

Smart Grids

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1. Theme description

Energy systems are changing fast. The methods to produce energy and the ways to transmit it are changing. The consumption of electrical energy is growing and its generation is becoming more decentralized, with grid management increasingly complex^[1].

With the objective to overcome the weaknesses of conventional electrical grids, the Smart Grid was introduced. A Smart Grid is an electricity network based on two-way digital communication. This system allows for analysis, monitoring, communication and control with the aim to improve efficiency and reduce energy consumption and cost^[2].

The Smart Grid has the opportunity to move the energy industry into a future more reliability, efficiency, and availability, allowing an improve of environmental health. During this period, it will be critical to carry out technology improvements, study, consumer education and standard regulations to ensure the benefits of the Smart Grid. The advantages of the Smart Grids are^[3]:

- Slower time of restoration of electricity after power disturbances;

- Improve the transmission efficiency;
- Reduce costs;
- Increased integration of large-scale system based on renewable energy;
- Improved security
- useful to use the plug-in hybrid technology for electric vehicles^[4].

In the following, a review based on smart grid, with example of installation and future development, are reported.

[1]<https://www.siemens.com/global/en/home/products/energy.html>

[2]<https://www.techopedia.com/definition/692/smart-grid>

[3]https://www.smartgrid.gov/the_smart_grid/smart_grid.html

[4]<https://www.nema.org/Policy/Energy/Smartgrid/Pages/default.aspx>

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