



## Benefits of Voltage Optimisation Technology

The Malta Intelligent Energy Management Agency (MIEMA) is carrying out a pilot project consisting of the refurbishment of 35 Maltese low income households as part of the ELIH-Med project - Energy efficiency in Low Income Housing in the Mediterranean. The ELIH-Med Project is co-financed by the MED Programme (85%) and the Ministry for Energy and Health (15%).

The ELIH-Med pilot project consists of the installation of solutions to improve energy efficiency in low income households. Different energy conservation measures have been selected to be introduced in the households, including both active and passive solutions. One of the measures was the installation of voltage optimisation (VO) units. Four selected households benefitted from the installation of a VO unit which helps to reduce energy consumption. Voltage optimisation is an electrical energy saving technique which is installed in series with the mains electricity supply to provide an optimised supply voltage for the site's equipment.

The declared electricity supply in Malta is 230V +/- 10%. This means that the voltage received by a household can vary between 207V and 253V, depending on the position of the household along the supply network. Overvoltage results in higher energy consumption of certain equipment and also reduces the expected lifetime due to the electronic components which are exposed to continuous voltage which is higher than the rated value.

It is proved that the higher the voltage, the higher the power consumption in the case of a pure resistance load while a reduction in voltage does not affect the energy used by the domestic appliances which use resistive loads. The main economic benefit when installing VO units, is on inductive loads, like motors which run pumps and fans (e.g. fridges and freezers) and has a potential energy saving of up to 12% on domestic electricity bills.

How does voltage optimisation work? The VO unit is connected between the electricity meter and the distribution board (or consumer unit) and works by constantly monitoring a number of variables from supply voltage and current through to ambient temperature and outgoing 'demand', while monitoring the units own performance and then intelligently optimising the supply voltage. By efficiently bringing supply voltages to the lower end of the statutory voltage range, voltage optimisation technology could yield average energy savings of around 10 – 12%.

The installation of the VO units as part of the ELIH-Med projects helps the households to reduce their energy consumption and reduce carbon emissions. It can be concluded that the voltage optimisation unit helps to reduce energy usage on electrical dependant loads, protect sensitive devices from damages due to under/over voltage and extends the lifetime of appliances and lighting and reduces maintenance costs.



MED Operational Programme – Cohesion Policy 2007-2013  
*Europe in the Mediterranean*  
This project is part-financed by the European Union  
European Regional Development Fund (ERDF)  
Co-financing rate: 85% EU Funds; 15% National Funds



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