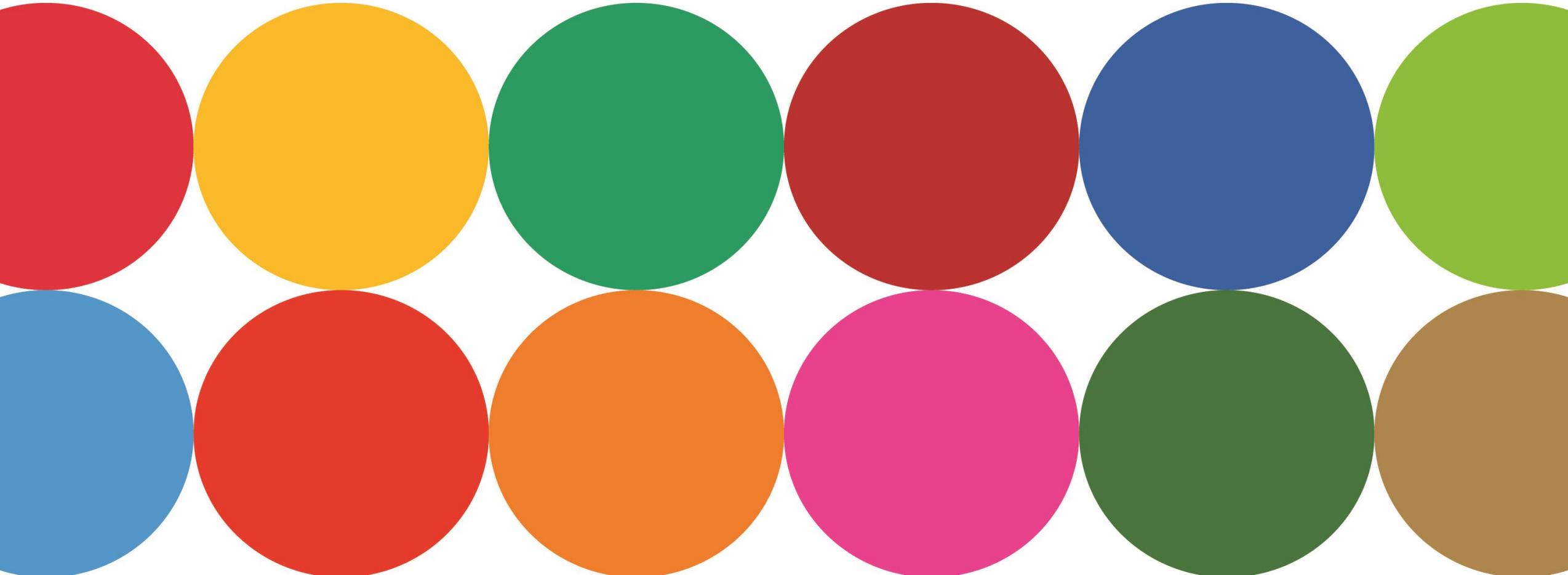

HIGH IMPACT COMMON SERVICES WITHIN BOS 2.0

Green & Sustainable Energy Solutions

Thur, Jan 27th 2021, 7:00 am NY/ET



UNITED NATIONS
SUSTAINABLE
DEVELOPMENT
GROUP



HIGH-IMPACT COMMON SERVICES

High-Impact & SDG
Common Services



UN Humanitarian
Booking Hub



Gender Responsive
Procurement



Disability Inclusion



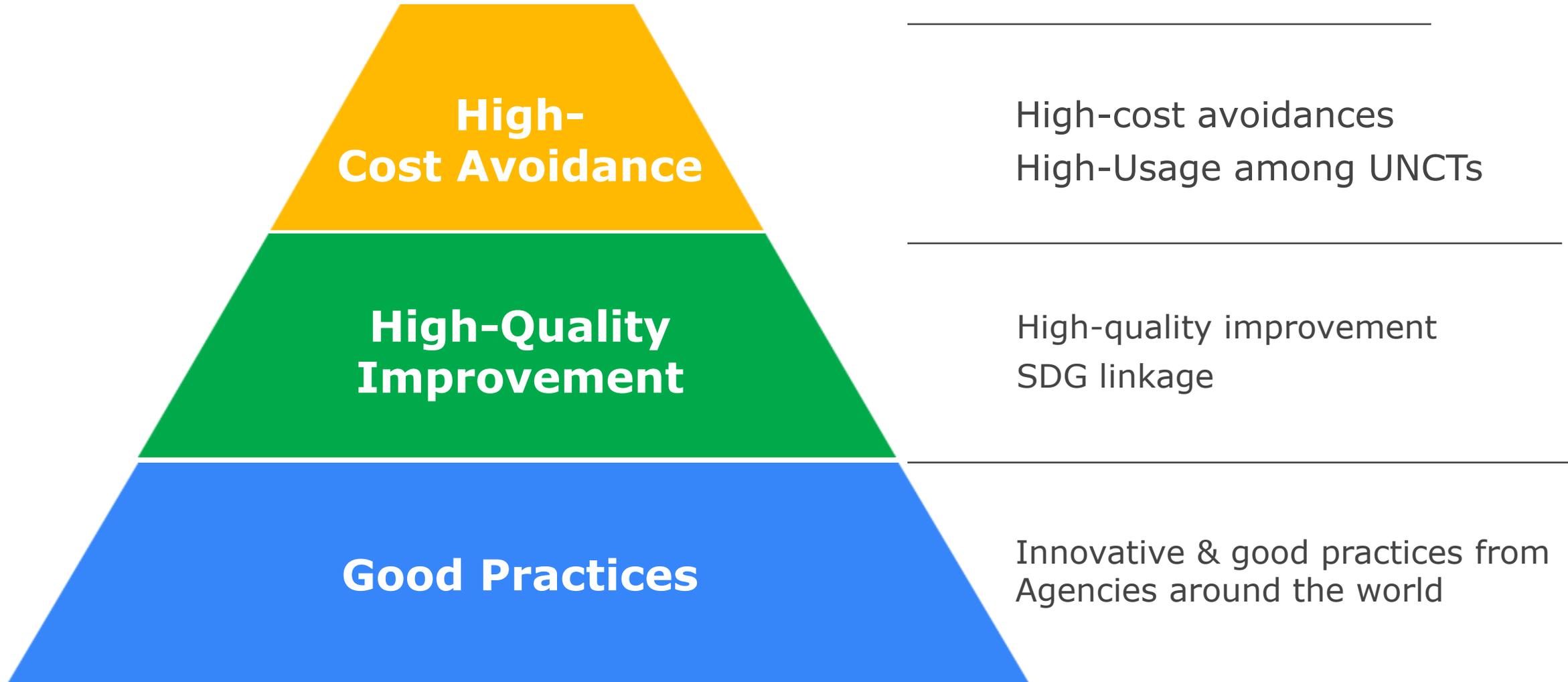
Green Energy Services



Sustainable Cafeteria



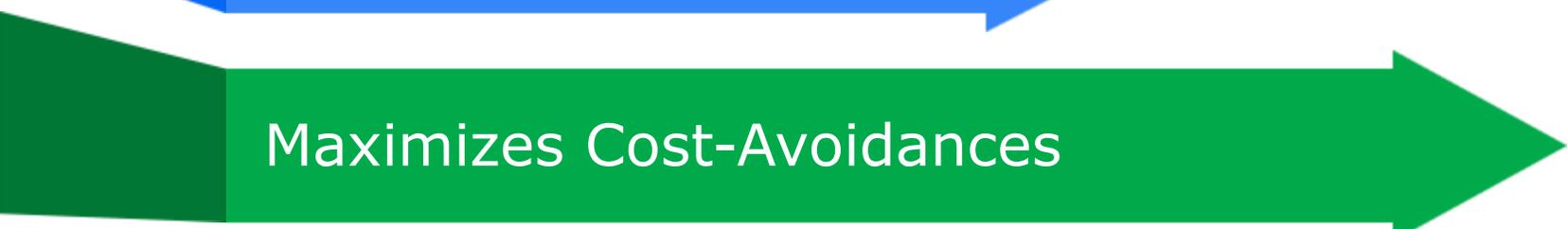
What are High-Impact Common Services?



Objectives & Benefits of Scaling High-Impact Common Services



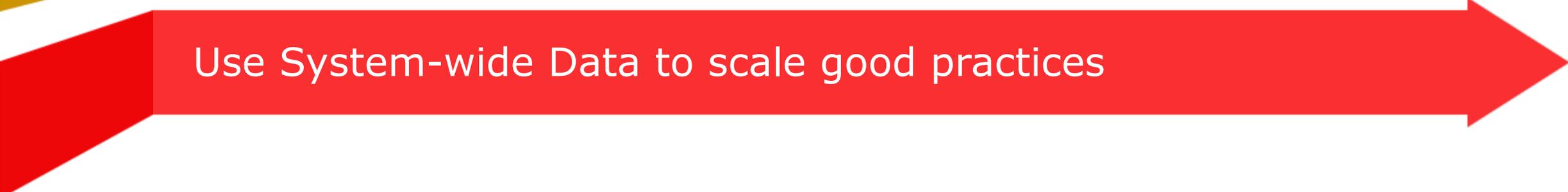
Standardization
Simplifies BOS Process



Maximizes Cost-Avoidances



Quality-improvement & Strengthen SDG Integration



Use System-wide Data to scale good practices

Intro & Background



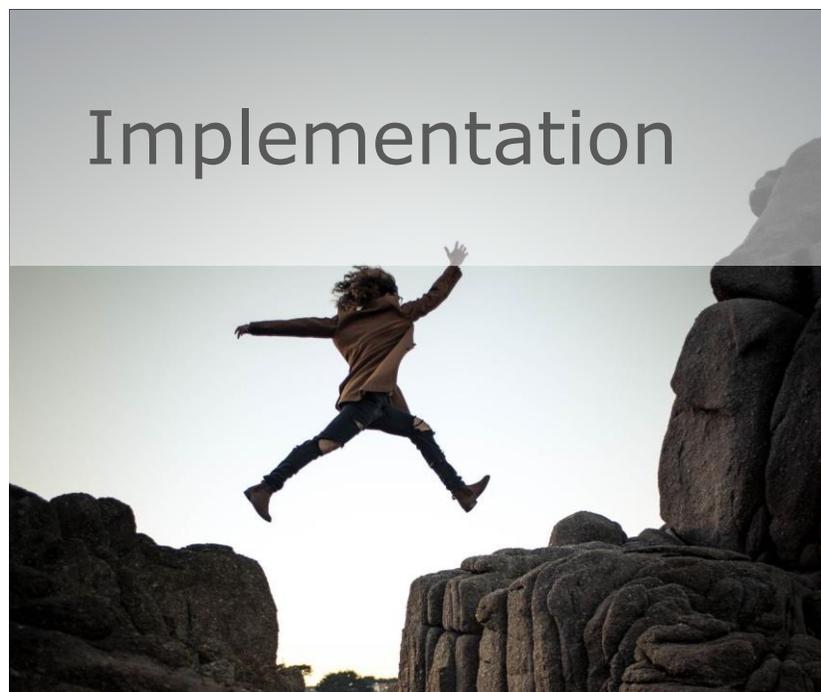
Objectives



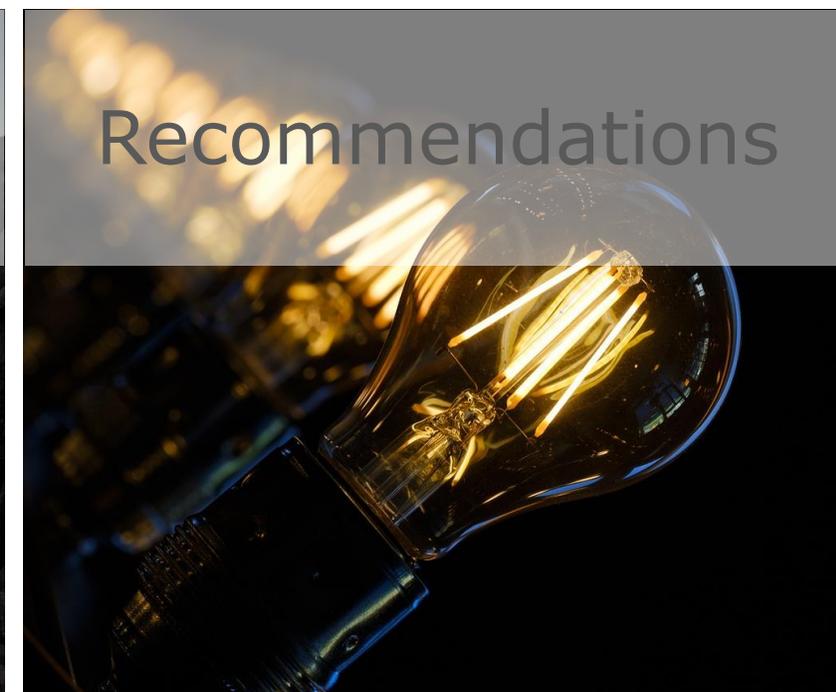
Benefits



Implementation



Recommendations





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

January 21, 2021

Gerald Demeules

Global ICT Advisor

UNDP Mission and ITM/CIAS Vision

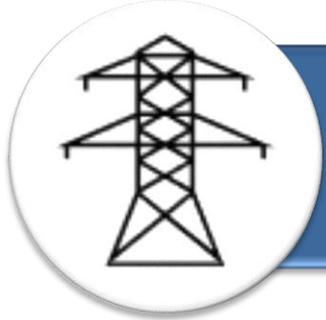
UNDP MISSION

"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/CIAS VISION

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

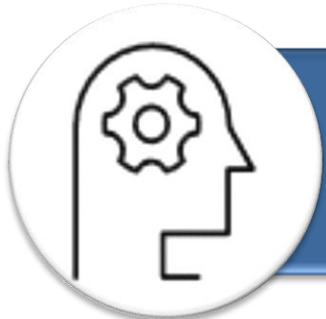
Challenges Being Addressed



Unreliable Grid



Generator as sole supply of electricity
Oversized Generators



Lack of Awareness

How We Solve | Smart Facility Model

ENERGY & MOBILITY

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



ICT, BUSINESS INTELLIGENCE & AI

- Atlas (ERP)
- Digital Workspace
- Cloud Computing
- OneICTbox
- Satellite Communications



BIG DATA & INTERNET OF THINGS

- Satellite Imagery
- Drones
- Energy Efficiency
- Energy Consumption & Environmental Monitoring



SECURITY

- Cyber Security
- Identity & Access
- Solar Street Lamps
- CCTV Cameras



smart facilities

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

Interconnecting Smart Technologies and People in the pursuit of Economic and Social Development

7 Step Green Energy Solution



7 STEP GREEN ENERGY SOLUTION



Continuously striving to promote energy efficiency across solar implementations and enhancing user behavior

Recognized best practice by UNDG for Solar implementation

Step 1 – Energy Audit & Assessment Using IoT

Key aspects

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





Green Energy

SUMMARY

Green Energy Site Survey Form

Insert project name

Search

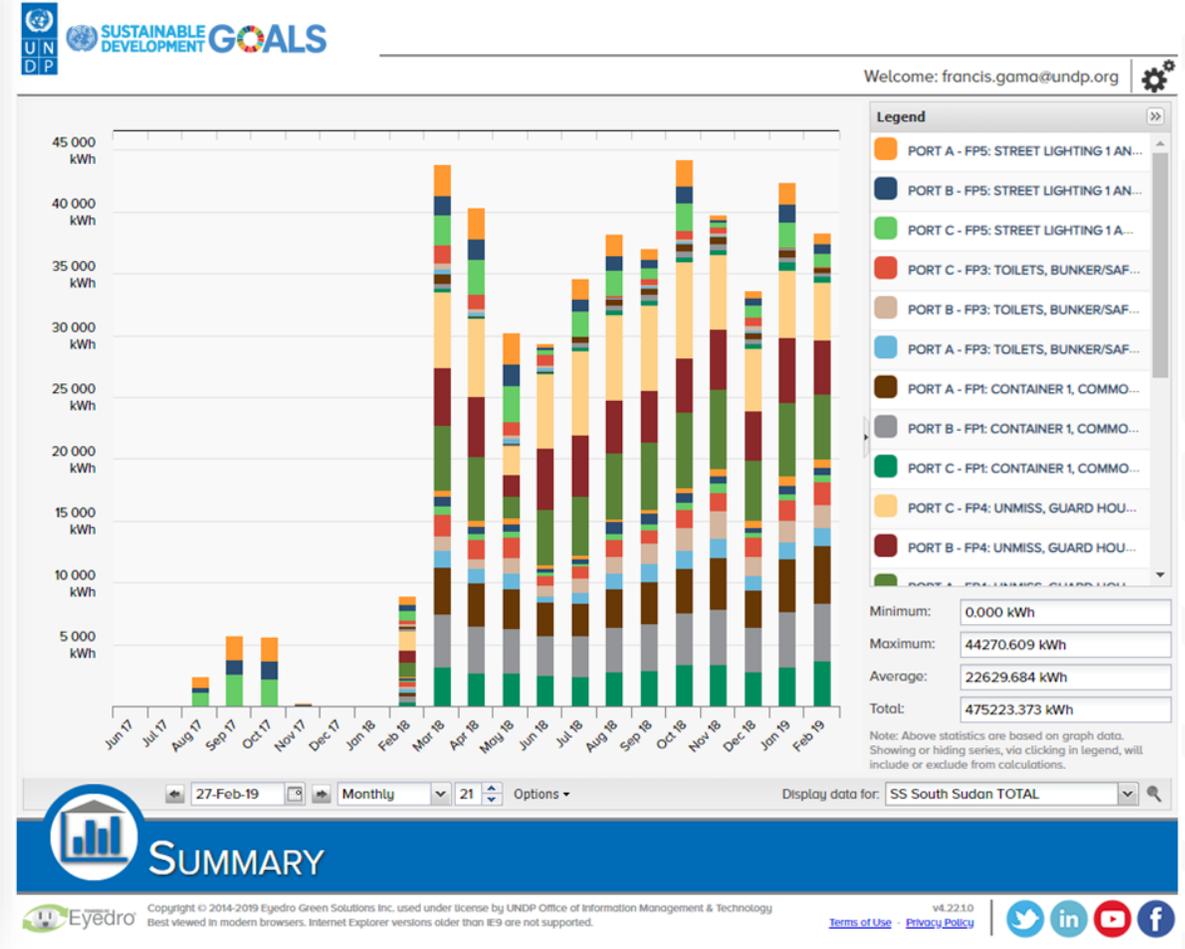


Step 1 – IoT for Energy Efficiency Case



Energy Efficiency Case

- IoT devices installed on several lines, enabling the possibility to see how the load is divided in the office.
- Isolate high energy consuming objects
- Suggest energy efficiency measures



Step 1 – Energy Audit & Assessment Using IoT

IoT for Generator Monitoring

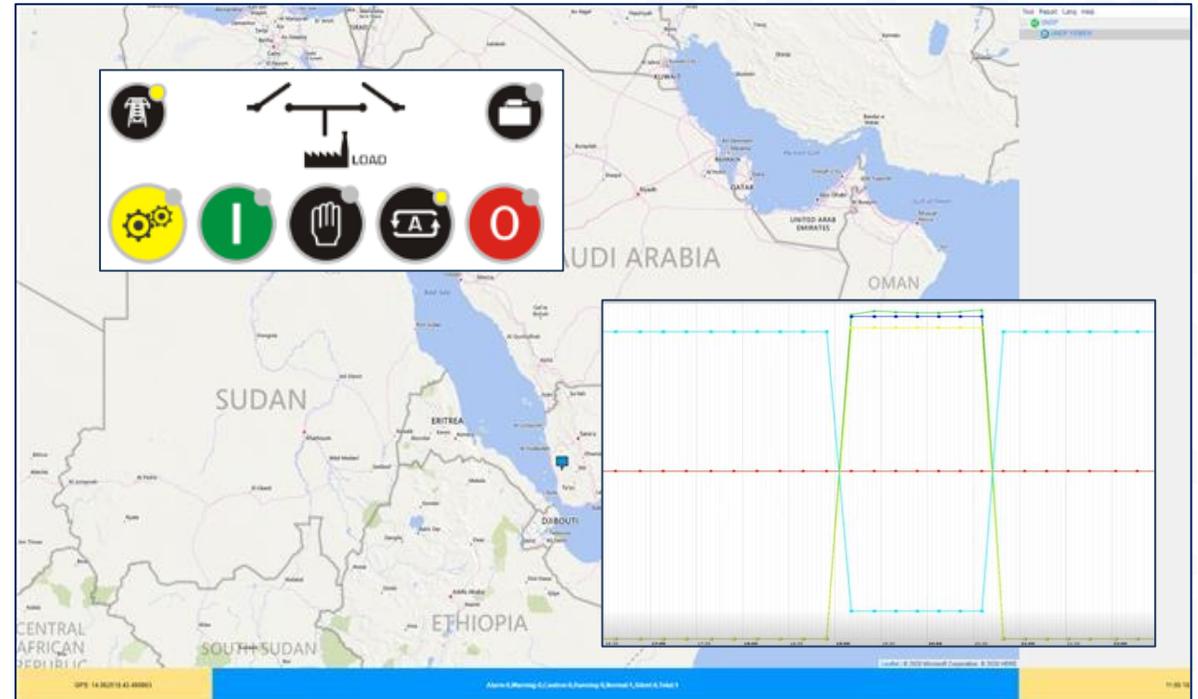
- i. Generator use
- ii. Frequency
- iii. Active Power
- iv. Alarms

Drones

- i. Site Survey
- ii. Communications

Other IoT

- i. Power Analyzers
- ii. Grid quality analyzer
- iii. AC and Motion Sensors



Step 2 – Business Case

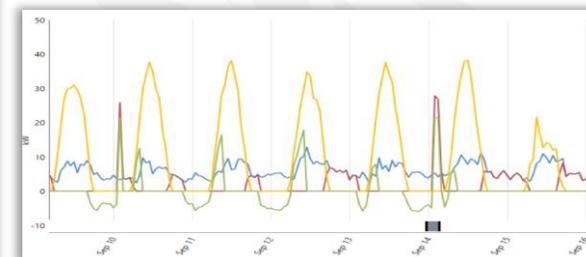
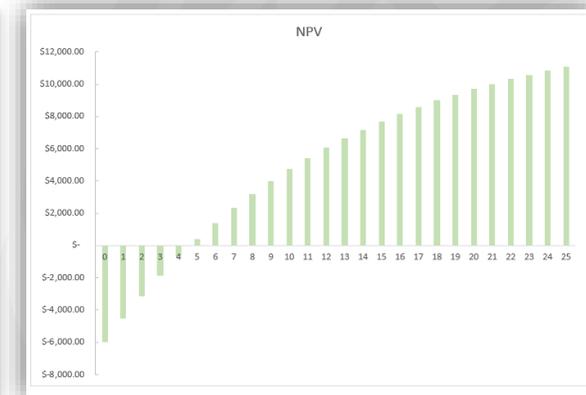
Key Aspects

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

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

Central African Republic
Business Case

| Solar PV Capacity | Battery Capacity | Renewable Fraction | CO ₂ Emissions Savings | Investment |
|-------------------|------------------|--------------------|-----------------------------------|-------------|
| 90 kWp | 40 kWh | 31% | 61 (tons/year) | 248,000 \$ |
| 225 kWp | 400 kWh | 65% | 139 (tons/year) | 700,000\$ |
| 360 kWp | 500 kWh | 82% | 168 (tons/year) | 1,013,000\$ |



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.

UN South Sudan Country Office (CO)

Terms of Reference: Solar Hybrid System

Smart Solar Hybrid System for UN South Sudan Country Office (CO), contributing to Create Smart UNDP Facilities Powered by Renewable Energy

| Solar PV Capacity (kWp) | Battery Capacity (kWh) | Renewable Fraction (%) | CO2 Emissions Reductions (tons/year) |
|-------------------------|------------------------|------------------------|--------------------------------------|
| 162 | 200 | 39.2 | 357.3 |



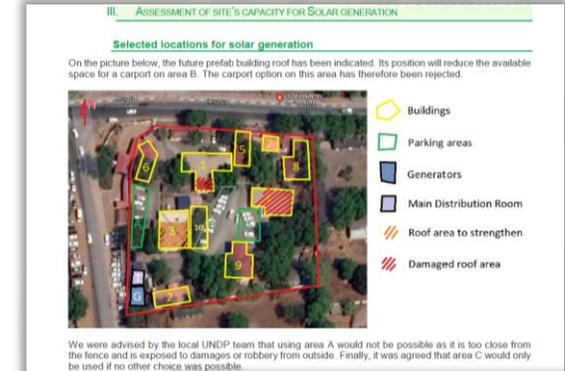
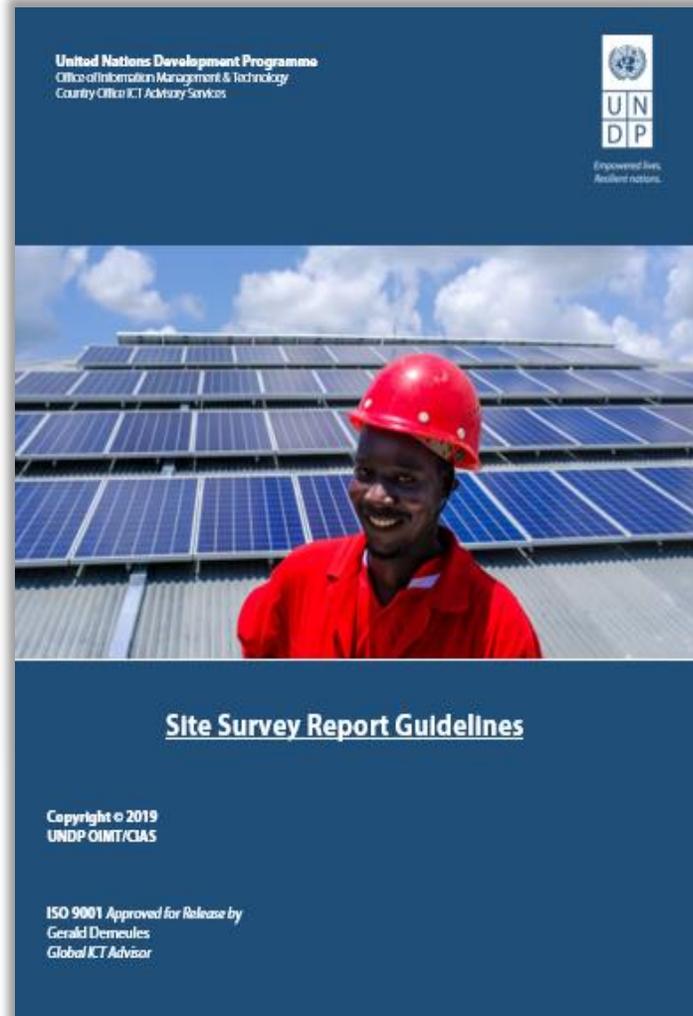
Photo: Training to CO during installation in Nigeria Sub-office



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

| Roof N° | Description |
|---------|--|
| 1 | Well exposed, but the south maintained in good state. |
| 2 | Well exposed, good state. |
| 3 | Very convenient exposed. South reinforced as solar panels. |
| 4 | Roof is mainly weak. |
| 5 | New entrance well located. Strengthened. |
| 6 | Roof in good sophisticated entry. |
| 7 | Small roof, poor location. |

4 Technical room
 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 sill
 → 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 → 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. → Very conveniently with direct access for cabling to the roof and a distance of about 1.6m to the transfer switch. | |
| Ventilation Climate | Ventilation is good Lack of air-conditioning will slightly decrease efficiency and lifespan 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 sill 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

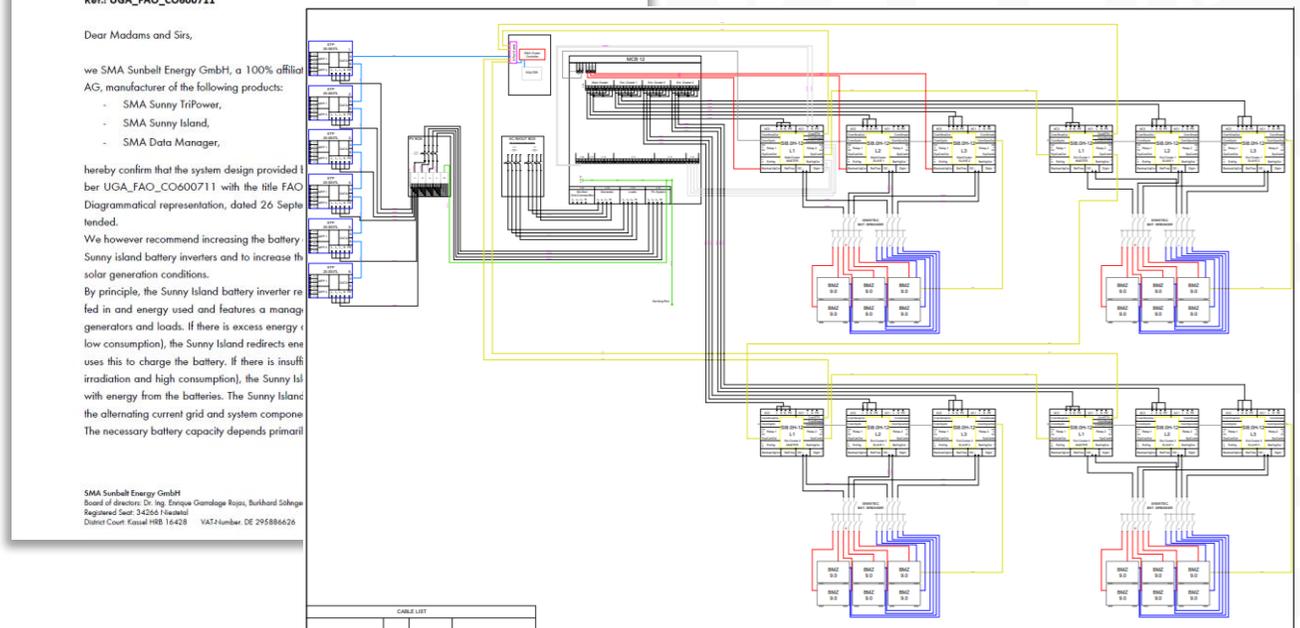
1. Vendor prepares the final technical design
2. Vendor submits **technology certificates** which are issued by manufacturers

SMA

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 Sonnenallee 1
 34266 Niestetal
 GERMANY
 Tel.: +49 561 9522 0
 Fax: +49 561 9522 3300
 E-Mail: Sunbelt@SMA.de
 Internet: www.SMA.de

To: UNDP Procurement Services Unit

Author: Göküma Magens
 Phone: +49 561 9522 422765
 Fax: +49 561 9522 421330
 E-Mail: Gokuma.Magens@sma.de
 Date: 11.10.2019

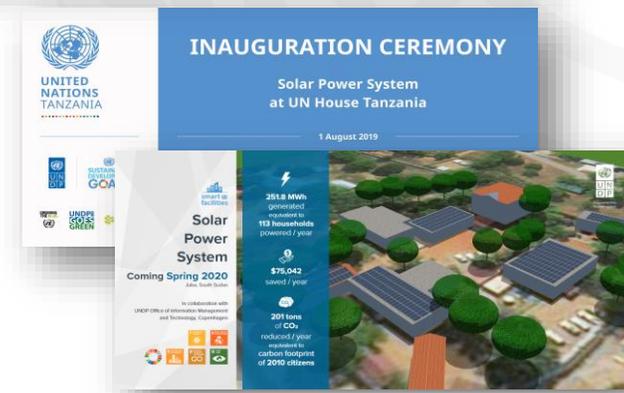


SMA Sunbelt Energy GmbH
 Board of directors: Dr.-Ing. Enrique Gamalanga Rojas, Burkhard Schäfers
 Registered Office: 34266 Niestetal
 District Court Kassel HRB 16428 VAT number: DE 295886626

Step 6 - Installation

Key Aspects

1. The installation is clearly outlined in the project plan, with management, milestones, risk etc. covered
2. Step 6 is concluded by commissioning of the systems and training of on-site staff
3. 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
5. Support CO with maintenance agreement with local company after 3 years



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 broken 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.

Table 1. System's specifications

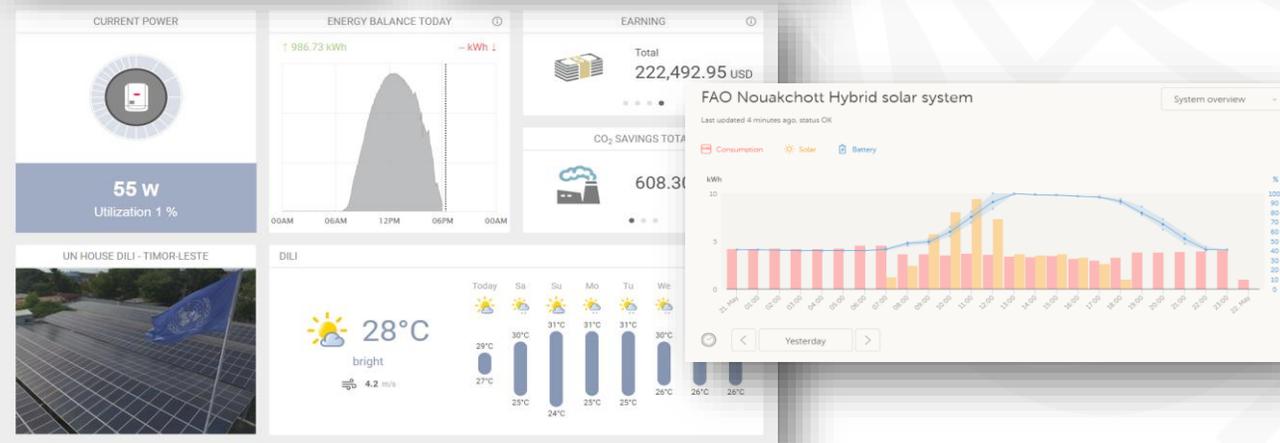
| | | |
|-----------------------|---------|-------|
| Solar PV | 128 | kWp |
| Batteries | 371 | kWh |
| Average hourly load | 11.52 | kWh |
| Total backup time | 24 | hours |
| Years of installation | October | 2017 |

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 retrieve 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 sectors and reaching a 95% uptime is a key requirement for this installation.

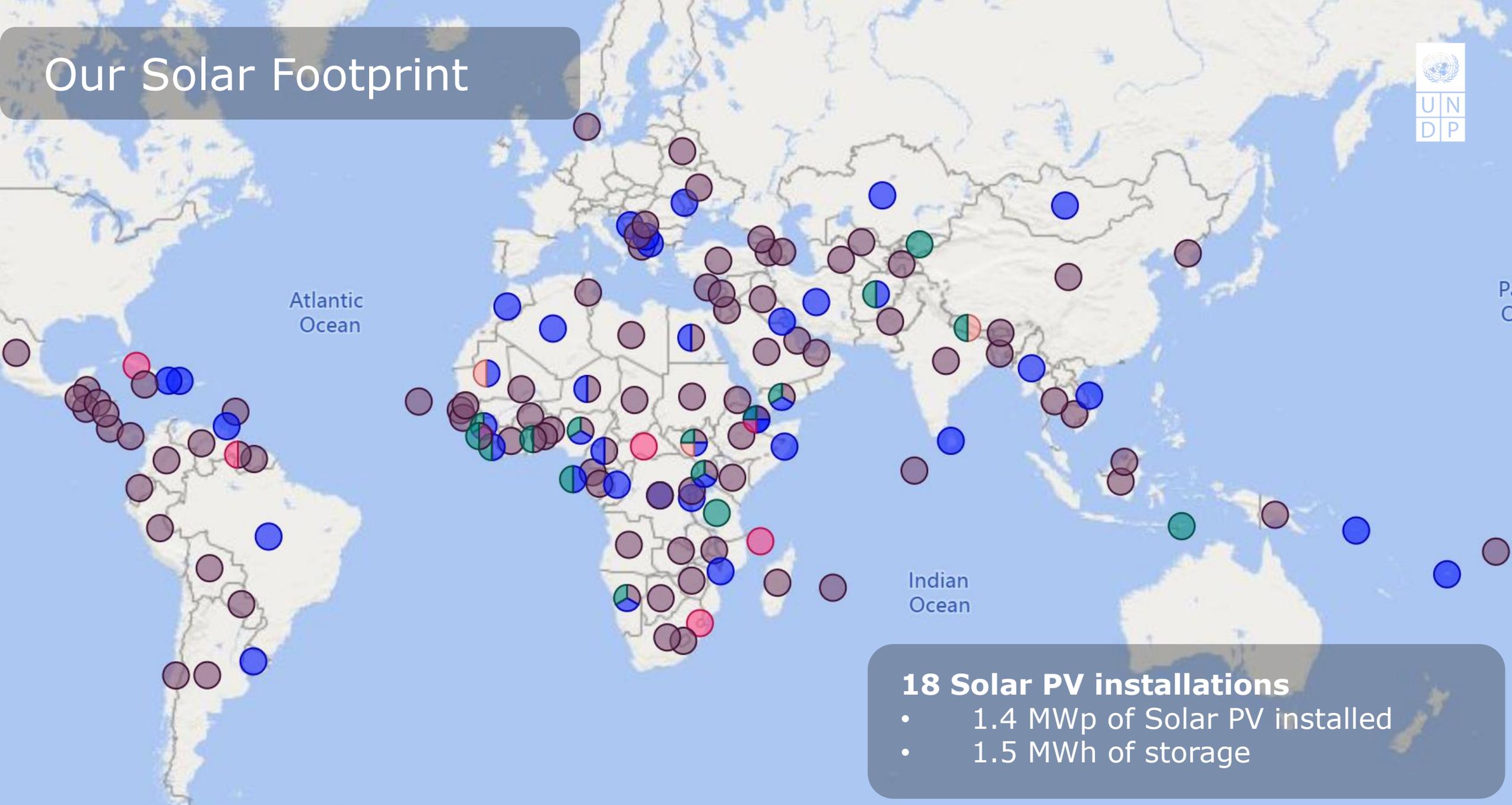
Environmental/Social - CO₂ savings remains in line with the initial expectations.

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



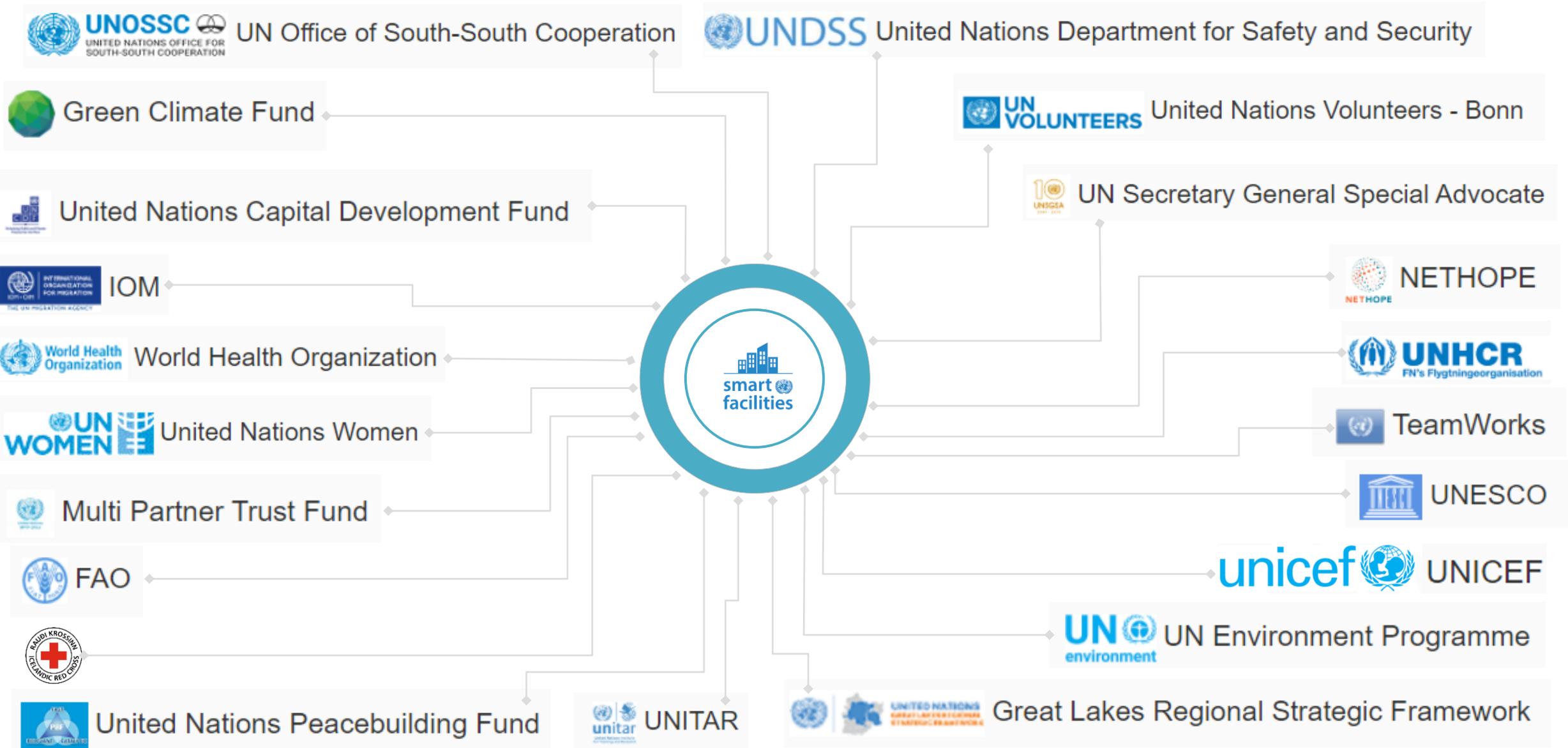
Our Solar Footprint



18 Solar PV installations

- 1.4 MWp of Solar PV installed
- 1.5 MWh of storage

ITM Smart Facilities Collaboration



Green Energy Services and Products – Summary



Photo: GE Training Mission UNDP Niger/2019



IoT Monitoring portal



Photo: Smart Facilities Mission UNDP South Sudan/2018



Photo: Solar Street Lamps - UNDP South Sudan

Green Energy Services

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



UN House Namibia



Video [here](#)

Photo: Solar project UN House Namibia/2017

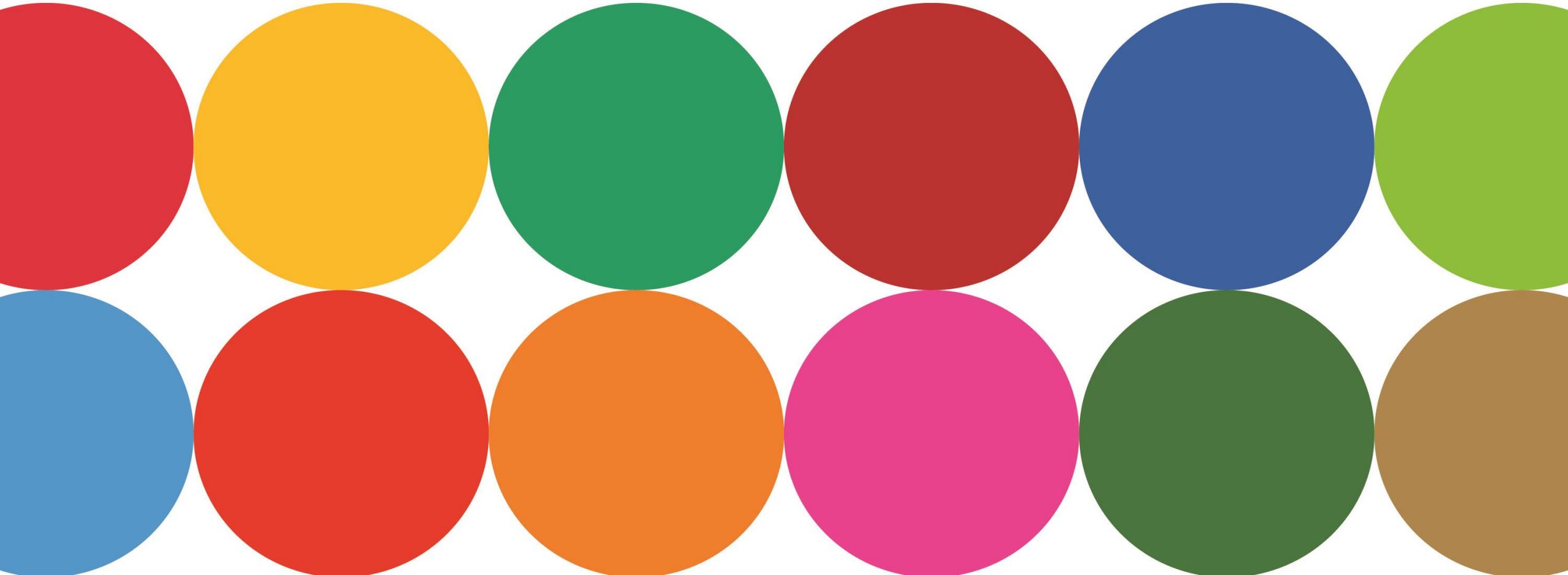


Photo: Sao Tome UN House

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.

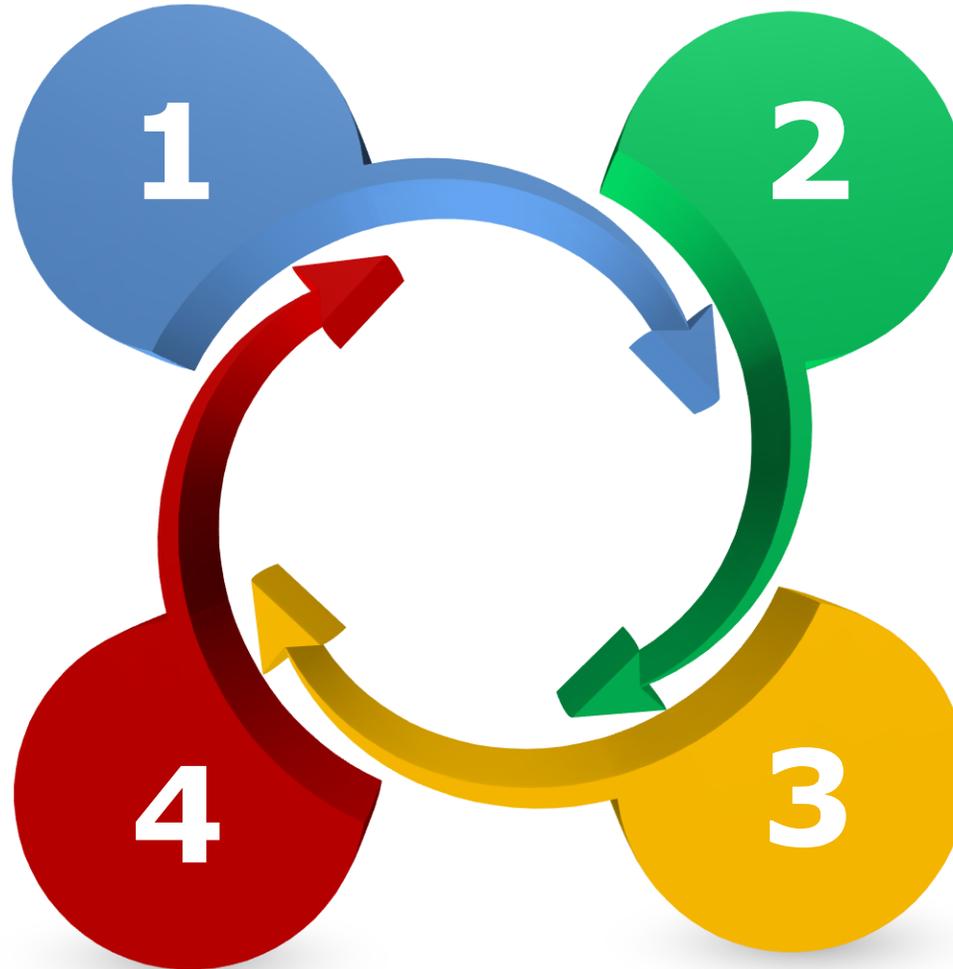
THANK YOU! 

ROLL-OUT & WAY FORWARD



WHAT DOES IT MEAN FOR OMTs

Collaborate as
Common Service

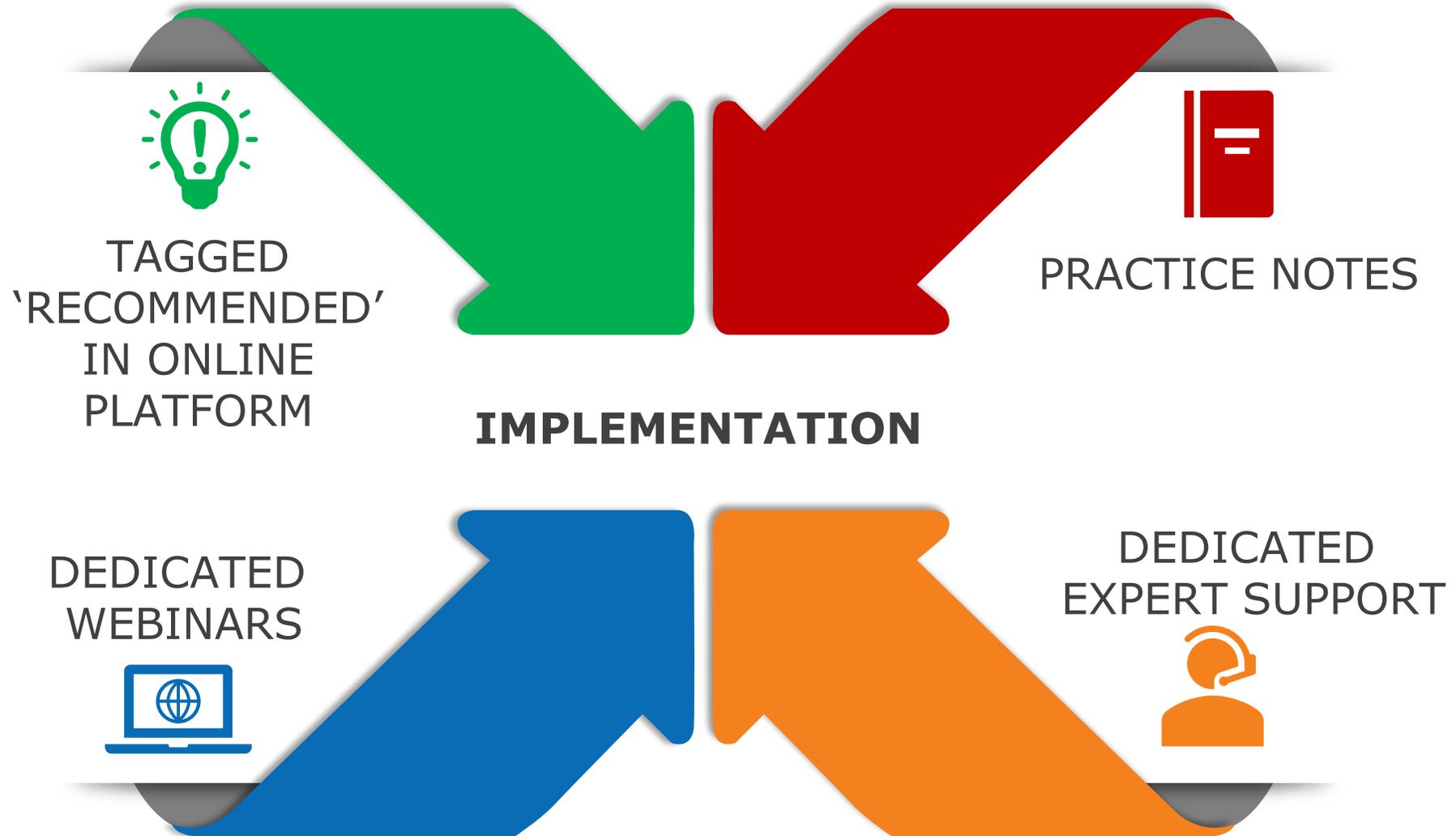


All Agencies
Encouraged to
Join

Use Expert Support
& Resource Platform

Prioritize the
implementation
parallel to
complimentary svcs.

HIGH-IMPACT SERVICES ROLLOUT



WAY FORWARD

IF YOUR BOS IS IN DEVELOPMENT



INCLUDE IN YOUR BOS NOW



IF YOUR BOS IS COMPLETED



INCLUDE IN BOS REVIEW



Q&A & FUTURE COLLABORATIONS



UNITED NATIONS
SUSTAINABLE
DEVELOPMENT
GROUP



HIGH-IMPACT COMMON SERVICES

High-Impact & SDG Services

Tue, Jan 19, 8:00 am NY

UN Humanitarian Booking Hub

Thur, Jan 21, 9:00 am NY

Tue, Feb 2, 7:00 am NY

Gender Responsive Procurement

Tue, Jan 26, 10:00 am NY

Disability Inclusion

Wed, Jan 27, 7:00 am NY

Green Energy Services

Thur, Jan 28, 7:00 am NY

Sustainable Cafeteria

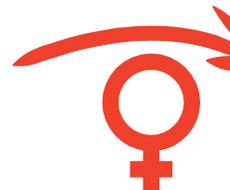
Wed, Feb 17, 8:00 am NY



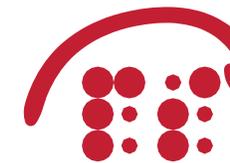
Selection of High Cost-Avoidance & SDG related CS



Innovative Digital Services for Fleet, Clinic, & UN Accommodations Management



Include gender sensitive criteria for procurement advancing SDG 5: Gender Equality



Disability Inclusive Services in 3 areas: Physical Premises, Inclusive HR, & Inclusive Digital Services



Solar & Renewable energy & Internet of Things solutions



Solar & Renewable energy & Internet of Things solutions

Thank you for your participation
Development Coordination Office
Country Business Strategy

