

Interreg IV Project Brief
SOLARE – Sustainability Laboratory for the study of Renewable Energy
<http://www.solare.org.uk>

Introduction / Summary

The aim of the Solare project (working title only) is to form a distributed centre of excellence in the area of sustainable and renewable energy. Industrial, domestic and transportation uses of energy are mainly dependent on fossil fuels. As such they are major sources of atmospheric carbon and hence human-induced global warming. Fossil energy sources also have limited lives. The Solare project aims to investigate the part that solar, wind, and other renewable energy sources can play in satisfying the energy needs of the euro-region in a sustainable and environmentally non-harmful way. The project will bring together a network of researchers to collaborate in devising new and enhanced ways of harnessing renewable energy. Through a visitor centre and courses, it will raise awareness of renewable energy issues, and contribute to better education in this area.

Activities and Outputs

The Solare project will consist of three tasks, the first being an initial research task intended to build and cement a firm partnership among several institutions. This may be followed by two supplementary tasks, namely a Visitor and Demonstrator Centre and a European Masters course.

Task 1 - Research Centre : A major part of Solare will be to combine and harness the expertise of researchers in the Interreg IV Euro-region who are working in the area of sustainable energy, via a collaborative project. Innovative and original methods of capturing, storing and applying sustainable energy sources will be developed and made available for exploitation by companies, local authorities, and individuals in the Euro-Region.

A suggested focus for the work of the partnership is the development of energy-optimised off-grid and grid-supplemented power systems using renewables for domestic use. The system would use a combination of energy sources, including wind and photo-voltaic power in conjunction with a micro-generation system, for example a fuel cell or efficient diesel generator, and a power storage sub-system such as a battery pack. When available, sun or wind energy would be used to generate electricity to be accumulated in the battery pack. When the battery pack is discharged, and if insufficient wind and sun energy are available to permit an adequate level of battery charging, the diesel / stirling cycle engine / fuel cell generation system would be started.

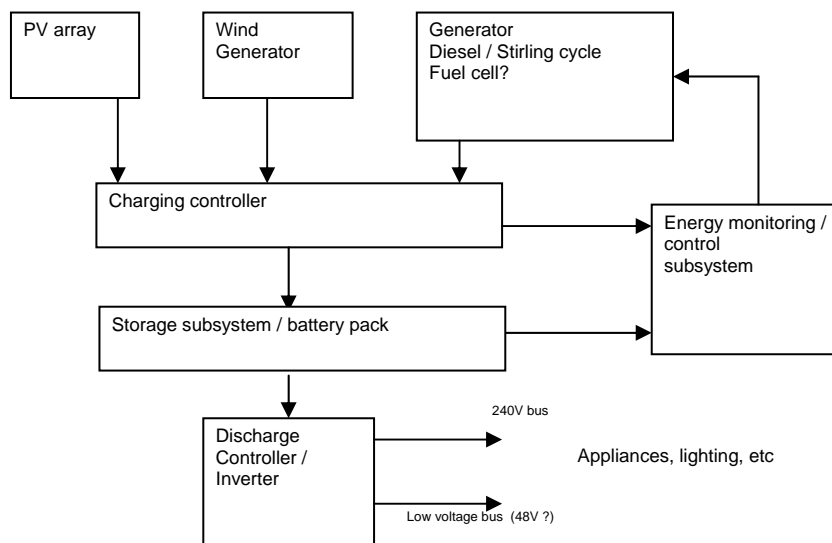


Figure 1 - Overview of the Multi-Source Renewable Energy System

There is a complex problem to be solved relating to the control of the system component blocks so as to ensure optimum energy efficiency, and at the same time, adequate availability of power for the users needs.

There are also interesting questions to be answered about whether it is best in terms of energy efficiency to invert the battery output to 240V, or whether a lower voltage should be adopted as a standard for systems like this (e.g. 48V, DC or AC), particularly if lighting using high-brightness LEDs is to be used.

There is an possible extension to the project that involves integrating a hot-water solar panel with the system, and incorporating the use of engine waste heat for water heating.

Task 2 - Visitor Centre : A visitor education centre will be created which will contain a number of examples of sustainable energy technology, for example, a solar-thermal panel, a solar-photovoltaic panel, one or more examples of wind-turbine (horizontal axis and vertical axis Savonius rotor). Concrete information will be made available on the energy gained from these devices under actual operating conditions, and the financial benefits.

Task 3 - Euro Masters Course : The knowledge gained during the project will be channelled into a European master's degree in Sustainable Energy. This will utilise the broad range of skills and expertise available across the Euro-Region to better educate Masters-level students in ways of tackling climate change related problems through better use of energy.

Partners

The University of Brighton can offer knowledge of the following areas:-

- intelligent instrumentation and control through the Centre for Smart Systems
- research experience with sustainable hybrid power-plants
- some familiarity with solar thermal and solar-PV panels and wind turbines
- familiarity with small scale combined heat and power
- utilisation of energy through the Centre for Sustainability in the Built Environment
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We would like to hear from potential partners with expertise in other areas relevant to the project who may be interested in working with us.

Contact

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