Rooftop Solar Power Plants

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Abstract:
Rooftop solar power plants provide several benefits such as self-reliance in electricity in a cost effective manner, insurance against future increases in electricity tariff, environmental sustainability, reduction in carbon footprint etc., utilising unused roof space. Governments encourage setting up rooftop solar power plants through net metering policy. Govt of Karnataka has been proactive in offering a feed-in tariff of Rs. 9.56/kWh with a 25 year PPA for net energy sold to grid under its net metering policy. Engineering Institutions can derive all the benefits listed above and additionally use the solar power plant infrastructure for education and research purposes.

However, in order to ensure optimal utilization of solar energy and derive maximum benefits from the investment made, it would be essential to integrate solar power plants with SMART LOAD & GENERATION MANAGEMENT SYSTEM comprising of a system for real time load monitoring and smart switching systems. Such integration will help match the load to the generation as far as possible with the difference being imported from / exported to the grid. Integrating Smart Load Management systems can also help shift some of the loads to peak generation time, reduce demand during peak load hours and minimize wasteful consumption of electricity, if any. Integrating Solar Power Plant with Smart Load & Generation Management System will help the institution to utilize the solar power optimally during grid interruptions by enabling generation during grid interruptions too and switching on the appropriate loads to match the solar generation automatically based on a load priority matrix, thereby utilising all the power generated and catering to the most important loads.

Engineering Institutions being the nursery for future nation builders, can use the rooftop solar power plant and smart load & generation management infrastructure as a SOLAR LABORATORY for education and R&D purposes. This can be done by designing the power plant to include different types of solar modules (crystalline, thinfilm, concentrating PV), different types of module mounting structures (fixed, single axis & dual axis tracking), different types of inverters (grid tie, hybrid). Needless to state that the educational and R&D value of the infrastructure will be over and above its productive use for power generation and its optimal utilization. Once such infrastructure is in place, engineering institutions can encourage its students and faculty to take up research in crucial areas such as energy storage, forecasting etc., which are essential for scheduling solar power which is a pre-requisite for increasing the penetration of solar power in the grid.
**Profile:**
A mechanical engineer with post graduation in rural management from premier institutes of India with more than 26 years experience focussing on renewable energy and clean technologies. Work experience has covered all aspects in the life cycle of renewable energy projects including opportunity identification and feasibility, viability assessment, project development, detailed engineering, project execution management and operations. Worked in the verticals of small hydro, biomass and solar energy and therefore has an excellent understanding of the technical issues and risk factors associated with each of these technologies. Raised debt and equity capital for several projects and therefore has a good understanding of evolving financial models and presenting the investment opportunities to debt and equity investors. Has worked on a few micro-hydel projects which were implemented for village communities / local businesses with significant investments from the electricity consumers. Also, worked on developing and promoting clean technology products such as improved cook stoves and biomass gasifiers for households, non-formal business and industries in the initial part of the career.

Currently, rolling out a new business related to Distributed Generation from Renewables, focusing on rooftop solar under PRDC