

**Title of Article :** Capacity Integration into a microgrid, a Tool for Electrical Energy Supply Cost Reduction in Nigeria- Covenant University as a Case Study

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**Abstract :** The cost implication of running a cluster of stand-alone power generating plants was investigated using the generating capacities of the generators and consumption (load) profile obtained from a campus based substation. Analysis of the results revealed a lot of unused available capacity within the system which invariably increases the operating cost of power generation within the campus. Integrating the power generators into a microgrid was suggested where there will be a common pool of energy sources and all loads attached to the network. The proposed network model seeks to reduce power plant engagement by integrating the generating power plants into a microgrid system. To overcome the challenge of synchronization in the AC platform as the power generators are dissimilar, the network is designed to operate as a DC microgrid where the AC generating plants and loads will be interfaced by converters (rectifiers) and inverters respectively. This method reduced the unused capacity being wasted by reducing power plant engagement and consequently reducing the running cost of power generation in the campus