



# Energy Modelling Platform for Africa (EMP-A) | 2024

## Concept Note

### Context

Secure, adequate, and reliable access to modern energy forms and services for livelihoods and industrialisation is critical for attaining Africa’s sustainable and inclusive development transformation, framed by the African Union’s Agenda 2063 and the UN 2030 Agenda for Sustainable Development. This will simultaneously bring about resilience to shocks posed by climate change.

Against a background of increased energy demand for structural transformation, a rising population, the need for sustainable livelihoods, and the adverse impacts of climate change on the continent, there is an urgent need to support African countries to strengthen their capacities in energy planning. This will optimise investments in energy production and services to take advantage of the continent’s abundant renewable energy resources, falling technology prices, and increasing availability of free open-source and robust energy planning models, data, and interfaces for customised applications to the needs of each country.

Furthermore, almost all African countries have included renewable power generation in their Nationally Determined Contributions (NDCs) to climate action under the Paris Agreement on climate change framework. The prominence of renewable energy in these actions, coupled with Africa’s abundant renewable energy resources (including variable renewable energy sources such as wind and solar) and the urgent need to mobilise investments to meet a considerable energy deficit on the continent, requires strategic assessment planning. This is needed to ensure (i) enough generation capacity and expansion of supply to meet demand, (ii) system flexibility to accommodate high shares of renewables, (iii) adequate transmission capacity to dispatch power to demand centres, (iv) grid stability to accommodate short time frame variations, (v) appropriate and effective off-grid systems, (vi) optimised investments that capitalise on falling costs of low-carbon technologies to minimise the risk of stranded underperforming energy infrastructure assets in the future, and (vii) sustainable and coordinated use of energy, land, and water resources. Climate action has gained even more credence in light of the ongoing energy transition and growing calls for Africa to define net-zero emission targets. Yet, much of Africa has a considerable deficit in human and institutional

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capacity regarding effectively using models and modelling tools for energy supply, demand, and investment planning and management.

To date, four rounds of the EMP-A, namely EMP-A 2018, EMP-A 2019, EMP-A 2021 and EMP-A 23 have taken place, witnessing growing participation and resounding calls for more dedicated sessions. EMP-A 2024 will take place from **May 13th to May 31st 2024** at **the Ghana Institute of Management and Public Administration (GIMPA) in Ghana**.

## **Objective**

Although the EMP-A acknowledges that different countries and regions within Africa will require context-specific approaches, the overarching objectives of the platform are to:

- Gather the energy planning and modelling community in Africa to share experiences, models, and data in climate, land, energy, and water systems.
- Support human and institutional capacity in Africa for integrated energy modelling and investment planning.
- Support the development of centres of excellence for energy planning in Africa.
- Promote efficient and widespread use of open-source modelling tools to support the implementation of the SDGs, the Paris Agreement, and Africa's Agenda 2063.

## **Structure of the EMP-A 2024**

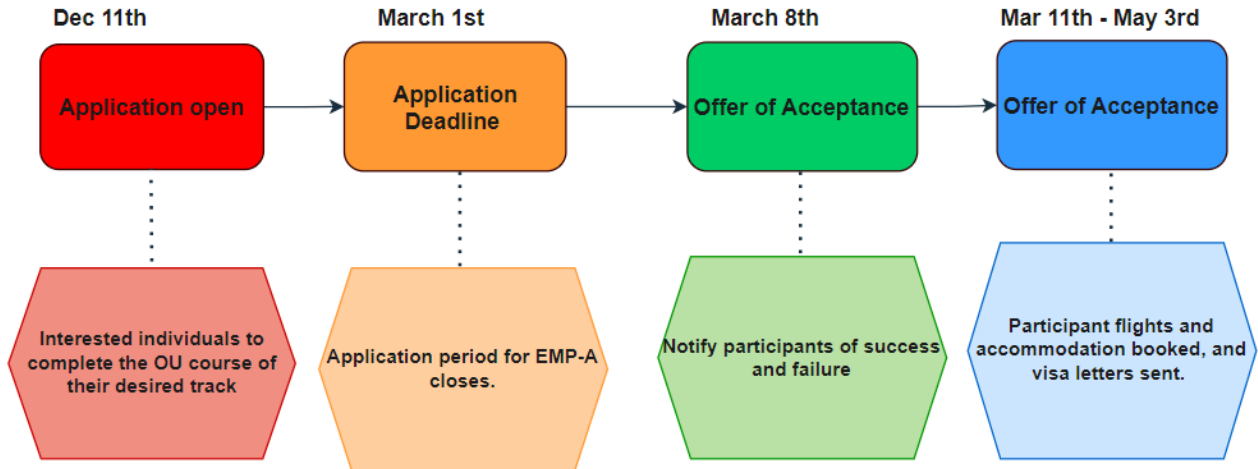
This year's EMP-A will be held in person.

The application period is as follows, please make note of the dates below:

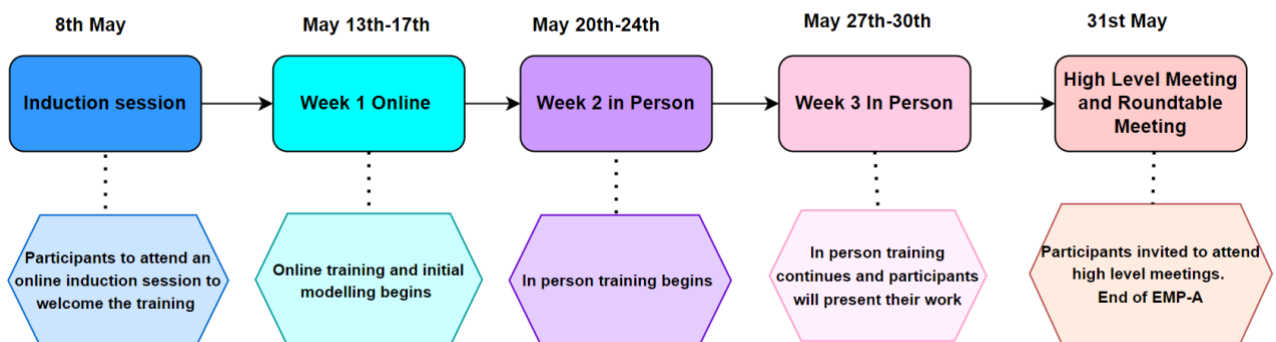
The application period will shortly be followed by the training period, see below for dates and details.

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## Application Period



## Training Period



Please note, the “Electricity Transition Playbook” is an in-person week-long course, likely taking place in Week 3 (this will be confirmed later).

During the EMP-A 24, participants will acquire energy and resource modeling skills using one of the following open-source modelling tools for sustainable development pathways under leading academics and researchers in the field of model-informed development strategies. There are ten tracks. They will focus on either.

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- **OnSSET / The Global Electrification Platform**

This course will help participants learn about geospatial energy modeling, how to build your own electrification analysis, how to include the geospatial dimension in your energy modelling to unlock new dimensions and gain an understanding of the earth's different energy resources, and how to incorporate them in your energy modeling.

- **Energy and Flexibility Modelling: OSeMOSYS & IRENA FlexTool**

This course will help participants to understand what investments, when, and at what scale are needed in the energy sector to meet the growing demand for energy while meeting security, environmental, and other constraints. Special considerations will be made for modeling the flexibility of the electricity system, to account for high renewables penetration.

- **FinPlan (Financial Planning of Energy Infrastructure) and Investment Pipelines**

This training course will provide basic knowledge on financial theory, will show how financing is done in the power sector across the world, with primary focus on developing countries, and will demonstrate how to carry out financial analysis of power projects using FINPLAN.

- **MAED**

This course will teach participants how to use two of the International Atomic Energy Agency (IAEA) modeling tools: the Model for Analysis of Energy Demand (MAED) and the Energy Balance Studio (in the process, participants will learn about energy balances and energy systems in general, assisting them in energy system planning).

- **Introduction to CLEWS: Climate, Land-Use, Energy and Water Systems**

This course will teach participants how to analyse policy decisions on issues such as the promotion of clean energy, competition for water and agricultural modernisation by teaching how to define model components, linking them together in an integrated system representation, populating the model with data, running a model, and interpreting results using CLEWS.

- **Electricity Transition Playbook**

This course will guide participants through the key steps required to successfully deliver an electricity system transition. It will use an engaging "lectures and case studies" approach to set out how to create a long-term vision for the electricity mix. It will build understanding of the key elements of political support, policy and regulatory delivery mechanisms, network infrastructure and operational requirements, all framed by enabling technologies, supply chain and workforce needs and consumer and public buy-in. Participants will also bring their own case study to the course (e.g., a country or

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region), to work on collaboratively with ICTP convenors and other participants. This will bring the course material to life and ensure practical value when returning home.

Please be advised, this course is an in-person week-long course, not a three-week course, and likely taking place in the final week of the school.

- **OnStove**

In this course you will be introduced to OnStove, an open-source spatial clean cooking tool identifying the best cooking solutions across any given area based on their costs and benefits. The track will take you from start to finish, from creating your own spatial repository to modifying your spatial data, calculating the net-benefits of different cooking solutions and lastly visualizing and presenting your results.

- **Energy Access Explorer: A data-driven, Integrated and Inclusive Approach to Planning for Achieving Universal Access to Energy for Equitable Development**

EAE will introduce the importance of spatial data & analytics for providing actionable insights regarding the expansion of clean energy services for socio-economic development. Participants will work on practical hands-on activities to identify high priority areas for energy access interventions. That is, through the front-end of the application. They will also be introduced to and work on the backend infrastructure (through the user-friendly interface of the dynamic information system) to develop an EAE application for a given geography of interest.

- **Geospatial data, best practices for collection and management**

Participants will get an overview of different types of geospatial data sources that can support their modelling efforts with a focus of open data, data quality standards, best practices and state-of-the-art tools for data collection, manipulation, spatial data infrastructure (SDI) and management, including how to best document the data to allow replication of models and their update when new data becomes available. This course is targeted to energy planners, utility representatives and IT specialists supporting energy planning efforts.

- **Microgridspy and RAMP**

This course will introduce participants to the use of two open-source models. The first to optimize the sizing of rural microgrids based on locally available renewable resources and the load demand of the community, simulated through a second model designed to estimate the electricity demand of rural isolated communities based on their appliances ownership and usage patterns data.

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### Each course has two parts:

- **Self-paced study:** Participants will complete the track of their choice and attach the certificate of completion on their application form. After participant acceptance an Induction Session will take place (May 8th), where the running of the event and a general introduction to the course will be given. Week 1 of the School (May 13th-17th) will be conducted online. Coaching and troubleshooting sessions will be scheduled to support applicants and further their modelling knowledge.
- **In-depth hands-on training** Week 2 and Week 3 (May 20th to 30th ) is comprised of an interactive component with dedicated trainers (except for the “Electricity Transition Playbook”, which is an in-person week-long course and will most likely take place in week 3). Applicants will receive further coaching and training on using the tool from their chosen track for a national case study. Applicants are expected to develop a report, and an 'elevator pitch' presentation for a senior decision-maker. Applicants are required to present their Presentation and Report at the end of Week 3 (30th of May). Feedback will be given based on these presentations, as well as invitations to a high-level dialogue (May 31st).

Participants will receive a certificate from on successful completion of the training, once they provide their presentations and reports.

The last day of the School (Week 3, May 31st) will be dedicated to:

- **A High-Level Strategic Dialogue** of government officials, representatives of international organisations, and the expert community on planning and policies for national and sustainable development for the 2030 Agenda. This strategic dialogue is scheduled to occur on May 31st.
- **Roundtable Discussion on Strategic Energy Planning** - A complementary event organised by the FCDO, this event is scheduled to occur on May 31st. (trainers only).

### Application

There is no fee to attend; however, competition for space is high, and space is limited. Applicants interested in participating in the EMP-A are required to complete the application form with the attached using the link below:

[https://loughboro.qualtrics.com/jfe/form/SV\\_bP0hanHRWitS2ea](https://loughboro.qualtrics.com/jfe/form/SV_bP0hanHRWitS2ea)

This form has a ‘Personal Details’ section and an ‘Application’ section, where candidates are required to share information such as, but not limited to, their current job responsibilities,

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motivation for the application, and field of interest. Such writing from the candidate will subsequently be taken into consideration for the application process.

1. In order to be considered, you **must attach the Open University certificate** of completion for your chosen track to your application (unless you are applying for the MicroGridsPy & RAMP).

2. Additionally, candidates are required to complete the ‘Modelling, policy and political economy’ course available on the Open University website, and attach the certificate of completion on the application form (this must be done also for applicants to the MicroGridsPy & RAMP). Please note, this course is available only in English.

3. Furthermore, a stamped **Letter of Commitment** stipulating **an express statement from participants’ respective institutions towards attendance of the module of choice is also mandatory** for attendance. To apply, you will have to demonstrate:

- That the output of your study is in demand by the government that you represent; or
- That the skills, tools, and teaching material that you acquire will be used in university teaching or government planning knowledge management; or
- That the output will fit into policy-relevant research to be published on a visible platform.

Supporting documentation will require a letter from a head of unit or higher (government) or head of department or higher (university and others). Exceptions will be made for selected candidates from participating organisations and ongoing technical assistance programmes, and applicants will be notified via those channels. Priority will be given to participants from countries with a demonstrated need and ability to apply the training to policy development. The selection of participants will include considerations of equity, diversity, and inclusion.

4. Lastly, a **Letter of Motivation** must be submitted by the applicant, **in which the applicant states why they should be selected for the course, and how their background knowledge and experience makes them ideal for the course (1 page long)**.

The deadline to submit the application form for participants who wish to **attend in person** is at **12.00 pm (CAT) on March 1st**. If unsuccessful, applicants may still be considered for online participation. It should be noted that spaces are limited and the application process is highly competitive.

Furthermore, full-time commitment towards the EMP-A is crucial.

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## Funding for in person participants

Funding will be made available for some in person participants to cover the cost of flights and/or accommodation. However, participants not selected for funding can still attend at their own expense, or can be funded by other organizations. Please specify in your application if you wish to be considered for funding.

## IT requirements

Note that participants will require a computer with stable internet access to participate in the training. It is recommended, for all tracks, that participants have at least 8 GB of RAM and a relatively new computer. Specific Tracks have additional computer requirements above and beyond this minimum:

- CLEWs - Windows 10 computer
- Energy and Flexibility Modelling: OSeMOSYS & IRENA FlexTool - Windows 10 computer, 8GB RAM, MS Office with Microsoft Access.

## Partners

In alphabetical order:

- African Climate Policy Centre - United Nations Economic Commission for Africa (ACPC-UNECA)
- Climate Compatible Growth Programme (#CCG)
- Energy Sector Management Assistance Program (ESMAP)
- Green Grid Initiative (GGI)
- Ghana Atomic Energy Commission (GAEC)
- Ghana Energy Commission
- International Atomic Energy Agency (IAEA)
- International Renewable Energy Agency (IRENA)
- Imperial College London (ICL)
- Kartoza
- KTH Royal Institute of Technology (KTH)



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- OpTIMUS Community of Practice
  - Politecnico Di Milano
  - Republic of Ghana Ministry of Energy
  - Simon Fraser University
  - Sustainable Energy for All (SEforALL)
  - The Loughborough Centre for Sustainable Transitions: Energy, Environment, and Resilience (STEER)
  - United Kingdom Foreign, Commonwealth and Development Office (UK FCDO)
  - United Nations Department of Economic and Social Affairs (UNDESA)
  - United Nations Development Programme (UNDP)
  - University of Cambridge
  - University of Oxford
  - World Resource Institute (WRI)
  - World Bank Group (WBG)

**Further information contact:** [inquiries@optimus.community](mailto:inquiries@optimus.community)