7.1.3: The Institution has facilities and initiatives for Alternate sources of energy and energy conservation measures

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SOLAR ENERGY

A solar panel is a device that converts sunlight into electricity by using photovoltaic (PV) cells. PV cells are made of materials that produce excited electrons when exposed to light. The electrons flow through a circuit and produce direct current (DC) electricity, which can be used to power various devices or be stored in batteries. Solar panels are also known as solar cell panels, solar electric panels, or PV modules.

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Generator

In electricity generation, a generator is a device that converts motion-based power (potential and kinetic energy) or fuel-based power (chemical energy) into electric power for use in an external circuit. Sources of mechanical energy include steam turbines, gas turbines, water turbines, internal combustion engines, wind turbines and even hand cranks. The first electromagnetic generator, the Faraday disk, was invented in 1831 by British scientist Michael Faraday. Generators provide nearly all the power for electrical grids.

Generator

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Wheeling to the Grid

In electric power transmission, wheeling is the transportation of electric energy (megawatt-hours) from within an electrical grid to an electrical load outside the grid boundaries. In a simpler sense, it refers to the process of transmission of electricity through the transmission lines. Two types of wheeling are 1) a wheel-through, where the electrical power generation and the load are both outside the boundaries of the transmission system and 2) a wheel-out, where the generation resource is inside the boundaries of the transmission system but the load is outside. Wheeling often refers to the scheduling of the energy transfer from one balancing authority (cf. Balancing Authority, Tie Facility and Interconnection) to another. Since the wheeling of electric energy requires use of a transmission system, there is often an associated fee which goes to the transmission owners

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Wheeling to the Grid

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Sensor-based energy conservation

Sensor-based energy conservation employs advanced sensors to monitor and optimize energy usage in various settings. These sensors detect occupancy, temperature, light levels, and other environmental factors to regulate lighting, heating, cooling, and equipment operation. By dynamically adjusting energy consumption based on real-time data, sensor-based systems maximize efficiency while minimizing waste. They enable smart buildings, homes, and industrial facilities to adapt energy usage to demand, reducing costs and environmental impact. Additionally, sensor networks provide valuable insights for energy management strategies, helping organizations and individuals make informed decisions to achieve sustainable energy conservation goals while enhancing comfort and productivity.

Sensor based energy conservation

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BIOGAS PLANT

A biogas plant harnesses organic waste to produce renewable energy. Through anaerobic digestion, bacteria break down biodegradable material like agricultural waste, manure, and food scraps, releasing methane gas. This methane is then captured and used as a clean fuel for cooking, heating, and electricity generation. The process also yields nutrient-rich digestate, an organic fertilizer. Biogas plants mitigate greenhouse gas emissions by preventing methane release from decomposing waste. They promote sustainable waste management, reduce dependency on fossil fuels, and support rural economies. By converting waste into energy and fertilizers, biogas plants exemplify an environmentally friendly and economically viable solution to energy needs.

Use of LED bulbs/ power efficient equipment

The use of LED bulbs and power-efficient equipment revolutionizes energy consumption patterns by significantly reducing electricity usage. LED bulbs consume up to 80% less energy than traditional incandescent bulbs while lasting longer, thus cutting maintenance costs. Power-efficient appliances and devices leverage advanced technology to optimize energy utilization without sacrificing performance. By promoting the adoption of LED bulbs and energy-efficient equipment, individuals, businesses, and governments mitigate carbon footprints, lower electricity bills, and alleviate strain on power grids. Embracing these innovations not only conserves resources but also fosters sustainability, paving the way for a greener, more energy-conscious future.

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