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The EU Global Technical Assistance Facility for Sustainable Energy (GTAF)

Draft Concept Note & Agenda

Training on SPLAT-Africa

Third session (A3): Developing alternative scenarios

Bonn, Germany

21 – 25 November 2022

Background

In 2018, the African Union Specialised Technical Committee (STC) on Transport, Transcontinental and Interregional Infrastructure, Energy and Tourism (STC-TTIIET) decided to develop a Continental Power System Masterplan (CMP) to serve as a blueprint for the African Single Electricity Market (AfSEM). The CMP aims to provide a strategic road map for connecting Africa's five power pools. The specific objectives of the CMP include the identification of priority power generation projects to meet the demand of the continent by 2040, and the establishment of a continental transmission system that will interconnect the regional transmission networks (CAPP, COMELEC, EAPP, SAPP and WAPP). Besides the AfSEM, the CMP builds synergies with the AfDB's New Deal for Energy in Africa, the African Union Agenda 2063, the United Nations Sustainable Development Goals and the IRENA-led initiative for Clean Energy Corridors in Africa. The first part of the CMP was implemented during the period February-November 2020 and produced five deliverables (reports), including the baseline of the five power pools and the project inception report.

The second part of the CMP (CMP II) includes modelling the continental masterplan together with the modelling partners: International Renewable Energy Agency (IRENA) and International Atomic Energy Agency (IAEA). It will build on three quantitative analyses: (i) demand assessment, (ii) capacity expansion optimization, and (iii) network analysis. The IAEA and IRENA's MESSAGE-SPLAT tool has been chosen to perform generation and inter country transmission capacity expansion optimization. The MESSAGE-SPLAT modelling framework includes the following components:

- MESSAGE software – a mathematical optimization software used to input data for modelling energy scenarios. In the context of the CMP II, it is used in the background as a model generator.
- **SPLAT-Africa model** – a model that IRENA developed using the MESSAGE software. Reference energy systems that define the energy flows within a country's power system have been configured for each African country, and the links between country models are configured with transboundary transmission lines.
- SPLAT model database and Excel utilities – the database contains the required input data and various key parameters used in the SPLAT-Africa model. The Excel utility works as an interface between the database and the MESSAGE model generator and allows bulk model-update.
- Renewable resources databases – geospatially referenced database with RE resource- and location-specific temporal profiles of power generation (solar, wind and hydropower).
- Online repository – Github-based system to manage and track the model versions developed by different members of the model development team.

The first training, that followed a one-week online MESSAGE e-learning, introduced the participants the key elements of SPLAT-Africa model as starter-kit. The 2nd training explained the participants on how to develop a reference scenario and how to interpret the scenario results.

In this third training, the participants will learn how to develop alternative scenarios using SPLAT-MESSAGE tool, particularly featuring different potential levels of interconnection (from low to high) within and among the different Power pools to ensure pertinence with CMP II Deliverable 4: Integrated Continental Planning Scenarios Report.

The training will cover:

- Representation of scenarios

- Use of the Excel utility to bulk update the model
- Creating, running and analysing alternative scenarios
- Parameters for different interconnection scenarios
- Analysing patterns of trade under different scenarios

After this training, the participants will be able to (i) connect qualitative scenario matrix described by CMP II deliverable 4 with operational details and (ii) develop the CMP scenarios. The training will be followed by consultative workshops with the five power pools led by the AUDA-NEPAD core modelling team to share the training learnings, discuss the results of the scenarios developed and obtain the feedback on the pertinence of these scenarios. Weekly discussions' sessions between the AUDA-NEPAD and modelling partners will also continue as per current routine.

Meeting venue

Willy-Brandt-Allee 20, 53113 Bonn

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Agenda

Day 1: Take stock of CMP reference scenario

Monday 21 November 2022

Time (Local)	Session	Speaker / participant
9:00–9:30	Coffee	
9:30–10:30	**Meeting introduction and welcome remarks** *Moderation: Bilal HUSSAIN (IRENA)* *Housekeeping/logistics announcements* - IRENA - AUDA-NEPAD - African Union Commission - Round of introductions with participants	
10:30–11:00	**Recap of previous training & objectives for the third training**	Asami MIKETA (IRENA)
11:00–12:30	**Update on SPLAT Africa Model since the second training** - Updates done since last training - Any feedback from CMP modelling team (SPLAT experience, model management process etc.) - Current *Planned Interconnection* (Reference) scenario results viz a viz past plans/studies/NDC - Feedback from the consultative sessions - Remarks on status of Reference scenario Brief on any notable updates in CMP model performed by modelling partners i.e. revision of cost characteristics of generic renewable technologies & Model Supply Regions MSRs & others (~ 20 minutes)	AUDA-NEPAD
12:30–13:30	Lunch	
13:30–14:00	**[Demonstration] Recap running all continent model through SPLAT** - Running with open-source solver - running all continent with cloud solver - SPLAT results table description - Instructions on hands on exercise	Mohammed Bassam BEN TICHA (IAEA)
14:00–15:00	**[Hands on exercise]** Run all continent & view results	IRENA & IAEA
15:00–15:15	Coffee	
15:15–17:15	**[Work session] Critical review of results** - Comparison with historical trends - Comparison with existing national/regional targets	Participants Instructor: Mohammed Bassam BEN TICHA (IAEA)
17:15–17:30	**Conclusion and program for the following day**	Bilal HUSSAIN (IRENA)

18:00	**Dinner**	

Day 2: Discuss CMP Reference Scenario and learn making alternate scenarios in SPLAT

Tuesday 22 November 2022

Time (Local)	Session	Speaker / participants
9:00–9:30	Coffee	
9:30–9:55	**Recap of previous day** Day1 leftover: Brief on modelling partner updates to CMP model	Bilal HUSSAIN (IRENA)
9:55–12:30	**Discussion on the findings from the review of the reference scenario** - Interventions from power pools - Comments from the EU-TAF team - Comments from the modelling partners	Moderated by CMP modelling team
12:30–13:30	Lunch	
13:30–14:30	**[Demonstration] Representation of scenarios in SPLAT** - Creation of scenarios in MESSAGE - How parameterize/mechanize involved aspects - Options for distinguishing between scenarios - Using SPLAT Excel utility to update scenarios - Instructions on hands on exercise	Bruno MERVEN (IRENA)
14:30–15:00	**[Hands on exercise]** Create, run & analyze alternative scenarios on SPLAT	IRENA & IAEA
15:00–15:15	Coffee	
15:15–16:30	**[Hands on exercise continued]**	IRENA & IAEA
16:30–17:15	**CMP Scenarios (CMP II Deliverable 4)** - Outcome of literature review/consultations - What qualitative scenario definitions need to translate into specific/quantitative detail - What's the translation methodology	CMP modelling team & EU-GTAF
17:15–17:30	**Conclusion and program for the following day**	Bilal HUSSAIN (IRENA)

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Day 3: Operationalizing CMP interconnection scenarios

Wednesday 23 November 2022

Time (Local)	Session	Speaker / participants
9:00–9:30	Coffee	
9:30–9:45	**Recap of previous day**	Bilal HUSSAIN (IRENA)
9:45–10:30	**Parameters for CMP interconnection scenarios** - Key controlling factors of interconnection level in CMP - Cost differentiating generic interconnector candidates	Sebastian STERL (IRENA)
10:30–12:30	**Group discussion on CMP interconnection scenarios** - Key intra-regional interconnectors - Key inter-regional interconnectors - Possible system constraints	Mohammed Bassam BEN TICHA (IAEA)
12:30–13:30	Lunch	
13:30–14:00	**[Demonstration] Modelling CMP interconnection scenario in SPLAT** - Analyze and review results - Instructions on ex1 and ex2	Bruno MERVEN (IRENA)
14:00–15:30	**[hands on exercise 1] Analyze scenarios with different interconnection levels** (participant work on common model instance i.e. a power pool model or mini-model)	IRENA & IAEA
15:30–15:45	**Conclusion and program for the following day**	Bilal HUSSAIN (IRENA)
15:45–16:15	Coffee	
16:15–17:45	**[Guest speaker session]** **Scenario development at pan-European scale** - How scenarios help planning - Insights into coordinated scenario development process	Dante Powell (Innovation manager ENTSOG |ex-ENTSOE)
17:45–18:30	**Refreshment (*tbc*)**	

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Day 4: Establishing initial ideas on CMP interconnection scenarios

Thursday 24 November 2022

Time (Local)	Session	Speaker / participants
9:00–9:30	Coffee	
9:30–9:45	**Recap of previous day**	Bilal HUSSAIN (IRENA)
9:45–11:30	**[hands on exercise 2] Analyze scenarios with different interconnection levels** (Participants make power pool wise groups and identify group lead, group lead to create continent model with edits learned from day 3 exercise 1, run all continent on cloud)	IRENA & IAEA
11:30–12:30	**[Work session]** power pool wise participant groups prepare slides of their Interpretations on outcomes of hands-on ex. 2	ALL
12:30–13:30	Lunch	
13:30–14:30	**[Work session continued]**	ALL
14:30–15:15	**Presentations by participant** (15-20 min per power pool)	Moderated by AUDA NEPAD
15:15–15:30	Coffee	
15:15–16:15	**Presentations by participant** (15-20 min per power pool)	Moderated by AUDA NEPAD
16:15–19:00	**Parallel Session A:** Meeting EU GTAF – AUDA NEPAD modeling teams	
16:15–17:30 (as per need)	**Parallel Session B:** Recap of topics requested by participants in post training 2 survey - Controlling deployment of committed and candidate supply options - How to set low and high RES targets at country level	Bruno MERVEN & Sebastian STERL (IRENA)

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Day 5: Consolidation & way forward

Friday 25 November 2022

Time (Local)	Session	Speaker / participants
9:00 – 9:30	Coffee	
9:30–9:45	**Objective of last day and recap of previous days**	Bilal HUSSAIN (IRENA)
9:45–10:15	**Brief info session on IRENA's Innovation landscape work in Africa**	Arina Anisie (IRENA)
10:15–12:00	**Presentations by participants (contd.)**	AUDA NEPAD
12:00–12:20	**User feedback on SPLAT interface:** Which features of SPLAT are convenient and what needs to become more user friendly	Bilal Hussain & Bruno Merven (IRENA)
12:20–12:30	**Short survey**	*Individual trainees*
12:30–13:30	Lunch	

13:30–14:30	**Quick review of survey results**
	Group discussion on next steps and homework
	- Goal for next training:
	  ○ fully configured CMP scenarios & sensitivity analysis
	  ○ collect topics for 4th training
	- Data needed to create CMP alternate scenarios
	- Decisions needed for scenario creation
	- Organization of consultative sessions by AUDA-NEPAD for Power Pools
	- Weekly update meetings and work by AUDA-NEPAD team before next workshop
		Discussion moderated by AUDA-NEPAD

14:30–15:00	**Closing remarks:** Moderation:Crispen Zana (AU-NEPAD) - EU (Partnerships Dept.) - Simbini Tichakunda (AUDA-NEPAD) - Mario Tot (IAEA) - Dr. Roland Roesch, Acting Director IITC IRENA	
15:00–15:15	Coffee	
15:15–17:00	**AUDA-NEPAD & West Africa Power Pool consultative meeting**	

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