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# BOS Practice Note on E-Mobility

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Solutions  
By UNDP's ITM



## I. Introduction & Background

The Business Operations Strategy (BOS) is a results-based framework that focuses on joint business operations to eliminate duplication, leverage the UN's common bargaining power, and maximise economies of scale. The Secretary-General mandates all United Nations Country Teams (UNCTs) to comply with an improved BOS by 2022 to support more effective programme delivery on the 2030 Agenda.

SDG 7 aims to ensure access to affordable and clean energy. This Goal has been adopted and set as a priority by many member countries in the UN. With this in mind, there is a need to have a well-defined process to ensure quality outputs, effective project implementation, and the need to achieve affordable and clean energy for everyone.

UNDP, as other UN agencies, has identified that partnerships add value, and projects are more likely to succeed with the broad-based support they provide. As part of the UNDP's Information & Technology Management (ITM) vision of creating smart UN facilities, UNDP in collaboration with UNICEF carried out the first Vehicle-Grid-Integration (VGI)<sup>1</sup> pilot project in Namibia UN house where two electric vehicles (EV) with bi-directional charging stations were installed. This project has shown positive results through shared learning, knowledge, and expertise management, and has demonstrated promising potential to be replicated and scaled-up in the future.

To successfully reach greening efforts and strengthen local capacity on sustainable energy in UN Agencies while fully leveraging the synergy created through partnerships, the Green Energy Team at the UNDP ITM has developed an innovative 7-Step Process to help UN partners with implementing green energy solutions.

The 7-Step Process is a tried-and-true process that offers multiple benefits:

- Gives unparalleled advice and support on energy optimisation and solar systems/e-Mobility solutions;
- Generates a comprehensive picture of UN Agencies' power consumption and vehicle fleet;
- Unlocks UN Country Teams' full potential for energy and mobility sustainability;
- Recognised as best practice by UNDSG (formerly UNDG) for solar implementation and the Joint Inspection Unit (JIU) for UN-wide adoption.

Recognizing the increased societal and owner benefits of Electric Vehicles (EVs), there is an increasing effort towards UN fleet electrification. UNDP ITM adopted the original 7-Step Process for e-Mobility solutions, allowing the Green Energy Team to provide technical expertise on the implementation of Electric Vehicles (EVs) and their integration with the supply equipment (EVSE)<sup>2</sup>, also known as Vehicle-Grid-Integration (VGI). VGI offers reduced costs of owning EVs and also, among others, the possibility to lower electricity bills by charging the vehicle when the electricity price is low or to optimize the utilization of green energy generated from a solar PV system.

Through the deployment e-Mobility solutions, this common service for the BOS not only supports the need to achieve SDG 7 but also advances:

SDG 3: Good health and well-being

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<sup>1</sup> VGI encompasses the many ways in which a vehicle can provide benefits to the grid, society, and UNCT drivers by optimizing the vehicle interaction with the electricity grid, building, and EVSE. VGI includes both unidirectional and bi-directional vehicle charging for better electricity cost and building load management.

<sup>2</sup> Electric Vehicle Supply Equipment (EVSE), refers to Charging Station Infrastructure.

SDG 8: Decent Work and Economic Growth  
SDG 9: Industry, Innovation, and Infrastructure  
SDG 11: Sustainable Cities and Communities  
SDG 12: Responsible Consumption and Production  
SDG 13: Climate Action

Developing a BOS provides an opportunity for UNCTs to increase and improve sustainable development practices in the operations, bringing the UN a step closer to achieving the Sustainable Development Goals and the 2030 agenda. UNCTs are strongly encouraged to integrate environmental sustainability considerations at the earliest opportunity for all common services to enhance resources and cost efficiencies of UN operations and limit adverse impacts on the local environment.

## II. Objectives of the common service

This practice note offers guidance to UNCTs and OMTs on how to drive the implementation of e-Mobility solutions including Electric Vehicles (EVs), Electric Vehicle Supply Equipment (EVSE), and Vehicle-Grid-Integration (VGI). These are accomplished through the Green Energy Team's 7-Step Process, which represents a movement towards a more sustainable future through a commitment to carbon reductions and the development of a socially inclusive global environment.

An objective of the e-Mobility common service is to work with local players in the country for the implementation of these solutions, which is key to success on the organisation's mandate, interconnecting technologies and people in pursuit of economic and social development and inspiring other players to enable widespread adoption. The values and opportunities offered through e-Mobility implementation include:

- Reduced dependence on fossil fuels;
- Reduced carbon emissions throughout UNCT's operations;
- Ensured business continuity;
- Increased energy efficiency;
- Increased awareness of environmental benefits of fleet electrification.

With the goals of zero-carbon emissions and risk-informed sustainable development, e-Mobility has been shaped as a core element for the sustainable development of UNCTs, especially through the replacement of Internal Combustion Engines (ICE). The urgent need for reliable energy (particularly in situations of crisis) could be addressed through VGI, which strengthens energy resilience while at the same time leveraging cleaner energy solutions. EV charging and power consumption can be monitored and visualized through online dashboards which can be used for educational or representational purposes. These efforts will lead to more informed decision making and more responsible use of electricity and vehicles.

One of the main potential challenges of e-Mobility solutions' implementation is linked to market readiness. Most specifically, the EV/EVSE market availability in UNCTs' countries might pose local procurement challenges given the electric automotive industry's current status and risk adversity in some locations. In those cases, the UNCT could consider running the procurement process through the Long-Term Agreement (LTA) that UNDP Central Procurement Unit (CPU) holds or through other existing LTAs. A related challenge pertains to downstream linkages in the form of lack of local market support, such as missing after-sales service providers and lack of charging infrastructure in UNCTs' countries.

### III. Key stakeholders and partnerships

The 7-Step Process for e-Mobility solutions is currently followed in projects partnered with UNDP Country Offices through internal UNDP commitments and initiatives such as Greening UNDP Moonshot. With the support and collaboration of Country Offices involved, the Green Energy Team has the experience to manage and lead the implementation of e-Mobility solutions of UN premises.

The Green Energy Team supports field staff like ICT personnel, electricians, and green energy focal points, from the initial phase of data collection to the final operation and maintenance phase. Additionally, the procurement of EV and EVSE could be either conducted in collaboration with UNCTs' local procurement team and under the support of the ITM, through the centrally managed EV Long-Term Agreement (LTA) that the UNDP Central Procurement Unit (CPU) holds or through other existing LTAs.

The collaboration between different stakeholders enables the ITM Green Energy Team to streamline the greening process and deliver high-quality, sustainable, transparent, and cost-effective solutions that will serve as showcases in UNCTs. Furthermore, ITM's approach emphasizes engaging with local players to create citizen-centric eco-systems.

Neither of these collaborations requires creating additional partnerships or special consideration, as the Green Energy Team has all the technical expertise and capacity to support and lead these activities for all UN premises.

### IV. Implementation of the Project/ Activity

The UNDP ITM Green Energy Team has adapted the 7-Step Process to ensure quality outputs and effective project implementation of e-Mobility solutions. The process's distinct steps, which have been carefully restructured and aligned with e-Mobility-specific needs, meticulously define the requirements for each phase, spelling out documentation and activities that different stakeholders should provide.

As a holistic end-to-end process, from the preliminary assessment to the post-installation operation & maintenance, the 7 steps for e-Mobility project implementation are specified as follows:

1. **Step 1 – Vehicle Utilization & Preliminary Assessment:** This step serves to collect all prerequisite information to draw up a sustainable e-Mobility solution for UNCTs. In this phase, the Preliminary Site Survey App, an in-house developed and intuitive cloud-based application, is shared with UNCTs to input, among others, information of the premises' current vehicle fleet and future expectations, electricity grid details, and conditions of parking space. In parallel, ITM could provide assistance by carrying out preliminary market research and outreach to potential dealers able to offer the expected products and services in order to ensure any potential procurement challenges in the next stages are overcome.
2. **Step 2 – Business Case:** Serves to provide essential information and data for decision-making. The information gathered in Step 1 is carefully analysed and factor into in-house developed tools to determine the optimal design that best fits UNCTs' circumstances. The Business Case can display different options containing a preliminary technical overview and a complete financial and environmental analysis to allow UNCTs' to make a well-informed decision on the desired e-Mobility solution.
3. **Step 3 – Procurement & Site Preparation:** This stage will begin once the UNCT or OMT approves the Business Case. At this point, vendors are engaged and contacted through either UNCTs' local procurement teams or UNDP's Central Procurement Unit (CPU) (if UNCT decides to piggyback on UNDP's LTA).

For the former option, compilation and publication of solicitation documents are carried out according to UN rules as applied by the procurement teams in such projects. UNDP ITM provides active support to UNCTs on tender document's structuring and drafting to ensure successful EV/EVSE requirements posting. The tender document will promote local partnerships to build local capacity and evaluation of bids or proposals will be carried out jointly by UNDP ITM and local focal points if needed.

4. **Step 4 – Site Survey:** The awarded vendor carries out an on-site survey to exhaustively consider all aspects that may adversely affect EV(s)/EVSE's implementation. Detailed information of on-ground conditions and the final costing of the project is scrutinized by the vendor, including measurements, required materials, equipment, and time frames. The vendor acts as an implementer, working closely with a focal point at the UNCT or OMT office when necessary and ITM Green Energy Team. The latter exercises technical oversight and project management throughout this step.
5. **Step 5 – Design:** The selected vendor drafts and submits the Site Survey Report and final EVSE technical proposal, taking into consideration findings from the Site Survey in the previous step. ITM Green Energy team must approve the final design before the actual installation starts. The submission of the final design and the implementation schedule marks the end of this step.
6. **Step 6 – Installation:** The installation step starts with a compilation of a transportation and implementation schedule, covering the shipment of equipment, assembling the team(s), and defining milestones, among other things. This step also covers system documentation, user acceptance (UAT), local staff training, and project commissioning to test and review the operation of both the EV and EVSE. The EVSE Installation process would be carried out by an on-site local partner with the Green Energy Team's constant oversight. A signed checklist confirming full compliance with all requirements marks the end of the step.
7. **Step 7 – Operation & Maintenance:** In this step, the EV and EVSE suppliers provide regular maintenance according to the warranty agreement, if needed. ITM Green Energy Team helpdesk services for first-level support and remote monitoring and troubleshooting of the system. The objective is to ensure correct day-to-day operations and that the mid and long-term system performances are aligned with the end-user's expectations.

Each phase of the project is expected to be completed in the preliminary time frame outlined in the Gantt chart in *Figure 1*. Please note that this is an estimated timeline and can be affected due to several contextual factors.

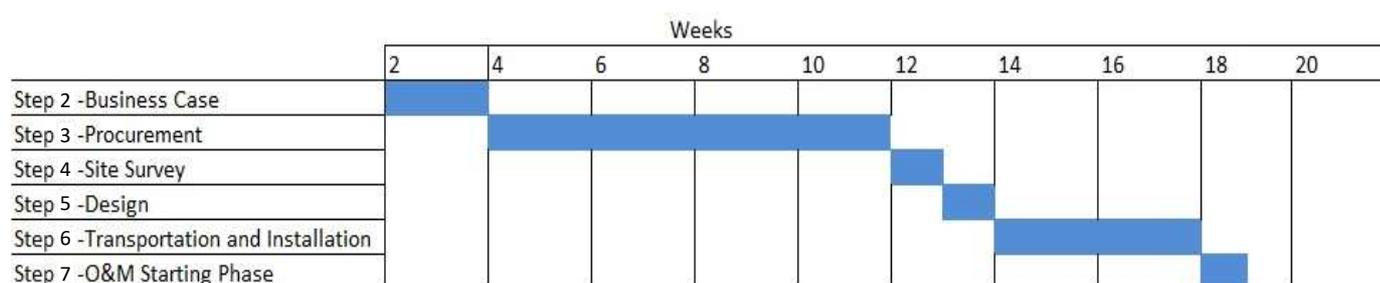


Figure 1: Estimated timeline for e-Mobility solutions' implementation

### Results/Outputs/Impact/Benefits

Behind the 7-Step process, there are several resulting documents that support the full execution and the correct step-by-step implementation.

1. **Step 1 – Vehicle Utilization & Preliminary Assessment:** Throughout this step, UNCTs will gain a more educated and informed understanding of their vehicle utilization and the benefits stemming from potential EV/EVSE implementation. Information gathered with the

- Preliminary Site Survey App** will help identify cost and financial and environmental benefits for the premises while exploring the feasibility of adopting e-Mobility solutions. Moreover, UNCTs will be exposed to the Preliminary Site Survey self-assessment best practices.
2. **Step 2 – Business Case:** A Business Case document is developed by the Green Energy team as an output of Step 2. In-depth technical, environmental, and economic assessments are presented to UNCTs, with different EV(s)/EVSE solutions to match premises' interests and actual project feasibility. Throughout this step, UNCTs can make an informed decision on the desired solution, considering estimated investments required and potential long-term savings, among other preliminary essential figures.
  3. **Step 3 – Procurement & Site Preparation:** If following a local procurement process, a Terms of Reference (ToR) for EV(s) and EVSE will be published during this step, reflecting the technical requirements of the project components to ensure high-quality proposals and best value for money. At the end of Step 3, and after assessing all offers received, a Purchase Order is signed with the awarded supplier.
  4. **Step 4 – Site Survey:** The awarded vendor performs the Site Survey as a result of Step 4. It consists of a comprehensive gathering of all the necessary data required for the vendor to prepare the EVSE installation. Throughout this step, the vendor gains relevant on-ground information to develop the Site Survey Report and final technical design.
  5. **Step 5 – Design:** The Final Technical Design, along with the Site Survey Report, are provided to ensure compliance with all technical requirements stated in Step 3. UNCTs will be aware of the final technical specifications of the e-Mobility solution and the implementation timeline for the project.
  6. **Step 6 – Installation:** The actual installation of the EVSE represents one of the main outputs of this step along with the EV delivery, paving the way to the Operation and Maintenance phase (O&M). During step 6, a User Acceptance Test (UAT) is carried out: a signed checklist confirming full compliance with all pre-established requirements and responsibilities. Soon after installation, however, training for local staff on the usage of EV/EVSE is provided by the vendor to promote the development of the local workforce.
  7. **Step 7 – Operation & Maintenance:** The Green Energy Team will produce a two-pager annual report and share it with the UNCT or OMT management, highlighting the system's performance, benefits accrued to date, and possible system improvements. As an additional output of this stage, the vendor provides after-sales services for the EV(s) and the EVSE (if needed) to ensure the optimal operation of the solution.

*In summary, the overall result will be a long-lasting and high-quality e-Mobility solution for UNCTs, efficiently and effectively implemented through the best practices 7-Step Process, which also delivers financial and environmental savings to the client. Moreover, following the 7-Step Process, apart from contributing to achieving the SDGs and meeting the commitments set by the organisation, the e-Mobility solution will contribute to building in-country local capacity, and inspire other actors to follow suit.*

## V. Budget & Monetary Costs

There are two cost factors to consider:

1. An estimated summary of costs for the 7-Step Process support and technical advice component from ITM's Green Energy Team, which will vary according to each approach;
  2. The actual e-Mobility solution selected.
1. 7-Step Process: These cost factors are significantly low. If an agency or OMT pursued e-Mobility on their own, the required time and risks of selecting an adequate and reliable provider, creating the niche expertise of the solutions, and having the UN-specific follow-up would be much higher. The ITM Team has the scale, capacity, and expertise to ensure OMTs implement these services at the lowest cost, with the lowest risk, and achieve the highest success rate. Table 1 below includes the broken down costs according to the stages to be followed.

Table 1: Costing 7-Step Green Energy Solution

Summary of Activities	Costing
Compilation, presentation, and delivery of a complete Business Case (covering <b>Step 1</b> and <b>Step 2</b> )	\$1,500 USD flat fee
Technical lead for all steps of the process for a turn-key solution, i.e., from <b>Step 1</b> through to <b>Step 7</b>	EV – 4% of project cost
	Charging Station (EVSE) – 8% of project cost
Technical lead for a project with an existing business case, i.e., execution of <b>Step 3</b> through to <b>Step 7</b>	EV – 2% of project cost
	Charging Station (EVSE) – 6% of project cost

2. A rough estimation of the projects' costs for an e-Mobility solution (including acquisition costs for EV/EVSE, freight, installation, and after-sales service costs) would range from 40,000 USD to 70,000 USD depending on the EV make and model and EVSE level and power rating. However, it is important to note that different locations and situations result in different costs. It is also important to consider cost differences resulting from freight, installation, civil works, and any other site-specific characteristic. The ITM Green Energy team stands ready to assist in the development of a Business Case to assess the actual investment required for the desired e-Mobility tailored to specific needs and constraints.

## VI. BOS Stages for Implementing these Common Services

As a first step to the implementation process, reach out to the ITM Green Energy Team at [itm.green.energy.team@undp.org](mailto:itm.green.energy.team@undp.org) with a copy to [itm.green.energy@undp.org](mailto:itm.green.energy@undp.org) in case your team would like to adopt the common service presented below.

The Common Service offered through the BOS for e-Mobility solutions is:

Table 1: Common Service for e-Mobility Solutions

Service Line	Category	Service	Description
Admin	Envi/Sustainability	Electric Vehicles (EVs), Electric Vehicles Supply Equipment (EVSE), and Vehicle-Grid-Integration (VGI) solutions	This service includes the assessment, design, and installation of Electric Vehicles (EVs), their supply equipment (EVSE) and the integration with the building and grid (VGI) and may include: 1) assessing the vehicle and site requirements for EV(s) & EVSE; 2) developing a Business Case: a technical, economic, and environmental analysis to allow for a well-informed decision; 3) procurement of the solution through UNCTs local procurement unit or existing LTAs; 4) on ground site survey; 5) final system technical design; 6) installation and commissioning; 7) Operation and Maintenance of the system.

Once the UNCT or OMT chairs and working groups have contacted the ITM team and decide to take up this service, **during the BOS annual review process**:

1. Go to the opportunity analysis in the BOS online platform;
2. Select the e-Mobility common service under the service line common administration services and the category Envi/Sustainability;
3. Once added to the BOS online platform, consider the following recommendations to implement this service shadowing the BOS stages of implementation.

**I. Kick-off:**

- a. Become familiar with the resources, webinars, and material on e-Mobility, Green Energy Team, and the 7 Step Process in the BOS Library;
- b. Determine the participating and hosting agencies for this service;
- c. Become familiar with the local, and national legal or national incentives for Electric Vehicles (EV) (many countries have incentives to adopt EVs).

**II. Stock-take:**

- a. Map the current and previous ways your UNCT and agencies already approached/ adopted e-Mobility solutions;
- b. Identify roadblocks, obstacles that these solutions have had in the past;
- c. Identify current mobility needs, taking into account drawbacks from keeping operating outdated internal combustion engine (ICE) vehicles or acquiring new conventional vehicles.

**III. Opportunity Analysis:**

- a. Brainstorm ways to have the highest impact with the selected services (e.g., where can these services be implemented with the highest benefits, how can the benefits be maximized, what other collaborations can you seek to get these services implemented and funded);
- b. Identify partnerships or available channels of collaboration with organizations advocating for e-Mobility.

**IV. Cost-Benefit Analysis:**

- a. e-Mobility solutions have a simplified CBA;
- b. Determine the one-time and recurring costs for the selected common services;
- c. With the help of the ITM Green Energy team, determine what the expected cost-avoidances and financial/environmental savings could be.

**V. Planning Framework:**

- a. Prioritize to implement the e-Mobility solution with the highest impact—in environmental sustainability—, and cost-avoidance;
- b. Identify how the common service will be organized, implemented, monitored, evaluated, and reviewed;
- c. Establish the KPIs cost, quality, and environmental that could be used as common metrics;
- d. Create the baselines and targets for the service;
- e. Determine how much funding is required in your country's context and the level of UNCTs engagement and costs needed;
- f. Identify any funding opportunities to leverage for the implementation of the proposed plan.

**VI. Implementation Plan:**

- a. Establish a detailed list of activities that need to occur to implement this service;
- b. Define a roadmap, timeframe, and timeline for implementation of the inclusive disability inclusion HR practices;
- c. Establish what the suggested time durations for each activity are;
- d. Finalize the budget for each activity;
- e. Determine what the risks and assumptions are and propose risk mitigation approaches.

**VII. Sign Off:**

- a. Review the details of the plan, ensuring there is an owner for each common service and action;

- b. Determine any final recommendations or suggestions for quality assurance before submission, in consultation with the ITM team;
- c. During the BOS sign-off, brief the UNCT on these particular common services, how they contribute to cost-avoidance, and the 2030 Agenda in numerous SDGs and environmental impact.

#### **VIII. BOS reporting and review:**

- a. Review the targeted activities' implementation, timeframes, and report on efficiency gains, challenges, and lessons learned.
- b. Setting a minimum of bi-monthly or quarterly internal reviews is recommended to achieve the set targets.

### **VII. Enabling factors and constraints**

The 7-Step Process has been followed by UNDP ITM in different locations since the outbreak of Ebola in 2014. With more energy projects being deployed, ITM has been called upon by a number of UNDP Country Offices to assist in green energy solutions. With several tools now in place to effectively provide support across the organisation, the team is well positioned to translate and apply the hands-on experience gained in the implemented projects to the deployment of e-Mobility related activities.

In order to facilitate and fast-track the process of preparing a Business Case for e-Mobility solutions, it is highly recommended that the UNCTs take prompt action to collect detailed information on vehicle utilization, electricity data, and site conditions in Step 1. With more data, better quality analysis of vehicle requirements and benefits can be carried out resulting in fact-based decision-making as opposed to extrapolation and assumption-driven conclusions.

When it comes to necessary resources to ensure a high-quality solution, the project would need technical support or a local staff focal point available on site since they are likely to have a better understanding of specific information and, therefore, offer better first-level support. From the Green Energy Team's side, a project manager will be assigned who will coordinate the project implementation and the rest of the stakeholders (awarded supplier, procurement team, and on-site focal point).

Regarding the constraining factors, based on previous green energy projects implemented, it was found that there were a number of potential Business Cases that have stalled due to funding challenges. Corporate efforts to push these to the next steps would go a long way in enhancing the organisation's chances to meet commitments made on GHG emissions. With tools and processes in place, ITM is well set to fulfill the mandate if funding is made available.

Together with the lack of funding, the need to look for all tenants' acceptance in multi-agency compounds, and the very new market and technology will constitute one of the biggest constraints for the project's implementation.

### **VII. Sustainability and replicability**

The implementation of e-Mobility solutions will be long-lasting and provide accumulative benefits after implementation. Consuming less electricity, having environmental and financial savings, or driving with renewable resources are directly leading towards more sustainable operation at UNCTs.

The 7-Step Process coordinated by ITM Green Energy Team removes the need of engaging external consultant(s) for the project implementation, who may not be available for ongoing support, while

significantly reducing costs associated with engaging an external consultant by directing these funds towards the actual implementation.

Having the Green Energy Team constantly involved in the process adds value by ensuring alignment with corporate standards for any proposed system or recommendations. The Green Energy Team's involvement creates a connection with the situation on the ground and offers at the same time technical support during the implementation of the e-Mobility solutions.

The main requirements for the implementation of e-Mobility solutions following the 7-Step Process are the availability of funding, willingness from all tenants, and a suitable location to park the EV and install the EVSE. Once these requirements are met, the process can be applied and tailored to fit the conditions of any location, therefore making this service line easily replicable.

With the 7-Step Process completed, local staff will be able to conduct a site survey for data collection, all the way to implementing project management best practices and carrying out the operation and monitoring of the e-Mobility facility. In the long term, the knowledge obtained can be used in the deployment of projects wherever required within the UNCT. This can also facilitate any remote support that ITM engineers provide to UNCTs and help speed up the implementation time.

## IX. Conclusion

The UNDP ITM 7-Step green energy solution methodology is a holistic project management approach initially developed for solar PV systems. Being recognised as best practice by UNSDG (formerly UNDG) for solar PV implementation, the process now has been adopted by ITM Green Energy Team to enable a sustainable deployment of e-Mobility solutions.

The main objectives of the process are to build the local capacity of UNCTs for the implementation of e-Mobility solutions and interconnect technologies and people in pursuit of economic and social development. These targets are expected to inspire other agencies of UNCTs to enable widespread e-Mobility adoption.

The Green Energy Team, with the support and collaboration of all stakeholders involved, has the technical expertise, experience, and capacity to manage and lead the implementation of e-Mobility solutions of all UN premises.

Aligned with the BOS goals, this common service provides an opportunity for UNCTs to increase and improve green mobility practices, bringing UN personnel and operations a step closer to achieving the SDGs.

If further information or any clarification is required, please contact the UNDP ITM Green Energy Team helpdesk: [itm.green.energy.team@undp.org](mailto:itm.green.energy.team@undp.org) with a copy to [itm.green.energy@undp.org](mailto:itm.green.energy@undp.org).