Green Parliament

Solar Power Generation Project

1 MW Solar Power System

Parliament House Islamabad, Pakistan

Visioned and Executed by
Honorable Speaker of The National Assembly **Mr. Ayaz Sadiq**

ABSTRACT

With the increased power demand and energy crisis in Pakistan, it is the need of hour to shift to alternate energy sources and to conserve the power available. Energy efficiency audit reports have trimmed us to curtail the power demand of Parliament Building to 50% while reducing the energy loses, Rest of the requirement will be met through renewable energy source like photo voltaic solar power, an environment friendly cradle . It will also be the excellent demonstration for rest of the country and will also strengthen the Pakistan Building management standards enactment.

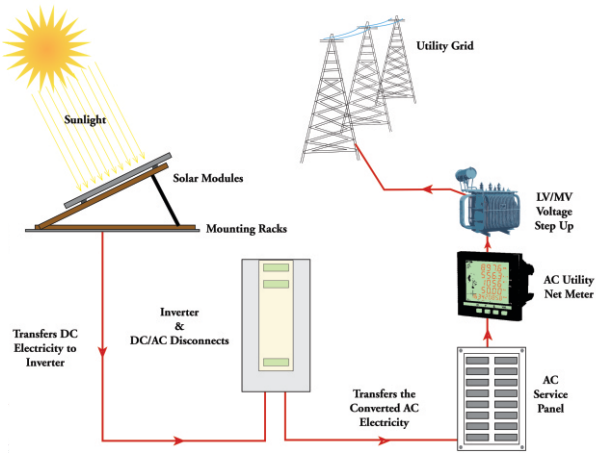
Go Green

Islamabad, 21st of April, 2015

A frequently overlooked feature of the global energy crisis is the opportunity to save enormous amount of energy by deploying energy-efficient technologies. Grasping the prevailed energy crisis and increasing energy demands around the nation it was the broad vision of the Hon'ble Speaker of the National Assembly, Mr. Ayaz Sadiq to carry out the Energy Efficiency Audit of the Parliament House, Islamabad. His principal intention was to transform the Parliament House into Greenhouse by reducing all the energy (Thermal & Electrical) losses of the building.

Green building (also known as green construction or sustainable building) refers to a structure and using process that is environmentally responsible and resource-efficient throughout a building's life-cycle: from sitting to design, construction, operation, maintenance, renovation, and demolition. This requires close cooperation of the design team, the architects, the engineers, and the client at all project stages. The Green Building practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. Due to essential use of electricity in the Parliament Building, Islamabad, the sanctioned load of the building is more than 2.3 MW. Over a period, actual observed load remains less than 2 MW. Keeping in view the expenditures of the electricity bills, the Honorable Speaker of National Assembly of Pakistan deliberated with the Federal Minister of Science and Technology to work on alternate solution in terms of Photo Voltaic Power generation for Parliament building. Consequently, Pakistan Council of Renewable Energy Technologies (PCRET), Ministry of Science and Technology collected

information for design inputs from the office of the Honorable Speaker of National Assembly. PCRET has studied the requirements in detail and proposed for a National Grid Tied 2 MW Photo Voltaic Solar Power System for the Parliament Building. However, Govt. of China agreed to install 1 MW solar power system in the parliament house.



With the implementation of the Grid-Tied PV system we can accomplish the following objectives:

- Solar Electrification of Parliament Building as substitute of IESCO Electric Supply.
- Sizing, Designing, Installation and Operation of On-Grid Photo Voltaic System capable of generating 1 MW Electric Power and connecting to National Grid at 11 kV.
- Installation of Net Metering System for this grid-tied system to claim rebate in electricity bill of the Parliament Building.

The concept of sustainable development can be traced to the energy (especially fossil oil) crisis and the environment pollution concern. The green building movement originated from the need and desire for more energy efficient and environment friendly construction practices. There are a number of motives for green building, including environmental, economic, and social benefits. However, modern sustain ability initiatives call for an integrated and synergistic design to both new construction and in the retrofitting of existing structures. Also known as sustainable design, this approach integrates the building life-cycle with each green practice employed with a design-purpose to create a synergy among the practices used.

Green building brings together a vast array of practices, techniques, and skills to reduce and ultimately eliminate the impacts of buildings on the environment and human health. It often emphasizes taking advantage of renewable resources, e.g., using sunlight through passive solar, active solar, and photovoltaic equipment, and using plants and trees through green roofs, rain gardens, and reduction of rainwater run-off. Many other techniques are used, such as using low-impact building materials or using packed gravel or permeable concrete instead of conventional concrete or asphalt to enhance replenishment of ground water.

While the practices or technologies employed in green building are constantly evolving and may differ from region to region, fundamental principles persist from which the method is derived: Sitting and Structure Design Efficiency, Energy Efficiency, Water Efficiency, Materials Efficiency, Indoor Environmental Quality Enhancement, Operations and Maintenance Optimization, and Waste and Toxic Reduction. The essence of green building is an optimization of one or more of these principles. Also, with the proper synergistic design, individual green building technologies may work together to produce a greater cumulative effect.

On the aesthetic side of green architecture or sustainable design is the philosophy of designing a building that is in harmony with the natural features and resources surrounding the site. There are several key steps in designing sustainable buildings: specify 'green' building materials from local sources, reduce loads, optimize systems, and generate on-site renewable energy.

Financial savings of the Parliament building will be up to Rs. 28 million per annum in terms of utility bill. The estimated cost of the project is Rs. 280.61 million and the payback period will be about 10 years.

Social benefits are directly linked to greater availability of energy generated by 1 MW PV

Solar Power Project of Parliament Building and electricity which is freed up by the project and provided to the general economy. Once the project is completed it will definitely set a trend for other private and public sector buildings where huge amount of electric power is being used to opt the PV Solar Power.

This will also increase the capacity and quality of local industries in the field of wires, cables and steel structures. A time will come when other parts like inverter and isolation transformers will be produced locally and these industries will also flourish and consequently more manpower will be required to work in these sectors. This means more employments resulting in improved social life of people in the society.

Solar power facilities reduce the environmental impacts of combustion used in fossil fuel power generation, such as impacts from greenhouse gases and other air pollution emissions. Unlike fossil fuel power generating facilities, solar facilities have no emission of air pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds, and the greenhouse gas carbon dioxide during operations. In addition to these benefits of solar development, construction and operation of solar facilities creates both direct and indirect employment and additional income in the regions where the PV Systems are installed and other solar energy related development occurs. The solar electrification of the parliament building will save approximately 2500 tons of carbon dioxide per annum with a carbon credit of Rs. 3.445 million per annum if the project gets registered under CDM mechanism. (1US$ = Rs.102 and 1 ton carbon abateme)

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