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FEASIBILITY STUDY OF THE FIRST ENERGY-EFFICIENT HOUSING PROJECT IN MALTA

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OVERVIEW

Malta is heavily dependent on fossil fuels for energy provision, with a very low penetration of renewable energy, although the potential may be quite significant. As a European Member State, Malta has to reach 10% renewables by 2020, as set by the European Directive 2009/28/EC on the promotion of the use of energy from renewable sources [1]. Lately, the prices of fuel and electricity have increased steeply, leaving no options except to educate consumers to reduce their energy consumption and most importantly to resort to energy efficient solutions and increase the use of renewable energy sources.

In a bid to lower capital costs, poor building design and practices have accumulated over the years, which caused buildings to be uncomfortable – too cold in winter and too hot in summer. No thought was given to the long-term energy costs of these buildings and therefore no energy saving measures were incorporated at the design stage. This was because the cost of energy was passed on to the buyer and no responsibility by law, was put on the original designer or builder, even if the building was poorly designed in terms of energy performance.

The implementation of the European Directive 2002/91/EC on Energy Performance in Buildings is imminent [2], and more so since the domestic sector in Malta consumes more than thirty percent of the electricity generated. More recently, Malta transposed the EU Buildings Directive into local legislation through Legal Notices LN 238 of 2006 (Minimum Requirements on the Energy Performance of Buildings Regulations) and L.N. 261 of 2008 (Energy Performance of Buildings Regulation) [3, 4, 5], but the actual enforcement is still pending.

Meanwhile, the Housing Authority of Malta that has the mission of providing affordable housing to the community has voluntarily taken the lead to build energy efficient housing projects since 2003. The first energy-efficient housing project, known as 'tal-Ftieh' was built in the village of Birkirkara, Malta. It is a 3-storey building comprising of 10 apartments and a show-room, with underlying semi-basement garages. A number of energy efficient measures were implemented such as double-glazing, louvered windows and doors, insulation to the roof, solar-heating, solar photovoltaics and sun pipes, among others [6].

This paper aims at evaluating the economic viability of some of the most prominent energy-efficient measures implemented on site, as one of the tools to be used to educate people on the long-term benefits of such key measures. It is difficult for people to visualise the significance of benefits such as lower carbon dioxide emissions and a greener environment, however, fiscal benefits are easily grasped by everyone. The scope of the paper is also to prioritise the different energy-efficient measures as and where applied in the local context, not only from their pure economic value but also in relation to their contribution towards lowering the carbon footprint of energy use in buildings. This study shall also estimate the incremental cost of capital needed in order to comply with the set minimum building requirements with regards to heat transfer. As a result, the additional capital cost required to introduce such new

measures and the repercussions on potential buyers who normally borrow from the banks to buy their home, will also be evaluated.

METHODS

The preliminary research has focused on gathering information regarding energy efficiency in buildings, in order to understand the basic technicalities of the subject. This has already been completed through extensive use of secondary data, namely discussion papers, books, journals and reports. The primary data has been collected through a number of in-depth interviews carried out with knowledgeable individuals including engineers, architects and research assistants.

Detailed drawings and information has also been gathered on the particular building project, namely *tal-Ftieh*, which would be instrumental to evaluate the effectiveness of the energy-saving measures that are in place today.

Economic analysis and other studies are being carried out to evaluate the viability of specific energy-efficiency measures, which include roof insulation, collection of rain water, double-glazing, louvers for apertures, shading, domestic solar water heating and solar photovoltaic grid-connected systems.

RESULTS

This paper will produce a hierarchical list of the most prominent energy-efficiency measures to be implemented in buildings, based on their actual capital and installation costs as well as their contribution to lowering the carbon footprint of energy use in buildings.

CONCLUSIONS

The results achieved will give a clear indication on the level of success in reducing the energy bill of this first energy-efficient building of *tal-Ftieh*. Given that the building follows the traditional way of building in Malta and around the Mediterranean region, the results may be instrumental to compare and if feasible, used to build other energy efficient buildings in Malta and elsewhere.

REFERENCES

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