Roll-Out of Smart Grid Technology in India for Harnessing Solar Energy

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Abstract*: The author proposes introduction of 'IoT' in Harnessing Solar Energy for the development of the nation. On a hot, sunny day at room-temperature the sun sends down roughly 1KW (the power of a toaster) for every square meter of the ground. The only challenge is to make it cost effective so that it can be easily marketed to individual households and organizations. The need is to efficiently manage this initiative so that the awareness and importance is transferred to the remotest locations, wherever the population exists. In this paper, the author proposes a roll-out of smart grid technology for India which implies a fundamental re-engineering of the electricity services industry, and have shared their experience, views and knowledge on how IoT integrated with project management best practices plays an important role in the development of solutions for enhancing solar harnessing.*

In this paper, the author tries to draw the focus on Internet of things (IoT), providing advanced interaction between devices (such as sensors, handheld computers, etc.).

More than 75% of the total energy is consumed by the cities in the world today and are responsible for 60% of the world's total greenhouse gas emissions. The demand for uninterrupted access to energy, i.e. 24×7 is increasing day by day. Hence, the development of low-carbon energy and energy efficiency programs are necessary for the cities. IoT plays an important role in the development of solutions for enhancing energy management. IoT driven innovations such as flexible generation, demand automation and smart grids to help attain the required outcomes from energy infrastructure in cities.

As the solar energy industry in India experiences unprecedented growth, the need for firms operating in this space to upgrade their IT networks and further utilize proactive monitoring tools grows.

The Internet of Things, also known as Internet of Everything asserts that 99% of identities are unconnected and derives the possibility if we were to intelligently link all of it. With these kinds of solutions in place, IT professionals working at solar energy firms can more easily and effectively control all endpoints and ensure that every distributed network endpoint is functioning properly. IoT and predictive data analysis can provide enormous growth opportunities.

IoT for Solar Power : SMART GRID
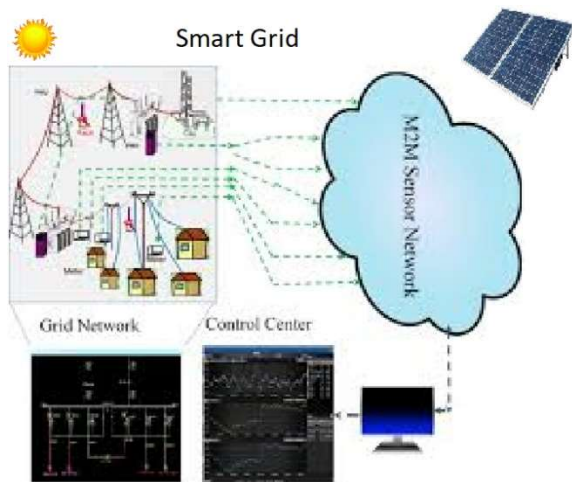
The electrical sector has opportunities through the design, installation and maintenance of devices such as both way metering, storage and invertor-phone combination.

The cost of solar power is decreasing continuously as the volume of renewable power increases and the cost of panels go down. We have to move to move to the DC network and DC equipment.
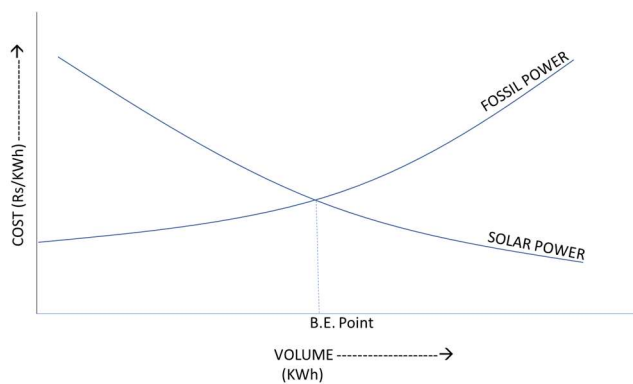
Author proposes a roll-out of smart grid technology for India which implies a fundamental re-engineering of the electricity services industry for solar energy.

SMART GRID TECHNOLOGY
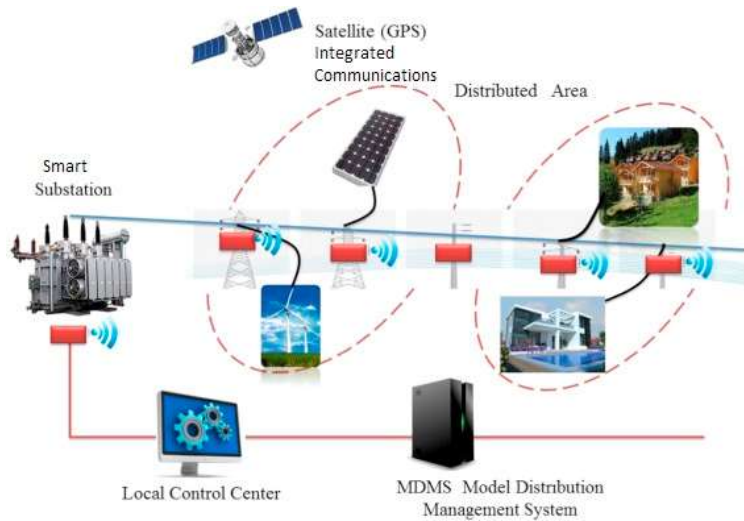
There are following fundamental technology used to derive the smart grid technology

- Managing Solar Growth with proactive Monitoring
- Intelligent Appliances
- Smart Substations
- Remote Monitoring of Conducting Cables
- Demand Response Support
- Integrated Communications
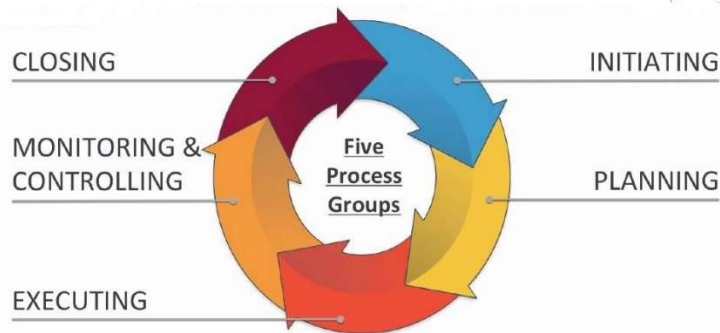- Smart Power Meters (dual)

Project Management Methodology

One of the most important aspects of a smart grid implementation is a standard project methodology which prescribes five steps, supervised by the project management office.
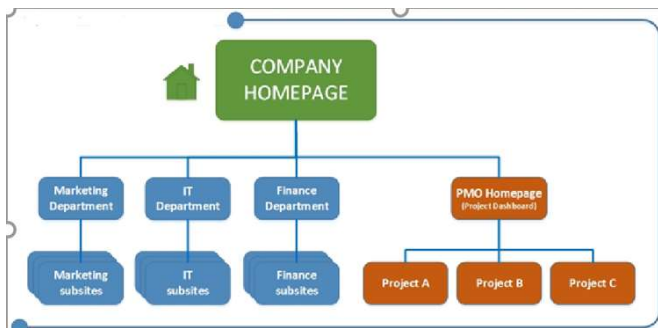
The steps known as process groups are - project initiation, planning, executing, monitoring and controlling, and closing.

Smart Grid program that cross organizational boundaries, encompasses modern tools to effectively communicate using the interfaces such as web browsers and e-Mail. Typical uses would be to:
• Analyze and track interdependencies of projects and the activities within the project.
• Make the detailed calculations concerning scheduling, costs, and progress, etc.,
• Publish progress information,
• Publish individuals' task details,
• Manage the workflow for submitting and handling changes, risks, and issues,
• Enforce controls, for example, in the "checking in" and "checking out" of documentation.

Managing solar growth with proactive monitoring

As the industry grows to new heights, some firms are presented with an entirely new challenge: sprawl. More installations means more endpoints to monitor and guarantee. For example, a UP-based PV firm is now just as likely to have installations in states such as Rajasthan and Gujrat as it is to operate sites located down the road from corporate headquarters. While solar energy firms could previously have relied upon manual processes to keep controls on everything, this approach is no longer feasible due to the sector's scale and spread.

To address this issue, solar energy companies can embrace the IoT. It is the creation of more Internet-connected endpoints designed for machine-to-machine interactivity.

Integrated communications

The key component of smart grid technology is integrated communications. It must be fast enough to the real-time needs of the system. Depending upon the requirement, many different technologies are used in smart grid communication like Programmable Logic Controller (PLC), wireless, cellular, SCADA (Supervisory Control and Data Acquisition).

CONCLUSION

Roll-out of Smart grid technology in India will play a very important role in modern smart world technology for harnessing solar energy. By using IoT technology in various sectors, we can create different intelligence services. The development of most aspects of the smart grid would be enhancing by integrating an IoT technology. Thus, it increases the flexibility of consumer as well as service provider. Project management solutions for the Smart Grid are based on an established Project Management Methodology supervised by a team of individuals comprising a Project Management Office, thus the integration on Management and Technology is the need of the hour to efficiently Harness Solar Energy.

REFERENCES

1. The IET's, 'What the Internet of Things will bring to the Electrical Sector'. Available Web address at: http://www.theiet.org/sectors/information-communications/topics/ubiquitous-computing/articles/electricity-and-iot.cfm

2. Wikipedia's, 'Renewable Energy in India'. Available Web address at: https://en.wikipedia.org/wiki/Renewable_energy_in_India

3. Wikipedia's, 'Smart Grid'. Available Web address at: https://en.wikipedia.org/wiki/Smart_grid