

# Electricity Market Functions & Pricing Pilot

## PROGRESS & WAY FORWARD

March 7<sup>th</sup>, 2022



# PAEM Stages

**2010-2018**

## Foundational Stage

- Completion of governance and institutional frameworks
- Support trade at the sub-regional level

We are  
HERE

**2020-2024**

## Transitional Stage-1

Implementing a transitional regional market design focusing on identifying and expanding trade opportunities.

**2025-2031**

## Transitional Stage-2

Expanding the transitional regional market's functionality, focusing on unbundling TSOs, and introducing wholesale competition.

**2032-2036**

## Transitional Stage-3

Moving toward an ultimate regional market design, focusing on full wholesale competition which is supported by several financial markets.

**2037-2038**

## Ultimate Goal

Achieving a fully integrated Arab regional market, focusing on a fully interconnected and synchronized Arab electricity network.



# Transitional Stage-1 (2020-2024)

Implementing a transitional regional market design focusing on identifying and expanding “bilateral” trade opportunities

## Focus areas

### **Forming Market Committees**

Regional-market institutions will be formed to cover all Arab countries, including a Secretariat, Regulatory (ARC), and an Arab TSOs Committee

### **Infrastructure readiness**

Strengthening and improving the efficiency of existing and planned interconnections

### **Scaling up commercial bilateral trade**

Introducing transitional pricing mechanism to promote regional trade opportunities by utilizing most-efficient plants in the region

### **Completing governance framework**

Finalizing market institutions bylaws (secondary documents)

### **Enforcing secure regional operations**

Improving reliability of regional operations through the Arab Grid Code

### **Deepening electricity trade knowledge**

Establish tailored capacity-building programs for stakeholders to increase the value of national and international power-system assets

# Foundations of Market Functions and Pricing Mechanism Pilot Program to advance trade in existing cross-border interconnections (~8GW)

Traders do not know what constitutes a fair market price

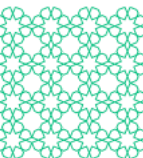
Limited trade volume and price discovery

Regional  
Pricing  
Mechanism

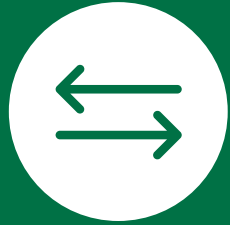
Subsidized fuels

Most Arab countries subsidize the price of fuel used for electricity generation

- To overcome these obstacles and build trust in trade, in 2019 the World Bank proposed a pilot for a **regional pricing mechanism** to test a **simple, fair** and **transparent** pricing for trade based on international fuel prices
- The proposed pilot program includes a simulation of **market functions** to conduct the trade based on **actual data** and was approved along with Saudi Arabia as a host by **the AMCE in 2019**
- **Pilot starting date delayed by 16 months.**



# The pilot aims to advance the preparation and readiness of Member States to scale up trade in early market operations under transitional stage -1



## Testing trade transactions

Trade based on Intl.  
Fuel prices &  
actual data in  
existing links

Testing pricing  
tools for 3 types of  
electricity trade  
transactions



## Testing Functions and associated groups

Joint TSOs  
committee bylaws  
tested (including  
market facilitator)

ARC committee  
bylaws tested  
(including  
surveillance group)



## Improving Secondary Governance Documents

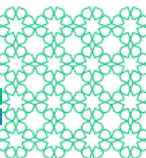
Finalize Joint TSOs  
bylaws

Finalize ARC  
bylaws  
Secretariat Statues



## Rolling out bilateral trade at the PAEM level

Increasing  
utilization of  
existing  
interconnections  
from 5-7% to  
higher levels



## Considerations taken in designing and executing the pilot



Formulate the nucleus of technical teams for the envisaged PAEM Committees in Transitional-Stage 1



recognize the different levels of sector development at the country level, the varying pace of reform processes, and the differences between the subregions



Trade will take place through direct utility-to-utility bilateral contracts while intermediate countries (if any) provide transit service

# The pilot simulate market key functions in line with PAEM governance to coordinate and perform trade transactions by MSs participants

## 1

### Pan-Arab advisory and regulatory (PAEM ARC) committee

- Review and advise on market governance documents, changes to governance documents, transmission tariffs, generation reserve criteria, cross-border transmission allocation, available transmission capacity, and so on.
- Ensure compliance with governance documentation including nondiscriminatory access.
- Market surveillance.
- Dispute resolution.

Market  
Surveillance  
Group

## 2

### Arab TSOs (PAEM TSOs) committee

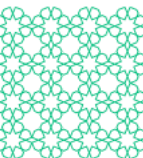
- Coordinate and cooperate with national TSOs.
- Play active role in rule-setting process.
- Promote market integration, reliability, and security of supply.
- Research and development, promote public acceptability.
- Participate in energy policy.

Regional  
Market  
Facilitator

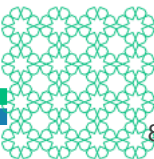
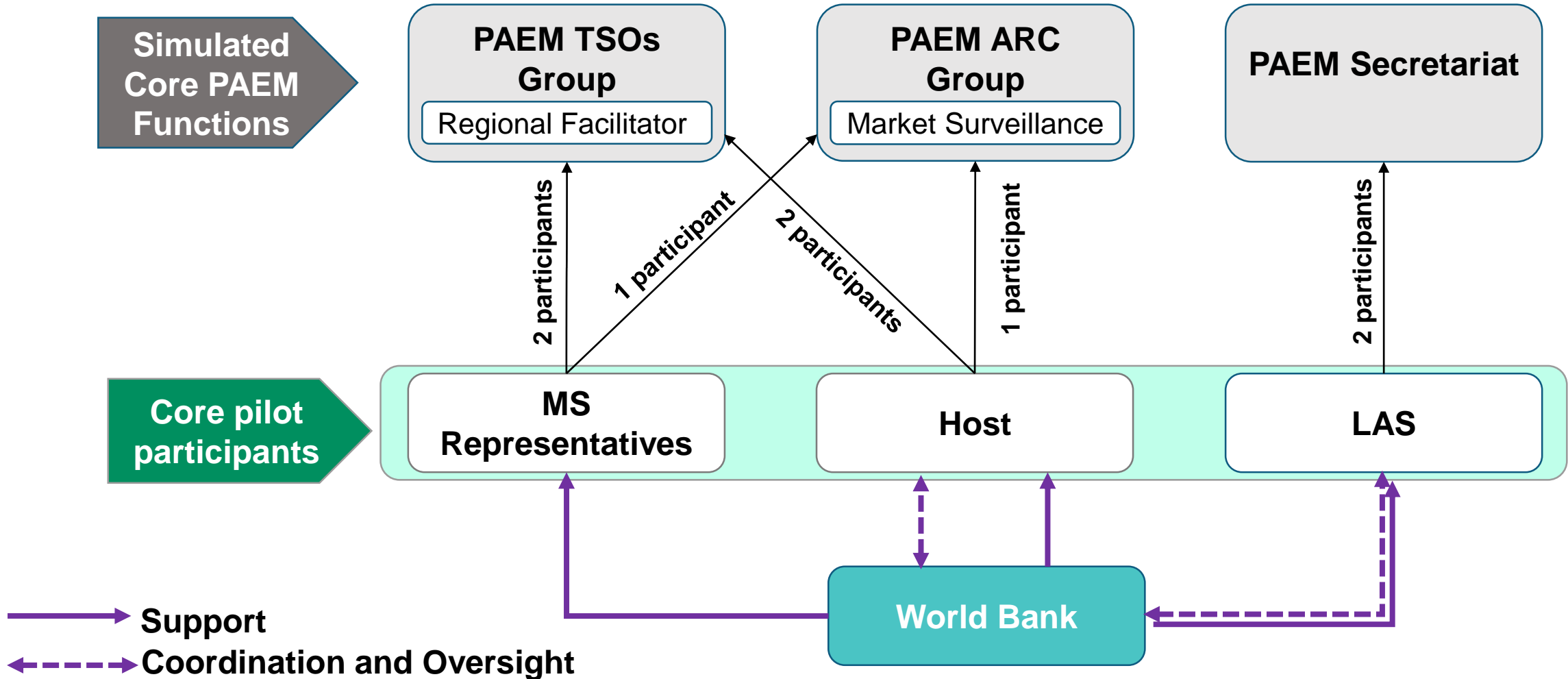
## 3

### PAEM Secretariat

- Provide administrative support to regional governing entities.
- Perform market monitoring function under Pan-Arab ARC.
- Maintain comprehensive information systems.
- Carry out other tasks as assigned.

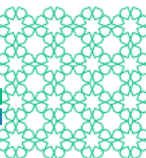
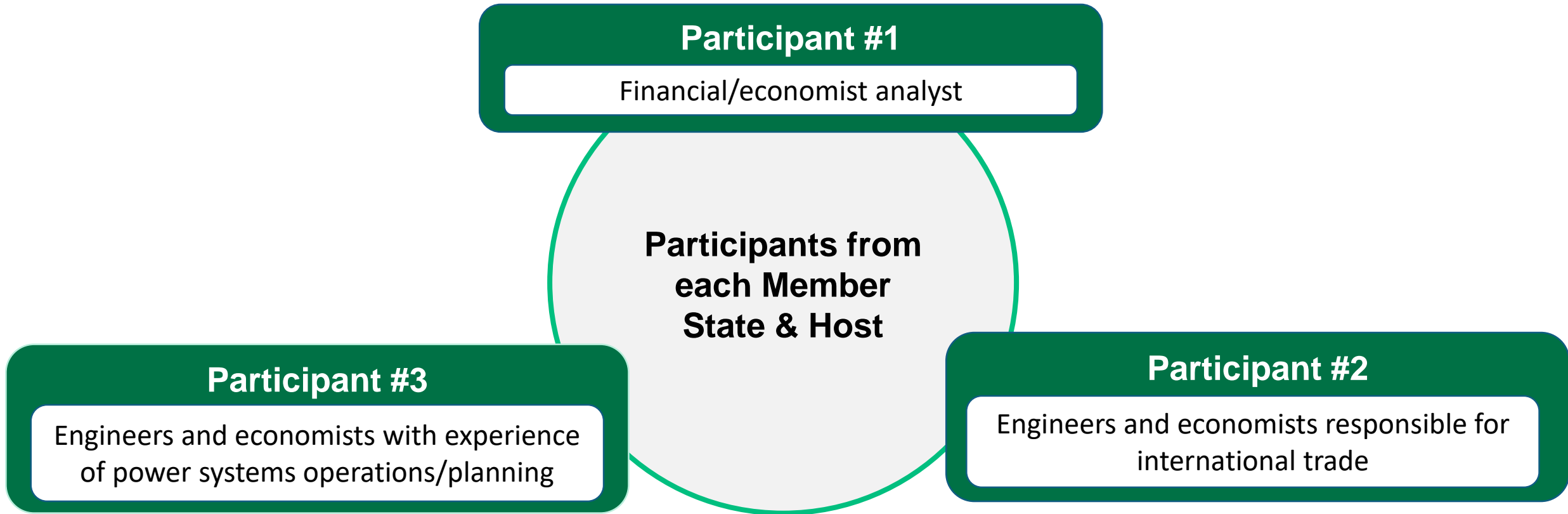


The pilot operational approach ensure representation of MSs in all the PAEM functions to engage, coordinate, and test trade transactions





Three participants from each Member State and host in the Pilot - all experts must meet a minimum experience requirements to join



# Three types of bilateral trade transactions are performed by working groups

## Exchanges-in-kind

- Recognizes different energy values at different times of year and exchanges energy accordingly

1

## Cost/benefit Sharing

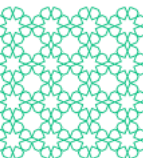
- Seller receives its marginal production cost plus  $1/2$  the difference between its marginal production cost and the marginal production cost of the buyer

2

## Emergency Support

- Seller receives its marginal production cost plus 15% fixed profit
- Improves energy security with cost savings

3



# Key roles during the pilot

## MS Representatives

- Experts from all PAEM Member States joining the pilot and the learning experience
- All Member States should be represented in the PAEM committees - should be the nucleus of country technical representatives in these committees once formulated

## Host

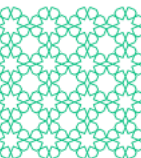
- Works closely with WB and takes responsibility to engage with all participating MSs
- Should be ready to utilize its capabilities to perform an active coordination role and pilot oversight with WB
- Develop strong dialogue with MSs representatives and ensure quality control of tasks performed

## LAS

- Coordinates the PAEM Pilot Pricing Program Plan
- Assign two participants to PAEM Secretariat
- Integrates outcomes into PAEM governance development
- Ensure execution of Arab Ministerial Council of Electricity (AMCE) and all MSs

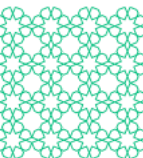
## World Bank

- Execute the pricing mechanism pilot program and provides technical oversight
- Provides just-in-time advice and global good practices on the operation of regional power trade networks
- Provide quality control support to the host
- Deliver the final results of the pilot



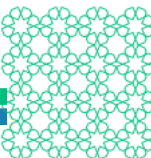
# Pilot phases for 12-month implementation plan (completed)

Phase	Purpose	Completion Date
<b>Phase 1</b>	Foundational: program preparation and Formation of Working Groups	Completed
<b>Phase 2</b>	International Exposure from 5 regions and initial model training	Completed
<b>Phase 3</b>	Hands-on training on modeling and the launch of version 1 of the communication platform	Completed
<b>Phase 4</b>	Trade Identification of missed and potential bilateral trade transactions as well as identifying country specific challenges to trade	Completed



## Pilot phases for 12-month implementation plan (planned)

Phase	Purpose	Completion Date
<b>Phase 5</b>	Role play of working groups and conducting bilateral trade transactions based on <i>actual data</i>	March 2022
<b>Phase 6</b>	Preparing a final round of bilateral trade working pilot and the launch of version 2 of the trade communication platform	April 2022
<b>Final Phase</b>	Bilateral and trilateral (TBC) trade transactions based on actual data (15 days lag) and final version of the trade communication platform	June 2022
<b>Post Final Phase</b>	Completion and strengthening of the PAEM-3Ps formulas; secondary governance documents; and inform market design improvements	June 2022



## Key Achievements

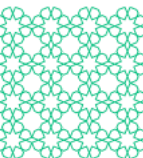
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- 1 Member States, represented by their nominated participants, can:
  - identify and price commercial trade opportunities based on a common understanding
  - run a Pan-Arab regional model to inform their trade and expansion plans
- 2 Started testing the roles and responsibilities of envisioned regional entities in line with their bylaws
- 3 Participants have been exposed to international experiences from a variety of countries and markets

## Key Challenges

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- 1 Participants are attending and completing the assignments of the pilot program on a voluntarily basis (i.e., they are not mandated to do so)
- 2 Virtual format due to travel restrictions has been challenging to some participants.
- 3 Challenges in receiving updated data related to power systems of some member states

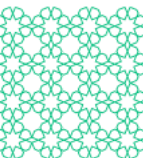
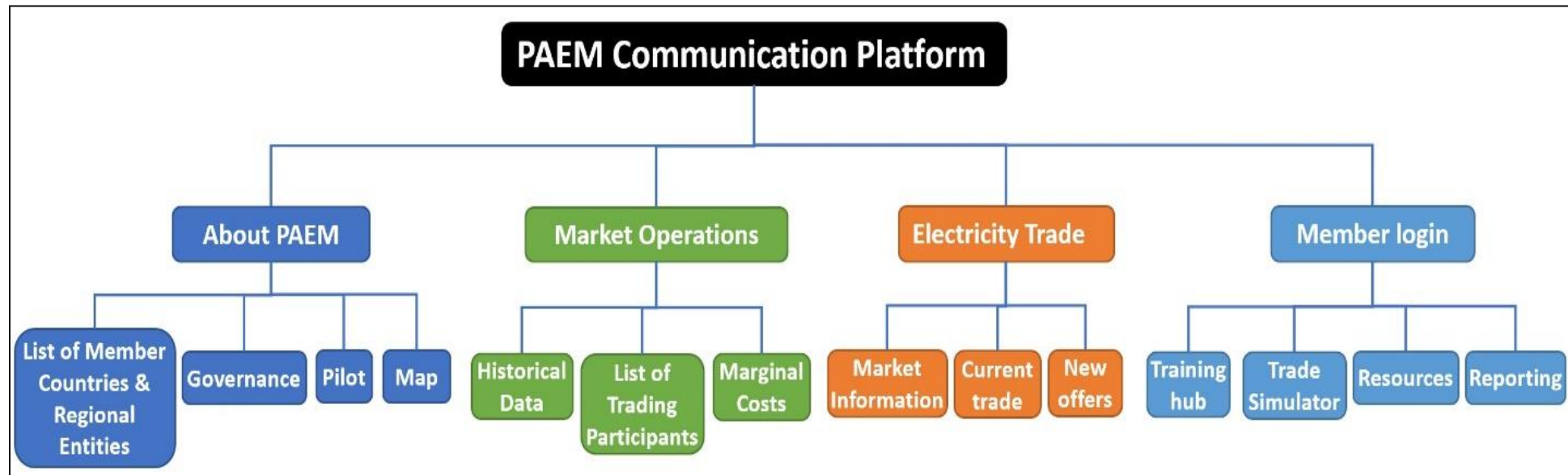


The pilot created a Communications Platform to coordinate and facilitate simulated trade & to prepare for the envisaged market operations in the Transitional Stage-1

**The Platform will be tested and finalized during the pilot to ensure:**

- Providing an overview of current PAEM development progress and relevant initiatives under one umbrella
- Facilitating the exchange of regional power trade data& information among market participants
- Enhance price discovery and improve the liquidity and transparency of trade transactions in the PAEM
- Improve and organize the communications between PAEM Secretariat, the Host, and WGs until committees are fully established
- Serve as a building block for a future PAEM website to coordinate market development and trade

Preliminary structure



# The Communications platform is developed in three stages

The communications platform is envisioned to evolve with the introduction of increasing levels of information relating to regional power trade.

- **Version 1: trial launch (Phases 1-4)**

In response to the virtual setting due to the pandemic, we have quickly deployed a readily available version of a communication platform. This version had limitations in terms of customizing content and functionality including a difficulty in sharing different types of files

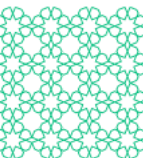
- **Version 2: soft launch (Phases 5-6)**

Upgrade version 1 to a new platform along with support to PAEM Secretariat and Host to operationalize it:

- General pages on the Pan Arab Electricity Market and its initiatives
- Discussion forums for members
- Data sharing and visualization
- Training center with all the resources developed during the pilot program

- **Version 3: Final deliverable**

A final version of the communication platform is planned to incorporate feedback of MSs and will be issued by the end of the pilot program in June 2022





# Defining the transition from the pilot to early market operations envisaged for transitional stage-1

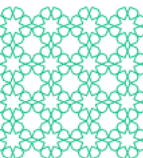
**Goal:** Help countries to make trading more efficient and increase the number of trades yielding a much more liquid market.

**Readiness:** by end of the pilot in June 2022, MSs would have better tools to identify and price trade opportunities

**Key requirements to ensure sustainable transition after the pilot:** MSs to enhance the market with the addition of:

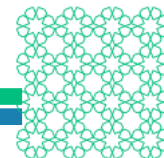
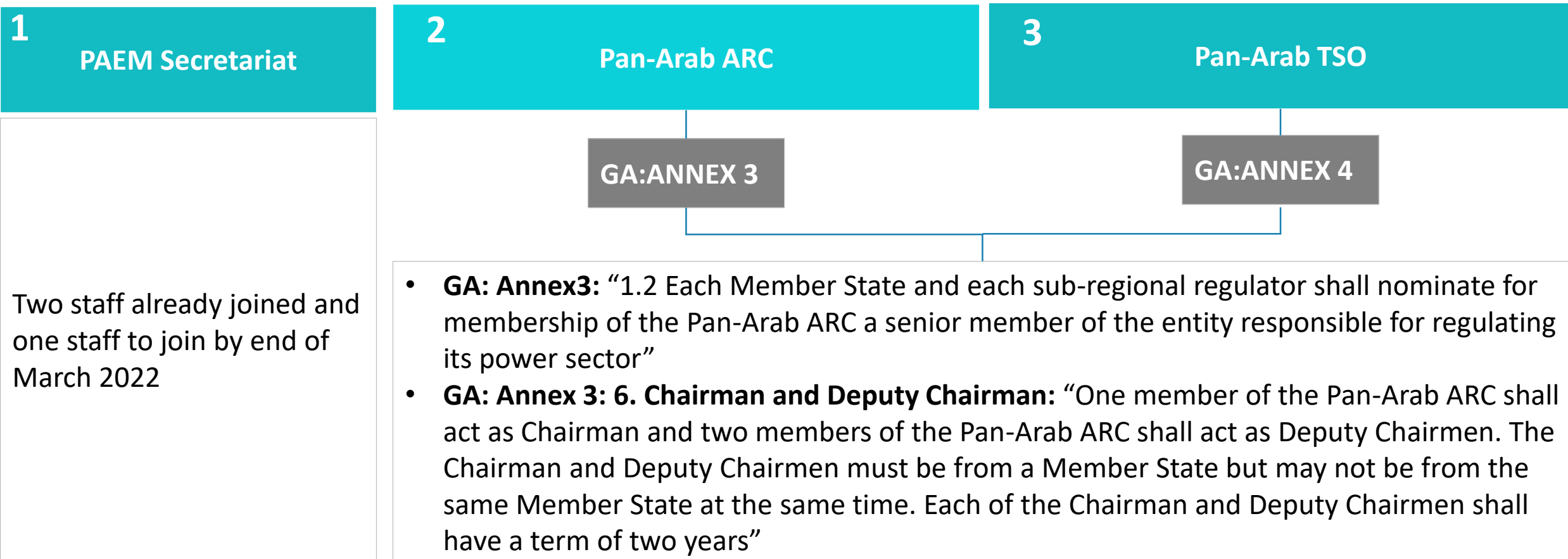
- Operational Pan-Arab ARC and Arab TSOs Committees
- Signing of the General Agreement and the PAEM Agreement
- Detailed Market Rules to govern the initial stage of the market
- A formal transmission access and tariff regime

Achieving the above requirements in **Transitional Stage 1** will pave the way for testing and calibrating key measures ahead of starting **Transitional Stage 2 in 2025**



# As agreements signing is delayed, MSs are encouraged to start establishing the leadership of the PAEM committees before completion of the pilot

This proposed transitional approach is in line with the current PAEM Secretariat staffing to join the pilot



# Key deliverables of the pilot by participants and World Bank

## 1. Updated Regional Pricing Mechanism

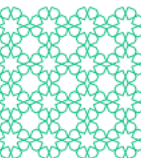
## 2. Finalized secondary governance documents:

- PAEM TSOs Bylaws
- PAEM ARC Bylaws
- Secretariat Statues

## 3. PAEM Communications platform

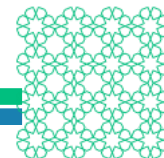
## 4. Other World Bank planned complementary tasks to be developed jointly with the established **PAEM committees** to advance the trade in transitional stage-1 and prepare for transitional stage-2:

- Detailed Market Design
- Transmission pricing and contract templates for trade
- Operational plans for TSOs and ARC committees



# Proposed next steps

- Proposed actions **prior to completing the pilot** to advance trade coordination in existing cross-border projects
  - Accelerating the signing of the GA and PAEM Agreements
  - Fully staffing the PAEM Secretariat
  - Selection of Chair and deputy Chair of PAEM committees; it is now essential to start building institutional memory at the leadership level
  - Assign the Pilot Working Groups as technical teams reporting to selected Chairs of the TSOs and ARC committees until full nomination of member states is received after the Agreements Signing
  - The PAEM Secretariat and Host should continue overseeing the pilot's communication/trade platform (planned for soft launch before AMCE)
- Proposed transitional actions to ensure continuation of momentum **after completing the pilot**
  - The PAEM Secretariat and Host should be able to continue the coordination of testing electricity trade on monthly basis until a full MSs representation in place for TSOs and ARC committees
  - Broadening the Host representation to include representatives from Eight Country Interconnection, GCC, and Maghreb sub-regions



# Thank You

