

Linking Up Africa's Electricity Infrastructure under the Continental Master Plan (CMP)

A Single Electricity Grid for Africa

A Continental approach to Africa's energy future

The African Union (AU) and the European Union (EU) have joined forces to forge **a continental approach to electricity markets in Africa**, where a fully integrated, competitive, and harmonised market will accelerate the development of the continent and improve energy access for all African citizens.

In this context, a high-level and collaborative planning of the electricity sector is crucial to address future surge in electricity demand, which is expected to triple by 2040, resulting from Africa's rapid industrialisation, migration to cities, rising household incomes, and effects of climate change.

Masterplanning Africa's Single Electricity Market

Physical interconnection of Africa's continental energy infrastructure is planned within the context of the ongoing effort to create an **African Single Electricity Market (AfSEM)** -one of the largest electricity markets in the world, covering the African Union's 55 Member States, and a population of more than 1.3 billion.

African energy ministers tasked the African Union Development Agency (AUDA-NEPAD) to lead the development of this interconnection - under a **Continental Master Plan (CMP) for electricity generation and transmission**.

Following a consultation process coordinated by the EU Technical Assistance Facility (TAF) for Sustainable Energy, the five African power pools selected the International Renewable Energy Agency (IRENA) and the International Atomic Energy Agency (IAEA) to support the continent's Master Plan technical modelling and capacity needs.

Africa's potential to become a leader in green energy

Green energy for Africa is a worldwide growth objective. The volume of green energy investments in Africa will not only impact the socioeconomic development of the continent, but could influence the entire global economy. Global cooperation and regional integration offer the best guarantees for sustainable international stability and economic growth.

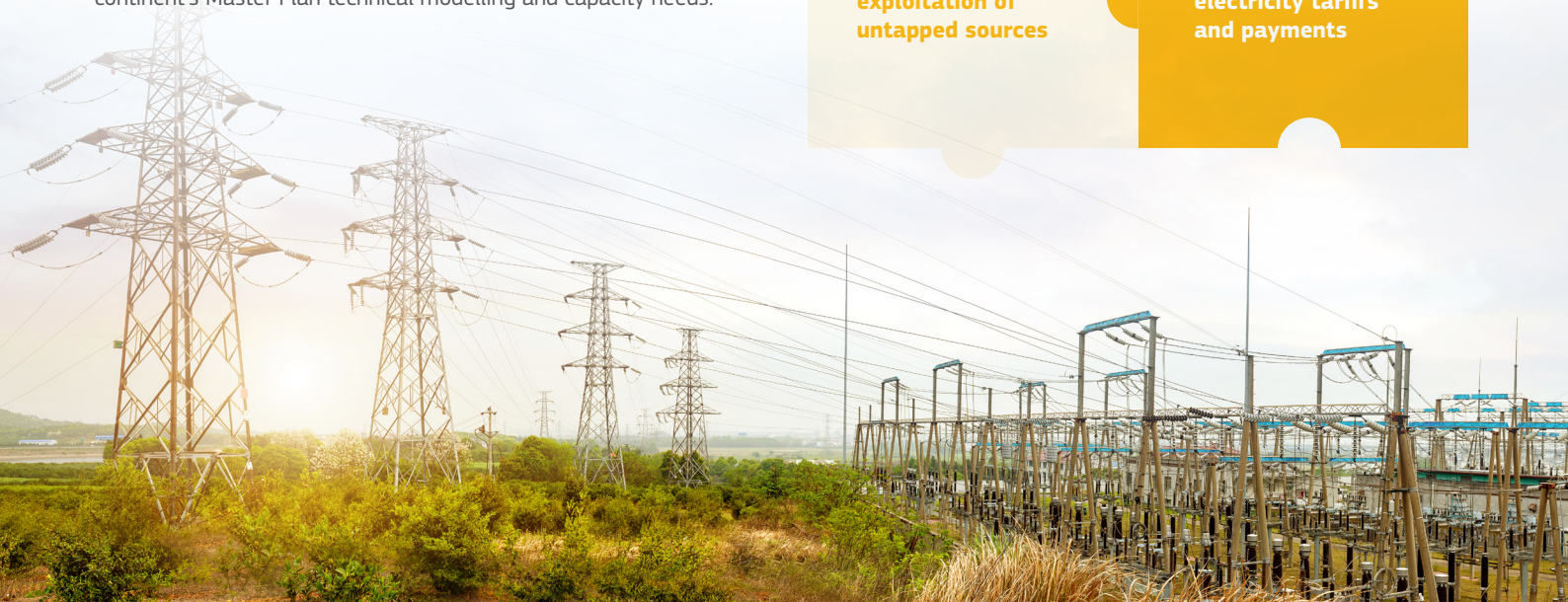
Under African leadership and African ownership, the Continental Master Plan (CMP) initiative brings together over 100 African energy stakeholders to rethink Africa's energy planning, and co-create solutions to tackle energy poverty, with selected expertise and lessons learned from the EU energy common market.

Address the growing energy demand of the Continent

Improve or allow cross-border electricity trade

Plan new infrastructure for exploitation of untapped sources

Ensure transparency in electricity tariffs and payments



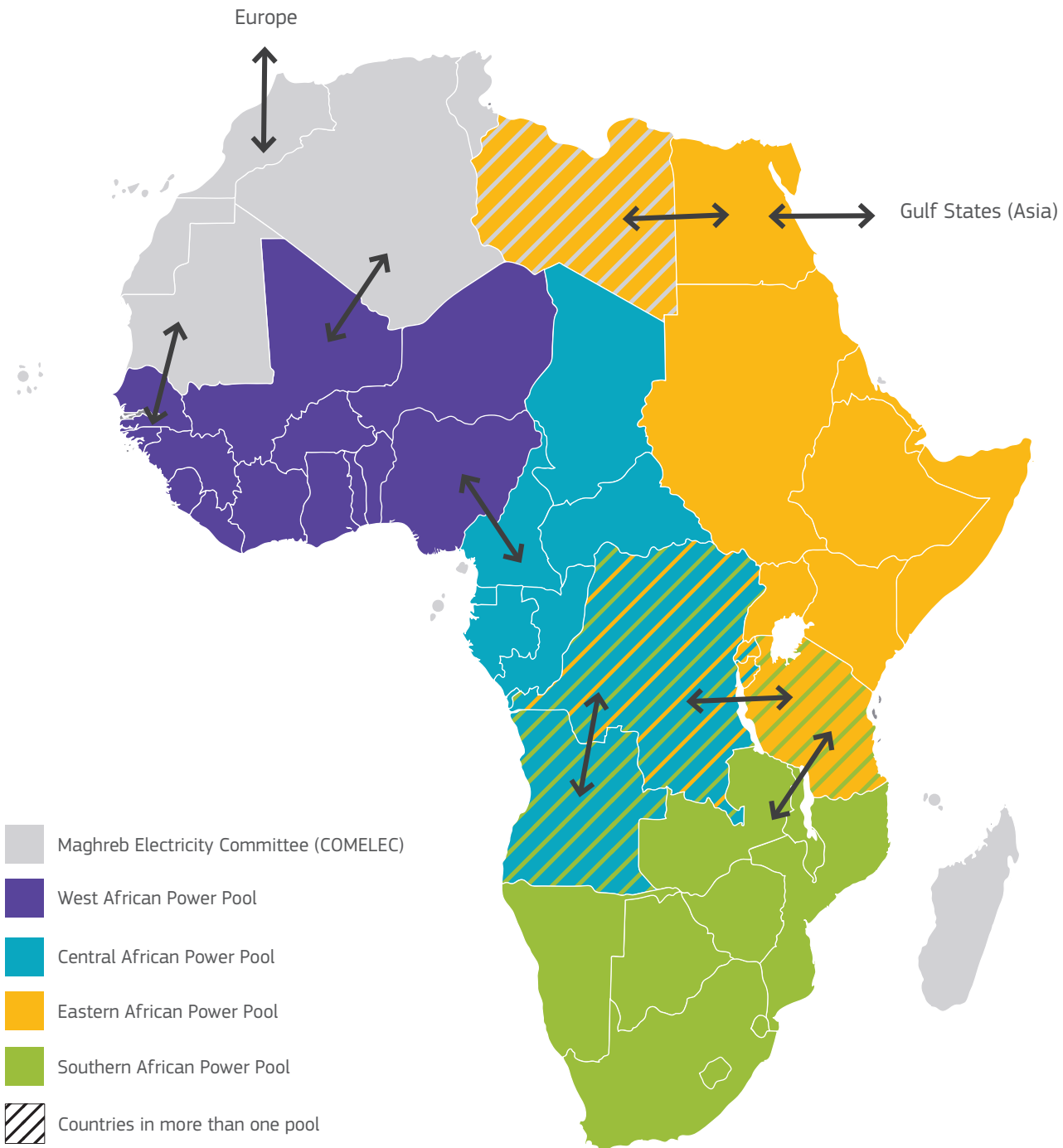
The Continental Master Plan

The Continental Master Plan (CMP) is the **'blueprint' of the African Single Electricity Market** and will act as the central pillar to solve Africa's energy challenge. It links the existing generation and transmission plans among the regional Power Pools and the AU Member States to identify Africa's priority energy infrastructure, focusing on the interconnected grid, and help channel energy to regions with deficits.

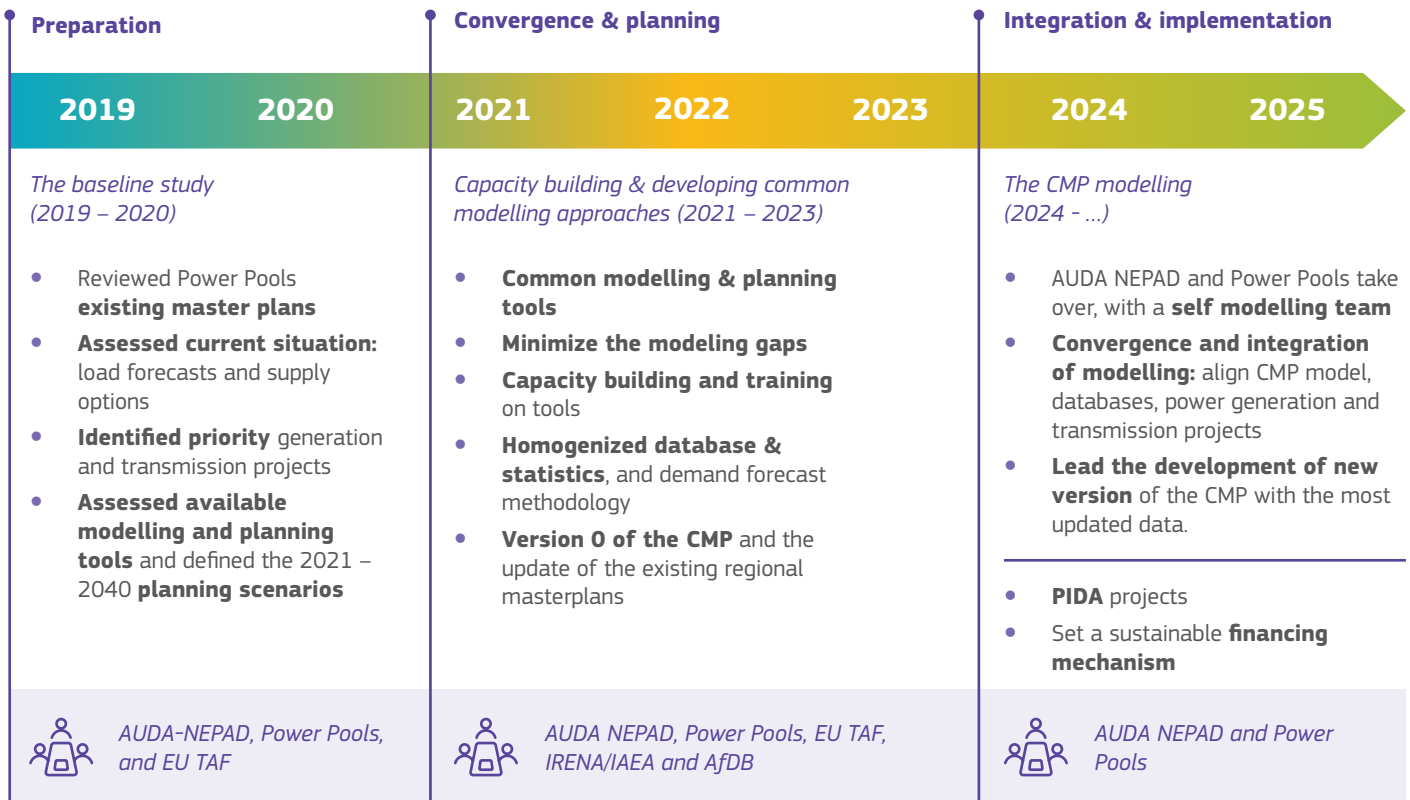
To curb the electricity deficit and allow a well-balanced sharing of resources, a set of common coordinated planning methodology and procedures is required, together with realistic reference energy

scenarios considering the African Union's Agenda 2063, national development plans, market integration, new resources, technology development, evolution of demand, and macro-economic aspects.

The CMP aims to build the **state-of-the-art African energy market and grid model** to understand the future trends in electricity demand and support the development of continent-wide network of infrastructure for energy generation and transmission to align with the African Union's Agenda 2063, the UN Sustainable Development Goals, the Paris Climate Agreement, and the Agreement Establishing the African Continental Free Trade Area (AfCFTA).



The CMP modelling & implementation timeline



The CMP modelling tools

The CMP implementing partners – AUDA, EU TAF, IAEA and IRENA – will support African stakeholders with the development of the CMP identifying surplus and deficit regions/countries in Africa in terms of electricity generation and demand. This will help identify the most cost-effective ways of expanding clean electricity generation and transmission infrastructure across the African continent.

The AUDA-NEPAD staff and Power Pool experts will also be trained on the use of the modelling tools, to take on the update and implementation of the CMP beyond the lifespan of the initiative.

Demand Forecast Model



EViews model calibration

Electricity Demand model

Forecast the evolution of the electricity demand for each country based on macro-economic drivers.

Long Term Planning Model



SPLAT Africa model

Capacity extension model to identify future least-cost power generation capacity per technology and interconnections.

Network Studies Model



Transmission network model

Transmission network simulation model to design a robust and flexible power system to supply the electricity demand.