

PV-Hybrid microplants and mini-grids for Decentralised Rural Electrification in Developing Countries

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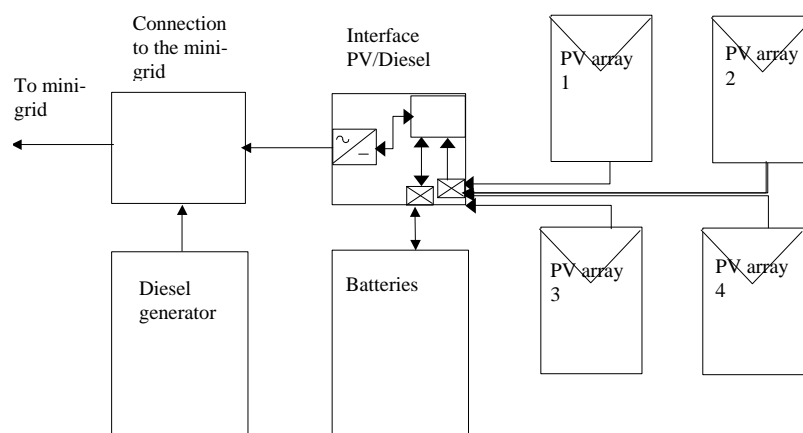
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Abstract

The objectives of this presentation is first to describe a range of PV-Hybrid micro-powerplants which has been designed by EDF/Research and Development for Decentralised Rural Electrification in developing countries, and then to describe the strategy proposed by EDF to supply electricity by mini-grids in remote villages of developing countries.

Our studies have shown that a range of three standardised micro-powerplants (5 kW, 15kW, 30kW), is the best techno-economic solution able to fulfil the solvable demand for electricity services of 90% of remote villages in rural areas of developing countries. So, EDF/R&D is developing this range of standardised micro-powerplants. The EDF's concept is a modular one. The micro-powerplant is composed of several units. The first casing contains a Diesel generator and the connection device to the mini-grid. An other unit contains the battery pack and the electronics (converter and charge regulator). The battery pack and the PV-array are also modular. According to the financing possibilities, they are sized for providing electricity from renewable energy one day on four, one day on two or everyday. In the last case, the Diesel generator is only used as a back-up generator when renewable energy is not sufficient. The figure below shows the modular concept of these microplants :



Generally, several micro-powerplants will be installed in the village in order to match the demand. Every powerplant will be connected to its own mini-grid. The different mini-grids of a village shall not be interconnected, at least in a first step, because interconnection needs spare power in order to supply power in case of failure of one of the microplant.