Updated Regional Investments and Tools to Facilitate Trade in PAEM

From assessing the benefits to realizing them
Recent developments merit reassessing the value of trade potential and investments for greatest returns across the PAEM

- Low-carbon energy mix has become a priority in many countries;
- Technological advances—enabled by generous financial support and mandatory requirements—have led to dramatic drops in the cost of renewable energy, especially wind and solar energy;
- Paris Agreement on climate change was agreed on in late 2015 by 196 countries and formally ratified in 2016; and
- Scale up of energy subsidy reform programs across the Middle East and North Africa.
The bigger picture of the PAEM is promising: Europe; Pan-Arab; South Asia; Africa
Integrating the enabling tools with the financing solutions of the PA-RETP Initiative to identify critical investments to promote commercial trade

1. Enabling tools for regional electricity and gas trade
   - Regional Pricing Mechanism
   - Pan-Arab Electricity Trade Model
   - Economic and financial feasibility studies template and guidebook
   - Institutional capacity building programs
   - Bylaws of the market committees

2. Developing regional governance structures and institutions
   - General Agreement
   - Market Agreement+
   - Market design guide
   - Draft Grid Code handed over to AFESD
   - Regional institutions

3. Innovative financing solutions for regional investments
   - Value of Trade and Regional Investment Plan
   - Financing Modalities (private, public, PPP)
   - Financing Options and potential funding plans
PAEM in 2018: the reality, connections exist!
But not much trade is happening

Generation capacity: 300 GW

Transmissions Transfer Capacity: 15.8 GW

Utilization of transmission: 5-7%
Scaling up investments to realize the PAEM objective in 2035 is not enough
Because increasing transfer capacity to advance trade with current fuel prices leads to substantial subsidies expors!

Annual gas subsidy flow is estimated from the difference between the total gas opportunity cost (total gas consumption times the difference between the current gas prices and international gas prices) in the case of no trade and the total gas opportunity cost under the case of electricity trade, for all countries.
Using international fuel pricing and regional pricing mechanism will lead to sharing benefits and greater utilization across the PAEM in 2035.
Therefore, PAEM will not achieve its benefits if fuel pricing does not reflect economic cost.

Impact of gas price on bilateral trade in 2020-2035

Cost savings shared by all countries engaged in bilateral trade: $91-135 billion

Gas subsidy borne by exporting countries: $170 billion
Attractive trade benefits will be shared among all market countries with international fuel prices

The value of electricity trade under bilateral contracts, in US$, for the interconnections considered in this study is calculated following: benefit = [(Pi + Pe)*Q]/2, where Pi, in $/MWh, is the marginal cost of electricity of the importing country without trading; Pe, in $/MWh, is the marginal cost of the exporting country without electricity trading, and Q, in MWh, is the total electricity exchange during that year. Positive values indicate the benefits received by the country engaging in trading. Negative values (in red) indicate the cost undertaken by the country for engaging in trading.
Implementation approaches for regional projects could undermine benefits realization: Spectrum of PPP models in Electricity Transmission Projects

The spectrum of PPP models stretches from their lighter varieties such as management contracts to those of deeper private engagement such as concessions and outright divestitures.

A well-designed PPP arrangement allocates tasks, obligations, risks, and rewards among the public and private partners in an optimal way.

Consistent with the basic principles of economic efficiency and effective risk management, rewards go to those who take risks, and the contractual obligations are designed to allocate risks to the partners who are best able to manage them.

<table>
<thead>
<tr>
<th></th>
<th>Service Contracts</th>
<th>Management Contracts</th>
<th>Lease Contracts</th>
<th>Concessions</th>
<th>BOT, BOOT, BOO Concessions</th>
<th>Divestiture/Privatization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope</td>
<td>Multiple contracts for a variety of support services (e.g., meter reading, billing, etc.)</td>
<td>Management of entire operation or a major component</td>
<td>Responsibility for management, operations, and specific renewals</td>
<td>Responsibility for all operations, financing, and execution of specific investments</td>
<td>Investment in and operation of a specific major component (e.g., a transmission line)</td>
<td>Responsibility for all operations, financing, and execution of investments</td>
</tr>
<tr>
<td>Asset Ownership</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public/Private</td>
<td>Public/Private</td>
<td>Private</td>
</tr>
<tr>
<td>Contract Tenure</td>
<td>1–3 years</td>
<td>2–5 years</td>
<td>10–15 years</td>
<td>25–30 years</td>
<td>Varies</td>
<td>License for 25–30 years</td>
</tr>
<tr>
<td>O&amp;M Responsibility</td>
<td>Public</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
</tr>
<tr>
<td>Capital Investment</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
</tr>
<tr>
<td>Commercial Risk</td>
<td>Public</td>
<td>Public</td>
<td>Shared</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
</tr>
<tr>
<td>Relative Level of Risk Assumed by Private Partner</td>
<td>Minimal</td>
<td>Minimal/Moderate</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: ESMAP 2015
Several different business models have been used to attract private investment in transmission. The four main models are privatizations, whole-of-grid concessions, independent power transmissions (IPTs), and merchant investments.

Private finance has brought substantial investment in new transmission to the countries using these models.

Private finance could accelerate the realization of benefits across the PAEM by high implementation efficiency, innovative risk mitigation, commercial operation, high utilization.

Source: World Bank 2017
Therefore, is private finance relevant to regional projects between countries of the PAEM: YES

**State-owned**

- **“Traditional” Model**: Utilities finance transmission infrastructure each in its own territory
  - *Note*: Complicated experience in MENA (long completion periods, lack of utilization, unsustainable risk mitigation)
- **SPV formed by state-owned utilities**
  - E.g., MOTRACO in Southern Africa

**Private Sector**

- **Merchant investment**
  - Many examples in Europe
- **Independent Power Transmission (IPT)**
  - E.g., Bhutan – India HVDC line
- **SPV with Private Participation**
  - E.g., Empresa Propietaria de la Red (EPR) - SIEPAC

Source: World Bank 2017
Example of private regional interconnector of Nepal-India: complicated design that shows risk aversion but a major mindset shift!

- Two SPVs with private and Government ownership,
- Including ownership by the trading partner’s Government owed entity
Toolkit to Implement Independent Power Transmission Tenders: Process Summary

Source: World Bank 2017
Thank You!

First Pan-Arab Energy Trade Conference
Towards an effective regional cooperation in electricity and gas trade among the Arab countries

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