MRA

MALTA RESOURCES AUTHORITY

Report on progress on the implementation of Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market

15 July 2009

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1 Introduction

Background

Directive 2001/77/EC requires the Member States to establish national indicative targets for future electricity consumption originating from Renewable Energy Sources (RES) in terms of a percentage of the electricity consumed. The Treaty of Accession sets Malta's reference value for electricity generated from renewable energy sources at 5% of the electricity generated in 2010.

The 5% share of renewable electricity was made on the basis of an estimated gross national electricity consumption of 2TWh in 2010 and sub-divided as follows:-

- 1.93% to be generated from wind (15MW and annual production of around 39GWh/annum in 2010);
- 3% to be generated from biomass (equivalent to 60GWh/annum in 2010)

Since accession to the EU in 2004, Malta, in accordance with the requirements of Article 3(3) of Directive 2001/77/EC has submitted two reports on the progress of the RES national indicative targets in 2005 and 2008 respectively.

In April 2009, the Commission published a renewable energy progress report (COM (2009)192) and Staff Working Document (SEC (2009) 503). In this report, Member States were graded according to objective criteria in regard to the percentage increase in the share of electricity derived from renewable energy sources achieved between 2004 and 2006 and the percentage of the effort made to reach the 2010 indicative target.

The bottom category for the first criterion is applied if growth has resulted in a zero or negative percentage point change in the share of electricity derived from renewable energy sources. The bottom category for the second criterion is applied if less than a third of the effort needed to increase the share from the base year to the 2010 target has been made. According to this report, Malta has placed in the bottom of both categories. This amounts to a breach of Article 3(1) of the Directive.

The new Directive 2009/28/EC on the promotion of the use of energy from renewable sources will require Malta to achieve 10% of renewable energy in the final gross energy consumption by 2020. The Commission deems that achieving substantial growth and striving to reach the 2010 targets for the share of renewables is the minimum to show a credible way to the 2020 targets. Therefore, the Commission is considering launching infringement procedures against Member States that have not made sufficient efforts to reach their 2010 targets.

In order to understand more clearly Malta's situation, the Commission has requested Malta to report on the following questions:

a) What actions have been taken, if any, since the submission of the last report, that would indicate that Malta will achieve substantial growth in the share of electricity derived from renewable energy sources in proportion to the objective to be attained in 2010.

b) given that Malta falls into the bottom category for both criteria, what reason can be offered to explain that Malta has complied with Articles 3(1), 6, 7 of the Directive.

2 Electricity Generation in Malta

The current nominal generation capacity of the two electricity generation stations in Malta is 551MW. Electricity is generated using liquid fossil fuels. The electricity generation fuel mix consists of 83% heavy fuel oil and 17% gas oil. The gross national electricity for the period 2004-2008 is shown in table 1

Table 1: Gross conventional national generation 2004-2008

Year	Gross national electricity generation MWh/annum
2004	2,216,103
2005	2,083,347
2006	2,261,189
2007	2,296,000
2008	2,312,000

Source : Enemalta Corporation

Table 2: Electricity generation from renewable sources

	2007		2008		2009(July)	
	Installed capacity in kWp	Estimated electricity generated MWh/annum	Installed capacity in kWp	Estimated electricity generated MWh/annum	Installed capacity in kWp	Estimated electricity generated MWh/annum
Solar photovoltaic	99	146	238	357	276	414
Micro-wind generating systems	4.8	10	4.8	10	4.8	10
Total RES-E	103.8	156	242.8	367	280.8	424
% from RES of total national electricity consumption		0.007		0.016		

Source : MRA records & estimates

3 Action at Policy level

The first draft of the National Energy Policy was issued for consultation in 2006. The policy document was based upon the following three objectives all pursued in a balanced way towards a sustainable energy supply:

- security of supply,
- environmental protection; and
- the social dimension , affordability and competitiveness

The draft energy policy of 2006 was recently reviewed to reflect among others the conclusion of the EU climate change and energy package in December 2008. In particular, the revised energy policy takes into account the EU mandatory target for Malta of 10% share of renewable energy mix by 2020 including 10% biofuels.

The policy proposal includes a series of measures and actions to reach the various objectives including measures to tap Malta's renewables potential.

A consultation process was launched in April 2009 on the revised Energy Policy. The outcome of the consultation is being analysed and concurrently the Strategic Environment Assessment (SEA) process on this policy was initiated.

In 2008, the Ministry for Resources and Rural Affairs (MRRA) appointed the National Climate Change Committee, an interdisciplinary committee constituting of senior players from appropriate public entities and the private sector, to draw up a strategy that will enable Malta to cohesively and coherently take measures to address Climate Change and specifically address one of the major harmful instigators of Climate Change: Greenhouse Gas emissions. In January 2009, this committee presented its Report entitled "National Strategy for Policy and Abatement Measures Relating to the Reduction of Greenhouse Gas Emissions[1]". This report while being in synergy with the draft national energy policy also proposes measures to increase the uptake of renewable energy systems as part of the effort for climate change mitigation.

An updated "Solid Waste Management Strategy for the Maltese Islands[2]" policy document was also launched for consultation in January 2009. This strategy intends to create synergy with the other efforts being made by Malta to fight Climate change and increase the contribution from renewable energy sources.

[1] The report submitted by the National Climate Change Committee can be found at www.mrra.gov.mt/cc_report.asp

[2] The Solid Waste Management Strategy for the Maltese Islands document can be found at www.mrra.gov.mt.

4 Developments in the renewable energy sector

In 2008, a new study[3] was commissioned to investigate the best and most likely options Malta should be considering to meet its renewable energy targets, based on the possibilities available in the proposed Directive for the promotion of the use of energy from renewable sources. This study was concluded in January 2009. The report compares the technical and commercial aspects of various scenarios; local energy generation from renewable sources (RES), by wind and solar, joint projects in RES with other EU countries or through interconnection with non-EU Member States and the possibility of buying green certificates through statistical transfers.

The study recommended that the relative importance of different drivers in choosing between the options identified should be assessed. The study indicated that investing in a joint project such as an onshore wind energy project elsewhere in EU could be the most financially attractive option. If the strategic benefits of generating renewable energy within Malta are considered a priority, offshore wind would be a more feasible option as this would contribute a higher proportion of renewable energy than solar PV. The main reason behind this recommendation is the perceived lack of public acceptance of onshore wind farms and the limited availability of suitable onshore sites. It is however the Government's prerogative not to exclude any option available, including onshore wind energy projects, before a detailed assessment is conducted.

4.1 Wind Energy

In 2009, Malta identified three sites to be assessed further for the development of wind farm facilities. The sites include two onshore sites and one offshore site. The onshore sites are located at Bahrija and Hal Far and the estimated potential wind farm capacity is 10.2MW and 4.2MW respectively. The offshore site is Sikka l-Bajda with an estimated potential of 95MW located at the north of the Island around 1.5km from the coast. The materialisation of these projects which will occur later than 2010 would bring the wind energy generation capacity in Malta to 109.4MW with an estimated annual electricity generation 217GWh, equivalent to around 8% of the electricity consumption in 2010.

The impact of the construction of large scale onshore wind generation facilities has been, from the outset, a source of concern. In particular, there are concerns linked with unacceptable visual and landscape impacts given the country's small superficial area and high population density.

The development of offshore wind farms using commercially available technologies is also limited by the bathymetry of the Maltese waters, since the 25 metre contour extends to just around 3km off the coast. Additional constraints in locating offshore wind farms come from the heavy and conflicting

[3] Feasibility Study for Increasing Renewable Energy Credentials: January 2009

use of the water. The Maltese economy is significantly dependent on marine and tourism activities.

Other concerns are the possible negative effects of the development of the wind energy facilities on the fauna and flora on the chosen sites in particular at Sikka l-Bajda.

The three sites will, therefore, be subject to all the necessary environmental assessment as required by the applicable directives and the local environment and planning regulations.

Wind data monitoring systems will be installed to enable a more accurate estimation of the wind energy yield from the three earmarked sites.

Another important factor is the impact on the stability of the electricity system of the integration of such intermittent generation sources. The current grid situation would not allow the connection of full 109MW wind farm capacity potential. A grid stability study has been carried out to determine the maximum wind farm capacity that could be integrated in the Maltese small isolated grid without jeopardizing continuity and reliability of supply. The outcome of this study is currently under review. Another grid stability study will follow to determine the effect on the wind farm capacity that can be integrated in the system with the Malta-Sicily interconnection in place.

Malta is also actively following the ongoing development of deep water offshore technologies.

4.2 *Micro-generation (wind and solar photovoltaic)*

Malta has continued to adopt measures to increase the penetration of micro-generation from wind and solar photovoltaic (PV).

Residential sector

The capital grant schemes for micro wind and solar photovoltaic systems introduced in 2006 continued to be applied up to the end of 2008.

In 2009, the previous capital grant scheme for the residential sector was replaced by the following financial support mechanism:-

- Capital grants of 30% on the purchase price of micro-wind turbine generating systems for installation in residential premises (subject to a maximum grant of € 750).
- Capital grants of 50% on the purchase price of solar PV systems for installation in residential premises (subject to a maximum grant of € 3,000). A fund of € 500,000 was allocated for this grant.

In addition to these grants:

- the cost for the installation of the meter necessary to monitor the output of these technologies is waived by the Maltese Distribution System Operator (Enemalta Corporation); and
- a net metering mechanism exists for electricity generated from renewable energy sources with a spill tariff of € 0.07/kWh for any excess electricity fed into the grid.

Malta will continue to seek community funds to provide financial assistance for micro-generation installations from renewable energy sources. An application for €11,000,000 funds to be used for residential grant schemes was submitted to the EU Commission in 2008. This application is being processed.

Public Sector

Malta is continuing to promote such micro-generation through the implementation of a number of Government projects. During the period 2006-2008, a number of PV systems (amounting to a capacity of 78.43kWp) were installed on public buildings including schools and ministries.

The Government has also established a Steering Committee to assess the possibility to lease out roof space available on Government buildings to one or more commercial operators to design, build and operate and maintain PV systems as part of a concession for a number of years. The possibility of providing private investors with the opportunity to invest in PV systems and benefit from a return or a rebate in their utility bills is also being assessed.

A number of Government buildings were earmarked for an initial evaluation of the potential to house PV installation on their roofs. The buildings include Water Reservoirs, Government Schools, Hospitals and some Government Departments. The initial assessment of the roofs of these buildings indicates a potential to accommodate 10MWp (15GWh/year) of PV generation capacity.

It is anticipated that a tender will be issued for the implementation of such PV capacity installation in whole/part in the coming years.

Commercial and Industrial sector

Malta is further promoting micro-generation renewable energy technologies in the commercial and industrial sector. During 2008, Malta Enterprise, the Government entity dealing with industrial promotion, co-financed with the EU, three PV installations in these sectors amounting to a total capacity of 62.3kWp.

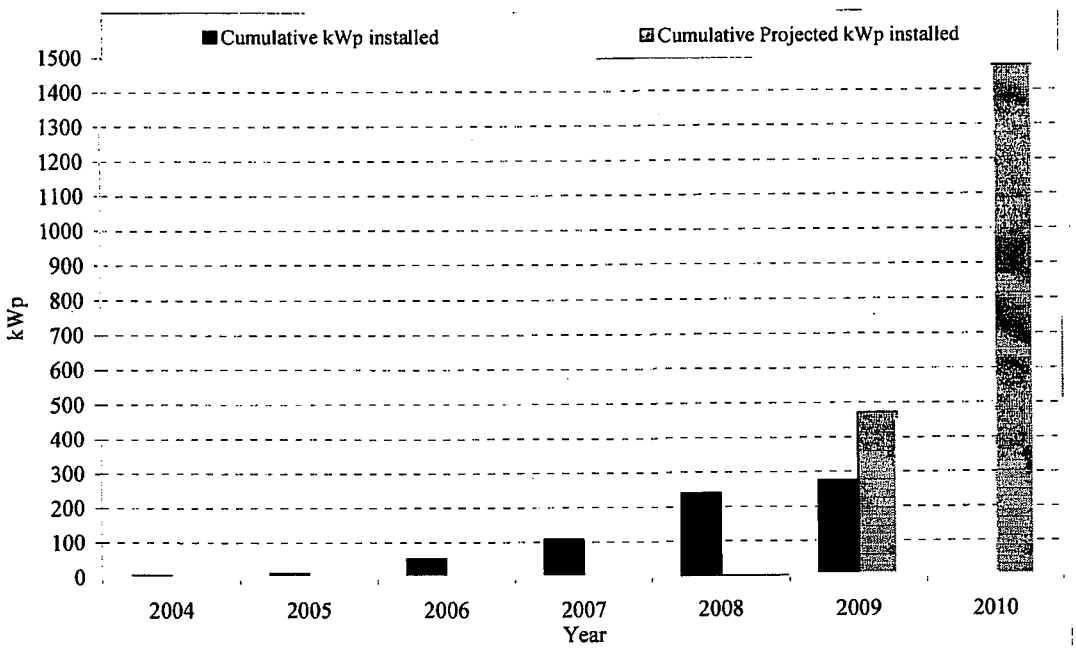
Another similar scheme under the European Regional Development Fund 2007-2013 programme was launched in 2009, to provide financial assistance to operators in these two sectors, who wish to implement renewable energy and energy efficiency projects. The funds available amount to €10,000,000 and

participants in this scheme can benefit from a 50% grant (maximum grant being €100,000).

A first call for proposals of projects has already been issued and the letter of award for the approved projects is expected shortly. It is estimated that a total of 1 MWp (1.5GWh/annum) PV capacity will be installed by 2010 as a result of this first call.

Another similar call for proposals will be launched before the end of 2009.

Chart 1: Cumulative installed and projected PV capacity 2004-2010



Source: MRA & ME[4] records

The total installed PV capacity to date is estimated to be 276 kWp and these installations are estimated to generate 414,000kWh/annum. It is estimated that the PV capacity will increase from the present 276kWp to 1,671kWp (2,507MWh/annum) that is, contributing to 0.09% of the electricity consumption in 2010[5]. This estimate is based on PV system installations for which an application for a grant has already been approved either as part of the Government residential grant scheme or the ERDF first call mentioned earlier on in this Report.

The total installed capacity (end of October 2007) of micro-wind generating systems is 4.8kWp and the electricity produced is estimated at 10,000kWh/annum.

[4] ME –Malta Enterprise who is administering the ERDF funds for the non-residential sector

[5] Assumed electricity generation in 2010 = 2.693 TWh (Source: Enemalta Electricity Generation Plan 2006 - 2015).

Malta will continue to adopt support mechanisms to further promote micro-generation from renewable energy sources. The introduction of a feed-in tariff for large producers is actively being considered.

4.3 Electricity generation from biomass waste

The Treaty of Accession sets Malta's reference value for electricity generated from renewable energy sources at 5% of the electricity generated in 2010 of which 3% to be generated from biomass (equivalent to 60GWh/annum in 2010).

In the report submitted to the EU Commission in 2005 Malta has indicated that the 3% electricity generated from waste is only achievable through the construction of a waste combustion plant. Furthermore, it was stated that in line with the Solid Waste Strategy published in 2001 a final decision for the construction of such a facility had to be deferred in order to exploit to the maximum the possibilities of waste recycling and composting facilities to be able to benefit from further advances in waste treatment technologies.

"A Solid Waste Management Strategy for the Maltese Islands" was published for consultation in 2009. This document intends to update the 2001 strategy and the following options are considered as the most favoured configuration

- The construction of three biological treatment plant (MBT) all equipped with energy recovery;
- The development of an incinerator with energy recovery for the treatment of the residual fraction of waste, including RDF derived from the mechanical separation of MSW and rejects from the sorting of dry recyclables at the MRF.

The first mechanical biological treatment plant (MBT) in Malta is expected to start treating and receiving waste by the 1st quarter of 2010. The plant is expected to treat approximately 71,000 tonnes of municipal solid waste and would generate between 6-6.5GWh/annum of electricity (equivalent to 0.22%-0.24 % of electricity consumption in 2010). In addition to this plant, two further MBTs are planned to be constructed by 2013 and when operational would generate an additional 16.8GWh of electricity annually.

Projections that had been made regarding the potential of energy production from the installation of the gas extraction system at the Maghtab landfill have proved to be too optimistic since the gas quality resulted to be poor and unfit for electricity generation. However, Malta is actively pursuing the production of biogas from the Ta' Żwejra and Ghallis engineered landfills.

A co-generation plant for Ta' Zwejra is planned for early 2011 and another co-generation plant for Ghallis after 2011 to utilise the biogas produced by these two landfills. The estimated electricity generation from landfill gas is 3.2GWh/annum in 2011 and 5.4GWh/annum in 2012.

A steam recovery turbine will be installed in the Marsa waste incineration plant, which is already producing steam. It is estimated that the generation capacity will be about 250-350kW. This steam recovery turbine will be commissioned and in operation by end of 2010. It is estimated that the electricity generated will cover the electricity needs of the incinerator.

The development of an incinerator with energy recovery for treatment of the residual fraction of waste is under consideration. The estimated potential for electricity generation from such an incinerator is 36GWh/annum.

4.4 Electricity generation from sewage sludge

The potential of energy recovery from sewage sludge and the waste resulting from animal husbandry is not yet established although this may be significant. Co-digestion of various waste streams with solid waste is being considered for this type of waste.

Malta is presently implementing the required sewage treatment infrastructure, namely the construction of three new sewage treatment plants, one in Gozo and two in Malta. The Gozo plant (40,000 population equivalent capacity) started operation in November 2007 whereas the Malta North plant (45,000 population equivalent capacity) was commissioned in March 2009. The largest plant in the South with an anticipated treatment capacity of 500,000 population equivalent will be equipped with anaerobic sludge digestion facilities generating enough biogas to supply 32% of the plant's electrical power requirements. It is estimated that the plant will have an electricity generating capacity of 900kW and 1400kW in heat. The construction of this plant started in January 2009.

4.5 Renewable energy for heating : RES-H

Malta enjoys favourable climatic conditions for the exploitation of solar energy. Solar thermal applications (mostly used for the production of domestic hot water) are by far the most diffuse renewable energy applications in the country. These applications do not contribute directly to RES-E national indicative targets established under Directive 2001/77/EC for the promotion of electricity generated from renewable energy sources for 2010, although they contribute indirectly through offsetting electricity demand from conventional sources. Furthermore, under the new directive 2009/28/EC, RES-H will be eligible to contribute to the renewable energy targets from 2011 to 2020.

Residential sector

Since January 2006, Malta has been implementing financial incentives for the passive use of renewable energy. In 2009, the financial support in the form of grants for solar energy products for domestic premises was increased from 25% to 66% on the capital costs of these products. The capping to this grant was also increased from €233 to €465.

In addition, in the case of Solar Water Heaters installed in new households, Enemalta is waiving €163 from the connection fee.

The total installed capacity of solar water heaters in the residential sector in 2008 is estimated at 25,451kWth and equivalent to 64kWth/1,000 capita. The total installed capacity of solar water heaters in 2010 is projected to be 33,868kWth and equivalent to 84kWth/1,000 capita. The contribution of solar thermal applications in offsetting electricity demand is estimated to be around 17,593 MWh/annum in 2010. This is equivalent to around 0.63% of that year's gross national electricity consumption in 2010.

Table 3: Estimates for Solar Water Heaters in Malta-residential sector

	2007	**2008**	**2010 (estimated)**
Installation capacity - kW_{th}	20,552	25,451	33,868
Estimated electricity offset from solar water heaters - MWh /annum	10,675	13,220	17,593

Source: MRA records and estimates

Commercial and industrial sector

In the first call for applications for funds under the ERDF 2007-2013 scheme twelve projects to be implemented in the non-residential sector, involving the installation of a solar thermal system, were approved for funding. It is estimated that if all these projects materialise they will offset the equivalent of 1GWh in electricity and fuel by 2010.

4.6 Biofuels- Electricity generation and other uses

Malta has continued to implement fiscal measures to promote the use of biofuels - mainly the biomass content of biodiesel is exempt from excise duty. It is estimated that approximately 1.5 million litres of biodiesel were sold in 2007 compared to the 0.616 million litres sold in 2006. This biofuel is produced from waste vegetable oil.

5 Administrative procedures

Administrative barriers associated with applications for permitting and licensing of small scale auto-generators (e.g. households or small businesses generating electricity using PV systems) have been reviewed and reduced or eliminated. A fast-track notification process has been developed for micro-generating renewable energy systems and small combined heat and power installations. This fast track process ensures that in most cases notifications for systems not greater than 16 Amps per phase are processed within three days from submission to the Malta Resources Authority.

The Development Policy and Design Guidance (2007) has been published with the aim to promote the creation of high quality development, which is visually attractive and appropriate to its surroundings. This Guidance sets policy statements and performance standards that developments should achieve. It encourages the use of solar water heaters and PV installations in residential and other forms of developments.

In July 2009 the Malta Environment and Planning Authority (MEPA) published a proposed Planning guidance for Micro Wind Turbines with a generating capacity of up to 20kW; this is currently open for public consultation.

The purpose of this planning guidance document is to provide prospective applicants with guidance on aspects concerning the location, siting, sizing, efficiency, feasibility and design of roof mounted and tower mounted micro wind turbines. The document indicates criteria to mitigate potential impacts on ecology, visual impact and other possible causes of nuisance to surrounding receptors.

Larger wind turbines are not within the scope of this consultation document. The process for assessing applications for wind turbines larger than 20kW will take into consideration the Government's Proposal for an Energy Policy of 2009, other supporting documents published by the Malta Resources Authority (MRA), and all relevant studies necessary to inform decisions on any future applications for such development.

6 Grid system issues

The renewable generators proposed to reach the 2010 target namely the 15MW wind farm and the waste to energy facility did not present any significant grid issues that could have hindered their connection to the grid. Moreover, there are no cases where renewable generators were refused connection to the grid.

The integration of larger scale renewable generation with the grid, in particular wind energy facilities, necessitated grid stability studies as already detailed in Section 4.1. The electricity interconnection Malta-Sicily which is expected to be in operation by end of 2013 will render the electricity system more stable and

robust. This will permit the full exploitation of the three sites identified so far for the development of wind energy facilities. It will also be possible to exploit the potential of deep-sea wind energy facilities should the technology mature enough to make these systems commercially feasible.

The internal electricity network is being reinforced as part of a long term distribution system development plan.

As already stated earlier on in this Report, a net metering mechanism for auto producers generating electricity from renewable sources is already in place, with a spill tariff of €0.07/kWh for any excess electricity fed into the grid.

7 Conclusions

The Treaty of Accession sets Malta's reference value for electricity generated from renewable energy sources at 5% of the electricity generated in 2010.

The 5% share of renewable electricity was made on the basis of an estimated gross national electricity consumption of 2TWh in 2010 and sub-divided as follows:-

- 1.93% to be generated from wind (15MW and annual production of around 39GWh/annum in 2010);
- 3% to be generated from biomass (equivalent to 60GWh/annum in 2010)

As already expressed in previous reports there are a number of concerns and constraints that limit the development of onshore and offshore wind energy projects. The main concerns regarding onshore wind farms are associated with unacceptable visual and landscape impact of such projects in a country having a small superficial area and a high population density. The development of offshore wind farms on the other hand is constrained by the few shallow water (less than 25m) sites available and the heavy and conflicting use of these waters. Given these constraints, Malta has seriously considered the potential and feasibility of deep sea wind farms. The outcome of these investigations showed that the technology was still at pilot project stage and Malta considered that it was not opportune to take the associated risks. It was therefore decided to investigate further two onshore and one offshore site with the expectation that public acceptance for such projects has now improved. These projects would generate the equivalent of 8 % of the gross electricity consumption in 2010 but will materialise later.

The EU Commission has given an indicative figure of 3% of electricity generated from waste by 2010. This target depended heavily on the construction of a relatively large waste to energy combustion plant. After making various considerations the government has decided to exploit the full potential of recycling and Mechanical Biological Treatment (MBT) technologies before deciding on waste incineration facility development. As already detailed in section 4.3, only

one mechanical biological treatment plant (MBT) is expected to be operational by the 2nd Quarter of 2010. The contribution from this plant is expected to be 6-6.5 GWh/annum (0.22-0.24 % of the gross electricity consumption in 2010). The other MBT will be in operation later on.

As detailed in this report considerable effort has however been made since the last report to increase the consumption of renewable energy. This effort includes the increase in the grant available on the purchase of PV systems and solar thermal systems in the residential sector and the availability of grants for the non-residential sector for similar but larger scale applications. The report shows the positive effect of the grant schemes on the uptake of these technologies. Although the renewable thermal energy cannot contribute to the 2010 target, it has a mitigation effect through the displacement of conventional electricity otherwise needed for water heating.

Other initiatives to increase the electricity from renewable sources include the tender the Government intends to issue for the installation of 10MWp PV capacity on government buildings. The tender for the first 5MWp will be issued in 2009. Several operators in the non-residential sector are willing to invest in relatively large scale PV installations.

Malta deems that a considerable effort has been made since the last report to increase the consumption of electricity from renewable sources but due to a number of circumstances as already detailed, the achievement of the 2010 renewables target will be delayed.

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