sup> [http://downloads.rews.org.mt/files/59b98640-c048-4b04-992a-7d5aea097268\\_dc49ce2e-f384-4435-80c9-8eab7e0b9cc2.pdf](http://downloads.rews.org.mt/files/59b98640-c048-4b04-992a-7d5aea097268_dc49ce2e-f384-4435-80c9-8eab7e0b9cc2.pdf); [http://downloads.rews.org.mt/files/d2fc7eb8-f918-4e3a-9d71-c0f87c36841a\\_aa278db9-4702-41f2-8eb4-1ad0e4fc0fc3.pdf](http://downloads.rews.org.mt/files/d2fc7eb8-f918-4e3a-9d71-c0f87c36841a_aa278db9-4702-41f2-8eb4-1ad0e4fc0fc3.pdf)

Who designed course	Private service provider in line with GN requirements.
Who approved course	The Regulator
Who delivered course	Private service provider
Who administers scheme	The Regulator

No other specific expertise, other than those in Table 8 has been identified as lacking or insufficiently available and so no new qualification, accreditation and certification schemes are being planned.

However, the recent focus on energy efficiency in buildings, requiring more substantial changes to the national building practices, was the subject of a comprehensive project - the main output of which was the publishing of a 'National Roadmap for Energy training for workers in the Building Industry'<sup>37</sup>. The project had the objective of charting a roadmap to equip the construction workforce with the knowledge, skills and competences required to qualify them to construct low energy buildings.

The exercise got underway with the identification of seven trades that are relevant to the subject at hand: Builder/Mason/Heritage Restorer, HVAC Technician,

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<sup>37</sup> <http://miema.org/projects/build-up-skills-malta-ieee/>

Construction Technician, Building Services Technician, Plumbing Technician, Facilities technician/manager, Construction site manager. Occupational profiles were developed for each of these trades. Following this, a Skills Gap Analysis was undertaken by comparing the skills provision of existing IVET courses to the identified requirements. The project found that there is lack of data about the green construction industry and that there is also potential for a higher level of awareness about RES and EE systems and the advantages of their use. The report continues that although the benefits are widely understood, the lack of awareness has caused companies to be cautious in investing in the relevant training. A sector composed of micro companies further aggravates this issue, as training would cause considerable strain on their human resources and financial capacities. <sup>38</sup>

### **3.1.6 Energy Services**

There are many companies operating in Malta that provide an energy service, but the concept of financing the investments through energy savings has not yet taken off. This is due to the generally low energy intensiveness, structure and ownership of local enterprises and the availability of alternative sources of finance.

The Government has explored the possibility of adopting energy service contracts in the public sector but no clear-cut case for their effectiveness could be established. The private sector also had similar experience and so far no concrete results have materialised.

As an initial exercise to explore the possibility of energy performance contracting in the public sector, the Government approached an international energy service firm to analyse the energy consumption of three public buildings. Two of these had an annual consumption exceeding the figure of 107 kWh/m<sup>2</sup> established as 'good practice energy consumption' in the report under Article 5 of the Directive, whilst the third was a relatively new building that exceeded 80 kWh/m<sup>2</sup>.

The exercise started in February 2016, after documental and technical data was gathered in order to define the significant energy loads for each site. The building energy loads were monitored for a 4-month period covering the summer season, which translates in peak demand mainly due to air-conditioning usage. At the end of the monitoring period, assumptions used in the energy models were validated and any corrections applied to the savings and proposals estimates.

Once the analysis part of the audit was completed, several energy saving proposals were investigated by preliminary calculation of potential: energy, CO<sub>2</sub> emissions and economic savings. The preliminary implementation costs were also estimated and the potential issues of each proposal were noted in order to define

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<sup>38</sup> [http://www.buildupskills.eu/sites/default/files/national\\_projects\\_documents/BUS\\_MALTA\\_-\\_NSQ\\_REPORT\\_-\\_FINAL\\_-\\_website.pdf](http://www.buildupskills.eu/sites/default/files/national_projects_documents/BUS_MALTA_-_NSQ_REPORT_-_FINAL_-_website.pdf)

a qualitative priority ranking for energy conservation measures in each site.

As expected due to the low energy consumption of the Maltese public buildings, the return on investment for the majority of the proposed energy saving measures was quite low. Consequently, in some cases the payback time exceeded the expected building or improvement lifetime. The Office of the Prime Minister - Energy and Projects and the Agency are taking due account of the report handed in by the international service company in order to determine the next steps, if any.

As regards energy performance contracting in the industrial and services sector in the period 2014 to 2017, interest was shown by a few national and international energy consultancies and/or service companies. However, no concrete projects have materialised.

In February 2017, a public consultation on Energy Performance Contracting<sup>39</sup> was launched by the Agency. The Public Consultation document explained what is meant by Energy Performance Contracting, the European Code of Conduct for Energy Performance Contracting and provides information on the International Performance Measures and Verification Protocols. The consultees were asked for input to queries raised in the end of the document. It is expected that input to the public consultation would help the Agency analyse, gain knowledge of any existing barriers, and shed light on how these may be addressed.

### **3.1.7 Other energy efficiency measures of a horizontal nature**

Article 19 asks the Member State to evaluate, and if necessary take appropriate measure to remove regulatory and non-regulatory barriers to energy efficiency on two fronts: the first relates to the split of incentives between the owner and the tenant of a building or among owners and the second to the financing of energy efficiency measures in the public bodies. The latter has already been described in the previous section where information is given on the possibilities of energy performance contracting currently going on. On the first point a series of actions were taken explained in 3.1.7.1.

#### **3.1.7.1 Split incentives**

The necessity was felt to discuss and assess the national situation with all stakeholders concerned with the aim to commission a formal study if necessary. The most relevant stakeholders were identified, namely National Statistics Office, the Malta Developers Association and the Federation of Estate Agents, and

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<sup>39</sup>  
[https://socialdialogue.gov.mt/en/Public\\_Consultations/OPM/Pages/Consultations/EnergyPerformanceContracting.aspx](https://socialdialogue.gov.mt/en/Public_Consultations/OPM/Pages/Consultations/EnergyPerformanceContracting.aspx)

discussions have started separately with each respective entity.

Through the meetings, the Agency started to obtain knowledge of the market. The statistics office data shows that the number of homeowners in Malta is very high and hence the issue associated with split incentives is limited. Further still, typically the majority of new rentals are short-let - maximum 3 years - so there is no incentive for tenants to make any investments.

Discussions held with the stakeholders and response from the market indicate that the landlord needs to be further informed to be able to invest in energy efficiency measures. Given the lack of data available, it was decided to conduct a study to assess in more detail the situation as well as propose any feasible solutions. The terms of reference for such a study are being drafted.

### *3.1.7.2 Street lighting*

In 2013, an exercise was started to replace all the country's street lighting to the more efficient LED lighting. The island of Gozo was chosen for the pilot project and involved the collaboration of the Agency, Transport Malta and the Gozo Regional Committee. The project consisted of the replacement of roads and street lighting (over 5,000 lamps) from the existing lighting luminaries to LED's. The existing lighting infrastructure, i.e. the poles and the cables, were retained and only the light fittings were replaced. The project saw also the introduction of smart lighting, including dimming capability. The Gozo pilot project was completed in 2015 and a second and third project are planned to be finalised by 2020. The second project involves replacement of 3,000 lamps in distributor and arterial roads while the third project will be a public-private partnership for replacement (in stages) of all the remaining street lamps in Malta.

## **3.2 Energy efficiency measures in buildings**

During the period under review a series of policy measures were taken in order to set benchmarks for the building sector.

### **3.2.1 Nearly Zero Energy Buildings Plan (NZEB) for Malta**

The NZEB plan<sup>40</sup>, issued in August 2015, states that the proportion of energy consumed by buildings is the lowest in Europe, with consumption for households in 2013 generating 17% of total carbon emissions. This equates to around half of the EU28 average consumption. Only a portion of the energy consumed by households is used for space conditioning, lighting and hot water, with the larger

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<sup>40</sup> <https://secure2.gov.mt/epc/file.aspx?f=131>

proportion relating to plug-in loads.

The Plan proposes the following definition of an NZEB:

*A 'nearly zero-energy building' is a building with a very high energy performance. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site. The 'energy performance of a building' is the calculated amount of energy needed to meet the energy demand associated with a typical use of the building, which includes, inter alia, energy used for heating, cooling, ventilation, hot water and lighting. The energy performance of a building is defined by a numeric indicator of primary energy use, based on primary energy factors per energy carrier as defined in the national calculation methodology, which are based on national annual weighted averages and specific values for onsite production.*

*The energy performance of nearly zero-energy buildings will be such that the primary energy balance will not exceed 220 kWh/m<sup>2</sup>yr, except for dwellings which shall have a higher energy performance. The primary energy balance requirement for dwellings shall be set according to building typology such that the renewable energy potential according to dwelling typology is taken into consideration. The mean primary energy demand requirement for dwellings shall be 75 kWh/m<sup>2</sup>yr. Energy demands shall be calculated in accordance with the approved methodology and according to the following explanatory notes.*

Requirements for nearly zero energy residential buildings may be differentiated according to building category such that it is possible to take into account the differing capabilities of the building to achieve very low energy levels. In this regard, the lack of roof access for flatted dwellings is taken into account and different requirements are applied than those pertaining to terraced houses, semi-detached buildings and fully detached buildings. This is indicated in the following table.

**Table 9 – Requirements for NZEB (residential)**

<b>Building Category</b>	<b>Flatted Dwellings</b>	<b>Terraced Houses</b>	<b>Semi-Detached Housing</b>	<b>Fully-Detached Housing</b>	<b>Mean Energy Requirement</b>
<b>NZEB overall energy demand requirement (kWh/m<sup>2</sup>yr)</b>	115	75	55	55	75
<b>Renewable contribution requirement</b>	Yes	Yes	Yes	Yes	



The NZEB Plan acknowledges that Malta has a limited range of renewables which may be of use. The most obvious, especially for buildings, is solar-based renewables (mostly photovoltaic and thermal). However, due to shading and limited access to roofs, this cannot be applied across the board. On the other hand, scarcity of land militates against communal photovoltaic farms. It was due to this scenario, that the definitions of NZEB have been developed with two components: a basic mandatory component which is mostly due to the building fabric and efficient building services; and a component of solar-based RES to be applied whenever possible. As indicated in the definition the two components would reach a mean figure of 75kWhr/m<sup>2</sup>yr for dwellings and 220kWh/m<sup>2</sup>yr for other buildings.

### 3.2.2 Minimum requirements for building services in Malta

The Building Regulation Board was tasked with updating the Minimum Energy Performance Requirements as informed by cost-optimality studies done previously under the Energy Performance in Building Regulations. The documents issued, commonly entitled "Technical Guide F", have been drafted by a working group consisting of members from the Building Regulation Board, the Building Regulation Office and the Agency.

The 'Minimum Requirements' were listed in two guides, the first related mostly on the Building framework and the second on the building services. The new requirements came into force on 1<sup>st</sup> January 2016 and establish an overall primary energy requirement as shown in Table 10.

**Table 10 – Overall primary energy demand by building category**

<b>Building Category</b>	<b>Overall Energy (kWh/m<sup>2</sup>yr)</b>	<b>Primary Demand</b>
Dwelling – Mean Energy Requirement	85	
Non-Dwellings used exclusively as Offices	290	
Non-Dwellings with offices occupying > 50% of useful area	350	

### **3.3 Energy efficiency measures in public bodies**

#### **3.3.1 Energy savings investment in public buildings**

The public sector has energy savings on its agenda, as the impetus given by the Government on a National Scale is also reflected in the decisions of the managing public officers. These measures are usually very expensive in the sense that the actions deliver a small amount of savings when economic viability is given its due importance. Some examples include:

- i) Work done by the Foundation for Tomorrow's Schools in incorporating renewable and energy efficient technologies when planning new schools and refurbishments<sup>41</sup>;
- ii) Action taken by the Ministry for Education and Employment to invest in double glazing in 11 public schools improving the comfort level of the students;
- iii) Investments in replacing old air-to-air heat pumps in:
  - a. Various 'Day Centres' and local support offices<sup>42</sup> under the administration of the Ministry for Family and Social Solidarity;
  - b. The central administration building of the Ministry for Home Affairs and National Security and the Fire Stations; and
  - c. The Ministry for Gozo
- iv) Investment done by the Police Force in its Headquarters and Police Stations.

#### **3.3.2 Energy improvements of buildings owned and occupied by Central Government**

The implementation of Article 5 by the Building Regulations Board is an ongoing process. Walkthrough audits done by consultants to the Energy and Water Agency in December 2016 showed that significant changes to the buildings and their use have taken place making the results notified in December 2013 in need of updating.

#### **3.3.3 Purchasing by public bodies**

Regulation 6 in LN 196 of 2014 requires the Government (and other public bodies) to procure products, services and buildings in line with Article 6 of the Directive as long as it is consistent with achieving value for money, economic feasibility,

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<sup>41</sup> <https://fts.gov.mt/en/Pages/default.aspx>

<sup>42</sup> Agenzija Sapport

wider sustainability, technical suitability and ensuring sufficient competition.

In order to ensure that this requirement is adhered to, the Department of Contracts in collaboration with the Agency has issued a Procurement Policy Note (PPN)<sup>43</sup> targeting the obligations of Article 6 on procurement of products, services and buildings by these entities. The PPN addresses products covered by the Energy Labelling Regulations and the benchmarks set under the Eco-design Directive, office equipment, tyres, services and buildings. The PPN was addressed and circulated to all government Ministries, departments, public authorities and entities falling under Schedules 1, 2 and 3 of the Public Procurement Regulations. The PPN puts the same procurement obligations upon the Central Government and all other public bodies except for Local Councils. This goes over and above the requirements set in the Directive.

A monitoring system is being set-up by the Agency to ensure correct implementation of PPN.

### *3.3.3.1 Green Public Procurement*

The implementation of Green Public Procurement (GPP) in Malta was formalised in 2011 through the publication of the first GPP National Action Plan (NAP) which spanned from 2012-2014. The NAP established GPP targets for 18 product and service groups and proposed a series of measures for their attainment. The targets set out in the Plan were set to be incremental, in order to avoid potential market distortions and to allow sufficient lead-time for the market operators to adapt to the new government purchasing policy. The requirements on GPP apply to all public tenders falling within the scope of the Public Procurement Regulations irrespective of tender type, value, tendering procedure or the nature of the contracting authority.

In light of the developments in procurement policies, Malta's NAP is to undergo a review in order to reinvigorate and strengthen the GPP process in Malta. The GPP office's aim is to devise and launch a new and updated National Action Plan which takes into account the difficulties experienced thus far and offer a realistic and ambitious plan for the coming years.

A consultation sessions with prospective bidders, was carried out in the third quarter of 2016 in order to facilitate the implementation of green public procurement which can transform and lead markets into a growth territory.

The aim of these sessions was to inform relevant stakeholders of the new and revised criteria that will eventually be incorporated in the 2nd NAP, namely those for electrical and electronic equipment used in the health care sector, computer and monitors, indoor lighting, sanitary tapware, toilets and urinals, road design,

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<sup>43</sup> Policy Procurement Note No. 27. Available: <http://contracts.gov.mt/en/ProcurementPolicyNotes/Pages/ProcurementPolicyNotes.aspx>

construction and maintenance, and office building design, construction and management.

### **3.4 Energy efficiency measures in the economic sectors**

In line with one of the objectives of the Directive, Malta is looking to become more energy efficient particularly in the industrial sector with the main focus being the increase in energy efficiency within large enterprises, otherwise known as non-SMEs.

The National Statistics Office reports that the business demography for Malta in 2014 as 74,269 entities (96.8%) employing between 0-9 persons, 1,923 entities (2.5%) employing between 10-49 persons, 437 entities (0.57%) employing between 50-249 persons and 84 entities (0.11%) employing 250 persons or over<sup>44</sup>. The attitude towards energy efficiency in the economic sectors is generally driven by:

- Awareness raised by Government directly and other entities on its behalf through various activities and national support schemes;
- Consultancies readily available and offered to enterprises by engineering companies, the research institutions and others.

The three most consuming economic sectors are:

- NACE C - Manufacturing;
- NACE G - Wholesale and retail trade; repair of motor vehicles; and
- NACE I - Accommodation and food service activities

#### **3.4.1 Main policy measures addressing energy efficiency**

The industrial and services sector are the prime movers of energy efficiency, with some of them having annual self-imposed obligatory reductions in energy consumption. The Government has contributed to numerous actions in support of these economic sectors. The following sections are some examples of policy measures taken by Government to promote and disseminate energy efficiency action.

##### *3.4.1.1 Energy Efficiency Partnership Initiative (EEPI)*

The Agency is in contact with individual enterprises coming from various sectors of the economy represented by the Malta Business Bureau to discuss energy

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<sup>44</sup>  
[https://nso.gov.mt/en/News\\_Releases/View\\_by\\_Unit/Unit\\_B4/Business\\_Registers/Documents/2015/News2015\\_084.pdf](https://nso.gov.mt/en/News_Releases/View_by_Unit/Unit_B4/Business_Registers/Documents/2015/News2015_084.pdf)

efficiency and energy management in general.

Through the initiative, organisations are encouraged to enter into a voluntary agreement with the Agency, committing to implementing measures increasing energy efficiency on an annual basis. EEPI partners are required to report on energy efficiency measures implemented, along with increases in energy efficiency achieved. This information allows government to identify trends and facilitate policy-making.

Firms participating in the EEPI are recognised for their commitment towards environment and social responsibility and are granted use of an official EEPI logo for marketing purposes.

#### *3.4.1.2 Investment Aid for Energy Efficiency*

Malta Enterprise, the country's economic development agency, together with the Agency are working together to attract investment in projects to improve energy efficiency. Through the Energy Audit Voucher Scheme, enterprises can identify opportunities for energy savings and apply for funding through tax credits.

The focus of this initiative is being directed to specific economic activities, amongst which one finds manufacturing, wholesale and retail trade, accommodation and food services. Private enterprises are invited to propose projects which achieve a higher level of energy efficiency. Technologies considered for aid range from intelligent lighting systems, heat pumps, industrial pumps to process improvements.

#### *3.4.1.3 Government-Owned Industry*

##### Water Services Corporation (WSC)

Malta's water stress index is by far the highest in Europe. Currently 55% of the island's public network supply is desalinated seawater by the reverse osmoses process. Water is distributed by an extensive network of some 2,500km in length.

The water supply system of the Maltese Islands has over the years developed to meet the expanding needs of the population. Since it was set up 20 years ago, the Water Services Corporation has set as its main technical objectives rationalising operations, the control of leakages in the distribution system, adoption of new cost-effective technologies and the optimising of water quality to meet specific applications at least cost.

The water supply system is highly dependent on a series of pumping operations which varies from extracting water from groundwater sources to pumping process water through the various stages of the reverse osmosis plants. Even the sewage collection network, which in itself is predominantly a gravity system, still comprises a large number of sewage pumping stations distributed throughout the collection network to compensate for the undulating topography of the Maltese

islands. This situation makes the Water Services Corporation one of the major power consumers in Malta. The Water Services Corporation accounts for some 6% of the electricity consumed.

Accordingly, the Corporation is very conscious of the need of efficiency in all of its operations as most of these impart its energy footprint. As part of its continual effort to improve on its energy consumption, the WSC is undertaking a project to implement various measures in different sectors of its potable water supply and sewage collection systems.

Actions being taken to reduce energy consumption in the operations of water production and distribution include:

- Reduction of power requirements in the transfer and distribution of water through certain pipelines;
- Variable speed drives for groundwater production, distribution and transfer pumps; upgrading of reverse osmosis(RO) high pressure pumps and energy recovery systems; replacement of RO auxiliary pumps;
- Polishing of groundwater; reduction of seawater infiltration into the sewage collection network.

#### Wasteserv Malta Ltd

Wasteserv Malta Ltd is a Government owned company responsible for waste management, including the treatment and disposal of solid and hazardous waste. It operates engineered landfills, waste treatment plants, a thermal treatment facility and other installations.

The company is conscious of its environmental responsibilities and maximises recycling of waste, waste to energy harvesting and implementation of RES projects on its sites. Harvesting of heat energy is handicapped by the lack of demand for this commodity in Malta.

At the Sant Antnin treatment plant, energy is generated from waste gases obtained from the anaerobic digestion process. The amount of electricity generated is such that at times, the plant is self-sufficient in electric energy during night hours. The plant is also capable of delivering heat in CHP mode, which is primarily used in its internal processes and the heating of facilities at a nearby rehabilitation centre.

Wasteserv also operates a thermal treatment facility (TTF) to treat a wide range of waste fractions. It treats abattoir waste, clinical waste, refuse-derived fuels and industrial sludge to high environmental standards. An autoclave has been installed at the TTF. The autoclave is an alternative treatment process for animal by-products as opposed to the current incineration process. The by-products produced following the rendering process can be used as a fuel for the TTF which results in less fossil fuel consumption at the incinerator.

### 3.5 Energy efficiency measures in transport

In 2016, the Ministry responsible for transport opened up consultations for a National Master Plan. The Master Plan sets out the framework and the overall priorities which will guide transport investment in air, sea and land transport sectors over the next 10 years. It defines clearly projects which require further studies, operational changes, infrastructural and organisational measures and identifies where funds from national, European Union and other financing sources can most effectively be invested, in our transport system to help attain the long term strategic targets.

The plan will serve to guide transport's contribution to the physical, environmental, social, and economic development of the Maltese islands, while focusing on delivering a safer, secure, more sustainable and healthier transport system over the short to medium term, for the ultimate benefit of citizens, businesses and visitors to our islands.

The Agency contributed to the consultations steering efforts towards energy conservation. Together, policies are being included to reduce the vehicle fleet age, hence eliminate higher consuming vehicles whilst shifting to non-conventional fuelled cars, and encourage more sustainable modes of transportation.

#### 3.5.1 Policy measures focused at increasing energy efficiency in public transport

The public transport fleet is continuously being upgraded, introducing buses of the latest Euro Standards. The table below highlights the progression of the public bus fleet between 2014 and 2016.

**Table 11- Bus fleet progression**

	EURO 3	EURO 4	EURO 5	EURO 6	Others	<b>Total</b>
<b>2014</b>	47	1	206	0	30	<b>284</b>
<b>2015</b>	42	19	200	145	2	<b>408</b>
<b>2016</b>	18	18	190	178	1	<b>405</b>

Route rationalisation is part of the process of improving the public transport service whilst increasing its attractiveness. The overall aim is to achieve a modal shift away from the usage of private passenger vehicles. Over the past two years

the public transport operator carried over 83 million passengers, with 40 million passengers in 2015 and 43 million passengers in 2016.

To encourage youngsters to make more use of public transport, the Transport Authority has launched a scheme in which it refunds the travel costs for one year for those who turn 18 years old during 2017. The Authority will provide a refund for all types of routes and trips offered by Malta Public Transport including day trips, night trips and special routes.

Where physically possible, new cycle lanes are being introduced as part of the road infrastructure in new and refurbishment projects. A platform for bike sharing has been recently introduced by a private operator. There are 52 docking stations located in 10 localities, providing a low-cost, efficient and convenient way to travel.

### **3.5.2 Policy measures focussed at increasing energy efficiency in private transport**

At the end of December 2016, the stock of licensed motor vehicles stood at 358,947 up by 3.5 per cent over the end of 2015. The fleet is almost fully dependent on fossil fuels. <sup>45</sup> Apart from encouraging the use of public transport, the Ministry responsible for transport has launched various measures to improve the efficiency in the private fleet. A list of measures is provided below.

- The Ministry responsible for Transport has published schemes to incentivise owners to purchase a new private passenger vehicle while at the same time de-register an old vehicle in the same category. The scheme aims at reducing the overall number of old motor vehicles from the road, replacing them by cleaner, more efficient vehicles, thus reducing consumption and air pollution.
- Prospective drivers undergo a training programme which covers rules regarding vehicle use in relation to the environment. Local Regulations on Motor Vehicle Driving Licenses provide rules to drivers on the appropriate use of audible warning devices, moderate fuel consumption (eco-driving), limitation of pollutant emissions, etc. Further information on Driving Licenses can be found in the Fourth Schedule (Regulation 17) of Subsidiary Legislation 65.18.
- As from 1<sup>st</sup> January 2016, car drivers can drive selected motorcycles without the need to acquire a separate licence, following training. The motorcycle's

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[https://nso.gov.mt/en/News\\_Releases/View\\_by\\_Unit/Unit\\_B3/Environment\\_Energy\\_Transport\\_and\\_Agriculture\\_Statistics/Documents/2017/News2017\\_011.pdf](https://nso.gov.mt/en/News_Releases/View_by_Unit/Unit_B3/Environment_Energy_Transport_and_Agriculture_Statistics/Documents/2017/News2017_011.pdf)



cylinder capacity must not exceed 125cc and have a power rating of 11KW or less. The power/weight ratio for electric motorcycles must not exceed 0.15KW per kg. Motor tricycles' power must not exceed 15KW. Drivers must train with a certified motoring school for ten hours, seven hours of which will be practical. The motoring school will issue a certificate and the Transport Authority will update the licence with the national code 111. Drivers will not be allowed to carry a pillion rider. The measure aims to shift drivers to use smaller and more fuel-efficient modes of transport. Since the introduction of the measure 1716 drivers have been certified, 940 of which have registered a motorcycle in this category.

- A range of taxation measures supporting energy efficient transport are in place supporting the polluter pays principle. The aim is of having a cleaner, smaller and newer private passenger vehicle fleet on the road. Registration tax is calculated on emissions, the length of vehicle and its value. The annual circulation license is based on the vehicle fuel type and emission rating. Electric vehicles licenses are capped at a token rate.

The transport sector has been in continuous growth, reflecting the steady growth of the economy and population. All the actions and measure described above achieve significant energy saving. However, the NEEAP 2017 does not quantify these savings, as a study is still under way to more accurately estimate eligible savings. These savings may be included in future reporting.

## **3.6 Promotion of efficient heating and cooling**

### **3.6.1 Comprehensive assessment**

The Comprehensive Assessment of the Maltese heating and cooling demand and supply<sup>46</sup> based on the guidelines and methodology in the Directive Annex IX Part 1 and containing information set out in Annex VIII, was completed by end 2015 and duly notified to the Commission. The assessment sought to identify the potential of technically and economically feasible application of high efficiency cogeneration and efficient district heating and cooling.

The assessment was carried out by external consultants, with the close collaboration of staff from the Ministry responsible for Energy as well as input by relevant government entities and other stakeholders. The consultants' report is quoted extensively in this section of the NEEAP.

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<sup>46</sup> <https://ec.europa.eu/energy/sites/ener/files/documents/H%20%20C%20Comprehensive%20Assessment-%20Art%20%2014%201%20and%2014%203%20.pdf>

### 3.6.1.1 Methodology

The methodology adopted for the Comprehensive assessment, including the country-level cost-benefit analysis in accordance with Part 1 of Annex IX, followed the following sequence:

1. A detailed evaluation of the heating and cooling demand data for each of the different sectors – residential, services, industrial and agricultural – and the energy sources and technologies used to satisfy the demand was carried out. In this evaluation, data available in national databases for the year 2013 was used. Expert judgement and assumptions were made where necessary and/or where data was not available. The results were organised by sector, by energy use (space heating and cooling, and water heating) and by energy sources (diesel, LPG, electricity etc.). The demand was also mapped out on the basis of geographical breakdown based on Local Council jurisdiction.
2. Projections for the sectorial heating and cooling demand up to 2030 taking into consideration the current policy initiatives and measures were produced. To arrive to the projected demand for the residential sector, the refurbishment rate of buildings as well as the estimated new construction rate was used. Water heating demand was also linked to the number of persons in a household. For the services and industrial sectors (including agriculture), the EU's Energy Trends publication was used, incorporating other parameters and figures specific to Malta where appropriate.
3. An analysis of the characteristics of the heating and cooling demand was carried out to identify the maximum or technical potential for local climatic conditions and resources i.e. those elements of the demand that can be satisfied by existing or future high efficiency cogeneration, or waste-heat sources, possibly integrated within district-heating and cooling networks.

To identify those parts of the technical potential where benefits exceed the costs using technically suitable systems that may be considered under local climatic and environmental conditions, relevant cost-benefit analyses were performed, including financial and economic analysis. A series of 12 scenarios were identified and analysed in detail. The scenarios included the application of micro-cogeneration in the residential sector, high-efficiency cogeneration in particular areas of the services sector, collective application of cogeneration in the industrial sector using small district-heating network, and the utilisation of waste heat from sources still to be developed.

4. Consideration of a series of possible strategies, policies and measures to deliver cost-efficient more sustainable solutions to satisfy heating and cooling needs in the coming years (both towards 2020 and 2030), and other measures aimed at reducing heating and cooling demand. Based on this,

an informed assessment of the most effective technological choices for local circumstances can be made.

### 3.6.1.2 Results and conclusions

The conclusions of the comprehensive assessment and the identified economic potential for the various relevant technologies are summarised below.

1. The current final energy consumption for heating and cooling purposes is relatively too low<sup>47</sup> compared to what is needed to create favourable conditions for enhancing CHP and district heating. Despite the increase in final energy consumption for heating and cooling foreseen for 2020 and 2030, in particular in the services and industry sectors<sup>48</sup>, the final heating demand will likely remain low. With the expected low thermal demand, it does not now appear feasible to install such technologies. This is even more evident for micro-cogeneration that needs stronger demand.
2. The sensitivity analysis conducted in respect of changing fuel types and pricing and the cost of electrical power, possibly supported by feed-in tariffs, show that in some specific cases, especially with LPG-fuelled plants, e.g. in hospitals, it may become feasible to install CHP plants. The key elements to reach feasibility are the maximization of the heating energy use and the value of the power production.
  - a. CHP technology seems to have at best a marginal potential role in Malta, even when taking into account provisions of Directive 2012/27/EU of enhancing this technology and district heating<sup>49</sup>. The up-take of CHP technology as small-scale stand-alone installations is rendered even more difficult considering the market competition of equally efficient heating technologies, like heat pumps and condensing boilers. Nevertheless, the economic cost-benefit analysis drawn up in accordance with Directive 2012/27/EU showed some positive results for some scenarios involving CHP plants when considering environmental benefits and health externalities that

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<sup>47</sup> The final energy consumption for Heating and Cooling purposes in 2013 is estimated as just 685 GWh, of which water heating purposes consumes (289MWh) followed by summer air conditioning and cooling with (257GWh). Winter spatial heating consumption is relatively lower, showing clearly that the winter climatic conditions are very mild to say the least.

<sup>48</sup> The residential sector increase in demand will be limited by energy performance requirements for new and refurbished dwellings.

<sup>49</sup> Malta has practically no cheaply available indigenous resources of biomass or biogas, and currently there is no natural gas network to render the fuel supply cheaper than present options.

could receive a better evaluation in the future.

- b. It is evident from the sectorial heating & cooling demand and final energy consumption estimates carried out as part of this exercise, that the local climatic conditions impose a much higher summer cooling demand than the winter heating requirements. This cooling demand is entirely supplied by very efficient heat pumps which have practically flooded the Maltese residential and economic sectors. The recent reduction in electricity tariffs due to higher power generation efficiency, is resulting in a clear shift towards the use of these same heat-pumps for spatial heating purposes, a cheaper more efficient option than the use of LPG gas heaters used in the residential making it even more difficult for the penetration of micro-CHP in the residential sector.

#### *3.6.1.3 The role of heat market developments in this progress*

Given the history of heat demand in Malta, supported by the findings of this study, it is difficult to realistically foresee the development of heat markets in Malta. One-off installations and minor communal-building initiatives are the most that can be foreseen.

Conventional district heating or cooling networks have been shown to be not feasible in Malta in Malta's Comprehensive Assessment 2015.

On the other hand, communal (centralised building) heating and cooling system based on chillers/heat pumps possibly with a building energy management system have already been used and have been shown to be effective

### **3.7 Energy transformation, transmission, distribution, and demand response**

The projects and initiatives in the power sector mentioned in the preceding NEEAP have either been completed or are nearing completion. Malta's energy sector is undergoing significant upgrading in terms of efficiency, reliability, and protection to the environment, whilst ensuring affordable energy to all consumers and improved economic competitiveness.

Until recently, electricity generation in Malta was inefficient and costly, a significant proportion being generated by old steam-driven turbo-generators. Attaining the objectives envisaged by the Energy Union required drastic radical initiatives and heavy capital investments to overhaul the power sector. Maltese Authorities determined that the most appropriate strategy to achieve these objectives and retain the desired security of supply was to implement the following

combination of measures:

- i) replace part of the existing generation capacity with highly improved efficient gas plant;
- ii) switch from fuel oil to natural gas for power generation:- this required the construction of LNG facilities;
- iii) decommission ageing, inefficient plants;
- iv) pursue with the planned investments to upgrade the distribution network;
- v) Construction of an electricity interconnector with Sicily to access the European electricity market and link with the European grid;
- vi) Connect to the European gas network within the shortest possible time.

In implementing this strategy, for the first time, Government involved the private sector to attract substantial capital investments into the energy sector. Malta now has very efficient on-island flexible generation facilities driven by LNG and also the opportunity to import electricity. This had significant positive impacts, not only monetary, but also in terms of energy efficiency and climate benefits.

Energy-wise, Malta was until very recently a small completely isolated system. Supported by EU policy and funding, the electricity network has been connected to the European grid via Sicily since March 2015. During the construction phase of the new gas plant and the conversion of existing plant to natural gas, approximately half of the electrical energy demand during 2015 and 2016 was imported over the interconnector.

A pre-feasibility study and cost benefit analysis completed in 2015, identified a 22-inch diameter and 155km gas pipeline between Gela (Sicily) Italy and Delimara (Malta) as the most economically feasible option to interconnect Malta to the European Gas Network. The route identification study and basic design study of the infrastructure, together with the preparation of the necessary documentation for launching the environmental permitting procedure, is currently underway. Following its completion in June 2017, the next step is to formally launch the permitting granting process in both Malta and Italy in Q3 2017.

The 200MW electrical capability of the interconnector constitutes the largest source of energy supply to Enemalta (some 38% of total normal dispatchable capacity). However, experience has shown that the availability of power on the interconnector is subject to constraints of the electricity market in Sicily and network congestion in Italy. In addition, being an underwater cable there are risks of prolonged outages in case of faults. Therefore, when the remaining old inefficient generating plant has been decommissioned, the new efficient gas plant shall ensure system reliability and adequate generation capacity at all times, in conformity with prudent management of electrical systems which requires the respect of the 'N-1' security criterion.

Distributed generation is mostly limited to RES installations, mainly PV. An incentive to promote the uptake of small-scale cogeneration has been launched

following the conclusions of the Comprehensive Assessment as required by Article 14(1). Electricity generation from small- and large-scale PV installations is expected to continue to increase steadily reaching approximately 185 MWp generating circa 278 GWh in 2020, almost 11.5% of the gross final electricity consumption. The inherent intermittency of such renewable source shall definitely present challenges to network stability and shall require a revision and strengthening of the network infrastructure coupled with adequate back-up generation capacity. Notwithstanding this, generation from RES will continue to benefit from priority dispatch subject to system stability limitations, to ensure Malta is effectively in line with the trajectory set by Directive 2009/28/EC.

Enemalta in its role as the exclusive distribution system operator shall endeavour to see that the dispatch of different generation sources is carried out on an economic basis, with the aim of minimising the overall system costs. In order to prevent the inefficient use of resources, Enemalta has invested in dispatch optimisation software to ensure that the appropriate sources are dispatched, taking into consideration any physical constraints on the local network.

### **3.7.1 Energy efficiency criteria in network tariffs and regulations**

Pursuant to Regulation 21 of the Electricity Market Regulations, S.L. 545.13 which defines the powers and duties entrusted to the Regulator, as developed from the general objectives of the Regulator under Regulation 20 of the same regulations, the Regulator in carrying out its regulatory tasks is duty bound among other to:

*"helping to achieve, in the most cost-effective way, the development of secure, reliable and efficient non-discriminatory systems that are consumer oriented, and promoting system adequacy and, in line with general energy policy objectives, energy efficiency as well as the integration of large and small-scale production of electricity from renewable energy sources and distributed generation in distribution networks; and ensuring that system operators and system users are granted appropriate incentives, in both the short and the long term, to increase efficiencies in system performance".*

The Regulator has the power to ensure that the DSO does not impede the demand for and delivery of energy services or other energy efficiency improvement measures. To date, the DSO has never withheld any applications for connection to the network which satisfy the Electricity Supply Regulations, and the Network Code.

The Commission acknowledges and underlines that the specificities of the island of Malta as a small and peripheral electricity system with atypical characteristics and these are recognised by EU legislation. In particular, Malta has unconditional derogations from Articles 9 (unbundling of transmission system and transmission system operators), Article 26 (unbundling of distribution system operators), Article 32 (third party access), and Article 33 (market opening and reciprocity) of

the Directive 2009/72/EC.

In these circumstances, the market cannot adequately deliver the desired level of services, thereby consistent with this derogation, there is only one supply company and the “full cost recovery” method is adopted to develop the an all-inclusive regulated tariff structure covering the generation, distribution and supply of electricity. The approval of the tariffs by the Regulator is subject to the submission of a proposal for a review of tariffs by the DSO which has to be backed with justifications and measures to reach the target revenue. The underlying principles and procedure for the approval of the electricity tariffs are set by the Electricity Supply regulations S.L. 545.01 in particular Regulation 36.

As mentioned in more detail below, smart grids are still at the preparatory groundwork stage. The rollout of smart meters is in an advanced stage and Enemalta has embarked on a programme to integrate distribution nodes at high and medium voltage levels into a SCADA system.

### **3.7.2 System services and network tariffs and regulations**

Network regulations and tariffs do not hinder any move towards energy efficiency or RES, independent of its source. Generation from renewables and cogeneration continue to benefit from priority dispatch and adequate financial support (if appropriate).

The DSO is applying a progressive rising block tariff whereby higher rates per kWh consumption apply as consumption increases. The tariff also incorporates an appropriate mechanism whereby lean electricity consumption is rewarded whereby consumers are granted rebates if their consumption is below a stipulated level. Non-residential customers with high consumption have the option to be billed on a reduced tariff based on kVAh rather than kWh, thereby encouraging consumers to improve their operating power factor to save on their energy bills whilst decreasing the losses on the network and possibly contributing to lower investments in the distribution network infrastructure.

Currently, there are very limited practical possibilities to store energy on any scale, except for solar water heaters (SWHs) which are reasonably widespread. Their installation is encouraged through fiscal incentive schemes for households. The structure of the electricity tariffs indirectly encourages the use of SWHs as it incentivises reduction in consumption.

Battery storage is still not considered as cost-effective. However the current regulations do not preclude them from accessing the grid on a non-discriminatory basis. There is, however, as yet no direct support, but may be considered in the future.

Most RES in Malta that require connection to the electricity network are relatively small and residential. Their incorporation in the grid is catered for in Regulation

25(1) of the Electricity Market Regulations S.L. 545.13 whereby in compliance with (EED Annex XI 2), the DSO, where technically feasible and with regard to system stability, is required to guarantee priority access and priority dispatch of electricity generated from renewable sources.

This successful inclusion of electricity generation from distributed photovoltaic panels provides automatic reduction in peak consumption from fossil-fuel sources and is particularly useful to meet the soaring demand for air-conditioning use in summer.<sup>50</sup> This load peak-shaving effect has reduced the need for load shifting from peak to off-peak in summer.

### **3.7.3 Network regulations and tariffs to fulfil the criteria in Annex XI of the Directive**

#### *3.7.3.1 Network tariffs, Network costs and Demand Response*

Distributed generation is mostly derived from small and medium sized PV installations distributed across the electrical network territory. The DSO maintains that quantifying the benefits in terms of energy and other infrastructural savings (if any) is highly complex and laborious. Moreover, the DSO observes that with the sharp increase of PV installations, it has abandoned its program of transformer downsizing until a detailed review of the network is completed.

The DSO remunerates all renewable energy exported to the grid with its proxy for the market price (as defined in S.L. 545.31); likewise, it may remunerate demand reduction if the exercise price is lower than the cost of the marginal generation source. Demand-side response (DSR) generally has a high exercise price and would compete with high-cost peaking units rather than base load plants such as the case with local plants.

The current tariff system (progressive rising block) has proven to provide a fair deal for customers and supplier. In view of the overhaul in the power sector including the improvement in efficiency in generation and supply of electrical power, the tariffs were revised in 2014/2015 and consumers both residential and commercial, benefitted from a 25% reduction across board.

Malta has a regulated tariff mechanism which provides the necessary comfort for both consumers as well as the sole electricity supplier (Enemalta plc). This made it possible for Enemalta to enter into a long-term agreement with the private sector for the construction of a high efficiency gas-fired generation plant and the provision of an LNG facility in order to guarantee Malta's security of supply whilst enabling the decommissioning of ageing, inefficient, electricity generation units.

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<sup>50</sup> See 'The National Renewable Action Plan – 2015 – 2020 Consultation Document'.



The limited demand, largely isolated power system, no liquid electricity market, and relatively flat on-island production costs, leave little room for dynamic pricing.

### 3.7.3.2 *Energy efficiency in network design and operation*

So far, Malta has no gas networks. The inland gas demand potential has been treated in the feasibility study for the gas pipeline, however as explained earlier the implementation of a gas network does not seem promising due to low seasonal demand and congestion of services in Malta's roads.

In 2014, the DSO launched the implementation of a multi-million project to consolidate the national electricity distribution network.<sup>51</sup> This investment will achieve the following objectives:

- Network resilience: Enemalta will attain an improved level of redundancy to reduce electricity supply disruptions to customers, whilst providing a quicker response to resolve natural faults, accidental or storm damage and other network disturbances.
- Increased capacity: As the country's electricity demand continues to increase, Enemalta needs to ascertain adequate network capacity to maintain an optimal level of service to its current and future customers.
- Adopting new technologies: At every stage of this project, Enemalta will be adopting the latest technologies in power transmission, protection and control equipment to increase the efficiency of its operations and augment its health and safety standards

As regards upgrading of the electricity network, Enemalta has produced a 'Distribution System Low Voltage Network Plan (2014 – 2020)'. The Plan details how Enemalta Corporation plans to develop its LV distribution network in the period 2014 – 2020 and its major objectives relevant to issues in the NEEAP are related to the reduction of network losses:

- Planned measures: Increase in the number of LV feeders;
- Transformer down rating at the rate of three per district per year;
- Load balancing of twelve feeders in each district per year and Use of compression connectors and IPC.
- A program for gradual replacement of line taps between different section of LV feeders with a target of 750/year for those areas where this is most required has been set. Replacement of LV aluminium feeders with 70mm copper.

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<sup>51</sup> <http://www.enemalta.com.mt/index.aspx?cat=20&art=257>

### 3.7.3.3 *Financing of energy supply measures*

As mentioned earlier, implementing Malta's energy strategy required an overhaul of the generation capacity to achieve higher efficiency in transformation whilst strengthening the security of supply. This required considerable capital investments including a Malta-Sicily 200MW interconnector, a new 215MW gas-fired CCGT plant, conversion of existing 149MW diesel-engine plant to run on natural gas and an LNG facility.

The EU through the European Energy Programme for Recovery (EEPR) part financed to the amount of €20 million the manufacture and supply of the high voltage submarine cable which was laid between Malta and Sicily, to interconnect the Maltese and European electricity networks, which was estimated to cost €200 million, and which became operational in March 2015. The greater part was financed by Enemalta as a public corporation. The interconnector has a 95 km route running sub-sea making this one of the longest high voltage alternating current (HVAC) submarine cables in the world, operating at 220kV and capable of transmitting more than 200MW.

The 215MW CCGT plant was constructed by a private investor, Electrogas Malta Ltd (EGM) following a competitive process, through which it was awarded a long-term power purchase agreement and a gas supply agreement. A tripartite Security of Supply Agreement (SSA) was also signed between the Government of Malta, Enemalta and EGM. The project and relevant agreements were endorsed by the European Commission. The Commission recognises that the entrustment of a public service obligation (by Enemalta) to EGM constitutes a genuine service of general economic interest (SGEI).

These agreements were regarded as crucial to attract the necessary investment given the clear market failure. The newly built plant uses state of the art technology to achieve best-in-class efficiency, and led to the decommissioning of old, inefficient generation units. It also provided the necessary security of supply level.

The August 2014 Enemalta act made a provision for the transfer of all the assets, rights, liabilities and obligations of Enemalta Corporation to Enemalta plc and to continue to act as the designated Distribution System Operator. Furthermore, the Government of Malta entrusted Enemalta with the public service obligation (PSO) to provide and maintain a reliable and continuous source of supply of electricity in Malta.

In line with Malta's strategy to shift generation to natural gas, existing efficient diesel-engine plant are being converted from the use of heavy fuel oil to natural gas, benefitting the island in terms of environmental improvement and reduced GHG emissions. The capital investment for the conversion is estimated at €70 million and is being privately financed.

The indicated projects helped Enemalta improve its economic outlook and focus on its distribution network, and in 2014 launched the implementation of a multi-million euro project to consolidate the national electricity distribution network. The project, estimated at some €80 million, has the objectives to attain network resilience in coping with faults and increase capacity to meet demand, while adopting the latest technologies in power transmission, protection and control equipment to increase the efficiency of its operations.

Electricity generation from PV's is a principal contributor to meeting Malta's renewables target to 2020. Malta's limited physical space constraints dictated the development of small and medium sized roof mounted installations on residential and commercial areas. The relatively high-levelised cost of energy of the technology compounded with issues of economies of scale has ever since the introductory phase required varying levels of support. Support schemes are issued periodically in line with State Aid Guidelines. Support schemes are usually in the form of feed-in tariffs and/or grants for both residential and commercial systems. Feed-in tariffs are funded from central budget, while ERDF funding is mostly used to fund grants.

Recently the European Commission approved Malta's scheme (maximum budget of €140 million over 20 years) to support large-scale renewable energy installations (=>1MW). This would be paid in the form of a premium above the market proxy price<sup>52</sup> of electricity over the 20 year guaranteed support period. Support shall be allocated through a competitive process.

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<sup>52</sup> There is no wholesale electricity market. A market proxy price is used instead.

# Annex I

Category of Measure	Measures		Cumulative End Use Energy Savings in the year 2017, kWh	Cumulative End Use Energy Savings in the year 2020, kWh			
Energy Efficiency Obligation Scheme	EMC-2	The Progressiveness of the Domestic Residential Household Tariff System	16,352,000	28,616,000			
	EMC-3	The Incentive towards Energy Efficiency in the Tariff Structure (Eco-reduction)					
Public Sector leading by example	P-1	Street Lighting Retrofitting (Gozo)	14,955,996	64,816,493			
	P-2	Street Lighting Retrofitting (All Malta) - ERDF					
	P-3	Street Lighting Retrofitting (All Malta) - PPP					
	P-4	Energy Efficiency Measures in ICT					
	PB-1	Retrofitting of Energy Efficient Measures in Public Schools					
	PB-2	Retrofitting of Energy Efficient Measures at St. Vincent De Paul – Rehabilitation Centre & Old Peoples’ Home					
	PB-3	Retrofitting of Energy Efficient Measures at Malta Police Force Buildings					
	PB-10	Tal-Qroqq National Pool Complex - Energy Efficiency Project					
	PB-11	Lighting for Reduced Carbon Footprint					
	PB-12	Energy Efficiency at MFSA offices					
Financing Schemes and instruments and fiscal incentives	WSC-1	Reduction of Power Requirements in the Transfer and Distribution of Water through Various Pipelines	235,652,079	691,748,336			
	WSC-2	Reduction of Power Requirements through the Use of Variable Speed Drives for Groundwater Abstraction Pumps					
	WSC-3	Upgrading of RO High Pressure Pumps and Energy Recovery Systems					
	WSC-4	Reduction of Power Requirements through Replacement of RO Auxiliary Pumps					
	WSC-5	Replacing Desalinated RO Water by Groundwater					
	WSC-6	Reducing Electricity Consumption through the Elimination of Seawater Infiltration in the Sewage Collection Network					
	WSC-7	Upgrading the Quality of Treated Sewage Effluent to Replace Desalinated RO Water for Non- potable Uses					
	WS-1	Rendering Plant (Autoclave) for Animal Waste in the Civil Abattoir					
	RSB-1a	Incentive Scheme for Building Envelope Improvement (Double Glazing)					
	RSB-1b	Incentive Scheme for Building Envelope Improvement (Roof Insulation)					
	RSB-2	Energy Efficiency in Low Income Houses in MED Grant Scheme (following already-completed Energy Audits)					
	RSB-3	Scheme for the Installation of Heat Pumps (Domestic)					
	RSB-4	Energy Efficiency for vulnerable groups					
	TR-1	Grant Scheme to Improve Vehicle Fleet Efficiency					
	TR-2	Grant Scheme to Improve Vehicle Fleet Efficiency					
	PS-8	Energy Efficiency Support Scheme					
	RE-1	Solar Water Heaters					
	RE-2	PV generation self consumption					
	Regulations and Voluntary Agreements	VA-1			Energy Efficiency Partnership Initiative	74,498,728	149,498,728
					<b>Total</b>	<b>341,458,803</b>	<b>934,679,557</b>