



UNIDO Programmes and Projects in Africa

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- **LCET Programme**
- **Geothermal Programme**
- **Advanced Mini-Grid Project in Rwanda**
- **Study on Application of Hydrogen Fuel
Combined with Geothermal Power**
- **Toward TICAD7**

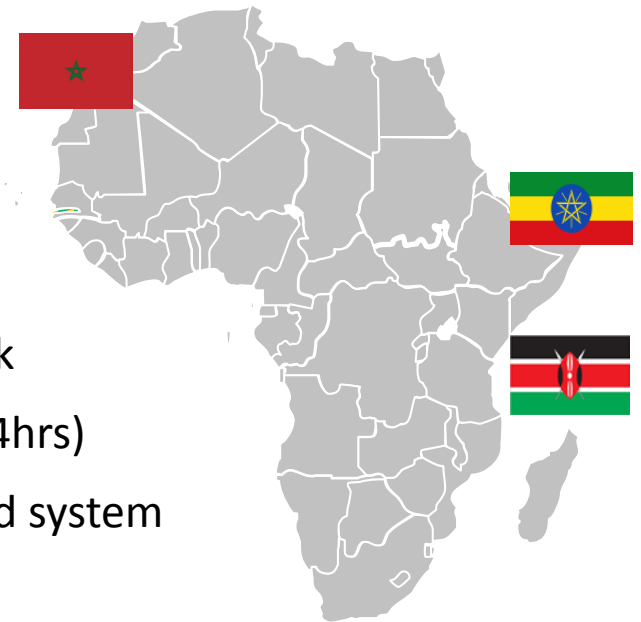
LCET Programme



Programme Summary

- Objective: Transferring innovative low carbon low emission clean energy technologies (LCET) for achieving inclusive and sustainable industrial development
- Donor: Ministry of Economy, Trade and Industry, Japan
- Start: September 2013
- Budget: USD 11.6 million
- Scope:
 - Technology Demonstration
 - Linking electricity to productive uses
 - Institutional capacity development
 - Industrial value chain and policy framework
- Project:

Morocco	VFB system as BESS (125kW/4hrs)
Ethiopia	1 x 10kW ULH-MHP-PV Hybrid system
Kenya	2 x 10kW ULH-MHP system



* VFB: Vanadium Flow Battery

* BESS: Battery Energy Storage System

* ULH-MHP: Ultra Low-head Micro-hydropower

* PV: Photo-voltaic

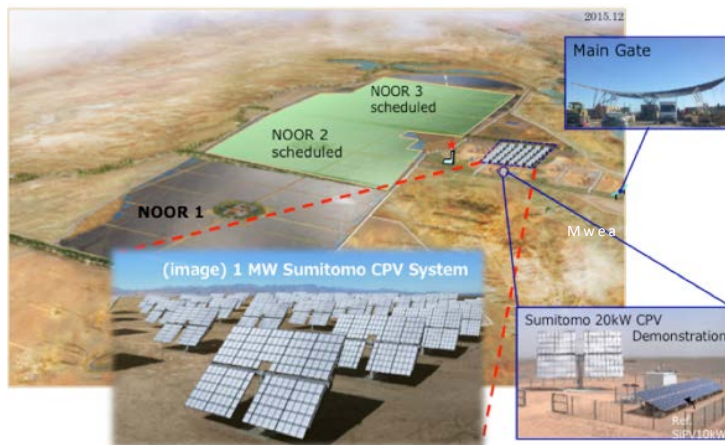
Morocco Project

Project Scope

- Implementation of VFB system (125kW/4hrs) in Ouarzazate region as BESS to stabilize electricity from renewable energy sources such as solar and wind for grid connection as well as mini-grid environments
- To be connected to already installed 1MW CPV system of Moroccan Agency for Sustainable Energy (MASEN) and Sumitomo Electric Industries
- To conduct PPP workshop for the local stakeholders

Way Forward beyond the Project

- Localization of the VFB system in Morocco & dissemination in Morocco & African neighboring countries in collaboration with MASEN and Sumitomo Electric Industries



(Source: Sumitomo Electric Industries)





Geothermal Programme



Programme Summary

- Objective: Assisting African countries in developing geothermal energy with Japanese geothermal power generation and its related technology
- Donor: Ministry of Economy, Trade and Industry, Japan
- Start: April 2017
- Budget: USD 12.7 million
- Scope:
 - Technology Demonstration
 - Institutional capacity development
 - Industrial value chain and policy framework



(Source: Website of Ministry of Foreign Affairs of Japan)



(Source: Website of Ministry of Foreign Affairs of Japan)

IoT Project

- O&M strengthening for Olkaria Geothermal Power Station operated by Kenya Electricity Generating Company (KenGen) in collaboration with JICA
- JICA will provide technical cooperation (capacity building, process improvement) through geothermal experts from Japanese utility companies (“Component A”), and UNIDO will introduce Japanese IoT technologies (“Component B”)
- UNIDO, JICA and KenGen held a signing ceremony for the Joint Declaration for cooperative implementation of the project in October 2018
- Expected to start procurement process for the project in the first half of 2019



Olkaria IV (Source: Public Relations Office. Government of Japan)

Advanced Mini-Grid Project in Rwanda



Background

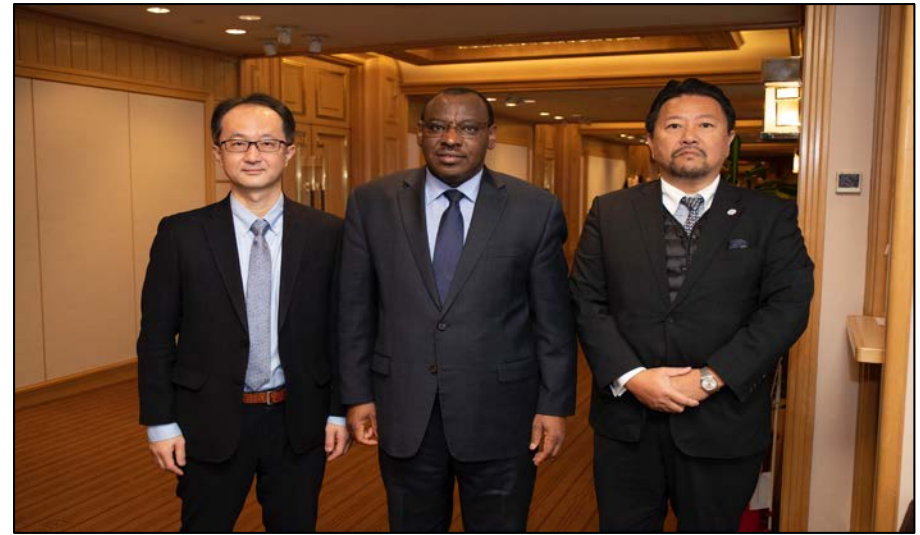
- Innovation will be a key for leapfrogging, non-incremental economic growth in Africa. At the same time, access to electricity needs to be improved to realize economic growth through industrialization
- Rwanda envisages promoting industrialization through innovation, especially in the field of information and communications technology (ICT)
- UNIDO conducted a study on promotion of advanced mini-grid systems in Rwanda from August to December 2018

December 2018 Workshop in Kigali

January 2019 Workshop in Tokyo

Way Forward beyond the Project

- Pursuing a demonstration project of PV advanced mini-grid system at Kigali Innovation City (KIC) with Japan's technologies such as EMS and BESS
- Concurrently, joint R&D and capacity building for localization as well as policy recommendations for promoting advanced mini-grid systems in Rwanda planned
- MOU between UNIDO and the Government of Rwanda for project implementation at the pre-TICAD event in July 2019 in Vienna under consideration



KIGALI INNOVATION CITY



DIGITAL INNOVATION PRECINCT

HOME IN AFRICA FOR "PROOF OF CONCEPT"

Study on Application of Hydrogen Fuel Combined with Geothermal Power



Background

- While electricity access in East Africa is still relatively low as showcased by an electrification rate at 39%, electricity demand is expected to significantly rise due to population increase and economic growth
- In Kenya where the electrification rate is at 65%, the lack of flexibility in the power generation fleet is reportedly to have, if periodically, caused over-generation of power, which would have resulted in the curtailment of geothermal output for load balancing
- One pathway that could take advantage of the excess power generated would be hydrogen fuel

Objective

To examine the possibility of the “Geothermal-to-Hydrogen” project for accelerated electrification and industrialization in the region

Schedule

May - July 2019 Study

Late August 2019 Releasing the result