



# PAEM Long-term Vision and Roadmap

## **PAEM Committees (TSO & ARC)**

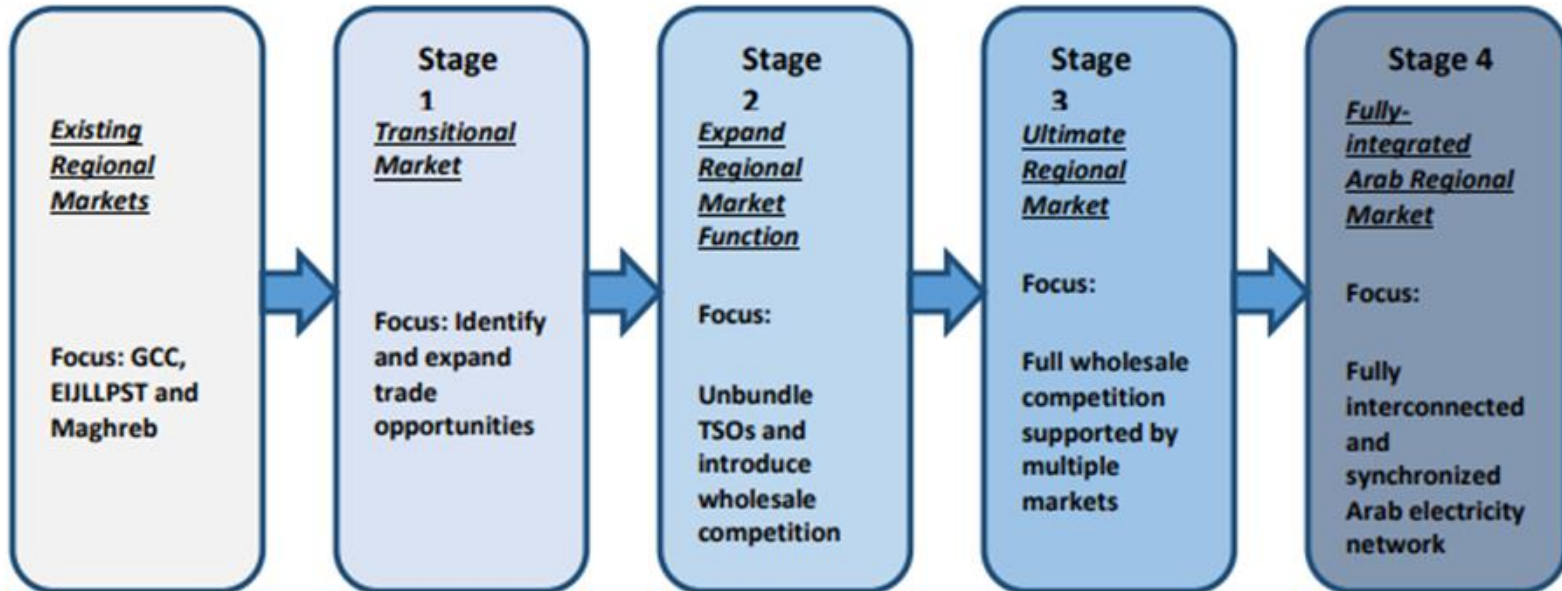
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# PAEM Long-term Vision

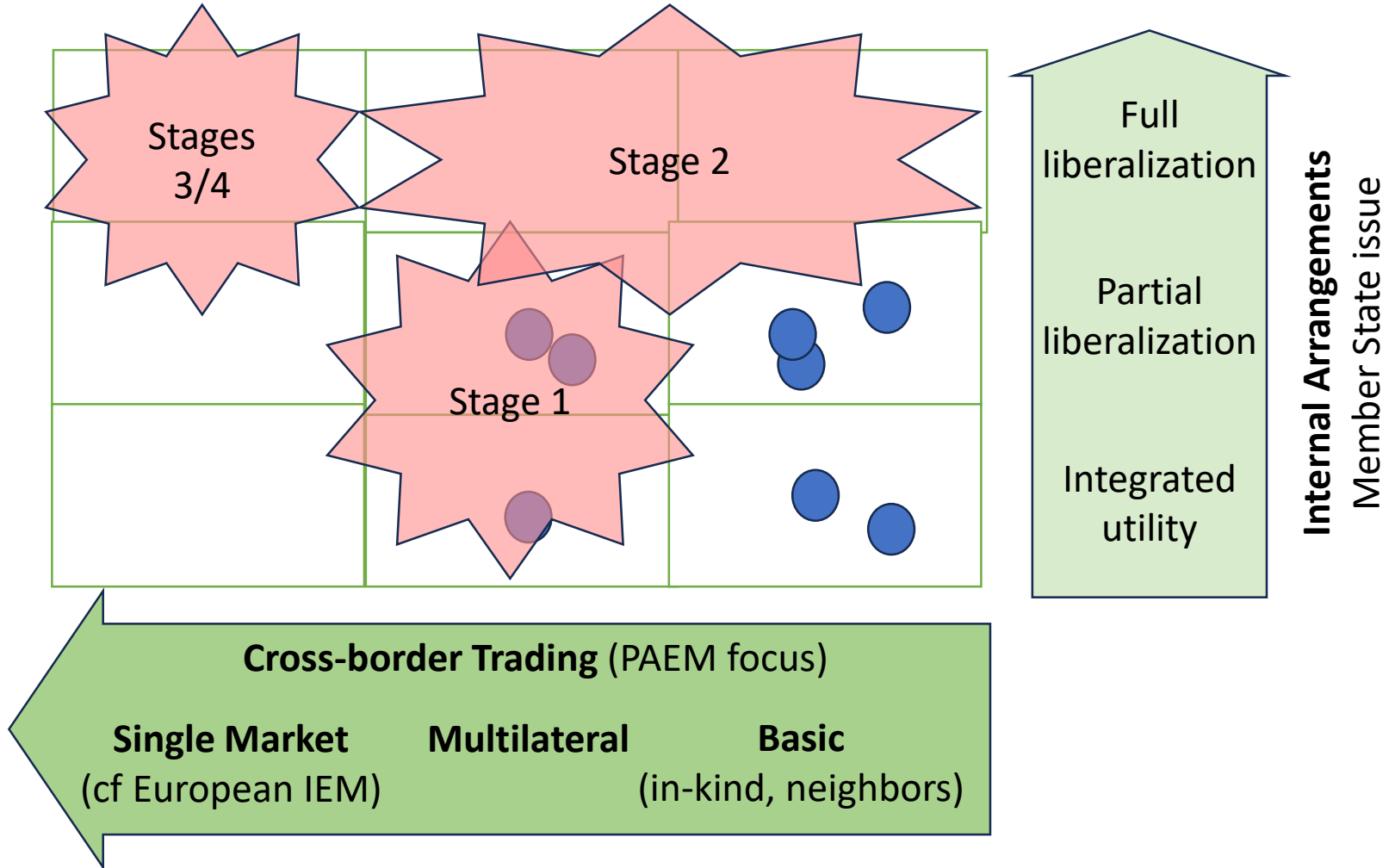


The PAEM regional roadmap focuses on the development of cross-border trading arrangements  
Internal market unbundling/restructuring is under the jurisdiction of individual Member States

Source: Market Agreement



# Development Stages





# Stage 1: Multilateral trading – Market model

## Ability to trade with anyone in the connected region, not just with bordering countries

- Price-based trading/competitive price discovery (trading-in-kind also supported)
- Bilaterally negotiated trading agreements (terms, price, etc)
- Variety of products traded: long-term or spot; base or shape
- Wheeling pre-arranged (declaration of firm availability; fair compensation for transit countries for infrastructure cost and losses)
- Open, non-discriminatory access to cross-border capacity
- Obligations and penalties for unscheduled deviations
- Open to any qualified market party – potentially including independent parties with grid access

**Further enhancements possible (e.g., day-ahead auctions), but multilateral trading will always be a core element of the PAEM**



# Stage 2: Liberalised national markets

## Development of internal markets and competition

- Unbundled TSO, independent regulation
- Generation competition – e.g.: IPPs (with and without PPA), private RES, unbundled national utility supply and generation, breakup generation, demand side participation
- Consumer choice of supplier: large users; small/domestic
- Access to cross-border market for independent participants
- Different ways to develop national markets
  - Isolated development (adequate scale?)
  - Cluster of coupled markets
  - Link to adjacent developed market
- Approach and timing is a prerogative of each Member State. PAEM does not impose any obligation to liberalise, but the PAEM must be accessible to all countries irrespective of the level of liberalisation they are at
- **Individual countries can liberalize in parallel with Stage 1 development**



# Stages 3/4: Fully liberalised, integrated markets

## Evolution to a highly integrated regional market

- Likely to be based broadly on European Internal Electricity Market model
- Organised spot markets (day ahead, intraday)
  - Auction-based plus continuous
  - Coupled: cross-border capacity allocated automatically
  - Cleared: trading against a central counterparty
- Regional regulation and TSO coordination
- **Not an issue for the near-term**



# Roadmap: Challenges facing the PAEM

- **Physical network issues**
  - Strategic: Mashreq-GCC, Maghreb-Mashreq
  - National interconnections and internal networks
  - European interconnections
- **Legislative & regulatory challenges**
  - Lack of strong legal/regulatory framework (cf Europe, USA)
  - Differing national priorities and situations
- **Practical impediments**
  - National readiness to trade (including motivation, subsidies, organisation)
  - Contractual basis to trade
  - Access to non-bordering counterparts



# Physical grid development

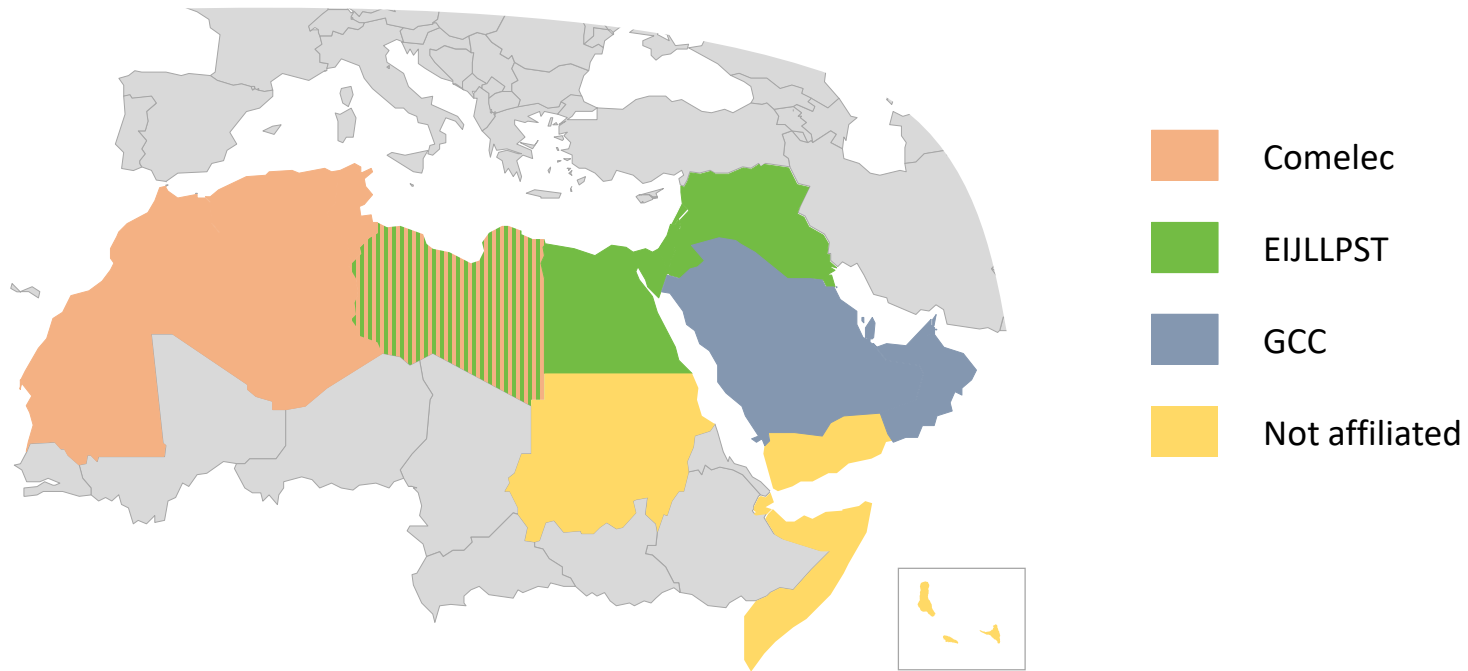
- 1. Strategic intra-regional developments** that determine the geographic scope of the connected PAEM region
  - **EIJLLPST-GCC:** KSA-Egypt and KSA-Jordan interconnection
  - **Comelec-EIJLLPST:** Libya internal reinforcement/HVDC link
- 2. National connections/enhancements** enabling countries to connect to the existing sub regional or regional solutions – e.g.: Iraq-Jordan, Iraq-KSA, Iraq-Kuwait
- 3. International connections** - in particular, capacity to Europe:
  - Morocco-Spain (additional 700MW, 2026)
  - KSA-Greece (3GW?)
  - Egypt-Greece (3GW)
  - Tunisia-Italy (600MW)





# Multilateral trading – implementation strategy

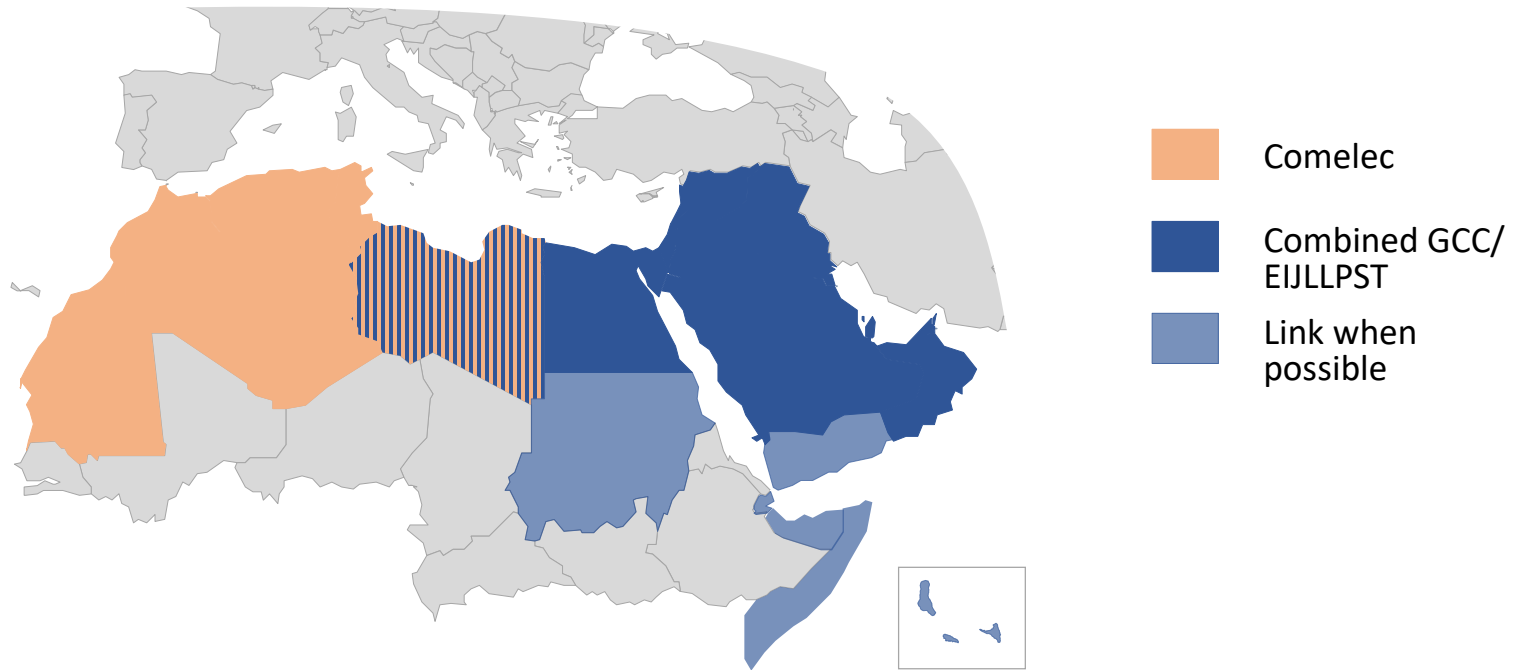
## *Current situation*





# Multilateral trading – implementation strategy

## *Step 1: GCC-Mashreq*



Trigger: KSA-Egypt interconnector which is at the discretion of the relevant States



# Multilateral trading – implementation strategy

## *Step 2: GCC/Mashreq-Maghreb*



Trigger: Libya internal system reinforcement which is the discretion of the relevant States



# Stage 1: Multilateral Trading

## Critical market arrangements

### Arrangements required to support multilateral trading

- Cross-border capacity calculation
- Capacity allocation/ congestion management
- Transmission services/wheeling
- Unscheduled deviations
- Market facilitation services
- Data transparency
- Market participation

### PAEM Rules

- Policies, rules, standards to be applied across region
- As needed to ensure fair, efficient and operable market
- Aligned national regulation/laws

### Market Enablers

- Market rules and participation terms
- Supporting systems, procedures
- Procurement of service providers
- Governance structure for multiparty cooperations

### Geographic scope

- Physically connected grid
- PAEM required minimum scope (sub-region, region)
- Option for TSOs to cooperate more widely (e.g., clusters, sub-regions, region)



# Arrangements to support multilateral trading (1)

<b>Cross-border capacity calculation</b>	<ul style="list-style-type: none"><li>• Fair and reasonable method of calculation</li><li>• Treatment of pre-existing rights</li></ul>
<b>Cross-border capacity allocation/congestion management</b>	<ul style="list-style-type: none"><li>• Open, non-discriminatory access for any qualified party</li><li>• Clear terms and conditions (e.g., firmness, rights, nomination)</li><li>• Method to handle congestion (demand exceeding availability): pro rata; explicit auctions (single or multi-border)</li></ul>
<b>Transmission services (wheeling)</b>	<ul style="list-style-type: none"><li>• Reasonable cost recovery for transit networks (infrastructure costs, losses); fair basis for allocating costs to users</li><li>• Regulated charges, no trade-specific negotiation</li></ul>



## Arrangements to support multilateral trading (2)

<b>Unscheduled deviations</b>	<ul style="list-style-type: none"><li>• Incentives on all countries to flow as scheduled</li><li>• Fair compensation for costs imposed on others due to deviations</li></ul>
<b>Market facilitation</b>	<ul style="list-style-type: none"><li>• Identify most relevant services (voice broking, online platform, price reporting, price model)</li><li>• Appointment/supervision of market facilitator; building necessary competences and trust</li></ul>
<b>Data transparency</b>	<ul style="list-style-type: none"><li>• Identifying the need for transparency: who needs what to be able to make rationale, efficient decisions</li><li>• Establishing accessible transparency platforms: national, regional</li></ul>



## Arrangements to support multilateral trading (3)

<b>Market participation: Qualified counterparts</b>	<ul style="list-style-type: none"><li>• Ability to trade with as many potential counterparties as possible</li><li>• Establish master bilateral agreements setting out key terms - e.g., invoicing and payment, guarantees, performance assurance, etc.</li></ul>
<b>Market participation: Trading competencies</b>	<ul style="list-style-type: none"><li>• Capable traders maximizing economic gain for both generation and supply: need to separate generation from supply?</li><li>• Adequate authority, resources (legal, financial, systems), focus, and motivation</li><li>• Detailed understanding of own marginal costs</li></ul>
<b>Market participation: New market parties</b>	<ul style="list-style-type: none"><li>• Recognizing benefits of widening market access</li><li>• Associated changes needed to support independent parties: domestic and cross-border</li></ul>



# East Pathfinder Project

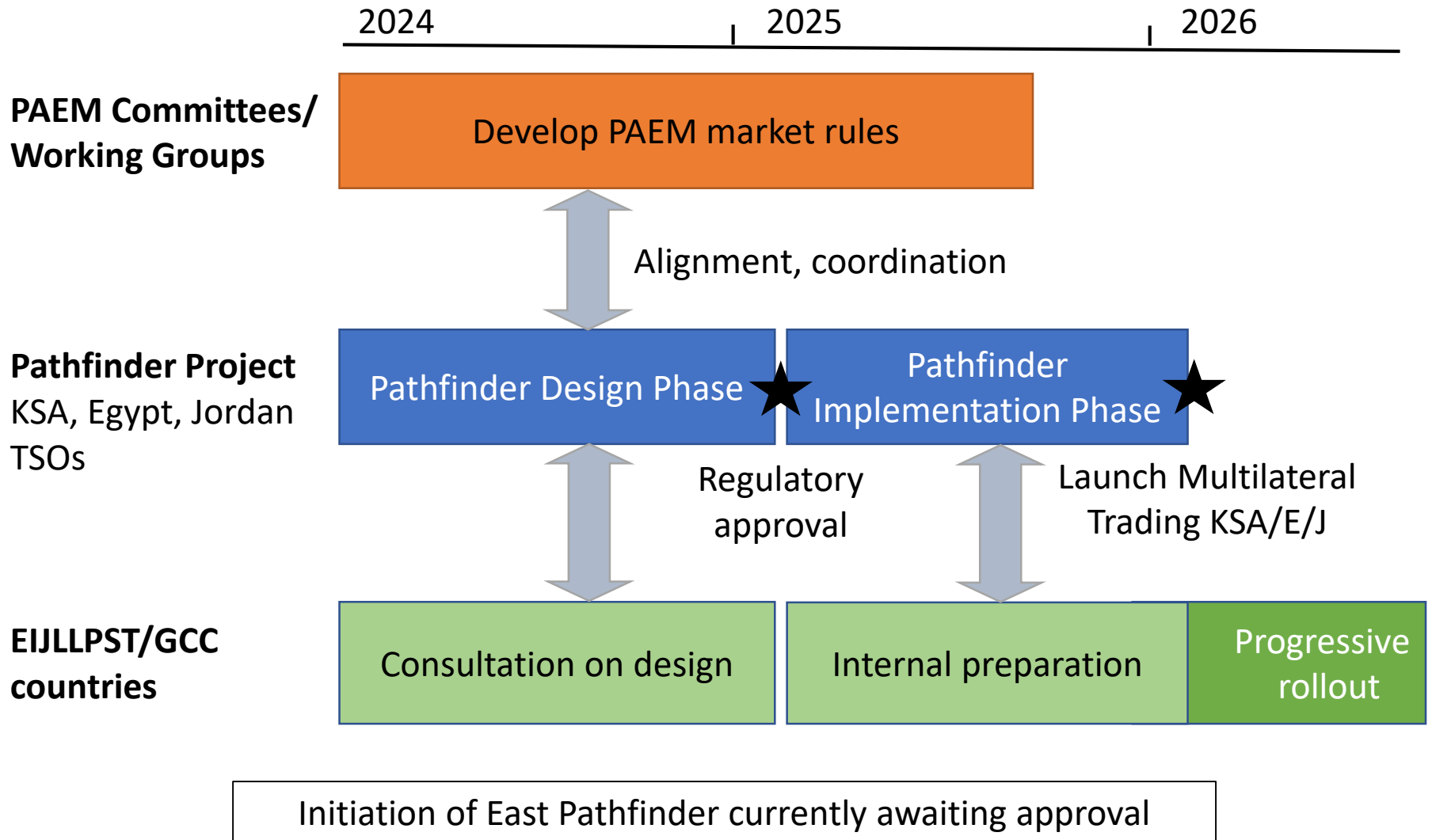
Way to develop and build the mechanisms and tools needed to support ***multilateral trading*** between countries in the GCC and EIJLLPST sub-regions

- Project led by joint Egypt, Jordan and KSA TSOs
- (1) Design and (2) implement the necessary systems, market enablers, rules and agreements
- Solution should be able to quickly extend to all countries in the two sub-regions – potential basis for PAEM
- Align project structure with PAEM committees and working groups





# Draft East Pathfinder coordination and timeline





# Roadmap: summary

## **Multilateral Trading (Stage 1)**

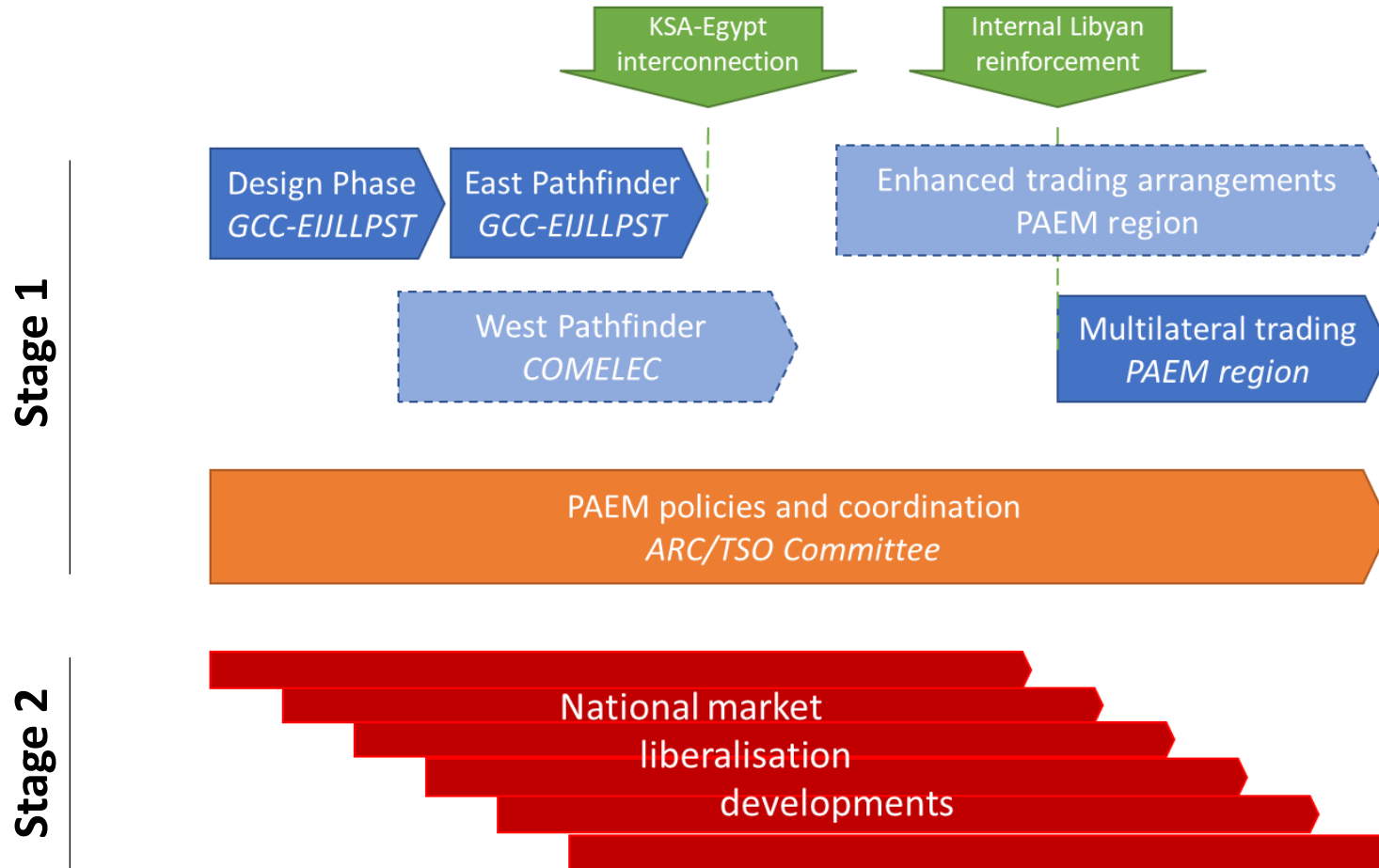
- Pathfinders project(s) to develop multilateral trading:
  - East Pathfinder: KSA-Egypt-Jordan to enable trade across EIJLLPST and GCC once KSA-Egypt interconnector operational
  - Potential West Pathfinder in Comelec; Libya internal reinforcement would enable linking of PAEM
- Ensure alignment between the Pathfinders and consistency with the emerging PAEM rules

## **Liberalized National Markets (Stage 2)**

- Development of national markets a local not PAEM decision
- PAEM market design should support a range of national market forms
- PAEM can help support national processes (e.g., sharing ideas)



# Summary Roadmap





# Near term Workplan Priorities

1. Progress East Pathfinder project: design phase
2. Development of PAEM rules and institutions
3. Assist development of national trading policies competencies and capabilities
4. Market facilitator options study and design



# Market Facilitator

## External Expert proposal

1. The Market Facilitator is a critical function during both the implementation and operation of the PAEM. A wide range of tasks have been assigned to the Market Facilitator in the agreements
2. There are some high impact issues/choices regarding the setup of the Market Facilitator, notably:
  - Is one organisation best placed to undertake all the assigned tasks? It might be preferable to subcontract some tasks to other entities, while still remaining under the overall responsibility and control of the Market Facilitator. A related issue is to determine which are the most urgent activities that need to be prioritised
  - Should the Market Facilitator and Secretariat be combined? This is an option in the agreements, and it would be best to address right at the start
  - How will the PAEM Market Facilitator and sub regional arrangements (notably GCCIA) work alongside each other in practice? The principle of sub regional arrangements is recognised in the agreements
3. Consideration of these issues could proceed in parallel with the Pathfinder. At the end of the Pathfinder Design Phase, the PAEM should be ready to make decisions on the establishment of the Market Facilitator without delay. Ideally, the time can be used to find a solution mutually acceptable to all parties



# Supporting slides



# Proposed high-level deliverables, 2023-4

## PAEM Rules and Institutions

Led by Steering Committee with AEEC oversight until ARC and TSO Committees formed

Deliverable		Comment
1	Build understanding at ARC/TSOC of key concepts (executive perspective)	World Bank knowledge building
2	Develop a methodology for calculating Net Transfer Capacity	International experience input
3	Establish principles for the remuneration of transmission services (wheeling, etc)	World Bank support
4	Establish the shared data requirements/ definitions and specify the required functionality for a data platform	International experience input, including Med-TSO
5	Plan for migration to enduring institutional structure, Market Facilitator	LAS role and AFESD funding ends 2023



# National trading competencies and capabilities

In order for the PAEM to develop, it will depend on the readiness of countries to trade, which requires the development of necessary policies, competences and capabilities. This is a national responsibility, but the PAEM can provide assistance

## Proposed near term actions:

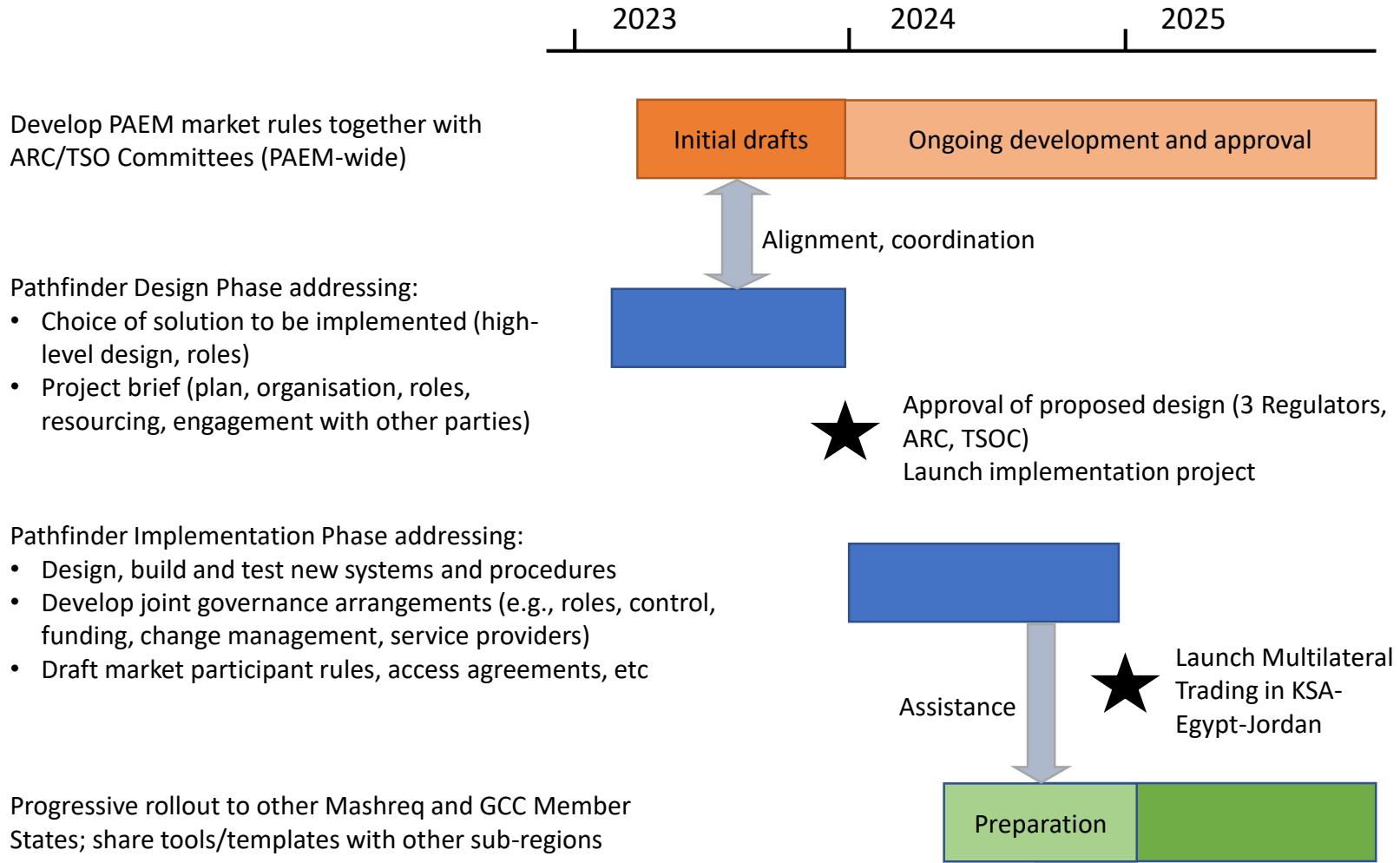
Deliverable		Comment
1	Collate current status in member states	Survey
2	Develop bilateral contract templates	Commercial WG
3	Facilitate competency building – sharing best practice, training	International experience input, including Med-TSO Member states with relevant experience





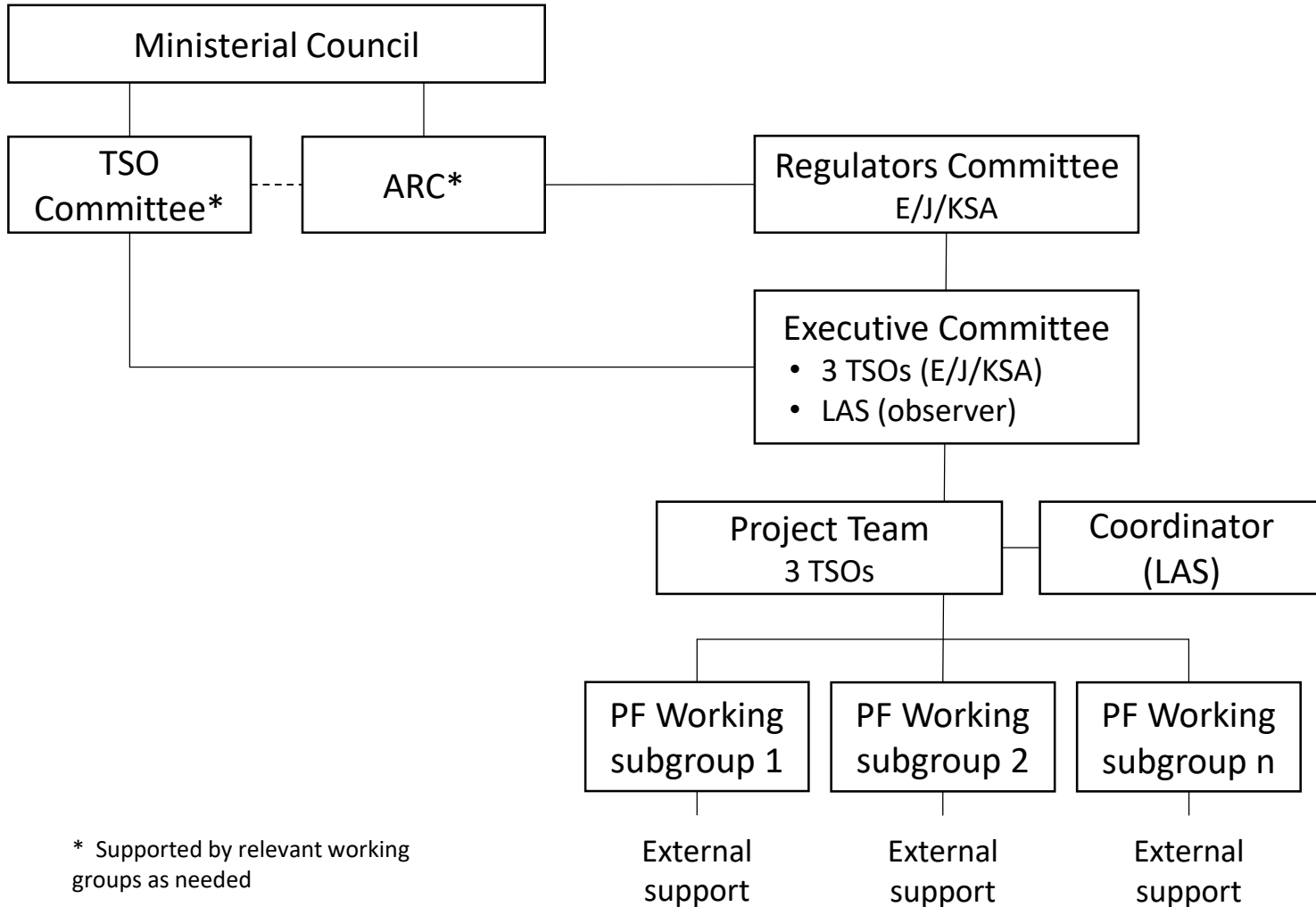
# Indicative Pathfinder timeline

- PAEM development (under AEEC)
- East Pathfinder (under Executive Committee)
- Rollout (under expanded Executive Cttee)





# Organisation – Pathfinder Design Phase





# Immediate East Pathfinder Tasks

1. Review East Pathfinder project proposal with interim ARC and TSO Committees; seek AEEC approval
2. Establish Executive Committee
  - Approve initial workplan
  - Appoint Project Team members
  - Agree secretariat support, meeting arrangements
3. Project Team review Design Phase plan and report recommendations to Executive Committee (1-2 month):
  - Review the critical design aspects to be addressed: relevance/ prioritisation; key issues to be resolved; likely interdependence with PAEM Rules development
  - Assess organisation and resourcing of the Design Phase, including identifying need for external expert support/consultancy (e.g., World Bank)
  - Prepare plan with tasks, resources and timelines
4. ARC/TSO Committees review proposed Pathfinder workplan; establish arrangements for coordination/consultation with PAEM