



Rooftop solar photovoltaic projects on Delhi Metro Rail Corporation Ltd. (DMRC) buildings

Highlights

- Delhi Metro is the 13th largest metro rail system in the world in terms of length
- GIZ and Delhi Metro Rail Corporation Ltd. joined hands to harness solar energy by promoting rooftop solar systems on DMRC's buildings, yards and stations
- The first pilot project of capacity 500 kW is already installed on Dwarka Sector-21 Metro Station roof and another tranche of 250 kW distributed at 3 locations is under construction. Additionally 1.5 MW is tendered out by DMRC to be implemented within this year.
- Further replication of 10 MW on other stations and buildings is planned. ComSolar team along with DMRC is identifying suitable roofs for quick implementation of projects

Context

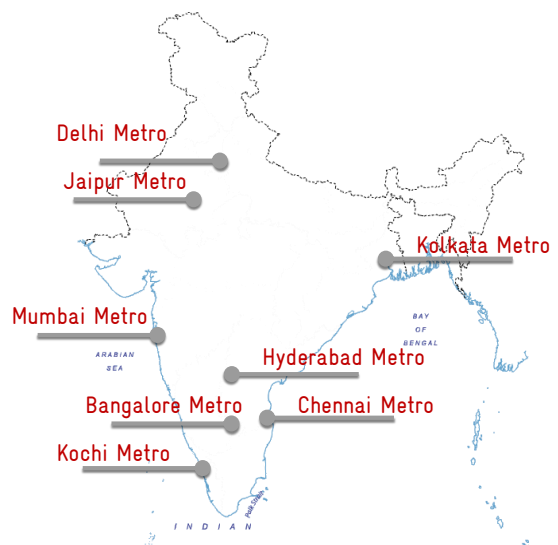
Metro rail transport is becoming a popular means of public transport in India. Metro Rail systems are either already running or in different phases of construction in about 11 cities in the country. The first rapid transit system in India was the Kolkata Metro, which started operations in 1984.

The Delhi Metro is India's first modern metro started its operation in 2002. More than 25 lakh passengers travel daily through the world class metro rail system in Delhi run by the Delhi Metro Rail Corporation Ltd. (DMRC).

The network consists of six lines with a total length of 189.63 kilometres (117.83 mi) with 142 stations, of which more than 100 are elevated.

Other major cities such as Ludhiana, Pune, Lucknow, Ahmedabad, Indore, Bhopal, Chandigarh, Nagpur and Guwahati are also mooted proposals on developing metro rail systems in their respective areas

On one hand such transport systems are rapidly transforming cities but on the other hand the massive infrastructure associated also requires huge amount of electricity. In 2012-2013, the Delhi Metro consumed about 600 million units of electricity which is equivalent to 100,000 households consuming 500 units a month. In 2011, DMRC approached Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH to seek technical support to realise rooftop photovoltaic power plants on few metro stations.



Expansion of Metro Rail Systems across different cities of India

GIZ through their project ComSolar entered in a MOU to support DMRC in harnessing solar energy through initial pilot projects and then to scale it up on other metro stations and buildings belonging to DMRC. Accordingly, three metro sites with different roof types were selected namely Dwarka Sector-21 metro station building, Yamuna Bank Depot buildings and Yamuna Bank metro station.

GIZ's work

GIZ has been instrumental in building capacities within DMRC officials and has played an advisory role in realising the potential of rooftop solar. Detail feasibility studies were conducted for three sites identifying a potential of 2 MW. The potential considers detailed shading analysis on building roofs such as shadow from outdoor AC units, telecom antenna's, water tanks etc. Different business models, power evacuation schemes, technology options were studied and presented. Further GIZ is supporting DMRC to replicate rooftop projects with a cumulative capacity of 10 MW.

Activity Details

Out of the three sites, the first pilot project of capacity 500 kW is already installed on the roof of Dwarka Sector-21 Metro Station. It was inaugurated by the Union Minister of Urban Development, Sh. M. Venkaiah Naidu in the presence of Union Minister of State for Power, Coal and New & Renewable Energy, Sh. Piyush Goyal as first-of-its-kind plant realized on a RESCO business model. It is built by SunEdison - one of the winner in the bidding organized by Solar Energy Corporation of India (SECI).



Construction of 500 kW begins at Dwarka Sector-21 Metro Station; GIZ and DMRC officials seek blessing

SunEdison will own, operate the plant and DMRC will purchase electricity from SunEdison through a power purchase agreement (PPA)

Up-scaling

DMRC is highly motivated to replicate similar projects with 250 kW already under development at 3 sites and tender for another 1.5 MW is out which will be implemented before the end of this year. GIZ is supporting DMRC to replicate it further to 10 MW of capacity on other stations and buildings. DMRC has dedicated a team for implementing solar energy and GIZ is supporting in building internal capacities. Further workshops and awareness generation initiatives are envisaged to motivate other metro corporations to replicate similar projects in their respective areas.

Impacts

- The pilot intervention is a means for educating and showcasing solar technology with an organization (DMRC) having huge potential of implementing rooftop photovoltaic power plants.
- With MW scale projects implemented, it shall directly help in reducing green house gas emissions and shall act as a light-house project for future replications.
- What is good for DMRC is also good for other metro rail corporations
- More than 25 lakh people take use Delhi metro daily and thus solar energy becomes a showcase to common masses at large and helps to create awareness among them.
- One pilot intervention will create ripples and lead to replication within DMRC and then further to others.



Hon'ble Union Minister of Urban Development, Sh. M. Venkaiah Naidu and Hon'ble Union Minister of State for Power, Coal and New & Renewable Energy, Sh. Piyush Goyal at inauguration event

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