

# Integration of electricity from renewables to the electricity grid and to the electricity market – RES-INTEGRATION

## National report: Malta

Client: DG Energy

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# RES-INTEGRATION – Country Report Malta

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## Interviewed Experts

We would like to thank all interviewed experts for their very valuable input and their support for this study. We highly appreciate their expert knowledge and their availability in the framework of the RES Integration Project on behalf of the European Commission.

For this country study, the following organisations / experts provided a contribution:

Enemalta Corporation (Enemalta)

Malta Resource Authority (MRA)

Charles Yousif, Malta Energy Efficiency and Renewable Energy Association (MEEREA)

The Malta Intelligent Energy Management Agency (MIEMA) was also contacted. Despite the numerous calls and emails requesting an interview and underlining the importance of this project, the author of this report was not able to obtain an interview with them.

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## Executive summary

Grid connection	
Effect on integration of RES-E	Negative
Obligation to reinforce if necessary	No
Distribution of costs	Deep
Relevant grid level	Distribution grid
Main barriers to integration	Inefficient administrative procedures Insufficient special planning Competing public interest

Grid operation	
Effect on Integration of RES-E	Neutral
Purchase obligation	Yes
Occurrence of grid curtailment	Common
Main barriers to integration	Grid not connected to the EU grid Potential problems when wind farms/large PV projects come online

Grid development	
Effect on Integration of RES-E	Negative
Regulatory instruments	Sufficient
Nationwide grid development studies	Existent
Main barriers to integration	Short-term planning Planning permits and financing

Market design	
Functioning markets	No competitive market
Intraday market and gate closure	Not available
Main issue	Too small to become a market by itself

Support scheme	
Support scheme	Two options of feed-in mechanisms: based on net-metering with spill-off rates equal to feed-in tariff or full sale of RE electricity at feed-in tariff rate with a ceiling on the amount of energy generated
Market integration and/or risk sharing elements	Not available
Balancing responsibility for RES producers	None

Table 1: Overview on grid and market integration Malta

There are rules and procedures for connection of RES-E plants to the grid in place in Malta. Their application, however, is only theoretical, as they refer to large RES-E plants, which are not present at

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the moment. As of now, most of RES-E generation is provided by small generation plants (e.g. rooftop-mounted PV systems) that do not require to follow the procedure laid out for connection. The remaining larger PV roof-top systems (>16 A per phase) would require a prior permit from the Malta Resources Authority (MRA). Given the size of the country, spatial planning and competing public interest pose two major barriers. Furthermore, administrative procedures are quite inefficient also due to the current sharing of responsibilities.

Electricity is guaranteed access to the grid, RES-E plants enjoy priority access and priority dispatching. The three consulted stakeholders disagree as regards curtailment: according to MEEREA, this occurs frequently, whereas Enemalta and MRA states that at present there is no curtailment on RES output. Rules on grid operation are laid out with large plants in mind, however it should be again underlined that in Malta, all RES-E plants are small installations that are not bound by such rules.

Planning permits and access to financing are indicated as being the most serious barriers hampering the development of the grid. Grid development studies exist, but only in the short term. As of now Malta is not connected to the EU grid and the infrastructure is able to cover the needs of the islands fairly well. In order to have large scale systems like the wind farm of *Sikka l-Bajda* (95 MW), though, it will be essential to connect Malta to the EU grid. At this time there is a project for building a 200 MW connection cable between Malta and Sicily that should be finished by 2013. Some studies are being undertaken for this wind farm, however mostly relating to the wind potential, seabed integrity and its impact on bird migration. The market and grid connection issues linked to this plant will be addressed at a later stage in the development of the plant.

There is no competitive market for electricity in Malta. The main support measures are grants and loans – instruments which are in other countries frequently used as supplementary instruments. These measures are directed towards small consumers who plan to build their own generation plant. For wind and PV plants the state offers a grant of up to 25 % capped at 230 Euro for wind energy, and a grant of up to 50% of the total investment capped at 3,000 Euro, for PV plants, per family. Additionally, there is a net-metering system with spill-off rates equal to the feed-in tariff for all RE electrical systems and reduced value-added taxes for PV and taxes for biodiesel. A feed-in-tariff is in place.

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## Renewable electricity deployment

In the overall context of this study, this chapter aims at providing a general introduction to the context for the deployment of renewable electricity in the target country in terms of electricity production, consumption, and grid operation.

Malta has an isolated power system. It is not included in ENTSO-E reports. Also for this reason, updated information is not always available in the same format used for other country reports of this study.

### *Current generation mix*

Based on available information, reaching up to 2004 (EC 2007), electricity generation is based exclusively on oil. In 2010 Malta generated 2,113 GWh of electricity (CIA 2011). According to the Maltese NREAP, in 2010 RES-E generation was forecasted to reach 14.89 GWh. This would imply a share of 0,007% of renewable electricity generation.

### *Electricity consumption*

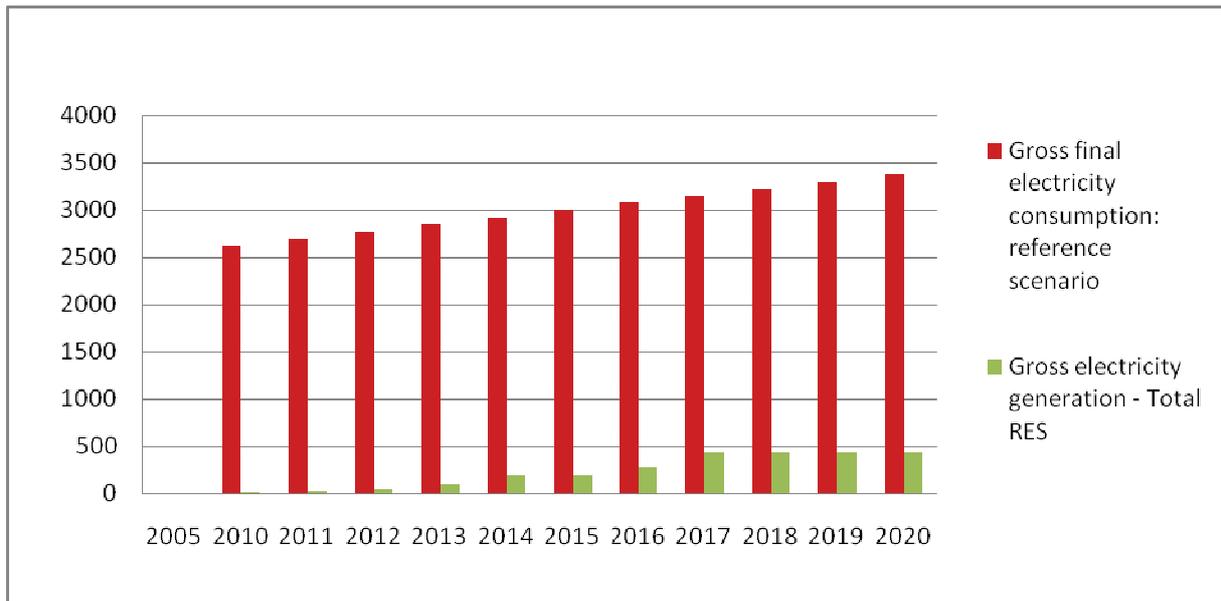
Malta consumed 1.99 TWh in 2010 (CIA 2011), i.e. 4.8 MWh per inhabitant, below the EU average of 6.2, MWh (ENTSO-E 2011, Eurostat 2011). In terms of electricity intensity of the economy, Malta in 2010 consumed 342.7 MWh/ million EUR GDP. This is substantially higher than the EU average of 257.7 MWh / million EUR GDP, and also higher than Cyprus and Greece with a comparable climate.

Considering the development of electricity consumption in time (EEA 2010), with an average growth rate of circa 4.2% in the period 1990/2007 Malta like other Mediterranean countries registered one of the highest growth rates in the EU, more than double than the average of the EU 27. The peak demand is usually in summer (MRA 2009).

### *RES-E share*

Chart 2 provides an indication of Malta's total electricity consumption and RES electricity production up to 2020, according to the submitted action plan (NREAP). In other words, this is not a forecast, but the plan according to the government.

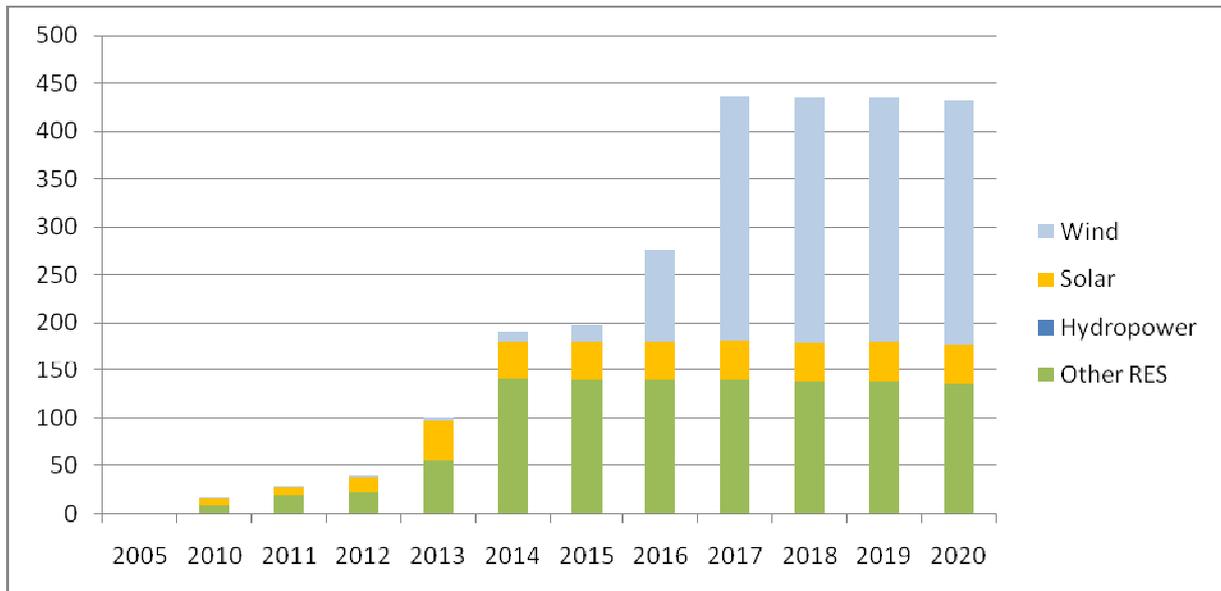
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**Chart 1: Electricity consumption and RES-E generation (GWh). Source: own elaboration of Malta's NREAP**

According to the Maltese NREAP, gross final electricity consumption is forecasted to grow from 2.7 TWh to 3.4 TWh (29% growth) between 2010 and 2020. RES-E production, in the same period, should grow from 14.9 GWh to 432.8 GWh (a 29-fold growth). Accordingly, the share of RES-E generation over gross final electricity consumption should grow from 0.57% in 2010 to 12.81% in 2020. Given the further increases in consumption, this impressive growth would nevertheless result in an increase of consumption from non-renewable generation and/or from net electricity imports from 2.6 TWh in 2010 to 2.9 TWh in 2020.

The evolution of renewable electricity generation is further broken down in Chart 3.



**Chart 2: RES-E generation (GWh). Source: own elaboration of Malta's NREAP**

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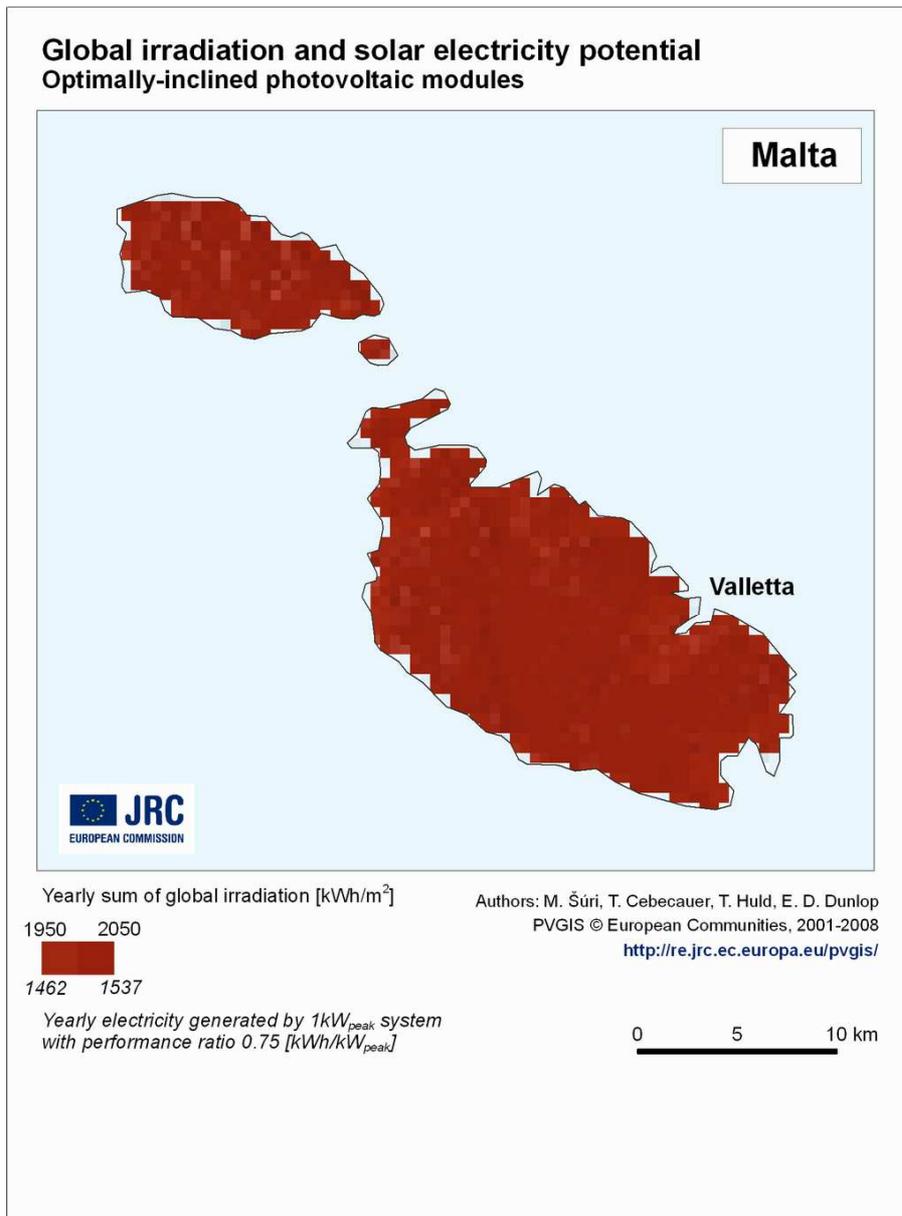
The largest part of the planned growth is expected from wind and biomass, with a significant contribution of solar PV. However, according to the Maltese authorities, the realisation of the wind plants (Sikka-l-Bajda) will depend on the connection to the European grid. If this connection is not carried out, the Maltese grid will have stability issues due to the variable generation of the planned 95 MW of wind farm (Malta Today 2011, MEEREA 2011).

### **Natural resources and geographical structure**

A number of studies on wind energy for different sites have been made in Malta. One of the main conclusions was that onshore wind will have limited contribution due to space limitations, whereas offshore wind could have better prospects. One of the largest potential offshore areas is Sikka l-Bajda, with an expected potential of 95MW. As of now there is one offshore wind mast to monitor and collect data. Two onshore wind farms are being studied, with a total potential of 14,4 MW (AEON).  
Moni

Malta has excellent solar resources, complementary to summer peak demand.





**Figure 1: Yearly sum of global irradiation on horizontal and optimally inclined surface, 8-years average of the period 2001-2008 [kWh/m<sup>2</sup>]. (Source: EC JRC 2007)**

In terms of installation of solar plants, there has been a huge leap from 2000 to 2010. PV plants are exclusively small rooftop installations, due to the size of the country and limited availability of space. PV has grown at an average yearly rate of 35% from 1995 to 2005 (1,8 kW to 40 kW) and of 63% between 2005 and 2010 (40 kW to 450 kW). The reasons for this large growth are twofold:

- A rise in electricity prices;
- The availability of grants (up to 50% in households, to a maximum of 3000€).

Thanks to grants available through the European Regional Development Funds, the construction of a number of PV systems, which cumulatively amount to 3 MW, has been tendered out with a 50%

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grant. These plants are distributed in small PV plants usually not larger than 100kW installed on various commercial/industrial buildings. These plants are in the process of being installed or are already connected to the grid (MRA 2011). Another project is being prepared, whereby public roofs amounting to a total useable area of 67,000 m<sup>2</sup> will be leased to install PV systems. This is not funded by the ERDF, but is following a similar process. In May 2011 the tender process between shortlisted tenderers was still ongoing (MEEREA 2011).

### ***Grid operators & dominant generators***

Enemalta is the corporation who takes care of generation and distribution and supply of electricity. As of now, Malta does not have a transmission network but only a distribution network (MRA 2011). With respect to this point, the European Commission granted Malta derogation from Chapter IV Article 20 (1) and 21 (1) of Directive 2003/54/EC (EC). Thus, Malta does not have to designate a Transmission System Operator. Further details on this point are provided on page 32.

### ***Interconnections, import/export***

Malta is not connected to the European transmission grid. Given this, no imports or exports of electricity can take place. Electricity consumed in the country is generated in the country.

### *Literature and other sources*

AEON (2010): *Assessment of non-cost Barriers to Renewable Energy Growth in EU Member States* (Germany). ECORYS, eclareon. Available at: <[http://ec.europa.eu/energy/renewables/studies/renewables\\_en.htm](http://ec.europa.eu/energy/renewables/studies/renewables_en.htm)> (last accessed on 11 May 2011).

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## Grid Connection

### Summary

There are rules and procedures for connection of RES-E plants to the grid in place in Malta. Their application, however, is only theoretical, as they refer to large RES-E plants, which are not present at the moment. As of now, most of RES-E generation is provided by small generation plants (e.g. rooftop-mounted PV systems) that do not require to follow the procedure laid out for connection. The remaining larger PV roof-top systems (>16 A per phase) would require a prior permit from the Malta Resources Authority (MRA). Given the size of the country, spatial planning and competing public interest pose two major barriers. Furthermore, administrative procedures are quite inefficient also due to the current sharing of responsibilities.

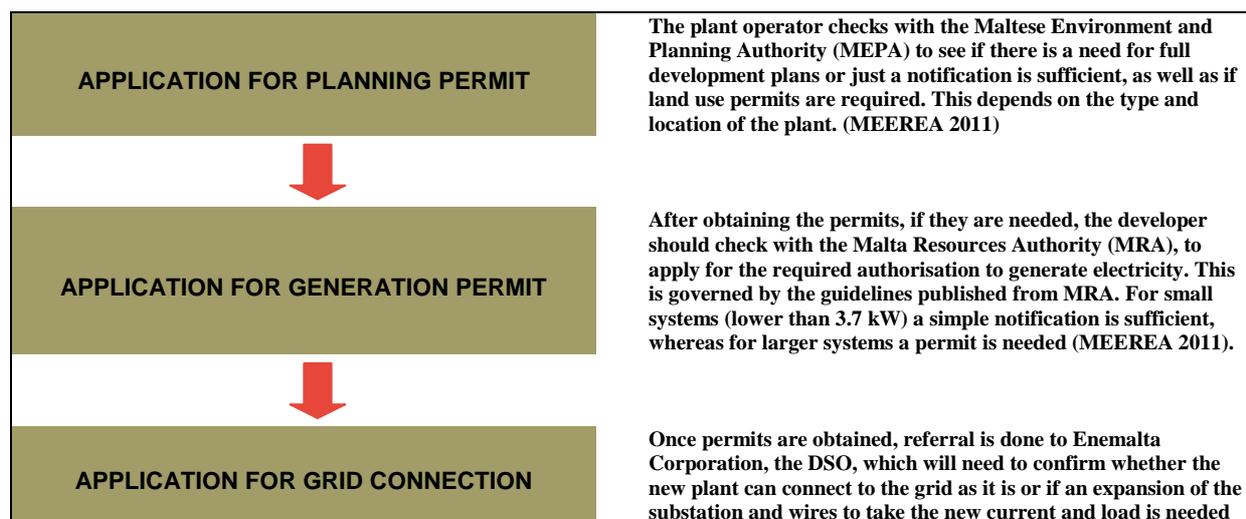
### Relevant legal sources

The Electricity Market Regulations 2011 indicates the network code of Enemalta Corporation as the main legal source for connection.

### Connection procedures, deadlines, and information management

Below, the procedure for connecting plants above 16 Amps/phase is provided. Installations below 16Amps/phase are exempted from the requirement to obtain an authorization for construction of the plant and from the need to hold a license to generate/sell electricity (MRA 2011). These installations are only required to send a notification of connection to the MRA (AEON 2010).

#### RES-E installations above 16 Amps/phase



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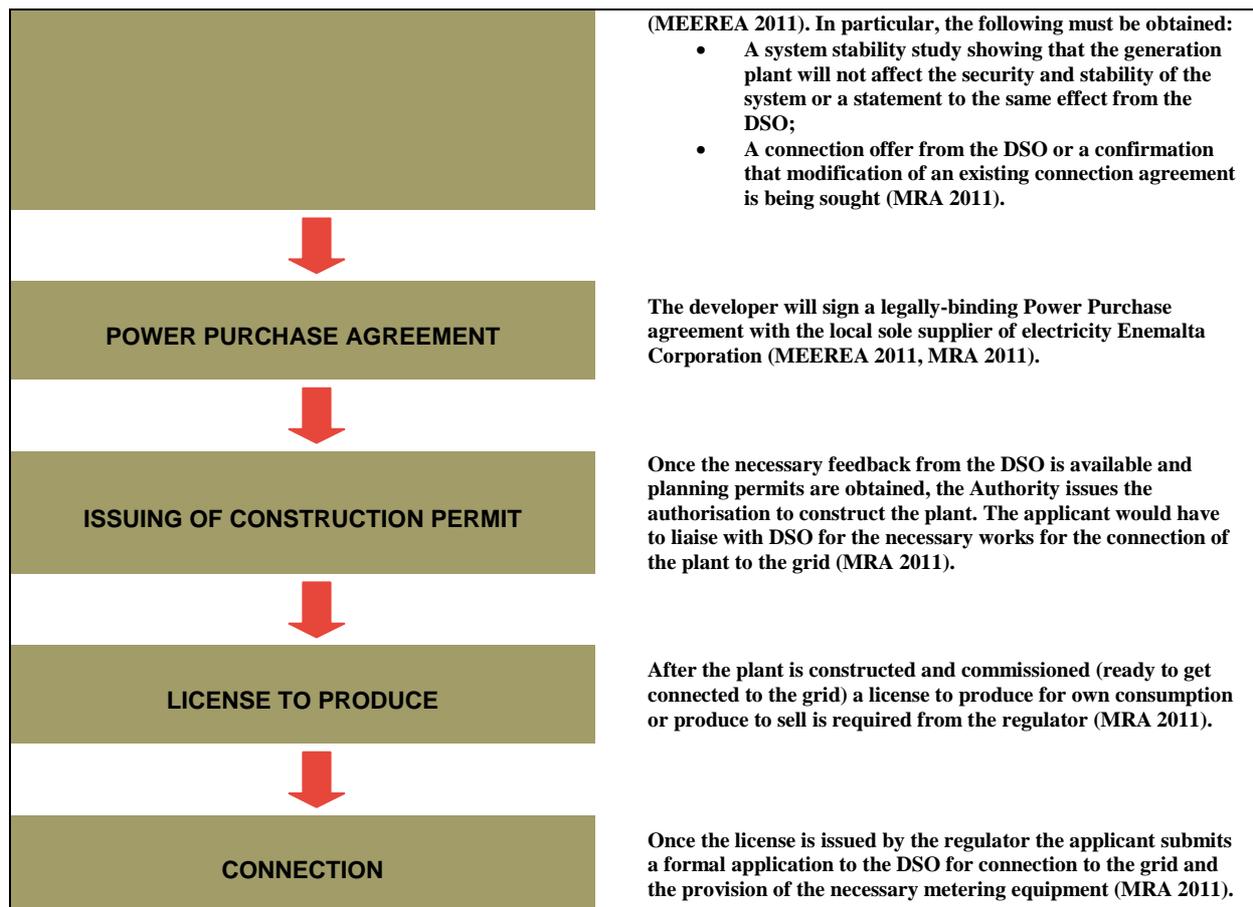


Diagram 1: Connection procedure of small and medium plans connected to low and medium voltage level

With respect to the planned wind farm of Sikka-I-Bajda, details for connection of offshore installations must still be set (MRA 2011).

### *Obligation, legal responsibilities and enforcement of legal rights*

The DSO is obliged to connect a plant; however, if the grid cannot offer sufficient capacity, the developer will need to bear the costs to upgrade the grid. Transparency of information in these cases is quite good (MEEREA 2011). The DSO is, in fact, obliged by the Electricity Market Regulations to provide any system user with the information they need for efficiently accessing the grid as well as to provide RES-E producers with the comprehensive and necessary information required, including:

- (a) a comprehensive and detailed estimate of the costs associated with the connection;
- (b) a reasonable and precise timetable for receiving and processing the request for grid connection;
- (c) a reasonable indicative timetable for any proposed grid connection (MRA 2011).

These rules apply to large-scale RES-E installations, however, so far applications from RES generators concerned mainly installations that did not require grid strengthening and hence there is still no practical experience yet in this regard (MRA 2011).

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In cases of disagreements (for example related to problems in feeding electricity into the grid) an arbitration procedure is defined by law. This is ruled by a lower level (ordinary) court (MEEREA 2011).

### *Costs of grid connection*

Malta seems to have a deep cost approach regime in place.

Normally the producer would have to pay for the connection to the grid. The methodology to determine the costs is regulated by the Electricity Supply Regulations.

The methodology for the sharing of the reinforcement costs is still under discussion (MRA 2011). In general, however, Enemalta will undertake the expansion works and then be compensated by the developer to whose benefit the grid was expanded (MEEREA 2011).

### *Problems*

The AEON study already highlighted the following barriers related to grid connection.

#### **Inefficient general administrative procedures**

Although the installation of **small PV panels** or solar heaters is rather straightforward and does not pose particular difficulties from an administrative point of view, **micro-wind turbines** are being somewhat limited in the built environment by MEPA because of the requirements, which includes a formal application for a building permit and may include a complete environmental impact assessment, which pose a large burden on the applicant. As for **large-scale projects**, a clear sharing of responsibilities is lacking, as MRA, MEPA and Enemalta refer to three different ministries and the responsibilities of each one are not clear to the other two (AEON 2010). Enemalta signalled its disagreement with this statement, as each of the three entities has specific roles (Enemalta 2011). In this regard, it seems prior to improve the communication between the subjects that have this shared responsibility and to agree on the areas of responsibility of each office. This, of course, should be done bearing in mind the current legal provisions.

#### **Inexistent or insufficient spatial planning, competing public interest**

The demographic and geographic characteristics of the country create issues of spatial planning alone, as Malta is a very small and densely populated state. Spatial planning, thus, takes into consideration the issue of devoting areas to RES, but often clashes with other planning needs. Large-scale RES installations are not possible in Malta, also for this reason. For example, the two onshore wind farms that are being studied, may not be implemented because of the destination of the area, which could be made a natural reserve, and because of its vicinity to a village, with consequences in terms of competing public interest. Furthermore, spatial planning is not done at a long-term level. A structure plan is publicly available at the website of the Malta Environment and Planning Authority, however this dates back to 1990 and does not take RES into consideration. Furthermore planning guidelines for

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micro wind turbines are also available, but do not consider larger plants. For the reasons mentioned above, large-scale (except offshore wind) approaches are not really possible in Malta. As for photovoltaic, the Government has tendered out the installation of photovoltaic panels on the largest possible scale (public buildings and schools). Once completed, no larger installation will be possible (AEON 2010). Furthermore, the lack of interconnection to the EU grid adds difficulties in undertaking large-scale RES-E projects, however this is being solved by establishing an underwater cable to Sicily.



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Barriers identified			Solution proposed	Detailed description (Page)
Stand Alone	Cause	Consequence		
	Physical lack of space	Difficult to undertake large RES-E projects	This aspect is a feature of the country, thus it cannot be solved.	17
	No interconnection to the EU grid	Difficult to undertake large RES-E projects	This issue is currently being solved through the cable from Malta to Sicily.	17-18
Unclear sharing of responsibilities as regards allowing connection			Improving communication.	17

**Table 2: Connection: Summary of identified barriers and proposed solutions to overcome barriers**

### *Literature and sources*

AEON (2010): *Assessment of non-cost Barriers to Renewable Energy Growth in EU Member States* (Malta). ECORYS, eclareon. Available at: <[http://ec.europa.eu/energy/renewables/studies/renewables\\_en.htm](http://ec.europa.eu/energy/renewables/studies/renewables_en.htm)> (last accessed on 24 May 2011).

Enemalta (2011): *Enemalta Corporation*. Email received on 16 November 2011.

MEEREA (2011): Yousif, Charles, *Malta Energy Efficiency and Renewable Energy Association MEEREA*. Interview on 2 May 2011.

MRA (2011): Anonymous, *Malta Resource Authority MRA*. Interview on 25 May 2011.

## Grid Operation

### *Summary*

Electricity is guaranteed access to the grid, RES-E plants enjoy priority access and priority dispatching. The three consulted stakeholders disagree as regards curtailment: according to MEEREA, this occurs frequently, whereas Enemalta and MRA states that at present there is no curtailment on RES output. Rules on grid operation are laid out with large plants in mind, however it should be again underlined that in Malta, all RES-E plants are small installations that are not bound by such rules.

### *Relevant legal sources*

The Electricity Market Regulations 2011 are the main reference in this context.

### *Obligations, legal responsibilities and enforcement of legal rights*

Electricity, regardless of the generation source, is guaranteed grid access (MEEREA 2011), priority access and priority dispatching are provided for RES-E generated electricity by the Electricity Market Regulations 2011 (MRA 2011). LN 422 2010 and successive modifications indicate that Enemalta has an obligation to purchase all electricity generated by PV systems under the FIT scheme, which will be paid the set tariff until a threshold has been reached (24,000,000 kWh for 2011).

The DSO is obliged to give priority dispatch to renewables in so far as the secure operation of the national electricity system permits and based on transparent and non-discriminatory criteria (MRA 2011). No specific obligations on RES-E producers to provide ancillary services, nor incentives for providing such services are currently in place (MRA 2011).

### *Grid curtailment*

Curtailment may occur in case the network is unable to take the load due to unavoidable technical faults (MEEREA 2011). The Electricity Market Regulations 2011 provide that the DSO shall ensure that appropriate distribution system and market-related operational measures are taken to minimize the curtailment of electricity produced from RES-E (MRA 2011). The DSO has to report to the Authority on measures taken with respect to curtailment of RES-E plants and indicate which corrective measures it intends to take (MRA 2011).

Curtailment problems might become more evident in the future as the government is now working on a project to lease 67,000 m<sup>2</sup> of public roof areas to private entities. According to a stakeholder, when this system comes online, larger challenges might arise, given this additional amount of variable

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generation (MEEREA 2011), whereas according to another one it is not expected that the mentioned project would cause curtailment problems since these will be small distributed systems (Enemalta 2011).

It is not yet clear whether curtailment will be regarded as a permanent solution for solving grid congestion issues or whether it will only be a temporary option (MRA 2011).

A compensation for RES-E producers for the period in which they are curtailed is currently not in place (MEEREA 2011, MRA 2011), the reason being that, according to Enemalta, as long as the reason for cutting power is unavoidable Enemalta does not believe they have an obligation to compensate producers, also in conformity with current legislation whereby Enemalta does not have such obligation (Enemalta 2011). Producers are also provided with statistical tables showing the historical power cuts data in the area, in order to be informed of how much of their power could be curtailed on a yearly basis (MEEREA 2011). The interconnection to Sicily could provide some positive effects in this regard, i.e. by reducing the need for curtailment, though a more extensive analysis would be needed.

### *Problems*

The electricity grid in Malta is not interconnected and hence the integration of large variable RES generators could be problematic given also the demand load profile. An interconnection with Europe is planned to be in operation by 2013 and this is expected to improve the robustness of the grid and balancing. Presently this is not such an issue given that RES plants being connected consist mainly of small PV installations (MRA 2011).



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Barriers identified			Solution proposed	Detailed description (Page)
Stand Alone	Cause	Consequence		
Frequent curtailment			This barrier could be mitigated with the connection of the grid to the European one through the underwater cable to Sicily.	22
Issue of curtailment more problematic in the future			This barrier could be mitigated with the connection of the grid to the European one through the underwater cable to Sicily.	22
No compensation in place for curtailment			This barrier could be mitigated with the connection of the grid to the European one through the underwater cable to Sicily.	22
Lack of interconnection with EU grid creates need for curtailment			This barrier could be mitigated with the connection of the grid to the European one through the underwater cable to Sicily.	22

**Table 3: Operation: Summary of identified barriers and proposed solutions to overcome barriers**

***Literature and sources***

Enemalta (2011): *Enemalta Corporation*. Email received on 16 November 2011.

MEEREA (2011): Yousif, Charles, *Malta Energy Efficiency and Renewable Energy Association MEEREA*. Interview on 2 May 2011.

MRA (2011): Anonymous, *Malta Resource Authority MRA*. Interview on 25 May 2011.

## Grid development

### *Summary*

Planning permits and access to financing are indicated as being the most serious barriers hampering the development of the grid. Grid development studies exist, but only in the short term. As of now Malta is not connected to the EU grid and the infrastructure is able to cover the needs of the islands fairly well. In order to have large scale systems like the wind farm of *Sikka l-Bajda* (95 MW), though, it will be essential to connect Malta to the EU grid. At this time there is a project for building a 200 MW connection cable between Malta and Sicily that should be finished by 2013. Some studies are being undertaken for this wind farm, however mostly relating to the wind potential, seabed integrity and its impact on bird migration. The market and grid connection issues linked to this plant will be addressed at a later stage in the development of the plant (MEEREA 2011).

### *Relevant legal sources*

The DSO's *Network Code* and the *Electricity Market Regulations 2011* both provide indications as regards grid development. The *Electricity Market Regulations 2011* further indicate that, in case this is directed by the Authority, a network code should be prepared and published by the DSO.

### *Regulatory framework for grid development*

When planning the development of the distribution grid, energy efficiency, demand-side management measures, distributed generation as an alternative measure are taken as reference points. The obligation as regard distributed generation is not specific to RES but to all types of generation (MRA 2011).

In case the reinforcement or the development of a part of the grid is needed, the DSO takes the final decision on priorities in the development of the grid. To carry out such works, the DSO submits the Distribution Plan to MRA. Moreover, given that the DSO is Government-owned, its budgets are subject to the approval of the Parliament (MRA 2011).

### *Obligations, legal responsibilities of the grid operator in relation to the RES-E producer*

The DSO is obliged to make a connection offer on request by a producer but there is no legal provision that gives the right to the producer to demand the DSO to reinforce the grid. In reality, a situation in which installations cannot be connected due to insufficient capacity of the grid has not occurred so far and there is no such legal obligation on the grid operator to reinforce the grid, in order

to allow for a connection of the installation. Grid reinforcement plans, however, already take into account foreseeable large scale RES projects (MRA 2011).

### ***Regulatory instruments to encourage grid development***

Major RES-E projects are included in the DSO plans and planned investments in the grid are taken into account when determining tariffs, no special incentives for grid developments related to integration of RES-E are currently applied (MRA 2011).

### ***Grid development studies and planned improvements***

According to par. DPC5.4 of the Network Code, distribution system planning reports must be presented by the DSO to the MRA every two years and must cover a 5-year period, detailing the plans for meeting predicted demand for electricity supplied through the distribution network and improve supply reliability to customers. The latest plan indicated that the DSO has started a nation wide project that involves the implementation of smart meters and SCADA systems. The implementation of an electricity interconnection with the European grid is also underway (MRA 2011).

Development, however, is considered mainly in terms of incremental expansion of the grid, but as of now there is no vision or strategy in a longer term (2020, 2030 or 2050). In case a connection request comes in and grid reinforcement works are needed, Enemalta will undertake them and then demand compensation to the developer. According to one stakeholder, there are further upgrades being made, for example a new HV cable between Delimara and Marsa, however there is no full-scale, long-term plan (MEEREA 2011), whereas according to another one, a HV network development plan (already updated twice) exists and has been submitted to MRA (Enemalta 2011). The author of this report has not been able to access such plan.

An Electricity Generation Plan 2006-2015 was published by Enemalta and the Ministry of Investment, Industry, Technology and Information, however there were no specific sections on grid development.

### ***Costs***

Rules determining the distribution of grid fees between plant operators and final consumers are still to be determined (MRA 2011).

### ***Problems***

Planning permits and access to financing are indicated as being the most serious barriers hampering the development of the grid (MRA 2011). Whereas the first aspect seems to be connected to the physical lack of space in the country, the second one could be mitigated by applying the solutions

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outlined for other barriers. It could be expected, in fact, that ameliorating the overall conditions would contribute to rebuilding trust and to allow easier access to credit.

In a long-term perspective, no other particular issues have been determined. Grid and curtailment issues are not considered relevant in a longer-term perspective. Considering the small size of the market and of the grid, in fact, the entity of any problem that might arise is considered to be also small, and thus fairly easy to deal with. Further on this point, stakeholders stated that Enemalta is the only responsible corporation, thus if the government decides for example on a maximum yearly curtailment level in the future, it should be expected – theoretically, at least – that Enemalta will have to comply with that. Some problems in this sense may however arise in a much longer perspective (2050). In a situation with say a 20% share of RES-E, in fact, major challenges could be foreseen and should be taken into consideration from now (MEEREA 2011).



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Barriers identified			Solution proposed	Detailed description (Page)
Stand Alone	Cause	Consequence		
Difficult to obtain planning permits			This may be seen in connection with the physical lack of space of the country.	26
Difficult access to financing			This barrier could be mitigated by applying the solutions outlined for other barriers. It could be expected, in fact, that ameliorating the overall conditions would contribute to rebuilding trust and to allow easier access to credit.	26-27
No strategic plan in a long to very-long term			This could be mitigated by enlarging the scope of the current plans for the country.	26-27

**Table 4: Development: Summary of identified barriers and proposed solutions to overcome barriers**



### *Literature and sources*

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MRA (2011): Anonymous, *Malta Resource Authority MRA*. Interview on 25 May 2011.

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## Market integration

### *Summary*

There is no competitive market for electricity in Malta. The main support measures are grants and loans – instruments which are in other countries frequently used as supplementary instruments. These measures are directed towards small consumers who plan to build their own generation plant. For wind plants the state offers a grant of up to 25 % and for PV plants a grant of 50 % of the total investment costs. The support for PV generation is capped but can be extended or determined by notice of the Government Gazette. Additionally, there is a feed-in-tariff based on a net-metering system for PV generation.

### *Relevant Legal Sources*

The Electricity Supply Regulation is based on Legislation 423<sup>1</sup> from 21<sup>st</sup> May 1940. The last amendment was made in 2010.

Decision 2006/859/EC<sup>2</sup> determines the exemption for Malta to designate a Transmission System Operator (TSO) and to enable competition in the electricity market. Directive 2009/72/EC has repealed Directive 2003/54/EC. The current directive in force specifies unconditional country specific derogations for Malta in article 44.

The Promotion of Electricity produced from RES is regulated with Legal Notice 186 of 2004.<sup>3</sup> To support the expansion of wind energy a 'Once-Only Grant on the Purchase of Wind Energy Systems' is guaranteed with Government Notice 136.<sup>4</sup> Support grants for photovoltaic energy is regulated in Government Notice 81.<sup>5</sup> Legal Notice 422 of 2010 regulates the feed-in-tariffs for solar power.<sup>6</sup>

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<sup>1</sup> Electricity Supply Regulation: <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667>

<sup>2</sup> Commissions Decision of 28 November 2006 granting Malta a derogation from certain provisions of Directive 2003/54/EC of the European Parliament and of the Council: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:332:0032:0033:EN:PDF>

<sup>3</sup> Promotion of Electricity produced from Renewable Energy Sources Regulations: <http://www.justiceservices.gov.mt/courtservices/>

<sup>4</sup> Once-Only Grant on the Purchase of Wind Energy Systems: [http://www.mra.org.mt/Downloads/Grants/GN2006\\_136%20wind%20grant.pdf](http://www.mra.org.mt/Downloads/Grants/GN2006_136%20wind%20grant.pdf)

<sup>5</sup> A Grant on the Purchase of Systems for Domestic Use that Reduce the Use of Energy, or Use Renewable Sources of Energy: [http://www.mra.org.mt/Downloads/Grants/2009%20Schemes/GN\\_81-2009.pdf](http://www.mra.org.mt/Downloads/Grants/2009%20Schemes/GN_81-2009.pdf)

<sup>6</sup> Subsidiary Legislation 423.46 Feed-in-tariffs (Electricity generated from Solar photovoltaic installations) regulations: <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=11430&l=1>

## *Market Design*

### **General availability of markets**

The Maltese national grid counts as a small isolated system without any connection to other electrical networks. With Decision 2006/859/EC<sup>7</sup> of November 2006 the European Commission granted Malta derogation from Chapter IV Article 20 (1) and 21 (1) of Directive 2003/54/EC (EC). Decision 2006/859/EC also states that there is “sufficient evidence that it is impossible or impractical for the time being to achieve the objective of a competitive market in electricity given the size and structure of the electricity market on the island” (Decision 2006/859/EC).

Directive 2009/72/EC has repealed Directive 2003/54/EC as from 3<sup>rd</sup> March 2011 and specifies unconditional country specific derogations for Malta under article 44. Thus, Malta does not have to designate a Transmission System Operator. There is only a Distribution System Operator (Enemalta Corporation) that is in charge of dispatch and balancing generation of the power system.

All Maltese customers are supplied by the vertically integrated company of Enemalta. In principle Malta’s generation sector is open for competition, but the dominant generator is still Enemalta. In order to improve market access it already made an effort to enable third party access by drawing up a Network Code. It regulates access to the network for all generators and own producers (Enemalta 2007).

## *Support Scheme Design*

### **General support scheme design**

Until today the Maltese government pays very little attention to support RES-E. The existing support scheme aims primarily at households, mainly to promote domestic electricity production. The investment climate is very risky as the scheme may be determined at any time (RE-SHAPING 2009).

The only promoted RES technologies are wind and solar energy. Since the 1<sup>st</sup> January 2006 there are investment grants for solar power and wind generation. The scheme was set in place for one year and shall be renewed for further periods of one year unless determined beforehand via the Government Gazette (Government Notice 81). With the ‘Once-Only-Grant’ for wind energy systems installations with a maximum capacity of 3.7 kW are legally entitled for a grant of 25 % of the purchase price, up to a maximum of 230 Euro. There is no overall cap for the budget of this support scheme (RE-SHAPING 2009). For photovoltaic generation plants there is a cap. Only 200 households can benefit from the investment grant which is set to 50 % of the installation costs and a maximum of 3,000 Euro per household. For solar water heaters the grant is set to 66 % of the eligible costs to a maximum of 460 Euro and a maximum of 4,500 families (Government Notice 81).

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<sup>7</sup> Commissions Decision of 28 November 2006 granting Malta a derogation from certain provisions of Directive 2003/54/EC of the European Parliament and of the Council: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:332:0032:0033:EN:PDF>

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In 2010 the call for photovoltaic grants had been fully subscribed on the first day. Thus, the government has kept the support scheme but increased the number of beneficiaries to 400 families per year (REPAP 2010). It is to be noted that the photovoltaic grant open only for a limited number of days and then closes.

In addition to the grant for PV there is also a feed-in-tariff regulation. The regulation is based on a net-metering system where the spill-over, which is not consumed by the producer, is remunerated by Enemalta. The feed-in tariff for households in Malta is 0.25 €/cents and in Gozo 0.28 €/cents, guaranteed for 8 years (up to a maximum of 4,800 kWh/year). For non-residentials and industries the feed-in tariff is 0.20 €/cents and is guaranteed for 7 years (up to a maximum of 160,000 kWh/year). Any electricity exported in excess of the thresholds shall be bought at the marginal cost of generation of Enemalta. This varies every year and is set by MRA. In 2010, it was set at 0,11€/cents per kWh (LEGAL NOTICE 422 of 2010). A revision of the FiT is expected once the capital grants on PV systems are stopped.

Another alternative is available, whereby all the generated RES electricity is fed into the grid at the stipulated feed-in tariffs and time-frames above. After that period, generated RES electricity can either be consumed as instantaneous net-metering or sold at the set marginal cost (MEEREA 2011). In 2011, the marginal cost per unit is set to 0.11 €/cent (LEGAL NOTICE 422 of 2010).



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### NREAP Analysis

The table below presents an overview on the identified national barriers of the RES Integration study as well as on the respective NREAP content. Throughout the study, the consortium carefully analysed, if the identified barriers of this study are addressed in the national energy action plan and whether or not the NREAP does foresee a solution approach:

- The column “Barrier identified in RES Integration Study” lists the various barriers, which the present study identified and addressed. The list contains barriers from the section connection, operation as well as development.
- The column “Is the barrier Contested?” would indicate, whether stakeholders in the country under concern would oppose to the identified barrier, namely if they do not see the listed issue as a barrier to the system.
- The column “Section in NREAP” identifies, if and where the respective NREAP is addressing the barrier under concern. The column would list the specific section of the national action plan.
- The column “Summary of foreseen Measure” would contain a short description of the foreseen measure of the NREAP, to overcome the addressed barrier. The column would be empty, if the respective NREAP does not identify the barrier, respectively if the NREAP does not propose a solution to the issue.
- The column “Comments & Evaluation” would contain a short analysis of the proposed NREAP solution and would evaluate, whether the solution is an appropriate and credible option to overcome the existing issue. If the NREAP does not identify the barrier, this section may also contain a short summary of the identified issue.

For a detailed description of the identified barriers in the framework of the RES Integration study, we kindly refer to the sections above, regarding connection, operation, development and market integration of RES-E installations.

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Barrier identified in RES Integration Study	Is the barrier contested?	Measures foreseen in NREAP		
		Section in NREAP	Summary of foreseen Measure	Comments & Evaluation
Physical lack of space		Not addressed		
No interconnection to the EU grid		4.2.6.a	An interconnection cable to Sicily is being planned and should enter into function in 2013.	
Unclear sharing of responsibilities as regards allowing connection	Yes	4.2.6.f		
Frequent curtailment	Yes	4.2.7.c	The connection to Sicily would connect Malta to the European grid, allowing for measures other than curtailment.	
Issue of curtailment more problematic in the future		4.2.7.c	This barrier refers mainly to smaller installations, which may increase and cause further issues to the distribution grid, though the interconnecting cable to Sicily may mitigate this aspect.	
No compensation in place for curtailment		Not addressed		
Lack of interconnection with EU grid creates need for curtailment		4.2.7.c	The connection to Sicily would solve this problem.	

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Difficult to obtain planning permits		Not addressed		
Difficult access to financing		Not addressed		
No strategic plan in a long to very-long term		Not addressed		

**Table 4: Summary of identified barriers and treatment of barriers in NREAP**

