

# The World Bank

Role in supporting the Pan-Arab Electricity Market

Day 1 – Session 1  
Waleed Tayseer Al-Haddad

# Agenda

1. Background
2. The World Bank past activities
3. The World Bank ongoing and planned activities
4. PAEM going forward

# Agenda

## **1. Background**

2. The World Bank past activities

3. The World Bank ongoing and planned activities

4. PAEM going forward

# Organization of PAEM

- **MOU signed in 2017** sets the vision and governance framework for establishing the Pan-Arab Electricity Market (PAEM)
- PAEM is **governed by two major market agreements** – the General Agreement (legal) and the PAEM Agreement (commercial) which were endorsed by the Arab Ministerial Council for Electricity (AMCE) in July 2020
- An Arab Grid Code (technical) has been developed and submitted to the League of Arab States (LAS) and Member States in June 2020

## PAEM CORE PRINCIPLES



# Organization of PAEM

## 1

### Pan-Arab advisory and regulatory (PAN-ARAB 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

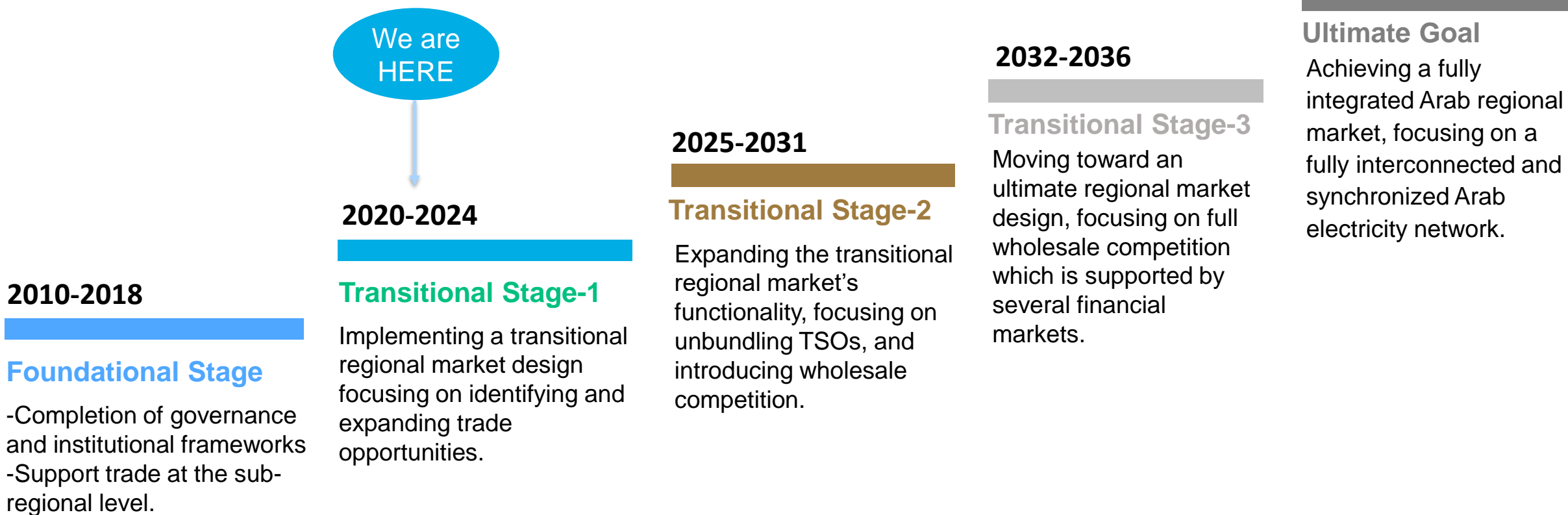
## 3

### 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.

# PAEM Stages: advancing between stages will evolve

The MOU sets the vision and governance framework in a five-stage development plan



# Agenda

1. Background

**2. The World Bank past activities**

3. The World Bank ongoing and planned activities

4. PAEM going forward

# Overview of The World Bank Engagement

- Since early 2010's, the WB has been a key partner to LAS and the Member States in advancing PAEM
- The World Bank role focused on three key pillars:
  1. Governance: developing the PAEM MoU, General Agreement, Market agreement, grid code, TSO and ARC bylaws, secretariate statutes, etc.
  2. Knowledge instruments: reports, tools, website, etc.
  3. Capacity Building



# Governance:

## Drafting the General Agreements for PAEM

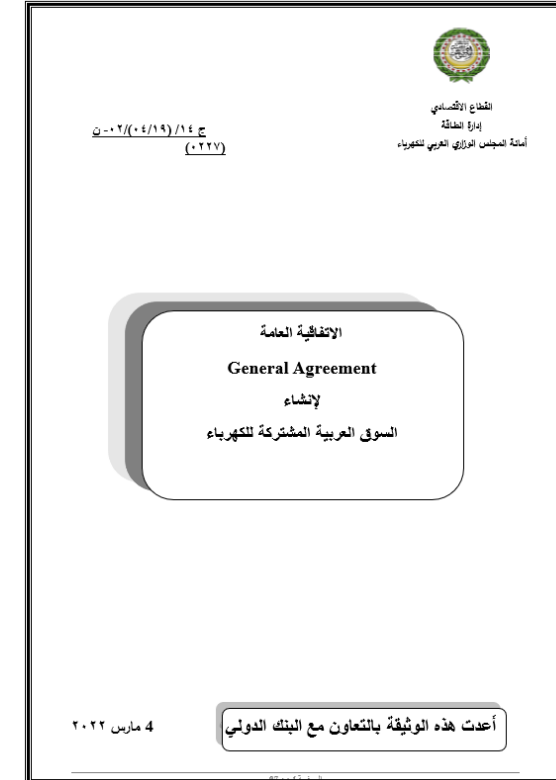
### Description

A general preliminary regulatory framework for electricity trade in the Pan-Arab region.

### Outcome (or envisioned outcome)

To facilitate trade and minimize barriers in the Pan-Arab region

League of Arab States Pan Arab Electricity Market General Agreement	جامعة الدول العربية الاتفاقية العامة للسوق العربية المشتركة للكهرباء
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# Governance:

## Drafting the Market Agreements for PAEM

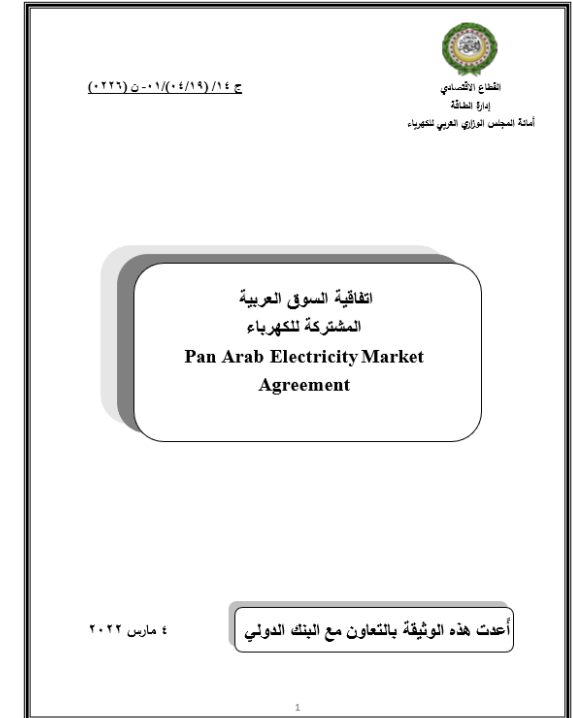
### Description

A preliminary regulatory framework for commercial aspects of electricity trade in the Pan-Arab region.

### Outcome (or envisioned outcome)

To facilitate commercial trade and minimize barriers in the Pan-Arab region

1.	<b>Part 1: General Provisions</b>	القسم ١: أحكام عامة
1.1	Definitions	١-١ تعاريف
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3.6	Transmission Congestion	٦-٣ اختناقات النقل
3.7	Transmission Service	٧-٣ خدمة النقل
3.8	Transmission Reliability Margin	٨-٣ هامش موثوقية النقل
3.9	Intervention and Market Suspension	٩-٣ التدخلات وإيقاف عمليات السوق
3.10	Market Information	١٠-٣ معلومات السوق
4.	<b>Part 4: Billing and Settlement</b>	٤- القسم ٤: الفوترة والتسوية
4.1	Scope of Part 4	١-٤ نطاق القسم ٤
4.2	Settlement Data Collection and Management	٢-٤ جمع بيانات التسوية وإدارتها
4.3	Determination of Hourly Settlement Amounts	٣-٤ تحديد مبالغ التسوية الساعية
4.4	Settlement Amounts (Non Hourly)	٤-٤ مبالغ التسوية (غير الساعية)
4.5	Settlement of Rebates	٥-٤ تسوية الخصومات
4.6	Settlement Statements	٦-٤ كشوف التسوية
5.	<b>Part 5: Dispute Resolution</b>	٥- القسم ٥: الفصل في النزاعات



# Governance :

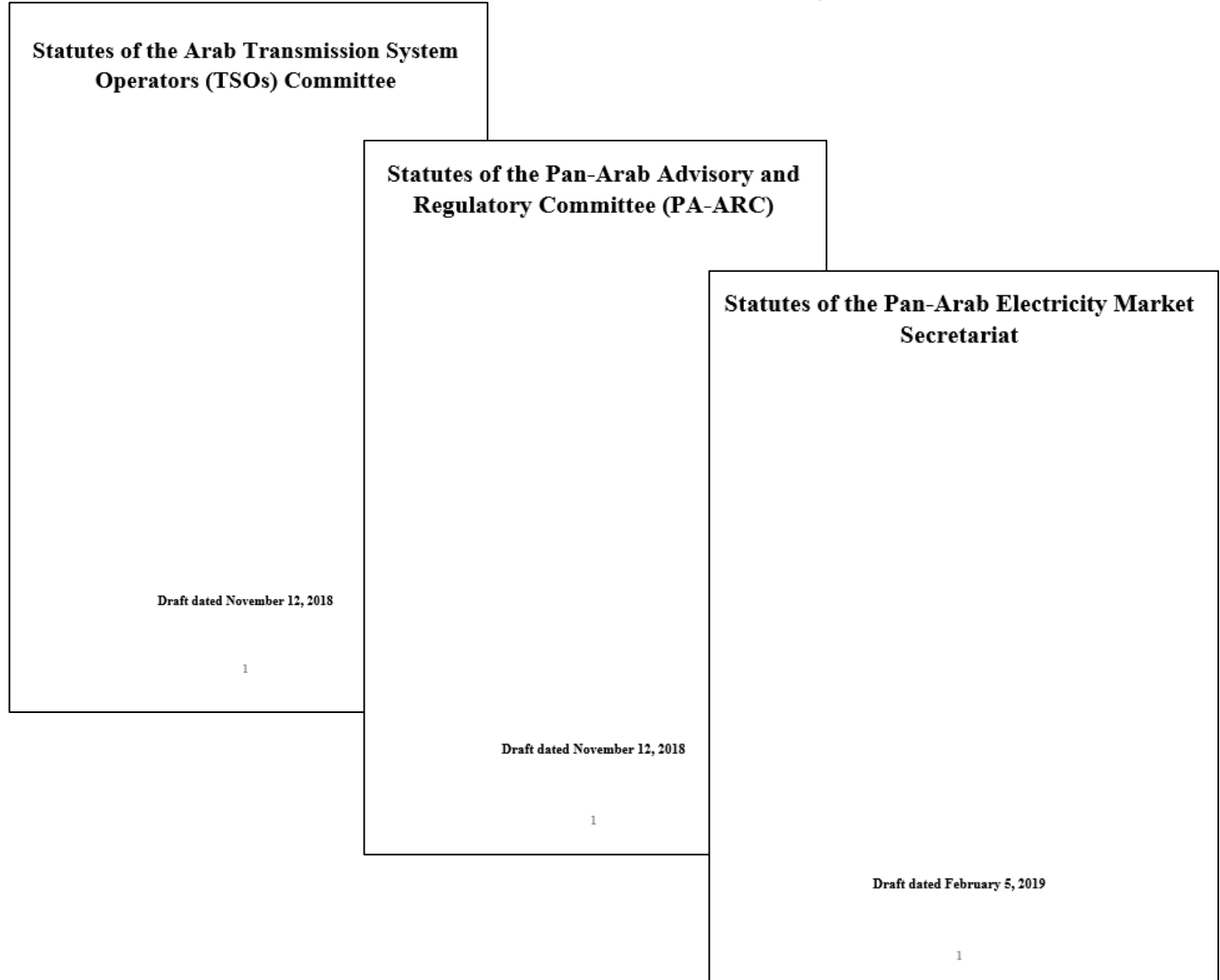
## Drafting the Statues of the PAEM Committees (TSOs, PA-ARC, Secretariate)

### Description

Ground rules outlining the establishment and operation of the PAEM committees

### Outcome (or envisioned outcome)

To achieve a fully operational and capable regional market



# Governance :



## Reviewing of the Pan-Arab Grid Code

### Description

Minimum requirements and procedures for planning and operation of PAEM covering both normal and emergency operating conditions.

### Outcome (or envisioned outcome)

To ensure reliability and quality of supply are maintained at adequate levels over the Pan-Arab region



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**REPORT**                      CONFIDENTIAL                      APPROVED                      VERSION 1.0


**INTERCONNECTION GRID CODE FOR THE  
PAN ARAB ELECTRICITY MARKET**

**GLOSSARY AND DEFINITIONS**

Arab Fund Grant Number 06/2018

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<b>N. of pages</b>	23	<b>N. of pages annexed</b>	-
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**CESI**  
Shaping a Better Energy Future

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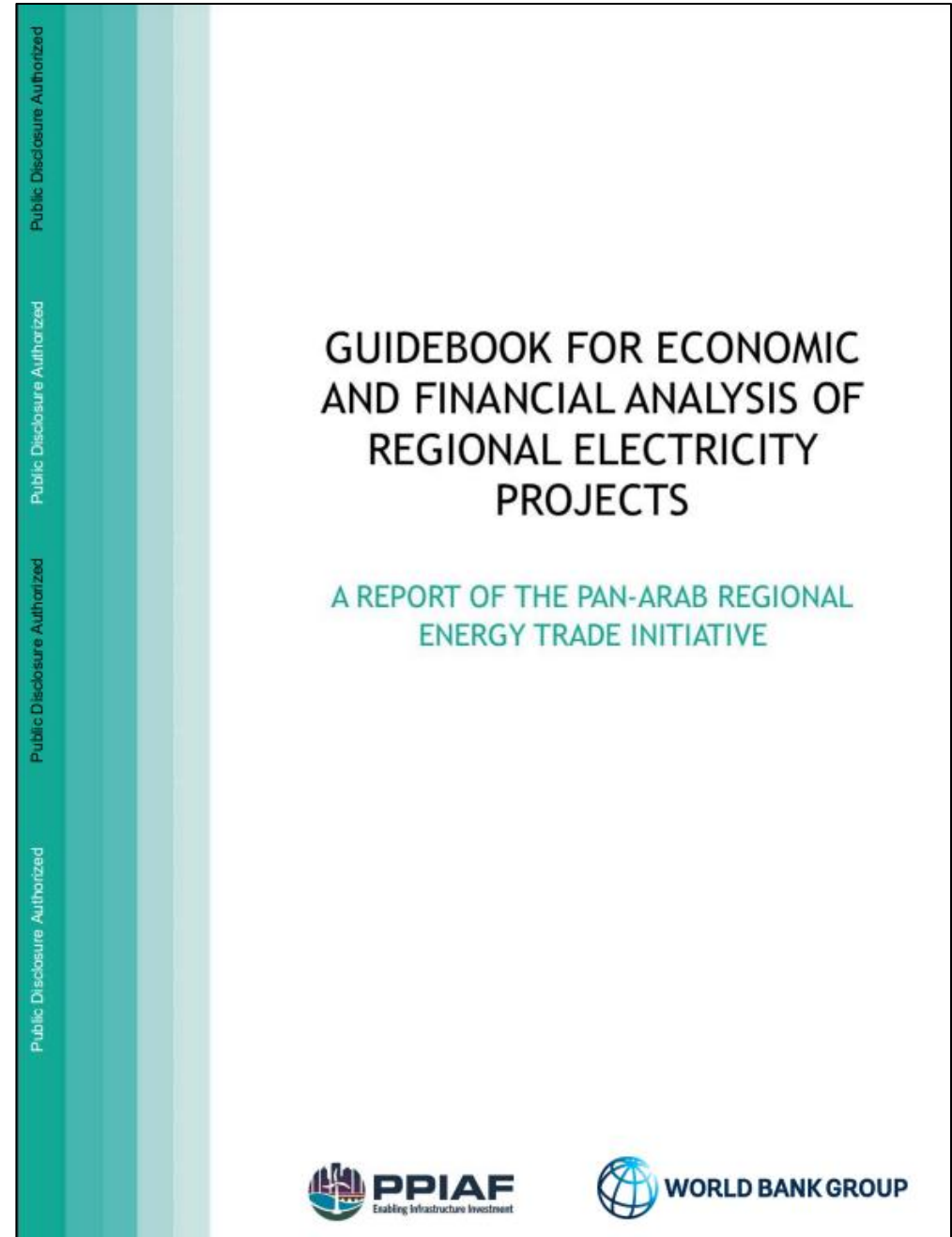
# Knowledge Instruments (Reports): Guidebook for Economic and Financial Analysis of Regional Electricity Projects

## Description

A methodology for economic and financial analysis of potential investments to facilitate regional electricity trade

## Outcome (or envisioned outcome)

To inform decision-makers on policy choices, and subsequently to inform the detailed project appraisal.



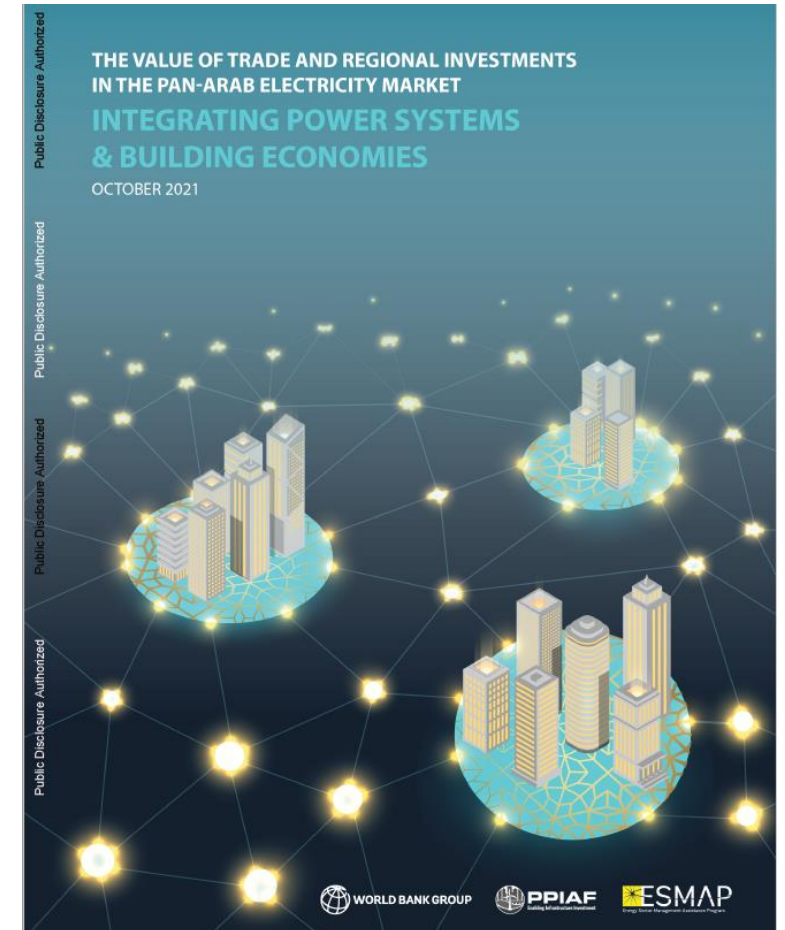
# Knowledge Instruments (Reports): The Value of Trade and Regional Investments in The Pan-Arab Electricity Market

## Description

The report recommended 25 transmission investment projects across the region in 2018-2035 that are considered a priority for investments to realize the value of trade and overall trade benefits across the PAEM.

## Outcome (or envisioned outcome)

Identify priority investment projects in terms of development impact and feasibility.




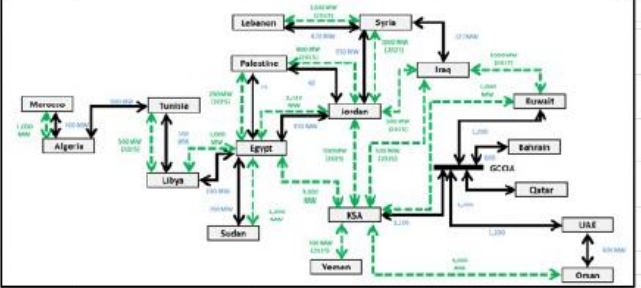
# Knowledge Instruments (Tool): World Bank Electricity Planning Model (EPM) pre-loaded with updated data

## Description

Developed a detailed model of the electricity systems of each Arab country for use in identifying trades and understanding the impacts of trade technically and financially

## Outcome (or envisioned outcome)

Fully populated Electricity Planning Model to be used by the trained cohort in the operationalization of the PAEM regional committees.

World Bank - Pan-Arab Electricity Market Pilot Project - EPM database and extension tool				
 <b>THE WORLD BANK</b>				
<u>Configure Scenario</u>		<input type="button" value="RUN"/>	<b>1</b>	<input type="button" value="Set Results"/> <input type="button" value="Set Model"/> <span style="color: green; font-weight: bold;">v03a</span>
Select Model	<b>MENA</b>	19 # of Countries in Model		
Demand forecast	<b>Base</b>	0% change in annual demand growth rate		
Fuel Price Projections	<b>Moderate</b>	0% change in fuel price projections		
Renewable Target	<b>Yes</b>	25% of energy generation from RE		
CO2 Tax	<b>Yes</b>	50 \$/tCO2 scaling target by 2030		
Interconnected Mode?	<b>Yes</b>	50 # of Interconnections		
Allow for Intercon Expan?	<b>Yes</b>	2 # of Intercon expan		
Name of Scenario:	WB_MENA_EPM_Regional_Model_2022-10-06_Scenario-1_v03a			

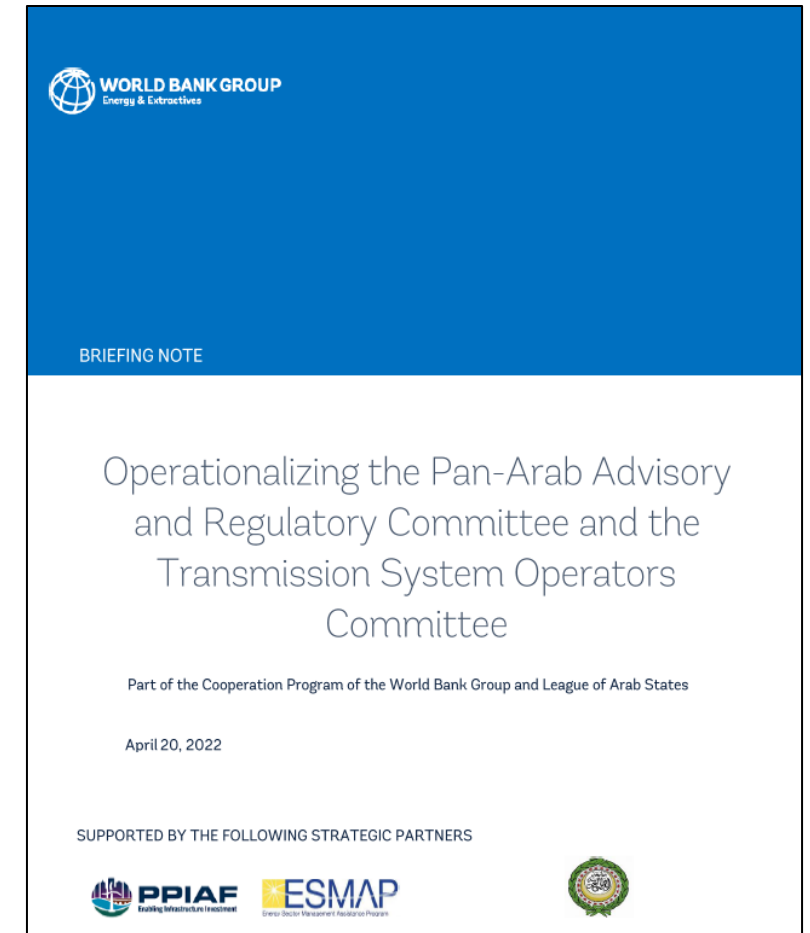
# Knowledge Instruments (Reports): Operationalization of the PAEM market committees

## Description

Staffing, work plan and capacity building. The Arab Fund has supported this activity through funding the salaries of two expert staff (local and international) for PAEM secretariate.

## Outcome (or envisioned outcome)

Establishment of effective PAEM regional committees to advance regional integration agenda.





# Knowledge Instruments (Conferences): Pan-Arab Regional Energy Trade Conferences

## Description

Series of conferences and workshops to promote discussion and knowledge sharing on Pan-Arab regional energy trade

## Outcome (or envisioned outcome)

To promote Pan-Arab regional energy trade



المؤتمر الأول لتفعيل التبادل التجاري للطاقة في الوطن العربي  
The Pan-Arab Energy Trade Conference

# Capacity Building: PAEM Pilot on Identification and consummation of cross-border trade

## Description

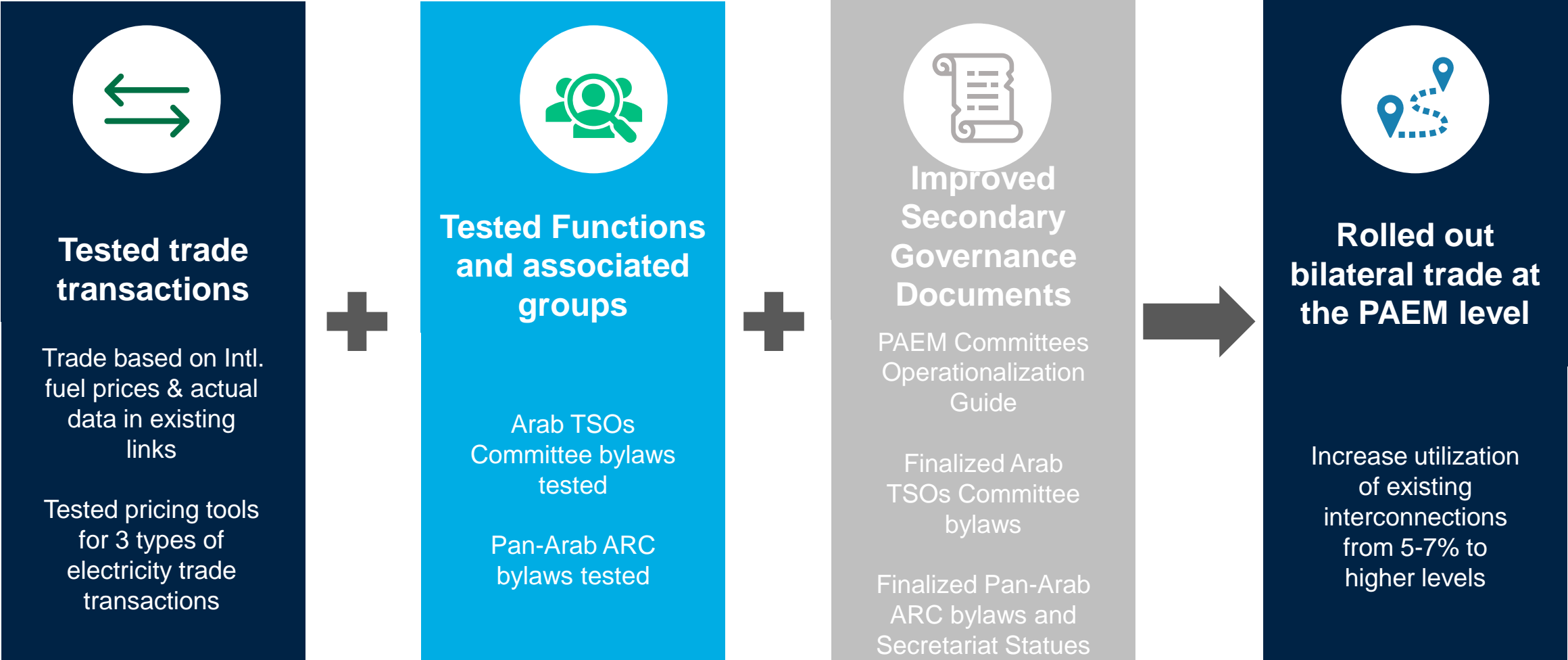
Delivered extensive training to officially nominated and Bank vetted mid-career working-level staff on cross-border trade pricing, identification and consummation of international trade. The PAEM Pilot provided an estimated total of 163 hours of instruction.

## Outcome (or envisioned outcome)

A cohort of 49 well-trained mid-career staff from 18 Arab member states to form the nucleus of the technical teams supporting PAEM regional committees.



# The PAEM Pilot aimed at advancing readiness of Member States to scale up trade under transitional stage -1



# The PAEM Pilot completed through six phases over 16-months

## Phase 1

### Foundational

program preparation and Formation of Working Groups

## Phase 2

### International Exposure

International Exposure from 5 regions and initial model training

## Phase 3

### Hands-on Training

Hands-on training on modeling and the launch of the communication platform 1.0

## Phase 4

### Trade Identification

Trade Identification of missed and potential bilateral trade transactions as well as identifying country specific challenges to trade

## Phase 5

### Bi-lateral Trade and Role-play

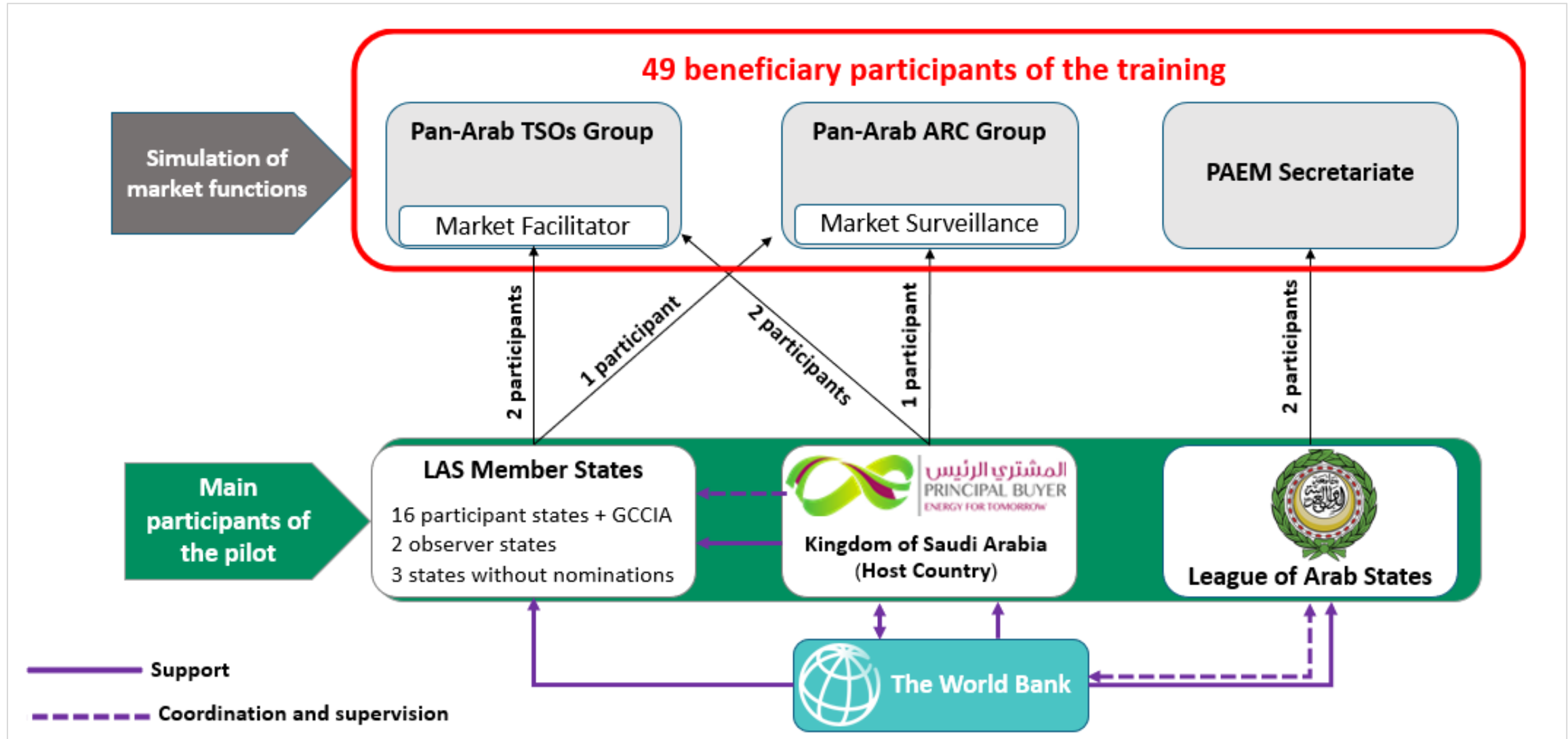
Role play of working groups and conducting bilateral trade transactions based on actual data

## Phase 6

### Final Round of Review

Preparing a final round of bilateral trade working pilot and the launch of the PAEM communication platform 2.0

The PAEM pilot ensured representation of Member States in all PAEM functions to engage, coordinate, and test trade transactions



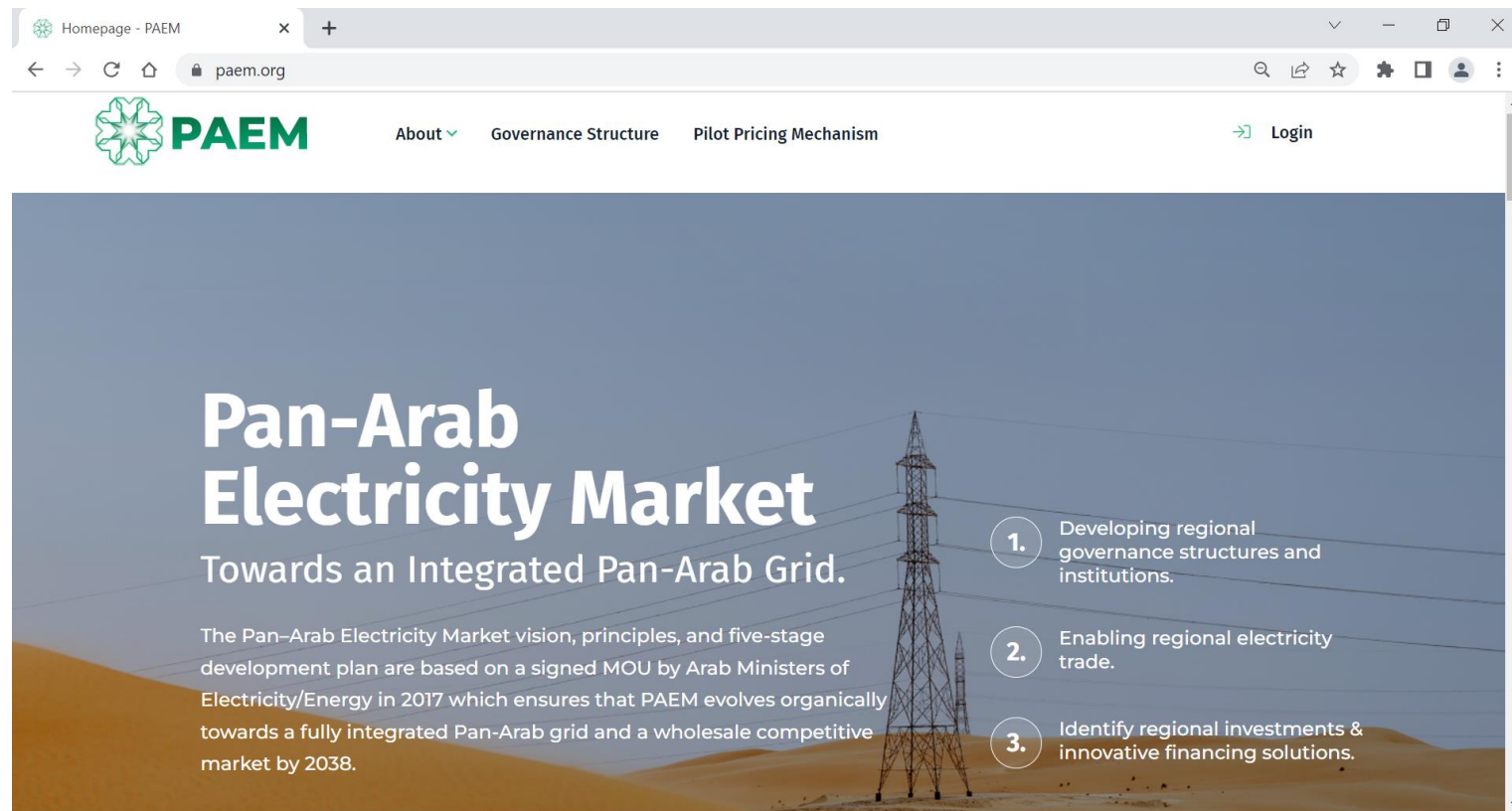
# Knowledge Instruments (Tool): Website and communication platform for the Pan-Arab Electricity Market (PAEM.org)

## Description

Developed a website and communication platform to facilitate the exchange of trade related information among market participants of PAEM.

## Outcome (or envisioned outcome)

Website and platform functionalities have been tested and the site ownership has been transferred to the PAEM Secretariate with a one-year maintenance package. The website is accessible at PAEM.org



In summary, The World Bank's PAEM pilot delivered the following:

1. **More than +100 capacity building sessions and 49 beneficiary participants**
2. **Robust Regional Trade Pricing Mechanisms**
3. **PAEM Website and Communications platform 2.0 (PAEM.org)**
4. **Finalized secondary governance documents (PAEM TSOs Bylaws, PAEM ARC Bylaws, Secretariat Statutes)**
5. **Other World Bank complementary tasks** to advance the trade in transitional stage-1 and prepare for transitional stage-2:
  - Contract templates for trade
  - Operational plans for TSOs and ARC committees
  - Updated and improved modeling tools (World Bank EPM for PAEM)

# Agenda

1. Background
2. The World Bank past activities
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# Knowledge Instruments (Reports): Best practices on Open Access and transmission pricing mechanism for multi-lateral cross-border electricity trades

## Status

Ongoing and first draft report expected by end of April 2023.

## Description

Develop options for open access and transmission pricing mechanisms for multi-lateral cross-border electricity trades based on international best practices.

## Outcome (or envisioned outcome)

Efficient transmission pricing mechanisms for electricity cross-border trade across the Pan-Arab region.



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# Knowledge Sharing: Executive-Level Knowledge Support on Operationalization of PAEM regional committees

## **Status**

Kick-off today (coordinated by LAS).

## **Description**

Deliver executive-level knowledge support to members of PAEM Regional Committees on regulatory and technical aspects based on international experiences

## **Outcome (or envisioned outcome)**

Fully operational and capable PAEM regional committees

# Knowledge Instruments (Reports):

## Procedures and processes to create a recurring Ten-Year Pan-Arab Network Development Plan (TY-PA-NDP)

### **Status**

Planned and initiation is conditional on establishment of regional market committees.

### **Description**

Development of procedures and processes to create a recurring Ten-Year Pan-Arab Network Development Plan (TY-PA-NDP).

### **Outcome (or envisioned outcome)**

PAEM regional committees to issue a periodical Pan-Arab Network Development Plan (PA-NDP).

## Knowledge Instruments (Reports):

Egypt-KSA-Jordan and KSA-Egypt-Greece tri-lateral arrangement to maximize commercial benefits of existing and upcoming interconnections

### **Status**

Planned and initiation is conditional on receipt of a formal request by the relevant Member States (Egypt, KSA, Jordan) under LAS coordination.

### **Description**

Design commercial framework for trilateral trade and open access as a pilot for other sub-regions.

### **Outcome (or envisioned outcome)**

Maximize commercial trade benefits of priority existing and upcoming interconnections.

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# Transition to early market operations and eventually to Transitional Stage-2 by 2025

**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.

# Transition to early market operations as envisaged under transitional stage-1 is timely and critical

## Goal

Support countries to increase trade of electricity in an efficient and commercial manner yielding a much more liquid market.

## Readiness

Member States now have better knowledge and tools to identify and price trade opportunities in existing infrastructure. Additionally, a cohort of 49 well-trained mid-career staff from 18 Arab member states are ready to form the nucleus of the technical teams supporting PAEM market committees.

## Key requirements for early market operations:

- Signing of the General and Market Agreements as soon as possible
- Fully operational and capable PAEM regional committees
- Initial market design including transmission access and pricing mechanisms for trade and transmission
- A commercial framework in place by Member States to facilitate trade and maximize their benefits

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**

Thank You