

PARTNER SEARCH FORM

For projects in the SmartGrids ERA-Net call

DATE: March 4, 2010
PROJECT INFORMATION
TITLE: Feasibility Research of Residential Microgrids
ACRONYM: FRRMG
<p>SUMMARY: The present centralised electricity generation system has many disadvantages caused by long supply chains exposed to weather and the nature of such an approach itself. A few major power plants pose an energy security issue, while the failure of one unit has a serious impact on the whole system. Distributed generation makes an energy system more reliable, encouraging a more extensive penetration of renewables. The latter is due to the fact, that the energy is more effectively generated in the vicinity of the primary sources, such as biomass producers and windy areas. In smaller scale, micro-generation helps to electrify remote communities, where the erection of long transmission lines is infeasible. In this way, the communities can establish their own stand-alone microgrids with distributed generation and storage facilities. Such micro-co-generation units can be either wind turbines, photovoltaic panels, fuel cells and micro co-generation plants. The excess energy, which cannot be consumed or stored locally, can be injected into the upstream distribution system, whose operator is obliged to buy energy produced by renewables with attractive prices. The main theoretical research objective is the elaboration of methodology for erecting stable renewable-based microgrids, where different generation and storage facilities are combined to achieve the minimal cost per kWh. The ultimate goal is designing such a stand-alone microgrid, where the resulting energy price would not remarkably exceed the price when connected to the macrogrid. The applicable objective is to work out control units for renewable-based microgrids. It is necessary to improve the power conversion units, interconnecting the single components of the microgrid. The number of converters should be reduced to the minimum and the multi-stage conversion should be avoided. An universal control unit should also be designed, based preferably on a programmable controller. The internal software should drive the system in all possible modes, including faults, ensuring the minimal fuel consumption and component wear. The control unit would resemble a frequency converter used in variable speed drives, which can be pre-programmed according to the system topology.</p>
KEYWORDS: Microgrids, interfacing converters, feasibility analysis
CALL: SmartGrids ERA-Net
PARTNERS INVOLVED: Tallinn University of Technology

DATE: March 4, 2010

PARTNER SOUGHT

PROFILE REQUESTED: Involvement in microgrid projects, residential co-generation and feasibility analysis expertise.

ORGANISATION TYPE: **SME** **Large Company** **University**
 Research Centre **Consultant** **Other**

HOW MANY ADDITIONAL PARTNERS ARE REQUIRED? ≥ 2

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*This information will be published and disseminated.