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Smart Grids

The Institute?s projects regarding renewable energy sources have included assessing the feasibility of increasing the use of renewable energy in electricity grids of the Hawaiian Islands. As a result of this work, HNEI has become involved more and more with studies and analyses of such grids, and in addressing methods for overcoming problems resulting from increased renewable energy on the grid. One method proposed is the implementation of smart technology to yield smart grids for dealing with problems of increased renewable energy use. HNEI has, therefore, interacted with the various utilities involved and has collaborated with subcontractors having the required special expertise.

One culmination of these activities was the Institute being selected by the US Department of Energy as the lead agency for conducting what we call the Maui Smart Grid project. This involves a specific substation of the Maui Electric Company (MECO) grid which will serve to demonstrate the application of smart technology for helping to achieve greater renewable energy utilization and to provide a variety of benefits for the MECO grid and its customers. Successes in this project could give similar benefits for other Hawaiian utilities and possibly even utilities on the mainland. See theMaui Smart Grid Project [1] section of our website for details of this important effort.

Another project relating to smart grids deals with development of a Smart Grid Inverter (SGI) and demonstration of the use of SGIs in reducing adverse effects of the high penetration of photovoltaic (PV) arrays onto an electric grid. See theSmart Grid Inverters for High-Penetration of PV Applications [2] section of our website for details on this project.

HNEI is also involved in other considerations of grid systems and our efforts in these areas can be seen in the Grid Modeling and Analysis [3] andGrid [4] Storage Systems [5] portions of our website.

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Links:
[1] http://www.hnei.hawaii.edu/projects/maui-smart-grid
[2] http://www.hnei.hawaii.edu/projects/smart-grid-inverters-high-penetration-photovoltaic-applications
[3] http://www.hnei.hawaii.edu/research/grid-systems/grid-modeling-and-analysis
[4] http://www.hnei.hawaii.edu/node/217
[5] http://www.hnei.hawaii.edu/research/grid-systems/grid-storage-systems