

# CASE STUDY

## FACTS AT A GLANCE

### PROJECT CAPACITY

403.15 kWp

### PROJECT LOCATION

Depot-2, Gurugram, Haryana

### TYPE OF PLANT

Rooftop Spread Over  
4567.90 Sq. Meters  
Pre-engineered Roof

### TECHNICAL DETAILS

**Pv modules:** 1156 Nos. of Sunpower Modules in Combination of 345 Wp & 350 Wp Capacities

**Inverters:** 6 Nos. of SMA 60 kW Inverters

### ANNUAL GENERATION

509.5 MWh

### GREEN ELECTRICITY PRODUCTION OVER THE SYSTEM'S LIFETIME

11,839,856 kWh

### AVOIDED CO<sub>2</sub> EMISSIONS OVER THE SYSTEM'S LIFETIME

11,390 Metric Tonnes



## OVERVIEW

Amplus Energy Solutions has partnered with Rapid Metro Rail Gurugram South Ltd. to provide solar power for Rapid Metro's depot in Gurugram, Haryana. The solar power will be generated by the solar plant set up by Amplus on-site depot.

The Rapid Metro Gurugram which is owned by the Infrastructure Leasing and Financial Services Limited (IL&FS), is one of the India's leading infrastructure development and finance companies has signed a Power Purchase Agreement (PPA) with Amplus for 25 years on OPEX model.

Rapid Metro has taken one-of-a-kind green initiative of operating its system with solar power by partnering with Amplus Solar. The capacity of the solar plant is 403.15 kWp which will produce pollution free solar energy of 11,839,856 units over system's lifetime.

Due to its uniqueness in implementation method, en-route challenges in project delivery and tangible and intangible benefits it brings to the Rapid Metro and the commuters, this project is considered as a showcase project.



## UNIQUE FACETS OF THE PROJECT

Some striking practices that the team executed under project implementation are:

### 'Mesh installation' on the skylights to mitigate the risk of their breakages:

Skylights are brittle in nature and without the use of mesh, there are high chances of breakage of skylights during construction. To deliver the best quality, without any damage to client's property, this was a necessary step in the project.

### 'Walkway optimization' to access each module during maintenance:

Walkways are necessary as they are used during cleaning of the modules and for regular inspection, and they even prevent roof damages. The walkways have been designed efficiently keeping in mind both safety aspects as well as space constraints so that no compromise is made in the capacity estimation.

### Efficient space utilization:

The team has even made use of both the adjacent spaces of skylight to maximise on the capacity while giving safety measures utmost importance.



## KEY CHALLENGES ENCOUNTERED

A Rooftop Solar Project implementation is typically done through various stages with site visit, capacity estimation, electrical and structural designing, procurement, construction and finally commissioning of the plant.

During its site visit, the team identified a few key challenges at the client location. After assessing the site with the technical team and taking in account the area capacity and other parameters, following were the obstacles identified by the team:

### **Safety concerns in the aspect of turbo vents and skylights:**

To give sufficient space around turbo vents and skylights while designing, it was observed that there was a reduction in the total capacity the space can accommodate.

To overcome this, adjacent spaces of skylight were used to maximise on the capacity while giving safety measures utmost importance.

### **Challenge in installation:**

Placing modules over skylights made the installation a challenging task as the skylights are brittle and the joints are not as strong.

To overcome this challenge, the entire installation area was strengthened using rails and clamps and placing a mesh over them.

### **Regulatory glitches and government compliances:**

The project initiation got delayed as it was mandatory to get labour licensing from Central Government especially for this project. This itself was a major challenge as it took more than the expected time and resources.



## BENEFITS OF THE SOLUTION IMPLEMENTED

Rapid Metro, one of the lifelines to Gurugram's working class commuters, is environmentally conscious in their power usage. In a bid to provide an efficient and economical mass rapid transportation that is also seen as the sustainability leader in infrastructure sector, this initiative was taken.

Here are some of the environmental savings that are derived through the solar initiative:

- This plant will produce pollution-free Green electricity of 11,839,856 kWh units over the system's lifetime.
- This green electricity is equivalent to 11,017 urban household's annual electricity consumption in India over the system's lifetime which can in-turn be equated to 623807 LED lights bulbs shining for one year and 3089330 I-phone charging for one year.
- This plant will help save 2,631,079 litres of water by avoiding the consumption of coal-fired electricity.
- The carbon footprints avoided due to the production of this electricity over the system's lifetime is 11,390 metric tonnes of  $\text{CO}_2$ . This is equivalent to planting 295,183 tree seedlings grown for 10 years.

(Figures above are Environmental Savings calculated for the installed capacity over the lifetime of the plant.)

The plant has got commissioned on April 3<sup>rd</sup>, 2018 and the entire team was appreciated for achieving completion of the project by the targets set despite many challenges thrown during execution.

The solar plant was formally inaugurated in Gurugram, Haryana in the presence of Mr. Sanjeev Aggarwal MD & CEO, Amplus Energy Solutions and Mr. Rajiv Banga MD & CEO, Rapid Metro Gurugram.

"This was possible because of the relentless efforts of the entire team at Amplus"

**Monika Uniyal**  
Project Manager