ADDENDUM TO

ENVIRONMENT AND SOCIAL SYSTEMS ASSESSMENT FOR ROOFTOP SOLAR PROGRAM FOR RESIDENTIAL SECTOR

(P171750)

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Introduction

In 2015, Government of India (GoI) set an ambitious target of 175 GW of installed renewable power by 2022 and raised its solar power target from 20 GW by 2020, to 100 GW by 2022, out of which rooftop solar installation target is 40 GW. Despite of GOI's strong policy support, the sector has witnessed a modest uptake due to factors such as lack of consumer awareness, limited availability of debt capital, higher upfront investments and other operational challenges related to net metering.

As of March 31, 2019, approximately 4375 MW[1] of GRPV projects have been installed, of this only around 690 MW have been installed in the residential sector – roughly 16 per cent of the entire rooftop solar installation. Despite the sluggish uptake of residential segment, the consumer surveys across the country confirms that there is a significant demand which can only be met if the identified barriers can be mitigated through market development initiatives such as making debt capital accessible to end consumers through concessional financing as well as capacity building.

The World Bank (WB) is partnering with MNRE to promote the uptake of solar rooftop in Commercial, Industrial and Institutional customers through a USD 625 million loan facility to State Bank of India. It is also supported by a technical assistance of USD 12.96 million which aims at creating and strengthening the solar rooftop ecosystem. Under this program 431 MW rooftop solar capacity has been sanctioned against the target indicator of 600 MW, of this 218 MW is installed and connected to the grid against the indicator of 400 MW.

Further to this, GoI and WB propose to partner for sustainable development of the rooftop solar sector, by offering access to low cost capital and institutional capacity building for relevant stakeholders.

The objective of this document is to identify and present the key environmental, health safety and social risks associated with the additional financing program for rooftop solar in residential sector, assess the ability of borrower – State Bank of India (SBI) to manage and mitigate those risks and recommend measures by which the identified EHSS risks can be minimized or mitigated.

An assessment of the key environmental, health safety and social risks associated with the rooftop program for commercial and industrial sector was conducted and detailed Environmental and Social Systems Assessment (ESSA) document was developed. This document is an addendum to the ESSA, with the details pertaining to residential rooftop solar sector, which is now proposed for inclusion as part of the Solar rooftop program to be implemented through SBI.

Scope of the program

World Bank envisages to support the residential rooftop proliferation in the country through providing concessional financing USD 245 million for a period of 5 years.

[1] https://bridgetoindia.com/report/india-solar-rooftop-map-june-2019/

Promoting innovative market development mechanisms is cornerstone for the success of the program. Through these mechanisms, the end consumer's risks can be mitigated for residential segment due to low paying capacity and high transaction costs while minimising utility's overall business risk. It will assist installation of approx. 700 MW in the residential sector. WB concessional financing coupled with MNRE subsidy under CFA scheme might act as a catalyst for smooth uptake in residential segment, thereby providing end residential consumers high investment benefits with low payback periods.

Need for Environmental and Social Systems Assessment

The Program for Results instrument - PforR requires technical, fiduciary, environment and social assessments to be carried out as required under Operational Policy (OP 9.00) - Program for Results Financing. The need for Environmental and Social Systems Assessment (ESSA) and its assessment is established in the ESSA for the existing World Bank program for Commercial, Industrial and Institutional (CNI) customers.

The purpose of the Environmental and Social Systems Assessment (ESSA) is to: (i) review the environmental and social management rules and procedures and institutional responsibilities that are currently being used by the Program; (ii) assess the implementing agency (SBI's) institutional capacity and performance to date to manage potential adverse environmental and social issues under the Program based on the agreed Program Action Plan that was devised under the original program; and (iii) recommend specific actions for improving the capacity of the SBI in regard to effective management of environmental, health and safety and social issues during implementation.

Changes to the on-going program

The Phase-II of grid connected rooftop solar program aims to promote RTS in all consumer sectors viz, residential, institutional, social, Govt., commercial, industrial etc. Even though the costs of rooftop solar installation have reduced thereby increasing the benefits, yet there has been modest uptake of rooftop solar in the residential sector. Thus, much impetus is given to residential sector by the government. Moreover, the Phase II program envisages to bring DISCOMS at the forefront of RTS deployment in the country, create awareness and capacities of all the stakeholders.

In the latest definition of rooftop solar, MNRE has included the ground mounted installation within the premises of the residential/institutional/commercial/industrial building under the ambit of rooftop solar installation. Therefore, it is imperative to undertake thorough investigation of environmental and social effects of ground mounted and rooftop solar installation within the premises of a residential society/RWA and develop strategies to mitigate the environmental and social risks arising due to such installations.

Approach for ESSA

1. Review adequacy of systems proposed in POM for GRPV program to address EHSS issues pertaining to residential sector
2. Undertake a desk review of the best practices and guidelines on the Environment Health Safety (EHS) and social management system

3. Hold Stakeholder consultation with the rooftop solar project developers working in the residential sector, residents of RWA and individual households, bank/lenders lending for rooftop installation in residential sector. The consultation and stakeholder engagement checklist is appended in the Annexure III.
4. Assess the EHSS impacts of rooftop solar plants in the residential sector including ground mounted installations and formulating strategies
5. Present a draft addendum to stakeholders for their input followed by finalization of addendum to ESSA and its disclosure to stakeholders.

Stakeholder Consultation

To understand the environmental, health, safety and social impacts of GRPV installation, stakeholder consultations were carried out with: i) developers working specifically in the residential sector; ii) those banks disbursing loans for residential rooftop solar implementations and iii) the residents of Residential Welfare Association and residents of individual houses. The objective of the consultation was to discern the risk and challenges faced by each stakeholder during various phase, viz. installation, commissioning and operation phase, of rooftop solar plant and understand the approach to management of environmental and social issue. Following are the findings of the consultations,

I. Oakridge Energy

Oakridge energy is one of the North India's leading solar rooftop installer and have worked extensively in the residential rooftop solar PV projects. Following are key insights form the discussion with Oakridge Energy,

- For residential sector with the plant capacity of up to 10kWp, the cost of designing the system is approximately 10% of the total cost. Due to cost sensitivity of residential rooftop sector, not enough impetus is given on designing of plant leading to poorly designed system lacking in structural integrity. This makes system vulnerable to bad weather, heavy wind causing damage to the plant, and poses great safety risk to people living in the vicinity in case panels fall from a high-rise building.

- Space constraints on the rooftops poses a great safety risk to labours working at height for installation & O&M activities. Lesser rooftop area may lead to installation of solar panels on the edge of rooftops making ladder/safety harness precarious, leading to fatal accidents. Thus, it is imperative to follow proper ladder/ safety harness procedures.

- Restriction to access rooftop and lack of usable rooftop space are some of the negative social impact of GRPV installation. These are more evident in case of RWAs and may lead to litigations if permissions are not sought from all members and residents of the RWA.

- Poorly designed electrical system increases short circuit risk due to DC voltage build-up leading to fire and damage to roof and building.

- Lack of warning signage may prove fatal for workers and residents, in case they come in contact with live wire, hence installation of wire mesh fence and warning signs should be mandatory for solar installation in residential sector.

II. MYSUN

MYSUN has installed various projects in the residential sector and has gained expertise in GRPV installations. Below are the key discussion points,

- Asset securitization is one of the biggest concerns of project developers in the residential sector, as the rooftops are accessible to everyone, making the plant safety vulnerable. Thus, installation of wire mesh fence is necessary to protect solar installation within the premises from unauthorized access.

- The RWA's generally have limited/restricted work hours during the plant installation activities can be performed. This leads to longer duration of construction and installation phase adding to costs of the project.

- The construction activities may produce noise and vibrations which may affect the health of children and elderly people living in the residential apartment. Thus, as a precautionary measure, all the stakeholders should be intimated well in advance of the installation work schedule.

III. Canara bank

Canara bank provides loan to individuals for installation of Grid connected Roof Top Solar Photovoltaic (PV) System on the roof top of house as a part of Home Loan or without Housing Loan. It also provides loan for purchase of Solar Equipment, but apart from MNRE guidelines for solar rooftop program, the bank does not follow any other environmental or social guidelines/checklist either at pre-sanction or post installation phase.

IV. RWA and individual residential houses

Aryanagar CHGS, Delhi and Ramakrishna Society, Delhi were consulted along with two other individual residential house owners. These RWA's have initiated the process for installation of rooftop solar plant but are yet to finish the installation. Below are the key discussion points,

- The individual house owners are motivated to install solar rooftop due to the benefits, such as reduced electricity bill, reduced heating of rooftops thereby reducing overall home cooling expenses etc., associated with the rooftop systems. The only impact that the rooftop systems have is restriction to access usable rooftop space.

- The RWAs face major challenges in getting consent from the members of society. As a practice, any developmental activity is first discussed with the members in general body meetings and upon analysing the costs and benefits associated, the activity is undertaken. Therefore, delays occur in securing consent from all the members.

- Lack of capital is another barrier faced by RWAs for implementation of rooftop systems. In the current market scenario, the financial institutions are hesitant to provide capital due to inexperience in lending for projects where RWA's are end beneficiary. This leads to higher cost of capital and delays in project implementations.

Best EHSS practices in rooftop solar installation and O&M activities in residential sector

The installation of rooftop solar plant in the residential sector poses great safety risks to the workers/labours and O&M personnel during installation and O&M activities. Thus, it is important to implement safety policies and procedures and management systems to mitigate safety hazards. A desk-based study was conducted to identify and understand the best practices in installation and O&M activities around the globe. Following are some of the findings of desk review.

Plant Installation Activities

Each rooftop installation presents its own unique set of occupational safety hazards and conducting an analysis of unique hazards (i) leads to properly identifying safety training needs; (ii) helps in identifying the measures necessary to ensure a safer workplace; (iii) determine ways to control or eliminate the safety hazards. Following are the best practices for installation of the plant,

- **Electrical Safety** – only a licensed electrician shall work on live electrical equipment and shall perform de-energise activities of solar panel during installation. Standard colour scheme for phase identification must be verified for all electrical connections. Power tools shall be double insulated or equipped with a grounding system and a polarized cord connector. All extension cords and equipment should be protected with Ground Fault Circuit Interrupters (GFCI) system. Electrical power cables laid on the floor or ground shall be inspected regularly by a Licensed Electrician, secured and protected from damage due to travel hazards. The working space and walkway should be clear of any extension cords. While working on the solar panel, the DC Disconnect Switch should always be disengaged. Battery banks can store voltages with high current potential that can create electric arc hazard, thus, due care should be taken while working with battery banks (if any).
- **Lifting Safety** – Lifting solar panels to rooftops can be dangerous and may lead to back strain or sprain or even cause permanent damage to spine, if not performed properly. Power machines such as cranes, hoists and forklifts should be used for loading and unloading of solar panels and other equipment. Proper lifting procedures should be followed to avoid any spinal or back injury.
- **Ladder Safety** – a correct size and design of ladder should be used for various tasks during installation process. The ladder should be selected after verifying work-load rating, ladder length, material, maximum weight to be carried. Straight and extension ladders must be tied off and using ladder stabilizers on straight and extension ladders are recommended. It is important to make sure the ladders are electrically insulated

and secured properly. A ratio of 1:4 for distance from wall to height of ladder should be maintained to ensure ladder safety.

- **Scaffold Safety** – generally, in the residential sector, the solar panels are installed on a raised platform. Thus, it is necessary to follow proper safety procedures and take adequate measures while constructing plant on platform. The scaffold should be securely held on a levelled surface with adequate counterweights. Wire or fibre rope used to suspend scaffolds and must be capable of supporting at least 6 times the maximum intended load. Fall protection mechanism should be implemented if scaffold is more than 6 feet in height. All scaffold systems shall include guard rails on all open sides and ends.

- **Fall protection -** Work at high elevations where no permanent provision for access or work platforms is available or at edge of structure/building can be hazardous. Proper safety measures and procedures should be implemented to mitigate risk from working at height. Full body harness with double lanyard with twin hook is recommended to be worn when working on the edges of structure or on slanted rooftops. Installation of a Guardrail System around the work area is required for fall protection. Safety net is required to be installed while working at height and where scaffolding cannot be provided.

Best practices in Operations and Maintenance Activities

- Periodic monitoring of plant by O&M contractor and setting KPI's for plant, equipment etc. in the contract. A periodic report generated should include information on raw data parameters such as total energy produced, PV power plant KPIs such as Performance ratio or availability, O&M Contractor KPIs such as the response time, Equipment KPIs and incidents.

- The operation of the PV plant should comply with national and local regulations and contracts. Countries with strict legal requirements for security services, PV power plant security should be ensured by specialised security service providers.

- The PV plant maintenance should be carried out by a team of specialized technicians. Annual maintenance plan with activities and specific timelines are set well in advance. Preventive Maintenance that involves regular site inspections, as well as verification activities necessary to comply with the operating manuals are undertaken. A contact number for O&M phase to handle any issues arising during the operation phase would be prominently displayed at the installation location. Corrective maintenance activities are aimed at restoring a faulty PV plant, equipment or component to desired performance level.

- Revamping and repowering of plant plays a significant role in delivering consistent output throughout the life of the power plant. It is done by replacing old and worn out power production related components within a power plant by new components to enhance the overall performance of the installation.

- Spare part management ensures the availability of components in a timely manner for Corrective Maintenance to minimise the downtime of a solar PV plant. As a best

practice, the owner/developer should own the spare parts and the cost of replenishment should not be included in the O&M contractor fee.

- Effective data monitoring frameworks should be in place, which includes data loggers that can collect, aggregate and store the data such as energy generated, irradiance, module temperature, etc. of all relevant components such as inverters, energy meters, pyranometers, temperature sensors etc, It should be able to store at least one month of data with a granularity of up to 15 minutes or less depending on the requirement. A visualization of the collected data will enable in monitoring the KPIs of the plant.

- The KPIs for O&M should also include acknowledgement time of an incident (the time between the alarm and the acknowledgement), intervention time (the time between acknowledgement and technician reaching plant) and resolution time (the time to resolve the fault starting from the moment of reaching the PV plant).

- The Global Solar Energy Standardisation initiative recommends use of availability and response time guarantee along with performance ratio guarantees. A best practice is a minimum guaranteed availability of 98% over a year.

- Innovative techniques such as Smart PV power plant monitoring and data-driven O&M, retrofit coatings for PV modules, and O&M for PV power plants with storage are setting new trends in the PV market.

Environmental, Health, Safety and Social Impacts

The potential environmental impacts of rooftop solar installation for the residential sector are small or modest in intensity and can be mitigated to acceptable levels with standard cost-effective measures available commercially. The ground mounted systems in the residential apartment/housing society may have following environmental & social effects,

Land Use –the impact on the landscape is likely to occur during construction phase by activities, within the premises, such as transportation, earth movements (land excavation) if installed on ground. This may also lead to rise in dust and particulate matter PM 2.5 and PM10 in the vicinity, affecting the health of residents. The envisaged impacts are of modest intensity and can be mitigated by taking adequate measures such as intimating the work schedule to the residents, creating temporary boundary wall etc.

Discharge of pollutants – Normal plant activities might not lead to release of hazardous materials, except in case of damaged/not-in-use panels, but incidents such as fire may lead to release of hazardous into ground posing health hazards to residents and to the land resources such as ground water table.

Batteries Management – The project will have an option to finance batteries in addition to regular solar plan infrastructure. Given the potential impacts of mishandling and inappropriate disposal of batteries, the implementation of the up-to-date version of Batteries (Management) Rules, 2001 will be very important. Compliance with the provisions of these requirements should be included in the check-list for appraisal and inspection during installation.

Visual Impacts – there might be some negative visual impacts due to ground mounted installations due to changes in the aesthetics of the residential building.

Stakeholders Consultation – The residential housing apartments in India can be broadly classified into two heads

(i) Residential Welfare Associations (RWA) – RWA is a body that represents interest of people living in a community or a society (including women, elderly and other vulnerable stakeholders) and is responsible for managing day-to-day activities, facilities and other developmental activities such as solar installation etc.; safeguarding the rights of all the residents and other stakeholders.

(ii) Housing apartments where there are no RWA.

During initial stakeholder consultation, the project developer shall seek consent from the RWA. The RWAs would have identified and taken consent from all the stakeholders in the society and provided the same to the project developer for implementation of the solar plant.

For apartments where there is no such representative body, the developers shall seek consent from all the owners of the rooftop for implementing the project. The developer shall also inform the RWA and other stakeholders regarding the hazards of a solar plant. To ensure safety and privacy of residents of the society, the developers shall notify to the residents, in a timely manner, regarding the working hours (approved by RWA) along with the complete timelines of construction and maintenance activities from time to time.

In general, solar rooftop installation in the residential sector will bring social benefits through job creation, overall air quality improvement in the region. For rooftop solar projects, one of the major negative social impact is restriction to access usable common rooftop space that has various uses such as presence of overhead water tanks, TV antennas, etc.- such usage would be identified as part of social screening. This impact can be mitigated by obtaining consent to install solar plant from all the residents while informing them of the need for restrictions on such usage. The ground mounted systems are envisaged to be installed in the carparks/ports and vacant land which is not used for any amenities (such as garden, kids play area etc.) for the residents. As a general trend, such vacant spaces are occupied for certain livelihood activities such as clothing presser, vegetable vendor etc. Therefore, ground mounted installations may have negative impact on the livelihoods of such communities and such sites need to be avoided through social screening.

The environmental and safety concerns arising from the installation of grid connected rooftop solar plant in the residential sector are illustrated in the table 1 below:

GRPV Specific Requirements	Level of Concern	Mitigation Measure
Safety of population living in vicinity	Moderate	None required, if the plant is well designed considering the weather pattern viz. wind speed and direction, and the plant can withstand such climatic conditions. Isolation of/ Regulated and safe (including with provision of railing, or parapet or other means) access to the installation site should be ensured. If not, then the plant should be designed by certified solar plant designer and the plant design should be submitted and reviewed during loan approval processes.
Plant safety	Moderate	Not required if the rooftop is private and access is provided only to installer and O&M personnel

		In case of an RWA/residential apartments, the plant equipment should be secured by installing wire mesh fence with proper warning signage.
Safety of installer and O&M personnel	Moderate	Installers and O&M personnel should be provided with personal fall protection system, ensuring proper lifting and ladder usage policies and procedures at sites and installation of guard rail system on rooftop during construction phase.
Electrical safety and fire hazard	Moderate	Along with fire protection and extinguishing system, basic measures such as protecting equipment with Ground Fault Circuit Interrupters, short circuit protection system shall be installed to protect the plant from short circuit.

Table 1: Environmental, Health and Safety concerns of GRPV in residential sector and Mitigation Measures

Social Impact -

Likely Social Impacts	Level of Concern	Mitigation Measure
Restriction to access rooftop and lack of usable rooftop space	Low	Due consent from authorized representatives of residents/members of the RWA/residential apartment needs to be acquired before installation of solar plant. Clear delineation of activities that would be allowed in the areas where installation would take place need to be explained as part of the process for obtaining this consent. As part of SBI's due diligence process, these documents shall be examined before disbursement of funds.
Construction/installation phase of GRPV plant	Low	Noise and vibrations during construction of plant may affect health of children and elderly people. Due intimation should be given to all the residents before starting the construction activities and high noise producing activities should be undertaken during first half of the day.

Table 2: Potential Social Impacts of GRPV in residential sector and Mitigation Measures

Compliance assessment of ESSA for rooftop program for C&I sector

The Program Appraisal Document (PAD) articulates the areas for action under the ESG framework by the SBI based on the ESSA for rooftop program for commercial and industrial sector. An assessment was conducted to understand the gaps (if any) and enable SBI officials and Lenders Independent Engineer's (LIE's) the implementation of the proposed actions in relation to the ESG framework. Below is the summary of compliance assessment findings,

SBI has in place a rigorous environment and social management framework to manage and mitigate the environmental and social risks of investment projects. The framework helps in selecting suitable investment projects that are environmentally friendly and have minimum social impact. The Bank also has stringent governance structure that strengthens relations with external stakeholders as well as internal stakeholders and ensure overall accountability. The internal governance policies and procedures help in providing equal opportunities to its employees, ensure diversity and provide healthy and safe working environment. SBI maintains a zero-tolerance policy against sexual harassment at workplace and has put in place a policy for the Prevention of Sexual Harassment (POSH) at work place. SBI is committed towards reducing environmental footprints of its operational activities and has taken various steps to be carbon neutral, energy efficient bank. The CSR initiatives are focused in the areas such as Education, Healthcare, Sanitation, Skill Development, Disability, Environment, Sports and Culture.

From the review of loan documentation, it can be concluded that the loan documents were prepared as per the guidelines stated in the Project Operation Manual. As recommended in the Project Appraisal Document by the World Bank, the clauses related to Anti-corruption and law against sexual harassment were included in the loan agreement. The sanction letters stipulate a condition on borrowers for compliance of takeback arrangement of panels after end of use and that the roofing material does not include any carcinogenic material such as asbestos. The inspection/appraisal report of bankers should be upgraded to include EHSS checklist in the report.

As recommended in the PAD, the LIE's scope of work included monitoring of applicable EHS norms, but as opposed to the recommendation, the LIE inspection is conducted only after installation and commissioning of the plant. Moreover, the inspection report did not clearly mention the EHSS checklist. Thus, as a mitigative action, the LIE report should include detailed EHSS assessment, including EHSS checklist. Some of the best practices such as inclusion of availability and response time guarantee clauses in the O&M contract, mandatory installation of data monitoring system for performance management, defining KPIs for O&M contractor, can be adopted in the rooftop solar systems.

Discussion of draft addendum to ESSA with developers and other stakeholders

A consultation workshop was conducted on 6th December at the Bank office, for the solar developers and other stakeholders to discuss the findings and recommendations of the draft addendum to ESSA for residential sector. A presentation was made to the participants (with whom the draft document was shared by email in advance) covering the ESSA findings, including how this built on the current systems at SBI to manage E&S issues for Rooftop Solar loans. (The participant list This list seems to be incomplete as there is no mention of participants from SBI, MNRE or think tanks. is appended in the Annexure IV)

Below are the key points on environmental and safety concerns raised and social challenges faced by the developers during implementation of rooftop solar plant in residential building or RWA,

A. Environmental and safety related concerns

- As opposed to C&I, issues of safety and quality in residential buildings are higher hence added measures should be ensured.
- For RESCO projects there could be potential safety issue for the personnel other than of the RESCO in accessing roof, namely technician for repairing TV antennas and plumber for repairing and maintaining water tanks.
- Right to access the rooftop should be secured before implementation of the project. Absence of unrestricted access may lead to delays in implementation and may instil apprehensions regarding safety of solar panels and other equipment.
- For high rise buildings, DG sets are mandatory, but, DG set is not financed in the proposed residential GRPV concessional lending; Financing Battery storage would not include lead-acid technology while it is envisaged to cover lithium-ion batteries.

B. Social challenges

- Securing consent to establish from the Resident Welfare Associations remains biggest challenge in residential rooftop sector and it was suggested that instead of receiving consent from all the residents, the consent of the General Body or the managing committee would be adequate as otherwise getting consent of everyone would lead to further delays in implementation.
- There is a need to evaluate the consensus procedures followed by RWAs in different states and device a best practice for providing consent for implementation of rooftop plant.
- As developers are denied access to rooftop after 5 years (in some cases), consent for O&M activities and performance monitoring activities is required be secured before/during implementation phase itself.
- For RESCO projects, though unrestricted access needs to be provided to RESCO, RWA may like and continue to have access to rooftops for certain activities. In such cases, it is imperative to sensitize the Security Personnel of RWA and taking enough measures to restrict access of RWAs for certain activities and need basis only.
- In some cases, RWAs are required to give up their rights to access the roof and manage TV antenna and plumbing and other maintenance activities accordingly.
- The security personnel should be sensitized regarding basis safety measures to be taken to ensure safety of residents and solar plant alike.

Citizen Awareness Plan

For the success of the program, it is critical to create awareness among residential consumers and other stakeholders for uptake of rooftop solar. The proposed program, as part of its consumer outreach, will devise a communication campaign to raise awareness of both rooftop solar developers or installer and particularly end consumers. It would focus on awareness raising of residential consumers at such massive scale to help them understand the nuances of going solar. Such an effort will involve: i) SBI designating and training specific officers to provide scheme-specific information; ii) SBI rolling out information stalls/kiosks; distributing printed material with scheme information to create awareness among the borrowers to sensitize them on the potential safety issues in installing solar rooftop plants initially as part of the process to obtain consent and subsequently during installation and operation; iii) solar power developer companies holding consultation meetings with resident associations of residential complexes/apartments as part of their rollout plan.. SBI shall engage the services of PMC to create awareness among them by:

- Disseminating media collaterals such as flyers, booklets, pamphlets etc to the consumers through the bank branches;
- Conducting workshops for RESCO borrowers and LIEs to sensitize them about the EHSS requirements;
- Revision of ESG training module for SBI officials and include the EHSS clauses pertaining to residential rooftop solar sector and conducting training sessions.

Grievance Redressal Mechanism

Under the ongoing program for C&I sector, SBI had established a Grievance redressal mechanism where SBI's overall customer care mechanism (which includes a tollfree number and email id), and grievance handling process is decentralized to each branch. Additionally, to ensure compliance with Environmental, Social, Health and Safety (ESHS) guidelines by the borrowers – especially during the construction and post-commissioning period, SBI had created 'data.cppd@sbi.co.in' to respond/redress to any queries/complaints. SBI has been segregating and furnishing reports related to the grievances that have arisen under this Program.

Recommendation

Following are the recommendations for due diligence process that shall be followed for sub-loan to address EHSS impacts of GRPV installation in residential sector,

- Due consent from authorized representatives of residents/members of the RWA/residential apartment needs to be acquired before installation of solar plant. Clear delineation of activities that would be allowed in the areas where installation would take place need to be explained as part of the process to obtaining this consent. As part of SBI's due diligence process, these documents shall be examined before disbursement of funds.

- The clauses to be added to the existing guidance EHSS checklist during proposal appraisal and monitoring (installation and operations) phase are illustrated in Annexure II. These clauses are over and above the clauses that were mentioned in the ESSA for Commercial and Industrial sector. The checklist for ongoing program for C&I sector is provided in Annexure I.

DISCLOSURE: The final version shall be disclosed on the World Bank website and translated version of the same in Hindi shall also be made available in SBI offices where the sub-loans are to be provided.

Annexure I

Guidance Checklist for verification of adequacy on Environmental, Health and Safety (EHS) requirements during appraisal and monitoring (Installation and Operation phases) of individual project funded under the Program by SBI for the ongoing program for C&I sector

S. No.	EHS Requirements of GRPV Program	Status (State Yes/No/Not Applicable)	Guidance for ensuring compliance of EHS requirements by SBI	Review and Monitoring by SBI for adequacy and compliance of EHS requirements
	Proposal Appraisal Phase			
1.	Whether GRPV proposal require consent to establish (CTE). If yes, whether the proponent has received CTE from State Pollution Control Board		If Yes, check validity and imposed consent conditions by State Pollution Control Board, if any. If not, ensure first disbursement is released subject to submission of valid consent by proponent.	Assess/Review compliance to consent conditions by proponent through periodic monitoring (till COD) by Independent Engineer (IE) or SBI's staff as per project cost thresholds.
2.	Whether GRPV proposal require lopping/pruning of tree branches to ensure shadow free area on roof. If yes, state whether permissions are obtained from competent authorities for periodic lopping/pruning of trees		f Yes, check validity and conditions imposed on proponent by competent authority, if any. If not, ensure first disbursement is released subject to submission of valid permissions for loping /pruning of trees.	Review compliance to permissions including conditions, if any by proponent through site inspections by IE or SBI's staff.
3.	Whether roof rights have been secured		If yes, please verify the lease agreement/draft lease agreement/title deed for establishing clear rights over the roof for installation and operations.	Review compliance to permission including conditions, if any by proponent through Legal Counsel or SBI's staff.
4.	Whether proposal has right to access roof through existing staircase on a 24 X 365 (all days of year irrespective of public holidays and Sundays). If not, what alternatives are considered to access like an external staircase or ring ladder etc. dedicated to GRPV		If not, seek details of alternative safe access along with the permission from owner.	Review the safety of the alternate access to roof through site inspections by IE or SBI's staff.

5.	Whether proposal includes estimated water requirements for washing of panels and dependable arrangements to draw or share water from the same water connection or overhead tanks with owner of the building		Seek details of water requirements and its sources along with required permissions from competent authorities, if any required.	Review the adequacy of arrangements through monitoring by IE or SBI's staff.
6.	Whether structural safety of the building, present condition of roof for leakages and/ or cracks and adequacy of roof drainage has been assessed		Seek a structural safety and roof condition certificate from a certified/approved Chartered Engineer / Architect/ Competent person along with an action plan for rectifications and responsibilities, if any required. If not ensure certificate is submitted by proponent prior to first disbursement of loan.	Check the validity, review the adequacy of arrangements through by IE or SBI's staff.
7.	Whether the proponent has an accreditation of ISO 14000, OHSAS 18001 or has received any recognitions for environmental friendly initiatives or best EHS practices		If Yes, seek details of valid certifications and or recognitions. Accreditation(s) give an indication to institutional capacity of the proponent to EHS requirements.	
Confirm that Roofing material does not contain any carcinogenic material like Asbestos.				
Installation and Operation Phase				
8.	Whether GRPV project require consent to operate (CTO). If Yes, whether proposal has received CTO from State Pollution Control Board		If Yes, seek a copy of the valid consent If not, ensure the same is submitted prior to following disbursement of loan.	Assess/Review compliance to consent conditions by proponent through periodic monitoring by IE or SBI's staff.
9.	State whether any arrangement has been agreed with manufacturer to take back damaged /discarded panels, batteries etc.		Seek details of take-back arrangement with manufacturer and in case such arrangement is not there with manufacturer stipulate condition in the sanction that the disposal of panel should be as per applicable local law for discarding such hazardous waste.	Undertaking will be taken from the proponent for compliance of the condition.
10	Whether any provision to include Diesel Generator (DG) set as		Seek the details of DG set funded under the project, confirm installed and precautions considered for	If DG set has been funded as part of the GRPV facility, then check whether GRPV has

	power backup has been considered to regulate /govern power demand and ensure synchronized connectivity with Grid as well as solar power generation level If yes, state reasons to prefer DG set over Batteries for power back up Also state whether DG set is considered as part of the GRPV or function as standalone & independent		avoiding backflow of current to DG set from solar panels/grid supply, which can lead to blast at times due to malfunction of relays etc.	all precautions considered for avoiding backflow of current to DG set from solar panels/grid supply. Assess/Review GRPV has all required consents/permissions and comply with conditions imposed thereof through periodic monitoring by Independent Engineer or SBI's staff.
11	Whether permissions from the owner is available to access the roof through existing staircase or whether external access will be required.		Seek details of arrangements made for safe lifting of the materials to rooftop through existing staircase or temporary/ permanent external access.	Assess adequacy and review the safety procedures followed during material handling through site inspections and periodic monitoring by Independent Engineer or SBI's staff until 3 months after CoD. Follow up with only annual visit reports.
12	Whether earthing of all plant and equipment / components under GRPV as per Indian Electricity Act,1956 and amended up to 2000 has been made, and tested by an approved competent agency		Seek certification from Chief Electrical Inspector to Government (CIG).	
13	Whether all safety provisions like provision of rubber mats, electric shock chart, first aid box, fire extinguishers to handle all types of fire (ABC type of required capacity), sand buckets, etc. are provided/installed at appropriate locations		Seek details of safety measures/provisions mandatorily provided prior to testing, trial run and commercial operations of GRPV facility.	Assess adequacy and review the safety provisions including exit routes provided and procedures followed during site inspections and monitoring by IE or SBI's staff.

14	Whether provision to provide safety wear like boots, hard hats (helmets), gloves, safety belts for personnel while working at heights among others have been included in the proposal.		Seek details of safety measures/provisions mandatorily provided to all work force deployed on site to ensure safety of personnel at work	Assess adequacy and review the safety provisions provided and procedures followed during site inspections and periodic monitoring by IE or SBI's staff.
15	Whether all personnel deployed for Installation / Operation and Maintenance are provided with basic training in first aid and firefighting.		An undertaking from the proponent that they will ensure that personnel deployed for Installation / O&M has basic knowledge about first aid and fire-fighting instruments	
16	Whether all personnel deployed for Installation / Operation and Maintenance (unskilled, semi-skilled and skilled) are paid at minimum wages as per applicable Minimum Wages Act.		An undertaking from the proponent that they will ensure compliance of applicable Minimum Wages Act.	
17	Whether all personnel deployed for Installation / O&M are covered under workmen compensation insurance policy, EPF (Employee Provident Fund) Act, Gratuity Act etc. as may be applicable or relevant		An undertaking from proponent they will ensure that all personnel deployed for Installation/ O&M personnel will be covered with workmen compensation insurance policy and are provided with benefits of any other applicable acts.	The adequacy of insurances to be checked by LIE or SBI's staff.
18	Managing chemicals used in transformers and other ancillary facilities		Ensure that the Standard Operating Procedures (SOPs) are followed and regulatory permissions for recycling and /or disposal under Hazardous Substances Rules are available for compliance.	Verification during the site visit; Check Documentation including receipts from recyclers, etc.

Annexure II

Clauses to be added to the guidance EHSS checklist during proposal appraisal and monitoring (installation and operations phase) of individual project funded by SBI

Sr No.	EHS Requirements of GRPV Program	Whether Applicable (Yes /No)	Guidance for ensuring compliance of EHS requirements by SBI	Review and Monitoring by SBI for adequacy and compliance of EHS requirements
	Proposal Appraisal Phase			
1.	Whether the consent[2] from residents / owners/general body have been secured? Whether the residents are informed about the timelines of the construction process.		If yes, please verify the consent document arrangements for maintaining secure and non-intrusive access to the installation site made and agreed with roof user/RWA If not, ensure first disbursement is released subject to submission of valid document The developer should also submit the timelines for construction activities	Review compliance to permissions by project proponent through site inspection by LIE or SBI staff.
2.	Does the loan include financial assistance for batteries?		If yes, ensure that undertaking is available for compliance with current Batteries (Management) Rules 2001	Check whether agreement with authorised recycler is in place.
	Installation and Operation Phase			
3.	Whether the end consumers have been sensitised to the potential safety issues in installing solar rooftop plants?		Share material about potential safety hazards, and likely restriction to activity in the areas where plant and machinery are to be installed/stored.	Review compliance of Safety measures through site inspection by LIE or SBI staff.

[2] Include an arrangement for maintaining secure and non-intrusive access to the installation site made and agreed with roof user/RWA.

Annexure III

Consultation and Stakeholder Engagement Checklist

Factors to be considered in formulating a consultation strategy	**Comments**
Who are the key stakeholders, and how are they likely to be affected by the proposed Program?	Key stakeholders are the residents of RWA, solar project developer, SBI
What are the potentially most significant issues for each stakeholder group to be addressed in the ESSA?	**RWA residents** - safety issues, Social issues such as restrictions to access rooftop and Visual impacts due to rooftop installation, privacy and safety for residents, visitors; and loss of livelihoods for vendors; specific needs, if any, of women, elderly, and the like; environmental issues such as air and land pollution, water insufficiency due to cleaning requirement etc. **Developers** - Safety of labours and O&M personnel; safety of solar system and equipment **SBI**- Loan securitization and timely repayment
Which stakeholders can be consulted informally, and which are involved in formal consultations?	SBI to be consulted formally by World Bank for discussing the PAP; Developers and RWA residents can be consulted informally
Are there political or social sensitivities or constraints that may affect timely or open consultations? Are any key stakeholder groups unable or unlikely to participate in consultations because of exclusionary practices, language, threats of political repercussion, or other reasons?	No political constraints Consultation were conducted in English as well as local language.
Are there legal issues that may constrain the Bank in conducting formal or informal consultations? If so, how can they be overcome or circumvented so that necessary communications can take place? What methods will be used in consulting with various stakeholders?	No legal constraints

What methods will be used in consulting with various stakeholders? Where the number of potential stakeholders is large, and they are dispersed across a wide area, what sampling strategy will be used to ensure equitable and inclusive consultation?	SBI can be engaged formally in face-to-face meeting or focused group discussion; Developers can be consulted over telephonic call and RWA residents by visiting the site
When and how will the consultation process unfold, so that results can be considered in the ESSA drafting and review process? What direct role will the Bank team (or Bank country office) have in arranging and conducting formal aspects of consultation?	In the first phase, review of best practices in EHSS is conducted. Stakeholder consultation is the second phase of the activity which helps in understanding the concerns of each stakeholder. This activity helps in identifying specific issues of stakeholders and evaluating mitigation options to address these issues. The Bank shall convene formal meetings with SBI.
What facilitating role, if any, will the client (i.e., Program agencies) play in the consultation process? For instance, the Bank team may require logistical support, assistance in identifying interpreters, or other forms of facilitation. If Program agencies are fully open to dialogue, it may be desirable to encourage their presence at or jointly convene the formal consultation meeting. In any case, it will be useful to keep Program agencies informed about the evolving ESSA process, so that they are not caught by surprise when critical findings and disclosed to the public recommendations are disclosed to the public	The client may provide an authorization letter for discussions with stakeholder
How will the consultation process be brought to the attention of stakeholders, how will their participation be facilitated, and how will the results be documented and reported?	The consultation processes shall be intimated to all the stakeholders prior to conducting the consultation. The results of the consultation will be documented formally and will form the basis for formulating mitigation strategies
What resources are necessary to support consultations? How will the draft ESSA Report be disclosed?	Consultations have been undertaken during the preparation of the Addendum to the ESSA through individual meetings, and stakeholder workshop on the draft version. The material shared with potential sub-loan seekers will guide them to the full document. SBI will have copies of checklists prepared in the ESSA and its addendum will be available in all offices where sub-loans are to be given.

Annexure IV

Financing Residential Rooftop Solar – Brainstorming Session with Developers and Market Enablers workshop participant list

List of Solar Developers, EPC contractors that participated in the workshop is as below,

- Adani Solar
- Solar Universe India
- Sunson Energy Devices pvt. ltd
- Sunsure
- Solis India
- Boond Solar
- Alien Energy
- Claro Energy
- Oakridge Energy
- Agios Engineer
- PVEV renewable private limited
- Indygreen Technologies Private Limited
- Sun Source Energy
- Ritika Systems private limited
- TSL
- Airia
- NetWorth Projects
- Amplus Solar
- Sterling and Wilson
- Alpine Energies
- Girlong Technologies
- Claro Energy
- Green Ripples
- Alien Energy
- Renew Power
- Quark Solar