



MALTA RESOURCES AUTHORITY

**Consultation Paper on the Development  
of a Strategy for the Exploitation of  
Renewable Energy Sources for  
Electricity Generation**

***Reference: MRA/ENE/2/2002/1***

# MALTA RESOURCES AUTHORITY CONSULTATION PAPER

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## 1. INTRODUCTION

The Malta Resources Authority (MRA) is an independent authority with regulatory responsibilities for water, energy and mineral resources in Malta and was established in terms of Act XXV of 2000. Its founding Act specifically mandates it to promote, encourage and regulate the use of alternative sources of energy.

This Consultation Paper is the first in a series of steps being taken by the Authority in the development and implementation of a strategy for the exploitation of renewable energy sources (RES) for electricity generation in Malta. This Paper includes the Authority's proposed objectives for this initiative, the general and specific terms of reference and the deliverables expected from consultants who are to be appointed to undertake a comprehensive and independent assessment of renewable energy exploitation in Malta. At the conclusion of this work, it is expected that the framework and a coherent blueprint for its structured introduction would be established.

The Consultation Paper outlines the areas that the consultants would be requested to address in detail, including :

- technical, environmental and economic aspects on the potential and feasibility of large scale exploitation of renewable sources to obtain electricity at national grid level;
- the development of a comprehensive strategy and an implementation plan for their structured and orderly introduction into Malta including their integration with conventional electricity in the national grid;
- the development of a methodology and procedures for the subsequent regulation of renewable energy generation and distribution and
- technical, economic and regulatory aspects on the potential and feasibility of small scale electricity generation at consumer level for his own use with access to the national electricity distribution grid for the balance.

The MRA invites the general public and interested parties to comment on this Consultation Paper. Comments should reach the Malta Resources Authority before 5.00 pm on 15<sup>th</sup> May 2002 at the following address:

**Malta Resources Authority  
Block A  
Floriana**

**Email: [ceo@mra.gov.mt](mailto:ceo@mra.gov.mt)**

All comments should be marked "Comments on the Development of a Strategy for the Exploitation of Renewable Energy Sources for Electricity Generation." Any material or information that may be confidential in nature should be attached in a separate Annex and clearly marked so that it can be kept confidential.

After the consultation period, the Authority will review the comments received and finalise the terms of reference for the consultancy.

In the course of the consultancy a Draft RES Strategy would be formulated. It is also expected that this Draft Strategy would be published for public consultation prior to finalisation.

## **2. BACKGROUND**

Renewable energy is increasingly becoming a vital component of the energy mix of the 21<sup>st</sup> century, and has already successfully penetrated the market in Europe and in other countries in the world. While a number of separate studies on the potential of some renewable energy sources have been carried out, the potential for renewable energy harvesting is not being exploited in Malta.

### **2.1 GOVERNMENTAL SECTORAL POLICY**

Government's energy policy follows the general policies of the EU with particular reference to the Maltese situation, including energy saving and efficiency, and renewable and alternative sources of energy.

The Malta Resources Authority Act further mandates the Authority to establish measures for the protection of the environment in the practices, operations and activities regulated by or under the same Act. Moreover the Authority is also entrusted with promoting, encouraging and regulating the harnessing, generation and use of all forms of energy, and with encouraging the use of alternative sources of energy. For such purposes and in accordance with such regulations as may be prescribed, it can impose levies on energy produced by non-renewable sources and grant subsidies in connection with the production of energy from renewable sources.

Malta is also entering into a number of European and international obligations that require it to adopt and implement strategies, in the short to medium term, that lead to environmental protection and sustainable development including a sustainable energy system.

Amongst these obligations are strategies to effectively reduce air pollutants and harmful emissions including participation in the international efforts to reduce greenhouse gas (GHG) emissions (e.g. renewable energy objectives set by the European Union for the year 2010, and GHG emission reduction targets set by the World Environmental Conference in Kyoto<sup>1</sup> and the United Nations Framework Convention on Climate Change (UNFCCC)).<sup>2</sup>

RES are widely considered to constitute an important part of the package of measures that are required to enable countries to comply with the Kyoto Protocol and to the UNFCCC.

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<sup>1</sup> Malta signed the Kyoto Protocol on 17th April 1998 and the date of receipt of instrument of ratification was 11th November 2001.

<sup>2</sup> The text of the UNFCCC was adopted at the United Nations Headquarters, New York on the 9 May 1992 and Malta signed the Convention on 12<sup>th</sup> June 1992. The date of receipt of instrument of ratification was 17/3/1994 and entry into force was on 15<sup>th</sup> June 1994. As a committed participant in the United Nations Framework Convention on Climate Change (UNFCCC) (March 1994), Malta is preparing its First National Communication (FNC) as required under Article 12.

Malta is also in the process of seeking accession to the European Union and is developing its negotiating position on the various chapters of the acquis. The main EU Directives relevant to this Consultation include:

1. EU Directive 2001/77/EC which seeks the promotion of electricity produced from renewable energy sources in the internal electricity market. The Directive establishes national indicative targets for contribution of electricity produced from RES and expressed as a % of the gross electricity consumption for each Member State. The EU overall target of RES-E is 22.1% in 2010.<sup>3</sup> This Directive also requires Member States to:
  - adopt appropriate steps to encourage consumption of electricity produced from RES;
  - adopt and publish a report setting national indicative targets for future consumption of electricity produced from RES and to report on the degree of success of meeting these targets;
  - guarantee the origin of electricity produced from RES;
  - evaluate existing legislative and regulatory framework to reduce regulatory and non-regulatory barriers to increase electricity production from RES and streamline administrative procedures;
  - adopt necessary measures to ensure transmission and distribution system operators guarantee transmission and distribution from RES;
  - report on the implementation of the Directive.

Malta is currently still in the process of estimating its national indicative targets for electricity produced from RES and this is one of the outputs of this present initiative.

2. EU Directive 2001/81/EC on National Emission Ceilings for Certain Atmospheric Pollutants. The aim of this Directive is to limit emissions of acidifying and eutrophying pollutants and ozone precursors in order to improve protection of environment and human health against the risks of adverse effects from acidification, soil eutrophication and ground level ozone. It sets projected emission ceilings for Member States of the EU for sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia for the year 2010. National emission ceilings for each member state to be attained by 2010 have been established.

Malta is in the process of assessing and eventually negotiating its national emission ceilings.

## **2.2 POWER GENERATION**

Electricity generation in Malta is carried out at two power stations (Marsa and Delimara). The total installed generating capacity is 582 MW, of which 272 MW are at Marsa Power Station and 304 MW are at Delimara Power Station (Enemalta Corporation, 2001). The entire generation system is a conventional thermal system. The electricity generation plant is based on steam power plant using heavy fuel oil

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<sup>3</sup> In the EU in 1999, renewable energy sources contributed 14.2 % of gross electricity consumption: 10.5% from large hydropower installations and 3.7% from all other renewables (EEA, 2001)

and gas turbines using gas-oil. During 1999/2000, 1,901,562 MWh were generated at Marsa and Delimara Power Stations and heavy fuel oil consumption was 467,772 Mtons while gas oil consumption was 69,020 Mtons (Enemalta Corporation, 2000).

### **2.2.1 Environmental issues**

The Marsa power station is an old plant and some of its steam turbines were first installed over thirty years ago. The generating plant installed or authorized prior to 1990 was not designed to meet the current European environmental legislation and standards (e.g. EU Directive 88/609/EC on the limitation on emissions of certain pollutants into the air from large combustion plants). The Delimara plant installed since 1995 complies with the requirements of European environmental legislation.

In 1995, the use of coal was phased out from Marsa Power Station. This has contributed to an improvement in environmental quality due to elimination of heavy coal dust over the area and problems associated with disposal of fly ash. Electrostatic precipitators on 3 boilers at Marsa Power Station have also been rehabilitated to remove particulate matter. Other plant boilers are however not fitted with electrostatic precipitators. In July 2001 Enemalta Corporation also started purchasing fuel oil with lower sulphur content (Enemalta Corporation, 2001).

The estimated SO<sub>2</sub> and NO<sub>x</sub> emissions from power generation for the year 2000 are 26,000 and 2,000 tons respectively.

#### **2.2.1.1 Greenhouse Gas Emissions**

The power sector is considered to be a major contributor to national greenhouse emissions, through the combustion of fossil fuel. CO<sub>2</sub> emissions from the power generation sector account for between 73-75% of CO<sub>2</sub> emissions in Malta. In the period 1999-2000, the estimated CO<sub>2</sub> emissions range between 1,398 – 1802 Gg and the maximum was in 1999 (Buttigieg, 2001).<sup>4</sup>

Buttigieg, (2001) estimated the other main and indirect GHGs emissions referred in the Intergovernmental Panel on Climate Change (IPCC) Guidelines from the energy sector (energy industries, transport, manufacturing and commercial, institutional and residential sectors). The annual emissions for the energy industries for the period 1990-2000 have been estimated as follows:

- methane (CH<sub>4</sub>) ranging between 16 - 27 tons with the maximum in 2000;
- nitrous oxide (N<sub>2</sub>O) ranging between 6.9 – 14.6 tons with the maximum in 1993;
- nitrogen oxides (NO<sub>x</sub>) ranging between 4,637 – 6,494 tons with the maximum in 1992;

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<sup>4</sup> GHG emissions from this sector between 1990-2000 have been estimated based upon the IPCC workbook.

- ❑ carbon monoxide (CO) ranging between 216 – 368 tons with the maximum in 1999;<sup>5</sup>
- ❑ non-methane volatile organic carbons (NMVOC) ranging between 84 – 118 tons with the maximum in 1999.<sup>5</sup>

Sulphur dioxide (SO<sub>x</sub>) is not a GHG and emissions are dependent on the sulphur percentage in the fuel. SO<sub>x</sub> emissions have been estimated to vary between 17,177 – 32,043 tons for the period 1999-2000 with the maximum estimated in 1998 (Buttigieg, 2001).

## **2.2.2 Renewable Energy Sources**

Renewable sources of energy are defined as “*renewable non-fossil energy sources (wind, solar, geothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases)*.” (Commission of the European Communities, 2001). The exploitation of these sources has a negligible impact on natural processes.

The most obvious sources for Malta are wind and sun. The use of renewable energy for electricity generation reduces the requirement to burn fossil fuels which are a significant contributor to greenhouse gas emission. Renewable fuel sources are indigenous and can also contribute positively to import substitution and security of energy supply.

Apart from diversification of primary energy sources, including those from renewable sources, other energy demand management measures could also contribute towards greater environmental protection and the national emission reduction programme. These however fall outside the scope of this initiative.

Renewable energy projects are generally of a smaller scale than conventional energy projects due to natural and technical constraints and consequently cannot benefit from economies of scale to the same extent. In relative terms, there may be high capital costs which need guarantees of long term stable income structures to ensure financial viability (European Environment Agency, 2001).

The capital costs of renewable energy projects are generally high and pose a significant barrier to development (EEA, 2001). In general the cost-effectiveness of renewable energy technologies in relation to fossil fuel technology in the electricity generating market depends on various factors including natural characteristics on site. Technology has made enormous strides in recent years in some sectors (wind in particular), but these can as yet be developed commercially if support measures are applied.<sup>6</sup> It is recognised that the adoption of renewable energy, with the specific characteristics that nature imposes, changes existing framework conditions of energy system operation (sources, techniques, infrastructures, investments, business organisation and economic considerations).

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<sup>5</sup> Carbon Monoxide (CO) and Non-methane Volatile Organic Carbons (NMVOCs), from power generation are small and the major contributor of these GHGs is the transport sector.

<sup>6</sup> Wind energy for example has been increasingly cost-effective in the last decade requiring less grants where feed-in arrangements are available. Subsidies may still be applied to support wind energy schemes (EEA, 2001).

Market intervention for this purpose may be justified on the basis that market prices for electricity generated from fossil fuels do not reflect the full economic costs of generation. In particular they exclude the negative externalities of environmental degradation, which is not associated with the generation of electricity from renewable fuel sources and the positive environmental benefits of renewable energy. Although wind energy may be competitive in price, it is frequently constrained by technical factors.

### **2.3 PAST STUDIES, EXISTING DATA AND DOCUMENTATION AVAILABLE**

Various studies on the potential of RES have been carried out in Malta. In particular published papers outlining research carried out in the sector include:

1. Analysis of the performance of a solar photovoltaic grid-tier system installed in Malta by Iskander Yousif and Scerri (2001);
2. Analysis and evaluation on the potential for offshore wind generation by Farrugia and Scerri (2000);
3. An evaluation of wind resource at different sites in Malta and using a combination of short and long term wind measurement programs coupled to analysis of results generated by the WASP program by Farrugia and Scerri (1999);
4. Monitoring of a 1.8 kWp grid connected solar photovoltaic system by Iskander Yousif and Scerri (1998);
5. Wind resource assessment for Malta by Farrugia (1998). This study evaluated long term wind conditions taken at Luqa Meteorological Office and determination of wind conditions at candidate sites by mathematical modelling. Wind maps show long term predicted wind speeds and power densities and highlight areas suitable for wind generation.
6. Analysis of wind characteristics such as diurnal trends and parameters relevant to power generation by Farrugia and Scerri (1997);
7. Design, set-up and commissioning of a grid-connected solar photovoltaic system in Malta by Iskander Yousif and Scerri (1997);
8. Developments in solar photovoltaic applications in Malta by Iskander Yousif and Scerri (1996);
9. Programme for establishing widespread application of solar water heating by Fsadni (1996);
10. Wind data evaluation by Scerri and Iskander Yousif (1996);
11. Testing, evaluation and optimisation of the performance of a stand-alone photovoltaic system in Malta by Iskander Yousif (1995);
12. The feasibility of using wind energy in Malta by Darmanin (1995);
13. Performance analysis between thermopile and silicon solarimeters by Scerri (1992);
14. Radiation climate of Malta by Scerri (1982).

The Institute of Energy Technology of the University of Malta has 5 different solar radiation databases ranging between 4 to 7 years. Wind measurements at different sites in Malta are available for different durations ranging between 6 months and 4 years (*Weather Data as Recorded at the Institute Energy Technology, Marsaxlokk, Malta*).

Climatological data is also held by the Meteorological Office at the Malta International Airport and by the Water Services Corporation.

## **2.4 MRA'S OUTLINE PROGRAMME**

Cognisant of Malta's international obligations, as well as recent EU Directives to reduce GHG emissions and in response to the requirements and responsibilities established by its Act, the Malta Resources Authority intends to employ consultancy services to assist in the investigations into the introduction of these alternative energies in Malta.

This Consultation Paper outlines the proposed objectives and deliverables that are expected from this investigation such that the optimum combination of options for Malta is sought and applied.

On the basis of this initiative, a RES Strategy will be formulated after appropriate consultation in the course of its preparation. This Strategy will seek the establishment of the appropriate receptive business environment through introduction of legislative, administrative and fiscal measures that would facilitate the implementation of the feasible technical measures recommended in the investigation.

In accordance with the adopted strategy, the MRA will also facilitate and support as far as possible project proposals aimed at development of renewable sources that will contribute to GHG emission reduction in line with the legislative, administrative and fiscal measures noted above. The physical characteristics in the host country/region, the degree of technological development and sophistication of the equipment and system and the supportive measures determine the extent to which renewable energy technology is successfully exploited.

An important element of this project is the training of local staff and their exposure to the investigative methodologies used in organisations with a high level of technical competence. It is therefore desirable for as much as possible of the work to be done in Malta with the effective participation of personnel from the Malta Resources Authority and other appropriate institutions indicated by it.

## **3. SCOPE OF PROPOSED INITIATIVE**

### **3.1 GENERIC OBJECTIVES**

The overall objectives of this Renewable Energy initiative is the exploitation of efficient and clean energy technologies to meet energy needs, enhance the quality of the environment, and concurrently satisfy Malta's international obligations.

This initiative is expected to contribute to:

- an improvement in health of the community and quality of life,
- an improvement in the environmental quality associated with a reduction in pollution emissions brought about by fossil-derived electricity production. This is expected to contribute towards reduction in GHG emissions, and other pollutants, which contribute to acidification, soil eutrophication and exposure to ground-level ozone.

The determination of the contribution of RES to the internal energy balance and its security of supply are considered to be important deliverables of the proposed investigation that should not be neglected.

It is envisaged that an appointed consultancy will carry out original, independent and the best possible analysis of relevant information, local situations and characteristics, on the basis of which, it will develop and recommend a detailed strategy and implementation programme, inclusive of targets of penetration, timeframes, milestones and benchmarks for the successful, structured and orderly introduction of renewable energy production and distribution in Malta, its integration with the existing national power grid, and possibly also with seawater desalination for water production.

The possibility of hydrogen production from RES, review and development of hydrogen technologies and applications, and promotion of hydrogen energy systems will also be explored.

The conclusions and recommended plans and programmes will also be subject to a strategic environmental assessment as required by EU Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment.

### **3.2 GENERAL DELIVERABLES**

The following are the general deliverables that are expected and envisaged to be attained through this initiative:

- Development on past work carried out on the potential of renewable energy and the way forward to implementation;
- Fieldwork, studies and other activities related to this investigation in co-ordination with the Malta Resources Authority and other participating institutions and organisations that may be involved in its technical aspects and financing;
- Training of local staff assigned to the project to a degree that will enable them to collaborate in the project and to carry out any follow-up that may be necessary;
- Any further work or investigations considered beneficial to the country in the light of progress achieved during the development of this initiative;
- Public and/or private consultations, presentations and educational programmes relevant to this initiative.

## **4. SPECIFIC OBJECTIVES AND DELIVERABLES**

It is envisaged that the proposed initiative will provide for the necessary investigations, reports and other deliverables as outlined under the following headings:

## **4.1 LARGE SCALE ENERGY GENERATION**

### **4.1.1 *Technical and technological assessments:***

As part of the initiative, technical and technological assessments on the following will lead to the following deliverables:

#### ***Availability and RES Potential***

1. A review of past studies and any additional work that may be required on the potential for exploitation in Malta of the various renewable (non-fossil) energy sources, with special reference (but not necessarily restricted to) wind and solar energy. This examination should lead to confirmation and/or new recommendations on commercially exploitable RES on a large scale and to the most suitable plant sites from a technical standpoint (land-based and/or offshore). Existing data will be utilised while advice on what additional data is required, and how this is best and expeditiously generated will be sought.
2. Analyse the best possible and credible scientific opinion on the potential and probable effects of climate change that can have an impact on the feasibility of renewable energy projects in Malta. This will need to be considered in view of the long-term nature of the projects and account will be taken of climate change scenarios, trends and the associated impacts on the proposed options. The uncertainty elements and associated risks will be clearly identified and reported upon.

#### ***Energy harvesting technology & equipment***

3. Report on the technically suitable, commercially available and sufficiently proven technology and equipment for harvesting the type of renewable energy identified above.
4. Recommendations, with motivations, of the preferred technology and equipment (or combination of options) for adoption in the Maltese environment and any customising that may be necessary or advisable for the local scenario to ensure best practice, security and safety.

#### ***Interfacing and delivery to the grid***

5. A discussion on the accepted practices and technical installations that are suitable for delivering bulk power into the grid, its control (safety and proper operation) or directly to dedicated users.
6. A detailed description of the method recommended for application as in (5) above specifically in the Maltese scenario.

### ***Integrated exploitation system***

7. A proposed vision of the final RES exploitation set-up, including its transmission and distribution, from a technological viewpoint taking into account the support infrastructure that exists or is recommended for construction and based upon other studies (economic, environmental, etc.) that will be undertaken as part of this consultancy.
8. A quantitative assessment and preliminary conceptual design of the system, including generators, grid access and transmission systems. Network flows under various scenarios of source availability will also be included.

### ***Siting***

9. Recommendations of which sites, prioritised in order of preference are to be considered for large scale RES exploitation and based upon an overall perspective of the knowledge gained in the course of this initiative. The final decisions will be taken after full scale Environmental Impact Assessments that will take into account other matters besides those considered in this investigation.

### ***Contribution to the energy balance***

10. Estimates with justification, the potential contribution to the national energy balance by the identified sources and the supporting infrastructure as described in response to the preceding subsection. These will be expressed as a percentage of electricity generating capacity and consumption in Malta as at 2000, under various statistically probable scenarios of source availability.

### ***Impact on quality and reliability of supply***

11. A qualitative description with explanations and a quantitative evaluation where possible, of the expected impacts on the current electricity system infrastructure (including any already commissioned projects of transmission/distribution system upgrading) and on the quality and reliability of supply to the consumers if the identified potential sources were to be mobilised, considering various scenarios and degrees of penetration based on data for the year 2000.

### ***Integration with other technologies***

12. Considering the existing seawater desalination activity in the country, an examination on the possible benefits that might accrue from the integrated management of water production, conventional electricity generation and renewable energy exploitation, noting on the one hand that water is a storable commodity while intermittent operation of the desalination modules is to be avoided.
13. Examination of other technologies including hydrogen production from RES, review and development of hydrogen technologies and applications, and promotion of hydrogen energy systems.

14. Identification of any other technological/technical opportunities and barriers to the successful exploitation of the renewable energy potential in Malta. These will be quantified where applicable, with recommendations on how to maximise the opportunities arising and overcome identified barriers.

#### ***Environmental impacts***

15. A detailed examination and environmental report on the likely significant effects on the environment in implementing the plans and programmes recommended in this investigation including consideration of reasonable alternatives and as outlined in EU Directive 2001/42/EC.

#### ***Stakeholder consultations***

16. An active consultation process with representatives of all interested stakeholder groups in the development of the studies and reports.

#### ***4.1.2 Financial assessment, costs and benefits***

The following financial assessment, costs and benefits will be addressed:

1. Production costs for the technically feasible scenarios outlined above including:
  - (a) capital costs, including land-take costs;
  - (b) operational costs, including manning, maintenance, spares, and any other, and hence the cost per unit generated on the basis of statistically acceptable levels of production.
2. Generally accepted methodologies for quantifying in financial terms environmental benefits and costs of renewable energy generation (relative to electricity generated from fossil fuels). The various methodologies for addressing the environmental externalities will be considered and reported upon including the respective advantages/ disadvantages of each as well as detailed support of the preferred methodology/methodologies.
3. Other directly and indirectly related costs generally associated with this type of venture and accepted methodologies for evaluating them. These costs would include back-up costs, unpredictability premiums, supply security and quality costs, transmission and any other costs, assuming scenarios of the operator of the RES-E plant/s being an independent power producer and separate from the distribution (and transmission) system operator and any other restrictive scenario.
4. Methodologies for the equitable sharing of interface costs of generation and transmission/distribution of the renewable energy and fossil fuel energy cost. Existing green pricing mechanisms that have been adopted elsewhere will be reported and the potential advantages and disadvantages of each scheme described. The above findings will be combined into coherent tariff

methodologies that can be adopted locally, based on the various possible supply arrangements and scenarios.

5. Based on the economic and technical criteria addressed in the above sections, detailed report on the need or otherwise for market preference, economic and/or fiscal incentives to encourage and promote the introduction and sustainability of renewable energy production and use in Malta. The various market/economic/fiscal support mechanisms will be identified and evaluated, and based on proven qualitative and quantitative performance criteria.
6. Comparisons with other countries (as may be applicable and suitable) to assist interpretation;
7. Recommendations with justification, how Malta may comply with the provisions of Council Directive 2001/77/EC and specifically; article 3 (national indicative targets), article 4 (support scheme), article 5 (guarantee of origin of electricity produced from RES) and article 7 (grid system issues).

#### **4.1.3 Legislative, Regulatory and Administrative Matters**

The following legislative, regulatory and administrative matters will be addressed:

1. The current legislative, regulatory and administrative structures and mechanisms in Malta will be examined to evaluate their adequacy for the implementation of the recommended strategy, implement article 6 of Directive 2001/77/EC (administrative procedures), as well as to regulate the RES-E sector thereafter, and propose upgrading or amendments to the current legal and regulatory framework and structures, including capacity-building where necessary.
2. An implementation plan for Council Directive 2001/77/EC will be proposed. In responding to the terms in this section this will take detailed account of Malta's implementation of Council Directive 96/92/EC (with special reference to Chapter 7, Organization of access to the system).
3. This investigation will assist the MRA to develop policies and procedures to fulfil all its functions as defined in Section 3 of these specifications, especially:
  - (a) ensuring the structured and orderly exploitation of RES in Malta
  - (b) the regulation and interconnectivity for the production, transmission and distribution of energy.
  - (c) fair competition in all practices, operations and activities.
4. Imposition of levies and/or subsidies to discriminate positively in favour of RES and to ensure accounting of all externalities in conventional electricity generation systems.

#### **4.1.4 Technically and Economically Feasible Targets**

Technically and economically feasible targets will be set in absolute terms (GWh). These targets shall be related to the national commitments made as part of the greenhouse gas emission reduction in line with Kyoto Protocol and others; and for the implementation of Council Directive 2001/77/EC

A strategic framework and road map for the introduction and achievement of national indicative targets (above), including progress monitoring and review mechanisms will also be developed.

### **4.2 SMALL SCALE RENEWABLE ENERGY GENERATION & USE.**

#### **4.2.1 Technical and technological assessments**

It is envisaged that this initiative will also address small-scale renewable energy use and generation and the following technical and technological deliverables are expected:

1. Report on the potential of small scale (consumer end e.g. domestic by photovoltaic) generation and its possible contribution to the grid.
2. The accepted methodologies for determining this and the most suitable will be indicated, with justification.
3. Report on the technology/ies available on the market, their reliability and proven track record, options for application in the local environment and any customising that may be necessary for local conditions.
4. Report on small scale renewable energy use (e.g. solar water heaters where penetration success in Malta has been limited).
5. Investigate innovative energy technologies and opportunities associated with small scale renewable energy use including solar air-conditioning of buildings.
6. Accepted practices for delivering access power to the grid, including the impact on safety and on the grid will be discussed and how any concerns can be overcome.
7. Technically and economically feasible targets for small scale generation and use to be set in absolute terms (GWh).

#### **4.2.2 Economic assessment, costs and benefits**

The following financial assessment, costs and benefits will be addressed:

1. An identification of costs attached to the above practices, including costs of equipment to generate electricity (e.g. photovoltaic cell installation) and to

transfer the excess to the grid including safety, security and monitoring equipment.

2. An identification of the costs, benefits and barriers to entry of small scale renewable energy uses.
3. An identification of other costs or benefits that are properly chargeable to these practices (generation and use).
4. The most suitable methodology for determining an appropriate tariff/payment scheme including adjustments for environmental economics, predictability, etc. will be proposed.

#### **4.2.3 *Regulatory, legislative and administrative matters***

This initiative is expected to assist the MRA to develop a system that is as simple and as customer-friendly as possible to regulate such small systems, if regulation is needed.

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## **ANNEX 1**

### **4. RESOURCES AUTHORITY: OBJECTIVES AND RESPONSIBILITIES**

*(Extract from Act XXV of 2000)*

The Malta Resources Authority Act (2000) entrusted the Authority with the regulatory responsibility of the Malta energy sector, and specifically:

- (a) to regulate, monitor and keep under review all practices, operations and activities relating to energy, water and mineral resources;
- (b) to grant any licence, permit or other authorisation, for the carrying out of any operation or activity relating to energy resources;
- (c) to regulate and secure interconnectivity for the production, transmission and distribution of the services or products regulated by or under this Act;
- (d) to ensure fair competition in all such practices, operations and activities;
- (e) to establish minimum quality and security standards for any of the said practices, operations and activities and to regulate such measures as may be necessary to ensure public and private safety;
- (f) to secure and regulate the development and maintenance of efficient systems in order to satisfy, as economically as possible, all reasonable demands for the provision of the resources regulated by or under this Act;
- (g) to carry out studies, research or investigation on any matter relating to the resources regulated by or under this Act;
- (h) to provide information and issue guidelines to the public and to commercial and other entities on matters relating to the said resources;
- (i) to regulate the price structure for any activity regulated by this Act and where appropriate to establish the mechanisms whereby the price to be charged for the acquisition, production, manufacture, sale, storage and distribution thereof is determined;
- (j) to establish the minimum qualifications to be possessed by any person who is engaged or employed in any activity regulated by or under this Act;
- (k) to establish measures for the protection of the environment in the practices, operations and activities regulated by or under this Act;
- (l) to ensure that international obligations entered into by the Government relative to the matters regulated by or under this Act are complied with;
- (m) to advise the Minister on the formulation of policy in relation to matters regulated by this Act, and in particular in relation to such international obligations;
- (n) otherwise to advise the Minister on any matter connected with its functions under this Act;
- (o) to formulate and implement the policies and strategies with short-term and long-term objectives, in relation to the activities regulated by this Act;
- (p) to perform such other functions as may from time to time be assigned to it by the Minister.

Moreover, the Malta Resources Authority Act identifies the following additional specific functions in relation to energy:

- to promote, encourage and regulate the harnessing, generation and use of all forms of energy, and

- to encourage the use of alternative sources of energy and, for such purposes in accordance with such regulations as may be prescribed, to impose levies on energy produced by non-renewable sources and grant subsidies in connection with the production of energy from renewable sources.

The Authority is also responsible to adopt and implement the European acquis for the energy sector, including:

- Directive 96/92/EC concerning the common rules for the internal market in electricity. Malta fulfils the criteria defining a 'small isolated system' in the mentioned Council Directive and will apply the provisions of Article 24 with regard to Chapter IV (Transmission System Operation), Chapter V (Distribution System Operation), Chapter VI (Unbundling and Transparency of Accounts) and Chapter VII (Organisation of Access to the System).
- Directive 2001/77/EC on the promotion of electricity produced from RES in the internal electricity market.