

A Renewable Energy Strategy for the Republic of Cyprus and the Potential Contribution from the Solid Waste Management Sector

Dimitrios Nikolaidis, Sue Grimes and Stephen R Smith

Department of Civil and Environmental Engineering, Imperial College London, UK

ABSTRACT

The Republic of Cyprus is at a critical stage in the evolution of its energy sector and more specifically in meeting the renewable energy and climate change targets set by the EU. The flexibility and diverseness of renewable energy sources, as well as the rising cost-competitiveness of the energy market has driven renewable energy to the pinnacle of the global agenda. The energy policy of Cyprus is harmonized with that of the EU. The renewable energy objective based on the National Action Plan issued by the Ministry of Energy, Industry and Commerce is to attain 13% of the total electricity supply from renewables by 2020. Currently, the rate of electricity generation from renewable sources is less than 8%, thus a considerable growth in output is required to achieve the target capacities.

Solar and wind energy are the existing main contributors of renewable power in Cyprus with a combined relative contribution of approximately 95% of the renewable energy generation in the island. A technology review has been carried out to assess the practicality and efficiency of these technologies as well as the feasibility of different renewable energy options to meet the EU requirements. The options for geothermal, wave and energy recovery from waste are examined and the potential benefits of incorporating these technologies for electricity generation are speculated. A multi-criteria analysis has been performed identifying a strategic plan for an energy mix, based on a balance for economic efficiency of investment against maximisation of energy production at logical time-scales.

Solid waste represents a potential indigenous fuel for Cyprus that may be harnessed for energy recovery, but this resource has not yet been exploited locally for this purpose. In this thesis, the possible contribution of solid waste to the renewable energy profile of Cyprus is determined. Gasification, anaerobic digestion, solid recovered fuel plus other forms of energy from waste are examined and assessed based on a cost relative to yield perspective, as well as the suitability of the incoming waste streams and output uses.

