



Green Energy Solutions

High-Impact Common Services Business Operations Strategy

Tue Aug 9th 7:00 am NY

Thu Aug 11th 10:00 am NY

Objectives & Benefits of Scaling HICS

Standardization
Simplifies BOS Process

Maximizes Cost-Avoidances

Quality-improvement & Strengthen SDG Integration

Use System-wide Data to scale good practices

High Impact Services - Overview

Common services selected for their potential to create benefits within the UN & provide a proof of concept for replication with other organizations.

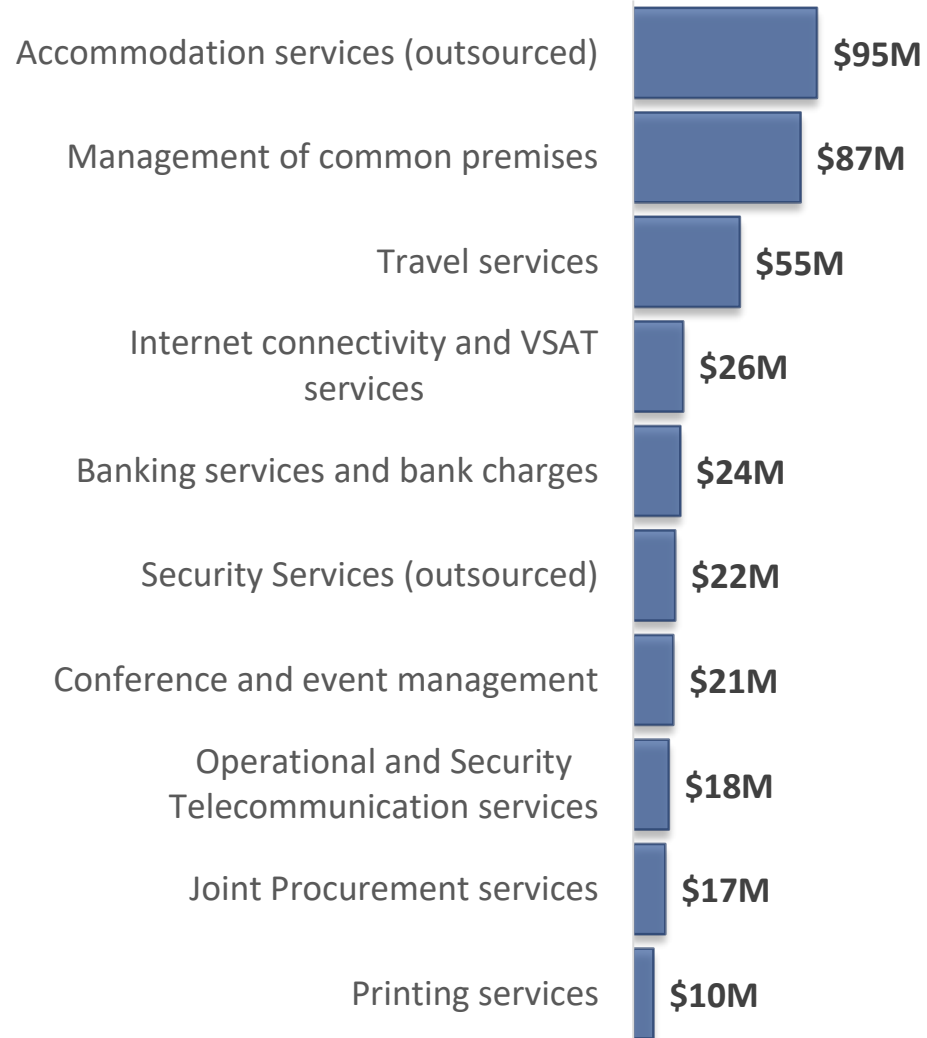
- 1 High-Cost Avoidance:** Top 10-15 high-cost avoidance services within the BOS
- 2 Good Practices:** Such as digital bookings & management of fleet, payments processing, & global disposal services.
- 3 Gender inclusive services:** Promote gender-responsive practices to achieve gender parity & equity & create inclusive working environments
- 4 Disability Inclusion:** Create inclusive environments for persons with disabilities in the UN across: Physical Accessibility, Inclusive HR, ICT/Digital Accessibility, & Procurement.
- 5 Renewable & Sustainable practices:** Integrate a united sustainable & green strategy across operations

High Cost
Avoidance

High-Quality
Improvement

Good Practices &
SDGs linkage

TOP 10 HIGH-COST AVOIDANCE \$375M



HIGH QUALITY & SOCIAL IMPACT COMMON SERVICES



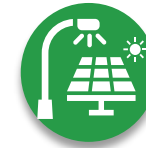
Disability
Inclusion

Physical Accessibility
Inclusive HR
ICT/Digital Accessibility



Innovation &
Efficiency

Common Mobility (WFP, UNDP, UNHCR)
Common Accommodation (WFP)
Clinic & Medical Booking (WFP)



Green &
Renewable
Energy

Energy Mgt., Monitoring & Consumption
Assessment & Business Case
Solar Solutions (Home, Street, H2O)



Gender
Inclusive
Operations

Gender Responsive Procurement
Supporting Women Owned Businesses
Gender Equity throughout operations



Enabling
Environments

Inclusive Working Environments
Staff Well-being & Community Reach
Sustainable Canteen

PROOF OF CONCEPT RENEWABLE ENERGY & DISABILITY INCLUSION

Business Cases for renewable energy in UN Premises

1. Facilitate implementation with real data & IoT devices
2. Reduce CO2 footprint, increase energy efficiency, reliability
3. Pilot UNCTs:
 AFR: Ghana, Lesotho, Namibia, Nigeria, South Sudan, Zambia, Zimbabwe;
 LAC: Haiti
 AS: Lebanon
 ECA: Kazakhstan, Kyrgyzstan, Turkmenistan



Disability Inclusion Seed Funding

1. Seed funding to UNCTs to advance UNDIS & make operations inclusive
2. Create **inclusive HR practices** with accessible premises & digital tools
3. Pilot UNCTs:
 AFR: Lesotho, Namibia, Nigeria
 APA: Indonesia, Iran, Nepal, Fiji
 AS: Lebanon
 ECA: Albania, Montenegro, Tajikistan
 LAC: Costa Rica, Dominican Republic, Guatemala, Uruguay

United Nations Development Programme

Information and Technology Management (ITM)

Information and Technology Management (ITM)

Prepared by:

Created on:

Last update:

ISO Quality Inspected.
Approved for release by:

ITM Green Energy Team

February 11, 2019

August 08, 2022

Gerald Demeules,
Global ICT Advisor

Photo: Solar Panel Installation South Sudan Rajaf Police Academy / 2018

UNDP Mission and ITM/SIS Vision

UNDP MISSION

"On the ground in about 170 countries and territories, UNDP works to eradicate poverty while protecting the planet. We help countries develop strong policies, skills, partnerships and institutions so they can sustain their progress".

ITM/SIS VISION

"Creating Smart Facilities to build local capacity and inspire a movement".

How We Solve | Smart Facility for X

Smart Facilities

ENERGY & MOBILITY

- Renewable Energy
- Electric Vehicles
- Vehicle-to-Grid
- Energy Storage (Li-ion)

DATA & INTERNET OF THINGS

- Sensors based technologies
- RFID and Block chain
- Energy Consumption & Environmental
- Monitoring Artificial Intelligence and Machine Learning Intergration



"The whole is greater than the sum of its parts" - Aristotle

CONNECTIVITY

- NextGen Broadband Connection - 5G, *LTE-M*, MultiFire
- Global Mobile Virtual Network Operator (*GMVNO*)
- OnelCTbox+
- NextGen Satellite Comms - *SpaceX*, SatCube
- IoT Connectivity - *LoraWAN*, BLE, Zigbee, Sigfox, NFC

SECURITY

- End-point protection Anywhere
- Next Generation Firewall
- Solar Street Lamps
- Perimeter Security - Cloud-based CCTV and Premise Access System

Challenges Being Addressed



Unreliable Grid



Generator as sole supply of electricity
Oversized Generators



Lack of awareness

Green Energy Services and Products | Summary



Photo: GE Training Mission UNDP Niger/2019



IoT Monitoring portal

Green Energy Services

1. Green Energy Solutions
 - a. Solar Installations
 - b. Solar Street Lamps
 - c. Solar Home Kits for Staff or Field Missions
2. Green Energy Mission
 - a. Energy Audit and Assessment
 - b. Training and Capacity Building
3. Energy Consumption Measuring and Monitoring (ECMM)
 - a. IoT for Energy Efficiency



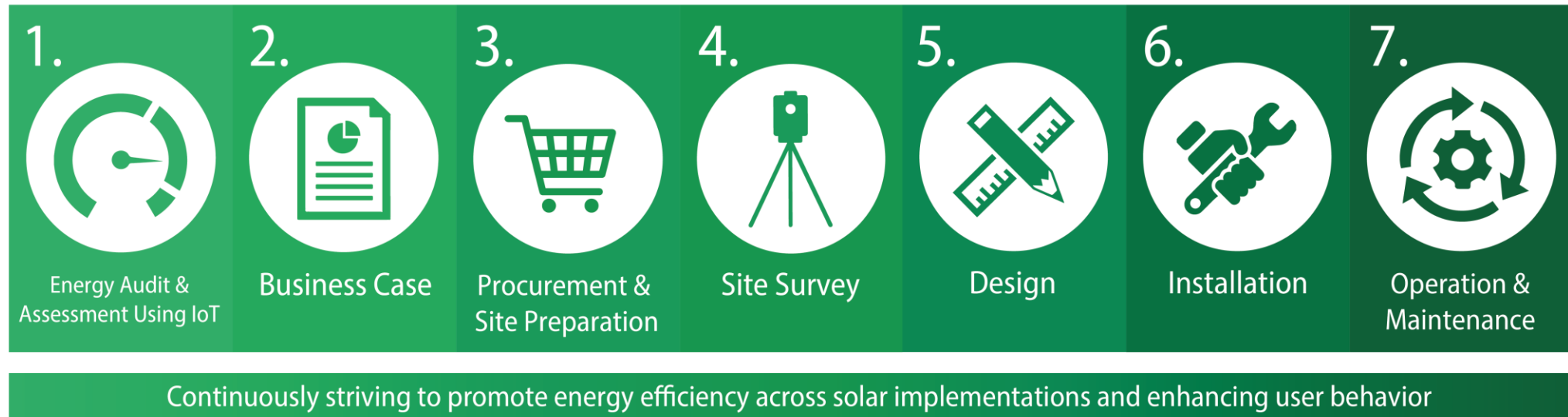
Photo: Smart Facilities Mission UNDP South Sudan/2018



Photo: Solar Street Lamps - UNDP South Sudan

7 Step Green Energy Solution

7 STEP GREEN ENERGY SOLUTION

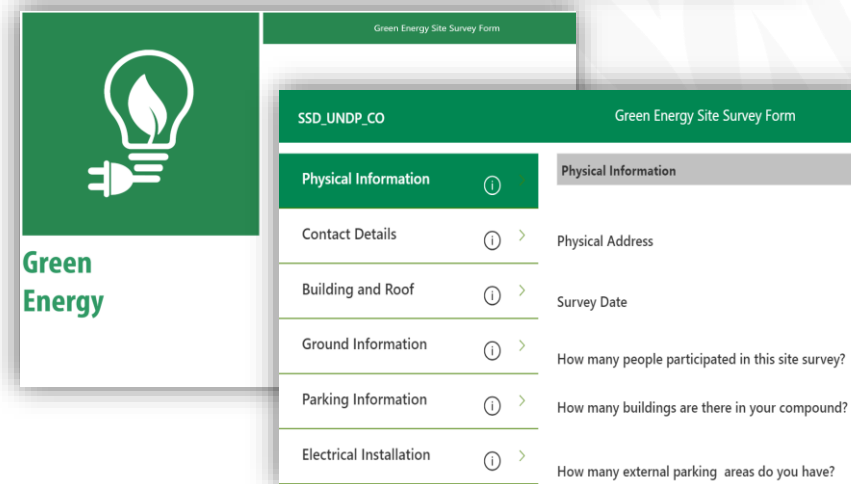


Recognized as best practice by UNSDG for Solar implementation

Step 1 – Energy Audit & Assessment Using IoT

Key Aspects

1. IoT devices for energy consumption and site-specific data
2. Preliminary Site Survey Application
3. Assess the current situation and build a load profile


Step 1 – Energy Audit & Assessment Using IoT | Implementation

Key aspects



1. ITM Green Energy Team supports determining the package a UNCT needs - number and size of circuits to be monitored
2. DIY installation of the IoT sensors: “Do it yourself” - ITM provides support remotely and a step-by-step installation guide
3. ITM GET provides 2nd tier support, and 3rd tier technical support is provided by the vendor

Step 1 – Energy Audit & Assessment Using IoT | Benefits



More educated, informed and responsible use of electricity



Implementation of energy efficiency measures



Monitoring of results

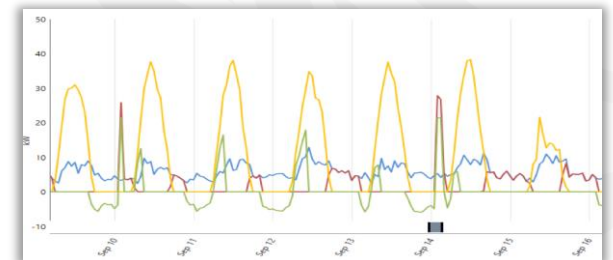
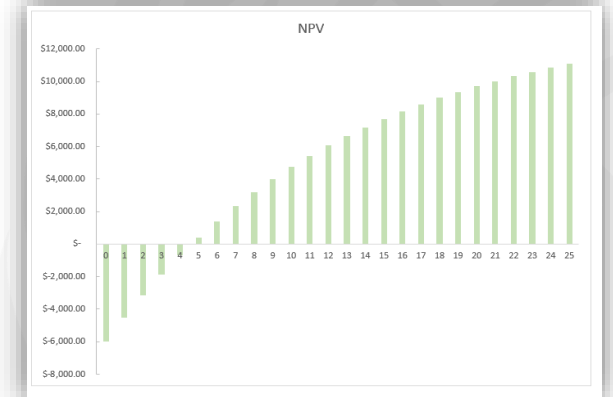


Basis for Renewable energy projects

Step 2 – Business Case

Key Aspects

1. Technical, economic, and environmental analysis.
2. Business Case gives essential information for decision-making.
3. Data collected from Step 1: Software for system modeling and in-house developed tools



Step 3 – Procurement

Key Aspects

1. Collaboration with UNDP PSU
2. Existing **LTA**s with vendors providing **international standard** installations
3. Secondary bidding process
4. RfQ published among LTA holders
5. **Local partner** - Development of local capacity

United Nations Development Programme
Office of Information Management & Technology
Country Office ICT Advisory Services

Empowered lives.
Resilient nations.

UNDP Comoros Country Office

Annex 1 - Terms of Reference:

Smart Solar Hybrid System for UNDP Comoros CO, contributing to Create Smart UNDP Facilities Powered by Renewable Enerav

Solar PV Capacity (kWp)	Battery Capacity (kWh)	Renewable Fraction (%)	CO ₂ Emissions Reductions (tons/year)
31	80	58.3%	64.9

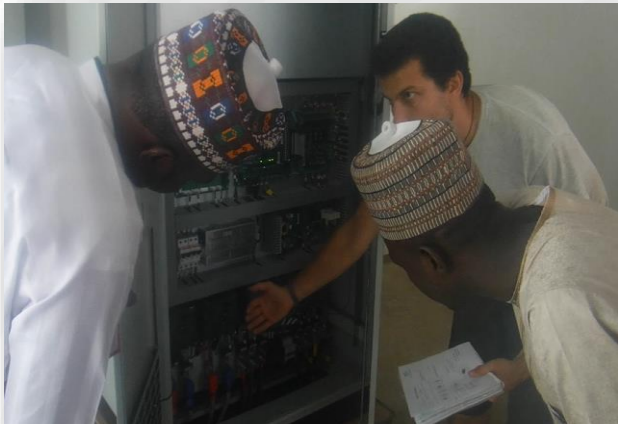


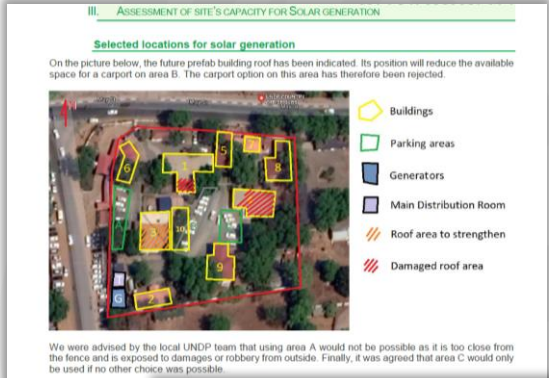
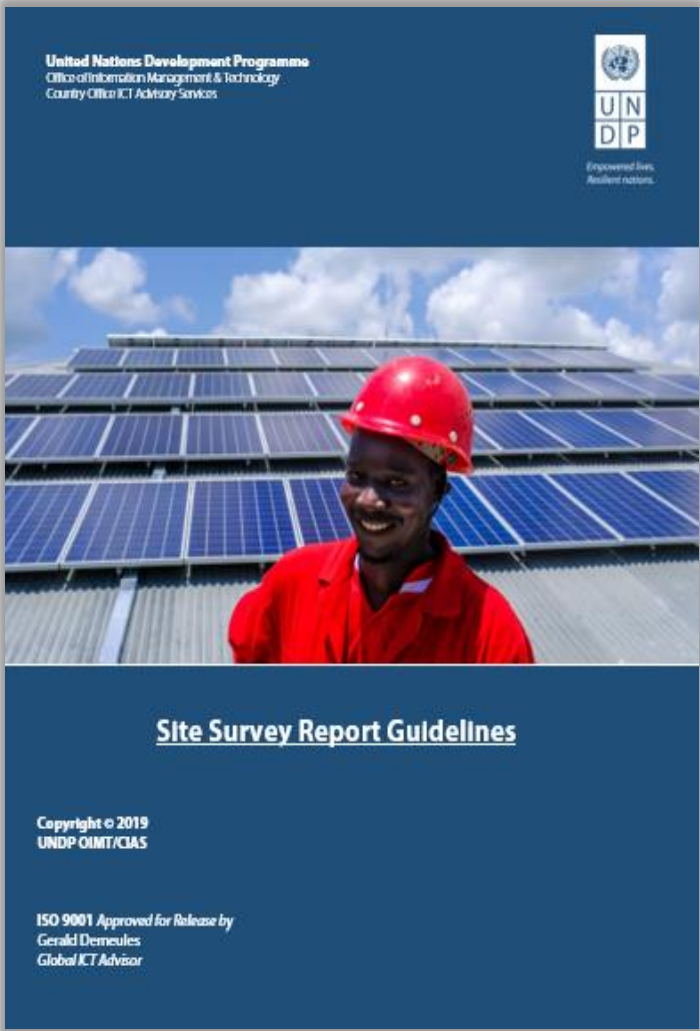
Photo: Training to CO during installation in Nigeria Sub-office



Step 4 – Site Survey

Key Aspects

1. Vendor carries out a **detailed site survey**
2. Vendor submits the **Site Survey Report** to ITM and PSU



The table below indicates the proposed battery room is not suitable to house the sensitive electrical equipment and batteries at its current state and needs a number of adjustments:

- Door to open to the outside and removal of the board
- Installation of water guard door or cill
- Anti-theft measures: Strong lock and closing of gaps

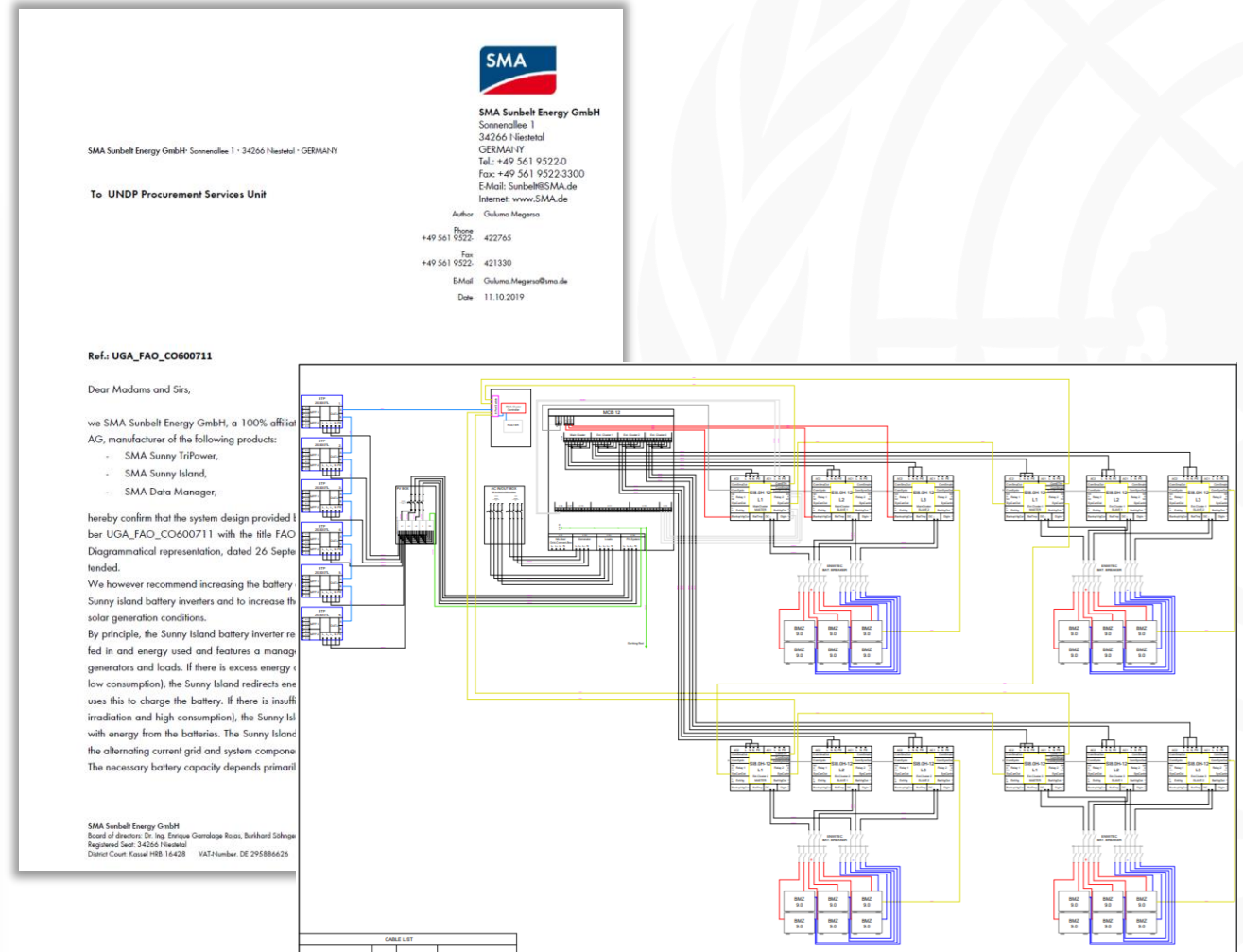
Without these adjustments, we recommend using another room for the equipment.

Dimensions	Description	Images
110 cm by 92 cm, plus an estimated additional square meter behind the board	<ul style="list-style-type: none"> → Space is small but sufficient if the board can be removed → Door need to be replaced/adjusted to open to the outside! 	
Location	On the ground floor within the toilet room. <ul style="list-style-type: none"> → Very conveniently with direct access for cabling to the roof and a distance of about 15m to the transfer switch. 	
Ventilation Climate	Ventilation is good Lack of air-conditioning will slightly decrease efficiency and lifetime of electrical equipment. High humidity may occur due to proximity to toilets. Flooding of the room must be avoided at all costs → Installation of a waterguard door or cill required	
Safety	The room in its current state does not provide sufficient security to avoid theft or tampering of the materials. → A strong lock and closing the current gaps is recommended	

Step 5 – Design

Key Aspects

1. Vendor prepares the final technical design
2. Vendor submits **technology certificates** which are issued by manufacturers – **endorsement letters**

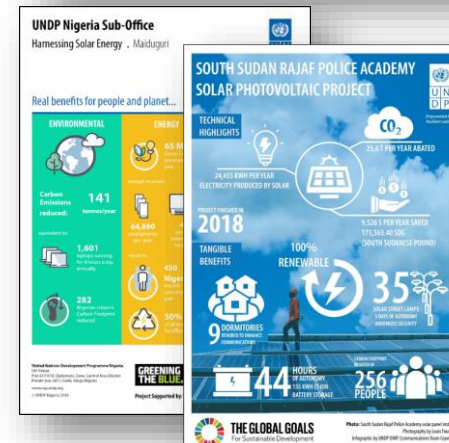




Step 6 - Installation

Key Aspects

1. The Project plan
2. User Acceptance test
3. Training
4. Commissioning
5. The installation is clearly outlined in the project plan, with management, milestones, risks etc. covered
6. Step 6 is concluded by commissioning of the systems and training of on-site staff
7. Communication efforts



Step 7 – Operation and Maintenance

Key Aspects

1. 3 years bi-annual maintenance guaranteed by the system provider
2. Local partner engaged ensuring prompt response to potential issues
3. Remote monitoring and troubleshooting
4. Lifetime long monitoring and performance evaluation – Biannual Reports



Biannual Report - Afghanistan

July - December 2019

The Off-Grid PV and Battery Storage solution, installed at the UNDP Country Office is located in Kabul, Afghanistan, has a capacity of 128 kWp Solar PV System with a 371.2 kWh lithium-ion battery energy storage. The installed solar system was designed to cover the energy consumption from UNDP's ICT data centers and switch rooms.

Unfortunately, the PV system was not running between 21st November and 23rd December. During this period the monitoring system was not able to provide data about the electricity consumption neither. Because of security reasons, from the 23rd November, the office was empty thus - while carrying out the calculations for the key performance indicators - the assumption was made that only the base electricity load was supplied, directly from the generator.

The overall system up-time during the past six months is 83%. To guarantee system performance the target value should be at least 95% for the next period. The green team is available to provide all the necessary support to Afghanistan CO to achieve this goal.

Apart from this drop in overall system up-time the trends of the first 6 months of 2019 have been confirmed and the overall renewable fraction has slightly improved.

The second bi-annual maintenance has been correctly carried out from Envera and its local partner ETC engineers on the 28th of October, where 2 Jonson PV Panels and the charge controller (MPPT) were replaced by the local partner of Envera. The next visit is expected by the end of April 2020.

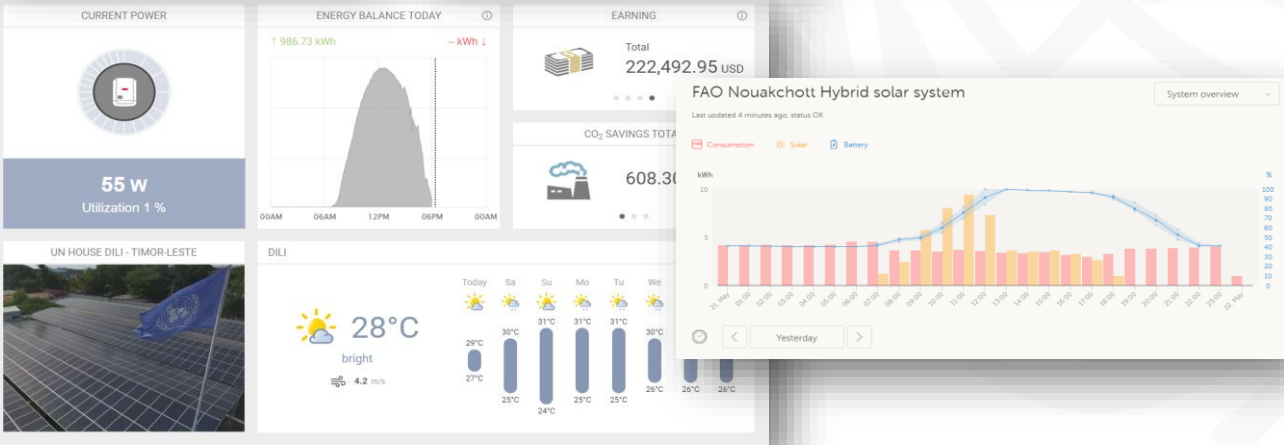
Technical - The system was performing properly except the one incident on the 21st November, but the local partner of Envera was able to troubleshoot the problem. Because of the 1-month long downtime, the overall PV production slightly decreased from the previous semester. During the other 5 months, the production was higher than in the first half of the year, which could be related to better weather conditions. A minor issue is affecting the online monitoring system since the installation of 2017 making it unable to correctly display renewable all the data from the PV production. The main objective of the project is to provide a resilient and reliable energy source to the Afghanistan critical circuits and reaching a 95% uptime is a key requirement for this installation.

Environmental/Social - CO₂ savings remains in line with the initial expectations.

Financial - The generated savings so far are substantial but not enough to guarantee a payback time for the installation. The trend of the previous period are confirmed. As mentioned by the CO Financial outcome is not the main purpose of this project and not having a payback can be considered acceptable.

ACTION POINTS

1. Focus on system reliability to guarantee sufficient up-time



Green Energy Services and Products | Summary



Photo: GE Training Mission UNDP Niger/2019



IoT Monitoring portal

Green Energy Services

1. Green Energy Solutions
 - a. Solar Installations
 - b. Solar Street Lamps
 - c. Solar Home Kits for Staff or Field Missions
2. Green Energy Mission
 - a. Energy Audit and Assessment
 - b. Training and Capacity Building
3. Energy Consumption Measuring and Monitoring (ECMM)
 - a. IoT for Energy Efficiency



Photo: Smart Facilities Mission UNDP South Sudan/2018



Photo: Solar Street Lamps - UNDP South Sudan

Green Energy Assessment and Training



Green Energy Assessment

1. Energy audit performed by specialized engineers
2. Support UNCTs in achieving optimal levels of power consumption

Green Energy Training

1. 7 Step Process for Implementing Green Energy Solutions
2. Hands-on training focused on tools, equipment, software, and best practices to design and implement Solar PV system



Green Energy Assessment | Implementation

Key aspects

1. Understand power consumption practices
2. Propose recommendations in terms of energy efficiency and electricity consumption
3. Energy audit report

Main tasks

- i. Installation or review of energy meters (IoT devices)
- ii. Review/assess of the electrical wiring system and single line diagram
- iii. Consumption patterns of electricity appliances
- iv. Collection of Site Survey information



Green Energy Training | Implementation

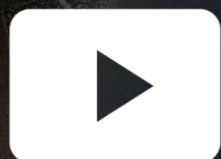
Key aspects

1. Average of six sessions: covering Creating Smart UN Facilities and the 7-Step Best Practice for Implementing Renewable Energy Solutions
2. Minimum 3 working days
3. Training for 8-15 participants
4. Official certificate and report





UN House Namibia



Video [here](#)

Photo: Solar project UN House Namibia/2017



Photo: Sao Tome UN House

Please contact itm.green.energy@undp.org or helpdesk.green.energy@undp.org with your requests and we'll be happy to provide any clarification and arrange a **kick-off meeting** for future engagement.

THANK YOU!

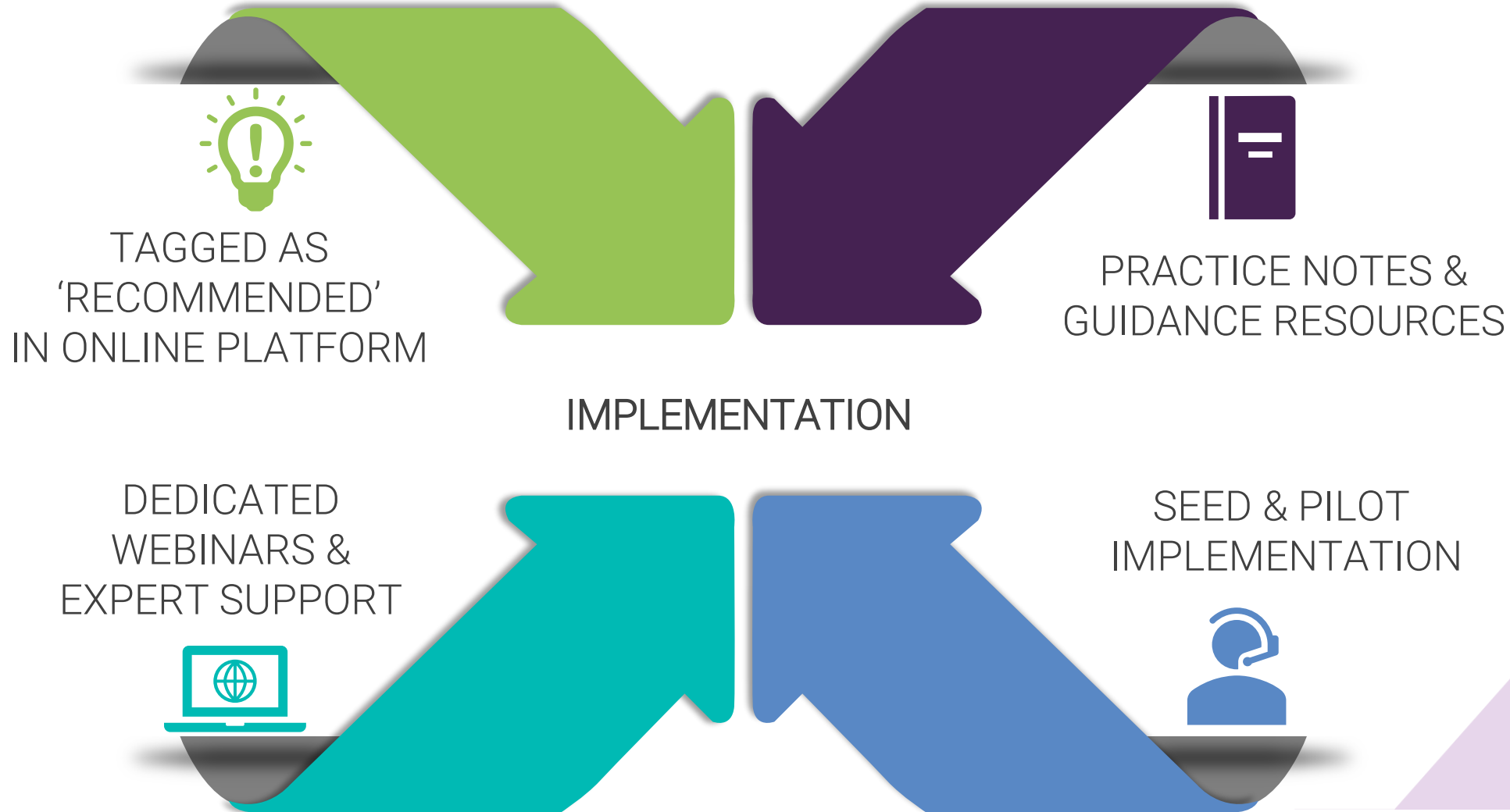


What is next?



Contact [**itm.green.energy@undp.org**](mailto:itm.green.energy@undp.org)
or [**helpdesk.green.energy@undp.org**](mailto:helpdesk.green.energy@undp.org)
with your requests and we'll be happy to
provide any clarification and arrange a
kick-off meeting for future
engagement.

HICS - Roll-out & Implementation support



Q&A

Use Q&A box,
Chatbox, or
Raise hand



BUSINESS OPERATIONS STRATEGY 2.0

Upcoming BOS High-Impact Webinars

I.Global Asset Management Solutions

[Tuesday, August 2, 2022, 7:00 AM NY/GMT-4](#)

[Thursday, August 4, 2022, 10:00 AM NY/GMT-4](#)

II.Green & Renewable Energy Solar Solutions

[Tuesday, August 9, 2022, 7:00 AM NY/GMT-4](#)

[Thursday, August 11, 2022, 10:00 AM NY/GMT-4](#)

III.Physical Accessibility in-person events & premise related constructions

[Thursday, August 18th 10:00am NY/GMT-4](#)

IV.Inclusive HR 1: Attracting and Recruiting persons with disabilities - BOS Webinar Series on High-impact common services

[Tuesday, August 23rd 7:00 AM NY/GMT-4](#)

[Thursday, August 25th 10:00 am NY/GMT-4](#)

Thank You

FOLLOW US

@UN_SDG
UNSDG.UN.ORG

UN DEVELOPMENT COORDINATION OFFICE
COUNTRY BUSINESS STRATEGY
dco.cbs@un.org

