MALTA RESOURCES AUTHORITY

Response to the Consultation Paper on the Development of a Strategy for the Exploitation of Renewable Energy Sources

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MALTA RESOURCES AUTHORITY
CONSULTATION PAPER

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Response to the consultation on the development of a strategy for the exploitation of renewable energy sources for electricity generation

1. Introduction

The Malta Resources Authority issued a consultation paper on the development and implementation of a strategy for the exploitation of renewable energy sources (RES) for electricity generation in Malta. The Paper was published in April 2002 and was open for consultation until 17th June 2002.

This Paper outlined 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. The paper also invited comments on its contents and on the terms of reference 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.

This document summarises the written responses received by the Authority and the Authority's response to the views expressed in these representations.

2. RESPONSE TO CONSULTATION PAPER

2.1 Analysis of representations

The following is an analysis of the written representations made in response to the consultation paper and a commentary on the key issues raised and highlighting the Authority's response.

There were a total of 33 responses of which 32 were letters or written communications. There were a number of issues raised which were outside the scope of the consultation paper. Relevant comments and suggestions were considered for the purpose of this document.

The list of consultees is shown in Appendix 1.

3. COMMENTARY ON KEY ISSUES AND THE AUTHORITY'S RESPONSE

3.1 General issues

Title & Introduction

3.1.1 Three consultees commented on the title of the consultation paper and suggested that this should be amended. Five consultees felt that the consultation paper, with particular reference to the title and introduction, limited the initiative to the potential of renewables to generate electricity and suggested that this should be amended to reflect an extension to all renewables. It was pointed out that RE use apart from electricity generation should also be considered and a more integrated approach should be adopted. It was also noted that reference was not made to the end use of the energy generated.

The Authority will amend the relevant sections to ensure that initiative is extended to clearly include consideration of all renewables and their application in so far as these have a direct or indirect effect on electricity flow to the grid.

Background

3.1.2 One consultee remarked that the paper should outline the intrinsic differences between conventional methods of power generation based on fossil fuels and RES such as to establish the constraints of RES utilisation and distribution.

3.1.3 Four respondents commented on the potential of RES and suggested reasons for limited exploitation of RES. These included the lack of enabling legislation, VAT and fiscal measures, lack of consumer information, inadequate supporting framework, and social impact (perception that this could lead to increased unemployment).

3.1.4 Four consultees commented on market intervention and welcomed the prospect of introduction of levies on energy produced by non-renewable sources and/or fiscal incentives in connection with the production of energy from renewable sources. One consultee noted that at the consumer level interest in renewable energy is aroused primarily by an energy audit scheme where energy consumption trends would highlight the need for diversity into alternative sources of energy. Two consultees noted that market forces would probably not suffice for RES introduction and suggests further development of this in the document. One consultee also suggested that PV and wind-driven water pumps could be made attractive for farmers to install on their on-site well/reservoirs.

3.1.5 One consultee noted that the modality of incentives has to be carefully chosen if it is to achieve the proper effect and not be misused. One consultee suggested that companies should be rewarded for the elimination or reduction of emissions using RES with Green Certificates. Another consultee remarked that fiscal measures should form part of a National Energy policy.

Authority's response:

The applicability and introduction of levies, subsidies, green certificates etc. is considered as part of the initiative and the Authority at this stage does not wish to pre-empt the results of the initiative.

Terms of Reference

3.1.6 Two consultees commented on the TOR and noted that these should:

i. be clear in terms of deliverables and in relation to the expected time scale of the project itself, interim reporting etc.;
ii. include an obligation to provide ongoing advisory services.

3.1.7 Two consultees questioned the appointment of consultants and suggestions were submitted for:

i. to adopt a national effort led by MRA instead;
ii. the issue of a preliminary set of guidelines on application procedures that direct RE investment;
iii. establishment of preliminary regulations that enable door to grid connection.

Another consultee commented that the consultation paper does not bring immediate action and anticipated that the process would be uselessly lengthy and expensive. It was noted that immediate action is required to define procedure to be adopted by companies willing to undertake RE generation and a short time frame established to respond to their application.

Authority's response:

In its outline programme the Authority has clearly stated its intention for employment of consultancy services and does not accept the suggestions received that this process should be amended.

3.1.8 One consultee commented that:

"Ï find it hard to believe that on this small island some people are not aware of what is taking place around them. It is indeed a fact that in Malta those who assume "they know it all meet together to discuss subjects ignoring completely the experts in the various fields. The result is usually a fiasco. This has happened time after time on this island, however due to the popular wish to publish everything on the internet and due to or desire to join the EU, I think it is high time for things to change."

This consultee also noted that the document failed to contain one technical word on grid connected solar systems which subject is currently being researched in Malta. The consultee was of the opinion that "*the report looks like something written by non-technical persons who have no direction whatsoever as concerns renewable energy*." The consultee also considered that the papers referred in the consultation document "*are very poor in content and quality*."

Another consultee remarked that the proposed study appears fairly comprehensive, particularly in relation to the technical aspects. In some

respect it was noted that the technical studies proposed appear to be more detailed than might be necessary, and that some elements might prove to be expensive to provide. The level of detail proposed was considered to be consistent with the MRA developing a very prescriptive renewable strategy, based on a centrally planned approach. However it was noted this might not be the approach most conducive to encouraging innovative third-party investment.

Authority's response:

The contents of these submissions were noted.

Selection of consultants

3.1.9 There were eight consultees which offered consultancy services to the MRA for the development of the strategy outlined in this document. There were also a further four responses from commercial organisations or individuals proposing commercial services for specific RES.

Authority's response:

The tender document based on the consultation document and relevant submissions received will be issued and all interested parties are free to submit their tender offer. Furthermore since the MRA is primarily seeking to develop a strategy for the orderly introduction and exploitation of RES, it is considered inappropriate at this stage to commit to specific technologies, but these would be expected to be further investigated by the Consultants.

3.2 Governmental sectoral policy

3.2.1 Four consultees noted that governmental sectoral policy has not yet been formally published. One consultee however further noted that the document reflects more government thinking. One consultee also commented on the need for formulation and implementation of a 'Fuels Policy'.

Authority's response:

Although Government's Energy Policy has not been published, the general policies for the sector are broadly established as indicated in the consultation document. The Energy Policy is currently being reviewed by the Authority and is considered important in supporting this initiative. It is expected that this would be published before end 2002.

3.2.2 One consultee commented that MEPA's role should be acknowledged and reference to the Utility Topic Paper for the Structure Plan made.

Authority's response:

It is acknowledged that there are various government entities, including MEPA who contribute towards government's policy in the sector. Reference to these entities will be made in the Terms of Reference.

International obligations

3.2.3 Seven consultees commented on Malta's international obligations and the targets established by the EU Directives and the Kyoto Protocol. Comments varied and consultees noted that:

i. targets for the reduction of air pollutants and harmful emissions were welcomed;
ii. the establishment of national targets for RES were considered an important move towards sustainable development and should be carried out as soon as possible;
iii. EU Directives are to be considered as a tool and not as a means and that the minimum levels established may be exceeded;
iv. the targets established for member states by EU Directive 2001/77/EC and the Kyoto protocol may prove difficult for Malta to attain;
v. significant capital investment is required to attain the 22% target established by EU Directive 2001/77/EC;
vi. when estimating the national indicative targets for electricity from RES, since Malta does not have any hydropower, the targets mentioned by EU for the year 2010 will not apply to Malta;
vii. the indirect approach of displacement via SWH, solar air conditioner and energy efficient buildings could contribute towards achieving these targets;
viii. assessment and negotiation of emission ceilings were considered to be disconcerting concepts.

Authority's response:

It is noted that the establishment of targets for RES is one of the deliverables expected from the initiative (refer 4.1.1- contribution to energy balance.) The Authority is of the opinion that for realistic targets to be established a clear assessment of RES potential outlined in this section is necessary. The 22.1% RES-E by 2010 target is an overall EU target and member states have different targets depending upon local conditions.

3.3 Power generation

Environmental issues

3.3.1 One consultee noted that NO_x and SO_2 emission figures for 2000 should be corrected. It was also noted that the purchase of lower sulphur HFO may be erratic and depends on price. Three consultees mentioned the possibility of using natural gas as a substitute for other, more polluting fossil fuels in view of the proposal for a pipeline between Sicily and Malta. This could help to attaining the EU emission limits for sulphur. However one consultee questioned the feasibility of building the pipeline.

Authority's response:

The emission figures are being revised. Other issues raised are considered part of the national energy policy.

3.3.2 One consultee noted that the paper emphasises renewable energy sources to reduce greenhouse emission. However it was remarked that providing additional generating capacity through renewable energy sources would not reduce current air quality problems. It was noted that existing sources need to be replaced to ensure a positive change.

Authority's response:

The Authority is of the opinion that, saving security of supply, RES, even if they do not replace existing plants, may in conjunction with demand management measures contribute towards postponement of new conventional generating systems. Moreover in the light of increasing environmental standards and the Electricity Directive, it is expected that the use of RES may be preferred.

3.3.3 One consultee noted that MEPA is currently preparing an assessment on the vulnerability of Malta to climate change and drawing up proposals for abatement and adaptation to climate change to be presented to the UN climate change convention.

Authority's response:

The Authority will refer to existing work being undertaken by MEPA and will seek co-ordination between these two entities.

3.3.4 Four consultees commented on potential environmental impacts of large scale renewable energy projects which include:

i. a lower output for an equivalent area of land use;
ii. negative impacts on landscape value;
iii. interference on flight paths and bird migration routes;
iv. impacts associated with blade movement and shadow flicker and
v. noise and electromagnetic pollution.

Authority's response:

The Authority noted these comments and will highlight the potential of environmental impacts from RES in the TOR.

Demand management

3.3.5 Thirteen consultees referred to demand management and energy efficiency and conservation measures. Suggestions and comments received were as follows:

i. demand management was not considered in the consultation paper and this should precede or at least form part of the proposed work and terms of reference;
ii. energy demand management / energy efficient initiatives are important in complementing RES and these could give greater returns and are cheaper and faster to implement;
iii. energy conservation measures, together with issues related to sustainable development and building construction should be incorporated;

iv. the integrated approach which calls for consideration of both supply side and demand side polices should be adopted;
v. the requirements for future energy demand, taking account of conservation issues and the growth in demand that is likely to be realized in the near future should be investigated;
vi. demand management and RES should be treated as separate studies.

Authority's response:

The Authority recognises that demand management and energy efficiency potential are important and will be studied in parallel. Consultants will be required to co-ordinate with ongoing projects and studies. Furthermore Consultants will be required to develop solutions and recommendations on the basis of realistic and varying scenarios of demand.

Renewable energy sources

3.3.6 One consultee noted that exploitation of these sources does not have a negligible impact on natural processes since visual and other impacts have to be considered at planning stage.

Authority's response:

It will be clarified that RES are by their nature renewable and therefore inexhaustible. Reference to natural processes will be eliminated.

3.3.7 Ten consultees commented on the investigation of specific renewable energy sources. Suggestions and comments were made on the following:

i. the most promising natural resources for Malta are the sun and the wind;
ii. the document should investigate the potential of other sources (apart from wind and solar) e.g. energy recovery from waste and wave power, as well as their combination;
iii. the potential of solar energy for heating should be considered;
iv. major infrastructure for the treatment of waste and sewage treatment are currently being designed and that this offers the possibility of catering for biogas recovery.

Authority's response:

It is not the intention of the Authority to exclude any renewable energy source and the document highlights this. Further amplification will be made in the document on this to ensure clarity of this point.

With respect to energy recovery from waste, the MRA has requested MEPA such that this issue is addressed in the Environmental Impact Assessment (EIA) for the eventual construction of a landfill facility. The Authority feels that energy recovery from waste should be treated separately of this initiative although consultants may be required to refer and co-ordinate their work with the findings of the EIA for landfill facilities.

3.3.8 Five consultees commented on economic, supply and R&D issues of RES. Comments and suggestions were made on the following:

i. RES contributes towards diversity of supply and this should be a key policy consideration;
ii. both RES and conventional energy projects require long term stable income structures;
iii. the description made of RES projects as generally of a small scale and the mentioning of their high cost were considered to be debateable;
iv. further amplification was warranted regarding the reasons why RE project are generally of small scale;
v. need was felt for increase in research and innovation in the relevant R&D sectors, in order for Malta to be in a position to respond to the challenges of the medium to long-term future in RES.

Authority's response:

Comments have been noted and the Authority agrees that diversity of supply should be a key consideration and this has been outlined in the consultation paper [ref. 2.2 and 3.1].

With respect to long-term stable income structures it may be further clarified that a difference between the two exists since whereas the framework of income structures for conventional energy has generally been in place over a large number of years, this is not necessarily the case for RES.

3.3.9 One consultee referred to previous work carried out by the G8 Task Force. This Task Force was set up to identify the barriers and solutions to elevating the level of renewable energy supply an distribution in developing countries. Its conclusions and recommendations included that:

i. the barriers to massive uptake and expansion of renewable are financial and political not technological;
ii. steps should be taken for the removal of incentives and other supports for environmental harmful energy technologies;
iii. global corporations should commit to procure and use renewable energy;
iv. emphasis on life cycle costs shows that renewables are already competitive with respect to conventional fuel.

Authority's response:

The Authority noted these conclusions and recommendations and where omitted, will be further highlighted in the terms of reference.

3.4 Past studies, existing data and documentation available

3.4.1 Seven consultees commented on past studies, available data and on the documentation highlighted in the document. Comments varied and it was noted that:

i. a number of past studies were omitted and the list indicated in the document is not exhaustive;
ii. additional studies were suggested;
iii. the paper is highly historical with a lot of emphasis on previous work;
iv. climatological data available at the Meteorological Office is mostly stored in log books and is not available in digital format making its use difficult;
v. wind measurements at various locations and at different heights above ground level for Malta are available for different time frames ranging between 6 months and 7 years.

Authority's response:

With respect to point (i), (ii) and (iii) it is acknowledged that the document is not exhaustive in the studies highlighted. Additional studies which have been suggested in the consultation and which are considered relevant will be further added to this section. It is further noted that it was not the intention of this consultation paper to highlight all studies on the subject but to give an outline of some of the main studies carried out in Malta.

With respect to point (iv) and (v) the Authority will add an explanatory note regarding climatologically data availability in the TOR.

3.5 MRA's outline programme

Methodologies for the introduction of RES in Malta

3.5.1 Five consultees commented on the methodology adopted by the MRA for the introduction of RES. Comments varied and consultees noted that:

i. no time frame for the work was proposed in the consultation paper. In this respect a framework in which new technologies would be inserted was suggested;
ii. clarity of concept was considered to be hampered by the officials typical of such publications;
iii. a normative multi-criteria decision-making framework for renewable energy planning could regulate the decision processes at the local level and give to the local people the administrative authority to influence the outcome;
iv. the paper gave the impression that although the advice of the consultants was sought, the Authority already has strong opinions on the subject;
v. further amplification and development is warranted on MRA's contribution in facilitating and supporting project proposals;
vi. the Authority should periodically issue a call for project proposals and that these should be budgeted for;
vii. the Authority should confer greater onus on the developers to suggest the most efficient, cost-effective proposals;
viii. legislation should put the responsibility on the operators for efficient operation rather than this being within the remit of the Authority;
ix. an application process and guidelines for RES operators were suggested;

x. an obligation could be established on Enemalta to develop specific forms of renewable generation, at specified sites. In the process the utility could be required to issue tenders for the construction and recover any additional cost through its tariffs. It was claimed that this option would involve the least change to the legal and regulatory arrangements;

xi. a possible supporting scheme consisting in an invitation of competitive bids from third parties (and potentially Enemalta) to provide renewable generation (the location, technology or amount of capacity required could be specified if necessary), and to oblige Enemalta to purchase the output from the successful bidders under long-term contracts at their bid price was suggested;

xii. the approach taken towards the development of renewable strategy should be consistent with the Authority's wider plans for the electricity industry. The renewable strategy should not be developed in isolation from the broader strategy for electricity (and potentially gas) on the island. It was suggested that the regulatory and administrative arrangements which will be designed as part of this project to support the renewable strategy should not restrict or undermine plans for the rest of the industry. It is particularly important that the industry Regulator is seen to be applying the same principles consistently. It was suggested that a broad framework for regulating the industry is established prior to undertaking this study;

xiii. technical studies specified in the consultation document should identify the scope and magnitude of the development potential and the capability of the network to accommodate new generation. It was proposed that in the case that the conclusions indicated that there are only a limited number of suitable sites – in terms of planning, resource availability and network capacity – then the renewable strategy should adopt a fairly prescriptive approach – identifying the sites for development and specifying the quantity and type of technology to be developed. It could even go as far as granting advanced planning consent and providing network connections. On the other hand, if it turns out that there are multiple options for renewables development, there would be greater scope to adopt a more flexible and open strategy.

Authority's response:

Comments have been noted.

With respect to (i) the Authority will indicate a proposed time frame for submission of the proposed strategy. Consultants will be required to submit an indicative road map for strategy development and implementation [ref. 4.1.4].

With respect to comments (v) - (viii) it is noted that the Malta Resources Authority Act specifically provides for the Authority to promote, encourage and regulate harnessing, generation and use of all forms of energy and to encourage the use of alternative sources of energy. It is not however within the remit of the Authority to act as an operator in the field and therefore does not foresee its role in issuing and budgeting for specific projects but in regulating the operation of these projects.

With respect to comments (ix) - (xi) it is noted that these are considered to be deliverables of the proposed initiative.

With respect to comment (xii), the Authority agrees that the RES strategy should be consistent with the wider regulatory framework. The Authority has plans for a twinning project with an international regulator such that this framework is established. Consultants will be required to integrate their work within this framework.

3.6 Generic objectives of proposed initiative

3.6.1 Four consultees commented on the generic objectives of the proposed initiative and comments varied as follows:

i. technical problems, limitations and legislation were not addressed in the paper;
ii. there is scope for financing of implementation projects under EU Programmes.

Authority's response:

With respect to comment:

(i) the Authority refers to section 4.1 and 4.2.

(ii) the Authority will include a requirement for consultants to seek appropriate structures for EU funding for the implementation of projects emanating from the strategy.

3.7 General deliverables of proposed initiative

<u>Training and education</u>

3.7.1 Five consultees commented on the training and education deliverables of the project. Comments and suggestions were made on the following:

i. education is important and is a fundamental part of the development of the strategy;
ii. education was not budgeted for and a suggestion was made for the establishment of a Renewable Energy Education Task Force to raise public consciousness on the benefits of renewable energy;
iii. education was not mentioned in the specific objectives and deliverables;
iv. the inclusion of training of local staff is a positive feature;
v. government intervention consisting in industrial training programs which re-orient and re-employ existing industry capacity was suggested;
vi. a campaign to encourage the concept of a "green island" was envisaged.

Authority's response:

The Authority has referred to educational programmes as part of the general deliverables and does not feel that further amplification is

warranted. The establishment of the proposed task force in comment (ii) will be considered in the course of the development of the strategy. Tender schedules will be inclusive of the budget element for training and educational programmes as outlined in the general deliverables.

3.8 Specific objectives and deliverables – Large and small scale generation

Availability and RES potential

3.8.1 Eight consultees commented on availability and RES potential and noted the following points:

i. there is a need for social data since this determines the utilization factors and RES potential. This is considered particularly true for displacement RES such as SWH as well as for grid-connected system in so far as the relationship between demand and supply are concerned;
ii. assessment should be on Malta's realisable renewable resource since there are siting, financial and other constraints which limit the actual potential;
iii. a considerable amount of data about e.g. current use of energy in households is required before small scale generation or displacement predictions could be reliably made;
iv. the inclusion of small scale generation was welcomed;
v. the consultation document fails to consider the potential of small scale renewable energy generation by commercial or industrial entities for own use and/or feeding into the grid. Many such entities have the skill and assets to develop their potential in a relatively short time. It is suggested that guidelines regarding sustainable energy use and energy conservation are established and applicable to public, private, domestic, commercial and industrial entities;
vi. small scale and large scale needs to be defined in terms of generation capacity;
vii. SWH and PVs should be introduced as mandatory in all government buildings, hotels etc.;
viii. the importance of solar water heaters as effective in reducing energy demand was highlighted. Consultees noted that limited uptake in Malta has been due to installation cost, lack of consumer awareness and fiscal incentives.

Authority's response:

Comments have been noted and the Authority considers that these are either consistent with or will be addressed in the Terms of Reference.

Energy harvesting technology & equipment

3.8.2 Two consultees commented on energy harvesting technology and equipment as follows:

i. the particular needs that our conditions require in terms of energy harvesting technology and equipment have not been carefully investigated yet;
ii. the type of equipment should not be specified [ref. 4.1.1 pts 3, 4] as this could restrict the interest from the private sector if the type of equipment to be used was specified. It was noted that this could also stifle any innovation that might be developed specifically for the Maltese environment.

Authority's response:

Comments have been noted. With respect to comment (ii) reference to specific equipment in clause 4.1.1 (4) will be removed.

Interfacing and delivery to the grid.

3.8.3 Five consultees commented on interfacing and delivery to the grid issues. Comments varied as follows:
i. concern was expressed regarding the impact of RES on the utility's system;
ii. concern was expressed regarding the reliability of wind generation and islanding (a condition when a solar system continues to produce electricity even when supply is cut), with the latter issue not being fully addressed for the local situation. It was recommended that the inverters monitor for voltage, frequency and impedance change as in the case of Germany;
iii. an appraisal of grid issues including grid reinforcement / renewal was suggested as part of an integrated study for the implementation of renewable energy technologies;
iv. specification of the technical configuration for connection of renewables to the grid (4.1.1 paragraphs 5,6) may be restrictive. It is probable that the most appropriate (and cheapest) connection would depend on the nature, size, and location of each potential generator;
v. the overall small scale network should be monitored and controlled from a centre power distribution point to allow efficient utilization of all grid connected sources of electrical energy. Standard techniques of remote diagnostic signalling were recommended. Fully approved reverse metering and switching modules allowing safe interconnection to the existing grid for the export of energy surpluses were also suggested.

Authority's response:

Comments have been noted and issues (i), (ii), (iv) and (v) are considered to be consistent with the TOR. With respect to comment (iii) it is noted that reference was made to support infrastructure in clause 4.1.1 (7) but further clarification will be made in the TOR.

Integrated exploitation system

3.8.4 Two consultees commented on integrated exploitation system. Comments were as follows:
i. integration with existing energy distribution system and energy consumption pattern is a crucial factor determining the feasibility of

utilizing RES. It was pointed out that the systems' operation should be studied and operational features predicted prior to embarking on large schemes;

ii. the use of modular power systems (wind and solar) was suggested in view of the advantages offered in rapid incremental capacity additions.

Authority's response:

With respect to comment (i) further clarification will be made in the TOR to address the point made. Comment (ii) is considered consistent with the TOR.

Siting

3.8.5 Six consultees commented on siting of RES as follows:

i. The MRA should support the work of companies in promoting RES particularly with respect to planning application permits and negotiations with MEPA regarding acceptable siting;

ii. recommendations on best sites for large scale RES exploitation, should refer to areas rather than specific sites;

iii. various specific sites for RES applications were suggested e.g. Maghtab as a wind farm and PV site, land reclaimed site for RES applications; rooftops for combination of small scale solar and/or wind power, offshore wind turbines and conversion of power stations to hybrid system by introducing solar thermal generation.

Authority's response:

With respect to comment:

(i) it is noted that the Malta Resources Authority Act specifically provides for the Authority to promote, encourage and regulate harnessing, generation and use of all forms of energy and to encourage the use of alternative sources of energy. Therefore as far as possible the Authority will seek to support companies in promoting RES depending upon outcome of the initiative.

(ii) the Authority agrees with the points made and where reference is made to sites this will be replaced by areas in the TOR.

(iii) it is noted that the Authority intends to adopt a continual consultation process whereby stakeholders will be invited to submit ideas and specific issues at more appropriate stages of the initiative.

Contribution to the energy balance

3.8.6 One consultee suggested that the contribution to the energy balance estimates should be extended to determine the impact of RES on the electricity demand patterns and with it the necessary installed electricity generating capacity. This would provide information for financial assessment cost and benefits [ref. 4.1.2].

Authority's response:

The Authority agrees with the comment made and Consultants will be required to provide input to a demand forecasting model prepared independently of this study.

Impact on quality and reliability of supply

3.8.7 Five consultees commented on the impact on quality and reliability of supply by RES. Comments and suggestions were as follows:

i. in an island system the introduction of a significant proportion of variable generation, such as wind energy can pose challenges for power quality. It was also pointed out that well designed renewable energy projects could improve power quality;
ii. pumped hydro storage offers a potential for smoothing the output of variable renewable;
iii. the determination of the maximum capacity that the system can assimilate (in terms of security of supply) is important;
iv. different types of renewable generation operate to different load factors and to different degrees of reliability. This will determine the extent to which they can be relied upon to meet system demand;
v. different types of generation and combination of technology have different implications on system security;
vi. a significant consideration would be the requirement for stand-by thermal generation to meet demand when the renewable resources are not available;
vii. existing thermal plant would be required to provide back-up supplies;
viii. conventional fossil fuelled plant will no longer be operating at base load, and will therefore suffer from reduced operation efficiency. This would imply that both emission and costs per unit would increase as a result. Such effects, together with the implications for existing industry will require to be assessed;
ix. assessment of network implications is necessary including the ability of the existing network to accommodate new generation and to contend with the power flows that might result form the intermittent operation patterns of the renewables;
x. establishment of the technical and cost implications for the network of connection at particular location and whether significant system reinforcement could be avoided. It was pointed out that large number of small scale generating plant evenly spread around the island can have benefits in network accommodation compared to large scale RES;
xi. combinations of RES sources should be adopted since this could increase the reliability of supply.

Authority's response:

Comments have been noted and it is felt that these are broadly consistent with the TOR.

Integration with other technologies

3.8.8 Six consultees commented on issues related to integration with other technologies. It was noted that:

i. estimates of the water storage capacity should be given, while the use of buffers applies also to hydrogen production;
ii. maintenance free lead acid batteries or fuel cells, can be required to "smooth" the delivery of power;
iii. hydrogen and fuel cells were not sufficiently addressed;
iv. reference to hydrogen production in the document was welcomed;
v. feasibility of hydrogen production in Malta was queried by one consultee;
vi. integration of waste minimization and recycling, desalination, hydrogen production etc. are all key parts of a holistic approach to energy generation and use.

Authority's response:

The Authority does not wish to exclude any potential RES application including hydrogen production for example to accommodate electricity generated by RES which is not being fed into the grid.

3.8.9 Two consultees commented on barriers to RES and noted that:

i. action is required to remove inappropriate barriers to deployment of RES taking into account that the legal, administrative, financing and planning infrastructure has grown up to facilitate the deployment of mainly large-scale centralized energy supply which are often unsuited to small local plants;
ii. barriers to the implementation of a strategy to exploit RES have to be given utmost attention, since success is determined by overcoming these barriers. It was also noted that there are no tailor-made recipes as each country has its different social, economic and political environment.

Authority's response:

Comments have been noted and these are broadly consistent with the TOR.

Environmental impacts

3.8.10 Five consultees commented on the environmental impacts of RES. Respondents noted that:

i. RES could lead to significant opposition due to their environmental impacts and this issue needs to be adequately addressed;
ii. a social impact assessment should be carried out independently of an EIA;
iii. MEPA is in a position to prepare planning guidance complementing the MRA initiative to encourage the exploitation of renewable energy sources. It was also pointed out that MEPA is normally charged with

the responsibility for drafting the TOR of EIAs for certain types of major projects as identified in the EIA regulations.

Authority's response:

With respect to:

(i) the Authority is of the opinion that any opposition to RES due to its environmental impacts should be highlighted and addressed in the EIA process.

(ii) The TOR of EIA generally addresses social impacts from the proposed development.

(iii) The Authority welcomes MEPA's position on the development of planning guidance in connection with introduction of RES. The Authority will clarify the point raised that TORs for EIAs are issued by MEPA.

Stakeholder consultations

3.8.11 Seven consultees commented on stakeholder consultations. Comments and suggestions were made on the following:

i. stakeholder consultation is important as a transparent way for enhancing participation and democratic practices and long-term ecological sustainability;
ii. Civil Society Organizations should be consulted throughout the process;
iii. no reference was made to the role of various players (e.g. Enemalta, the Institute of Energy Technology, University of Malta, MEPA, NGOs etc.) and their role in the development of the strategy was not specified;
iv. an expression of interest in consultation was expressed by MEPA;
v. a brainstorming exercise of what could be useful might be needed to generate ideas before starting the reduction process of discarding potential avenues because of economic or other considerations.

Authority's response:

The document will be amended to reflect consultation and co-ordination of the commissioned work with all interested stakeholders. The Authority will in the course of the development of the strategy ensure a forum for exchange of ideas between selected stakeholders and consultants commissioned by the Authority.

Comparative analysis

3.8.12 Fourteen consultees noted that comparisons with other countries should be made. In particular it was suggested that:

i. the experiences and best practices of Mediterranean islands should be analysed;
ii. reference should be made to European and International Standards;

iii. reference should be made to renewable energy legislation, policies and standard procedures being followed by other countries such as the UK and Germany;
iv. consideration should be made of financial schemes introduced in other parts of Europe, including benefits, incentives and penalty systems.

Authority's response:

The document referred to comparisons with other countries under section 4.1.2 (6). On the basis of submissions received, this will be amended and incorporated as a separate section where comparison will not be restricted to a financial assessment only.

Financial assessment, costs and benefits

3.8.13 Twelve consultees commented on issues related to financial assessment, costs and benefits. Comments and suggestions were received on the following:

i. the importance of market intervention was remarked upon;
ii. green pricing mechanisms should be favoured;
iii. financial assessment should take into account the attendant costs of oil storage and the vagaries of oil price fluctuations;
iv. levies and/or subsidies discriminating positively in favour of RES could lead to subsidizing inefficient commercial non-viable systems and are subject to strict controls of a political nature. It was remarked that only free competition will result in long-term success;
v. there are high capital costs involved, long payback periods and there is need for subsidies and tax credits. These would enable the renewable energy industry to develop and improve its technology, reduce costs and provide significant cleaner emission from electrical generation;
vi. economic feasibility should not be given priority over environmental issues and that payback periods should not be the determining factors for decision making;
vii. environmental costs should take into account reduction in: burning of HFO: CO_2, SO_2, CO, NO_x HC, and PM emissions; and in asthma incidence and other health related hazards;
viii. financial assessment should address total cost of ownership;
ix. one of the issues that needs to be clearly established is agreement by Enemalta to purchase excess electricity produced by RES. It was noted that a connection policy and a system charging structure is required to provide network access to competing generators. The connection and use of system charges should:
    a. accurately reflect the cost they impose on the system;
    b. not subsidise Enemalta's own activities;
    c. be consistently with those of other similar system users, including Enemalta's own generation business;
x. excess cost over and above the existing cost of generation should be met by a green levy. This would introduce some competition into the provision of new generation, but would not require extensive liberalization and deregulation of the industry. Such a scheme would entail:

a. new legislation, to legitimise the levy/tax and to oblige Enemalta to purchase the output of the renewable generators;
b. new regulations to establish the rules of the 'renewable mechanism' and to allocate responsibilities and liabilities between parties;
c. a means of identifying the cost of existing generation that would be displaced by the new renewable energy, in order to calculate the magnitude of the cost to be recovered by the levy/tax.
d. identification of an independent party to run the competition;
e. a connection policy to allow the competition generators to apply for connection to the Grid and to receive quotes for the cost of connection. The policy will require to establish what proportion of any necessary reinforcement work is paid by the generator and whether they also require to pay for use of the system;
f. a means of preventing Enemalta abusing it position as network owner in order to discourage or prevent third parties connection to the Grid
g. a means by which the MRA can regulate the behaviour of Enemalta (and potentially the new generators) and apply sanctions if they contravene rules. This could be done through licenses, but the MRA would require the support of the legislative authority and
h. a pricing mechanism is required that allows Enemalta to recover the cost of providing stand-by/top-up generators.

xi. it could be impractical to set up a competitive generation market in Malta. In the absence of transparent competitive dispatch arrangements, investors would look for additional certainty that they would be able to achieve an adequate return on investment. Positive discrimination in favour of renewable generators in the dispatch merit order or structure procurement contracts could be necessary so that the investor would be able to get their full fixed cost back. The dispatch and procurement arrangements would inevitably have implications for the remuneration of existing plant that is displaced but which is still required for back-up and will set a precedent for any new thermal plant that will be required in the future. The merits of establishing robust and potentially independent power procurement arrangements should be considered;

xii. Enemalta noted that it should be compensated for the cost for absorbing electricity into its system;

xiii. an important issue that needs to be addressed is the disaggregation of Enemalta's existing charges into its constituent elements (transmission, distribution, generation and supply), in order to establish the appropriate level of charges for each activity. This will require accounting separation and cost allocation of Enemalta's core activities;

xiv. potential economic opportunities arise out of the introduction of RES technology in Malta. This includes creation of jobs from local retailing, installation and maintenance of the systems, local production by manufacturing industry, and eventual exportation possibilities;

xv. information is needed to facilitate the development of an indigenous industry to supply the national and rapidly expanding international energy market;

xvi. there is potential for Malta to take a leading role in RES for island communities, for collaboration with the University of Malta and Enemalta and the possibility of developing a centre of excellence in solar energy conversion and storage systems and devices;

xvii. Government intervention in the form of appropriate funding (e.g. soft loans) to support local community investment in indigenous renewable energy sources and in supporting renewables in government procurement programmes was suggested.

Authority's response:

The Authority has highlighted the need to establish the level of market preference, economic and fiscal incentives to encourage and promote introduction of RES and these are deliverables of the proposed imitative [ref. 4.1.2 (5)].

The Authority has highlighted that socio-environmental costs and benefits need to be quantified in economic terms [ref. 4.1.2 (3)].

The Authority has outlined that methodologies for the equitable sharing of interface costs of generation and transmission/distribution of the renewable energy and fossil fuel energy cost need to be established [ref. 4.1.2 (2)].

The Authority agrees that economic regulation of Enemalta including disaggregation of costs of the utility needs to be carried out. This is being carried out independently of this initiative.

<u>Legislative, regulatory and administrative matters</u>

3.8.26 Five consultees submitted comments and suggestions on legislative, regulatory and administrative matters. These varied and consisted in the following:

i. details of possible supporting schemes that may be developed by the Authority were suggested. These were based on a market driven approach that seeks to create additional market value for renewables rather than providing them with long term contracts and fixed prices. It was noted that implementation of this scheme would require significant liberalization and deregulation. In order that renewable generators had a market for their output, it would require the opening of supply competition and the establishment of a wholesale market, together with the extensive structural and regulatory reform of the industry. Consultee questioned the practicality of this in Malta. Consultee suggested that the key to attract the maximum number of potential investors, is the creation of a sufficiently robust and transparent legal regulatory environment, in which developers can be confident that they will be treated fairly and will be able to secure a return on their investments. Consultee noted that issues regarding the regulation and accessibility to network connection; charging for grid connection; and the establishment of the appropriate legislative framework such that investment security can be safeguarded need to be clearly established;

ii. the issue of liberalisation process and the establishment of an appropriate regulatory framework to support competition and/or promote fair access by renewables to relevant energy supply and distribution systems was brought forward;
iii. need was felt to establish a balance between liberalization measures necessary to meet EU Directive requirements, thus creating the environment most conductive to private sector investment and the most cost-effective and practical solution for Malta;
iv. the appropriate mechanisms to stimulate broadly-based research and development need to be established;
v. planning policies which promote environmentally and socially sensitive renewable energy developments were called for;
vi. the regulatory framework for supporting small scale RE should be as simple as possible;
vii. rigorous testing and well-enforced national technical standard for SWH are required.

Authority's response:

Comments have been noted and these are broadly considered to be consistent with the TOR.

APPENDIX 1: LIST OF CONSULTEES

Alternattiva Demokratika
ATON Europe
Dr. Jan Spiteri
Dr. Vince Buhagiar
Enemalta Corporation
Entec UK Ltd.
Federation of Industries
Greenpeace International
Institute of Energy Technology – Ing. Charles Yousif
Institute of Energy Technology – Ing. Robert Farrugia
Investia Consult Ltd.
IPA Energy Consulting Ltd.
Koperazzjoni Internazzjonali (Kopin)
Malta Energy Efficiency and Renewable Energies Association (MEEREA)
Malta Environment and Planning Authority – Director of Planning
Malta Environment and Planning Authority - Ms. Michelle Borg
Malta Wind Parks Ltd.
Mr. Albert Caruana
Mr. Brian Azzopardi
Mr. John Ellul Vincenti
Mr. Karmenu Gerada
Mr. Mario Fsadni
Mr. V. Coppini
PKF Malta
Profs. Edward Mallia
Rimis Vaitkus
Shell Solar BV
Simpson Research Ltd.
STMicroelectronics (Malta)
Strand Marine & Automotive Systems
Tua Engineering Ltd.
University of Malta – Dr. Joe Cilia
Wirth International Marketing

APPENDIX 2: ACRONYMS

CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
EC	European Community (also referred to as European Union, EU)
EEA	European Environment Agency
EIA	environmental impact assessment
EU	European Union
FNC	First National Communication
GHG	greenhouse gas
GWh	gigawatt hours
HFO	heavy fuel oil
IPCC	Intergovernmental Panel on Climate Change
kWh	kilo watt hour
MEPA	Malta Environment and Planning Authority
MRA	Malta Resources Authority
MWh	megawatt hours
NGO	non governmental organisation
NMVOC	non methane volatile organic carbons
NO_x	oxides of nitrogen
PM	particulate matter
PV	photovoltaic
R&D	research and development
RES	renewable energy sources
SO_2	sulphur dioxide
SO_x	oxides of sulphur
SWH	solar water heater
TOR	terms of reference
UNFCCC	United Nations Framework Convention on Climate Change
VAT	value added tax
VOCs	volatile organic compounds