Institute for Sustainable Energy, University of Malta
L-Imħalleff Paolo Debono Street, Msida. MSD 2033. Malta

Creating an Energy Model of Malta – Assessment of the Current Situation

G.Misiukaite and M.Weissenbacher

1. Introduction

Energy systems modeling has become an important tool to assist decision makers in energy planning efforts.

For two main reasons energy models are turning more complex:

1) *Energy security* and climate change concerns stimulate the **integration of larger shares of renewable energy** options into the overall system, which involves the challenges of intermittency, energy storage and grid stability.

2) It has been realized that adequate energy modeling efforts need to go far beyond the technological aspects to take into account such ***macroeconomic goals*** as high employment and balance of payments, and include the ***impact on the environment.***

As a first step in the course of creating a ***complex energy model*** that considers all the advantages and disadvantages of various renewable and fossil energy options to achieve selected optimum levels of the overall energy mix with regard to sustainability, affordability, energy security, employment and other factors, the Maltese energy situation has been reviewed to assess the status quo and the officially proposed energy plans.

2. The Current Situation

Malta currently has the lowest share in renewable energy of all EU member countries. Still in 2005 Malta's renewable energy share was effectively zero, and Figure 1, based on 2010 data, indicates that ***at present renewable energy shares remain very low***.

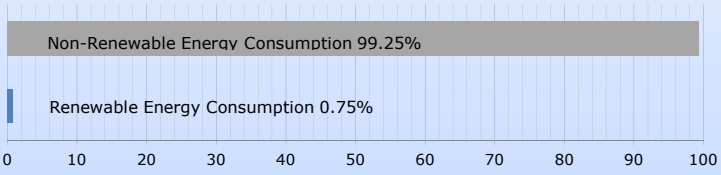

Figure 1. Renewable & Non-Renewable Energy Consumption in Malta, 2010. (%)
Based on data from [1].

Malta's electricity is produced in two power stations, Delimara and Marsa, which rely entirely on imported heavy fuel oil and light distillate [2]. Figure 2 shows the current Electrical Power Generation Capacities.

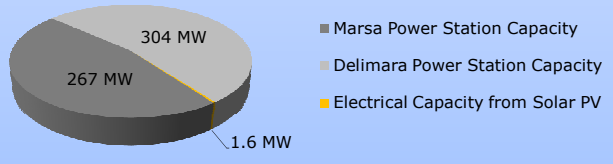

Figure 2. Electrical Power Generation Capacity in Malta, 2010 [2], [3].

3. The Official Plan

As required by European Directive 2009/28/EC, Malta submitted a ***National Renewable Energy Action Plan*** in May 2011, which states that Malta intends to achieve the imposed overall renewable energy consumption share target of 10% by 2020. The contribution of different renewable energy options according to this plan are shown in Table 1. One interesting feature of this plan is that ***photovoltaic (PV) installations will merely contribute 0.69% by 2020***.

Table 1. Share of Renewable Energy in Gross Energy Contribution [4].

Share of Renewable Energy in Gross Energy Contribution	2020
Biofuels	2.40%
PV	0.69%
Offshore wind	3.48%
Onshore wind	0.61%
Energy from waste – Electricity	2.18%
Energy from waste – Heat	0.32%
Solar Water Heater	0.52%
TOTAL:	**10.20%**

Electricity supply infrastructure is about to increase from 575 MW to 780 MW (Figure 3) and will by 2020 have to support a projected annual electricity demand of 3.14 TWh [4], up from 2.1 TWh in 2010 [1].

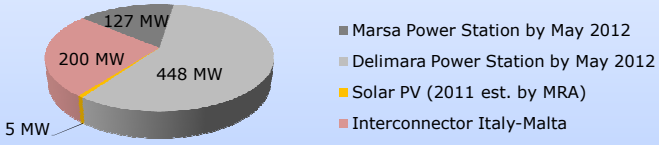

Figure 3. Electrical Power Supply Capacity – nearest future [2], [3], [5]

The interconnector to Sicily needs to be implemented because the polluting boilers at the Marsa Power Station will be decommissioned, and for reasons of grid stability to allow an offshore wind farm (is-Sikka l-Bajda) to come on line. This will add 95MW in capacity next to another 14.4MW of planned onshore wind capacity. However, environmental assessments for the proposed wind farms are still pending.

4. Beyond the 2020 Targets

Ultimately, it will be necessary to think beyond 2020 and to prepare for the longer-term future with substantially larger renewable energy shares. It is important to raise ***public awareness*** for possible radical changes within the energy sector, but so far acceptance of renewable energy options in Malta has been motivated mainly by ***direct financial incentives to end users.*** (Farmers, for instance, would not consider investing into renewable energy systems without the use of grants due to the ***high initial capital expenditure*** [6].)

Tumbling prices of solar panels in recent years raised hope that ***PV installations would become competitive*** without government support in sunny Mediterranean regions, but critics maintain that

- the panel market is now oversupplied and volatile, and a wave of consolidation in the industry might be followed by price increases.
- the price decrease was caused by a big increase in polysilicon production capacity, while feed-in tariffs have failed to trigger innovation in the industry: Practical silicon panels are still no more than 15% efficient on average.
- generous feed-in tariffs redistribute funds from general electricity users to a wealthy middle class with access to roof space.
- generous feed-in tariffs might only be justified in countries such as Germany, where a large industrial base allowed for the build-up of "green" production industries, while few jobs would be created in countries that merely import and install panels.
- irrespective of cost, high space requirements of relatively inefficient solar panels do not allow them to make large contributions to the overall energy mix in densely populated areas.

Nevertheless, ***PV installations*** will play an important role to ***cover part of Malta's peak electricity*** demand during ***summer daytime***.

5. Conclusions & Future Prospects

Considerations of this kind for all renewable and fossil energy options need to be tied into one complex ***model to allow for advanced energy planning*** and the assessment of various *energy mix scenarios*. Some scenarios of large renewable energy shares will remain too radical within the framework of current thinking, but eventually fundamental change will be imminent. However, even small changes within the energy sector require careful analysis of all ***sustainability dimensions***: technical, economical, social, institutional.

6. References

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E-mail: gintaute.misiukaite@um.edu.mt; manfred.weissenbacher@um.edu.mt