

Environmental and Social Code of Practice for Solar-Diesel Mini-grid Systems

1. General

1.1. Purpose of the Environmental and Social Code of Practice

This Environmental and Social Code of Practice (ESCOP) provides guidelines to follow for the preparation, construction, and operation of small-scale solar-diesel mini-grid sub-projects under the National Electrification Project (NEP) of the Union of Myanmar. These guidelines are intended to avoid environmental and social problems whenever possible or to mitigate those problems if they cannot be avoided.

1.2. Compliance to Legal Requirements

The developer shall comply with all relevant national laws and regulations on environmental conservation and management and with all applicable World Bank environmental and social safeguards throughout project planning, preparation and construction, and during operation of the mini-grid system.

1.3. Consultation and Disclosure

The developer shall consult with and provide adequate and timely information to the communities and other people affected by the project throughout project planning, preparation and construction, and during operation of the mini-grid system.

1.4. Ethical Clause of the Contractor

1.4.1. The contractor must not either directly or indirectly exploit the local community in any other way to prevent unnecessary social issues.

1.4.2. The contractor must completely disburse the necessary payment (eg: land issues, labour hiring cost and etc.) to community in project implementation.

1.5. Language

1.5.1. Communication with affected people should be in a language they understand clearly and easily

1.5.2. If the company or its agents cannot communicate in any of those languages, translators must be engaged to provide the oral or written information as needed.

1.6. Payments to Communities for Food and Other Goods and Services

1.6.1. With several teams visiting the communities, providing meals to these teams on these numerous occasions can cause undue financial stress to the communities. To avoid this, food should be brought in by those visiting the community or if the community provides the food or meals, these should be paid for at replacement cost.

1.6.2. Other goods and services (including accommodation) provided by the communities at the request of the teams surveying, installing, or conducting follow-up for the NEP project should be paid for at market cost.

2. Project Planning and Preparation

2.1. Evidence of Compliance with Environmental Laws and World Bank Safeguards Policies

- 2.1.1. The project proposal documents shall include all applicable clearances pertaining to environmental protection and management under the laws and regulations of the Government of Myanmar and shall contain the necessary plans and procedures for compliance of the same
- 2.1.2. The project proposal documents shall include the environmental and social safeguards screening form and shall contain the necessary plans and procedures for compliance to any safeguards triggered by the sub-project
- 2.1.3. Approval of the projects will be subject to review and approval by the DRD Safeguards Team for the NEP of the above-mentioned plans and procedures to comply with national environmental laws and regulations and with World Bank environmental and social safeguards.

2.2. Consultation with Communities and Other Affected People

- 2.2.1. Consultation on project plans
 - 2.2.1.1. The developer shall consult with the communities, both men and women, to be served by the mini-grid on the proposed plans for the project.
 - 2.2.1.2. The sub-project proposal documents must show evidence of these consultations, including any concerns and recommendations that have been raised, and show evidence of agreement by the communities and other affected people to the project plans.
- 2.2.2. Consultation on compliance with safeguards and environmental laws and regulations
 - 2.2.2.1. The developer shall also consult with the communities and other affected people, both men and women, on the procedures to comply with national environmental laws and regulations and with World Bank environmental and social safeguards.
 - 2.2.2.2. The project proposal documents must show evidence of agreement by the communities and other affected people to the selection of the site for the array of solar panels and storage batteries, the diesel generator, fuel storage facilities, and of any other infrastructure of the project.

2.3. Site Selection for Infrastructure and Grid Route

- 2.3.1. VEC members and other village representatives, both men and women, shall be consulted on selection of the sites for solar panels and power station, the diesel generator, fuel storage facilities, and any related infrastructure; the proposed route of the grid; and lighting for public buildings and street lights.
- 2.3.2. The sites selected for the diesel generator and fuel storage facilities must be free from risk of erosion or other damage that may cause runoff into waterways, agricultural areas, residential areas or other sites used by the community. The project proposal should include plans to limit any spill and for cleaning up and rehabilitation of areas affected by a spill.
- 2.3.3. The proposed sites are to be presented to the community and other affected people for their consideration and agreement under Section 2.2 above.
- 2.3.4. The land used for the infrastructure shall be acquired according to Section 2.6

2.4. Workers' Housing, Storage Spaces, and Other Temporary Facilities

- 2.4.1.If workers need to be in the community for more than 4 to 5 days, the developer will assess the need for workers' housing, to determine if there is sufficient existing housing available or if temporary housing or a workers' camp is needed.
- 2.4.2.If in the community for only 4 to 5 days, arrangements can be made for the workers to stay at a community building, or in temporary housing (tents) arranged by the contractor, or accommodated by local residents at the invitation of and arranged by the VEC and other community leaders and compensated as specified in Section 1.5 above on Payments to Communities.
- 2.4.3.If workers' housing is required, the project proposal will include plans for that housing (even if in existing structures), including water supply, sanitation, health care, provision of meals, security, solid and liquid waste management, and the impact on the local communities.
- 2.4.4.The project proposal will include plans for storage facilities of construction materials, the protection of these sites, borrow areas, access roads, and/or any other temporary structures or facilities required during construction.
- 2.4.5.VEC members and other village representatives shall be consulted on the selection of the sites for workers' housing and facilities, storage spaces, and other temporary facilities.
- 2.4.6.The workers' housing and related facilities, the storage facilities, and other temporary facilities should be located on sites free of risk from erosion or runoff into any waterways.
- 2.4.7.The proposed sites are to be presented to the community and other affected people for their consideration and agreement under Section 2.2 above.
- 2.4.8.The land used for these sites shall be acquired according to Section 2.6

2.5. Waste Management

- 2.5.1.The developer shall identify activities during construction that have the potential to generate waste, and prepare measures to manage and dispose of waste in the construction schedule, including management of materials that can be recycled and management of hazardous waste.
- 2.5.2.The measures must abide by the laws and regulations concerning waste management of the Government of Myanmar and of the Ministry of Natural Resources and Environmental Conservation..
- 2.5.3.The waste management measures adopted by the developer will be reviewed by the PMO of the DRD.

2.6. Land Acquisition and Compensation

- 2.6.1.All permanent and temporary land acquisition required by the project must be completed prior to construction in accordance with the Resettlement Policy Framework.
- 2.6.2.Any permanent or temporary loss of livelihood aside from loss of land caused by the project must be compensated prior to construction in accordance with the Resettlement Policy Framework.
- 2.6.3.Adequate documentation must be provided for review by the DRD-NEP Safeguards Team for all land acquisition and compensation under the Resettlement Policy Framework
- 2.6.4.All land acquisition and compensation must be completed before construction can start.

2.7. Physical Cultural Resources

- 2.7.1. The developer shall consult with the Department of Archaeology, National Museum and Library to determine if there is any site of cultural significance in or near the project area that should be avoided.
- 2.7.2. The developer shall consult with VEC members and other village leaders to determine if there are any sites in the project area that are of cultural or religious significance to members of the community, including any ethnic or religious minorities in the community, and project design should be altered to avoid any such sites.

2.8. Preparation of an Environmental and Social Management Plan, Resettlement Action Plan, and/or Indigenous Peoples Plan

- 2.8.1. If the screening forms and assessments indicate any environmental and/or social issues that need to be mitigated or avoided, the PMO may request the developer prepare an Environmental and Social Management Plan (ESMP), a Resettlement Action Plan (RAP), and/or an Indigenous Peoples Plan as needed.
- 2.8.2. The ESMP will indicate how the developer will manage those environmental and/or social issues during construction and operation of the sub-project and be included in the project plans (proposal or feasibility study)
- 2.8.3. The RAP will indicate how the developer will handle any compensation required for land acquisitions, loss of assets, or loss of livelihoods, and provide evidence of that compensation.
- 2.8.4. The IPP will detail the procedures in conducting free, prior and informed consultations with ethnic minorities in order to obtain their broad community support.
- 2.8.5. If no ESMP, RAP, or IPP is required, this ESCOP will serve as the framework for managing environmental and/or social issues during construction and operation of the sub-project.

2.9. Requirements for Initial Environmental Evaluation

- 2.9.1. If the sub-project is 5 Mw or greater, an Initial Environmental Evaluation (IEE) is required and must be approved by the Environmental Conservation Department
- 2.9.2. An IEE may be requested by the DRD Safeguards Team if the sub-project is expected to have any significant environmental or social impacts.

3. Construction

3.1. Workers' Housing and Facilities

- 3.1.1. If temporary housing is built or provided, it should be built with adequate and safe materials, and with adequate ventilation, natural and artificial lighting, and protection from rain and storms.
- 3.1.2. The housing should be on sites free from flooding and other natural hazards.
- 3.1.3. The housing should be kept free from rubbish and other refuse.
- 3.1.4. The site should have an adequate supply of clean water for consumption, personal hygiene and other domestic uses.
- 3.1.5. The site should have adequate drainage to avoid stagnant water.
- 3.1.6. Facilities must be available for adequate removal or disposal of waste water, sewage, and solid waste. Containers should be available for rubbish collection.
- 3.1.7. Toilets, showers, and other sanitary facilities should be clean, safe, and adequate number for the work force. Separate facilities should be available for females in the workforce.

- 3.1.8.A canteen where food is prepared for the workers and/or cooking facilities where the workers prepare their own food should be provided, with the facilities adequately furnished and designed for good hygiene.
- 3.1.9.Clean, safe, and adequate facilities for workers to wash and dry clothes should be provided.
- 3.1.10.First aid kits and facilities should be provided, with separate space available for any sick or injured workers. A sufficient number of workers should be provided training in administering first aid.
- 3.1.11.Adequate security should be provided at the workers' housing.

3.2. Workers' Code of Conduct

- 3.2.1.Workers must be provided with and given training on a code of conduct, to prevent adverse impacts to the environment and local community and to avoid undesirable contact with members of the community.
- 3.2.2.The code of conduct should be provided in writing and on posters in the workers' housing and at construction sites.
- 3.2.3.The code should include, but not be limited to:
 - 3.2.3.1.instructions on waste disposal and hygiene
 - 3.2.3.2.prohibition on use of illegal drugs
 - 3.2.3.3.prohibition on theft of personal or community property
 - 3.2.3.4.prohibition on hunting, fishing, or other activities causing harm to the natural environment
 - 3.2.3.5.restrictions on drinking or gambling with members of the community
 - 3.2.3.6.prohibition on making any unwanted verbal or sexual advances to those in the community
 - 3.2.3.7.prohibition on vandalism, theft, desecration, or otherwise damage to items or sites considered physical cultural resources in 2.7 above.
 - 3.2.3.8.awareness of religious practices or social customs of the community if different from that of the workers.
 - 3.2.3.9.prohibition on making any interactions with minors in the local communities, glorification of violence, incitement of hate against minority groups of society such as ethnic, national or religious minorities, or any segments of society

3.3. Occupational Health and Safety

- 3.3.1.Personal Protective Equipment
 - 3.3.1.1.Workers must use personal protective equipment (PPE) and protective clothing
 - 3.3.1.2.People not involved with installation should be kept safely away from the worksites.
- 3.3.2.Working at height
 - 3.3.2.1.If working at heights, sufficient protection against falls must be in place.
 - 3.3.2.2.Equipment used to work at heights including safety belts and straps must be tested for integrity before use.

3.4. Community Health and Safety

- 3.4.1.The community should be informed of the potential risks to health and safety during construction. These include risks of:
 - 3.4.1.1.road accidents

- 3.4.1.2. communicable diseases from the workers, including HIV/AIDs and other sexually transmitted diseases
- 3.4.1.3. other undesirable contact from the workers, as noted in 3.2.3 above.
- 3.4.2. The community should be informed of potential environmental impacts caused by the project, such as
 - 3.4.2.1. dust, pollution, and noise during construction
 - 3.4.2.2. pollution and noise during operation
 - 3.4.2.3. risks of and emergency procedures for fuel spills
 - 3.4.2.4. risks of and emergency procedures for accidents
- 3.4.3. The developer will install proper safety and warning signs to inform the public of potential hazards during construction

3.5. Construction Near Waters

- 3.5.1. Runoff from construction entering any water body should be free of pollutants and generally free of sediments
- 3.5.2. No wastewater, sewage or other drainage from construction or from the workers' housing should flow into the water bodies.
- 3.5.3. Dirt, silt, or sediment should be collected and stockpiled for possible reuse, for example surfacing of slopes that need to be re-vegetated. Those stockpiles need to be protected from runoff.
- 3.5.4. Cutting of embankments of water bodies should be avoided or if necessary kept to a minimum to avoid flooding of surrounding areas.
- 3.5.5. Alternative drain inlets and outlets should be provided in the event existing drainage channels of the water body are closed.
- 3.5.6. No waste from the construction sites or from the workers' housing should be disposed in the water bodies.

3.6. Solar Panels, Power Station, Diesel Generator, Fuel Storage Facilities, and Related Infrastructure

- 3.6.1. If removal of any large trees is unavoidable at the sites for the solar panels, the power station, the diesel generator, fuel storage facilities, and any related infrastructure, the wood from those trees removed by the developer will be given to the community or, if on private land, to the land owner. For every tree felled, the developer will do compensatory planting, at sites selected by the community, of two (2) saplings of species of equal or greater value, such as fruit trees.
- 3.6.2. Dirt, silt, or sediment should be collected and stockpiled for possible reuse, for example surfacing of slopes that need to be re-vegetated. Those stockpiles need to be protected from runoff.
- 3.6.3. Grease traps or containers should be used to capture potential oil spillage from the diesel engine. The exhaust pipe from the diesel engine should be checked for its height according to relevant technical specifications.
- 3.6.4. The solar panels, power station, the diesel generator, fuel storage facilities, and any related infrastructure should be adequately protected from theft or other interference during construction.
- 3.6.5. If Lithium-ion batteries are used, to avoid improper use and thermal runaway, the battery cells and charge controller should be encased in one common housing that cannot be opened with commonly available tools such as screwdrivers. The housing should clearly indicate the type of battery enclosed.

- 3.6.6. Construction of power house (If applicable): Power house typically has three separate rooms: battery room, electronic component room, and generator room. The house should be well ventilated especially battery room, safe from moisture well-lit and safe from intrusion and vandalism. Batteries emit a corrosive and explosive mix of hydrogen and oxygen gases during the final stage of charging, which can ignite if exposed to flame or spark.
- 3.6.7. Construction of powerhouse need to have detailed layout/sketch on battery installation.
- 3.6.8. Power house must have a well-ventilated enclosure, especially nearby battery installation.
- 3.6.9. Limit access to the battery room to people trained in maintenance and shut-down procedures.
- 3.6.10. Warning signs must be visible on the housing, in English and the local language(s), to prevent any tampering or attempts to alter the system, clearly stating the risks of electric shock, fire, and explosion.
- 3.6.11. Trees should be planted in the compound of the diesel generator (but not blocking the solar panels) to absorb some of the emissions and particular matter.

3.7. Plant Clearance Along Mini-Grid

- 3.7.1. Final alignment of the mini-grid should try to minimise the loss of existing tree cover.
- 3.7.2. If removal of any large trees is unavoidable, the wood from those trees removed by the developer will be given to the community or, if on private land, to the land owner. For every tree felled, the developer will do compensatory planting, at sites selected by the community, of ten (10) saplings of species of equal or greater value, such as fruit trees.

3.8. Physical Cultural Resources

- 3.8.1. If at any time during construction the developer or its workers comes across a “chance find,” that is, finds an item or site that appears to be archaeologically, historically, or culturally important, either nationally or locally, work on that site should be stopped immediately, the site protected, and the Chance Find Procedures in Annex 8 of this ESMF be followed.
- 3.8.2. Project design should then be immediately altered to avoid the site.

3.9. Installation in Households

- 3.9.1. The position of the light points (bulbs) should be decided by the contractor only after detailed discussion with both men and women of the house; and the house wiring should be done accordingly. There must be a light point in the kitchen or cooking area and in the area where children read or study.
- 3.9.2. All connections and wiring in households must be done by the developer only, to assure the wiring is adequately safe. Wiring by the household or by a third party is not permitted.
- 3.9.3. If the household already has wiring, the developer should replace it with the wiring and materials provided under the sub-project.
- 3.9.4. The connections, meters and fuses should be placed out of reach and inaccessible to young children.

3.10. Installation of Public Lighting

- 3.10.1. The decision for location of light points (bulbs) should be decided by the contractor only after detailed discussion with the public facility authorities, but the contractor has to evaluate the safety of the suggested positions.
- 3.10.2. All wiring must be done by the contractor only, to assure the wiring is adequately safe. Wiring by members of the community or a third party is not permitted.
- 3.10.3. If the site already has wiring, the contractor should replace it with the wiring and materials provided under the sub-project.

3.11. Waste Management

- 3.11.1. The developer shall educate the workforce on the proper disposal of waste, the location of disposal sites, and other requirements and measure in waste disposal.
- 3.11.2. During construction, the developer will handle and dispose of waste according to the Waste Management Plan approved by the DRD, including arrangements for recyclable materials and toxic waste, so that debris and waste do not accumulate.
- 3.11.3. After construction, the developer shall clear all construction and storage sites and the workers' housing site of all debris and waste.
- 3.11.4. The developer shall restore those sites to as near the original condition as possible.

3.12. Reporting

- 3.12.1. The developer shall include sections in its monthly reports on compliance with environmental and social safeguards, including the ESMP, Waste Management Plan, and other issues covered in this ESCOP.

4. Operations

4.1. Protection and Safety of Infrastructure and Equipment During Operation

- 4.1.1. Proper protection of vulnerable points in the system will be put in place (such as fencing, cages, locks, etc.), regularly inspected by the developer and the VEC, and maintained.
- 4.1.2. If replacement batteries are stored on site, they should be in a site free from erosion, runoff, or potential threats, to avoid damage to the batteries and risk of toxic pollution.
- 4.1.3. Diesel fuel should be stored in a site free from erosion, runoff, or potential threats, to avoid damage and risk of spillage.

4.2. Occupational Safety

- 4.2.1. Personal protective equipment (such as ear plugs for noise, proper clothing) should be provided.
- 4.2.2. If noise is found to exceed 80 dB (WHO Guidelines value), soundproofing should be seriously considered.

4.3. Repairs and Maintenance

- 4.3.1. The developer shall follow all relevant environmental measures above when carrying out any maintenance or repair work.
- 4.3.2. The practices detailed in Section 3 on Construction should be complied with for all repair and maintenance work.

4.4. Disposal of Used/Damaged Equipment and Waste Management

- 4.4.1.The developer shall dispose of any defective or used batteries according to the measures for battery disposal and recycling set by the DRD
- 4.4.2.The developer shall dispose of any defective solar panels or other equipment according to measures set by the DRD
- 4.4.3.Recyclable or toxic materials should be disposed according to the arrangements set in the Waste Management Plan for construction, or according to measures set by the DRD, whichever is stricter.
- 4.4.4.All other waste should be disposed according to the arrangements set in the Waste Management Plan for construction.

4.5. Community Health and Safety

- 4.5.1.The community will be informed through posters, brochures, and other means, of the risks and dangers of tampering with any part of the system
- 4.5.2.The developer will install proper safety and warning signs to inform the public of potential hazards
- 4.5.3.To protect local residents from excessive noise from the wind turbines or diesel generator, trees will be planted by the developer as necessary to create sound barriers.