REPORT

15\textsuperscript{th}–19\textsuperscript{th} February 2021

15\textsuperscript{th} EDITION OF MICRO-GRID MODULE 1 - ONLINE TRAINING
Renewable Energy Solutions for Community Needs and Local Development
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INTRODUCTION

UNEP Africa Office, the Renewable Energy Solutions for Africa (RES4Africa) and other partners conducted 15th edition of the Micro-Grid Training, for the Africa Women Energy Entrepreneurs and youths from the Africa Community that was held from 15-19 February 2021. This training was held virtually and focused on renewable energy solutions for community needs and local development with a mention to soft and business skills in Kenya. This training was held in the framework of collaboration and partnership between UNEP and RES4Africa together with other partners such as Strathmore University, Kenyan Power Company Limited, East Africa Renewable Energy and Energy Efficiency Centre (EACREEE), AVSI Foundation, St. Kizito Vocational Training Institute and ENEL Foundation.

Over 70 African women (working as energy entrepreneurs) and youths (who are currently graduate students in renewable energy and engineering) as well as members of the Africa Women Energy Entrepreneurs Framework (AWEEF) participated in this training. This training took the shape of a mixed-formula which alternated e-lectures, virtual working-group discussions, and the use of an online training platform.

On the last day, participants had the possibility to visit St. Kizito VTI’s premises, located in the outskirts of Nairobi. The MGA students were then able to test themselves, putting in practice what they had learnt during the training.

MGA student at the St. Kizito VTI’s premises
The training focused on solar mini-grids through the guide of the new curriculum developed in collaboration with Strathmore University. The new curriculum provides a general overview of the whole mini-grids’ value chain for rural electrification, hands-on learning in labs about renewable energy technology. More specifically, this course dealt in detail with the Module 1 of the Curriculum, namely:

- Module 1.1: Introduction to micro-grids, rural community needs & demand assessment
- Module 1.2: Renewable and non-renewable sources, basic components of decentralized energy systems.


In this framework, UNEP Africa Office convened the first day of this training on 15 February 2021 in the context of Renewable Energy Solutions for Community Needs and Local Development. UNEP thus made a presentation on ‘Introduction to SDG and Energy Access’. Other presentations included, Introduction to Rural electrification by RES4Africa; Renewable energy sources potential in Africa by ENEL Foundation and Productive uses of energy and water-energy-food nexus integrated solutions by AVSI.

2. HIGHLIGHTS OF THE TRAINING

2.1 Opening Session of the Training

Ms. Marta Caradonna the project coordinator of the Micro grid Academy from RES4Africa opened the meeting welcoming all the participants. She then opened the floor for the partners to introduce themselves. These were Ms. Meseret Zemedkun, the Programme Manager Energy Unit, UNEP Africa Office; Professor Izrael Da Silva, Deputy Vice-Chancellor Research and Innovation Strathmore University; Ms. Romana Koech, Kenya Country.

Ms. Marta Caradonna the project coordinator of the Micro grid Academy from RES4Africa
Representative at AVSI Foundation; Giuseppe Valerio, the Founder and Chief of St. Kizito Vocational Training Institute; and Suelen Quadri of ENEL Foundation.

2.1.1. PRESENTATIONS FROM UNEP, AVSI, ENEL AND RES4AFRICA

(i) INTRODUCTION TO SUSTAINABLE DEVELOPMENT GOAL’S (SDG’s) AND ENERGY ACCESS

The Programme Manger Energy Unit, UNEP Africa Office Ms. Meseret Zemedkun then did a presentation on ‘Introduction to SDGs and Energy Access’. She begun by introducing UNEP and SDGs, and UNEP’s response to global and continental agendas. She then presented on the social and economic dimension of Sustainable Development. Social dimension in terms of energy poverty and Renewable Energy as an enabler for transformative action towards achieving multiple SDGs. Economic dimension in terms of energy security where Renewable Energy can be utilized for economic growth in terms of job creation, agricultural productivity like SMART agriculture and agri-business and industrial development.

Ms. Zemedkun, in her presentation on the ‘Africa Current Reality Check’, she highlighted on some of the statistics in that about 600 million people do not have access to electricity, and approximately 730 million people rely on traditional biomass uses. She added that the average annual gross domestic product growth rate of 6.2 per cent, predicted three-fold growth by 2030 and seven-fold growth by 2050, entails a much larger energy demand and calls for a better-performing energy sector. Lastly due to COVID-19, in 2020, the GDP fell by 6%, energy investment decreased by 30%, number of people with access to electricity decreased. Therefore, energy poverty remains a serious obstacle to economic and human development in Africa.

Ms. Zemedkun stated that tackling today’s energy challenges in Africa requires a firm commitment by Governments, Multilateral Organizations, and national, regional and continental energy initiatives, to
promote the accelerated use of renewable energy sources for sustainable development. Additionally in the current pandemic, promoting fast, green, resilient and inclusive Post COVID-19 recovery programme is key.

(ii) RENEWABLE ENERGY SYSTEMS POTENTIAL IN AFRICA

Ms. Suelen Quadri from ENEL Foundation then gave her presentation on Renewable Energy Systems Potential in Africa. Endowed with substantial renewable energy resources, Africa can adopt innovative, sustainable technologies and play a leading role in global action to shape a sustainable energy future, she stated. The continent could meet nearly a quarter of its energy needs from indigenous and clean renewable energy sources by 2030 and increase the share of renewables in its total energy mix to as much as two-thirds by 2050.

It is rather unfortunate to note that about half of Africa’s energy currently comes from inefficient biofuel and waste systems. Africa has an almost unlimited potential of solar capacity (10 TW), abundant hydro (350 GW), wind (110 GW), and geothermal energy sources (15 GW). She then mentioned that researchers estimate that renewable energy capacity in Africa could reach 310 GW by 2030; which would put the continent at the forefront of renewable energy generation globally.

Africa has an installed hydropower capacity of over 37 gigawatts (GW) and the highest untapped potential across the world. The continent has so far only utilised around 11% of its capacity, with 906 megawatts (MW) placed into operation last year in 2020. In terms of solar energy, Africa has installed only 5 GW of Solar-PV, which is less than 1% of the global total. In terms of post COVID-19 recovery, she mentioned that there is huge scope for Africa to build a climate-resilient and low-carbon continent, with attractive investment opportunities in climate-resilient infrastructure, climate-smart agriculture, and the sustainable management of natural resources.
(iii) COMMUNITY ENGAGEMENT PRESENTATION

Ms. Suelen Quadri from ENEL Foundation talked about the rationale for community engagement, community engagement process, tools, quality standards, Service Level Agreements, and the types of stakeholders and their roles. Ms. Suelen defined community engagement to be a full suite of communication and direct interaction with impacted communities that, ideally, leads to community consent for a project. Ms. Quadri mentioned that the rationale for community engagement is aimed at identifying potential stakeholders who have interests or influence on the project such as local community, local government bodies, and the likes. These local communities are key to the successful implementation of any project as they are powerful vehicles for behavioural change that can improve the wellbeing and livelihoods of the community.

The work of increasing access to electricity in sub-Saharan Africa involves a diverse array of participants, from power project developers and financiers, to local government agencies, civil society organizations, and the everyday users of electricity themselves. Often, the most successful power projects are those that streamline the path to financial close by ensuring that the concerns and needs of all parties are heard and addressed at every stage of the development cycle.

Ms. Suelen believes that genuine, robust community engagement from the early stages of project development and all the way through to commissioning, should be a core business best practice. Indeed, community engagement should be embraced as a means to help de-risk projects, keep transactions on track, and create shared value for companies and local stakeholders.

(iv) WORKING GROUPS - COMMUNICATION SKILLS

The last session of Day 1 entailed a presentation on communication skills by James Bundi and Evans Gacheru from AVSI Foundation. Evan Gicheru started off with three proverbs: A man is rarely better than his conversations; If you want to go quickly go alone, if you want to go far go together; Words are responsible for cutting down a big tree, the axe is only an instrument.
He later highlighted on communication styles. These are, Passive, Aggressive, Passive-Aggressive and assertive communication behaviour styles. Assertive is of Win-Win; Aggressive- I win and you lose; Passive- I lose and you win; while Passive-aggressive is of Lose-lose. James Bundi then gave an overview on types of communication in terms of verbal, non-verbal, written, and visual.

2.2 Summary of the Training

Day 2 training included ‘How to assess and quantify impact and development scenarios for micro-grid projects’ by Luca Traini from RES4Africa; ‘Energy needs assessment of a greenfield community’ by David Van Berkel from RINA; Day 3 presentations included: ‘Overview of the different types of delivering energy access, with a techno-economic comparison and a focus on micro-grids’ by Fred Amariati from GIZ; ‘Key concepts regarding solar irradiation’ and ‘Solar irradiation data requirements for micro-grid systems’ by Prof Izrael Da Silva from Strathmore University. Day 4 included: ‘Energy management, control systems and energy storage’ by Massimo Schiavetti from ENEL Foundation; ‘Micro-Grid Architecture and Management System - case studies by FRIEM’ by Idris Tayebi from FRIEM.

2.2.1. PRODUCTIVE USES OF ENERGY

Ms. Francesca Oliva from AVSI Foundation did a presentation on ‘Productive Uses of Energy’. She first gave a background of AVSI stating that it was created in 1972, and is a not-for-profit organization, which carries out development cooperation and humanitarian aid projects throughout the world. Ms. Francesca explained how energy can transform society and economy and access to electricity is one of the most transformative elements when brought in poor and remote communities.

Despite this Ms. Francesca mentioned four barriers that hinder energy’s transformational potential. These are: (i) Lack of business skills and access to finance prevents communities from using electricity productively; (ii) Poor technical skills hinder the proper operation and maintenance of the micro grids; (iii) Lack of sensitization about domestic use of electricity and prevents households to improve family
wellbeing; (iv) Authorities lack of understanding of off-grid energy provision business models prevents their scale up.

As a solution to this AVSI’s theory of change in access to electricity entails: (i) Business creation, access to finance (ii) awareness creation on safe use of electricity; (iii) Saving practices; (iv) Training national and local authorities. In this regard AVSI initiated solar mini-grid projects in Mozambique, Uganda, Rwanda, Burundi Kenya and D.R. Congo.

In conclusion Ms. Francesca explained AVSI’s processes on how to promote productive use of energy. These include: (i) Scoping of opportunities; (ii) Feasibility and viability analysis; (iii) Business model canvas; (iv) Development of a business plan.

2.2.2. WORKING GROUPS- BUSINESS SKILLS- INTRODUCTION TO THE GENERATION OF BUSINESS IDEAS

Ms. Anna Mwangi from AVSI Foundation during the final working group session, then highlighted on the Business Skills needed for successful Renewable Energy deployments. She mentioned that, as the demand for renewable energy continues to increase, the industry is looking to recruit high-calibre candidates to drive green energy business forward. Individuals looking to enter these professions in the clean energy and sustainability sectors need to demonstrate competency in communication, an active interest in green energy, and a natural aptitude for understanding changing technologies related to energy and environmental systems. She then added that for those hoping to pursue leadership roles, an energy leader should be able to manage geographically diverse teams, coordinate complex technical projects and possess the ability to identify and run with new ideas.

Ms. Mwangi stated that more professionals than ever before are joining these related industries to make a real difference in the future of energy and sustainability. There are hundreds of jobs that you can choose from in this industry with healthy career prospects. In addition, she mentioned that one may find a job
within a commercial enterprise that is not selling a green product per se like in the hotel industry, etc. but that has a mission that embraces energy efficiency and sustainability, with a focus on corporate sustainability.

3. CLOSING REMARKS AND WAY FORWARD

In summary Professor Izrael Da Silva concluded that the new energy paradigm entails 3 ‘Ds’. These include ‘Decarbonisation’ from fossil to Renewable Energy; ‘Decentralization’ as opposed to the traditional generation-transmission-distribution architecture and to have one that occurs at the same place i.e. Micro grids. And ‘Digitalization’ of SMART grids, SMART metering etc. Another key aspect is also one of ‘Democratized’ energy solutions that entails an inclusive participatory approach of women and youth, as well as private sector.

After 5 days of the training the participants gained knowledge on Renewable Energy Solutions for Community Needs and Local Development. Specifically they gained an understanding on:

- SDG’s and Energy Access
- Rural Electrification
- Renewable Energy Mix in Africa
- Productive uses of energy and water-energy-food nexus integrated solutions
- Community Engagement & Demand Assessment
- Quality and quantity impact assessment of micro-grid development projects
- Energy needs assessment of a greenfield community
- Technological architecture of a micro-grid
- Solar Irradiation
- Energy management, control systems and energy storage
- Micro-Grid Architecture and Management System
The training also achieved the following outputs:

- Partnership enhanced between RES4Africa and UNEP, as well as Strathmore University, Kenyan Power Company Limited, East Africa Renewable Energy and Energy Efficiency Centre (EACREEE), St. Kizito Vocational Training Institute and AVSI foundation
- Peer-to-peer mentorship network among women entrepreneurs as well as youth established in the energy sector
- Enhancement of access to energy in rural communities
- Fostered local enterprise and job creation, through the empowerment of young people’s knowledge and skills.