

Solar PV Rooftop Projects for Developing Countries in Asia

Benchmarking of Generation Cost and Successful Development Approach

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 - More than 5 GW of Solar Projects in Asia (12 GW global)
 - More than 7 GW of Wind Projects in Asia (70 GW global)



Today's Agenda



Rooftop System and Challenges



Successful Approach

Generation Cost Benchmark



Summary



1. Rooftop System and Challenges





Challenges Commercial aspect









Project

9.4 MWp Portfolio Rooftop

Client

Local Company

Location

Thailand

Role

Lender Technical Advisor (LTA)

Opportunity

Carry out technical due diligence report for Rooftop Portfolio – Site assessment, technologies review, plant design review, EYA, contractual review, and Financial assessment

Challenge

Site assessment: some sites locate in the flood risk area.

Plant Design: installations were proceeded based on the installers experience rather than actual designs, structural issues

Contract: PR guarantee is provided but no monitoring equipment and pyranometer installed at the site. **O&M:** relatively high maintenance cost cost



Project

3.3 MWp

Client Local Company

Location

Thailand

Role Lender Technical

Advisor (LTA)

Opportunity

The scope covers technologies review, EYA, design review, contractual review, and financial review.

Challenge

This project consists of 4 sites and has now operated for 3 years. Overall, plant is wellmaintained where PR is approximately 75-76% at year 2. Minor issues are associated to cleaning of the pyranometer and the tilt angle of pyranometer.



2. Successful Approach

Successful Approach for Solar Rooftop

From our experience



Understanding requirement on permits and regulations.



Site assessment and energy yield prediction.

Acquire credible contractors and ensure all required safety equipment are installed according to grid code.



Perform O&M activities to maintain high operation performance.



3. Generation Cost

Solar Rooftop System Cost for Developing Countries in Asia Based on MM's project experiences and analysis Myanmar CAPEX = 1,000 – 1,600 USD/kWp OPEX = 10 – 20 USD/kWp

Thailand

CAPEX = 1,100 - 1,700 USD/kWp OPEX = 10 - 25 USD/kWp

Philippines

CAPEX = 1,200 – 1,800 USD/kWp OPEX = 10 – 25 USD/kWp

Indonesia

CAPEX = 1,100 - 1,700 USD/kWp

OPEX = 10 - 25 USD/kWp

CAPEX = 1,100 – 1,700 USD/kWp OPEX = 10 – 25 USD/kWp

India

CAPEX = 950 - 1,400 USD/kWp

Malaysia

OPEX = 9 - 20 USD/kWp

Levelised Cost of Energy (LCOE)

Based on MM's analysis and derived assumptions



Summary

With a good understanding of project site's constraints and proper design using the right equipment, LCOE of solar-rooftop can be very attractive



Thank you Q&A

