

IMPLEMENTATION

Designer / architect shall identify open spaces available for the projects to install solar panel to generate power required to meet the compliance. With the technological advancement, various forms of panels are available that can be easily incorporated into different areas of the building structure. Photovoltaic cells and modules can be integrated into building structure in various forms like sun shades, blinds, façade, roof top, car park shade etc.

Though the initiative is to generate the on-site renewable energy, the primary aim of the project team designer must be to design an energy efficient building using technologies to reduce the load demand.

Project team should calculate total building energy load requirement and percentage of energy that can be generated from the on-site solar energy. The power generation from on-site solar energy should be 10% of the electrical load of the building (excluding electrical loads for fire extinguishing system, air conditioning units and air conditioning system pumps). If sufficient space is not available for the solar system to achieve 10% of the electrical load of the building, then 30% of the lighting loads of common areas must be through on-site solar energy. However in this case, the total capacity of the proposed solar panels should not be less than 20 kWp.

Number of photovoltaic panels required to meet the power demand depends on available shade-free area, project orientation etc. Reflectance efficiency and thermodynamic efficiency are the two main factors that influence the efficiency of solar panels. Highly efficient solar panels generate more power and can reduce the total number of panels required.

Design of other major components of the solar PV systems shall be as per the DM or DEWA guidelines. If excess power is produced and surplus is intended to feed into DEWA's network, prior approvals and procedures stipulated by DEWA shall be followed.

During the operational phase of the project, equal importance shall be given to the maintenance of PV systems like other systems. Power loss due to shading, soiling etc are some of the major factors affecting the power generation from PV panels. Scheduled maintenance shall be employed to ensure the PV panels are cleaned and unobstructed for the generation of solar power.

Case Study

Scenario 1 (with sufficient roof space)

Consider a typical G+4 office building with a built-up area of 8,500 m² and a roof area of 1,800 m². Roof space consists of MEP equipment like HVAC units, plumbing equipment like tanks, window cleaning systems, open area for tenants etc. The available space on roof to install on-site power generation is 500 m². Let's find out if this project can comply with Golden Sa'fa requirements.

To start with, electrical loads in the project excluding the load for fire extinguishing system, air conditioning units and air conditioning system pumps are tabulated in Table 504.03 (1).

Table 504.03(1): Electrical Load

Electrical Load	Calculated Load (kW)
Lighting	57.50
Socket Outlets	92.50
Electrical Water Heaters	40.00
Home Appliances	52.50
Lifts, Elevators, Water Pumps, etc.	68.00
Total Load	310.50