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

Draft Concept Note & Agenda

Training on SPLAT-Africa

Second session (A2): Developing a reference scenario

Cairo, Egypt

14 – 18 August 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). The MESSAGE-SPLAT model serves as a tool for this activity. 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.

In the second training, the participants will learn how to develop a reference scenario and how to interpret the scenario results. Before this training, the base year data are expected to be fully configured with the updated figures available from the Power pools. The training will cover the followings:

- modelling committed, site-specific, and candidate technologies
- modelling transboundary transmission projects
- controlling the technology deployment
- representing targets and setting constraints
- use of the Excel utility to analyse the scenario results
- analysing the results (economic aspects, emissions, dispatch, trade)
- version control using the Github

After this training course, the participants will be able to develop reference scenarios reflecting the current policy goals and targets of the power pools. The training will be followed by consultative workshops with the five power pools led by the AUDA-NEPAD core modelling team, and weekly discussions' sessions between the AUDA-NEPAD and IRENA.

Meeting venue

Golden Tulip Flamenco

02 El Gezira El Wosta, Abu Al Feda,

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Agenda

DAY 1: INTRODUCTION

Sunday 14 August 2022

Time (Local)	Session	Speaker / participants
9:30–10:00	**Meeting introduction and welcome remarks** • Mr. Tichakunda Simbini - AUDA-NEPAD • Mrs. Martina Vraila – European Union Delegation Egypt • Dr. Sebastian Sterl - IRENA • Mr. Mario Tot - IAEA • Mr. Joseph Mwangi – African Union Commission • Dr. Eng. Ahmed Mohamed Mohenah - Ministry of Electricity and Renewable Energy, Arab Republic of Egypt	*Moderation:* Prof. Mosad ELMISSIRY
10:00–10:30	**Recap of previous training & objectives of the meeting** *Remarks*: Sebastian STERL (IRENA)	*Moderator*: Egypt
10:30–12:30	**Update on SPLAT Africa Model** • Overview of important changes • AUDA-NEPAD Experts feedback	
12:30–13:30	Lunch	
13:30–15:00	**Recap of results visualization & working with pivot tables**	*Hands-on exercise:* Mohammed Bassam BEN TICHA (IRENA)
15:00–15:15	Coffee	
15:15–17:15	**Recap of results visualization & working with pivot tables (cont'd)**	*Hands-on exercise*
17:15–17:30	**Conclusion and program for the following day**	*Remarks*: Sebastian STERL (IRENA)

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DAY 2: CONTROLLING AND CONSTRAINING TECHNOLOGY DEPLOYMENT

Monday 15 August 2022

Time (Local)	Session	Speaker / participants
9:30–9:45	Coffee	
9:45–10:00	**Recap of previous day & What is a scenario?**	*Remarks*: Sebastian STERL (IRENA)
10:00–11:00	**Modelling committed, site-specific, and candidate power plants and transmission projects** ▪ Introduction of categories ▪ Distinguishing between existing, committed and candidate power generation and transmission technologies ▪ Required data collection in SPLAT-Africa ▪ Purpose of setting technology constraints	*Intervention*: Mohammed Bassam BEN TICHA (IRENA)
11:00–12:30	**Demonstration of controlling technology deployment in SPLAT-MESSAGE** (exercise) ▪ Constraints (*bdc* and *bdi*) ▪ Control from SPLAT interface	*Demonstration:* Sebastian STERL (IRENA)
12:30–13:30	Lunch	
13:30–15:00	**Controlling technology deployment in SPLAT-MESSAGE** (exercise)	*Hands-on exercise:* Sebastian STERL (IRENA)
15:00–15:15	Coffee	
15:15–17:15	**Controlling technology deployment in SPLAT-MESSAGE** (cont'd)	*Hands-on exercise*
17:15–17:30	**Conclusion and program for the following day**	*Remarks*: Sebastian STERL (IRENA)

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DAY 3: SETTING SYSTEM CONSTRAINTS AND TARGETS

Tuesday 16 August 2022

Time (Local)	Session	Speaker / participants
9:30–9:45	Coffee	
9:45–10:00	**Recap of previous day**	*Remarks*: Sebastian Sterl (IRENA)
10:00–11:00	**Representing system constraints and targets** ▪ Purpose of setting systems constraints in MESSAGE ▪ Modelling of reserve margin ▪ Modelling of instantaneous VRE share ▪ Modelling of GHG emissions ▪ Other constraint possibilities ▪ Controlling constraints with the SPLAT-Excel interface	*Intervention*: Mario TOT (IAEA)
11:00–12:30	**Demonstration of setting system constraints in SPLAT and MESSAGE**	*Demonstration*: Bruno MERVEN (IRENA)
12:30–13:30	Lunch	
13:30–15:00	**Setting constraints and examining their effect** (exercise)	*Hands-on exercise:* Bruno MERVEN (IRENA)
15:00–15:15	Coffee	
15:15–17:15	**Setting constraints and examining their effect** (cont'd)	*Hands-on exercise*
17:15–17:30	**Conclusion and program for the following day**	*Remarks*: Sebastian STERL (IRENA)

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DAY 4: BATTERY STORAGE AND DISCUSSIONS ON REFERENCE SCENARIO OPTIONS

Wednesday 17 August 2022

Time (Local)	Session	Speaker / participants
9:30–9:45	Coffee	
9:45–10:00	**Recap of previous day**	*Remarks*: Sebastian STERL (IRENA)
10:00–10:30	**Recap of battery storage technology in SPLAT-MESSAGE**	*Intervention*: Mohammed Bassam BEN TICHA (IRENA)
10:30–12:30	**Controlling battery deployment in SPLAT-MESSAGE (exercise)** • Case study exercise for single country • Controlling relevant parameters for reference scenario	*Exercise*: Mohammed Bassam BEN TICHA (IRENA)
12:30–13:30	Lunch	
13:30–15:00	**Group discussion – Operationalizing a first scenario** ▪ Recap of agreed scenarios for CMP ▪ Operationalizing a first scenario (reference demand + low integration case) ▪ Candidate power plants ▪ Candidate interconnections ▪ Possible system constraints ▪ Introduction / guidance on Power Pool presentations	*Group discussion led by AUDA-NEPAD*
15:00–15:15	Coffee	
15:15–17:15	**Group work - Identifying the steps towards a first scenario**	*Practical work*
17:15–17:30	**Conclusion and program for the following day**	Remarks: Sebastian STERL (IRENA)

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DAY 5: CONSOLIDATION & WAY FORWARD

Thursday 18 August 2022

Time (Local)	Session	Speaker / participants
9:30 – 9:45	Coffee	
9:45–10:00	**Objective of last day and recap of previous days**	*Intervention*: Asami MIKETA (IRENA) & Sebastian STERL (IRENA)
10:00–12:30	**Group discussion on next steps and homework** ▪ Goal for next training: a fully configured first scenario for each Power Pool ▪ Data needed ▪ Organisation 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*
12:30–13:30	Lunch	
13:30–16:00	**Group discussion on data collection (cont'd)**	*Discussion moderated by AUDA-NEPAD*
16:00–16:15	Coffee	
16:15–16:45	**Short survey**	*Individual trainees*
16:45 –17:30	**Closing remarks** • Ministry of Energy, Arab Republic of Egypt • IAEA • IRENA • AUDA-NEPAD	*Moderation:* Prof. Mosad ELMISSIRY