Ref. Ares(2023)3777589 - 31/05/2023

ENERGICA

ENERGY ACCESS AND GREEN TRANSITION COLLABORATIVELY DEMONSTRATED IN URBAN AND RURAL AREAS IN AFRICA

D2.2. Community activation and involvement monitoring and evaluation report

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101037428.

Deliverable Report

Start date of project:	01/11/2021
Duration of project:	48 months
Deliverable nº & name:	D2.2 Community Activation and involvement monitoring and Evaluation
Version	1.0.
Work Package n°	2
Due date of D:	M18, 30/04/2023
Actual date of D:	24/05/2023
Participant responsible:	UAM
Main authors:	Moussa Mounkaila Saley, Abdou Latif Bonkaney, Rabani Adamou, and Josephine Mwasaru
Website:	https://www.energica-h2020.eu/

Nature of the Deliverable		
R	Document, report (excluding the periodic and final reports)	x
DEM	Demonstrator, pilot, prototype, plan designs	
DEC	Websites, patent filing, press & media actions, videos, etc.	
OTHER	Software, technical diagrams, etc.	

Dissemination Level		
PU	Public, fully open, e.g., web	x
CO	Confidential, restricted under conditions set out in Model Grant Agreement	
CI	Classified, information, as referred to in Commission Decision 2001/844/EC	

Quality procedure			
Date	Version	Reviewers	Comments
27/04/2023	V1	SACREEE – Kornelia Lipinge	Report Reviewed. It needs to be clear the roles of the stakeholders in the report are proposed and not finalised
09/05/2023	V1	EACREEE – Godfrey Marambe	Report reviewed. I have included comments throughout the document.
13/05/2023	V1	ECREEE – Guillaume Kouhie	Report Reviewed. Comments were made throughout the report
17/05/2023	V2	HUD – Lena Schmid	Report endorsed

I. PROJECT SUMMARY

Funded by the European Commission under the Horizon 2020 programme (H2020) and supported by the African Union, the ENERGy access and green transition collaboratively demonstrated in urban and rural areas in AfrICA (ENERGICA) project, is an ambitious collaboration between 11 African-based partners and 17 European organizations with offices or subsidiaries in Africa, that aimed at promoting energy access and sustainable energy development.

Energy access and green transition are the key challenges addressed by the ENERGICA project to positively impact the social, environmental, technical, and economic aspects of high energy efficiency with low carbon emissions.

The project's primary objective is to demonstrate the efficient implementation of innovative solutions that are tailored to the specific needs of local contexts and expected to yield positive social, environmental, technical, and economic impacts, resulting from the high energy efficiency and low carbon emission Renewable Energy Technologies (RETs).

This will be achieved through the deployment of three demonstration sites, which will be managed by local Energy Transition Boards, and will utilize community-scale Integrated Community Energy Systems (ICESs).

To ensure that the ambition of the project is achieved, sustained, and replicated, communities' involvement will be at the centre of project implementation. This report outlines the methodology for the activation and involvement of the local stakeholders in each of the demonstrators' locations, Sierra Leone, Madagascar, and Kenya.

II. OBJECTIVE AND EXECUTIVE SUMMARY

The ENERGICA project centres around three captivating demonstration sites, with unique energy challenges and great potential for the production and utilisation of green energy: Madagascar, Sierra Leone, and Kenya. In Madagascar, the demonstrator strives to create nano-grid solutions that will provide vital support to rice farming, as well as cooling and freezing systems for the fishing and local trading communities residing in the Diana Region. Meanwhile, in Sierra Leone, the demonstration site tackles the challenges at the intersection of water, energy, and food in peri-urban Freetown by implementing innovative waste recycling methods. As for Kenya, the demonstrator focuses on pioneering e-mobility solutions tailored specifically for the Boda-Boda sector (motorcycle taxis) in urban Nairobi, with plans for replication sites in the sub-urban areas of Kisumu City and Homa Bay counties.

To ensure the active involvement and participation of local communities and stakeholders, the project team collaborates closely with the communities at the demonstration sites through the establishment of Energy Transition Boards (ETBs). These boards will guide and facilitate the activation of Integrated Community Energy Systems (ICES), which seek to integrate innovative Renewable Energy Technologies (RET) for productive end-users in the three contexts. By strengthening the partnership between the project partners from both continents, the project aims to promote sustainable energy access and development.

The report outlines the framework and approach used to identify, engage, and incorporate the ETBs in the project, highlighting their existing capabilities and potential contributions across all three demonstration areas.

This report is a deliverable enclosed in the WP2 “Co-creation of the demonstrators” of the project "ENERGICA" as defined in the Grant Agreement. This report details the local community and stakeholders’ activation, involvement monitoring and evaluation methodology to ensure communities and stakeholders’ participation in the different demonstration sites of the project.

More information about the project can be accessed through the project website at https://www.energica-h2020.eu/

III. TABLE OF CONTENT

IV. TABLE OF FIGURES

V. ACRONYMS

ADEME	:	French Environment and Energy Agency
ADER	:	Agence de Développement de l'Electrification Rurale
AEE	:	Association of Energy Engineers
AEMDA	:	Association of Electrical Mobility and Development in Africa
AEPEA	:	Association of Energy Professionals of Eastern Africa
AFD	:	Agence Française de Développement
AfDB	:	African Development Bank
AKDN	:	Aga Khan Development Network
AWC	:	Aberdeen Women's Centre
CSO	:	Civil Society Organizations
EAPP	:	East African Power Pool
ECREEE	:	ECOWAS Centre for Renewable Energy and Energy Efficiency
EDBM	:	Economic Development Board of Madagascar
EDSA	:	Electricity Distribution & Supply Agency
EGTC	:	Electricity Generation & Transmission Authority
EnDev	:	Energising Development
EPRA	:	Energy and Petroleum Regulatory Authority
ETB	:	Energy Transition Board
EU	:	European Union
EWRC	:	Water Regulatory Commission
FAO	:	Food and Agriculture Organisation
FCC	:	Freetown City Council
FEA	:	Finite Element Analysis
FFEM	:	Fonds François pour l'environnement Mondial.
FWT	:	Freetown Waste Transformer
GES	:	Green Energy Solutions
GIZ	:	Deutsche Gesellschaft für Internationale Zusammenarbeit
GRET	:	Group for Research and Technology Exchanges
ICES	:	Integrated Community Energy Systems
IGMOU	:	Intergovernmental Memorandum of Understanding
INSTA	:	Institut National de la Statistique
ISTD	:	Higher Institute of Technology of Antsiranana
IUMOU	:	Inter Utility Memorandum of Understanding
JIRAMA	:	JIro sy RAno Malagasy
JKU	:	Jomo Kenyatta University
KenGen	:	Kenya Electricity Generating Company
KEREA	:	Kenya Renewable Energy Association
KETRACO	:	Kenya Electricity Transmission Company
KFW	:	Kreditanstalt für Wiederaufbau
KIRDI	:	Kenya Industrial Research and Development Institute
KPLC	:	Kenya Power and Lighting Company
KU	:	Kenyatta University
MAFFS	:	Ministry of Agriculture Forestry and Food Security

MEAH	:	Ministère de l'Eau, de l'Assainissement et de l'Hygiène
MEEH	:	Ministère De L'énergie Et Des Hydrocarbures
MPEB	:	Ministère de la Pêche et de l'Économie Bleue
MLCPE	:	Ministry of Lands, Country Planning, and Environment
MoAFFS	:	Ministry of Agriculture Forestry and Food Security
MoE	:	Ministry of Energy
MoFED	:	Ministry of Finance and Economic Development
MoFIC	:	Ministry of Foreign Affairs and International Cooperation
MoHS	:	Ministry of Health and Sanitation
MoITC	:	Ministry of Industry, Trade and Cooperatives
MoLHCP	:	Ministry of Lands, Housing and Country Planning
MPED	:	Ministry of Planning and Economic Development
MSWGCA	:	Ministry of Social Welfare, Gender, and Children's Affairs
NORAD	:	Norwegian Agency for Development Cooperation,
NTSA	:	National Transport and Safety Authority
ORE	:	Office pour la Régulation de l'Électrification
PAD	:	Sustainable Agrifuels Platform
RE	:	Renewable Energy
RET	:	Renewable Energy Technologies
REREC	:	Rural Electrification and Renewable Energy Corporation
SAEP	:	Power Africa; Southern Africa Energy Program
SEM	:	Malagasy Society of Energies
SLARI	:	Sierra Leone Agricultural Research Institution
SLEWRC	:	Sierra Leone Electricity and Water Regulatory Commission
SMEE	:	Malagasy Society of water and electricity
SSE	:	Social Solidarity Economy
TUB	:	Technische Universität Berlin
UAM	:	Université Abdou Moumouni
UNCDF	:	United Nations Capital Development Fund
UNDP	:	United Nations Development Programme
UNIDO	:	United Nations Industrial Development Organization
USAID	:	United States Agency for International Development
WB	:	World Bank
WCMA	:	Waste Collection Management Association
WEF	:	Water Energy & Food
WWF	:	World Wildlife Fund

1. INTRODUCTION

The global transition to renewable energy sources is a crucial component of efforts to mitigate climate change and ensure a sustainable future for all. While governments and industries are key players in driving this transition, community activation and involvement are also critical to its success. Next to inclusion of government representatives, policy makers and businesses, it is a major goal of the ENERGICA project to enhance community participation in decision-making, improve access to energy resources and services, and promote the empowerment of marginalised groups such as women and youth and other sectors as defined by the communities. The success of this project is hinged on effective monitoring and evaluation, in collaboration with all stakeholders in the energy sector at all levels to promote economic, social, technological, and environmental well-being.

The relevant stakeholders of the community among the sub-groups of its members including local authorities, local industry representatives, Non-Governmental Organisations (NGOs), International Organizations, members of educational institutions, representatives of civil society organisations and local community members were mapped to constitute a sample reflective of the structure of the composition of the community itself.

This report provides insights into the proposed methodology to monitor and evaluate the implementation, progress, achievements, and challenges that will be encountered during the implementation of ENERGICA's demonstrator energy solutions. The methodology used is based on a participatory and collaborative approach that involves community members, government officials, and development partners to build and sustain a bottom-up approach for effective energy transition structures to boost sustainability and replicability.

The report defines the composition and roles of the Energy Transition Boards guided by the needs identified in ENERGICA's Deliverable 2.1 - Baseline community, market, and ecosystem assessment. The report will also guide the work of the Integrated Community Energy Systems (ICES) on each demonstration site. The methodology guides the activation and implementation of Energy Transition Boards by ENERGICA's consortium and will aid energy stakeholders and the public in activating community development initiatives.

2. DEMONSTRATION SITES

2.1. Madagascar

The Malagasy demonstrator aims to implement nano grid technologies for the Water, Energy and Food (WEF) nexus in the Diana Region, considering local factors related to technical, socio-economic, and environmental aspects. This innovative technology will contribute to improving energy access in three districts located in northern Madagascar: Ambanja, Ambilobe, and Diego II.

During ENERGICA's baseline assessment study, a need for sustainable and accessible energy solutions in Madagascar was identified to address disparities in energy access. The adoption of renewable energy sources, such as solar energy, was suggested to promote sustainable environmental practices and increase support for Renewable Energy Technologies (RETs). Challenges were identified, including the influence of powerful authorities and diesel smugglers that could discourage the communities' uptake of RETs. Respondents of the survey also highlighted the importance of training and civic education to increase women's participation in Renewable Energy (RE) projects. The study indicated that addressing inequalities, improving access to basic amenities, promoting economic development, and addressing infrastructure challenges were critical components for improving the social fabric of communities in Madagascar. The study suggested that it was essential to implement community projects in collaboration with the community to promote RE solutions for sustainable development.

Through collaboration between local stakeholders and project partners, the activities will ensure that the productive use of energy technologies is tailored to the specific needs of the local context, particularly in terms of integration within the nano grids for Water-specific, Agri-specific, and Freezing-specific productive use machines for sustainable development.

Figure 1: The demonstration site of Madagascar

2.2. Sierra Leone

The Sierra Leonean demonstrator is focused on promoting low-tech biogas production, water purification, and fertiliser demonstration in urban and peri-urban areas of Freetown. This innovative approach to green energy transition in the Western African country aims to develop an integrated solution for implementing flexible, low-technology biogas production that can be tailored for water purification and the productive use of fertilisers. The system is being adapted to suit both on-grid and off-grid areas.

Sierra Leoneans identified several needs including the low level of access to energy, the need for sustainable and accessible energy solutions, infrastructure challenges, waste management issues, child labour and traditional gender roles in households. The study recommended improving affordability, increasing access to RE sources, and improving the infrastructure and reliability of existing energy providers to address the disparities in energy access. The importance of promoting community participation in Sierra Leone and addressing waste management challenges was also highlighted in the report. Finally, the need for greater awareness and education on RE for the whole community, as well as the importance of empowering women to participate fully in RE projects to reduce gender-based and domestic violence to promote the well-being of the family unit and put an end to child labour while specifically monitoring the capabilities of who is in charge for waste collection and separation.

Through collaboration between local stakeholders and the project consortium, the activities will ensure that the waste management demonstrator is tailored to the specific needs of the local context, to address the direct energy access challenges and promote economic and social development for improved social cohesion.

Figure 2: The demonstration site of Sierra Leone

2.3. Kenya

The Kenyan demonstrator is introducing e-mobility through boda-boda (motorcycle taxi) and smart energy management systems for battery fleet management and RE integration in Nairobi and replication sites in sub-urban Kisumu City and Homa Bay counties. The aim is to integrate renewable energy technologies in sustainable ways tailored for urban areas to foster the green energy transition in the transportation sector and thereby reduce Carbon Dioxide (CO^2) emissions. ENERGICA Project consortium's local partners (ROAM, STIMA BODA & KPLC) are collaborating to conduct smart management of hardware and software around the battery stations, providing sustainable services to boda-boda riders.

The findings from ENERGICA's baseline assessment indicated that despite Kenya having a high level of energy access, many households spend a sizable portion of their income on energy due to inflated costs and reliability issues. The study recommends improving affordability and infrastructure, as well as increasing access to RE sources. The communities are open to adopting RETs, with women playing a key role in promoting RE projects. However, challenges need to be addressed, such as building trust and addressing initial costs. The adoption of electric motorcycles can offer significant benefits to boda-boda riders, but there is a need for collaboration between stakeholders to create a supportive environment for adoption by focusing on the charging duration and costs, decentralised maintenance of the motorcycles, the motorcycles capacity, financing options to acquire them, and awareness creation. Finally, the study highlights the importance of promoting women's participation in RE projects through awareness creation, equitable resource distribution, and financial support.

Collaboration between local stakeholders and the project consortium in implementing the demonstrator energy solution will ensure that the uptake of the e-bikes is successful.

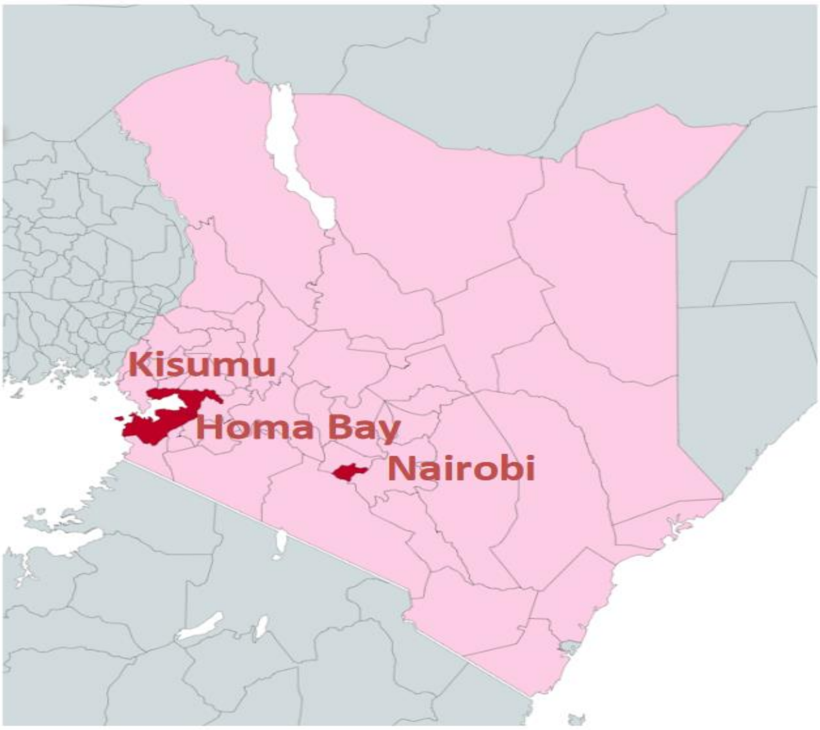

Figure 3: The demonstration sites of Kenya

3. STAKEHOLDERS

3.1. Description

Stakeholders are individuals or groups that have an interest in an organisation's decisions or activities, as defined by ISO 26000[1]. According to Styk and Pawel (2022), stakeholders can be broadly defined as all individuals or organisations involved in project development and its implementation. They can be internal or external and may include regulators, suppliers, customers, administrative authorities, financial institutions, investors, consumers, clients, owners, local and regional communities, and more. In the ENERGICA project, there are three demonstrators' sites involved, each including specific stakeholders from the government, community, and respective technical solutions. Cleland's (1999) definition of internal and external stakeholders is depicted in Figure 4 below.

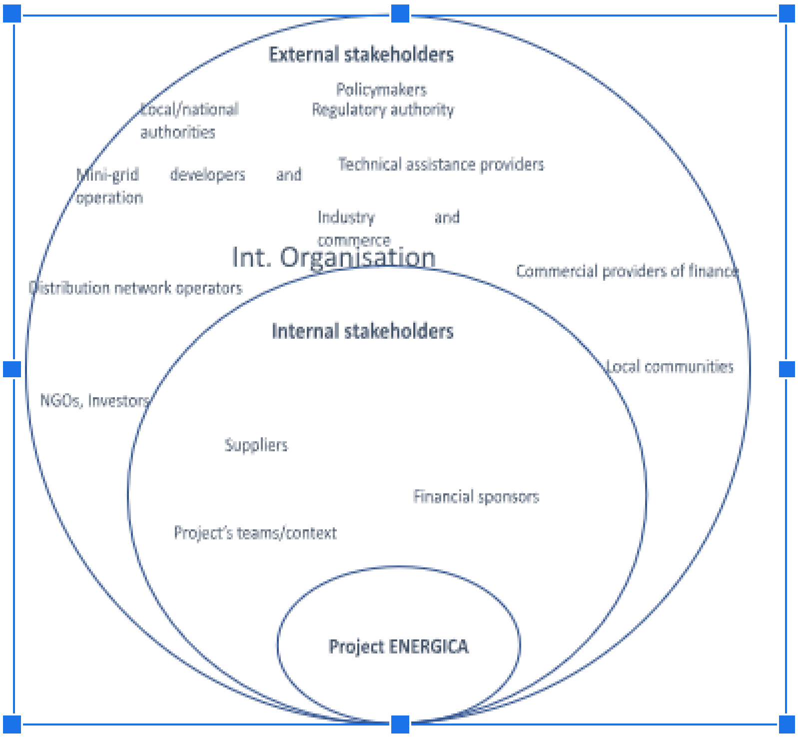

Figure 4: Internal and external stakeholders adopted from Cleland (1999)

Internal stakeholders are individuals or groups actively involved with the ENERGICA project and its implementation, working alongside the project team to achieve its objectives. On the other hand, external stakeholders are crucial in supporting the internal stakeholders to attain their goals. The ENERGICA project comprises various sub-groups of stakeholders, including:

- Key technical services of governmental institutions such as ministries of water, energy, agriculture and food, forestry, and environment, as well as local authorities and affiliated organisations to the ministry, including policymakers, regulatory authorities, and distribution network operators and rural electrification agencies and more.

[1] https://asq.org/quality-resources/stakeholders

- National, regional, and international organisations, NGOs, and Civil Society Organisations (CSOs)
- Providers of commercial finance and external investors, Local Banks, and Microfinance.
- Local companies and industries.
- Members of educational institutions such as universities and research institutes at the local, regional, and international levels.
- Local communities including customers, consumers, residents, and landowners.

The different sub-groups of stakeholders mentioned above are involved in each of the demonstration sites for the ENERGICA project. From these sub-groups, an Energy Transition Board (ETB) will be established as a multi-stakeholder coordination mechanism, which will comprise representatives from the different stakeholder groups.

3.2. *Mapping Methodology*

The steps for stakeholder mapping in each context, as outlined by Styk and Bogacz (2022), are as follows:

1. Define the mapping area. This involves identifying the demonstration sites or contexts to be considered, namely Madagascar, Sierra Leone, and Kenya, and the specific implementation locations for each demonstrator. Section 2 provides detailed information on each context, including the project implementation area where multi-stakeholder groups will carry out their activities.
2. Identify stakeholder groups. This step lists all potential stakeholders thematically related to the specific context and project content, considering all sectors involved in the demonstration sites. Section 3 gives detailed information on the stakeholder groups in each context. For each demonstration site, stakeholders from all distinct groups outlined in section 3, both internal and external stakeholders need to be included.
3. Develop the mapping selection. This step involves gathering the necessary information on stakeholders or their representatives, such as official contact information. The purpose is to exchange information on their ongoing activities in the context, facilitate replicability of these activities, and ensure ways to engage them in the project.
4. Perform the mapping selection. This step is a qualitative selection that enables the identification of relevant stakeholders based on their level of interest and impact (information from step 3). Following the matrix developed by (Johnson and Scholes, 1999), stakeholders' groups can be categorised by four levels of interest and impact:
    i. high interest and high impact,
    ii. high interest but the gentle impact,
    iii. low interest and minor impact, and
    iv. high impact but low interest.

    This categorization may help identify groups of stakeholders that require/deserve attention in ETB implementation.
5. Synthesise the results. This step summarises the activities to be conducted during ETB implementation and outlines the project outcomes for effective engagement action. It also involved aligning the roles of the potential ETB to the needs identified by the communities.

3.3. Stakeholders' Mapping

The relevant potential stakeholders were mapped with the help of local consortium partners. These stakeholders will be updated based on the changing needs of the communities, as identified in the baseline assessment report and throughout the implementation of the demonstrator projects. Several distinctive stakeholders from different sub-groups were identified for each context. The project will benefit from their vast knowledge and experience of both their disciplines and the local contexts.

The stakeholders include technical government service workers in the energy, agriculture and food, forestry, and environment sectors, with emphasis on key services from these ministry agencies. Local industry representatives, NGOs, CSOs, international organisations, and members of educational institutions were mapped to join the Energy Transition Boards of the ENERGICA project. Civil society organisations will be crucial to advocate for the positive impact and promote uptake of the project's demonstrator solutions on the local population and engage and inform them about ongoing activities.

The integration of each stakeholder is crucial for effective communication and collaboration between the communities and the consortium partners during the implementation, monitoring, and evaluation phases.

3.4. Madagascar's Stakeholders and their potential roles

3.4.1. Local authorities

The Ministère De L'énergie Et Des Hydrocarbures / (Ministry of Energy and Hydrocarbons) – (MEEH)'s regional representative in the Diana Region has a vision that centres around five qualitative objectives, namely: ensuring access to modern energy for everyone, ensuring affordability, improving the quality and reliability of services, enhancing energy security, and promoting sustainability. The MEEH aims to increase the rate of access to electricity from 15% to 50% by 2023 and reduce the cost of electricity by 25% within five years. To accomplish this, the MEEH plans to double the production of electrical energy over the next five years, expand access to electricity, and popularise and distribute solar kits across the country.

Based on the findings from the baseline assessment survey and the functions of MEEH, this ministry would have a critical role in addressing the need for sustainable and accessible energy solutions in Madagascar, particularly in the Diana Region. The MEEH would aid the process of prioritising and uptake RE sources, such as solar energy, to promote sustainable environmental practices and increase support for RET. MEEH would also need to address challenges such as the influence of powerful authorities and diesel smugglers that could discourage the uptake of RETs by communities.

To address the gender inequality challenges highlighted in the study, MEEH can support recurring local civic education programs like training and awareness campaigns to create and increase women's participation in RE projects. This will be instrumental in supporting the uptake of RET improving the social fabric of communities in Madagascar.

Ministère de l'Eau, de l'Assainissement et de l'Hygiène / Ministry of Water, Sanitation and Hygiene (MEAH) – MEAH[2] is responsible for ensuring the implementation of the State's general policies

[2] https://meah.gov.mg/

regarding water, sanitation, and hygiene. This task is accomplished through collaboration with all relevant entities, coordination of actors, and efficient administration.

Based on the baseline assessment findings, MEAH would have a crucial role in improving access to basic amenities like clean water and addressing sanitation infrastructure challenges in Madagascar, particularly in the Diana Region. Communicating communal sanitation challenges will be easier through partnerships with community associations and leadership.

Ministère de la Pêche et de l'Économie Bleue /Ministry of Fisheries and Blue Economy (MPEB[3]) – this ministry is responsible for all the marine resources activities in the entire country. MPEB can support the productive use of the energy value chain by promoting sustainable fishing practices and creating favourable policies for value addition, employment creation, recycling of the fishing industry waste, technology transfer, market sourcing, economic management training and awareness-creating programs. These activities can help promote environmental sustainability.

3.4.2. Organisations Affiliated with Government Ministries

Agence de Développement de l'Electrification Rurale/Rural Electrification Agency (ADER[4]): ADER is responsible for providing electricity services in rural areas, supervising and financing rural electrification projects, monitoring related activities in economic, statistical, and technical aspects, supporting rural development initiatives, and ensuring proper functioning of basic rural social services. Being the primary government agency for rural electrification, ADER can assist in implementing ENERGICA project activities.

The findings from the baseline assessment study suggest that ADER's primary responsibility will be to provide electricity services in rural areas and to supervise and finance rural electrification projects. Additionally, ADER will likely play a vital role in monitoring related activities in economic, statistical, and technical aspects to ensure that renewable energy technologies, such as solar energy, are adopted to promote sustainable environmental practices.

As the primary government agency for rural electrification, ADER also provides support for rural development initiatives and ensures the proper functioning of basic rural social services, a role they can engage in, in the ENERGICA project. The agency may need to collaborate with community members to promote the adoption of RETs, especially in the face of powerful authorities and diesel smugglers that could discourage communities from embracing these technologies.

The study's findings also suggest that ADER can play a crucial role in addressing inequalities, improving access to basic amenities, promoting economic development, and addressing infrastructure challenges to improve the social fabric of communities in Madagascar. Training and civic education can also be essential components to increase women's participation in RE projects, and ADER may need to provide this support to promote sustainable development. They can spearhead the uptake of RE initiatives of the ETB.

Office pour la Regulation de l'Electrification/Regulatory Authority of Electricity (ORE[5]): Their primary functions are to establish, publish, and oversee electricity tariffs, ensure adherence to quality-of-

[3] https://www.facebook.com/MPEBMADAGASCAR
[4] https://ader.mg/
[5] http://www.ore.mg/

service regulations, and monitor and uphold fair competition. As an independent regulator of the electricity sector, ORE is well-positioned to oversee the adherence to quality standards of the sustainable energy solutions proposed in the Diana Region for the ENERGICA project.

In addition to their normal functions, ORE will be responsible for overseeing the adherence to quality standards of sustainable energy solutions proposed in the Diana Region. This will involve establishing and publishing electricity tariffs that reflect the cost of RETs such as solar energy, to promote their adoption in rural areas.

ORE is responsible for ensuring compliance with quality-of-service regulations and will also ensure that communities have access to reliable and safe electricity services from the demonstrator solution. Additionally, ORE will monitor and uphold fair competition to prevent the influence of powerful authorities and diesel smugglers from discouraging communities from adopting RETs.

The study's findings suggest that ORE could play a critical role in promoting sustainable development by addressing inequalities, improving access to basic amenities, promoting economic development, and addressing infrastructure challenges. ORE may need to collaborate with community members to implement community projects that promote the adoption of renewable energy solutions in the Diana Region. The study also highlights the importance of training and civic education to increase women's participation in RE projects, which ORE may need to support to ensure the success of the ENERGICA project.

JIRAMA (JIro Sy RAno Malagasy): JIRAMA is Madagascar's national company for the production and distribution of water and electricity. It was formed on October 17, 1975, through the merger of two companies engaged in similar activities: the Malagasy Society of Water and Electricity (SMEE) and the Malagasy Society of Energies (SEM). It operates under the common law of public limited companies and is wholly owned by the Malagasy State. JIRAMA is responsible for producing, transporting, and distributing electricity throughout Madagascar, as well as providing almost all the country's public water and electricity services. It serves as a central buyer of electric power, both through public-private partnership mechanisms and as an operator within the framework of design, build, and finance mechanisms. JIRAMA is supervised by the Ministry of Energy and Hydrocarbons. JIRAMA's roles in ENERGICA will include supporting local private companies involved in the energy sector to increase energy access in rural areas using mini-grids and solar home systems. Additionally, JIRAMA may need to address the challenges identified in the baseline assessment study, including promoting civic education and training to increase women's participation in RE projects, improving access to basic amenities, and addressing infrastructure challenges.

The Economic Development Board of Madagascar (EDBM[6]): EDBM is the leading investment agency in Madagascar, aiming to enhance the competitiveness of the Malagasy private sector and increase Foreign Direct Investment (FDI). It provides incentives related to private investments in Madagascar and assists investors in their establishment and expansion process by offering specialised advisory services from Investment Managers. The EDBM is the government's institutional expression of its commitment to driving economic growth and job creation by implementing and developing projects that benefit Madagascar, whether carried out by foreigners or nationals. The EDBM serves as the gateway for business opportunities in sectors where Madagascar has a comparative advantage and high growth potential, including agribusiness, textile/clothing, infrastructure, Public Private

[6] https://edbm.mg/a-propos/ (accessed online on Jan,15 2023)

Partnership (PPP) projects, mining, Information and Communications Technology (ICT), and tourism. The EDBM's primary objectives are to improve the business environment, promote Madagascar as an investment destination, attract multinationals and local operators to invest in priority sectors, and provide free services to both new and existing investors to facilitate the implementation and expansion of their projects in Madagascar.

Based on the findings of the baseline assessment report, they can play a vital role in promoting sustainable energy solutions and addressing energy disparities in Madagascar. As the board is responsible for attracting foreign and local investors, the EDBM can encourage investment in the RE sector, including solar energy, and incentivize the implementation of community projects that promote sustainable development. Additionally, the EDBM can work with local authorities to address the influence of powerful actors and diesel smugglers that discourage the adoption of RETs. The agency can also facilitate training and civic education programs that promote women's participation in RE projects and support the development of infrastructure to improve access to basic amenities. By implementing these initiatives, the EDBM can help address inequalities, promote economic development, and improve the social fabric of communities in Madagascar.

As a national agency responsible for enhancing investment opportunities in the country, EDBM can aid the ENERGICA by facilitating necessary documentation for business such as importation tax reductions for solar photovoltaic panels and subsidies for Independent Power Producers through the Ministry of Ministère De L'énergie Et Des Hydrocarbures.

Institut National de la Statistique / National Statistical Institute (INSTAT[7]): INSTAT has two primary functions: as a public service, it creates official data on essential statistics for a socio-economic analysis, including price indices, national accounts, macroeconomic frameworks, human development indices, and social profiling. As a service provider, it conducts surveys on living standards, and socio-economic and demographic studies, and manages databases and computer development, including data entry and control. INSTAT is specifically responsible for creating national indicators such as the domestic and national product, economic growth rate, inflation rate, and investment rate within the framework of national accounts.

The INSTAT could potentially be involved in conducting surveys and studies related to the adoption of renewable energy sources, such as solar energy, to promote sustainable environmental practices and increase support for renewable energy technologies in Madagascar. This could involve collecting and analysing data on energy consumption, energy access, and the use of renewable energy sources in the country. INSTAT could also provide statistical data on the impact of such projects on the national accounts, economic growth rate, and investment rate. In addition, INSTAT could be involved in assessing the impact of the ENERGICA project on social profiling and human development indices and providing insights into the importance of training and civic education to increase women's participation in renewable energy projects. They will also be instrumental during the monitoring and evaluation of the project.

The Sustainable Agrifuels Platform (PAD[8]): PAD is an organisation that advocates for the growth of Madagascar's nascent biofuel industry. Its mission is to facilitate the adoption of appropriate policies,

[7] https://www.instat.mg/ (accessed online on Jan,15 2023)
[8]https://www.wwf.mg/en/ourwork/on_the_land/footprintprojects/promotion_of_the_sustainable_production_of_agrifuels_in_madagascar/ (accessed online on Jan,15 2023)

strategies, regulatory frameworks, and tools to support agrofuel investments in the country. To achieve this, the PAD project is focused on three key areas: establishing and operationalizing a national-level governing platform for the agrofuel sector, creating an Environmental and Social Impact Assessment (ESIA) guide for conducting pilot studies on the agrofuel sector and forming a network of NGOs and civil society organisations to monitor agrofuel investments at the national level. The goal of the PAD project is to encourage sustainable development in the biofuels industry of Madagascar by promoting responsible investment practices and fostering cooperation among stakeholders.

PAD could play a crucial role in promoting sustainable and accessible energy solutions in Madagascar. The baseline study identified a need for renewable energy sources like solar energy to address disparities in energy access and promote sustainable environmental practices. However, the study also highlighted challenges such as the influence of powerful authorities and diesel smugglers that could discourage the uptake of renewable energy technologies. The PAD could help address these challenges by promoting appropriate policies, regulatory frameworks, and tools to support the adoption of renewable energy solutions. The PAD could support community projects in collaboration with local communities to promote renewable energy solutions for sustainable development, thereby addressing social challenges.

3.4.3. Local Industry Representatives

In the ENERGICA project implementation area in the Diana Region, few companies could be identified. These companies offer energy supply services through solar PV systems for small to large-scale applications and cater to various categories of clients. One of the key strategic stakeholders in the ENERGICA project is Nanoé.

Nanoé[9] is a French-Malagasy social business enterprise working in integrating energy access using an innovative approach to the electrification model called ''lateral electrification''. It is a model based on renewable energies and digital technologies to provide easy and affordable basic energy services access and modern energy services to communities without energy access (ENERGICA's GA, 2020).

Nanoé's role in the ENERGICA project will be to provide innovative and affordable energy solutions to communities without energy access through their lateral electrification model, which utilises renewable energies and digital technologies. As a local partner, Nanoé will use its knowledge of the local communities to guide and support other stakeholders in the project, especially in the areas of community activation and involvement, and ETB implementation. They will also provide access to their nano grid products, such as Pico solar products on a cash or pay-as-you-go basis, solar home systems, and mini-grid connections, which will play a significant role in the project's success. Additionally, Nanoé will help address the challenges identified in the baseline assessment study to promote civic education and increase women's participation in renewable energy projects. Overall, Nanoé will contribute to the project's goal of improving the social fabric of communities in Madagascar by addressing inequalities, improving access to basic amenities, promoting economic development, and environmental sustainability, and addressing infrastructure challenges through sustainable and accessible energy solutions.

[9] https://www.nanoe.net/en/

3.4.4. NGOs and International Organisations

The relevant international organisations and NGOs that were mapped play a crucial role in supporting the development of mini-grids to increase energy access in remote or rural areas of Madagascar, with particular emphasis on supporting ADER. These organisations have provided significant financial support for mini-grid development in the country, such as Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and Fodem, who have been actively involved in PV mini-grid development. Furthermore, mini-grid or stand-alone solar companies have received subsidies from other relevant partners, to foster their expansion in this field. Although these entities are not currently operating in the Diana Region, they can actively contribute to addressing the requirements outlined in the baseline assessment within the region.

They can provide technical and financial support for the development of mini-grids in rural areas of Madagascar, with a focus on promoting sustainable energy and water access. These organisations can also complement efforts to address challenges in the energy sector, such as the influence of powerful authorities and diesel smugglers by promoting civic education and training programs to increase women's participation in renewable energy projects. Furthermore, international organisations and NGOs can collaborate with local communities to implement community-based projects to improve access to basic amenities, promote economic development, and address infrastructure challenges to improve the social fabric of communities in Madagascar.

More of the organisations mapped under this category are listed below.

1. GIZ[10] United Nations Industrial Development Organization (UNIDO)[11], United Nations Development Programme (UNDP)[12], The EU[13], KFW[14] and African Development Bank (AfDB)[15] [16]
2. World Bank and its partners (Least Cost Electricity Access Development Project)[17]
3. Power Africa[18]
4. World Wildlife Fund (WWF)[19]
5. Fonds François pour l'environnement Mondial (FFEM)[20],
6. The French Environment and Energy Agency (ADEME)[21],
7. Food and Agriculture Organization (FAO)[22],
8. Café Lumière" project[23]
9. Agence Française de Développement (AFD)[24],
10. United Nations Capital Development Fund (UNCDF)[25] - Making Access Possible Programme

[10] https://www.giz.de/en/worldwide/322.html
[11] https://www.unido.org/
[12] https://www.undp.org/tag/madagascar
[13] https://www.eeas.europa.eu/madagascar/european-union-and-madagascar_en?s=106
[14] https://www.kfw-entwicklungsbank.de/Internationale-Finanzierung/KfW-Entwicklungsbank/Weltweite-Pr%C3%A4senz/Subsahara-Afrika/Madagaskar/
[15] https://www.afdb.org/en/countries/southern-africa/madagascar
[16] https://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/africa-energy-market-place/aemp-round-3/madagascar
[17] https://www.worldbank.org/en/country/madagascar
[18] https://www.usaid.gov/powerafrica/madagascar
[19] https://www.worldwildlife.org/places/madagascar
[20] https://www.ffem.fr/fr/page-region-pays/madagascar
[21] https://www.climate-kic.org/
[22] https://www.fao.org/countryprofiles/index/en/?iso3=MDG
[23] https://electriciens-sans-fronTieres.org/en/projet/cafe-lumiere-multi-service-energy-platforms/
[24] https://www.afd.fr/fr/page-region-pays/madagascar
[25] https://www.uncdf.org/madagascar

11. **Helvetas**[26] **Madagascar**: The organisation is focused on promoting sustainable living conditions for both men and women in a secure and dignified manner using environmental resources. Its main goal is to assist individuals living in impoverished and disadvantaged circumstances globally, with a particular emphasis on developing countries.

12. **The Aga Khan Development Network (AKDN**[27]**)**: This international agency strives to improve the quality of life for disadvantaged communities, particularly in Asia and Africa, regardless of origin, gender, or faith. It employs a multifaceted approach to implement sustainable, long-term programs that address poverty, empowering individuals, and communities to become self-reliant. The network includes governments, businesses, and civil society organisations, and it is committed to serving communities through initiatives that include physical and social infrastructure, health and education services, business and finance facilities, habitat, and environmental planning, as well as cultural preservation and revitalization.
13. **Blue ventures**[28]: the focus is on ocean restoration and improving the livelihoods of traditional fishing communities both in Madagascar and across the globe. They collaborate with local fishers and community organisations to promote sustainable fishing management, conservation, and protection of the ocean. They also advocate for reforms, share tools and best practices, and work towards ensuring healthy oceans. Their efforts are aimed at benefiting the local communities as well as contributing to the global goal of ocean sustainability.
14. **AXIAN**[29] **Group**: a collaboration between AXIAN Group and GreenYellow Group, has developed a hybrid solution that incorporates photovoltaic and thermal technologies to meet the energy demands of eastern Madagascar (Toamasina). Colas Madagascar serves as the primary supplier of materials for constructing the power plant. AXIAN Group has proposed a unique power plant design that is mobile and can function independently of the electricity grid.

3.4.5. Educational Institutions

This stakeholder group plays a crucial role in promoting sustainable energy solutions and increasing awareness among the local communities. They can support capacity building and training of local communities in the local language to facilitate the key messages of the project and its benefits in improving their living conditions. Through group discussions and sharing of experiences, education institutions can convince the local communities to actively participate in the project by providing a comprehensive understanding of the project components and subcomponents and the full project benefits to the local communities. Education institutions can also play a role in increasing women's participation in renewable energy projects through civic education and training programs. Additionally, education institutions can contribute to developing capacity-building programs, conducting needs assessment and research on the impact of the project on social, economic, environmental, and technological development. As prominent institutions in the field of education, the below two were mapped:

[26] https://www.helvetas.org/helvetasusa.org/en/who-we-are/vision-mission (accessed online on Jan 15, 2023)
[27] https://the.akdn/en/who-we-are
[28] https://blueventures.org/what-we-do/
[29] https://www.aggbusiness.com/ab7/news/ges-builds-solar-energy-plant-madagascar-quarry

1. **The Higher Institute of Technology of Antsiranana (ISTD)[30]:** ISTD is a public institution dedicated to higher education and research and operates under the supervision of the Ministry of Higher Education and Scientific Research. It enjoys educational, administrative, and financial autonomy, and offers a diverse range of undergraduate and postgraduate programs in fields such as industrial engineering, management, commercial and service engineering, civil engineering, and naval engineering.
2. **Higher Polytechnic Institute of Antsiranana:** is a public institution of higher education and research, under the supervision of the Ministry of Higher Education and Scientific Research.

3.4.6. Representatives of Civil Society Organizations

The term Civil Society Organizations (CSOs) encompasses various entities, such as NGOs, public and private foundations, professional associations, trade unions, and entities in the Social Solidarity Economy (SSE) sector, including cooperatives and economic actors. In this section, CSOs refer specifically to professional associations, local NGOs, trade unions, cooperatives, and economic actors that work autonomously or in conjunction with international NGOs to achieve specific goals related to education, access to clean water, healthcare, environmental issues, and natural resource conservation.

At present, there is no local CSO mapped in the project implementation area. However, it is possible to come across them during implementation and it would be noble to invite them into the ETB.

CSOs play a crucial role in monitoring and evaluating the current situation faced by the communities and seeking ways to improve it. To do so, representatives of CSOs must clarify energy sector policies related to the project, act realistically and collaboratively, and ideally act as neutral and independent actors between the project and beneficiaries in the Diana Region to balance and assess project activities with local authority representatives.

3.4.7. Local Community Members

Situated in north-western Madagascar, the Diana Region boasts some of the country's most important marine and terrestrial biodiversity. Its diverse ecosystems include small islands, moist forests, mangroves, coral reefs, and transitional vegetation. With a population of approximately 486,000 people and a thriving shrimp agricultural industry, the Diana Region is also a popular tourist destination that contributes to the country's economic development.

For this project implementation, the primary community members selected include Mayors of the Diana Region, village opinion leaders (such as traditional chiefs and religious leaders), Micro, Small, and Medium-Size Enterprises (registered or not registered), productive nano grid users, farmers, and fishers. As stakeholders of the project outcomes, these local community members play a vital role in facilitating its implementation using a bottom-up approach. They are involved from the project's inception to its conclusion as local actors. Community activation and involvement are critical first steps towards ensuring that all project contours are understood by facilitating discussions and defining key roles among community members.

[30] https://www.auf.org/les_membres/nos-membres/institut-superieur-de-technologie-dantsiranana/

3.5. Sierra Leone's Stakeholders and their potential roles

The information on the identified stakeholders in the Sierra Leone context is as below:

3.5.1. Local Authorities

The success of locally based projects depends on various stakeholders, such as ministries, affiliated agencies, and key technical services. These entities can contribute to the success of the project by providing strong policies and regulatory frameworks, structuring financial channels, and offering technical assistance to local communities, such as training on equipment installation and maintenance. Additionally, many governments establish dedicated agencies to oversee the deployment of electricity in rural and isolated regions. Specifically, the mapped institutions will have roles that relate to their functions as below:

Ministry of Energy (MoE)[31]: MoE is responsible for overseeing the energy sector and developing/ implementing policies, regulations, and programs to provide affordable and sustainable energy services to the population. The MoE is also tasked with formulating and implementing energy-related projects and programs. Furthermore, the MoE provides oversight functions across the entire energy supply chain for all agencies, including the Electricity Generation & Transmission Authority (EGTC), the Electricity Distribution & Supply Agency (EDSA), the Electricity & Water Regulatory Commission (EWRC), and other forms of energy supply and utilisation.

The MoE could play a crucial role as a regulatory body before and after the implementation of the ETB. To facilitate the successful execution of the project, several measures can be adopted, including: Offering fiscal incentives, subsidies, tax and duty exemptions to ease the upfront expenses for potential investors in the renewable energy sub-sector; Ensuring that renewable energy prices are cost-effective, resulting in reasonable returns on investment; Creating guarantees for investments in the renewable energy projects; Incorporating biogas into the country's energy policy; and enacting new energy sector legislation that integrates biogas and provides equal opportunities for its development.

MoE's other role would be to address the energy-related needs of Sierra Leoneans. Specifically, the MoE would need to focus on improving affordability, increasing access to renewable energy sources, and improving the infrastructure and reliability of existing energy providers to address the disparities in energy access. The MoE would also need to promote community participation in the energy sector to ensure that the needs and priorities of the people are reflected in the policies and programs that are developed. Additionally, the MoE would need to address waste management challenges to ensure that the energy sector is sustainable and does not have negative environmental impacts.

Finally, an important focus of the MoE is education and awareness-raising campaigns to promote renewable energy solutions and empower women to participate fully in renewable energy projects. This would not only reduce gender-based and domestic violence but also promote the well-being of the family unit and put an end to child labour. Overall, the MoE would need to take a holistic approach to address the energy needs of Sierra Leoneans, considering the social, economic, and environmental factors that contribute to the challenges faced by the population.

[31] About Us – Ministry of Energy

Foreign Affairs and International Cooperation[32]: The Government of Sierra Leone's foreign policy department plays a crucial role in enhancing the country's competitiveness in the global economy. This department is primarily responsible for pursuing Sierra Leone's foreign policy objectives as outlined in Section 10 of Chapter II of the 1991 Constitution of Sierra Leone. The department's vision is to integrate the Foreign Service into the country's efforts to promote peace, security, and development at the national, sub-regional, and global levels.

The foreign policy department of Sierra Leone would have a role in addressing the energy-related needs of the country as part of its broader efforts to promote sustainable development and peace. The department could engage in diplomacy to foster international partnerships and secure funding and technical support for renewable energy projects and initiatives aimed at improving energy infrastructure and reliability. This could involve collaborating with foreign governments and international organisations to address the challenges of low access to energy, affordability, and waste management. The department could also promote community participation in the energy sector by working to integrate renewable energy solutions into national and regional development plans and strategies. This could involve engaging with local communities to promote awareness and education on renewable energy and working to empower women to participate fully in the renewable energy sector.

Overall, the foreign policy department can play a crucial role in addressing the energy-related needs of Sierra Leone by leveraging international partnerships and promoting policies and initiatives that support sustainable development and the well-being of the country's citizens.

Ministry of Agriculture Forestry and Food Security (MAFFS)[33]: The ministry is responsible for developing agricultural policies and providing advice to the government on the management of Sierra Leone's agricultural sector. Ensured the proper implementation of donor-funded and government-initiated projects aimed at improving agricultural production and productivity. Numerous ongoing projects are aimed at achieving food security and fulfilling sustainable development goals. The MAFFS aims to create an enabling environment for farmers and promote appropriate research, extension services, input delivery, and market systems to increase rural incomes, reduce poverty, and preserve the natural environment.

The MAFFS could play a vital role in ensuring the availability of supply resources and the interconnection between water, energy, and food, waste management from biogas plants, and the utilisation of fertilisers in farming. It is also responsible for implementing policies by developing regulations and issuing permits, creating a conducive environment, facilitating dialogue opportunities, improving coordination, and establishing monitoring mechanisms. In addressing the issue of low access to energy, the agriculture department of the MAFFS could promote sustainable and accessible energy solutions for farmers, improve infrastructure, and waste management, and reduce child labour in the waste management and agriculture sectors. They could also collaborate with other stakeholders to provide education on renewable energy, encourage women's participation in renewable energy projects, and ultimately promote the well-being of families while reducing gender-based and domestic violence.

[32] https://mofaic.gov.sl/
[33] Ministry of Agriculture & Forestry – Government of Sierra Leone (maf.gov.sl)

Ministry of Planning, and Economic Development (MPED)[34]: The MPED could play a crucial role in addressing the issues highlighted in the report. They could prioritise sourcing for funding and implementing projects that address the low level of access to energy and promote the use of sustainable and accessible energy solutions. They could also work towards improving the infrastructure and reliability of existing energy providers, which could help alleviate some of the waste management challenges. The MPED is in the position to promote community participation in decision-making processes and encourage the involvement of women. Additionally, the Ministry could leverage its expertise in planning, monitoring, and mobilising resources to ensure that the implementation of these projects is comprehensive and fair, ultimately promoting sustainable growth and development of the nation.

The MPED could play a vital role in tackling the issues raised in the report. They can prioritise securing funding and implementing projects that address low energy accessibility and promote the use of sustainable and accessible energy solutions. Additionally, they can work towards improving the infrastructure and reliability of existing energy providers to help alleviate some of the waste management challenges. The MPED could also encourage community involvement in decision-making processes and promote the participation of women in renewable energy and economic projects. Furthermore, the Ministry can use its expertise in planning, monitoring, and resource mobilisation to ensure that the implementation of these projects is comprehensive and fair, ultimately promoting sustainable growth and development of the nation.

Ministry of Health and Sanitation: MoHS[35] aims to provide accessible, equitable, and affordable high-quality healthcare services to all Sierra Leoneans through a functional national health system. The MoH is in the position to address health issues developed or fostered through sanitation challenges, especially in communities living near dump sites. Additionally, the MoHS could focus on addressing underlying social issues such as gender-based violence and child labour that can negatively impact the health and well-being of individuals and communities. By prioritising these actions, the Ministry of Health can help ensure that all Sierra Leoneans have access to high-quality healthcare services that meet their needs.

The MoHS's role could be to prioritise providing accessible, equitable, and affordable high-quality healthcare services to all Sierra Leoneans through a functional national health system. They could work towards improving healthcare infrastructure and facilities in Sierra Leone to address the disparities in healthcare access and address sanitation challenges, especially in communities living near the dump sites. They could also promote community participation and education on healthcare to increase awareness and knowledge of the importance of seeking healthcare services. Additionally, the MoH could focus on addressing underlying social issues such as gender-based violence and child labour that can negatively impact the health and well-being of individuals and communities. By prioritising these actions, the MoHS can help ensure that all Sierra Leoneans have access to high-quality healthcare services that meet their needs.

Ministry of Lands, Housing and Country Planning (MoLHCP)[36]: The MLCPE could play a key role in addressing environmental concerns related to the adoption of sustainable and accessible energy solutions. They could provide technical support to conduct environmental evaluations, assess the

[34] About Us - moped.gov.sl
[35] https://mohs.gov.sl/
[36] https://molhcp.gov.sl/

impacts of technology on ecosystems and advise on the development of environmental policies and regulations. They could also facilitate the planning and coordination of waste management activities, promote community participation, and improve awareness and education on renewable energy.

Ministry of Social Welfare, Gender, and Children's Affairs (MSWGCA): is charged with the responsibility of responding to the social needs about Gender inequalities, and social depravity of groups like people with disability. In this project, they can work with other stakeholders to empower women to participate fully in renewable energy projects and reduce gender-based and domestic violence. They can also work with the Department of Labour to streamline and enforce labour laws and curb child exploitation in the waste collection industry in Freetown.

3.5.2. Organisations Affiliated with Government Ministries

The Electricity Distribution and Supply Authority[37]: This national entity is responsible for electricity distribution and supply, pending contact. It is financially dependent on the Ministry of Finance and Economic Development (MOFED).

As the national entity responsible for electricity distribution and supply in Sierra Leone, the Electricity Distribution and Supply Authority will have a crucial role in implementing the recommendations of the study. Specifically, they will need to improve the affordability and reliability of their services, increase access to renewable energy sources, and improve their infrastructure to address the disparities in energy access. Additionally, they will need to work closely with the MLCPE to ensure that their operations are environmentally sustainable and that they do not contribute to waste management issues or other negative impacts on ecosystems. Finally, they will need to promote community participation in their operations and consider ways to empower women to fully participate in renewable energy projects to reduce gender-based and domestic violence and improve the well-being of families in Sierra Leone.

Sierra Leone Electricity and Water Regulatory Commission (SLEWRC)[38]: This regulatory authority is responsible for issuing licences, approving tariffs, and formulating and monitoring compliance with regulatory frameworks to ensure the safe, secure, affordable, and reliable supply of water and electricity in Sierra Leone.

As the regulatory authority responsible for monitoring compliance with regulatory frameworks for the safe, secure, affordable, and reliable supply of water and electricity, the SLEWRC may play a role in ensuring that any biogas production and water purification systems comply with relevant regulations and safety standards. They may also work to facilitate the adoption of sustainable and accessible energy solutions and infrastructure improvements to increase access to reliable water and electricity services in Sierra Leone.

The Freetown City Council (FCC)[39]: As a local representative and key stakeholder, this entity plays a significant role in the solid waste management system in Sierra Leone.

[37] https://www.energica-h2020.eu/
[38] https://www.energica-h2020.eu/
[39] https://fcc.gov.sl/

3.5.3. Local Industry Representatives

Industries can play a significant role in promoting infrastructural investments, such as the installation of new environmentally friendly biogas plants. The Freetown Waste Transformers (FWT) and Waste Collection and Management Association (WCMA) can provide testing and transformation of household and commercial waste, while CAMSERV SL LTD can suggest technical engineering solutions tailored to the Sierra Leonean context. Additionally, industries may offer personal development schemes, including training programs.

Freetown Waste Transformer (FWT)[40]: This company has over 15 years of experience in both the waste management and energy sectors in Sierra Leone, operating as an integrated waste-to-energy company in Freetown. Using anaerobic digestion technology, the company has executed a productive pilot for a waste-to-energy site that converts organic waste into thermal heat, electricity, and organic fertiliser with success. Their goal is to provide sustainable solutions to their clients and communities, improve the working environment for their employees, and deliver better services to their stakeholders.

FWT is the local partner responsible for implementing the demonstrator solution by providing sustainable solutions to address waste management challenges in Sierra Leone, such as converting organic waste into energy and fertiliser. They contribute to improving access to energy by supplying thermal heat and electricity through their waste-to-energy process; Empowering their employees to perform optimally and deliver better services to their stakeholders, which could involve training and personal development programs; Promoting community participation in waste management and renewable energy projects, in line with the report's recommendations and Increasing awareness and education on renewable energy for the whole community, which aligns with the report's call for greater education on renewable energy solutions.

Waste Collection Management Association (WCMA[41]): This association is composed of groups of tricycle operators that aim to promote the growth of their businesses and sustain household waste collection in Sierra Leone. They have the potential to become a strong advocate for their members, pushing for better access to finance, improved training, and better working conditions and contract terms.

The WCMA could play a vital role in addressing waste management challenges identified by Sierra Leoneans, as well as advocating for better access to finance, improved training, and better working conditions and contract terms for their members. By promoting sustainable and accessible waste management solutions, the WCMA can contribute to the improvement of infrastructure and reliability of waste management services in Sierra Leone. Furthermore, the association can help promote community participation in waste management initiatives and raise awareness of renewable energy for the whole community, while empowering women to participate in renewable energy projects to reduce gender-based and domestic violence and promote the well-being of the family unit and end child labour.

CAMSERV SL LTD[42]: CAMSERV can contribute to addressing the infrastructure challenges and low access to energy identified by Sierra Leoneans by providing their engineering and consultancy services,

---

[40] https://www.freetownwastetransformers.com/
[41] https://www.thesierraleonetelegraph.com/waste-collection-management-association-launched-in-freetown/
[42] Home – Camserv (camserv-group.com)

project management, equipment sale and rental, and refurbishment expertise to support the development of renewable energy solutions. They can utilise their experience in the oil and gas industry to identify and address challenges in the renewable energy sector and contribute to the improvement of infrastructure and reliability of energy providers. Additionally, CAMSERV can play a role in promoting community participation in renewable energy initiatives and raising awareness of the benefits of renewable energy for the whole community. They can also work to empower women to participate fully in renewable energy projects.

Women in Energy SL LTD[43]: The non-profit association is dedicated to supporting the professional growth of women in the energy sector and empowering them to achieve leadership roles. Their mission is to increase the visibility of women in the field and promote their participation in top decision-making positions.

3.5.4. NGOs and International Organisations

NGOs are at the forefront of actively engaging in community involvement and activation. They can participate in energy transition activities by promoting sustainable consumption, advocating for bioenergy policies, empowering local communities socially, economically, or politically, and protecting the local or global environment. However, there is a lack of contact with NGOs as relevant stakeholders whose vision aligns with the ENERGICA project in Sierra Leone. To address this, grants and funds assistance can be provided by various organisations to play a significant role in the energy transition. For example, loans from Energising Development (EnDev) could be made available to local communities and private sectors to afford initial cost expenses, while the World Bank can provide funding and subsidies through government and NGOs for the rapid deployment of biogas production technologies. They could also support local cooperatives in clean cooking facilities using biogas products. Finally, they are positioned to facilitate scientific and technological collaborations among stakeholders, such as educational institutions and other ENERGICA project partners, by promoting research and development activities in the context of this project.

1. **Care International**[44] has been operating as an NGO in Sierra Leone since 1961, with a primary focus on enhancing children's nutrition through school food programs. However, in recent times, CARE Sierra Leone has shifted its priorities towards tackling crucial issues such as economic development, food security, and public health.
2. **Energising Development (EnDev)**[45]**:** EnDev is a global initiative operating in twenty-six countries, implemented by GIZ on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). Since its inception in 2014, EnDev has collaborated with government agencies, national and local NGOs, donors, and the private sector to promote sustainable energy systems, establish markets for PicoPV products, increase awareness through marketing, introduce solar dryers for cocoa farmers, and improve cooking technology.
3. **The World Bank**[46]**:** The current initiative involves the approval of funding for the energy sector to enhance the operational efficiency of the national electricity distribution system in Sierra

[43] https://womeninenergysl.com/
[44] https://www.care-international.org/our-work/where-we-work/sierra-leone
[45] https://www.giz.de/en/worldwide/28867.html
[46] https://www.worldbank.org/en/country/sierraleone

Leone. Additionally, the aim is to promote capacity building and foster the development of human capital for the Ministry of Energy.

3.5.5. Educational Institutions

The successful implementation of the project requires active involvement from key stakeholders, including educational institutions. These institutions can contribute to the development of bioenergy technology alternatives, bioenergy scenarios, and project cost-benefit assessments. Such actions would increase fertiliser production for agricultural activities and improve water purification. Notably, Njala University and the Sierra Leone Agricultural Research Institution can play a significant role in this regard by developing tailored technologies for biogas production at the demonstration site and conducting cost and environmental benefit analysis. Additionally, they are expected to support societal transformation by:

i. Promoting research and development in the renewable energy sector, with a particular emphasis on biogas.
ii. Preparing energy reports that highlight the societal impacts of the project.
iii. Collaborating with other key stakeholders to establish research priorities.
iv. Offering capacity-building through short-term training courses that focus on biogas technologies to train a new generation of local energy professionals.
v. Informing end-users about the benefits and uses of the technology.

Njala University[47]: Njala University is a renowned institution in Sierra Leone that provides quality education to undergraduate and postgraduate students across various disciplines. These specialisations include Education, Agricultural Research and Extension, Agricultural Engineering, Environmental and Community Health Sciences, Social Sciences and Law, Natural Resources Management, and Information Technology, among others.

Sierra Leone Agricultural Research Institution (SLARI)[48]: SLARI is the only agricultural research and technology-generating organisation in Sierra Leone, that focuses its efforts on several research areas, including root, tuber, and grain legume crops program, cereal crops program, livestock program, forestry and tree crops program, land water and environmental, among others.

3.5.6. Representatives Of Civil Society Organizations

The involvement and participation of civil society organisations are also crucial in the context of Sierra Leone to bridge the information and communication gaps between local communities, policymakers, and other stakeholders. They are expected to also contribute to information gathering and dissemination, policy development, implementation, and advocacy, as well as the assessment and monitoring of project activities. They are seen at the implementation site of Sierra Leone as a reliable intermediary between the ENERGICA project partners, government representatives, and end-users.

Don Bosco Fambul[49]: This is a local non-governmental organisation that provides support to vulnerable children, teenagers, and young adults who live on the streets of Freetown. They can work together with MSWGCA to address the plight of children in the waste collection industry in Freetown.

[47] www.njala.edu.sl
[48] http://www.slari.gov.sl/
[49] https://donboscofambulsl.org/

3.5.7. Local Community Members

The active participation of the local community in the energy transition and their collaboration with other stakeholders provides the customer base and might also grant ownership of land and other resources necessary for the project. For example, FCC and AWC can play a role in promoting information campaigns, increasing social awareness, and motivating action throughout the project.

The Aberdeen Women's Centre (AWC)[50]: This hospital offers a variety of free health services to women, adolescent girls, and children in Sierra Leone, recognizing that women are particularly susceptible to diseases caused by air pollution from the waste-dumping areas.

3.6. Kenya's Stakeholders and their potential roles

3.6.1. Local Authorities

The formulation of policies and regulations to promote the cost-effective usage of electric vehicles can be facilitated by local authorities. This can be achieved by integrating policymaking into larger frameworks, such as national mobility plans, greenhouse gas reduction plans, sustainable development goals (SDGs), and nationally determined contributions (NDCs). The following roles could be fulfilled by local authorities in this regard:

The Ministry of Energy (MoE)[51]: The MoE is the lead institution at the national level, responsible for policy formulation and providing a long-term vision for all players in the energy sector. Its purview includes sectoral planning, rural electrification, and exploration of domestic energy sources. Additionally, the MoE promotes the development of renewable energy and mobilises financial resources for the public sector. Its mission is to facilitate the provision of clean, sustainable, affordable, reliable, and secure energy services for national development while protecting the environment.

Based on the ENERGICA baseline assessment, the MoE in Kenya will have to undertake various important tasks to tackle the challenges in the energy sector. These tasks include aligning project objectives with national policy and regulatory texts, ensuring the efficiency of subsidies for electric mobility infrastructure, simplifying administrative procedures, and reducing bureaucracy. Additionally, the MoE will need to engage in policy formulation, sectoral planning, rural electrification, renewable energy development, collaboration, and promotion of women's participation in renewable energy projects to improve affordability and infrastructure, increase access to renewable energy sources, and promote the adoption of electric motorcycles. All these efforts will require collaboration with other government agencies, private sector actors, and civil society organisations to create a conducive environment for the energy sector in Kenya.

The Ministry of Industry, Trade and Cooperatives (MoITC)[52]: This ministry is tasked with establishing and upholding Electric Vehicle standards and is mandated to create a favourable environment for a globally competitive, sustainable Industrial, enterprise, and Cooperative sector through proper policy, legal, and regulatory frameworks. The MoITC will have several key roles to play based on the findings of ENERGICA's baseline assessment. These roles include establishing and upholding electric vehicle

[50] https://wearepurposeful.org/meet-our-community/the-aberdeen-womens-centre-awc/
[51] ENERGICA Deliverables 1.3 - https://www.energica-h2020.eu/
[52] https://www.developmentaid.org/donors/view/147615/ministry-of-industry-trade-and-cooperatives-republic-of-kenya

standards and creating a supportive environment for a globally competitive, sustainable industrial, enterprise, and cooperative sector through proper policy, legal, and regulatory frameworks. In addition, the MoITC will need to collaborate with other stakeholders to address the challenges facing the energy sector, such as improving affordability and infrastructure, increasing access to renewable energy sources, promoting the adoption of electric motorcycles, and addressing trust and initial cost issues related to the adoption of renewable energy technologies. The MoITC will also need to promote women's participation in renewable energy projects through awareness creation, equitable resource distribution, and financial support. To achieve these objectives, the MoITC will need to work with other government agencies, private sector actors, and civil society organisations to create a supportive environment for the energy sector in Kenya.

3.6.2. Organisations Affiliated with Government Ministries

The Ministries mentioned above have affiliated organisations that possess extensive experience in Kenya's energy sector, including technical services and ministerial departments. Notable examples include the Kenya Electricity Generating Company, Kenya Electricity Transmission Company, and Kenya Power and Lighting Company, which are responsible for electricity generation, transmission, and distribution respectively. The National Transport and Safety Authority is tasked with regulating the transport sector. These organisations can support the ENERGICA project in the following ways: Advocating for the continuous development of policy incentives to promote electric mobility in Kenya; Aiding in the scaling-up of electric mobility by applying for green funds; Contributing to the deployment of technology through techno-economic incentives and investing in electric mobility infrastructure using global green funds; and Assisting in the development of a sustainable transport roadmap.

Energy and Petroleum Regulatory Authority (EPRA)[53]: It is an independent regulatory authority responsible for technical and economic regulation of electricity, upstream petroleum, and coal. It works to set, review, and adjust consumer tariffs as well as to provide consumer protection and approve power purchase agreements (PPAs) and power tariffs. It also promotes competition and provides regulation to energy sub-sectors, resolves consumer complaints, and enforces environmental, health and safety regulations. Its mission consists of enhancing lives by ensuring that there is sustainable, cs-efficient, and quality energy and petroleum. Based on the findings from ENERGICA's baseline assessment, the EPRA has several important roles to play in the implementation process. To improve affordability and infrastructure, increase access to renewable energy sources, and promote the adoption of electric motorcycles, EPRA will need to review and adjust consumer tariffs, approve power purchase agreements (PPAs) and power tariffs, and ensure that there is competition in the energy sub-sectors. Additionally, EPRA will need to provide consumer protection, resolve consumer complaints, and enforce environmental, health, and safety regulations to ensure the provision of sustainable, cost-efficient, and quality energy and petroleum. EPRA will also need to work with stakeholders to create a supportive environment for the adoption of electric motorcycles and promote women's participation in RE projects through awareness creation and equitable resource distribution.

The Rural Electrification and Renewable Energy Corporation (REREC)[54]: REREC is the Kenyan authority responsible for implementing rural electrification through the extension of the grid and off-grid projects, managing the Rural Electrification Program Fund, mobilising funds in supporting rural

[53] https://www.epra.go.ke/our-mission-vision-and-values/
[54] ENERGICA Deliverables 1.3 - https://www.energica-h2020.eu/

electrification projects, financing project preparation studies for rural electrification and recommending suitable policies to the government; developing, promoting and managing the use of all renewable energy and technologies excluding geothermal. It also coordinates research in renewable energy and has a mission to provide sustainable energy solutions for all through rural electrification and renewable energy for social economic transformation. REREC is supposed to support rural electrification and promote renewable energy technologies. The organisation will need to focus on improving affordability and infrastructure in rural areas, increasing access to renewable energy sources, and promoting the adoption of electric motorcycles by providing financing options and awareness creation. REREC will need to coordinate research and development in renewable energy technologies, mobilise funds, manage the Rural Electrification Program Fund, and recommend suitable policies to the government. The organisation will need to work closely with other stakeholders, including government agencies, private sector actors, and civil society organisations, to create a supportive environment for the energy sector in Kenya. REREC's mission to provide sustainable energy solutions for all through rural electrification and renewable energy for socioeconomic transformation will be critical in addressing the challenges facing the energy sector in Kenya.

The Kenya Electricity Generating Company (KenGen)[55]: The national enterprise responsible for producing electricity is owned 70% by the government and 30% by the private sector. KenGen is mandated to develop and manage all public power generation facilities, while also competing with independent power producers (IPPs).

Based on the information provided, KENGEN's leading role could be to develop and manage public power generation facilities and compete with IPPs to ensure the availability of affordable and reliable energy. KENGEN will need to consider the recommendations from the ENERGICA baseline assessment and explore opportunities to increase the use of renewable energy sources in its power generation facilities, which could help to reduce the cost of energy for households. Additionally, KENGEN may want to consider collaborating with other stakeholders, including REREC, to explore opportunities for off-grid and decentralised energy solutions that can address the reliability issues faced by households. KENGEN may also want to consider initiatives that promote women's participation in the energy sector to support the adoption of renewable energy technologies and other sustainable solutions.

Kenya Electricity Transmission Company (KETRACO)[56]: The national company is responsible for planning, designing, constructing, owning, operating, and maintaining high-voltage electricity transmission grids, including regional interconnectors that form the backbone of the National Transmission Grid. It is fully owned by the government and is responsible for the ownership, planning, design, construction, operation, and maintenance of high-voltage electricity transmission lines (132kV and above) and associated substations.

KETRACO's roles will be crucial in improving affordability and infrastructure for energy access in Kenya, particularly with the high-voltage electricity transmission grids. KETRACO will play a key role in increasing access to renewable energy sources by ensuring that transmission infrastructure is in place to facilitate the integration of renewable energy into the grid. Additionally, KETRACO's regional interconnectors will be instrumental in linking various parts of the country, enabling the sharing of power resources, and improving reliability. KETRACO can collaborate with stakeholders to ensure that transmission infrastructure supports the adoption of electric motorcycles, by providing charging infrastructure and facilitating the connection of decentralised renewable energy systems to the grid.

[55] https://www.kengen.co.ke/
[56] https://www.africaoutlookmag.com/company-profiles/819-kenya-electricity-transmission-co-ltd-ketraco

Finally, KETRACO can work to promote women's participation in RE projects by ensuring equitable access to transmission infrastructure and ensuring that women's voices are heard in decision-making processes related to transmission infrastructure development.

Kenya Power and Lighting Company (KPLC)[57]: This company is responsible for most of the electricity transmission and distribution systems in Kenya, serving over eight million customers as of the end of June 2020. It is a publicly owned entity that transmits, distributes, and retails electricity throughout the country. The company's mandate is to provide innovative solutions that secure business sustainability while powering people for better lives. They are also an ENERGICA consortium member and local partner for the Kenyan context. Among their other roles in the consortium, KPLC will help address affordability and reliability of electricity challenges for households in Kenya as raised in the household survey. As a publicly owned entity responsible for the transmission, distribution, and retail of electricity, KPLC could work towards improving the country's infrastructure and increasing access to renewable energy sources. They could also collaborate with stakeholders to create a supportive environment for the adoption of electric motorcycles by boda-boda riders by focusing on the charging duration and costs, decentralised maintenance of the motorcycles, the motorcycles' capacity, financing options to acquire them, and awareness creation. Additionally, KPLC can promote women's participation in RE projects through awareness creation, equitable resource distribution, and financial support, as highlighted in the study's findings. KPLC's mandate to provide innovative solutions that secure business sustainability while powering people for better lives could play a critical role in achieving these objectives.

The National Transport and Safety Authority (NTSA)[58]: The national authority responsible for harmonising the regulation, licensing, and registration of motorcycles is also responsible for providing relevant data and information. Its mission is to enhance road safety for all road users through effective planning, management, and regulation of the road transport system. NTSA's roles concerning the findings from the ENERGICA baseline assessment would be to harmonise regulations and licensing for the adoption of electric motorcycles as a means of transportation, ensuring that safety standards are met and the vehicles are properly registered and licensed; They can provide relevant data and information about the adoption of electric motorcycles to stakeholders, including riders, manufacturers, and government agencies, to support informed decision-making and they are experienced to work with stakeholders to create a supportive environment for the adoption of electric motorcycles, focusing on issues such as charging infrastructure, financing options, and awareness creation, enhancement of road safety for all road users, including riders of electric motorcycles. Overall, the NTSA plays a critical role in ensuring the safe and efficient adoption of electric motorcycles as a means of transportation in Kenya.

Kenya Industrial Research and Development Institute (KIRDI)[59]: Established in 1979 under the Ministry of Trade and Industry, this is a national research institute that is mandated to undertake multidisciplinary research and development in industrial and allied technologies. They, together with the mapped universities, will build on the knowledge base of RE and RET in the country to inform project implementation strategies.

[57] https://kplc.co.ke/content/item/14/about-kenya-power
[58] https://ntsa.go.ke/index.php
[59] https://www.kirdi.go.ke/

3.6.3. Local Industry Representatives

The participation of local industry representatives, especially those in the transport sector, is crucial to the future of mobility. They assist in integrating new variables and distributed resources, improving operating efficiency, and reducing costs for all customers. Additionally, they can invest in electric vehicle infrastructure, prepare to manage load and support emerging transportation service providers by developing rate plans that incentivize off-peak charging. It is also important that they identify electric vehicle (EV) owners and educate them about special rate plans, offer "green charging" plans where possible, develop smart charging solutions to shape load and create new grid services. Local industry representatives can also work with fleet owners, cities, and emerging mobility providers.

ROAM[60]: Established in Nairobi in 2017, this international organisation aims to expand the accessibility of electric transport to a wider market by improving cost-efficiency and simplifying deployment. Their focus is on developing all-electric conversion kits for fleet vehicles, including light trucks, public transport, and buses, as well as electric motorcycles and energy storage systems. It is also the consortium partner responsible for implementing the demonstrator solution.

ROAM's roles will be to develop electric motorcycles and energy storage systems, to improve cost-efficiency and support the adoption of renewable energy sources, which can help to address the challenges of inflated energy costs and reliability issues in Kenya. They can also collaborate with stakeholders to create a supportive environment for the adoption of electric motorcycles, focusing on issues such as charging infrastructure, financing options, and awareness creation, to ensure that the adoption of electric transport is accessible to a wider market, including boda-boda riders, who can benefit significantly from electric motorcycles; Implement the demonstrator solution in collaboration with other consortium partners, which can help to showcase the benefits and feasibility of electric transport and encourage further adoption of renewable energy technologies in Kenya. Overall, ROAM plays a critical role in expanding the accessibility of electric transport to a wider market in Kenya and supporting the country's transition towards a more sustainable and cost-efficient transport system.

CUSUM Energy Ltd: This is an energy management company focusing on advisory services on renewable energy and energy efficiency through improving the skills of engineers by breaking down complicated statistical, problem-solving, and software-related concepts, enabling them to develop professionally.

Kiri EV Ltd[61]: Based in Nairobi, this EV startup aims to disrupt the motor industry across Africa and prove the potential of electric vehicles in the future of transportation in Kenya and beyond.

3.6.4. NGOs and International Organisations

NGOs can act as neutral mediators between local authorities and beneficiaries and play a significant role in the energy transition. They can assist stakeholders in identifying social and environmental risks associated with the implementation of the project. In the ENERGICA project, NGOs can help modernise environmental policy, advise on regional environmental cooperation, and embed environmental protection in other areas of policy. They can also safeguard and accelerate the energy transition markets.

International organisations are significant players in the energy transition in Kenya, as they provide funding and investment. Their roles can include contributing to the development of local expertise in electrical mobility to ensure the sustainability of the project, ensuring alignment of existing and

[60] https://www.roam-electric.com/about
[61] https://kiriev.com/

expected policies and regulations with regional ones, securing continuous power supply for electrical mobility, facilitating the development of the local electricity market, and upscaling the project at both national and regional levels. Additionally, international organisations can provide investment, such as loans, to overcome the initial cost of electrical mobility by supporting the purchase of electric vehicles and the installation of charging infrastructure.

NGOs can play a vital role in the energy transition in Kenya by acting as neutral mediators between local authorities and local communities. They can help modernise environmental policy and embed environmental protection in other areas of policy. NGOs can also assist stakeholders in identifying social and environmental risks associated with the implementation of the project. In addition, they can help safeguard and accelerate the energy transition markets.

International organisations can contribute significantly to the development of electric mobility in Kenya by providing funding and investment. They can ensure the sustainability of the project by contributing to the development of local expertise in electric mobility. Additionally, they can ensure alignment of existing and expected policies and regulations with regional ones, secure continuous power supply for electrical mobility, facilitate the development of the local electricity market, and upscale the project at both national and regional levels. International organisations can also provide investment, such as loans, to overcome the initial cost of electrical mobility by supporting the purchase of electric vehicles and the installation of charging infrastructure.

1. **Gesellschaft für Internationale Zusammenarbeit** (**GIZ)**[62] is the German development agency that intervenes in various areas for sustainable development in a broad variety of locations globally. GIZ assists its partners in Kenya in identifying the wide range of causes of environmental risks. It helps modernise environmental policy at all levels, advises on regional environmental cooperation and develops strategies to embed environmental protection in other areas of policy.
2. **Stichting Nederlandse Vrijwilligers** (**SNV)**[63] is the Netherlands Development Organisation with an active role in Kenya in Agri-food, Energy and Water. Its ambition is to contribute to transforming energy markets, to ensure access to affordable, reliable, sustainable, and modern energy for all. In addition, SNV is also engaged in partnerships with national and county governments, private and public sector organisations, civil society organisations, farmer groups, and other NGOs to increase its effectiveness and resources.
3. **East African Power Pool (EAPP)**[64] is a regional institution established in 2005 to coordinate cross-border power trade and grid interconnection among nations of the Eastern Africa region. It aims at providing a more reliable, affordable, and sustainable electricity supply for all the region through coordinated actions. Currently, the EAPP has eleven (11) member countries that have signed the Intergovernmental Memorandum of Understanding (IGMoU) and fourteen (14) utilities that have signed the Inter-Utility Memorandum of Understanding (IUMoU). Among its missions, include the development of a competitive electricity market in the Eastern Africa region and the local expertise for sustainable electricity for its member states.

[62] https://www.giz.de/en/worldwide/317.html
[63] https://snv.org/country/kenya
[64] https://eappool.org/

3.6.5. Educational Institutions

Educational institutions have a crucial role to play in the energy transition as it requires significant transformation. In the transport sub-sector, these institutions can aid in the development of more efficient processes and technologies for electric mobility, leading to better service delivery (ENERGICA Baseline Survey, 2023). They can also facilitate the development of better performance indicators through research and development, generate various socioeconomic scenarios, and evaluate the costs and potential benefits of different actions by utilising advanced modelling and analysis tools. Furthermore, educational institutions can assist in maintaining the charging infrastructure by offering short-term training to the end users.

The University of Nairobi[65]: The University of Nairobi is a research-intensive university with a reputation for excellence and a strong and vibrant research culture. Its research work is recognized for its impact and relevance to the region. The university is in the city centre.

Jomo Kenyatta University of Agriculture and Technology[66]: Situated 36 kilometres northeast of Nairobi, this university is a public institution that offers courses in Technology, Engineering, Science, Commerce, Management, and Building Sciences.

Kenyatta University (KU)[67]: Kenya's Kenyatta University is a public research institution located in Nairobi City County. It became a university in 1985, following the University of Nairobi (1970) and Moi University (1984). The university offers programs in engineering and technology, economics, agriculture, and enterprise development. Its objective is to establish and maintain a conducive environment within the Kenyatta University community that fosters and supports research, scholarship, and innovative pursuits of excellence.

Strathmore University[68]: This is a top private non-profit university in East Africa, with a focus on raising funds to support various university initiatives. The university foundation is overseen by a board of directors made up of respected individuals appointed with the guidance of the University Council and University Management Board. The research and innovation office are responsible for promoting and developing research and innovation in various fields such as Digital Revolution and Data Science, Sustainability, Climate Innovation and Clean Energy Technologies, Global Health, Business, Economics, and Management.

3.6.6. Representatives of Civil Society Organizations

A cohort of experts, such as those in the transportation sector, can have a crucial impact on the energy transition. They can engage with local communities throughout the project implementation phase and raise awareness of electric mobility, offering guidance and support to beneficiaries. These professional organisations can play a significant role in promoting scientific and educational interest in the transition to electric mobility.

Civil Society Organizations can play a crucial role in the energy transition in Kenya. They can work with local communities to raise awareness of electric mobility and offer guidance and support to beneficiaries, especially regarding addressing challenges such as building trust and addressing initial

[65] https://www.uonbi.ac.ke/
[66] www.jkuat.ac.ke
[67] https://www.ku.ac.ke/riosite/en/
[68] https://research.strathmore.edu/innovation/

costs. CSOs can also contribute to promoting women's participation in RE projects through awareness creation, equitable resource distribution, and financial support. Additionally, CSOs can collaborate with other stakeholders to create a supportive environment for the adoption of electric motorcycles by focusing on the charging duration and costs, decentralised maintenance of the motorcycles, the motorcycles' capacity, financing options to acquire them, and awareness creation. Finally, CSOs can advocate for policy changes that support the development of renewable energy sources, affordability and infrastructure improvements, and the development of better performance indicators through research and development, socio-economic scenario generation, and evaluation of the costs and potential benefits of different actions by utilising advanced modelling and analysis tools.

The Association of Energy Professionals of Eastern Africa (AEPEA)[69] - This is a local regional affiliate organisation of The Association of Energy Engineers (AEE) which is a global professional organisation that was founded in 1977 non-profit with a mission to promote scientific and educational interests in the energy industry and foster sustainable development. AEE has over 17,000 members worldwide, and it has established local chapters to enhance its reach and impact. The second local chapter of AEE is in an unspecified location, and t works to support the mission of AEE by providing a platform for certified energy professionals to connect, learn, and exchange ideas.

The Association of Electrical Mobility and Development in Africa (AEMDA)[70] - AEMDA is an impartial industry initiative that facilitates the involvement of organisations of all sizes and stages in the electric mobility transition across Africa. It offers a platform to accelerate this transition and supports the diverse stakeholders' interests in making a positive impact on the rapid shift towards a low-carbon transport sector in Africa.

Kenya Renewable Energy Association (KEREA)[71]: The KEREA is an organisation that advocates for the adoption and utilisation of all forms of renewable energy technology to drive economic development and enhance the quality of life in Kenya, East Africa, and the entire continent.

3.6.7. Local Community Members

The success of any project depends greatly on the involvement of local community members, such as mayors, entrepreneurs, and cooperatives, who can develop social networks to support the project. For example, electrical mobility clubs can provide mutual support for system installation and charging, as well as context-specific knowledge and expertise, leading to a better community attitude towards the technology and successful implementation. Additionally, awareness and behaviour networks can be set up to provide guidance and reassurance to neighbours on the environmental benefits, and cooperatively owned small-scale electrical vehicles can be established.

Nairobi, located in the southern part of Kenya, is a major urban centre serving as the economic, financial, cultural, educational, and political hub, and the seat of the Kenyan Government. Its population was 4,397,000 in 2019, projected to reach 8.5 million by 2035. The main community members selected for the project implementation are Nairobi Metro, Mombasa City, Kisumu City, Nakuru City, and Eldoret Municipality.

---

[69] https://www.aepea.co.ke/
[70] https://aemda.org/
[71] http://kerea.org/

The local community will have a crucial role in the successful implementation of the project. Members of county assemblies, entrepreneurs, local mechanics, boda-boda riders and customers can develop social networks to support the project, such as electrical mobility clubs, which can provide mutual support for system installation and charging, context-specific knowledge, and expertise. Additionally, awareness and behaviour networks can be set up to provide guidance and reassurance to neighbours on the environmental benefits, and cooperatively owned small-scale electrical vehicles can be established.

The communities expressed willingness to adopt Renewable Energy Technologies, and women could play a key role in promoting RE projects. However, challenges such as building trust and addressing initial costs need to be addressed. The adoption of electric motorcycles can offer significant benefits to boda-boda riders, but there is a need for collaboration between stakeholders to create a supportive environment for adoption by focusing on charging duration and costs, decentralised maintenance of the motorcycles, financing options to acquire them, and awareness creation. Therefore, the local community members, especially those in the transportation sector, will need to engage with the communities throughout the project implementation phase, raise awareness of electric mobility, offer guidance, and support to beneficiaries, and collaborate with other stakeholders to create a supportive environment for the adoption of electric mobility.

4. COMMUNITY ACTIVATION AND STAKEHOLDER INVOLVEMENT

Community engagement and involvement start with relationship building with individuals and groups with an interest in the project or those that will be affected by the project. The aim is to build collaborative decision-making processes and improve legitimacy and knowledge sharing by tapping into local knowledge to reduce conflicts, share benefits and boost sustainability. The community activation and participation process will enable people on site to be the main actors in the creation of organisational structures within their environments and to shape the interaction between the stakeholders out of their circles as well as with international actors and the general local communities' members to empower them for the implementation and management of the project activities.

Community engagement and involvement are possible at different stages of the participation continuum, spanning from awareness raising, education activities, and participation in some actions up to a commitment to take up main responsibilities. An example of this sort can be the development and energy communities which involve creating networks of people who collaborate to plan, implement, manage, and share energy resources in a specific geographic area addressing common energy needs.

Establishing community engagement structures through local energy initiatives is primarily fuelled by community spirit, cooperative traditions, a sense of local responsibility, and environmental concerns. When it comes to the adoption of RE sources by households, various demographic and socio-economic factors play crucial roles, including age, education level, income level and cultural beliefs on the impact of the RE solution on social well-being (Koirala et al., 2018). These socio-institutional characteristics, in addition to other demographic, socio-economic, and environmental factors, can influence the level of citizen participation in local energy systems. According to (Koirala et al., 2018) community energy structures are stronger and have more control when the communities can self-organise and cooperate amongst themselves. This enables them to become co-producers, and are engaged in generating, making available through local and external sourcing of products, storage, and consumption.

Building local energy communities can be a complex process, but with careful planning and community engagement, it can be a rewarding and effective way to promote sustainable energy use and reduce carbon emissions.

4.1. Community Building

These communities will be built through the below steps:

1. **Identifying Potential Community Members**: The first step will be to identify potential stakeholders in the communities from all local groups like residents, entrepreneurs, community organisations, local leadership, interest groups like youth, gender, people with disability, and ethnicity representation. Various methods to identify potential members such as community meetings, social media groups, or local media platforms, will be used at the local level of interaction. HUDARA and local partners will physically work with the communities to form the Tier 1 Energy Transition Boards (ETBs). For the case of ENERGICA, local project partners will lead the mapping and verification exercise of all the relevant local stakeholders to the demonstrator energy solutions in Madagascar, Sierra Leone, and Kenya

that will form Tier 2 ETBs. These were already mapped as indicated in section 3 but will continue to be updated as suggested by communities.

2. **Develop a Vision**: Meeting with the verified local stakeholders in all contexts to develop a shared vision for the community will be conducted by HUDARA with the support of the local partners at the context level. This will involve setting goals, such as reducing energy costs, increasing energy efficiency, promoting renewable energy sources, and reducing emissions, etc. Involvement of all members in the visioning process will ensure everyone's needs, concerns and goals are considered.

3. **Assess Energy Needs and Resources**: After developing a vision, an assessment of the energy needs and resources of the community will be conducted with the stakeholders collaboratively and within the demonstrator solutions scope. This will include gathering data on energy consumption, identifying potential energy sources (e.g., solar, wind, geothermal), and evaluating the potential for energy storage and energy efficiency measures. These will be guided by the stakeholder's experiences, needs identified, and workable solutions suggested in the baseline assessment report in all the technical, social, economic, and environmental spheres of the project.

4. **Develop a Community Energy Plan**: A community energy plan will be created based on an assessment of energy needs and available resources. This plan will outline the necessary actions to achieve the community's energy goals. It will provide details on the specific roles' community members will undertake, their involvement in energy generation, storage, distribution, consumption, and prosumption, as well as the implementation of energy efficiency measures. Additionally, it is crucial to establish clear responsibilities and ensure the equitable sharing of benefits. To solidify community engagement, representatives forming the Energy Transition Boards (ETBs) will participate in the development and signing of a formal commitment document, such as a Memorandum of Understanding (MoU).

5. **Build Infrastructure**: Once the plan is in place, the project partners responsible for building the necessary infrastructure to support the community's energy needs will be involved with the activities with the support of the projects' technological team. This will include installing renewable energy systems, identification of the locations for the installations of the RE systems, building energy storage facilities that will be advised by the consumption patterns, and upgrading the energy distribution infrastructure where needed.

6. **Establish Governance and Management Structures**: To ensure the community's energy systems are managed effectively, local governance and management structures will be established through democratic processes with the energy community and in close collaboration with local authorities. This will include setting up the legal structure for a local energy cooperative or other binding entity that will manage the community's energy resources and finances and offer leadership to energy challenges, engagement, and knowledge sharing.

7. **Engagement of the general local population not directly involved in energy communities**: Together with the local partners, HUDARA and the ETBs will ensure information sharing and participation through regular community engagement by communicating the benefits of the local energy system, raising awareness in residents on energy efficiency measures, and

involvement in consultation and planning, analysing the local needs and linking them to the local strengths, resource mapping, identification of challenges and development of roadmaps to overcome them and consultative decision-making processes throughout the project. Regular local meetings will be held and social media updates by the project consortium and the local leaders and stakeholders will all help to keep the community engaged, involved, and informed.

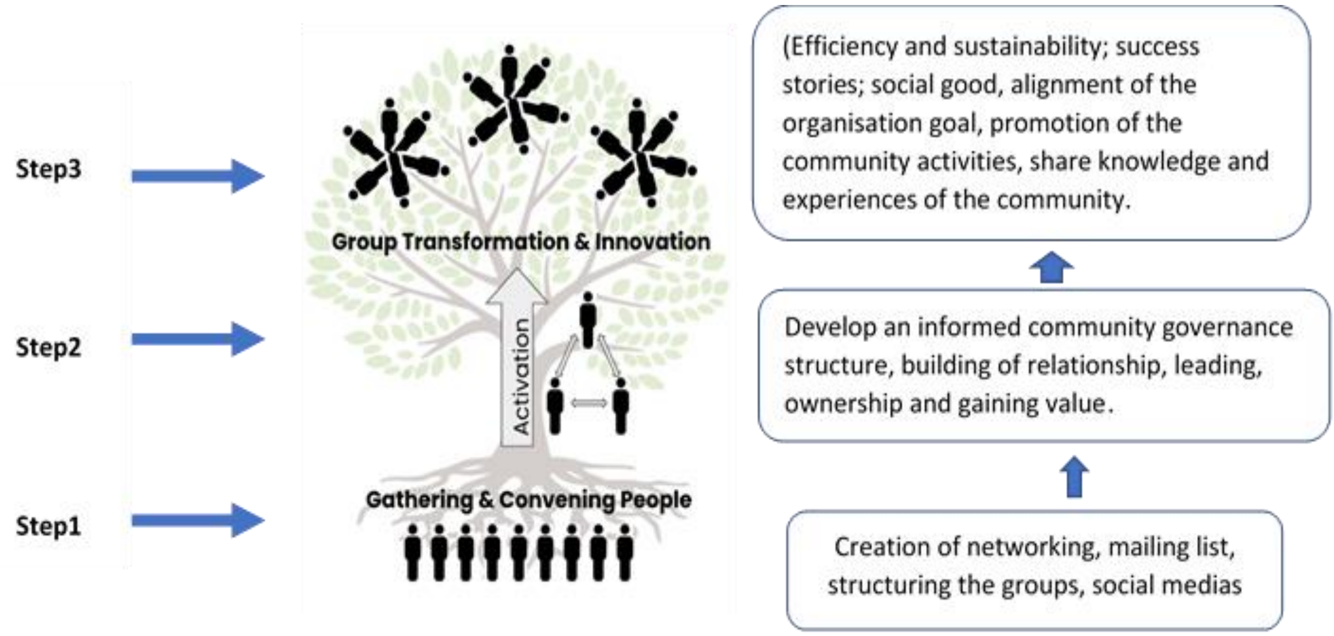

Figure 5: Community activation tree, adopted from Arika (2022)

The community activation and involvement in the context of each demonstration site will depend on the rules and regulatory framework in each context but the outcome will be the same as described in Figure 5 above. The characteristics such as governance, ownership and control and the purpose of the community activation must be pre-defined at the beginning of the project considering the geographical scope, the activities, participants, autonomy, and the effective control of each context.

4.2. Energy Transition Boards (ETBs)

Energy Transition Boards (ETBs) are bodies established at various levels of governance, business, and civil society to coordinate and facilitate the transition from fossil fuels to renewable energy sources. They consist of representatives from different stakeholder groups, including government agencies, businesses, academic institutions, community groups, and environmental organisations. Their main purpose is to develop and implement sustainable strategies for reducing greenhouse gas emissions and promoting the use of renewable energy sources. They will provide a platform for collaboration and coordination on energy transition issues. Their tasks in the ENERGICA project will include supporting renewable energy solutions' deployment, promoting energy efficiency measures, promoting innovation in clean energy technologies, supporting research and development initiatives, and providing information and resources to stakeholders and project consortium members. At later stages of the project, they will play a key role in supporting the adoption of the project's solutions, upscaling and participating in the replication activities to other areas. They will also initiate the policy development processes to incentivize renewable energy adoption at the country level.

The ETBs, which will comprise local spectrum experts and stakeholders from various sectors mapped by local partners, have emerged as an important mechanism for facilitating this community involvement and engagement. Through their efforts, ETBs seek to promote public awareness and understanding of the need for a shift towards renewable energy sources and to provide guidance and support for policymakers and decision-makers in implementing effective strategies.

To activate community involvement and to understand the empowerment of these communities through the ETB, the results of the baseline assessment will be used to analyse the methodological approach for the implementation of the ETB. The mix of qualitative and quantitative methodological approaches used during the baseline assessment is of immense importance. Indeed, the surveys of local communities and the semi-structured interviews of stakeholders in each context will help identify the perceptions of the energy transition and the expectation of the communities as well as the kind of roles the local communities will intend to play. The semi-structured interviews of relevant stakeholders in each context on the technical, socio-economical, environmental, and institutional dimensions will be used as the first level to set up future ETBs.

4.3. Benefits of Participation in ETBs

All consortium project partners (EACREEE, ROAM, STIMA BODA, SACREEE, NANOE, CLUB-ER, ECREEE, FWT, UAM and HUD) will be involved in the activation of the ETBs at the context level with their participation highlighting on the specific roles and responsibilities they play in building the demonstrator solution and supporting energy transition in line with the communities' energy needs.

Members of the energy transition boards (both Tier 1 and Tier 2) would benefit from the ENERGICA project in several ways as they will also identify including the below:

1. Professional Development: Serving on an ETB will provide members with the opportunity to develop new skills and gain experience in energy policy, project management, and stakeholder engagement.
2. Networking Opportunities: Working on an ETB will provide members with the opportunity to connect with other energy professionals, community leaders, and stakeholders in the energy industry. This will help to build relationships with the potential to create new opportunities for collaboration and partnership.
3. Community Impact: ETB members will have the opportunity to make a positive impact in their communities by promoting RE and sustainability, creating new jobs, and reducing carbon emissions. This can be a rewarding experience for those who are enthusiastic about environmental and social issues.
4. Civic Engagement: Serving on an ETB is a form of civic engagement and will provide members with the opportunity to make a meaningful contribution to their community. This can be an important aspect of personal and professional fulfilment.
5. Access to Information: ETB members can gain access to valuable information and insights about energy policy, market trends, and emerging technologies. This can help to inform their work and provide them with a competitive edge in the energy industry.

It is important to note that the primary responsibility of the ETBs is to represent the interests of their broader community to promote energy transition to a more sustainable and resilient energy system that benefits all members of the community. The benefits listed above are potential positive outcomes that could arise from serving on an ETB and will not be the sole focus of the board's work. The primary goal of an energy transition board should be to promote the transition of energy to a more reliable, affordable, clean, and sustainable energy.

4.4. Functions of the ETBs

4.4.1. Tier 1 ETBs

These stakeholders that will form the Tier 1 ETBs will be identified from within the communities in the various demonstrator locations. They will be members of these communities and from the local areas. Their key role is to create multi-sectoral coordination (Economic, Social, Technological, Environmental, and institutional) acting as a medium of communication and dialogue within the community and with the partners of the ENERGICA project. Indeed, the ETB will also create an inclusive participation and commitment of the stakeholders at the various phases of the project implementation. Their specific roles will be related to their functions and unique to the demonstrator solutions in their contexts as will be defined by the communities. These stakeholders under Tier 1 ETBs will support and partly carry out the implementation of the Integrated Community Energy Systems in task 2.3 of the ENERGICA project. They will also be instrumental in informing the activities under WPs 7 and 8 of the ENERGICA project.

The technological stakeholders within the ETBs will play a crucial role in overseeing the following key responsibilities:

Monitoring and Evaluation: The ETBs will closely monitor and evaluate the project's progress to ensure the long-term sustainability of the implemented technologies. This includes assessing the performance, efficiency, and effectiveness of the technologies in meeting the intended objectives. By continuously monitoring the project, the ETBs can identify areas for improvement and make necessary adjustments to enhance the overall success and longevity of the technologies. They will also participate in surveys throughout the implementation period to assess the practicability of the demonstrator solutions.

Capacity Building: The ETBs will prioritise capacity-building efforts, aiming to empower users and stakeholders to effectively utilise the technologies. This involves supporting training by being trainers of trainers, resources, and support to enhance the knowledge and skills of individuals involved in utilising the technologies. By strengthening the capacity of users, ETBs contribute to the successful adoption and integration of innovative technologies, maximising their impact and benefits.

Identifying Challenges: They will actively identify and analyse the challenges faced during the implementation of innovative technologies on the ground. By closely monitoring the real-world application, they can gain insights into potential obstacles and limitations. Identifying these challenges allows for a proactive approach to addressing them effectively, ensuring that the technologies can overcome any barriers and operate optimally.

Solutions Development: The ETBs will collaborate with relevant local partners to develop innovative solutions for the challenges identified by the communities they represent. This may involve engaging with technology developers, experts, and community members to brainstorm and implement practical strategies that address the identified obstacles. By actively contributing to solution development, the ETBs can ensure the continuous improvement and success of the technologies, promoting their wider adoption and positive impact.

The socio-economic stakeholders will ensure the successful integration and adoption of technologies. Their efforts in creating awareness, co-creating activities, and supporting income generation activities will contribute to the overall socio-economic development and sustainability of the projects. Their specific roles will include but not be limited to:

Creating Awareness: They will focus on creating awareness about the technologies within their respective contexts. This involves actively promoting and disseminating information to ensure that stakeholders and community members are well-informed about the available technologies. By raising awareness, the ETBs contribute to fostering understanding, uptake, and adoption of the technologies, maximising their potential benefits.

Co-Creation of Activities: The ETBs will facilitate a collaborative approach in designing and implementing project activities. By engaging in co-creation, the socio-economic stakeholders will contribute their unique perspectives, knowledge, expertise, and cultural experiences to their communities. This collaborative process ensures that the activities are tailored to meet the specific needs and priorities of the communities. Through co-creation, the ETBs can foster ownership and participation, resulting in more effective and sustainable outcomes.

Supporting Income Generation Activities: The ETBs will aim at supporting income generation activities related to the technologies by engaging with the communities to identify the potential. This may involve assisting in the identification of income-generating opportunities that are directly or indirectly related to the project, linking communities to training and resources locally available, and facilitating access to necessary local networks and markets. By supporting income generation activities, the socio-economic partners contribute to improving livelihoods and socio-economic conditions within the communities. They will consider the local economic impact of the energy transition and identify opportunities to support local economic development throughout the transition. This will involve encouraging local procurement and supply chains, and circular economies, and supporting the development of local skills and expertise in the RE sector. They will also represent and highlight the plight of the marginalised, minority and discriminated groups of the communities, by putting them at the forefront of the implementation and benefit structure of the project.

The environmental stakeholders within the ETBs will play a vital role in driving the adoption of sustainable practices and technologies. Their efforts contribute to building a more environmentally conscious society and fostering the transition towards a greener future. Their specific roles will include but not be limited to:

Creating Awareness of the Green Transition: The ETBs will actively focus on creating awareness of the importance and benefits of transitioning to a more sustainable and environmentally friendly approach. By promoting and disseminating information about the green transition, the environmental stakeholders will aid in understanding the significance of adopting eco-friendly practices and technologies. This awareness-building effort aims to drive behavioural change and encourage the wider adoption of sustainable solutions.

Assessing Environmental Benefits of Technologies: The ETBs will assess the environmental benefits associated with the implemented technologies. This includes evaluating their impact on reducing greenhouse gas emissions, conserving natural resources, and promoting overall environmental sustainability. By conducting comprehensive social assessments, the environmental partners can provide valuable insights into the positive ecological outcomes and help identify areas where further improvements can be made.

In addition to their sectoral coordination roles, the Tier 1 ETBs will collaboratively promote participatory processes that engage local citizens in the development and implementation of the transition plan. This can involve public consultations, community meetings, and stakeholder engagement activities to gather feedback, input, and ideas from residents with support from local partners and HUDARA. As they will be appointed by the communities, they will be responsible for representing their communities by ensuring their voices and perspectives are reflected in the project. This will also involve appointing community representatives in the ETBs from different groups of the communities (e.g., women groups, ethnic minorities, people with disabilities, people working in specific interest sectors, low-income households, elderly members of the community, and youth) to provide input, monitoring, and feedback.

The Tier 1 ETBs will be actively involved in managing and resolving potential conflicts that may arise during the implementation of the demonstrators. They will assess and address any conflicting interests or concerns among communities and stakeholders, ensuring that all parties are heard, and their perspectives are considered. By effectively managing conflicts, they will help maintain a harmonious and collaborative environment, enabling the smooth progress of the project and the achievement of its objectives.

Together with the local partners and HUDARA, they will develop communication and outreach strategies that will target residents, using a range of channels such as social media, community events, local administration, and local media. This will be critical for effective communication and wider reach to communities in their regions for a holistic energy transition.

By promoting participatory processes, local representation, effective communication and outreach, and support for local economic development and vulnerable communities, they will help ensure that the energy transition is effective, inclusive, beneficial, and sustainable.

4.4.2. Tier 2 ETBs

These will involve the stakeholders identified and listed in section 3 of this report. Their roles will be aligned with their institutional functions with the responsibility to support the sustainability and replicability of the demonstrator solutions at a wider national and regional scope. Their input will be valuable in shaping the activities under WP 9 of the ENERGICA project.

In addition to their potential roles in the project, as highlighted in sections 3.4, 3.5, and 3.6 of this report, they provide subject expert guidance, support, and oversight within their respective institutional frameworks and in collaboration with the local project partners responsible for building the demonstrator solutions. SACREEE, ECREEE, and EACREEE will collaborate with Tier 2 ETBs to help realign and foster regional energy access opportunities, strengths, priorities, and vision that will help address the regions' energy access challenges and needs. They will draw learnings from the Tier 1 ETBs that will be used for wider replication of the demonstrator solutions.

Furthermore, they will champion international cooperation by actively engaging with other relevant entities, both domestically and internationally, to exchange knowledge, best practices, and lessons learned. This expanded role enables the ETBs to leverage the collective expertise and resources available across different countries, institutions, and demonstrator locations, to enhance their ability to tackle complex and cross-cutting issues.

The Tier 2 ETBs will play a key role in developing and implementing sustainable policies related to the technologies. This involves creating frameworks and guidelines that promote the adoption and utilisation of RETs while considering factors such as tax reduction incentives, gender equality, and regulation. By establishing sustainable policies, the institutional stakeholders will contribute to creating an enabling environment for the successful integration and growth of these technologies.

Through their oversight of sustainable policies and conflict management, the institutional partners within the ETBs play a crucial role in shaping the institutional landscape and facilitating the successful implementation of the technologies. Their efforts contribute to creating a supportive framework and ensuring a balanced and inclusive approach that benefits all stakeholders involved while also setting the pace for sustainability and replicability for energy access demonstrator solutions.

4.5. Communication

The success of the ENERGICA project is heavily dependent on effective communication. To facilitate communication between the local communities and the project consortium team through HUDARA, various tools will be employed:

Email will serve as an efficient means to share updates, progress reports, and other project-related information between the ETBs and the project consortium team.

Video conferencing tools like Zoom, Skype, Google Team, and Microsoft Teams will be utilised to conduct virtual meetings and facilitate real-time discussion, providing a platform for seamless communication between the parties involved.

Google Docs/sheets will be utilised to share and collaborate on project-related documents and data, enabling multiple stakeholders to contribute and access the project information in real-time.

Social media platforms like the ENERGICA website and LinkedIn, project partners' websites and LinkedIn pages, and communities' social media platforms, will be employed to share updates and news about the project and engage with stakeholders and the wider public. These activities will be coordinated by EuroQuality to ensure consistency and coherence across all social media channels.

Community meetings /workshops will be an effective media of communication by facilitating direct interaction, two-way communication, information sharing, relationship building, problem-solving, empowerment, training, and civic education. By utilizing these platforms, all stakeholders and project partners can actively participate in the exchange of ideas, express their concerns, and collectively work towards the socio-economic development of the communities.

Door to door information provision requires significant effort and resources but will offer a unique and impactful way of communication. Its personalized approach, trust-building potential, inclusivity, feedback loop, community engagement, targeted communication, and relationship-building aspects will make it an effective media of communication, particularly when reaching out to specific community members or conveying important messages directly to residents' doorsteps.

By leveraging these various communication tools, the project consortium team and the local communities can establish clear communication channels, enabling efficient dissemination of information, timely collaboration, and proactive engagement with all stakeholders.

Throughout the implementation period of the project, the project consortium and HUDARA will prioritise regular demonstrator visits, ensuring frequent meetings and monitoring activities. These visits will actively engage the communities through focus group discussions, to assess and realign their objectives within the project.

To facilitate the effective implementation of the demonstrator solution and promote collaborative learning, the project consortium and HUDARA will organise workshops. These workshops will serve as platforms for knowledge sharing and interactive sessions, enabling participants to gain valuable insights and actively contribute to the project's progress.

By employing a combination of demonstrator visits, regular meetings, focus group discussions, and workshops, the project consortium and HUDARA seek to establish continuous engagement with the communities. This iterative approach allows for ongoing assessment, feedback, and alignment of objectives, ultimately maximising the project's success and impact.

The specific communication tools utilised will vary based on the project's urgency, stage of development, and the communication preferences of the local communities and consortium partners. It is crucial to establish clear lines of communication and employ multiple channels to ensure that all stakeholders remain informed and engaged throughout the project's duration.

Regular, and ongoing engagement with local communities is critical for ensuring that the energy transition is inclusive and participatory. With the help of the ETBs and local partners, the below factors will be considered when determining the frequency of engagement:

1. The Stage of the Energy Transition: The frequency of engagements will depend on the stage of the energy transition. For example, during the planning stage, there will be a greater need for regular and ongoing engagement to ensure that communities are involved in the development of the transition plan. During the implementation stage, there may be a greater need for periodic updates and progress reports.
2. Local Needs and Priorities: The frequency of engagement will also depend on the needs and priorities of local communities. For example, if some concerns or issues require attention, more frequent engagements will be necessary to address these concerns and provide updates on progress.
3. Availability of Resources: The frequency of engagement will also depend on the availability of resources, such as the availability of communities, ongoing national or local events, security, and meeting facilities. In some cases, where it is not feasible to meet the entire community, representatives nominated by the community members (Tier 1 ETBs) will be engaged.

Overall, it is important to ensure that there is ongoing and meaningful engagement with local communities throughout the energy transition process. This may involve a combination of in-person and virtual meetings, public consultations, stakeholder engagement activities, and other forms of outreach and communication. By establishing a regular and ongoing dialogue with local communities, ETB will help to ensure that the transition is effective, inclusive, and responsive to the needs and priorities of residents.

5. CONCLUSION

This report highlights the methodology for the involvement and activation of communities with emphasis on the flexibility and adaptability of the ETBs in response to evolving communities' needs, institutional functions, and emerging issues in Madagascar, Sierra Leone and Kenya, and demonstrator locations (Diana Region, Freetown, and Nairobi respectively), in relation to energy access challenges and its impact on other aspects of society whilst capitalising on the emerging opportunities. As the landscape of challenges and priorities continues to shift, it becomes imperative to revise and redefine the roles of these ETBs accordingly. This will allow for an efficient, effective, and productive collaboration. The report suggests an ideal scenario for two-Tier ETBs built on the bottom-up approach.

Tier 1 will involve local representatives in the demonstrator locations appointed by the communities themselves and represent the predefined groups catering to the technical/technological, social, economic, and environmental aspects of the project. They will be involved throughout the project implementation and participate in the wider community awareness activities on the ground level while supporting close monitoring of the project and communication with the local project partners and HUDARA. The ETB's predefined working groups will engage in necessary duties and communicate project outcomes and support Integrated Community Energy Systems in each context. These will be developed with ENERGICA's Deliverable 2.5.

Tier 2 will encompass institutions in the three demonstrator regions mapped in section 3 of this report and their roles in the project aligned with their functions. They will play a major role in supporting the sustainability and replicability of the demonstrator solutions at a wider scope of the project. From time to time, they will provide subject expert guidance, support, and legal oversight within their respective institutional frameworks and in collaboration with the local project partners responsible for building the demonstrator solutions. They will also work with SACREEE, ECREEE, and EACREEE to realign regional energy access opportunities, strengths, priorities, and vision that will help address the region's energy access challenges. They will draw learnings from the Tier 1 ETBs that will be used for wider replication of the demonstrator solutions. Tier 2 ETBs can foster international cooperation by actively engaging with other relevant entities, both domestically and internationally, to exchange knowledge, best practices, and lessons learned. This expanded role enables the ETBs to leverage the collective expertise and resources available across different countries and demonstrator locations, enhancing their ability to tackle complex and cross-cutting issues.

The report highlights some opportunities to further enhance stakeholder engagement for the ETB implementation. While some challenges have been identified during the stakeholders mapping exercise, including limited availability of key stakeholders in certain contexts and a lower number of contacts identified in the mapping list, the report acknowledges that there are potentially available stakeholders who can be tapped into. To ensure the successful implementation of the ETB, it is essential to work closely with these stakeholders, including local-level representatives such as local authorities, industry representatives, members of educational institutions, civil society organisations, landowners, NGOs, and the community members themselves. Their involvement will be crucial in mobilising the community and influencing the implementation of the project activities.

The report suggests a need for continuous in-depth exploration of community engagement and involvement best practices that are most suitable for specific contexts and regions. The Tier 1 and Tier 2 Energy Transition Boards (ETBs) can serve as valuable resources for conducting further research on community engagement and fostering collaboration. These activities will contribute to the development of a comprehensive knowledge base on renewable energy (RE), renewable energy technologies (RET), as well as climate adaptation and mitigation approaches, using innovative technologies to uplift the economic and social welfare of communities in the global south.

REFERENCES

[1] ENERGICA project (2020): Grant Agreement ID 0103742

[2] Arika Virapongse (2022): Middle Path EcoSolutions: Taking engagement to the next level with Community Activation, http://middlepatheco.com/community-activation/#structure (accessed 14/12/2022)

[3] Roberts, J., Frieden, D., Gubina, A., (2019): 'Energy Community Definitions', Compile Project: Integrating Community Power in Energy Islands, No. of May.

[4] Frieden, D., A. Tuerk, J. Roberts, S. D'Hebermont, and A. Gubina (2019): 'Collective Self-Consumption and Energy Communities: Overview of Emerging Regulatory Approaches in Europe', No. of June.

[5] Cleland, D. I. 1999. Project Management - Strategic Design and Implementation, McGraw-Hill.

[6] Styk, K.; Bogacz, P. A Method for Stakeholder Mapping in Connection with the Implementation of a Development Project. Energies 2022, 15, 1592. https://doi.org/10.3390/en15041592 Johnson, G.; Scholes, K. Exploring Corporate Strategy, 5th ed.; Prentice Hall Europe: London, UK, 1999.

[7] The Aga Khan Development Network, Fact Sheet, online, accessed at https://akdn.imgix.net/53832/1664646980-akdn-quick-facts.pdf,

[8] ENERGICA Baseline Assessment report, 2023 https://www.energica-h2020.eu/

[9] Koirala, B. P., Araghi, Y., Kroesen, M., Ghorbani, A., Hakvoort, R. A., & Herder, P. M. (2018). Trust, awareness, and independence: Insights from a socio-psychological factor analysis of citizen knowledge and participation in community energy systems. *Energy Research & Social Science*, *38*, 33–40. https://doi.org/10.1016/j.erss.2018.01.009

ENERGICA