The Implementation of Directive 2001/77/EC on the promotion of electricity from renewable energy sources in the internal electricity market

MINISTRY FOR RESOURCES AND RURAL AFFAIRS

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1 Introduction

Background

Article 3(3) of Directive 2001/77/EC requires Member States to publish a report every two years which includes an analysis of the success in meeting the national indicative targets taking into account, in particular, climatic factors likely to affect the achievement of those targets and to indicate to what extent the measures taken are consistent with national climate change commitment.

Following Malta's accession to the European Union in 2004, Malta's first report in line with the requirements of this Directive was submitted to the European Commission in October 2005. This is Malta's second report pursuant to its obligations under article 3(3) of Directive 2001/77/EC.

Directive 2001/77/EC requires Member States to establish national indicative targets for future electricity consumption from 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% value was made on the basis of an estimated gross national electricity consumption of 2 TWh in 2010 and subdivided as follows:

- 1.93% of total electricity demand for 2010 generated from wind (15 MW for an annual electricity production of around 39 GWh/annum in 2010);
- 3% of 2010 electricity demand generated from biomass (equivalent to around 60 GWh/annum in 2010).

2 Electricity Generation in Malta

Malta has no indigenous supplies of fossil fuels. Malta has one of the highest population densities in the world (approximately 1,265 inhabitants/km^2). The country has a small surface area and a high percentage of urban development. Malta's GDP (at market prices) in 2006 was €5,095.97 million. The GDP per capita in purchasing power standards (PPS) in 2006 was 75.5 (EU-27 = 100).

The energy intensity in 2005 was 269.90 kgoe/000€ in comparison to the EU-27 average at 208.05 kgoe/000€.[1] The final energy consumption[2] in Malta in 2005 was 1,294 kgoe/capita compared to the final energy consumption of 2,380 kgoe/capita in the EU 27 countries.

Malta has no refineries or natural gas. Coal for electricity generation used to be imported until the 1990s but this was stopped for environmental reasons. To date, it has no gas network or interconnections.

The current total nominal generation capacity at the two electricity generating stations in Malta is 571 MW. The gross national electricity consumption for the past 5 year period (2002 – 2006) is shown in Table 1. Electricity generated from renewable energy sources is shown in Table 2.

Table 1. Gross national electricity consumption 2002 - 2006

Year	Gross national electricity consumption MWh/annum
2002	1,973,451
2003	2,235,541
2004	2,216,103
2005	2,083,347
2006	2,261,189

[1] The energy intensity is calculated as the ratio of gross inland energy consumption (in tonnes of oil equivalent) to GDP (in constant 1995 euro). Source: Eurostat

[2] Final energy consumption includes all energy delivered to final consumer's door for all energy uses. It excludes deliveries for transformation and/or own use of energy producing industries and network losses. Source: Eurostat

Table 2. Electricity Generation from Renewable Energy Sources

	2005		**2006**		**2007 (end October)**	
	Installation capacity kW_p	**Estimated electricity generated MWh/annum**	**Installation capacity kW_p**	**Estimated electricity generated MWh/annum**	**Installation capacity kW_p**	**Estimated electricity generated MWh/annum**
Solar photovoltaics	15	23	58	87	80	120
Micro-wind generating systems	0	0	0	0	4	8
Total RES-E (MWh)	15	23	58	68	84	128
% from RES of total gross national electricity consumption	0.001		0.003			

Note: Solar thermal applications are estimated to offset approximately 0.38% of the gross national electricity consumption in 2006. This is not eligible for consideration as part of the renewable energy targets set under Directive 2001/77/EC, which is limited to electricity generation.

3 Policy Framework

A draft energy policy for the Maltese Islands was published for public consultation in 2006. The policy document is based upon the following three objectives all pursued in a balanced way to move towards a sustainable energy supply:

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

This draft policy also includes a series of measures and actions designed to reach the various objectives, as well as the entity responsible to co-ordinate the various actions. This policy is currently under review following the mandatory EU target of 20% renewable energy by 2020 including a 10% biofuels target which was unanimously agreed by EU Heads of State and Government at the 2007 Spring European Council.

In August 2006, Malta also published a draft Renewable Energy Policy which identified the following three key objectives namely:

- Promotion of RES by setting ambitious goals and targets for penetration and putting in place appropriate support schemes and regulatory measures to encourage meaningful public investment and participation. Government will also lead by example.
- Ensuring that the quality of life is not compromised or negatively affected by the choices made in considering and promoting RES development.
- Seeking the holistic, most suitable and robust adoption of RES by ensuring that support services and development facilities are available and accessible including access to and dissemination of information, the promotion of public participation and acceptance of RES projects as well as human resource development to participate meaningfully and with excellence in the development and uptake of RES.

4 Sectoral Development of Renewable Energy Exploitation

4.1 Wind Energy

Comprehensive studies on the potential of electricity generated from renewable energy sources in Malta and including site specific studies on the wind potential and options available for Malta have been carried out.

Malta considers that there are severe impacts towards the construction of large scale onshore wind generation facilities. The main concerns are associated with unacceptable visual and landscape impacts in a country having a small superficial area and high population density.

Assessments of the potential for the development of offshore wind power have also been carried out. The bathymetry of Maltese waters imposes severe difficulties and limitations on wind farm development, since the 25 metre contour extends to just around 3km off the coast. There are additional constraints in locating offshore windfarms in these shallow water sites due in part to the heavy and conflicting use of the waters. A significant proportion of the economy depends on marine activities and tourism.

In view of such constraints, Malta has sought to assess the potential of deepwater offshore wind power. A call for expressions of interest (EOI) for deepwater offshore windfarm development was issued in 2006. This call was open to interested parties willing to undertake offshore wind projects with a final capacity of between 75 and 100 MW in Maltese territorial waters on a public private partnership basis. This approach also coincided with a decision taken by Malta that the national electricity distribution grid was to be interconnected with the European grid. Such an interconnection would render the system stable and robust and permit a scale of operations sufficient to make the project economically feasible.

Responses to the call for EOI and follow-up studies including the study on the interconnection to Sicily suggest that with the current technology it is unlikely that deepwater offshore windfarm would be constructed before 2010. Further work is necessary to ensure the commercial feasibility of deepwater offshore technologies. Malta is actively following the ongoing developments in this sector.

4.2 Micro-generation (wind and solar photovoltaic)

Malta has adopted various measures to increase the penetration of micro-generation from wind and solar photovoltaic (PV). This includes the introduction of both financial support mechanisms instruments which assist consumers to invest in renewable energy technologies as well as the establishment of supporting administrative measures.

In 2006, Malta introduced the following financial support mechanisms:

- capital grants consisting in 25% on the purchase price of micro-wind turbine generating systems (with a maximum generation capacity of 3.7 kW) for installations on domestic premises (subject to a maximum grant of €233));
- capital grants consisting in 20% on the purchase price of solar PV installations with a minimum size of 1 kWp and maximum size of 3.7 kWp on domestic premises. This grant is subject to a maximum of €1,166 with an additional grant of €582 for every additional 1 kWp (±5%) above the minimum 1 kWp. In addition to this grant, the costs for the installation of the metre necessary for the operation of the PV

technology were waived by the Maltese distribution system operator (Enemalta Corporation); and

- net metering for electricity generated from renewable energy sources with a spill tariff of 3c/kWh (€0.07/kWh) for any excess electricity fed into the grid.

Malta is further promoting such micro-generation renewable energy technologies through implementation of a number of Government demonstration projects. During the period 2006-2007, a number of PV installations were installed on public buildings, including a 10 kWp PV installation in Gozo and a 6.84 kWp installation on a public school.

Administrative barriers associated with the application for permitting and licensing of small scale auto-generators, such as 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.

A Development Policy and Design Guidance (2007) was 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 a development should achieve. It encourages the use of solar water heaters and PV installations in residential and other forms of development. Planning guidance for the development of micro-wind installations is also expected to be developed by the Malta Environment and Planning Authority.

Despite the introduction of various measures for promoting micro-generation from renewable energy, market response to these technologies has been relatively slow. In the Draft Renewable Energy Policy, Malta proposed a target of between 360 – 720 kWp solar PV installations by 2010 (i.e. a penetration rate of 120 - 240 kWp/annum). This would contribute to around 0.5 - 1.1 GWh/annum in 2010.

The total installed capacity as at 31 October 2007 is estimated to be 80 kWp and these installations are estimated to generate around 120,000 kWh/annum. The total installed capacity as at 31 October 2007 of micro-wind generating systems is 4 kWp and the electricity produced is estimated at 8,000 kWh/annum.

Malta will be reviewing and increasing support mechanisms to further promote micro-generation from renewable energy sources. For the period 2008 – 2013, EU Structural funds will be sought to provide financial assistance for micro-generation installations from renewable energy sources. However, it is likely that contribution of electricity generation from solar photovolatics is likely to remain small in percentage terms.

4.3 Electricity generation from biomass waste

The construction work for the development of a first mechanical biological treatment plant (MBT) in Malta is currently underway. This plant is expected to start treating and receiving waste by the third quarter of 2008. The plant is expected to treat approximately 71,000 tonnes of municipal solid waste and would generate approximately 7 GWh/annum of electricity (equivalent to 0.26% of electricity consumption in 2010).[3] In addition to this plant, two further MBTs are also being planned to be constructed and when operational would generate an additional 16.8 GWh of electricity annually.

In addition to the construction of the MBT at Sant' Antnin, existing closed landfills are also being rehabilitated. Collection systems are being constructed to enable the utilisation of good

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

quality gases for the production of electricity. Malta is actively pursuing the production of biogas from the Ta' Żwejra and Ghallis engineered landfills.

It has recently been estimated that by the beginning of 2009 a 140 kW engine, producing 1.1 GWh /annum of electricity (equivalent to 0.04% of gross national electricity consumption in 2010) will be installed. The installed power is expected to increase towards 2010 by another two engines of 300 kW each. After 2010, it is, therefore, expected that Malta will have an additional 750 kW of electrical power being fed by landfill gas (LFG) and producing 5.4 GWh/annum of electricity (equivalent to 0.2% of gross national electricity consumption of 2010). This is lower than the previously reported estimates for electricity generation from landfill gases and takes into account monitoring tests progress.

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 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 operations whereas the Malta North plant (45,000 population equivalent capacity) is at an advanced stage of construction and is expected to be commissioned shortly. 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 50% of the plant's electrical power requirements. The energy recovery would equate to approximately 7.1 GWh annually (equivalent to 0.26% of estimated electricity consumption in 2010). Electricity generation from the Malta South plant, which is not yet operational, has not been included in the national indicative target since it is still unclear whether the energy recovery system would be online in 2010.

4.5 Renewable energy for heating - RES-H

Malta enjoys favourable climatic conditions for the exploitation of solar energy. Solar thermal applications (mostly in the form of solar water heaters for domestic use) are by far the most diffuse renewable energy applications in the country. Although such 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, they contribute indirectly through offsetting electricity demand from conventional sources.

Malta has introduced financial incentives for the passive use of renewable energy. In January 2006, the financial support in the form of grants for solar energy products for domestic premises was increased from 15% to 25% on the capital costs of these products. The capping to this grant was also increased from €116 to €233.

In addition, other support mechanisms for solar water heaters also exist and the network connection fee of €163 is waived by Enemalta Corporation in the case of new households installing these systems.

The uptake of solar thermal applications has been relatively slow although there are recent encouraging signs in increasing uptake. The increases in the financial support mechanisms introduced in 2006, reflected increases in the number of applications for grants for solar water heaters. In 2006, approximately 1,564 applications for subsidy on solar water heaters were received which is an increase over 360 applications received in each of the two previous years (2004 and 2005).

The total installed capacity of solar water heaters in 2006 is estimated at 16,700 kWth and equivalent to 41.80 kWth/1,000 capita. This is above the EU-27 average of 27 kWth/1000 capita. The contribution of solar thermal applications in offsetting electricity demand is estimated to be around 8,675 MWh/annum in 2006. This is equivalent to around 0.38% of that year's gross national electricity consumption.

Table 3. Estimates of Solar Water Heaters in Malta

	2004	*2005*	*2006*
Installation capacity kW_{th}	10,752	13,552	16,700
Estimated electricity offset from solar water heaters MWh/annum	5,585	7,040	8,675

4.6 Biofuels – Electricity generation and other uses

Preliminary tests on a small scale have been carried out by Enemalta Corporation to assess the feasibility of electricity generation from biofuels. Further tests are, however, warranted in this area.

Malta introduced financial support mechanisms to promote the use of biofuels. It is estimated that approximately 0.597 million litres of biodiesel were sold to industry in 2005 and 0.616 million litres sold in 2006. This biofuel is produced from waste vegetable oil and is generally used in boilers.