Scientific and Technical Advisory Panel

The Scientific and Technical Advisory Panel, administered by UNEP, advises the Global Environment Facility
(Version 5)

STAP Scientific and Technical screening of the Project Identification Form (PIF)

Date of screening: March 14, 2016
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Consultant(s):

I. PIF Information *(Copied from the PIF)*

FULL SIZE PROJECT	**GEF TRUST FUND**
GEF PROJECT ID:	9249
PROJECT DURATION:	4
COUNTRIES:	India
PROJECT TITLE:	Grid-Connected Rooftop Solar PV Program
GEF AGENCIES:	World Bank
OTHER EXECUTING PARTNERS:	State Bank of India, Ministry of New and Renewable Energy
GEF FOCAL AREA:	Climate Change

II. STAP Advisory Response *(see table below for explanation)*

Based on this PIF screening, STAP's advisory response to the GEF Secretariat and GEF Agency(ies):
Minor issues to be considered during project design

III. Further guidance from STAP

1. This is a well thought through proposal to install "up to 750 MW" of solar PV on rooftops throughout India (GRPV programme). Having a rooftop system on the State Bank of India will be a good demonstration. The GEF Data Sheet shows that GEF will invest $22,935,780 in Component 2 of the project (Table B), while later in the text costs for this component are assessed at $13 million.

2. Submitted documents provide very limited information about the demand and type of technical assistance to be funded using GEF resources. Component 2 covers technical and institutional support to state agencies and this is to be managed by SBI plus a "qualified co-ordination consultant. It is not clear how that person will be selected or what technical expertise is required that SBI does not have. Is one consultant sufficient given the scale of the project?

3. The major challenge faced by this project is how to scale up the GRPV programme. No details about the approach are provided which is a concern given the significant amount of funds to be invested. GoI policies and regulations will play an important role in this process as will those of the individual states. There are multiple categories of policies and regulations used elsewhere for GRPV to support installation costs, on-going O&M, grid connectivity issues, financing, enhancing public awareness and information. In India, the range of mechanisms is used to support RE projects including capital subsidies, feed-in-tariffs, RE certificates, net metering incentives, accelerated depreciation, and power purchase agreements. What would be the relative weight of these or other mechanisms in assuring expansion of GRPV in India?
Full details of mechanisms used elsewhere can be found in the series of REN 21 Global Status reports published annually (http://www.ren21.net/status-of-renewables/global-status-report/).

STAP recommends project proponents explore the lessons learned, particularly in Germany which is a good model and where GRPV systems now account for more than 70% of all installed PV capacity. The key success factor in that country was the optimization of the entire system over time from encouraging local manufacture, capacity training for installation and maintenance, and grid integration rules for exporting

surplus PV generation after meeting local on-site demand. Recent revisions to the German regulations provide good examples of the lessons that can be learned from experience and that could equally apply to India. Given the large investment involved with this project, further assessment is warranted to better determine the optimum system approach for scaling up.

4. The barrier of skills shortage is worthy of noting as it is a key issue for successful GRPV deployment and operation over the longer term. The Operational Manual is to mention practices by eligible installers. It would be advisable for these installers to be trained and licensed to ensure the quality of installations is of a high standard.

5. Integration of variable solar power into a grid can become a challenge as generation shares increase, as outlined in Chapter 8, Integration of Renewable Energy into Present and Future Energy systems of the 2011 IPCC Special Report, Renewable Energy Sources and Climate Change Mitigation (http://srren.ipcc-wg3.de/report/IPCC_SRREN_Ch08.pdf).

6. The level of greenhouse gas emission reduction is difficult to assess. The World Bank Technical Assessment document values emission reductions at USD 141 M (Table 10, page 27), but the carbon price assumed for this calculation is not provided. Quoting a range of all values for this analysis would be more appropriate given the uncertainties involved, the future carbon price being one example. The potential emission reduction is stated to be 13 Mt CO2 over the life of the project. It is not clear what life for a PV panel was chosen or how the total installed capacity increasing over time is accounted for? It is assumed the "thermal counterfactual" is coal-fired generation but what was the emissions factor used for the mitigation potential calculation? Taking 400 MW (page 26) rather than the 750 MW target capacity on page 1 of the Data sheet, and assuming a capacity factor of 12% gives an annual generation of around 400 GWh or 8,000 GWh after a 20 year life. This doesn't reconcile with the 13 Mt CO2 since the emission factor used would have to be 1625g CO2eq /kWh which exceeds even 100% coal-fired power generation in inefficient plants. The marginal abatement cost of $5.1/t CO2 avoided is dependent on this calculation, but again, due to the uncertainties, quoting a range would be more appropriate.

STAP advisory response	*Brief explanation of advisory response and action proposed*
1. Concur	In cases where STAP is satisfied with the scientific and technical quality of the proposal, a simple "Concur" response will be provided; the STAP may flag specific issues that should be pursued rigorously as the proposal is developed into a full project document. At any time during the development of the project, the proponent is invited to approach STAP to consult on the design prior to submission for CEO endorsement.
2. Minor issues to be considered during project design	STAP has identified specific scientific /technical suggestions or opportunities that should be discussed with the project proponent as early as possible during development of the project brief. The proponent may wish to: (i) Open a dialogue with STAP regarding the technical and/or scientific issues raised. (ii) Set a review point at an early stage during project development, and possibly agreeing to terms of reference for an independent expert to be appointed to conduct this review. The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.
3. Major issues to be considered during project design	STAP proposes significant improvements or has concerns on the grounds of specified major scientific/technical methodological issues, barriers, or omissions in the project concept. If STAP provides this advisory response, a full explanation would also be provided. The proponent is strongly encouraged to: (i) Open a dialogue with STAP regarding the technical and/or scientific issues raised; (ii) Set a review point at an early stage during project development including an independent expert as required. The GEF Secretariat may, based on this screening outcome, delay the proposal and refer the proposal back to the proponents with STAP's concerns. The proponent should provide a report of the action agreed and taken, at the time of submission of the

	full project brief for CEO endorsement.