LEAP-RE

Research and Innovation Action (RIA)

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http://www.leap-re.eu/

Results from clustering in LEAP-RE

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Summary

Deliverable D4.2 presents the results of clustering activities carried out under the LEAP-RE (Long-Term EU-Africa Partnership on Renewable Energy) programme, aimed at strengthening collaboration, knowledge exchange, and impact across EU-Africa renewable energy projects. The report documents how thematic and regional clustering has enhanced coordination among funded projects, improved visibility of results, and fostered synergies between research, innovation, and deployment initiatives. The clustering process focused on key renewable energy themes, including solar, wind, geothermal, bioenergy, and cross-cutting issues such as policy frameworks, capacity building, and financing mechanisms. Through structured interactions? workshops, joint sessions, and shared dissemination platforms'projects were able to exchange best practices, identify complementarities, and align technical outputs with policy and market needs. The report highlights that clustering has contributed to reduced fragmentation, increased coherence with African and European energy strategies, and stronger engagement with stakeholders such as policymakers, industry actors, and local communities. Importantly, it demonstrates how clustering supports LEAP-RE?s strategic objective of accelerating clean energy transitions in Africa by bridging research outcomes with real-world implementation. Overall, Deliverable D4.2 confirms that clustering is a valuable instrument for maximizing project impact, strengthening AU-EU cooperation, and laying the groundwork for scalable, coordinated renewable energy actions beyond individual projects.

Approval

Date	By
2025-12-31 23:11:55	Mwangi DOREEN (AESG)
2026-01-05 12:25:06	Léonard LéVêQUE (LGI)

LEAP-RE

Long-Term Joint EU-AU Research and Innovation Partnership on Renewable Energy

Research & Innovation Action

November 2025

D4.2 – Results from Clustering in LEAP-RE

Version N°1

Authors:
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(UH)

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Abbreviations and Acronyms

Acronym	Description
WP	Work Package
LEAP-RE	Long-Term Europe-Africa Partnership on Renewable Energy
MARs	Multi Annual Roadmaps

Summary

Keywords

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1. Introduction

The Long-Term Europe-Africa Partnership on Renewable Energy (LEAP-RE) was established to foster a durable R&I partnership between the two continents. A core mechanism to achieve this was clustering, a strategic tool designed to move beyond isolated research efforts. The key aim of clustering was to support the delivery of strategic goals, encourage mutual learning, enhance impact, and build dynamic networks of scientists and innovators. It is both an input into achieving the programme's Multi-Annual Roadmaps (MARs) and a valuable outcome in itself, strengthening the fabric of the EU-AU renewable energy ecosystem.

The clustering activities in LEAP-RE were designed to:

- Facilitate the formation of project clusters around common themes, methodologies, and goals.
- Encourage knowledge exchange and joint activities among projects and with external stakeholders.
- Support the implementation of the Multi-Annual Roadmaps (MARs) and contribute to the long-term objectives of the AU-EU Research and Innovation Partnership on Climate Change and Sustainable Energy (CCSE).

2. The LEAP-RE Clustering Framework

2.1 Cluster Formation

Guided by the initial taxonomy from D4.1, the clustering effort evolved into a structured portfolio of distinct groups. This was not a static list but a dynamic ecosystem, subject to the real interest of the community, availability of leadership, and emerging opportunities. The clusters were formally categorized into Thematic and Methodological groups, each serving a specific purpose in advancing the LEAP-RE objectives. There were instances where some clusters would merge based on the topic addressed. The clustering model was dynamically adapted to tackle cross-cutting themes with several workshops intentionally designed as inter-cluster collaboration fostering a holistic exploration of topics.

There were eight thematic clusters and six methodological clusters established to facilitate focused discussions and collaborations. The thematic clusters were:

- Geothermal Cluster
- PV Cluster
- Grid Digitalization Cluster
- Water Food Energy Cluster
- Modern Cooking Technologies Cluster
- Hydrogen Cluster
- Biomass Cluster
- Biofuels Cluster

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The methodological clusters were:

- Energy Modelling Cluster
- Data Collection Cluster
- Capacity Building Cluster
- Local Communities Cluster
- Gender Cluster
- Value Chains & End-of-Life Management of RE Components Cluster

2.2Engagement Formats

The clustering strategy employed a diverse set of engagement modalities to create multiple touchpoints for the community. This ensured both broad outreach and deep, focused interaction.

2.2.1 Clustering in the LEAP-RE Annual Stakeholder Forums

To support the implementation of LEAP-RE clustering formation and development, clustering workshops were organized alongside the annual LEAP-RE Stakeholder Forums. These clustering workshops facilitated the formation of clusters by bringing together projects; encouraging dialogue between clusters; and supporting the definition of needs, synergies, and, potentially, activities. In addition, the workshops served as the principal forum for dialogue between the project clusters and LEAP-RE, creating space for multiple interactions. The sessions were in person with hybrid components.

2.2.2 Online Clustering Webinars

In the grant agreement amendment process, the clustering activities were decided to be intensified. Within this framework, online clustering webinars and workshops were also to be organized under each thematic and methodological cluster with energy access, sustainable energy stakeholders. A continuous series of online webinars formed the backbone of sustained clustering activity.

3. Clustering Activities

Action	Sub-action
Clustering in LEAP-RE Stakeholder Forums	The second LEAP-RE Stakeholder Forum (MS3) held on 4.10.2023 - 05.10.2023 in Kigali •Session 1 – Minigrids and Local Energy Systems •Session 2 – Technology in the Transition - Clean Cooking, Advanced Materials and LCA •Session 3 – Geothermal Energy •Session 4 - Local Applications of Geothermal Energy

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Action	Sub-action
	<u>The third LEAP-RE Stakeholder Forum (MS4) held on 8.10.2024 - 11.10.2024 in Milan</u> ●Session 1 - Digital technologies, AI and Blockchain ●Session 2 - Critical raw materials, end-of-life, and circularity ●Session 3 - Energy Systems and Modelling with Considerations to Water-Energy-Food Nexus ●Session 4 - Local Communities, Capacity Building, and Gender in Renewable Energy Projects <u>The fourth LEAP-RE Stakeholder Forum (MS5) on 21.10.2025 - 23.10.2025 in Brussels</u> ●Session 1 – Grid Modelling ●Session 2 – Water Energy Food Nexus
Clustering Webinars	Planning clustering webinars focusing on the needs expressed by the projects, e.g. socio-economic perspectives, end-user input needs and social acceptance, life-cycle analysis, challenges and mitigations, as well as funders' clustering. Quarterly webinars on internal and external clustering and follow-up outcomes •07.05.2024 - Local communities and Capacity Building Cluster: •03.06.2024 - Gender Cluster, together with Genesys: •04.06.2024 - Modern Cooking Technologies Cluster •8-11.10.2024 - All clusters – Stakeholder Forum - Milan •13.11.2024 - Water, food, energy – Partner with SU •29.01.2025 - Climate Energy cluster LEAP-RE & ICOS •27.02.2025 - Biomass and Biofuels Clusters •22.04.2025 - Geothermal Cluster and Energy Systems integration (WEF) + SU •29.07.2025 - Grid Digitalization Cluster •21-23.10.2025 - Water, food, energy nexus cluster and Energy Modelling Cluster (Brussels) •02.12.2025 - Data Collection Cluster + PV
External Webinars with Leap-RE Participation	●30.04.2024- EURAXESS ●10.09.2024 - FlowPhotoChem - EU-Africa Collaborations for a Clean and Just Energy Transition ●12.12.2024 - MSC Advocacy x LEAP-RE

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3.1 LEAP-RE Stakeholder Forum, Pretoria and Second online Clustering event

The first clustering session was organised alongside the first LRSF on 4.10.2022 in Pretoria, South Africa with 61 participants from the LEAP-RE Pillar 1 and Pillar 2 projects, and the scientific and ethical advisory board. The session began by introducing the projects to the clustering and knowledge management strategy of LEAP-RE, and the approach and methodology for clustering. The aim of the first clustering session after the Pillar 1 kick-off meeting and Pillar 2 project presentations was to provide a platform for networking, research uptake, mutual learning, and synergy building. Geographical focus of project activities and principal multi-annual roadmaps addressed were derived as taxonomies for the clustering exercise based on the clustering and knowledge management strategy. The so-called scientific clusters of energy modelling, data collection and capacity building were on the other hand derived from identification of key synergy groups for clustering at the related session in the LEAP-RE General Assembly in Nairobi. The session was constructed through guided discussions facilitated by the synergy group leaders and WP4 personnel in three phases which all started with a round of project introductions: 1) group discussions based on geographical focus; 2) discussions on the 6 MARs addressed; 3) contemplation on the project related aspects of the scientific clusters.

The participants were free to choose their preferred discussion group in each of the three phases. Within the discussions, the participants identified field testing, energy economics, and commercialization as possible interest areas for future clustering. Also, a need to diversify capacity building activities with different target groups was expressed.

Based on the feedback of the first clustering session, the second clustering session was organised online on 14.12.2023. The session gathered 91 participants from the projects, European Commission and the scientific and ethical advisory board. The chosen taxonomies for clustering in the second session included four different online rooms: the scientific clusters of 1) energy modelling, 2) data collection, and 3) capacity building; but also, a new cluster of 4) market and business strategies was included. The session was divided into two 45-46 minute discussion sessions with an exchange of preferred room in the middle, and 30 minutes wrap-up session for the synergy group leaders to reflect altogether the discussions taking place. In addition, smart grids appeared to be a key theme of discussion with main topics of interest being: data logging, real time digital data sharing (including digital security); block chain for energy transmission (e.g. ME-SOL-Share); and electricity security (damaging of appliances). On energy modelling, most participants expressed interest in load demand modelling (both real time forecast and long term forecast), and also more interest was expressed towards minigrids rather than national systems.

On the market strategies and business cluster, all projects expressed interest in 1) access to markets (contacts on the field, access to customers, networking opportunities, identification of local funding sources); 2) access to fundings (venture capital, business angels, crowdfunding, diaspora investment etc.); and 3) capacity building activities on finance and investment (addressed in priority to local communities). All projects identified a potential to scale-up but they also represent different TRLs, outputs (demonstrators), and demo sites.

Participants requested a better identification of LEAP-RE project outputs within the projects portfolio and the need to identify these outputs on the LEAP-RE Website. Furthermore, they identified matchmaking and networking with private equity, business angels, industry, innovation ecosystems (i.e. incubators within African universities) and governments as possible steps how the LEAP-RE could further support their actions. In addition, a need to define LEAP-RE services and value proposition, draft a Business Model Canvas for LEAP-RE and then discuss with funders was expressed.

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During the session, the synergy group leaders introduced the participants to the LEAP-RE app and the specific clustering groups within it for further networking. A funding watch feature was suggested to the app. Finally, the participants proposed additional relevant clusters on digitalization, geothermal energy, social impact, demonstration sites and TRLs.

3.2LEAP-RE Stakeholder Forum, Kigali

During the second LEAP-RE Stakeholder Forum in Kigali, Rwanda, four thematic clustering sessions were organized on 4 – 5 October 2023. The themes selected for the sessions corresponded to the clusters formed in collaboration with Pillar 1 and Pillar 2 coordination. Additionally, an extra thematic session was organised on energy modelling. The sessions included presentations given by LEAP-RE projects' representatives. They were moderated by the LEAP-RE Scientific and Ethics Advisory Board members who guided a debate with the panelists after their presentations. Each session also included a Q&A to allow interaction with the audience.

The LEAP-RE App was used to enable interaction with different stakeholders before, during and after the stakeholder forum.

Thematic session 1: Minigrids and Local Energy Systems

In this thematic session the LEAP-RE projects Energy Village, Setadisma and HyAfrica presented their approach to the theme of minigrids and local energy systems guided by the moderator Jeshika Moonsamy.

João Cardoso (LNEG) discussed the optimization of green microgrids/minigrids with solar and wind power production. Nicolò Stevanato (POLIMI) presented archetypes of rural users in SSA for load demand estimation. Leticia Tomas Fillol (LUT) gave a presentation about a bottom-up framework for estimating appliance adoption over time: Implications for energy demand evolution in rural mini-grids. Nebiyu Girgibo (University of Vaasa) gave an overview of the energy village concept application in Africa. Finally, Júlio Carneiro (Converge) outlined a preliminary mapping of natural hydrogen resources in Morocco and South Africa. After the presentation, the panel guided by the moderator SEAB member Jeshika Moonsamy revolved around the three following aspects:

1. Technical applicability, key considerations for scale
2. Social adaptions, future proofing of your assumptions, approach
3. Price point and costing vs market conditions, how to make innovations more accessible

Thematic session 2: Technology in the Transition - Clean Cooking, Advanced Materials and LCA

The session was moderated by the scientific and ethics advisory board member Siffedine Labed. The following presentations were given in the session:

- Raphaël Scheider (Université de Lorraine): Compositional engineering of highly emissive and widely tunable I-III-VI2 quantum dots (QDs) for photovoltaic applications
- Cristiana Ciobanu (Central IT pentru Stiinta si Tehnologie SRL): Design, development and functional testing of the LEDSOL disinfection unit

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- Anne Wambugu (Strathmore University): Quality of Household Electrical Appliances: A case study for Kenya

- Sorin Melinte (Université Catholique de Louvain): Understanding life cycle analysis for RE systems

The following discussion guided by the moderator, Prof. Labed, included the following questions:

- What are the technical advantages of using QD in PV applications?

- How competitive are QD cells compared to Si cells?

- Could solar electricity be a viable solution for kitchen electrical appliances in rural areas?

- Could we develop a parallel economy to green economy by considering waste management in renewable energies?

- Are there any environmental impacts when considering circular economy?

- Can we integrate regulatory aspects related to wastes in renewable energies?

Thematic session 3: Geothermal Energy

This session was guided by Kudakwashe (Kuda) Ndhlukula, SACREEE. The session comprised the following contributions:

- Loris Piolat (Université de Lorraine): Electrical conductivity and normalized chargeability tomograms, news tools to prospect geothermal resources

- Claudio Zuffi (University of Florence): Integrated Decision Support Tool for Optimal Exploitation of Geothermal Resources. A Thermodynamic, Thermo-economic, and Environmental Approach

- Yves Geraud (Geo2D): Geothermal play types in Africa: identification and development approach

- Luis Magaia (Eduardo Mondlane University): Current assessment of the geothermal potential in Mozambique

- Nicholas Mariita (Dedan Kimathi University of Technology): Capacity Building in Geothermal Energy Development in Africa – Successes and Challenges

- Islam Abou El-Magd (National Authority for Remote Sensing and Space Sciences): Exploring Current and Potential Locations and Utilization of Geothermal Energy in Egypt using Multi-Data Sources and Modelling

The moderated discussion centred around the following questions:

1. Technical aspect: what are the challenges and limitations in your model?

2. Characterization/profiling of the resource: what applications do you see as the most viable for Africa?

3. The issue of socio-environmental impact: in your view, what are the impacts and potential mitigation methods in geothermal energy in Africa?

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Thematic session 4: Local Applications of Geothermal Energy

The session included the following inputs:

- Yves Geraud (Geo2D): Ethiopian Geothermal Village
- Fabio Iannone (SSSA): "Geothermal Energy Communities and sustainable business model. Preliminary evidences from WP9 and WP11 activities"
- Walter Wheeler (NORCE Research): Grid concepts for geothermal-based village energy systems.
- Yves Geraud (Geo2D): Selecting a site for a demonstration of the "Geothermal Village" concept

Discussion guided by the moderator, Patrick Nussbaumer, SEAB member, followed the presentations.

In addition to the Thematic clustering sessions, the WP4 leads gave a presentation on the clustering activities during the General Assembly of the LEAP-RE Stakeholder Forum in Kigali. The presentation included an overview of the clustering strategy, sub-actions in the work package, clustering workshops held so far, a detailed update on the LEAP-RE project portfolio, including diagrammes and charts of funded projects, partners in the projects, projects according to main output, MARs, Energy Supply Chain as well as sciences and technologies.

3.3LEAP-RE Stakeholder Forum, Milan

Under the 4th Stakeholder Forum in Milan (M49), altogether four clustering sessions were organized in a hybrid format on the 10th October 2024 bringing together a total of 102 participants.

Thematic Session 1: Digital Horizons: Transforming Renewable Energy with AI, Smart Solutions, and Capacity Optimization

This session explored the transformative role of digital technologies in the renewable energy sector. The discussion focused on AI integration, smart grids, predictive maintenance, satellite data use, and blockchain applications. The session drew the insights from LEAP-RE Pillar I and II projects including SETADISMA, OASES, RE4AFAGRI and MiDiNA, and the Digital Energy Partnership and highlighted opportunities for optimizing energy systems and enhancing collaboration between African and European stakeholders.

Speakers:

Moderator: Tinyiko Ntshongwana, Deputy Director for Africa Multilateral Cooperation at the Department of Science and Innovation (DSI) at Rhodes University South Africa

Panelists/Speakers:

Marco Bovo, Associate Professor at University of Bologna (UNIBO) at the Department of Agricultural and Food Sciences, SETADISMA report: Sustainable Energy Transition and Digitalization of Smart Mini-Grids for Africa project

Cyril Renault, Energy task team leader at Agence Francaise de Developpement (AFD)

Malte Lindenmeyer, Coordinator of OASES: research project on Development and Demonstration of a Sustainable Open Access AU-EU Ecosystem for Energy System

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Modelling at Fraunhofer IEE (Fraunhofer Institute for Energy Economics and Energy System Technology)

Giacomo Falchetta, coordinates modelling at RE4AFAGRI: Renewables for African Agriculture (LEAP-RE project), Scientist at the Euro-Mediterranean Center on Climate Change (CMCC) and the European Institute on Economics and the Environment (EIEE), completed PhD and postdoctoral research positions

Azeddine Houari, Project Coordinator MiDiNA: A comprehensive methodological approach on the development potential of microgrids and the integration of renewable energies in North Africa (LEAP-RE project), Electrical Engineering at Nantes University, completed PhD and postdoctoral research positions

Thematic Session 2: Materials: Critical Raw Materials, End-of-Life and Circularity

The second session discussed the role of critical raw materials, end-of-life management, and circularity in renewable energy systems. It also addressed supply chain resilience, life cycle analysis, and recycling practices for technologies such as hydrogen, geothermal, solar, and wind. Emphasis was placed on circular economy principles to enhance the sustainability and long-term viability of renewable energy projects. This session highlighted RESTART project, and included speakers as below:

Moderator: Anne Wacera Wambugu, Head of Electrification under the UNESCO Chair for Climate Change Resilience and Sustainability in Strathmore University.

Dr. Ismael Saadoune, Professor at Mohammed VI Polytechnic University

Luca Xodo, Steam's Global Sales and Partnerships Director and Lead Project Advisor - ETIP-Geothermal (the European Technology & Innovation Platform on Geothermal), and

Teresa Simoes, Researcher at LNEG: Laboratório Nacional de Energia e Geologia, Portugal.

Thematic Session 3: Energy Systems and Modelling with Considerations to the Water-Energy-Food Nexus

The third clustering session discussed integrated energy systems and context-specific modelling approaches. The webinar addressed minimizing bias in energy models, lessons from best practices, and the design of both on-grid and off-grid systems. It also highlighted the interlinkages between energy, water, and food systems, emphasizing the need for holistic, cross-sectoral planning in AU-EU cooperation. This session highlighted results from EMERGE, RePower and Africa Energy Parks in LEAP-RE, and external projects including KADI project: Knowledge and Climate Services from an African Observation and Data Research Infrastructure, lead by ICOS: The Integrated Carbon Observation System, Institute for Water and Environmental Engineering (2iE) and ONEPLANET Project.

Speakers:

Corneliu Barbu, Associate Professor Aarhus University

Nikola Matak, Project Manager, EMERGE

Theresia Bilola, Project Manager, KADI

Pedro Solano, economist currently pursuing his Ph.D. in Applied Economics at the University of Valladolid (UVa)

Laura Bartolome, Industrial Engineer, ONEPLANET

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Thematic Session 4: Gender, Local Communities and Capacity Building

The last session explored the social dimensions of renewable energy. Discussions focused on community involvement, gender equality, and capacity building as key factors in the success and sustainability of energy initiatives. The session highlighted strategies for inclusive engagement, community-led planning, and tailored training programmes, while emphasizing the importance of addressing gender-specific challenges and promoting women's empowerment in the energy sector. This session had speakers as below:

Susan Onyango, Géo2D - Geological Resources for Sustainable Development (LEAP-RE partner in WP11-GV1 Geothermal Atlas for Africa and WP11-GV Geothermal Village)

Marine Cornelis (ONLINE), Executive Director and Founder of Next Energy Consumer (policy and public affairs consultancy focused on the social aspects of energy and climate transitions)

Dr. Sarah Khalil, SOLAR-induce project. Induced domestic clean efficient cooking and refrigeration for off-grid applications in Africa, at the British University in Egypt.

Prof. Dr. Boris Heinz, Professor of Community Energy and Adaptation to Climate Change at Technische Universität Berlin

Tanja Gillmann, Senior Scientific Officer for African-European Cooperation in Research & Innovation at DLR Projektträger & Region Liaison Officer for African Union at MSCAdvocacy project

3.4LEAP-RE Stakeholder Forum, Brussels

Under the 5th Stakeholder Forum in Brussels, altogether two clustering sessions were organized in a hybrid format on 22nd October 2025 bringing together a total of xx participants.

Session 1: Energy Modelling Cluster

This LEAP-RE clustering session brought together leading African and European researchers working on energy system modelling to share insights, compare approaches, and explore synergies across ongoing projects. The session focused on three interlinked themes:

1. Energy planning challenges in Africa – from rural electrification and industrial applications to national-level strategies.
2. Energy modelling approaches – highlighting tools and methods used by the speakers and their projects.
3. Data availability and collection – practical challenges and innovative solutions for generating reliable input data.

The session featured LEAP-RE Pillar 1 project, OASES as well as external projects EPIC Africa, OpenMod4Africa, EMERGE, SEforALL, and RE-INTEGRATE and explored opportunities for collaboration and knowledge exchange. This engagement provided an opportunity to raise questions, share perspectives, and contribute ideas for strengthening modelling efforts that support Africa's energy transition.

Session 2: Water Energy Food Nexus - Strategies for Sustainable Development in Africa

This session explored the Water-Energy-Food (WEF) Nexus as an integrated approach to sustainable development, resilience, and innovation in Africa. By examining the WEF nexus as a project framework, the session unpacked why the integrated approach offers a more holistic and effective strategy compared to traditional sectoral approaches. Discussions

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addressed the challenges and opportunities shaping resilient WEF systems, while also spotlighting emerging innovations and the barriers that slow their development and adoption. Through practical case insights from OPTiMG, RE4AFAGRI, PRIMA, ENERGICA, Strathmore University - UNESCO Chair and ONEPlanet, participants gained an understanding of how WEF innovations can be scaled up and sustained across African contexts. The session further emphasized the critical role of partnerships between governments, the private sector, and civil society in driving innovation and resilience within the WEF space. Further, the session addressed the challenges and opportunities shaping resilient WEF systems, while also spotlighting emerging innovations and the barriers that slow their development and adoption.

The 2 panel discussions were distributed as below:
Panel Discussion 1 (Virtual) Diana Kosgey (SU) - Moderator
Best Practices in Nexus integration- Case Studies - Ms Jane Wambui - UNESCO
Policy Support for Integrated Approaches - Steve Gichuki and Bw. Simon Thuo , Consultants SU
Future Trends in WEF Nexus Research- A look at LEAP RE and LEAP SE - Fabio Montagnino - The Cyprus Institute
JRC Africa Knowledge Platform - Magda Moner/Irene Angeluccetti

Panel Discussion 2 (On site)
Innovative solutions towards resource maximization with sustainable and resource efficient WEF implementation Moderator - Gabriela Aguinaga (ENERGICA)
Projects:
OPTiMG - Julian Fleischmann
Energica - NANOE Nicolas Saincy (Madagascar), FWT Aminata Dumbuya (Sierra Leone)
ONEPlanET - Brenda Insonne
RE4AFAGRI - Giacomo Falchetta

Total participants - registered - 58
Male - 25
Female - 33

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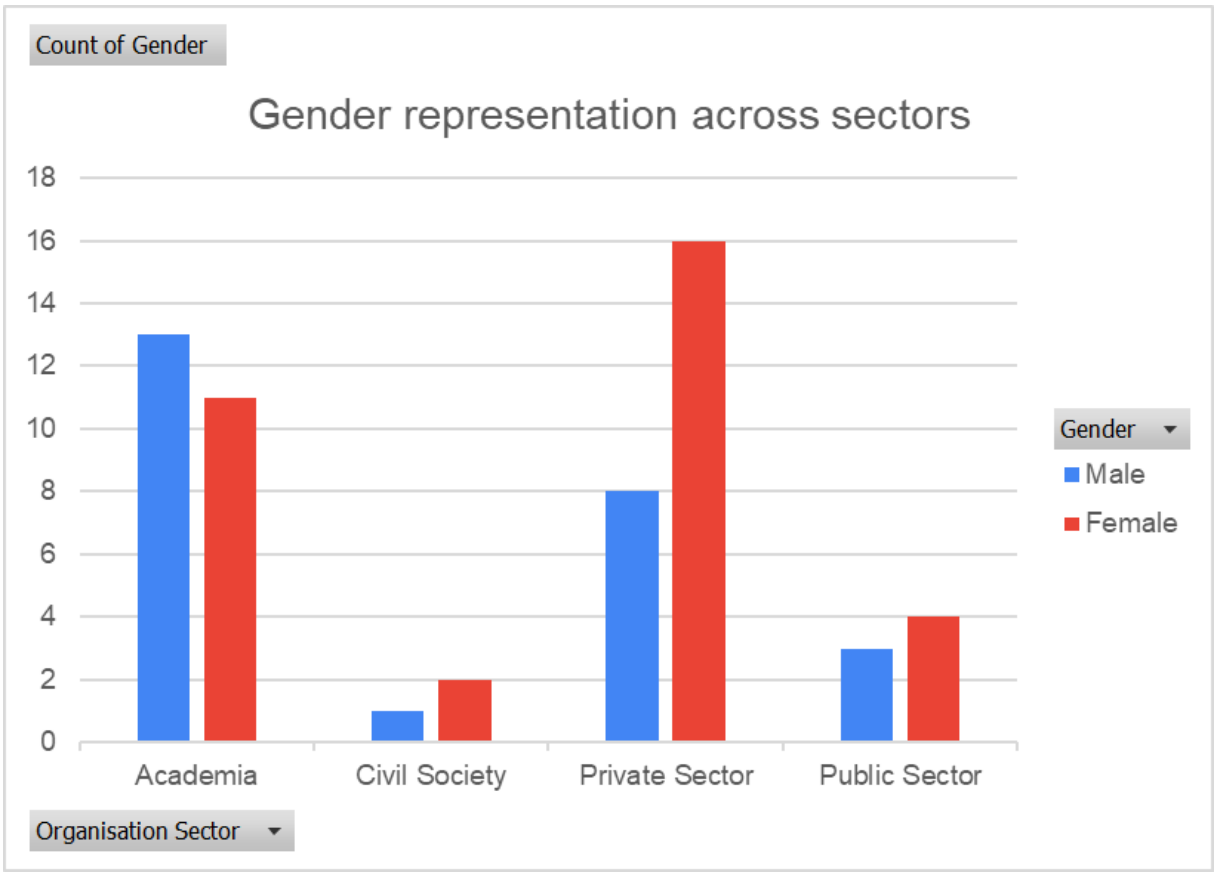

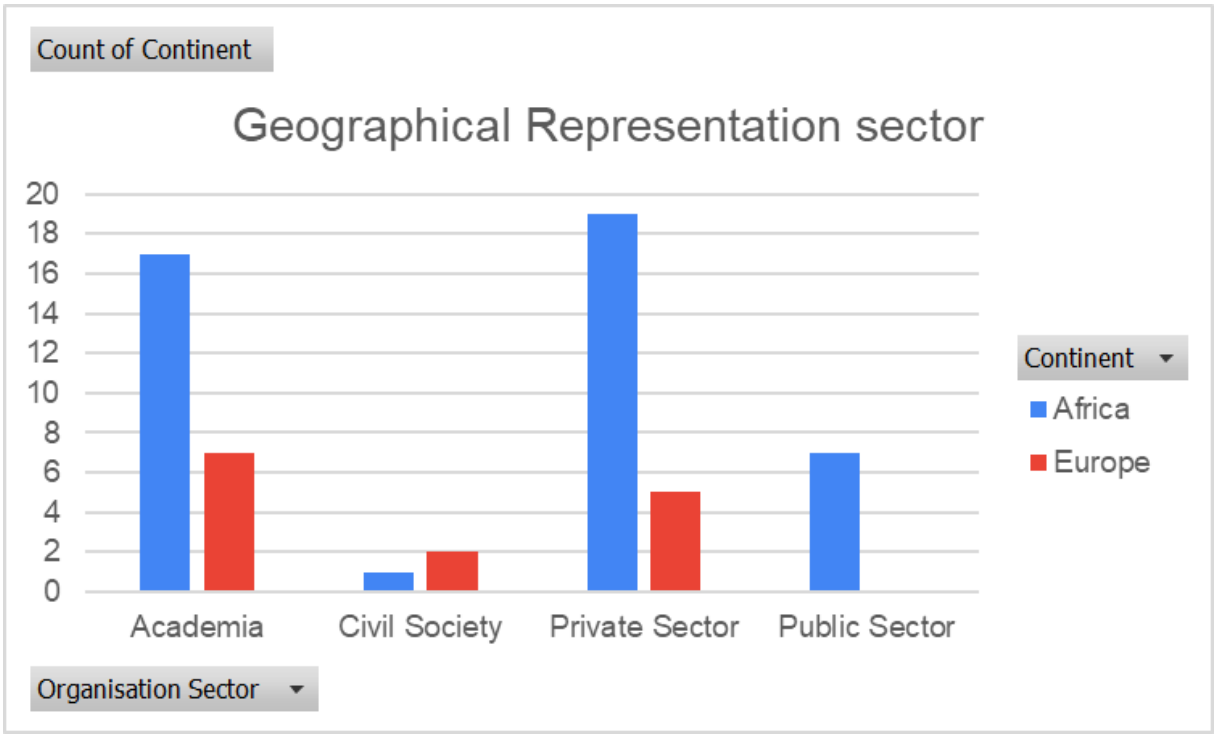

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3.5Online Clustering Webinars

The Peer-2-Peer Session for the Green Energy Transition in Africa

The Peer-2-Peer Session for the Green Energy Transition in Africa was held on 7 May 2024 from 11:00 to 13:00 CET, organized by the Green Deal Projects Support Office in collaboration with LEAP-RE. The session gathered 39 participants and 9 speakers to foster knowledge exchange between Green Deal Call (GDC) projects and similar initiatives funded by other EU programmes. It focused on transferring lessons from more "mature" projects to newer ones. Topics included assessing local community needs, designing effective training sessions, enhancing community participation, supporting policymaking, and boosting socio-economic benefits through capacity building. The session followed a presentation format and highlighted best practices and practical tools. It was part of a broader effort to strengthen learning, collaboration, and capacity across projects.

Integrating Gender-Energy Nexus in AU-EU Energy Transition Efforts

On 3 June 2024, the EU-funded LEAP-RE and gEneSys projects hosted a webinar titled Integrating Gender-Energy Nexus in AU-EU Energy Transition Efforts. The seminar brought together 34 participants and 9 speakers. The registered participants represented a range of sectors. The largest share came from academia (18 participants), including universities, students, and research networks. The private sector was represented by 7 participants, followed by 3 participants each from the public sector and third sector (NGOs). The seminar was aimed at fostering a fair and socially inclusive transition to carbon neutrality by integrating gender-sensitive, context-specific energy transition pathways. Experts shared insights and experiences from the gEneSys and LEAP-RE projects and focused on practical strategies to achieve just and equitable outcomes in African and European energy transitions. The discussion emphasized maximizing the impact of Horizon Europe projects by addressing power dynamics and inequalities. Participants exchanged ideas to promote actionable, inclusive solutions for sustainable energy systems.

Solar Powered Solutions: Advancing Clean Cooking Technologies in African Countries

In May–June 2024, a two-part webinar series gathered 125 participants and 11 speakers to explore the development and use of solar cooking appliances and their socio-economic impact in African countries. The first webinar introduced the LEAP-RE project, PURAMS, and innovation projects on cooking under Pillar II. It also highlighted research activities from Pillar I and other initiatives across the continent that are focused on cooking technologies. The webinars presented solar cooking activities in Spain as well as industrial solar cooking efforts. The series introduced the research results and promoted knowledge exchange to advance sustainable solar cooking solutions in Africa. Participants discussed ways for scaling up these innovations that can benefit local communities.

Opportunities and Challenges in Integrating WEF Nexus Approaches for Resilience and Sustainability

On 24 November 2024, the WEF Nexus cluster hosted the WEF Nexus Approaches for Sustainability in Africa webinar, featuring 4 speakers and 57 attendees. The session explored the interdependencies between water, energy, and food systems, using experiences from African projects to highlight challenges such as vulnerable climate conditions, socio-ecological systems, and innovation and investment needs. Moderated by Gladys Ombati, the discussion emphasized the importance of localized strategies to address community needs, climate vulnerability, and investment gaps. Partners proposed mapping regional WEF "hotspots" and integrating nexus metrics into national energy policies to improve sustainable resource management. The webinar provided valuable insights into practical solutions and policy recommendations for enhancing community resilience.

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Clean Cooking Solutions in African Countries: Give e-Cooking a Chance!

On 28 November 2024, the Modern Cooking Technologies cluster hosted a webinar on clean cooking solutions in Africa and gathered 4 speakers and 79 attendees in an online session with presentations and a roundtable discussion. The webinar highlighted the growing funding opportunities and initiatives promoting clean cooking technologies across the continent. Despite this progress, significant barriers remain, particularly regarding business financing and the affordability of solutions for end users. Discussions focused on the opportunities and challenges that e-cooking must overcome to scale up in the coming years. The event emphasized the need for continued investment and innovation to drive sustainable, accessible clean cooking options in Africa.

MSCA Staff Exchange Opportunities for Joint AU-EU R&I Cooperation

On 12 December 2024, an online webinar was held to explore MSCA Staff Exchange (MSCA-SE) opportunities supporting joint research and innovation collaboration between the African Union (AU) and the European Union (EU). The session brought together 125 participants and included presentations and interactive discussions highlighting the objectives and benefits of MSCA-SE, administrative guidance for proposal preparation, and support available through EURAXESS Africa. Participants engaged in networking sessions to explore potential collaborations and interdisciplinary partnerships. The event provided practical insights for researchers and institutions to strengthen AU-EU cooperation through MSCA-SE. It aimed to build capacity and encourage wider participation in future joint R&I efforts.

Bridging Data and Action: Leveraging Greenhouse Gas Research to Drive Policies and Renewable Energy in Africa

On 29 January 2025, the LEAP-RE Climate Energy Cluster hosted a webinar to explore how greenhouse gas research and climate data can inform policies and support renewable energy development in Africa. The session brought together 47 participants and highlighted KADI's work on greenhouse gas monitoring and capacity building, as well as FOCUS-Africa's climate services in Tanzania's hydropower sector. It also addressed air quality challenges in South Africa and their relevance to the Just Energy Transition. The event promoted science-based decision-making and stronger collaboration between researchers, policymakers, and industry actors. It aimed to strengthen Africa's voice in global climate negotiations through data-driven climate services.

Biofuels, Biomass and Energy Security: A Pathway to Africa's Future

On 27 February 2025, the Biomass and Biofuels Cluster hosted a webinar to explore the role of biofuels and biomass in Africa's energy future. The session examined how these resources can reduce greenhouse gas emissions, enhance energy security, and create economic and rural development opportunities. Participants discussed diverse technologies, impactful case studies, and innovative strategies advancing the sector. The event emphasized the potential of biomass and biofuels to support sustainable development across the continent. It provided a platform for sharing solutions that align energy goals with climate and socio-economic priorities. Gender, Local Communities and Capacity Building.

The Role of Geothermal Technology in Africa's Just Energy Transition

The webinar "The Role of Geothermal Technology in Africa's Just Energy Transition" was held online on 22 April 2025 and brought together 66 registered participants from across sectors. The gender distribution was relatively balanced, with 53% identifying as male and 47% as female. The session focused on the significant potential of geothermal energy in Africa and its contribution to a more just and sustainable energy transition. Experts

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explored how advanced geothermal technologies are improving equitable energy access, supporting local economic development, and strengthening Africa's renewable energy mix. Highlights included key innovations from the LEAP-RE Energy Village, Geothermal Village, and the Geothermal Atlas for Africa.

Grid Intelligence, Renewable Integration and Economic Growth: A Digital Pathway for Africa

This webinar held on 29 July 2025 under the grid digitization cluster explored how grid digitization, through technologies like advanced metering, IoT, AI, real-time analytics, and automation is transforming Africa's energy systems. It highlighted global partnerships, innovative tools, policy frameworks, and lessons from leading initiatives that are shaping resilient and future-ready power systems across the continent. By examining real-world case studies, the webinar provided a platform to share best practices and discuss strategies to scale up digital infrastructure in African energy systems, with specific reference to LEAP-RE projects.

Data-Driven Approaches to Enhance Solar PV System Design, Performance and Efficiency

On 2 December 2025, a webinar was held under the data collection and PV Cluster. This webinar brought together researchers, engineers, and policymakers to explore how data collection, analytics, and digital technologies are revolutionizing PV system design and management. Discussions focused on three interrelated themes: Data collection and monitoring tools, PV system design optimization, and Performance benchmarking and analytics. This webinar was integral as solar photovoltaic (PV) systems continue to expand globally making accurate, reliable, and actionable data central to ensuring their optimal performance and long-term sustainability. Perspectives adressed how to effectively harness data collected by PV installations through advanced monitoring tools, smart sensors, and analytics platforms to detect inefficiencies, predict potential failures, and optimize energy generation.

4. Key Outcomes and Results

As listed above, the implementation of LEAP-RE clustering formation and development was supported by clustering workshops that were organized alongside the LEAP-RE General Workshops. These clustering workshops facilitated the formation of clusters by bringing together projects; encouraging dialogue between clusters; and supporting the definition of needs, synergies, and, potentially, activities.

In addition, the workshops served as the principal forum for dialogue between the project clusters and LEAP-RE, creating space for multiple interactions. Altogether ten sessions were organized during the general workshops and 14 online webinars were organized under the thematic and methodological clusters. These together gathered a total of 736 participants.

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4.1 Networking, Joint Learning & Knowledge Sharing

External Partner	Webinar Focus	Cluster	Contribution	Outcome
ENERGICA PRIMA IN THE MEDITERRANEAN AREA ONEPlanET	Innovative solutions towards resource maximization with sustainable and resource efficient WEF implementation	Water Energy Food Nexus	**PRIMA** represented by Mohamed Wageih presented the Overview of WEF nexus and significance giving Learnings from Mediterranean region **ENERGICA Projects:** NANOE – Nicolas Saincy (Madagascar) Freetown Waste Transformers (FWT) - Aminata Dumbuya (Sierra Leone) Coordinator Gabriela Aguinaga was one of the panel moderators **ONEPlanet**: Brenda Insonne was a guest speaker	The partners were able to give practical case insights, and the participants gained an understanding of how WEF innovations can be scaled up and sustained across African contexts.
KADI	Knowledge and climate services from an African observation and Data research Infrastructure (KADI) aims to provide concepts for developing the best available science and science-based services in Africa. It aims to advance the foundations for a pan-African research infrastructure for atmospheric and climate services.	Climate Change Cluster	KADI came on board as a co-planner to the webinar. Matthew Saunders presented the KADI project and showcased KADI's work in greenhouse gas monitoring, policy support, and local capacity building.	The webinar was able to explore how greenhouse gas research and climate data can be leveraged to drive policy action and renewable energy development in Africa. with reference to the KADI Project.

External Partner	Webinar Focus	Cluster	Contribution	Outcome
OpenMod Africa RE INTEGRATE EMERGE GREEN AFRICA SUSTAINABLE ENERGY FOR ALL	Grid Modelling Cluster: • Energy Planning challenges in Africa, at different scales (Rural, Industrial, National) • Energy Modelling Approaches of the different speakers • Data availability and Data collection techniques	Energy Modelling	**OpenMod4Africa:** Grid analyses best practices from Eastern Africa Power Pool - Atsede Endegnanew, Eastern Africa Power Pool **RE-INTEGRATE:** Tunisian Energy System Modelling using OSeMOSYS: Challenges & Opportunities - Prof. Essia Znouda from Ecole Nationale d'Ingénieurs de Tunis **SEforALL:** Energy Modelling Challenges and Solutions in SEforALL - Tamojit Chatterjee **EMERGE:** Energy planning challenges in Africa, at Rural, Industrial and National scales Francesco Roncallo, EnGreen	Engagement of these external projects explored opportunities for collaboration and knowledge exchange. This created an opportunity for questions, to share perspectives, and contribute ideas for strengthening modelling efforts that support Africa's energy transition.
Green Deal Projects Support Office	The Green Deal Projects Support Office was committed to organize peer-to-peer meeting sessions between Green Deal Call (GDC) and similar projects financed through other relevant EU programmes. The idea is to encourage exchange of knowledge and synergies, but even more to create learning experiences and transfer knowledge	Capacity Building	LEAP-RE co-organised the peer to peer session on Green Energy Transition in Africa with the Green Deal Supports Office	This Peer-2-Peer session focused on how to best assess the real needs of site-specific local communities and the best approach training and capacity building sessions for the local community

4.2 Effective dissemination of results/outputs

In 2024, a dedicated LEAP-RE Clustering webpage was launched to centralise information on clustering activities and online workshops. It is regularly updated with all the relevant

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information. The page's event calendar is directly linked to the LEAP-RE platform and is regularly updated with all the upcoming clustering workshops, ensuring easy access to the most recent information for partners and stakeholders.

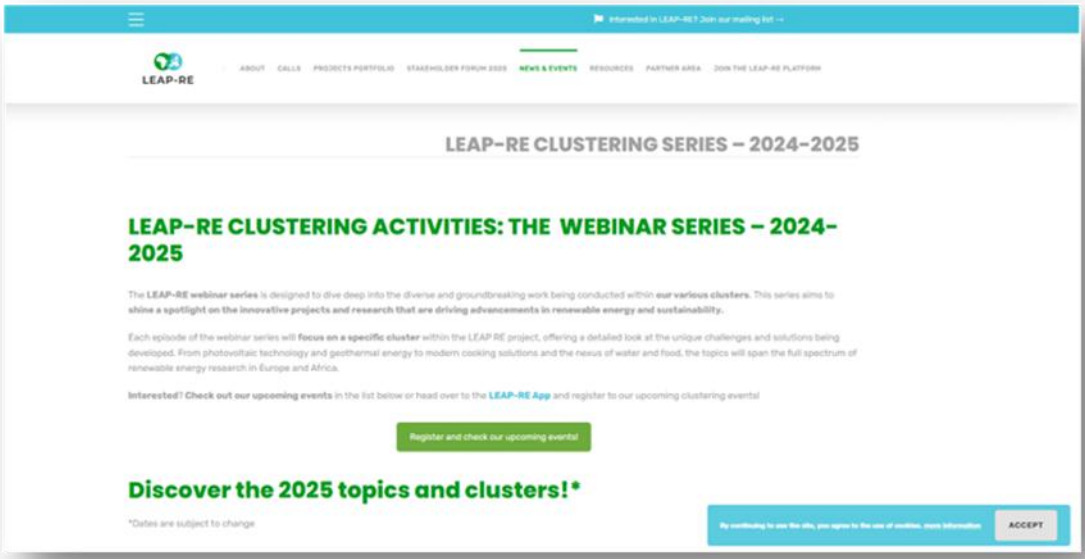

Figure : LEAP-RE Clustering Activities webpage

To extend the reach of these activities, the replays of the clustering workshops are uploaded to the LEAP-RE YouTube channel, enabling wider dissemination and long-term visibility of the discussions and outcomes.

Besides, each webinar was advertised in the LEAP-RE platform, LEAP-RE social handles, across different partner academia, private and public institutions using flyers and save the date placeholders on attendees calendars and emails. For each webinar an event page was created where the registration form, save the date, event program with speaker information, and event recording were published. The flyers used in the outreach and dissemination is as in the figure below:

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Figure 4-1: LEAP-RE Clustering webinar flyers at the LEAP-RE platform.

5. Conclusion

The clustering activities under LEAP-RE have proven to be a vital instrument in advancing the partnership's strategic objectives. Through a structured yet flexible framework, the initiative has successfully brought together diverse stakeholders across eight thematic and six methodological clusters, fostering an environment of collaboration, learning, and innovation. The series of stakeholder forums and online webinars have not only facilitated knowledge exchange but also laid the groundwork for sustained networks that will outlive the project itself.

Key achievements include enhanced visibility of project outputs, strengthened AU-EU research ties, and the integration of cross-cutting themes such as gender, digitalization, and the Water-Energy-Food Nexus into the renewable energy dialogue. The establishment of a dedicated clustering webpage and YouTube channel has further extended the reach and impact of these activities, ensuring that insights and outcomes are widely accessible.

Moving forward, it is recommended that LEAP-SE continues to leverage the momentum generated by these clustering efforts, with an emphasis on scaling successful collaborations, addressing identified challenges, and deepening engagement with local communities and private sector actors.

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