ESG on Solar Energy Options for Gibraltar?

In our last issue, we promoted the use of **Combined Cycle Combustion Turbines** as the next step up from diesel engines which currently produce Gibraltar's electricity. It is clear that renewable energy options are possible for Gibraltar and deserve analysis.

Solar energy involves directly harnessing the sun's emissions of heat and light to generate electricity. Two types of electricity generation that use solar power are:

- Solar thermal (also used to heat water)
- Solar photovoltaic (PV, solar panels)

Solar thermal works by using the heat of the sun to heat a fluid that can be used to generate electricity. Solar collectors such as mirrors and lenses are used to focus sunlight onto a receiver mounted at the system's focal point. The receiver absorbs and converts the sunlight into heat. This can then be stored and transported by means of a heated liquid, through pipes to a steam generator or an engine and converted into electricity (see diagram and photo).

This technology is especially useful as energy produced can be stored, ie be "on tap", unlike solar panels .Solar thermal farms are springing up everywhere as the technology becomes established. Gibraltar could set up such a system in the southern end of the Rock, say at Windmill Hill, which could provide clean renewable energy to supplement the new Combined Cycle Combustion plant.
(**http://www.psa.es/webeng/instalaciones/index.html)**

Solar water heating could provide up to**80% of a household's hot water requirements** if conditions are right. New developments in Gibraltar could incorporate features such as solar panels and solar water heaters, which would result in electrical load reduction, less emissions, etc. (see photo).It would be advisable to have standby immersion heaters to guarantee hot water supply during unfavourable weather conditions. Energy for this could come from waste heat from power stations.

Solar Photovoltaic (PV): Better known as solar panels these are now available in different sizes from 5-150W. PV work by converting sunlight into electricity using semiconductors. Panels can be integral parts of building structures replacing conventional roof tiles but can also be fixed on frames above existing tiles (see photo).Global demand for solar power has been growing at an average annual rate of over 30%making it one of the most dynamic sectors in the energy industry. However, compared to conventional electricity stations and wind power, it is still relatively small.
Government could encourage and accelerate its application through financial incentives. The other advantage of PV generated power is that any excess generation can be sold to the grid.

Experts maintain that a **solar thermal power plant** would be more efficient land use than a **photovoltaic system.** These options should be studied further as a way of reducing CO_2 emissions in Gibraltar.

Environmental Safety Group