TAREA Success Stories

TAREA STRATEGY 2023-27

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Contents

Abbreviations

AfDB	African Development Bank
BEST	Business Environment Strengthening Tanzania
bfz	Berufliche Fortbildungszentren der Bayerischen Wirtschaft (bfz) gGmbH
BMZ	German Federal Ministry of Economic Cooperation and Development
BUREA	Burundi Renewable Energy Association
COSTECH	Commission for Science and Technology
CRDB	Cooperative Rural Development Bank
CTCN	Commission for Science and Technology
DTP	Deutsch-Tansanische Partnerschaft e.V.
EDF	European Development Fund
EE	Energy Efficiency
EPD	Energy Private Developers – Rwanda
ESIA	Environmental and Social Impact Assessment
ETF	Energy Transition Facility
EU	European Union
EWURA	Energy and Water Utilities Regulatory Authority of Tanzania
FCC	Fair Competition Commission
GHGs	Green House Gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IFC	International Finance Corporation

KEREA	Kenya Renewable Energy Association
KIITEC	Kilimanjaro International Institute for Telecommunications Electronics and Computers
kWp	Kilo Watt Peak
LGAs	Local Government Authorities
LIFE	Life International Foundation for Ecology
MEM	Ministry of Energy and Minerals
MoE	Ministry of Energy
MP	Member of Parliament
MW	Mega Watt
NEMC	National Environment Management Council
NGO	Non-Government Organization
PV	Photovoltaic
RE	Renewable Energy
REA	Rural Energy Agency
RETs	Renewable Energy Technologies
SE4ALL	Sustainable Energy for All
Sida	Swedish International Development Agency
SIDO	Small Industrial Development Organization
SMEs	Small and Medium Enterprises
SPP	Small Power Project
TANESCO	Tanzania Electricity Supply Company
TAREA	Tanzania Renewable Energy Association
TASEA	Tanzania Solar Energy Association
TBS	Tanzania Bureau of Statistics

TPSF	Tanzania Private Sector Foundation
TRA	Tanzania Revenue Authority
TV	Television
UNCDF	United Nations Capital Development Fund
UNDP	United Nations Development Program
UNIDO	United Nations Industrial Development Organization
UNREEEA	Uganda National Renewable Energy and Energy Efficiency Alliance
USAID	United States Agency for International Development
VAT	Value Added Tax
VETA	Vocational Education and Training Authority
VICOBA	Village Cooperative Bank
VPO	Vice President Office
VTC	Vocational Training Centre
WB	World Bank
Wp	Watt Peak

Foreword by TAREA Chairperson

TAREA has done a tremendous job in coordinating the renewable energy industry for the past 20 years. The sector has contributed to the quick country's electricity access from about 10% in the early 2000s to 84% in April 2020. The early programs like the SIDA/MEM Solar PV and UNDP's Transformation of Rural PV Market in Tanzania projects, of which TAREA was a leading partner, contributed a great deal in creating awareness of renewable energy technologies to policymakers, entrepreneurs, financial institutions, and the general public. Moreover, the decision by the government to waive importation taxes for solar and wind products in the early 2000s, the move initiated and advocated by TAREA, had a positive impact on the application and usage of renewable energy technologies in Tanzania.

As we speak today, more than 2MW of Solar Home Systems have been installed in different areas in Tanzania. Application of pico-solar products for lighting has largely increased and adopted such that kerosene usage for the same has dramatically dropped. Awareness of solar, in particular, pico-solar has largely spread across the country that it now does not need promotion at all. Solar PV technology is now being applied to provide power in homes, businesses, health and educational facilities, water pumping, street lighting, telecommunication facilities, factories, etc. Big renewable energy projects are now implemented in Tanzania, an example being the 5MW Kigoma Solarwazi project, a good number of solar mini-grid projects, and solar PV backup power in buildings. Moreover, TANESCO has also resumed negotiations and signing of Power Purchase

Agreements (PPAs) from private Small Power Producers. 7 PPAs for renewable energy projects were signed in 2022/23 with a total generation capacity of 597MW.

The government is also implementing its big renewable energy projects. In August 2022, TANESCO and Masdar, a UAE renewable company signed a JV agreement to develop a total of 2GW of solar and wind projects to contribute to the country's generation capacity target of 5GW by 2025. Through its established Tanzania Geothermal Development Company, the government has set a target of generating 200MW of electricity from geothermal sources by 2025.

Clean cooking and electric mobility are the other emerging subjects that have recently highly been discussed in our country. The Ministry of Energy is currently developing a Clean Cooking Roadmap to transition to clean cooking and make 80% of the Tanzanian population adopt clean cooking technologies by 2033. TAREA is among the key partners involved in the development of the roadmap. As for electric mobility, transitioning to electric vehicles in Tanzania is gaining ground faster than in any other East African country. Despite an unclear regulatory environment and marginal investment (11 start-up companies in Tanzania have raised a total of USD 1 million+) into the electric mobility sector, a report by Africa E-mobility Alliance shows that there are at least 5,000 electric vehicles in Tanzania. Kenya with an already satisfactory electric mobility ecosystem (regulatory and supportive environment) and reasonably good investment climates (40 companies in Kenya have raised USD 52 million while 9 companies in Uganda have raised USD 5 million) has so far recorded a total electric vehicle fleet of about 600. It is high time Tanzania worked on creating an enabling environment for the electric mobility sector to support the already encouraging initiatives on the ground and TAREA envisages taking the leading role in the advocacy for the same.

TAREA is also actively engaged and participating with all other key energy stakeholders in the development of the Renewable Energy Strategy and Roadmap, the Energy Efficiency Strategy and Implementation Action Plan, the Biomass Energy Strategy, the Rural Energy Masterplan, and the Power System Masterplan; initiatives being administered by the Ministry of Energy. In general, with all the current support that TAREA and the renewable energy industry are receiving from different stakeholder

Eng. Prosper Magali,
TAREA Chairperson

1.0 Introduction

Tanzania Renewable Energy Association (TAREA) was founded under the name of Tanzania Solar Energy Association (TASEA) in the year 2000 and registered by the Tanzania Ministry of Home Affairs on 7th May 2001 with Registration number SA10900. Due to the members' involvement in renewable energies beyond solar, the name was changed from TASEA to TAREA in 2010. TAREA is a member-based non-profit NGO that brings together actors in the renewable energy (RE) and energy efficiency (EE) sectors. TAREA promotes the accessibility and efficient use of renewable energy and energy efficient in mainland Tanzania. TAREA is a network organization gathering 998 (Dec 2022) members.

The mission of TAREA is to promote and advocate for RE and EE by developing an effective network of members and stakeholders, emphasizing the need for quality and best practices throughout these sectors.

TAREA's mission is realized through the implementation of the following strategic areas:

1) To manage knowledge and information dissemination
2) To network public and private renewable energy and energy efficiency stakeholders
3) To support the creation of an enabling environment and framework for sustainable renewable energy and energy efficiency markets
4) To promote institutional capacity building

TAREA conducts capacity building in RE and EE sectors; mentors and coaches small and medium-sized energy enterprises (SMEs); does awareness-raising and technology demonstrations for RE and EE; strong lobbies and advocates for standards, incentives, policies, regulations, and financing products; performs applied technology research; collects and disseminates the information; implements service quality control, energy gender mainstreaming, market studies and technical support to the non-profit projects.

TAREA has got code of conduct that require its members to support the Government and other initiatives that improve the quality and performance of renewable energy technologies and other equipment through the provision of quality service.

The road to success is neither smooth nor easy but with hard work, teamwork, commitment, and struggles, finally, success comes. TAREA is happy to share a few of many stories on its activities conducted from 2001 to 2022 with the public. Success stories will be presented under each strategic area of the association.

TAREA welcomes all people who love the “sustainability of the future” to join hands in scaling up the uptake of renewable energy and energy efficiency technologies in mainland Tanzania.

2.0 Success Stories

2.1 Objective 1: To Manage Knowledge and Information Dissemination

2.1.1 Piloting Solar Photovoltaic Technologies in Malinyi District

In the year 2016, Malinyi was still an off-grid area. Most of the households used kerosene and candles for lighting. Electricity for business was generated using petrol and diesel generators. Most businesses closed early evening (by 7 p.m. latest) for security reasons. The crime rate was high and school dropout continued increasing. Overall academic performance of the schools in the village was low. There was no public internet facility in the village. Students at secondary schools had no opportunity to the evening studies.

Photo 1: Solar artisans installing a solar system at Igawa Secondary School, Malinyi ©TAREA

TAREA implemented two projects in the village of Malinyi, Malinyi District to demonstrate the potential of solar photovoltaic technologies sustainably. The project components consisted of community awareness-raising; training of 5 solar artisans for installation and maintenance that were equipped with working tools and mobilized to form a cooperative; installation of an internet centre with 5 solar-powered computers; installation of solar systems at 3 secondary schools; installation of 3 solar street lights at the market place; and setup & management of a solar revolving fund to enable households to access solar technology.

Photo 2: Solar lanterns distribution in Malinyi ©TAREA

The outputs of the projects were: conducted awareness sessions for the villagers and students at the schools; trained and organized 5 solar artisans for

solar installation and maintenance in the village of Malinyi; installed and connected internet centre for communication and online learning at the village of Malinyi; installed 900Wp each at 3 secondary schools that supported evening learning and light for girls' dormitory; installed 3 lights at the market place that was being littered in the night by people, thus increasing property security and environment cleanliness, and revolving fund contributing to replace kerosene lanterns by solar PV lights for the more than 400 households.

Photo 3: Malinyi market illuminated by solar light ©TAREA

The impacts of the projects were: reduced environmental pollution from the use of kerosene; funds saved from the use of kerosene; secondary school students passing examinations to join Form V; Girls encouraged to study science subjects; Increased income as the time of working at the market increased;

increased knowledge of the members of the communities as they could access online platforms; and increased youth employment. The project results were replicated in Mang'ula and Ifakara in Kilombero District.

Resources: TAREA, Associazione Microfinanza e Sviluppo Onlus and URBIS Foundation.

2.1.2 Introducing Solar Photovoltaic Fishing Lanterns on Lake Victoria

Fishing of sardines (Dagaa) employs four million people around Lake Victoria, Tanzania. Fishermen used kerosene pressure lamps for fishing at night.

Photo 4: Accident, exploded pressurized kerosene lantern ©TAREA

The pressure lamps had challenges of exploding, consuming much kerosene thus exhausting fishermen profits, and the kerosene was emitting carbon dioxide and spilling polluting water. Kerosene

pressure lamps could not be used during bad weather like rain and storms.

Photo 5: Lights introduced by TAREA © TAREA

> "I hired 10 solar lamps from the project and gave my husband to replace kerosene lamps. I paid installment each month 80,000/= for seven months. Deducting all running costs, we got a good profit and decided to save half of the profit at the Bank. I managed to get a loan at Bank with a contract of two years, and bought an engine, boat and fishing net. I started night fishing while I continued paying the loan at the bank. Later we built a three-room house."
>
> *Elizabeth Mazige, Buswelu, Mwanza*

The impacts of the project are reduced water pollution; reduced costs of fishing thus reduced prices of the fish at the market; increased profits from reduced fishing costs; and enabled continuous

communication as fishermen can recharge mobile phones while fishing.

Resources: TAREA, DTP and Mwanza-Wurzburg e.V

2.1.3 Establishment of TAREA - ATC Solar Training Centre

Tanzania Mainland has a deficit of skilled solar photovoltaic artisans. The deficit has resulted in a challenge of poor workmanship in solar photovoltaic system installation and maintenance.

To intervene in the challenge of inadequate skilled solar artisans, in the year 2019, TAREA partnered with PUM-Netherlands Senior Experts and Arusha Technical College to establish the ATC Solar Training Centre. It became operational in April 2019.

Photo 6: Launching of ATC Solar Training Centre ©TAREA

The establishment of the solar training centre has the impact of increasing the number of skilled solar artisans. By December 2020 a total of 232 solar artisans have been trained of which 34 (15%) were girls.

Resources: ATC, PUM Netherlands, and TAREA

2.1.4 Conduction of National Renewable Energy Day

To create a sustainable market of renewable energy products, it is important to ensure that the clients are aware of the availability, potentials, and limits of the technologies, and how to access quality services.

Photo 7: Hon. George Simbachawene, VPO Minister for Environment and Union Affairs, in the presence of the Ambassador for the Kingdom of the Netherlands, opening the event of National Renewable Energy Day 2019 ©TAREA

TAREA network raises awareness of potential clients through technology demonstrations. Besides technology demonstrations, workshops are held for stakeholders to be informed on the regulations, policies, and laws related to the renewable energy and energy efficiency sectors.

TAREA has been conducting an annual event of National Renewable Energy Day since its founding so that end users are sensitized on the technologies and entrepreneurs interact with policy and decision-makers.

Photo 8: Workshop in progress during National Renewable Energy Day 2019 ©TAREA

From 29th to 30th November 2019 TAREA conducted the National Renewable Energy Day in Dar es Salaam. Technologies that were demonstrated are solar photovoltaic; solar water heating; and improved biomass cooking. Besides technology demonstrations, there was a workshop in which government leaders and financial institutions were invited to provide knowledge on policies, regulations, and potential financial products. The learning event attracted energy companies, the Bank of Tanzania, Tanzania Investment Bank, CRDB, the Embassy of the Kingdom of the Netherlands, the Ministry of

Energy, EWURA, TBS, EU, UNIDO, UNCDF, AfDB, and Media.

Renewable Energy Day 2019 attracted Hon. George Simba Chawene (MP) then VPO Minister for Environment and Union Affairs representing Minister for Energy, Hon. Innocent Lugha Bashungwa (MP) then Minister for Industry and Trade, and His Excellence Ambassador for the Kingdom of the Netherlands Mr. Jeroen Verheul.

The impacts of the event were stakeholders understanding better policies and regulations guiding renewable energy and energy efficiency sectors. Stakeholders learned about the financial opportunities available within the country. Ministers promised support in the sector, especially in the area of efficient biomass for cooking. The ambassador promised continued support to the Tanzania energy sector. Technology exhibitions visitors learned about the available RE&EE technologies, their potential, and their limitations.

Resources: The Embassy of the Kingdom of the Netherlands, Sida, Horizont3000, bfz, IFC-World Bank, European Union, and URBIS Foundation.

2.1.5 Promoting Sustainable Solar Photovoltaic Market in Tanzania

In 2000 years, solar technology use in Tanzania started growing, following the introduction of technology by the missionaries that used it for lighting, radio call communication, and medicine cooling. Tanzania had neither skilled installers nor retailers at the base of the pyramid. Ministry of Energy received financial support from Sida to implement the project Sida/MEM

Solar PV in which TAREA played a great role in training artisans on installation and maintenance; VTC Teachers on training youth solar photovoltaic technology, and regulators on the technical quality control.

Photo 9: Regulators practising product quality control at the company Ensol (T) Ltd ©TAREA

TAREA trained 183 solar artisans from 14 regions of Tanzania Mainland, the first group in Tanzania's history, on installation and maintenance. Training on product control was conducted for the following participants: 35 regulators from TRA; 2 regulators from TBS; 6 regulators from FCC; 3 developers from TAREA; and 1 officer from the Ministry of Energy. Training of Trainers was conducted for 52 VTC instructors and sensitization training for 47 district council officers.

The project had the impacts of increased: off-grid areas electrification; youth self-employment; solar market regulation; and decreased air pollution caused by the use of petroleum products.

Resources: TAREA, Sida

2.1.6 Training of Stove Producers of Mtwara and Lindi Regions

Most Tanzanian households are still cooking using charcoal and firewood, 26.2% and 63.5% by 2020, respectively. 0.7% of the population was using improved biomass cookstoves by the year 2004.

Photo 10: Training of stove producers at SIDO in Lindi ©TAREA

Therefore, the technologies used for biomass cooking are not energy efficient, wasting much energy and polluting causing healthy negative impacts and deterioration of forestry. Stove makers for years have been producing inefficient stoves.

TAREA and COSTECH piloted the program of training 12 biomass stove producers from the Lindi and Mtwara Regions. The training was conducted at SIDO in Lindi town. Lindi and Mtwara were chosen because these regions had never received training support on efficient biomass stoves production before. 12 Biomass stove producers were trained, thereof 2 females.

The impacts of the training were increased sales of efficient biomass stoves; reduced forestry deterioration; and increased uptake of the efficient biomass stoves in the regions of Lindi and Mtwara.

Resources: Sida, TAREA, and COSTECH

2.1.7 Enabling Employability of Girls

Tanzanian youth are facing an unemployment problem. Girls are the most affected. Most affected girls are dropouts of school due to pregnancy or family poverty. Some girls are falling into sex work to earn a living. Some girls migrate to the Middle East to work as housemaids. Housemaids in the Middle East face challenges of low salaries; brutality; long working days to 21 hours; and sexual harassment.

TAREA piloted an activity of enabling girls' employability using solar photovoltaic technology. TAREA trained 13 girls from Tanzania's Southern Highlands regions of Mbeya, Njombe, Ruvuma, and Songwe. Girls were trained in the installation and maintenance of solar home systems, and entrepreneurship. After training, girls were given working tools and provided with mentorship services. Mentorship that lasted for 6 months consisted of

connecting girls to the retailers for accessing the clients, and technical support on installation to ensure quality service.

Photo 11: Girls practising solar home system installation in Njombe © TAREA

13 girls have remained in their original villages and are earning a living from the works of solar installation and maintenance. The long-term result of the project was to ensure the livelihood of the girls through self-employment.

I got solar training in July 2019 from TAREA which helped me to expand the scope of my work, now I can install a solar system and also advise the client before buying solar equipment," Suzana MGUMBA, 30 years, Employee at Njombe Electronics shop

TAREA piloted a project named “Enabling Employability and Safety of young women through Solar Photovoltaic in Masasi, Mtwara.” Specifically, to young and disadvantaged women in the Masasi District.

The project was realized to increase the percentage of women engaged in solar photovoltaic technology and enable self-employment. The model has to start from community engagement, instead of generalizing the adverts in the newspapers, and district offices.

Photo 12: 20 women trainees receive start-up tool kits and working cloth ready for work.

The model starts with community engagement at the village level in identifying benefiting trainees. The community engagement also helped to break the perception that becoming a solar photovoltaic artisan is a men’s profession. This notion among the community leaders is one of the barriers making women not enrol in technical trades training.

A second important step is the modality of executing the training. There should be classroom training as well as a live demonstration in a few sites followed by

at least two to three months of internships in the field doing live installations, maintenance, and servicing.

Photo 13: Women artisans explaining the use of safety gears

After the training, these trainees are supposed to be equipped with a start-up toolkit, and safety gear to aid their smooth working environment.

Marketing them and ensuring that their communities know and appreciate them as new experts should be done. This was done in the form of community sensitization events on the potential of solar photovoltaics and the advantages of using well-trained and equipped artisans.

Frequent monitoring of progress and getting feedback from both the trainees as well as their clients help to continuously improve the program.

Resource: TAREA, URBIS Foundation and Hivos

2.1.8 Facilitation of International Training

Tanzania has few experts in the sectors of renewable energy and energy efficiency. Most of the big RE&EE projects in Tanzania are being planned and developed by foreign experts. The impacts of using foreign experts have been the high costs of developing projects and the unsustainability beyond development.

Photo 14: Training of Solar Trainers at Gemeinde Wildpoldsried, Germany ©Shukuru Meena

To enable knowledge transfer, since 2008 TAREA has been facilitating members to attend various continuous training conducted by partner institutions like Strathmore University, Gemeinde Wildpoldsried Training Centre Bayern, Germany), LIFE Academy (Karlstad, Sweden), National Institute of Wind Energy (Chennai, India), and National Institute of Solar Energy (Delhi, India). Members were trained on Solar photovoltaic training, planning, and development; wind power planning and development; energy efficiency; and environmental and social impacts assessment.

The impacts of facilitating network members attending training in other countries have increased local planning, development and after-sales service human capacity.

Resources: Government of India, Sida, bfz and BMZ

2.2 Objective 2: To Network Public-Private Renewable Energy and Energy Efficiency Stakeholders

2.2.1 Facilitation of Business Delegation to Germany

The Renewable Energy and Energy Efficiency market in Tanzania is still an infant compared to the developed countries. To make Tanzania's RE&EE market grow, TAREA works to network its business members with companies outside Africa to create business partnerships and enable technology transfers.

Photo 15: Delegation visiting a 5MW on-grid low-water flow hydro station Wolfzahnauwehr in Augsburg, Germany @TAREA

TAREA organized two business delegations of 6 persons each from Tanzania RE&EE businesses in the years 2018 and 2019 that visited Bayern in Germany. The delegations had opportunities of

visiting renewable energy communities, training and research centres, renewable energy and energy efficiency companies, and the Minister of Economic Affairs and Energy in Bayern. The technologies visited were biogas for power generation, solar photovoltaic plants, wind farms, and co-generation.

The visits' impacts were the creation of business partnerships between Tanzania and Germany, and knowledge and technology transfers.

Resources: TAREA, BMZ

2.2.2 Partnering with DTP in Worldward Volunteering Project

International understanding enables win-win cooperation between international partners in this era of globalization. To enable cultural understanding, Deutsch-Tansanische Partnerschaft e.V of Hamburg partnered with TAREA in conducting two programs of Cultural Learning, North-South Exchange, and REN Volunteering.

In the program of Cultural Learning, German youth come to Tanzania, working with Tanzanian Non-Profit Organizations voluntarily to sensitize communities to the potential of renewable energy, and living with Tanzanian families. German youth learn African culture through working and living with Tanzanians. In the program of North-South Exchange, Tanzanian youth visit Germany for six months to practice different trades with skills that can be replicated in Tanzania. REN-Volunteering is the program that provides opportunities for internships to Tanzanian youth that have graduated in subjects that

can be applied in the renewable energy sector. REN Volunteers work with Tanzanian companies or organizations. TAREA is no longer operating programs of Cultural Learning and North-South Exchange. TAREA continues to cooperate in the program of REN Volunteering.

Photo 16: German Volunteers working with villagers in Kyela ©TAREA

The outputs of the programs were 112 German youths who learned African Culture; 26 youths who gained renewable energy entrepreneurship skills; and 5 Tanzanian youths who attended an internship in Hamburg, Germany.

The impacts of the programs were: increased understanding among people of different cultures; increased awareness of renewable energy; and increased employment opportunities.

Resources: TAREA, DTP, and BMZ

2.3 Objective 3: To Support the Creation of an Enabling Environment and Framework for Sustainable Renewable Energy and Energy Efficiency Markets

2.3.1 Advocating for VAT Exemption on Solar and Wind Technologies

In early 2000, solar photovoltaic and wind technologies entered into Tanzania market, but Tanzanians were failing to purchase solar and wind equipment and appliances due to their high initial investment cost. Historically, off-grid areas used kerosene lamps for lighting and petrol generators as a source of electricity.

Photo 17: 2.96kWp solar system at St. Ann Sisters, Morogoro ©TAREA

TAREA (by then TASEA) initiated dialogue with the Government of Tanzania on the removal of VAT on solar and wind products as one of the strategies for reducing the prices of the technologies. In the year 2005, the Government of Tanzania granted VAT exemption on solar and wind technologies in Tanzania's Mainland.

The removal of VAT on solar and wind technologies increased the update of the technologies, especially solar photovoltaic technologies increased rapidly from 100kWp (2005) to 1,160kWp (2009). Solar photovoltaic technology has made a contribution of 30.4% to households' electrification by 2020 and a total replacement of kerosene on Lake Victoria that was being used for fishing lights. Besides the direct benefits of access to electricity, there is the benefit of reduced environmental pollution.

Resources: TAREA, Horizont3000, and UNDP

2.3.2 Development of Vocational Training Renewable Energy Curriculum

For the Renewable Energy Sector to grow, continued education for the youth is needed. In Tanzania, there was no renewable energy training curriculum for vocational education at the artisan level. Youth received training at different training centres using different curriculums. The lack of curriculum resulted in the availability of renewable energy artisans of various qualities, from poor to good ones, and VETA could not control the training quality.

In 2009 TAREA initiated a process of advocating VETA to develop the Vocational Training Renewable Energy Curriculum. The work was completed in 2015 when VETA released a curriculum that covers technologies of solar photovoltaic, solar water heating, biogas, wind power, hydropower, and biomass plants.

Photo 18: Participants of curriculum validation workshop visiting mechanical workshop-VETA Dodoma ©TAREA

The availability of renewable energy curriculum catalysed training in renewable energy at artisan levels. Old training programs like TAREA and Mafinga Lutheran Vocational Training Centre were improved. New training programs were established like those of ATC Solar Training Centre, REA, SNV, and Don Bosco Network. The main impact has been trained, skilled renewable energy artisans.
Resources: TAREA and EDF

2.3.3 Advocating for Solar Photovoltaic Standards

The solar market in Tanzania has been experiencing the challenge of the quality of the products being substandard. The situation led to potential clients losing trust in solar photovoltaic technologies. Client trust in the solar technologies built by the projects of Sida/MEM Solar PV and UNDP's Transformation of Rural PV Market in Tanzania started deteriorating when the Tanzania market was flooded by the sub-standard solar products. Clients lost money and

endangered their health when they bought substandard solar products.

TAREA, since 2015, has been advocating Tanzania Bureau of Standards (TBS) to develop different renewable energy standards. In the year 2016, TBS enacted Solar Photovoltaic Standards and started implementing market surveillance.

Photo 19: Law Enforcers seizing substandard batteries in Kariakoo in 2018 ©TAREA

The availability of Solar Photovoltaic Standards and market surveillance conducted by TBS has resulted in reduced substandard products in the Tanzanian market and increased trust of the end-users in solar photovoltaic technology. The public and private sectors have projects for on-grid solar of more than 400MW in the pipeline.

Resources: TAREA, IFC-World Bank, Best-Dialogue, ETF-Netherlands.

2.3.4 Energy Access Explorer (EAE).

Geospatial data and analysis in Tanzania through the Energy Access Explorer (EAE).

For better renewable energy planning and investment decisions, one needs reliable data and analysis that is accurate and up-to-date. For many years private developers and TAREA had been struggling to obtain data that is up to date.

Difficulties in obtaining spatial digital data on demand estimation by location, the income of the population, ability to pay for energy services, and social economic conditions at regional, district to village levels versus existing energy infrastructure, energy resources location and distribution, and environmental situation.

In 2017, Energy Access Explorer for Tanzania was launched by World Resource Institute (WRI) and its partners. This was a great step towards easy access to data for better-informed decision-making. The platform needed regular updates and was not timely done until 2022 when TAREA and WRI agreed to ensure the sustainability of the EAE through regular updating and the creation of a working group that would be analyzing the various updates that have to be carried out to ensure EAE is sustainable.

Energy Access Explorer is an integrated, data-driven approach to achieving universal access to energy. EAE tool is an online, open-source, interactive, geospatial platform that enables clean energy entrepreneurs, energy planners, donors, and

development-oriented institutions to identify high-priority areas where energy access can be expanded. Using spatial data to link energy supply with growing or unmet demand is essential to gaining a better picture of energy access and expanding energy services to those who need it the most.

EAE synthesizes several geospatial data to visualize and analyze the demand for energy services. These are such demographics (population density, poverty rates asset ownership); Social Services (named productive uses in the EAE) such as schools, health clinics, agriculture activities, etc. EAE also incorporates data on the current potential energy supply such as resource availability (wind, solar, and hydro); Power infrastructure available (transmission network, distribution, generation as well as mini-grids). The tool also has data on the environment such as protected areas, and access to finance from various service providers. EAE enables all users to make a multi-criteria decision analysis to identify high-priority areas where access to energy should be expanded.

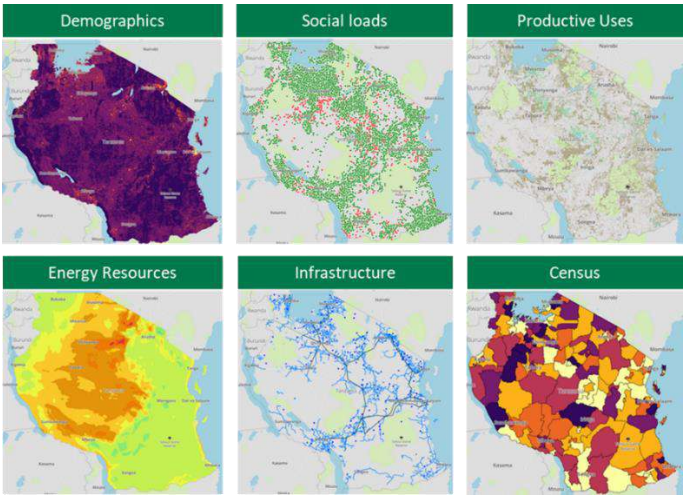

Figure 1: Snapshot of Energy Access Explorer –for Tanzania (more spatial data are available on https://www.energyaccessexplorer.org/tool/s/

EAE help energy planning agencies, enterprises, investors, development finance institution, and departments in the health, education, and agriculture sector to mention a few.

To ensure the sustainability of this important tool, TAREA through the support from the World Resource Institute (WRI) worked to update the platform and to enable frequent updating, a working group of 20 institutions was formed and has been launched. Working Group will be convening twice every year to review the available data collected that are to be updated and also see if any redundant data are to be removed.

Resource: TAREA, World Resource Institute (WRI)

2.4 Objective 4: To Promote Institutional Capacity Building

2.4.1 Training of Developers on Developing Responsive Tender Bidding Document

TAREA identified a problem of Tanzanian renewable energy and energy efficiency developers losing most of the international tenders conducted for Tanzania projects. Tanzanian developers lose most of the tender responses due to the no responsiveness of the bidding documents.

TAREA conducted training for 20 renewable energy and energy efficiency developers on preparing responsive tender bidding documents. The training was facilitated by the Public Procurement Regulatory Authority.

The impacts of the training to the RE&EE developers on developing responsive bidding documents are an increase in Tanzanian winners of tenders called for Tanzania.

Resources: bfz and TAREA

2.4.2 Capacitating District Councils with RE&EE Management Skills

Local Government Authorities (LGAs) have developed a good number of renewable energy projects. Renewable energy projects, like most solar photovoltaic technology, have minimum maintenance plans as well as fewer experts to deal with RE technologies during the development of the council planning. The lack of council renewable energy experts leads to the poor maintenance of solar

systems and inadequate mainstreaming of renewable energy in the development plans. Also, when renewable energy developers visit councils for the introduction of the projects, there are no appropriate officers to attend them.

TAREA in cooperation with COSTECH, trained council members of staff on renewable energy management covering planning development, and sustainability strategies of renewable energy systems. Participants who benefited from the training came from the regions of Tabora, Geita, Kagera, Katavi, Kigoma, Mwanza, Rukwa, and Tabora.

The output of the training was that 101 council officers were trained in the management of renewable energy technologies. The impacts of the training are the increased use of renewable energy in the district councils and the sustainability of the installed renewable energy systems.

Resources: bfz, COSTECH, REA, Sida, and TAREA

2.4.3 Provision of Technical Support to the Community Projects

The quality of installed solar photovoltaic systems for community health services has been a challenge for a long time. Most of the solar photovoltaic projects for community services have been constructed by contracted companies without control over the quality of the service provided. The practice of installing solar photovoltaic systems without involving the independent controller has resulted in premature failure of the installed systems.

Photo 20: Solar photovoltaic system at Magubike Health Centre, Morogoro Region ©TAREA

To avoid the challenges mentioned above, USAID-TUNALI Program and Enzkreis-Masasi Partnership involved TAREA in their projects of developing solar systems for health services. USAID-TUNAJALI Program installed solar photovoltaic systems at the health facilities in the regions of Dodoma, Iringa, Morogoro, Njombe, and Singida. TAREA supported USAID-TUNAJALI in community mobilization; system designs; development installation specifications; installation monitoring; installation evaluation; and training the end-users on the best practices of using the solar system. Enzkreis-Masasi Partnership installed solar photovoltaic systems at 29 health facilities in Masasi District. In addition to the technical support mentioned above, TAREA implemented awareness-raising through radio and Nane-Nane Exhibitions and trained 12 solar artisans for carrying out service and maintenance, and practice self-

employment through installing solar home systems for the villagers.

The technical support provided by TAREA resulted in sustainable solar photovoltaic systems; increased quality of health services in the regions of Dodoma, Iringa, Morogoro, Njombe, Singida, and the district of Masasi. Also, the use of solar home systems increased in the off-grid villages of Masasi District.

Resources: USAID-TUNAJALI Program and Landratsamt Enzkreis (Germany).

2.4.4 Conduct Project Proposal Writing Training to the EAREAs Secretariats

East Africa Renewable Energy Associations' Secretariats, which consist of national associations of Burundi, Kenya, Rwanda, Tanzania, and Uganda, were found to be weak in writing project proposals as one of the strategies of fundraising. The associations had been responding to several calls for funding without success.

TAREA organized the training on bankable project proposal writing that attracted national renewable energy associations of BUREA, KEREA, EPD-Rwanda, TAREA, and UNREEEA. The training was conducted in Arusha.

Photo 21: Members of Secretariats of East Africa Renewable Energy Associations participating in the training of project proposal writing ©TAREA

The training had an impact on increasing the possibilities of winning grants. Further, the associations have increased their visibility at the global level.

Resources: TAREA and bfz

3.0 TAREA Partnership and Membership

Partnership


Enzkreis


Hivos
people unlimited


naba
Norwegian-African
Business Association


giz

Membership


ISES
International
Solar Energy Society


Member of
PREVENT
Waste Alliance


Wind
EMPOWERMENT.org


bfz


USAID
FROM THE AMERICAN PEOPLE


Shell Foundation
GOGLA

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Twitter: www.twitter.com/tareatz