Synthesis Report of the "Seventh Roundtable Discussion on Strategic Energy Planning" (Online event, 12th December 2021)

December 2021

Executive Summary

This synthesis report summarises the discussion and outcomes of the **Seventh Roundtable Discussion on Strategic Energy Planning (RD7)**, held on 12th December 2021 as an online event. It was arranged on the back of the **Energy Modelling Platform for Africa (EMP-A)**. The workshop was part of the **Roundtable Initiative on Strategic Energy Planning**, a global initiative focused on improving how development partners support energy systems modelling and planning in developing countries. To promote harmonised engagement, the Roundtable process has developed the **'Key principles for improving the support to strategic energy planning in developing and emerging economies'**[1] (hereafter referred to as 'the Principles'). **Twenty-one high-profile organisations have already endorsed the Principles** (see section 1 for a full list).

The RD7 with a session on the official launch event of the Principles, which was held on 4th November at Strathclyde University, Glasgow, UK, during a week of side events to the UNFCCC COP26 promoted by the CCG programme. A promotional video shown during the event was shown. After playing the video, representatives from the newest endorsers expressed their appreciation and commitment towards the Principles.

The next sessions were each based on specific aspects of the Principles to be discussed (see the full agenda in Annex A).

Session 3 revolved around two questions about **Principles 1-2: National ownership, coherence and inclusivity, which were discussed.** These are:

- How can we promote national ownership, coherence and inclusivity of the strategic energy planning process? What good examples are already out there?
- How can the Principles be brought to the attention of national stakeholders?

There were different inputs and suggestions from the attendees, which can be summarised as follows: a) **There is the need to broaden the spectrum of the stakeholders who know of and agree with the Principles**, so that they can champion them in their countries and push for their application by Development Partners. Some of the mentioned stakeholders are civil society organisations (CSOs), parliamentarians, and academics. b) Now that the Principles have been launched, efforts need to be put into **developing targeted communication and dissemination efforts for national stakeholders**. Some examples mentioned are specific knowledge and awareness products targeted at policy-makers, and outward-facing events. c) The importance of **having robust and coherent data so that governments can trust the results** of strategic energy modelling was emphasised. Some of the practical efforts discussed were the development of basic country models that can be further developed and improved by national modellers (for example the EMP-A trainees), more work on ensuring the interoperability of data for different models/tools, and improving the retrievability of energy data by properly indexing them. d) It is important to **support governments in strengthening their institutional frameworks**, for example by promoting the creation of dedicated energy planning units in government.

Session 4 looked at **Principles 4-5: Robustness, and transparency and accessibility**, by providing an update on the application and refinement of the U4RIA goals, a series of principles, with the ambition to become standards for good, transparent and accessible energy data modelling

[1] The Principles that the document advocates for strengthening the energy systems planning support to developing countries are: 1) National ownership; 2) Coherence and inclusivity; 3) Capacity; 4) Robustness of evidence, analysis and tools; and 5) Transparency and accessibility of planning inputs and outputs.

and management, jointly developed by multiple organisations involved in the Roundtable Initiative. These are Ubuntu (community), Retrievability, Reusability, Repeatability, Reconstructability, Interoperability, Auditability. **A template of Terms of Reference (ToR) Annex defining ways for modelling projects to align with the U4RIA goals was developed** by EEG and taken on by GIZ in climate-economy modelling activities in the project "Policy Dialogue and Knowledge Management on Low Emission Development Strategies (DIAPOL-CE)". In addition, a **United Data Advisory Group** involving the FCDO-funded applied research programmes EEG, CCG and the High-Volume Transport (HVT) programme was created to develop common guidelines on using open science practices aligned with the U4RIA goals by the programmes.

The following discussion highlighted some aspects to be considered by Development Partners to foster robustness, transparency and accessibility of the data, but also linked to foster their national ownership. Firstly, it was emphasised how it is important to have, **on the one hand, the Roundtable Initiative, speaking with the development partner and policy-maker community, and, on the other hand, an active dialogue with the analyst and modelling community** that is more data-oriented. Active coordination between these two levels of engagement is crucial for properly supporting strategic energy planning. Secondly, Principles' endorsers should **support the governments to own the Principles and even "reinterpret" them into a version tailored to their national contexts**, including the specification of the roles of different stakeholders in the strategic energy planning process.

Session 5 was about Principle 3: Capacity, and sought to distil key lessons from the design and running of the EMP-A course. CCG chaired the session, which began with the presentation of the feedback received by trainees and trainers. The full presentation with the feedback from the EMP-A trainees is included in Annex D. In summary, the following suggestions about activities useful to follow up the EMP-A course were received:

- **Monthly coaching session**, including technical assistance for participants to continue modelling at their own pace
- A **webinar** as a refresher program and giving out projects to strengthen the skills acquired
- Much of the work done has been at an intermediary level, an **upgrade of the course** would be good
- Develop an **alumni platform** for continuous communication and knowledge sharing
- **Publish and share** any information of what the participants had put in practice regarding the tools and training gained during this course
- **Analyse the impact** in terms of research, policy and decision
- Learn how to **translate modelling results into policy messages**
- Setting up #CCG country teams; NDC country updates; **research collaborations**
- **Scholarship for PhD students** who want to use modelling in their thesis.

After the presentation, a brief open discussion followed. Some **issues with communicating properly the need for a full-time commitment** to the applicants were raised, as it appears that several trainees struggled to complete the course. Despite that, **having the initial part of the course dedicated to self-study allowed to increase the participation in the course**, particularly of government officials who may not have the time to commit full-time. It was also remarked the importance of **focusing not just on technical aspects of energy modelling, but also on translating the modelling results into structured policy issues and recommendations**.

The final session of the RD7 was dedicated to facilitating the share of knowledge between the Roundtable participants. In this regard, the floor was open to several Development Partners to briefly **present their capacity building activities in the field of strategic energy planning.** The

full list can be found in Section 6, while the latest version of the Excel tracker is provided in Annex E.

Finally, Table ES-1 below shows a list of all key actions and actionable recommendations that emerged from the Roundtable Discussion. EEG and CCG will own the overall coordination of their implementation, although each of them has an identified lead.

Table ES-1. Key actions and recommendations from the 7th Roundtable Discussion

Item	Description	Lead / Proposer	Action / Recommendation
1	**Promoting energy data working groups within countries**	Dimitrios Mentis (WRI)	Recommendation
2	**Develop specific knowledge and awareness products about the Principles targeted at policy-makers**	Luca Petrarulo (EEG/CCG)	Action
3	**Organise outward-facing events about the Principles**	Luca Petrarulo (EEG/CCG)	Action
4	**Develop basic country models** that can be further developed and improved by national modellers	Ioannis Pappis (KTH)	Recommendation
5	Ensuring data interoperability and their appropriate indexing to develop a **search engine of energy data**	Mark Howells (CCG)	Recommendation
6	**Fostering institutional strengthening in developing countries**, including the creation of dedicated energy planning units	Laura Gutierrez (GIZ)	Recommendation
7	**Support governments to own the Principles and even "reinterpret" them into a version tailored to their national contexts**	Simon Trace (EEG)	Recommendation
8	**Better communicate the need for full-time commitment to the EMP-A and similar courses**	Rudolf Yeganyan (CCG)	Recommendation
9	**Have a two-part series in the next EMP-A**, with a part more technical like the current course, and a part dedicated to translating the modelling results into structured policy issues and recommendations	Mekalia Paulos (UNECA)	Recommendation

Table of contents

1 Introduction

This synthesis report summarises the discussion and outcomes of the **Seventh Roundtable Discussion on Strategic Energy Planning (RD7)**, jointly convened by the Energy and Economic Growth (EEG) and the Climate Compatible Growth (CCG) programmes, both funded by the UK Foreign and Commonwealth Office (FCDO), and the OpTIMUS community of practice. RD7 was held on 12th December 2021 as an online event, because of the health risk posed by the global pandemic of COVID-19. It was arranged on the back of the **Energy Modelling Platform for Africa (EMP-A)**, a multi-donor training course on energy modelling for African countries hosted by the University of Mauritius and the United Nations Development Programme (UNDP), United Nations Economic Commission for Africa (UNECA).

The workshop was part of the **Roundtable Initiative on Strategic Energy Planning**, a global initiative focused on improving how development partners support energy systems modelling and planning in developing countries. The initiative's activities focus on four areas: 1) Harmonised engagement; 2) Capacity building through co-development; 3) Community platforms for data and tools accessibility; 4) Data, models and standards. The initiative is coordinated by EEG, a programme managed by Oxford Policy Management (OPM).

To promote harmonised engagement, the Roundtable process has developed the **'Key principles for improving the support to strategic energy planning in developing and emerging economies'**[2] (hereafter referred to as 'the Principles'). The Principles are a "code of conduct" for development partners to work collectively towards improved effectiveness of their support to country governments on strategic energy system planning. **Twenty-one high-profile organisations have already endorsed the Principles** (alphabetic order): Agence Française de Développement (AFD), African Development Bank (AfDB), Applied Research Programme on Climate Compatible Growth (CCG), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Applied Research Programme on Energy and Economic Growth (EEG), Applied Research Programme on Energy and Economic Growth (EEG), World Bank – Energy Sector Management Assistance Program (ESMAP), Fondazione Eni Enrico Mattei (FEEM), United Kingdom – Foreign, Commonwealth & Development Office (FCDO), Institut du Développement Durable et des Relations Internationales (IDDRI), International Renewable Energy Agency (IRENA), Swedish Royal Institute of Technology (KTH), Open Tools, Integrated Modelling and Upskilling for Sustainable Development Community of Practice (OpTIMUS), Netherlands – Environmental Assessment Agency (PBL), Politecnico di Milano, Regional Center for Renewable Energy and Energy Efficiency (RCREEE), Stockholm Environment Institute (SEI), The Bartlett Energy Institute – University College London (UCL), United Nations Development Programme (UNDP), United Nations Economic Commission for Africa (UNECA), United Nations Institute for Economic Development and Planning (UNIDEP), World Resources Institute (WRI).

The objective of the day was to follow up on some of the advances made by the Roundtable Initiative during the past six months. The event was attended by 38 representatives from 27 organisations, including donors, international organisations, research organisations/academia and the private sector. A full list of participants is provided in Annex B.

The synthesis report is structured along with the sessions in the agenda (included in Annex A), as follows:

- Section 2: Strategic Energy Planning Principles – Endorsement
- Section 3: Principles 1-2: National ownership, coherence and inclusivity

[2] The Principles that the document advocates for strengthening the energy systems planning support to developing countries are: 1) National ownership; 2) Coherence and inclusivity; 3) Capacity; 4) Robustness of evidence, analysis and tools; and 5) Transparency and accessibility of planning inputs and outputs.

- Section 4: Principles 4-5: Robustness and transparency
- Section 5: Principle 3: Capacity - Preliminary lessons from the EMP-A design and running
- Section 6: Principle 3: Capacity - Energy planning capacity building initiatives
- Section 7: Summary of key actions and recommendations.

2 Strategic Energy Planning Principles – Endorsement

After welcoming the attendees and introducing the agenda of the day, Luca Petrarulo, the Roundtable Coordinator from EEG/CCG gave an update on the state of the endorsement of the Principles. **Error! Reference source not found.** provides an overview of the **21 organisations that have officially endorsed the Principles** so far. Since the last Roundtable Discussion (1st July 2021), 3 new organisations have endorsed the Principles: GIZ, the EEG Programme, and the CCG Programme.

Figure 1. Current organisations endorsing the Roundtable Principles

Next, Luca reported back from the **official launch event of the Principles**, which was held on 4th November at Strathclyde University, Glasgow, UK, during a week of side events to the UNFCCC COP26 promoted by the CCG programme. The launch event took the form of a panel discussion chaired by Linus Mofor (UNECA) and with the participation of a diverse panel with representatives from the UK FCDO, GIZ, KTH, the IAEA, and the University of Costa Rica.

To open the launch event, a **promotional video** explaining the importance of the Principles and showing the commitment of the endorsing organisations in effectively supporting strategic energy planning was screened. The video was also screened during the RD7 and it is available on the Roundtable Initiative section of the EEG website.

After playing the video, representatives from the newest endorsers expressed their appreciation and commitment towards the Principles. Mark Howells (CCG) remarked that the Principles are important to coordinate more easily with other organisations with the same "DNA", i.e. that are committed to improving evidence-based energy planning in developing countries. Mark also reminded that CCG is working on developing guidelines to implement the Principles on transparency and accessibility. Laura Gutierrez (GIZ) stressed how the Principles help bring about a more systematic and structured approach to energy planning activities. She feels the next challenge or focus area should be to disseminate the Principles internally to GIZ so that they can be incorporated into the work. Simon Trace (EEG) is glad to have contributed to the definition of these joint principles and thinks that the next step is raising awareness of the Principles amongst national governments for holding development partners accountable for their application. EEG will be working with Climate Parliament and insert the Principles in webinars with national government and parliamentarians from developing countries in the next few months. Finally, William Blyth (FCDO, i.e. the funder of EEG and CCG) stressed the importance of engaging with the finance community as well, so that the Principles are aligned with the expansion of global green investments.

3 Principles 1-2: National ownership, coherence and inclusivity

Each of the following sessions focussed on specific aspects regarding the Principles. This session focussed on the principles of national ownership, coherence and inclusivity and discussed the following topics:

- How can we promote national ownership, coherence and inclusivity of the strategic energy planning process? What good examples are already out there?
- How can the Principles be brought to the attention of national stakeholders?

There were different inputs and suggestions from the attendees, which are summarised below:

- **Broadening the spectrum of involved stakeholders:** Jacqueline Kimeu (Access Coalition) advocated involving civil society organisations (CSOs). Some are already working on energy issues and, if engaged, they can keep Development Partners accountable to align with the Principles. Simon Trace (EEG) also reminded the potential role of parliamentarians in mainstreaming some of the Principles in the national political debate. Dimitrios Mentis (WRI) reinforced the concept of national and sub-national ownership as linked to the involvement of national academic institutions, which can help support and train the policy-makers and the other key energy planning stakeholders. He proposed promoting the development of energy data working groups within countries, which would involve different energy data providers to share, explain, and review the data, leading to increased ownership of the modelling results.
- **Developing targeted communication and dissemination efforts:** National governments and policy-makers are the main beneficiaries of the energy planning support covered by the Principles. Mark Howells explained that several ministers from developing countries participated in the COP side events held by CCG, where some of the concepts covered by the Principles were touched. He suggests developing targeted messages to follow up with them and let them know about the Roundtable Initiative and its Principles. Agnese Beltramo (KTH) agreed with Mark's suggestion and proposed to develop specific knowledge and

awareness products targeted at policy-makers to: a) understand the results and implications (pros and cons) of energy modelling data; thus b) building their trust towards strategic energy planning and the application of the Principles. Luca Petrarulo pointed out how having more outward-facing events where the Principles are explained to national policy-makers would also be needed.

- **Ensuring consistency of energy modelling data and outputs:** Ioannis Pappis (KTH) remarked on the importance of the need to have robust and coherent data so that governments can trust the results of strategic energy modelling. To do so, he suggested developing basic country models that can be further developed and improved by national modellers (for example the EMP-A trainees). In this way, the national stakeholders would know where to find reliable evidence for their strategic energy planning. Nicolina Lindblad (ESMAP) referred to the Global Electrification Platform as a platform that can be a starting point in that sense, where there is a least-cost electrification model for each country, but it can also be expanded with country models on other aspects (e.g. currently for Somalia). Mark Howells reminded how working on the interoperability of data is important so that the data can be disseminated as widely as possible. Moreover, he expressed the need of indexing the data to be included in a search engine for energy data so that the right data can be mined easily.

- **Fostering institutional strengthening:** Laura Gutierrez pointed out that sometimes what is missing to raise the ownership of national governments is the right institutional and financial resources. For example, where there are dedicated government units, the government ownership of the energy planning process is generally high.

4 Principles 4-5: Robustness and transparency

This session aimed at providing an update on the application and refinement of the U4RIA goals, a series of principles, with the ambition to become standards for good, transparent and accessible energy data modelling and management, jointly developed by multiple organisations involved in the Roundtable Initiative. These are Ubuntu (community), Retrievability, Reusability, Repeatability, Reconstructability, Interoperability, Auditability.

A template of Terms of Reference (ToR) Annex defining ways for modelling projects to align with the U4RIA goals was developed by EEG and taken on by GIZ in climate-economy modelling activities in the project "Policy Dialogue and Knowledge Management on Low Emission Development Strategies (DIAPOL-CE)". The ToR Annex template is included in Annex C below.

Laura Gutierrez (GIZ) provided an update on the application of U4RIA in DIAPOL-CE, explaining that the ToR Annex template was used in procuring activities in Jordan, Rwanda and Uganda. The modelling activities are undertaken in collaboration with the national ministries of energy. Since the models are Excel-based, they are already prone to be transparent. The activities are only at the beginning and more updates can be provided in subsequent Roundtable Discussions. More broadly than DIAPOL-CE, GIZ has started to encourage the alignment of project design and implementation with the Principles in other work (e.g. in Tunisia), including using the ToR Annex template.

Following that, Luca Petrarulo explained that the FCDO has asked **EEG, CCG and the High-Volume Transport applied research programme to work together to improve consistently their data management.** A three-party United Data Advisory Group was created under the

leadership of KTH. Agnese Beltramo (KTH) explained that the aim is to first review the current data and model management practices used in the three programmes, followed by the development of common guidelines on using open science practices aligned with the U4RIA goals by the programmes.

Mark Howells highlighted the need to reach out to the broad energy modelling community to work out together the contents of the U4RIA standards. The Open Energy Modelling Initiative (openmod) and the OpTIMUS community have been involved in it. At the same time, Mark noted that it is important to have, on the one hand, the Roundtable Initiative, speaking with the development partner and policy-maker community, and, on the other hand, an active dialogue with the analyst and modelling community that is more data-oriented. Active coordination between these two levels of engagement is crucial for properly supporting strategic energy planning.

Simon Trace (EEG), responding to a comment from Phil Mudavanhu (Action 24), raised the question of whether Development Partners should assist national energy planning processes to be more inclusive. To that point, Mark Howells proposed that the **Principles' endorsers should support the governments to own the Principles and even "reinterpret" them into a version tailored to their national contexts**, including the specification of the roles of different stakeholders in the strategic energy planning process. He mentioned Costa Rica and Cyprus as examples of countries that have been pushing for Principles-aligned energy planning.

5 Principle 3: Capacity - Preliminary lessons from the EMP-A design and running

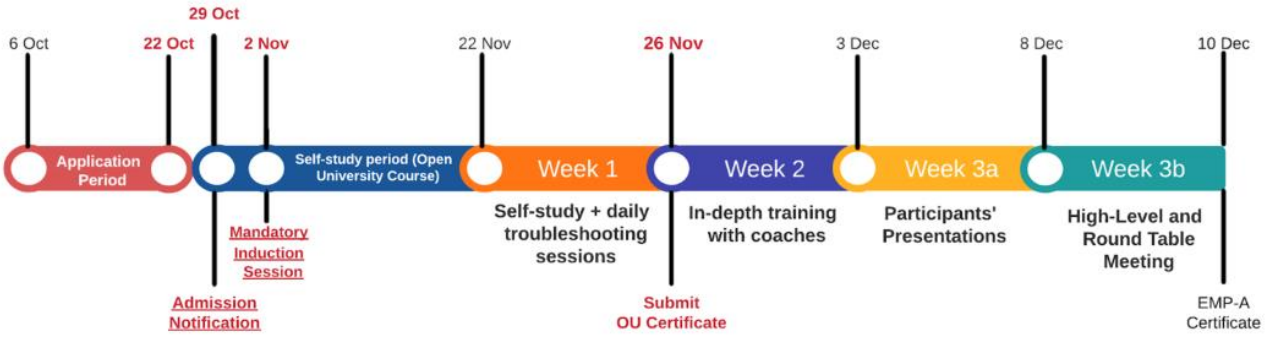
This session looked back at the design and running of the EMP-A online course to summarise the key lessons learnt for future capacity building initiatives. The session was chaired by Carla Cannone (CCG), who first presented some slides with the feedback from the trainers and the trainees about the EMP-A and then facilitated an open discussion among the roundtable participants. The full presentation with the feedback from the EMP-A trainees is included in Annex D. Here some of the highlights are provided.

Based on the feedback received and lessons learnt from running the ICTP Joint Summer School on Modelling Tools for Sustainable Development in June-July 2021, several changes were made to the design of the EMP-A 2021:

- The Open University Courses were updated
- New function to track progress was added on the OU Website
- An Induction Session was held three weeks before the beginning of the EMP-A to provide logistic information
- Videos recording on the logistics were made available (how to enrol for OU courses, how to use Teams, how to use Gather town, etc.) and shared well in advance
- Gather Town space was re-designed to be more user-friendly
- Extra time (2 weeks more) was given for the self-study period to complete the OU course
- For the OSeMOSYS and FlexTool tracks, videos for all hands-on exercises were recorded
- Fewer tools were used (Teams and Gather.Town)
- No more policy brief as a Deliverable (only Presentation and Poster).

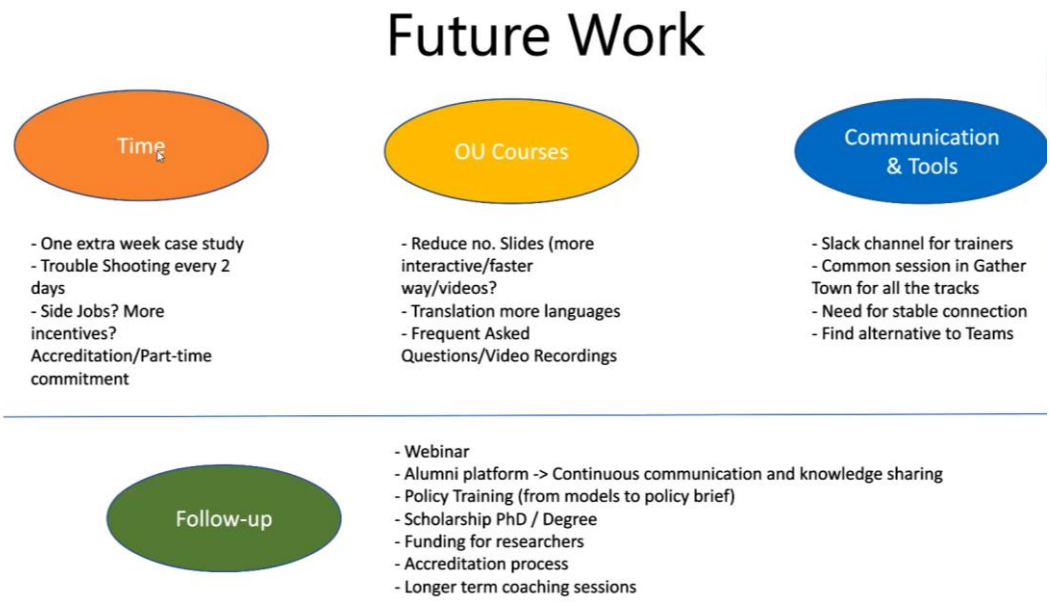
The timeline of the EMP-A course structure is summarised in Figure 2.

Figure 2. EMP-A 2021 timeline



Key suggestions on course improvements and follow-up activities are included in Figure 3.

Figure 3. Proposed EMP-A course improvements and follow-up activities



Trainees made the following suggestions about activities useful to follow up the EMP-A course:

- **Monthly coaching session**, including technical assistance for participants to continue modelling at their own pace
- A **webinar** as a refresher program and giving out projects to strengthen the skills acquired
- Much of the work done has been at an intermediary level, an **upgrade of the course** would be good
- Develop an **alumni platform** for continuous communication and knowledge sharing
- **Publish and share** any information of what the participants had put in practice regarding the tools and training gained during this course
- **Analyse the impact** in terms of research, policy and decision
- Learn how to **translate modelling results into policy messages**
- Setting up #CCG country teams; NDC country updates; **research collaborations**
- **Scholarship for PhD students** who want to use modelling in their thesis.

After the presentation, a brief open discussion followed. Rudolf Yeganyan (CCG) pointed out how the **need for a full-time commitment might have been communicated** less clearly to the EMP-A applicants than to the ones of the ICTP summer school, which could partially explain the lower completion rate of the EMP-A course. Mark Howells noted how **having the initial part of the course dedicated to self-study allows increasing the participation in the course**, particularly of government officials who may not have the time to commit full-time. He then followed on by reminding how the course material is now available on the Open University website and can be further used by other organisations. Mark also explained that the EMP-A is supposed to help build African centres of excellence in energy modelling: for example, this edition was hosted by the University of Mauritius and supported by UNECA. Mekalia Paulos (UNECA) stressed how they are glad to champion the EMP-A initiative. For the next edition, she proposes to have a **two-part series with a part more technical like the current course, and a part dedicated to translating the modelling results into structured policy issues and recommendations.** This is particularly interesting in the context of the African energy transition and the multitude of linked policy issues that need to the addressed. Dinesh Surroop (University of Mauritius) agreed with Mekalia on the need to further support the capacity of technical modellers in conveying their messages in the right way to policy-makers. Then, Dinesh closed up the session by acknowledging that the EMP-A has evolved positively and that it is an important means of building the capacity of local energy modellers. He pointed out how **persevering with building the capacity of a growing number of people will have a positive lasting impact**, even if some of them may move to different jobs.

6 Principle 3: Capacity - Energy planning capacity building initiatives

In this session, in a view of facilitating the share of knowledge between the Roundtable participants, **the floor was open to several Development Partners to briefly present their capacity building activities in the field of strategic energy planning.** Priority was given to those who had provided updates on their initiatives so that they were included in the "Energy Planning and Modelling Initiatives Database" of the Roundtable Initiative (see Annex E). Below is a summary of the activities presented. The order follows the presenting order during the workshop:

- **IRENA (Asami Miketa)**
    - **Regional analysis and modelling support.** IRENA has been using a System Planning Test (SPLAT) Model that is built on the MESSAGE model. For the last 9 months, they have been providing training and modelling support to the Central African "Power Pools" and their members. The second phase is about to start during which IRENA will work with North African countries.
    - **National master plan development support programme.** IRENA is currently supporting Cameroon, already assisted Sierra Leone and Eswatini.
    - **African Continental Power Systems Master Plan (CMP).** IRENA and IAEA were selected as modelling and training partners for developing the CMP, an initiative led by the African Union. IRENA and IAEA have already started to provide training to the African Union Development Agency (AUDA-NEPAD) and the African Power Pools.

- **Africa hydropower database.** IRENA developed a continental database of hydropower resources, which is built to be used for modelling. IRENA will soon build similar databases for solar and wind energy.

- **Politecnico di Milano (Nicolò Stevanato)**

  - **National support to Eritrea and Somalia.** Politecnico di Milano (Polimi) has been working on two projects funded by the Italian Agency for Development Cooperation (AICS) in Eritrea and Somalia looking at the sustainable energy requalification of a University Campus in Mogadishu and cultural heritage sites in Eritrea.

  - **LEAP-RE project.** Polimi is involved in the Long-Term African Partnership on Renewable Energy, which is a flagship project from the European Commission. Polimi is leading a work package aiming at developing a harmonised framework for rural microgrid modelling and planning, so that modellers can a standard/harmonised methodology for data collection and data use. This framework involves collecting data through surveys and turning them into low-demand or resources assessment methodologies. This work also aims to develop a conceptual sizing and dispatch strategy and optimisation model for minigrid sizing, as well as business model analysis and digitalisation of minigrids. The countries of focus are Kenya, Rwanda, Mozambique and Algeria.

- **World Resources Institute (WRI)**

  - **Energy Access Explorer.** WRI is supporting several countries throughout Sub-Saharan Africa and India in building their capacity in an integrated, inclusive, and data-driven approach to achieving their electrification targets. The platform used is called the Energy Access Explorer, which was customised with local partners in several geographies, including Uganda, Kenya, Tanzania, Zambia, Nigeria, Ethiopia, India (sub-national level only), some of which at both national and sub-national levels. The Energy Access Explorer is an online interactive geospatial platform enabling different stakeholders to identify high-priority areas where energy access expansion should be prioritised. It is different for example from the Global Electrification Platform because it implies the use of multi-criteria analysis to identify the high-priority areas, rather than in what technologies are the most cost-effective to use to expand electrification. The platform comes with a back-hand system to enable data providers to manage a dynamic information system. The Energy Access Platform is in line with the Roundtable Principles.

- **World Bank / ESMAP (Nicolina Lindblad)**

  - **World Bank active Access to Electricity (A2E) projects.** Nicolina showed a map of the active A2E projects from the World Bank ESMAP. They currently have 14 least-cost analysis projects, 7 national electrification analysis projects, and 4 spatial data infrastructure (SDI) projects ongoing. Most of them have an important capacity building component.

  - **Open University learning material for GAP – OnSSET.** ESMAP has worked on developing a full training course on the Global Electrification Platform (GAP) which runs the OpeN Source Spatial Electrification Toolkit (OnSSET) model, which is now available on the Open University website.

- **EEG Programme (Simon Trace)**

- **Accelerating Large-Scale Deployment of Renewable Energy in Southern Africa through Bridging Analysis and Application of Decision Support.** This research project with the University of California Santa Barbara, SACREEE, and RERA, aims at identifying renewable energy resources and grid integration strategies specific to the needs and opportunities of the 12 Southern Africa Power Pool countries. The project, inter alia, involves modelling, policy analysis and supporting technology-specific capacity targets. The project has provided a multi-criteria decision support tool for mapping renewable energy resources reflecting country contexts, and is delivering analysis on cost estimates, renewable technology integration (including cross-country) and other decision support analysis. In particular, it has been training staff from local stakeholders to understand and use these decision support tools.

- **Capacity building on renewable energy auctions.** EEG has done some work with the University of Cape Town reviewing experience and practice running renewable energy auctions across Sub-Saharan Africa, with case studies in South Africa, Uganda, Zambia, Namibia and Ethiopia, as well as several countries in Latin America and South Asia. These case studies are available on the EEG website and will be collated in an upcoming book from Oxford University Press. The project also involved running courses for energy professionals on renewable energy auction design in connection with the broader course "Finance, contracts and risk mitigation for private power investment in Africa", run by the Power Futures Lab of the University of Cape Town.

- **CCG (Mark Howells)**

  - **Open University courses and Energy Modelling Starter Kits.** CCG in collaboration with other partners involved in the ICTP Summer School and the EMP-A have uploaded energy modelling courses on the Open University website, which are free to use. In addition, there are free data kits on energy system expansion planning for about 70 developing countries that can be used as "starter kits" for building modelling activities.

The Roundtable Discussion was then closed after a quick summary of the key points and decisions taken.

7 Summary of key actions and recommendations

Table 1 below shows a list of all key actions and actionable recommendations that emerged from the Roundtable Discussion. EEG and CCG will own the overall coordination of their implementation, although each of them has an identified lead.

Table 1. Key actions and recommendations from the 7th Roundtable Discussion

Item	Description	Lead / Proposer	Action / Recommendation
1	**Promoting energy data working groups within countries**	Dimitrios Mentis (WRI)	Recommendation
2	**Develop specific knowledge and awareness products about the Principles targeted at policy-makers**	Luca Petrarulo (EEG/CCG)	Action

Item	Description	Lead / Proposer	Action / Recommendation
3	**Organise outward-facing events about the Principles**	Luca Petrarulo (EEG/CCG)	Action
4	**Develop basic country models** that can be further developed and improved by national modellers	Ioannis Pappis (KTH)	Recommendation
5	Ensuring data interoperability and their appropriate indexing to develop a **search engine of energy data**	Mark Howells (CCG)	Recommendation
6	**Fostering institutional strengthening in developing countries**, including the creation of dedicated energy planning units	Laura Gutierrez (GIZ)	Recommendation
7	**Support governments to own the Principles and even "reinterpret" them into a version tailored to their national contexts**	Simon Trace (EEG)	Recommendation
8	**Better communicate the need for full-time commitment to the EMP-A and similar courses**	Rudolf Yeganyan (CCG)	Recommendation
9	**Have a two-part series in the next EMP-A**, with a part more technical like the current course, and a part dedicated to translating the modelling results into structured policy issues and recommendations	Mekalia Paulos (UNECA)	Recommendation

Annex A Seventh Roundtable Discussion Agenda

Seventh Roundtable Discussion on Strategic Energy Planning, Online, 12th Dec 2021

Time (GMT)	Session
8:30 – 8:45	**Introduction** Introductions and objectives of the day **Strategic Energy Planning Principles – Endorsement** • Brief reporting from the official launch event at COP26
8:45 – 9:30	**Principles 1-2: National ownership, coherence and inclusivity** • How can we promote national ownership, coherence and inclusivity of the strategic energy planning process? What good examples are already out there? • How can the Principles be brought to the attention of national stakeholders?
9:30 – 9:45	**Principles 4-5: Robustness and transparency** • Brief updates from initiatives that are piloting the U4RIA energy data management goals • Next steps for further developing and applying U4RIA
9:45 – 9:55	**Coffee break**
9:55 – 10:25	**Principle 3: Capacity - Preliminary lessons from the EMP-A design and running** • Reporting from organisers about key lessons learnt • Open discussion on how to apply these and other lessons in future capacity building initiatives
10:25 – 10.55	**Principle 3: Capacity - Energy planning capacity building initiatives** Highlights from capacity building initiatives from the Roundtable Partners
10.55 – 11:00	**Summing up and closing remarks** Summing up of action points from the day Concluding remarks

Annex B List of attendees

List of participants: **Seventh Roundtable Discussion on Strategic Energy Planning**

Date and time: 12th December 2021, 8:30 – 11:00 GMT

Location: Zoom online platform

No.	Name	Organisation
1	Helen (Xiangyang) Xu	Center for Resources and Environment, China University of Mining and Technology
2	Jacqueline Kimeu	Access Coalition
3	Grace Ronoh	Access Coalition
4	Phil Mudavanhu	Action 24
5	Michael Tarney	Cities and Infrastructure for Growth (CIG), Zambia
6	Laura Gutierrez	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
7	Simon Trace	Energy and Economic Growth (EEG), Oxford Policy Management (OPM)
8	Luca Petrarulo	Energy and Economic Growth (EEG), Climate Compatible Growth (#CCG)
9	Grant Tuff	Energy Systems Catapult
10	William Blyth	Foreign, Commonwealth & Development Office (FCDO), UK
11	Rudolf Yeganyan	Imperial College, Climate Compatible Growth (#CCG)
12	Andrii Gritevksy	International Atomic Energy Agency (IAEA)
13	Ilse Berdellans-Escobar	International Atomic Energy Agency (IAEA)
14	Mario Tot	International Atomic Energy Agency (IAEA)
15	Manuel Welsch	International Atomic Energy Agency (IAEA)
16	Asami Miketa	International Renewable Energy Agency (IRENA)
17	Eunice Ramos	KTH (Royal Institute of Technology)
18	Ioannis Pappis	KTH (Royal Institute of Technology)
19	Agnese Beltramo	KTH (Royal Institute of Technology)
20	Carla Cannone	Loughborough University, Climate Compatible Growth (#CCG)
21	Mark Howells	Loughborough University, Imperial College, Climate Compatible Growth (#CCG)
22	Jose Ignacio Perez-Arriaga	Massachusetts Institute of Technology – Center for Energy and Environmental Policy Research (CEEPR)
23	Satheesh Krishnamurthy	Open University
24	Holger Rogner	OpTIMUS
25	Nicolò Stevanato	Politecnico di Milano
26	Riccardo Mereu	Politecnico di Milano
27	Mamahloko Senatla	South Africa Department of Environmental Affairs
28	Ingrid Rohrer	Sustainable Energy for All (SEforALL)
29	Mekalia Paulos	United Nations Economic Commission for Africa (UNECA)
30	Yacob Mulugetta	University College London (UCL), Climate Compatible Growth (#CCG)
31	Wikus Kruger	University of Cape Town

No.	Name	Organisation
32	Bruno Merven	University of Cape Town
33	Gregory Ireland	University of Cape Town
34	Dinesh Surroop	University of Mauritius
35	Albert Osueke	USAID / Power Africa
36	Anjana Das	VITO
37	Nicolina Lindblad	World Bank – Energy Sector Management Assistance Program (ESMAP)
38	Dimitrios Mentis	World Resources Institute (WRI)

Annex C Template to align Terms of References of projects to the U4RIA data and modelling transparency and management goals

Introduction

This document has been prepared by the Secretariat of the Roundtable Initiative on Strategic Energy Planning, in discussion with the UK FCDO funded programmes Energy and Economic Growth (EEG) and Climate Compatible Growth (CCG), and the OpTIMUS Community of Practice.

The purpose of this document is to provide donors, international organisations, development partners, and whoever else is going to commission activities involving strategic energy planning and modelling support to developing countries with a **practical way to embed sound data and modelling transparency and management practices**.

Below is an initial template that can be customised and finally included in the Terms of Reference of energy planning and modelling assignments to **align the data, metadata and models produced and treated with the principles of Ubuntu, Retrievability, Repeatability, Reconstructability, Interoperability and Auditability (U4RIA)**.

The different sections of the template refer to each of the U4RIA goals with the following specific objectives:

- **Ubuntu (community engagement):** knowledge and/or capacity about the data is left behind;
- **Retrievability:** the data are easily retrievable and openly accessible;
- **Repeatability:** the key features of the data, model, and modelling process are known;
- **Reusability:** the data are built on previous relevant modelling efforts, and are reusable by future modelling efforts;
- **Reconstructability:** the process to obtain the data can be reconstructed by a third party;
- **Interoperability:** output data can be compared and utilised using other models;
- **Auditability:** third parties are able to audit the data.

The template below has to be understood as an initial suggestion only and users will likely need to further tailor it to their project's circumstances and key aspects.

The document contains footnotes with some editor's comments that should be deleted before the document is included in Terms of References.

For any questions or further information, please contact eeg@opml.co.uk.

ANNEX X. SPECIAL REQUIREMENTS FOR DATA, METADATA AND MODELS

Property and Confidentiality of Data and Modelling Outputs

Data collected and deliverables produced under this TOR – including metadata, intermediate data and data collection and analysis methodologies – are the property of ["PROJECT OWNER"][3] and considered confidential information. The Consultant or vendor will protect the confidentiality of establishments and individuals participating in the provision of data or information at all stages. Exception to such protection of confidentiality is at the sole determination of ["PROJECT OWNER"], provided such an exception is allowed under applicable national laws. The Consultant or vendor will ensure that no data or related documentation collected or compiled under these TORs are distributed for commercial or non-commercial purposes to third parties, nor will they be used by the Consultant, firm, its staff or sub-contractors for purposes other than those expressly stated in these TORs, without the prior written approval of the ["PROJECT OWNER"].

Compliance with the U4RIA data and modelling principles

["PROJECT OWNER"] has been part of the process to define a set of principles to promote the robust, accessible and transparent delivery of energy modelling for policy support. Therefore, **all data collected and deliverables produced under this TOR must comply with the principles of Ubuntu, Retrievability, Repeatability, Reconstructability, Interoperability and Auditability (U4RIA)**, as illustrated below.

Ubuntu (Community Engagement)[4]

Under the provision of this TOR, the Consultant agrees, to the extent specifically agreed with ["PROJECT OWNER"], **to engage with the national and international energy planning and modelling community about the outputs and methodology produced under this TOR in one or more of the following ways:**

- **Peer review:** The output data and methodology used are reviewed by a group of national and international experts. Indication of the peer reviewers' names and the peer review process (including the comments received) must be documented and submitted to ["PROJECT OWNER"].
- **Presentation of final deliverables:** The output data and methodology used are presented to a list of relevant national and international stakeholders agreed with ["PROJECT OWNER"].
- **Internal capacity building:** The Consultant builds the capacity of the main governmental end-users in order to transfer the knowledge and ownership of the output data and methodology used. This should also involve regular interaction with the main end-users throughout the modelling process.

[3] **Editor's comment:** Please change everywhere in the document the reference to "["PROJECT OWNER"]" with the appropriate wording of the project outputs' "owner", according to your organisation and project's needs. Depending on the specificities of the case, this may be the Donor / Development Partner (e.g. UK FCDO, IRENA), the main government partner (Ministry of Energy), a third party or even a combination of those option.

[4] **Editor's comments:** 1) Peer review, presentation of the final deliverables and internal capacity building should be the minimum requirements to be U4RIA compliant. External capacity building, particularly of local academia, is highly encouraged, but not mandatory. 2) The text in the main body of the TOR will have to include specific activities of stakeholder engagement / research uptake that reflect these "Ubuntu" points.

- **External capacity building:** The Consultant builds the capacity of a list of relevant national and international stakeholders agreed with ["PROJECT OWNER"], in order to transfer the knowledge and ownership of the output data and methodology used.

Retrievability

In accordance with the "Key principles for improving the support to strategic energy planning in developing and emerging economies", ["PROJECT OWNER"] intends to make all data and other deliverables produced under these TOR publicly available, unless ["PROJECT OWNER"] believes that the public dissemination of the data will violate confidential information.[5]

In particular, ["PROJECT OWNER"] intends to upload all data and other deliverables produced under these TOR on the following open access platforms and websites:

- [LIST OF WEBSITES AND PLATFORMS]

The Consultant will provide advice to ["PROJECT OWNER"] on options for uploading all data and other deliverables produced under this TOR.

Repeatability

Essential metadata describing, *inter alia*, data in and out, model generators, model generated, processes followed, 'storage' of that information and related meta-information should be provided for all data products. Core metadata requirements for each data product are:

- Names and contacts of the authors/consultants and lead institution
- Problem or policy issue analysed
- Type of modelling framework (e.g. accounting, optimisation, simulation, etc.)
- Version of the software considered
- Available code base / instance of both the:
    - Software i.e. model generators (e.g. MAED, LEAP, OSeMOSYS, MESSAGE, MARKAL, MAPS, etc.) and
    - the country-specific model 'generated' and 'calibrated'
- Input data (plus related meta-information) to the model, scenario assumptions and the outputs obtained
- Techno-economic information and degree of detail of the energy system structure represented in the model (what components/technologies included and how they are interlinked)
- System boundaries and restrictions (technical, environmental, social) applied and why
- If applicable, policies evaluated, results interpreted, and policies formulated based on the results
- Sensitivity and uncertainty analyses carried out.

Reusability

It is important that the modelling outputs from this assignment build on previous relevant modelling efforts. In this regard,

[5] **Editor's comment:** Your legal department should consider tailoring this part according to the specific circumstances.

- on the one hand, ["PROJECT OWNER"] commits to share with the Consultant any relevant material in its knowledge and facilitate the Consultant's retrieval of previous relevant modelling outputs;
- on the other hand, the Consultant must document its efforts to retrieve and build on relevant modelling outputs, including by submitting a list of stakeholders contacted and data / material received.

In addition, the data and deliverables produced under this TOR should be provided in formats that allow as much as possible to be the basis for future modelling efforts. Therefore, data should be provided to ["PROJECT OWNER"] in at least one machine-readable, non-proprietary open file format that complies with the Open Definition. Tabular formats such as CSV and tab-delimited text, or geospatial formats such as Shapefile or GeoJSON satisfy this requirement. Excel, STATA, or other proprietary data formats may optionally be used in addition to at least one open format. PDF and Word are not acceptable formats for data.

Data should be provided according to recognized standards and encodings whenever possible. Data standards are available for many types of data; for instance, GTFS for transport data, or DDI for microdata. The Open Geospatial Consortium documents standards for a broad range of applications and disciplines.

Reconstructability

The Consultant should provide a clear description of the workflows to move from the modelling input to the output data, so that the process to obtain the output can be reconstructed by a third party. As a minimum, this will include:

- Reference(s) of the original input data, e.g. source name and author, publication date etc. – or no reference, i.e. the value is an assumption from the modeller
- Level of manipulation (e.g. single value from one source, calculation from multiple values from one source, calculation from multiple values from multiple sources)
- Type of manipulation (e.g. average, mean, straight interpolation etc.)
- Time series included, i.e. details of the years the final value refers to
- Further comments (including description of assumptions involved).

Interoperability

The modelling output data from this assignment should be delivered in a form that is conducive for their utilisation by other models with minimal manipulation. To achieve acceptable levels of interoperability, as a minimum, the Consultant commits to:

- Submit well documented or annotated copies of base data to be appropriately stored by ["PROJECT OWNER"]
- Ensure it is on accessible media
- Ensure that the required model version can be downloaded
- Made the data compliant with the Standard Interchange Formats [NAME AND LINK / REFERENCE OF THE SPECIFIC STANDARD INTERCHANGE FORMAT].

Auditability

It is important that all the previous U4RI principles are followed, so that a successful audit of the data and deliverables produced under this TOR can be carried out. ["PROJECT OWNER"] reserves the

right to include the compliance to the U4RIA principles as described in this Annex in an official audit and link the full or partial release of funding under this contract to the audit’s outcomes.

Annex D Energy Modelling Platform for Africa (EMP-A): Lessons learnt & Future Work

Click on the image below to open the PDF document.

Annex E Roundtable Initiative’s Energy Planning and Modelling Initiatives Database

Click on the icon below to open the Excel document.

9-12-2021_Energy planning and modellir