

Pan-Arab Interconnection and Development of Arab Power Markets

*Based on Recommendations made by the joint League of Arab States/World Bank Study
on Arab Electricity Integration Institutional and Regulatory Framework*



Husam Beides
Lead Energy Specialist
The World Bank

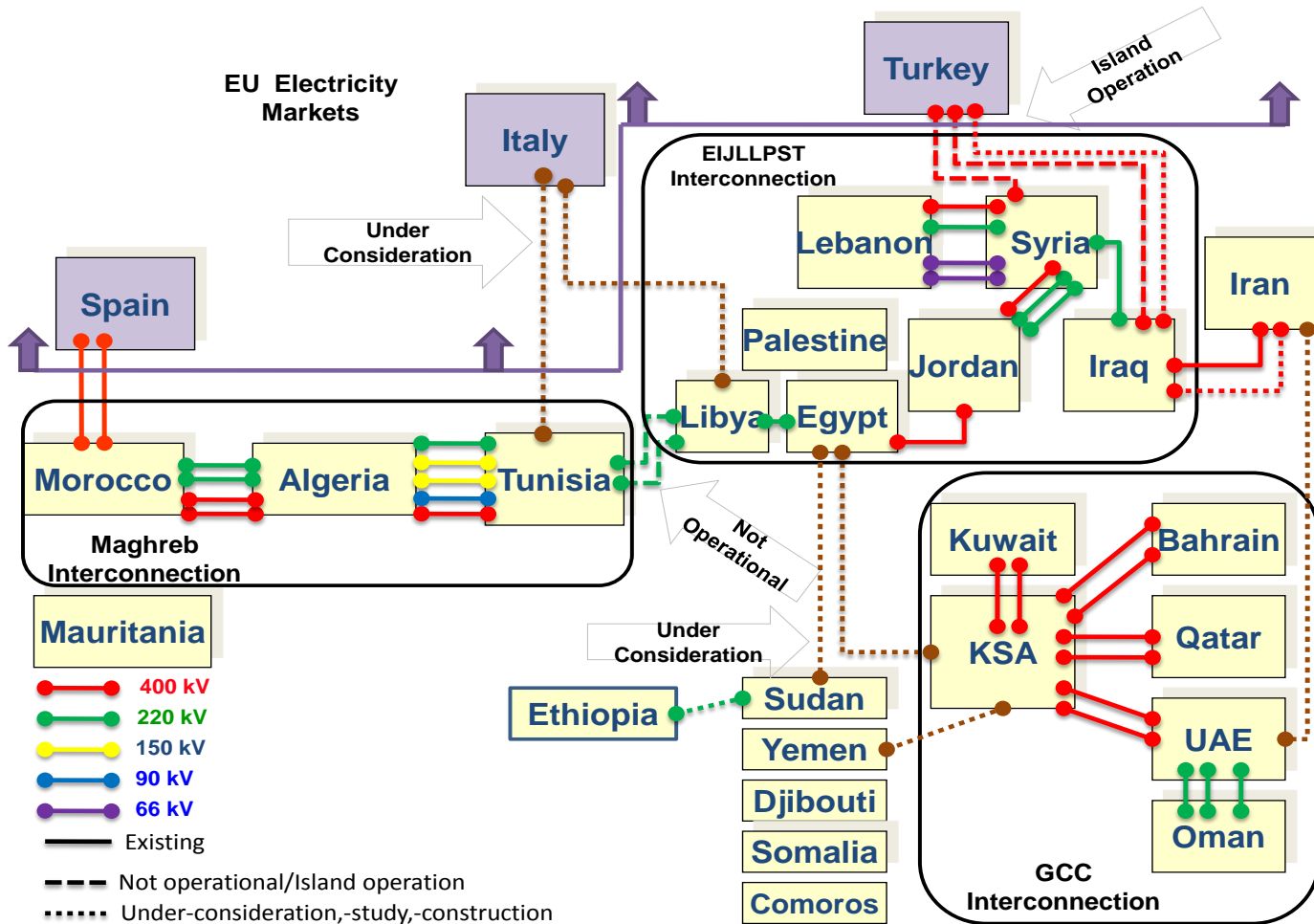
GCCIA Power Trade 2nd Forum
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Presentation Objective and Outline

- Current Situation
- Guiding Principles for Development of Pan-Arab Electricity Market
- Proposed Market Integration Plan
- The Transitional Market Design
- Next Steps



Current Situation – Existing and Planned Interconnections

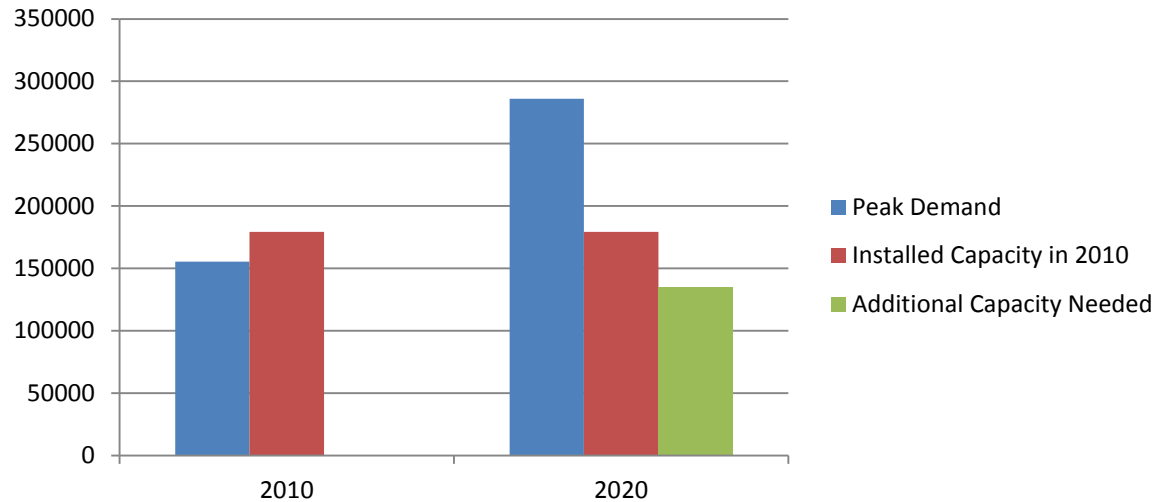


- ❖ **EIJLLPST Interconnection**
Egypt, Iraq, Jordan, Libya, Lebanon, Palestine, Syria & Turkey
- ❖ **GCC Interconnection**
Kuwait, Saudi Arabia, UAE, Bahrain, Oman & Qatar
- ❖ **Maghreb Interconnection**
Morocco, Algeria & Tunisia

Although electrical interconnections exist, trade among Arab countries has been minimal at less than 2 % of capacity

Arab Countries Current Situation – Growing Demand

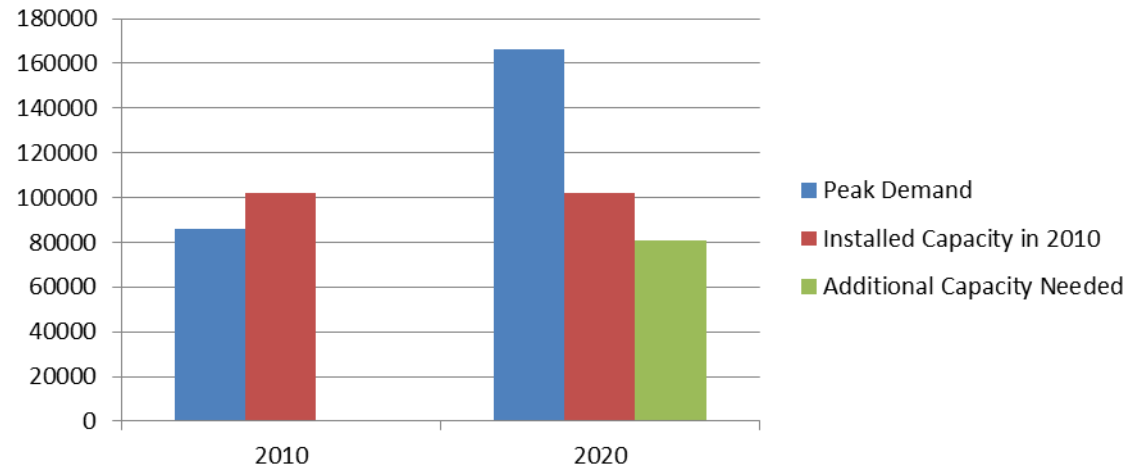
- Electricity demand in Arab countries will increase 84 % by 2020, requiring an additional 135 GW of generating capacity.



- Required infrastructure investment in Arab countries for electricity alone estimated at US\$ 450 billion by 2020.

	2020 New Generation
Without Regional Integration	135 GW
With Regional Integration	102 GW

- Electricity demand in GCC countries will increase almost by 100 % by 2020, requiring an additional 80 GW of generating capacity.



- High Interconnection transfer capacity but low exchange utilization (2011)

	Max transfer capacity (MW)	Energy exchanged (MWh/year)	Load factor (%)
Saudi Arabia – Import	1200	207	-
Saudi Arabia – Export	1200	25,072	0.3
Kuwait – Import	1200	54,551	0.7
Kuwait Export	1200	98,849	1.2
Qatar – Import	750	41,554	0.8
Qatar – Export	750	73,078	1.4
Bahrain – Import	600	57,268	1.4
Bahrain – Export	600	48,426	1.2
UAE – Import	900	27,513	0.4
UAE – Export	900	35,941	0.6

Drivers for Pan-Arab Market Integration

- As worldwide experience has shown, improved regional electricity integration imparts many benefits:
 - Increased energy security and reliability
 - More efficient and effective use of infrastructure
 - Economies of scale in investments
 - Greater renewable energy penetration
 - Reduced environmental impact (reductions in greenhouse gases)
 - Reduced cost of supply for consumers

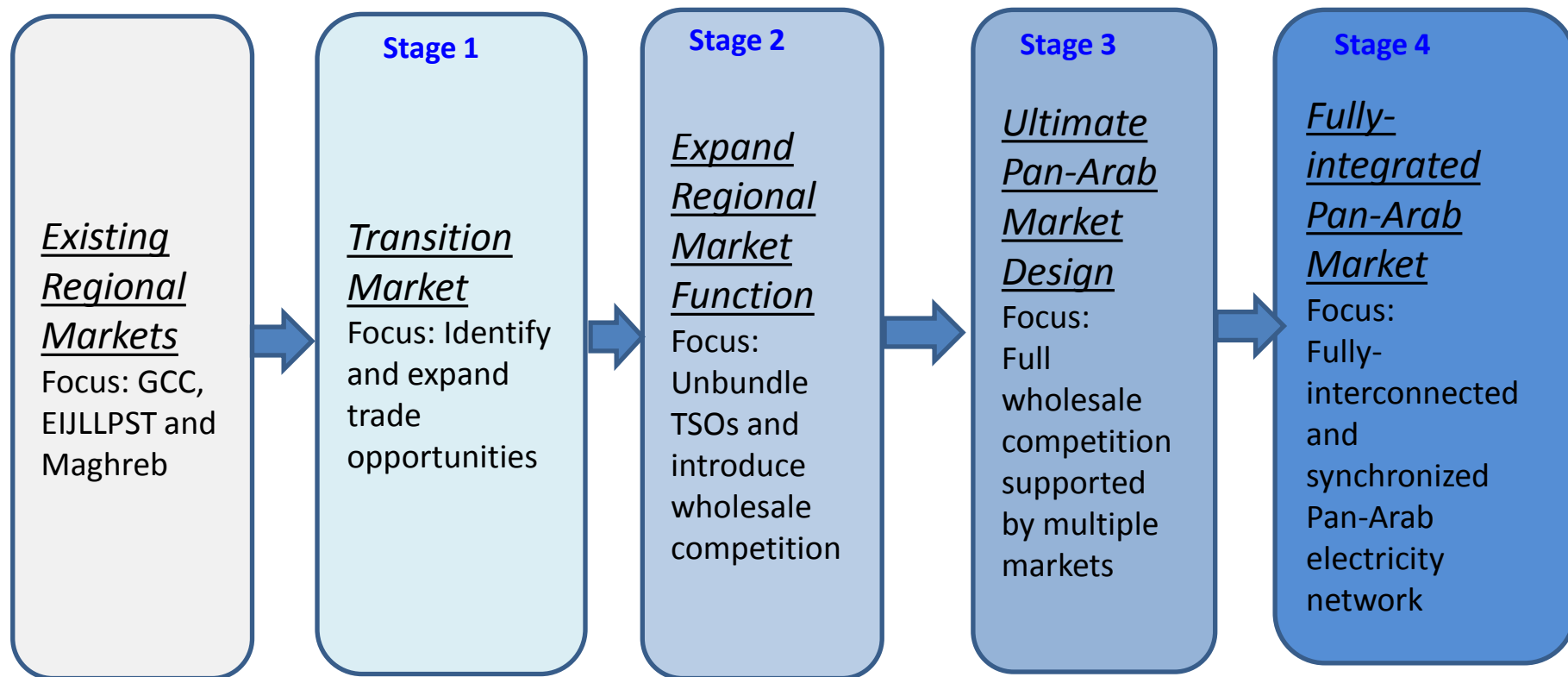
- Pan-Arab market integration can help meet the challenge through initially reserve sharing and energy exchanges that take advantage of daily and seasonal demand diversity and by planning and operating the electricity sector from a broad regional perspective:
 - More efficient use of infrastructure
 - More efficient use of primary energy resources

Pan-Arab Electricity Market: Development Guiding Principles

- Recognize that Arab countries are at different stages of market reform with different levels of commitment
- Build on the existing regional electricity market integration framework and institutions
- Initially promote increased regional integration and trade while removing existing barriers to trade
- Maintain consistency with market reform objectives
- Incorporate lessons learned and best experience elsewhere
- Provide responsibility, authority, incentives and training necessary to promote regional integration and trade

Pan-Arab Electricity Market: Market Integration Plan

- A transition path to promote regional electricity market integration consistent with goals of sustainability, reliability/security of supply and competition is proposed below



- The pace and actual path of development toward the full integration is subject to periodic assessment of achievements, sovereign decisions, and techno-economic market studies

- An ultimate regional electricity market design is proposed as a long term objective to serve as a target for harmonizing development of the national and sub-regional markets during multi-year transition period. The ultimate regional market is characterized by:
 - open access to the transmission networks
 - unbundling of supply and transmission entities
 - Wholesale competition
 - Governing regulations for regional trade

- Four Stages of development are proposed to allow the national and sub-regional markets to develop at their own pace and time to address the challenges and risks facing market reform.

- Objectives of Stage 1 - Transitional Market:
 - Strengthen regional integration within each subregion
 - Develop the institutional framework needed for a coordinated move toward a harmonized regional electricity market

Pan-Arab Electricity Market: Stage 1 - Transitional Market

Expansion of Infrastructure and Trade	Institution Building/ Legal/Policy
<p>Sub-regional TSOs/Market Facilitators identify trade opportunities based on international fuel prices</p> <ul style="list-style-type: none"> - Utility-to-utility bilateral contracts - Trade among GCC, EIJLLPST and Maghreb countries 	<p>Establish:</p> <ul style="list-style-type: none"> - Secretariat (within LAS) - Pan-Arab Advisory and Regulatory Committee - Arab TSOs Committee - Sub-regional TSO/Market Facilitators
<p>Reinforce infrastructure:</p> <ul style="list-style-type: none"> - Expanding generation - Reinforcing existing cross-border interconnections <ul style="list-style-type: none"> - Iraq–Syria - Jordan–Egypt - Egypt–Libya - Libya–Tunisia - Others to be identified by Study Part 1 	<p>Develop and sign Memorandum of Understanding and General Agreement on Pan-Arab Electricity Market Integration</p> <p>Develop and sign a General Pan-Arab Electricity Market Agreement covering commercial aspects</p> <p>Develop and sign an Arab Grid Code and harmonize technical and reliability standards</p>
<p>Construct new interconnections:</p> <ul style="list-style-type: none"> - Egypt–Saudi Arabia - Egypt–Sudan - EIJLLPST and Turkey - Maghreb and Europe - Others to be identified by Study Part 1 	<p>Prepare cross –border transmission tariffs</p>

- ❑ Develop and approve a Road Map for development of the Pan-Arab Electricity Market including an action plan for developing the Transitional Market institutions and governance documents

- ❑ The implementation of the Road Map requires a high-level executive (ministerial) decisions to move the process forward

- ❑ A Memorandum of Understanding covering the following is proposed for signing to provide the political endorsement and direction needed to initiate the process:
 - Vision of the Evolution of the Pan-Arab Electricity Market
 - Governing Institutions
 - Governance Documentations
 - Time Table for Implementation
 - Ratification and Coming into Force
 - Membership (Signatories and Observers)

Thank You