REN21 2014 Global Status Report
Renewable energy in the MENA region

Presented by the UAE Ministry of Foreign Affairs
3 July 2014
News of 2013 and early 2014

- 200 MW of wind completed and 160 MW of CSP under construction in Morocco
- 15 MW of PV completed in Mauritania
- Libya increases RE target from 7 to 20% by 2020
- Feed-in-tariff activated in Jordan
- 50 MW of CSP tendered in Kuwait
- 100 MW of CSP completed, 13 MW of PV completed, and 100 MW of PV tendered in UAE
- Revision feed-in-tariff in Algeria
- 100 MW of CSP under construction and 200 MW of PV tendered in Egypt
Motivating factors – RE’s relentless move toward (and past) fossil fuel parity

Source: ESIA and PwC, *Sunrise in the Desert*
Ripe for RE: cost reduction and energy security imperatives

2011 Generation Mix across the MENA region

<table>
<thead>
<tr>
<th>Country</th>
<th>TWh</th>
<th>Oil</th>
<th>Gas</th>
<th>RE (Hydro)</th>
<th>Coal</th>
<th>Nuclear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>175</td>
<td>38%</td>
<td>62%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Egypt</td>
<td>157</td>
<td>16%</td>
<td>75%</td>
<td>8.3%</td>
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</tr>
<tr>
<td>UAE</td>
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<td>2%</td>
<td>98%</td>
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<tr>
<td>Kuwait</td>
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<tr>
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<td>Libya</td>
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<td>56%</td>
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<td>REGION</td>
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<td>71%</td>
<td>3%</td>
<td>0.4%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

Source: IEA 2013 (from 2011)
The case for countries that use oil for power (especially exporters)

Cost advantage for importers

- IRENA research shows that RE is significantly cheaper than oil-fired generation for new power

‘Miracle’ for exporters

- Reduced pressure on exports from domestic consumption: allocation choices get easier
- Increase revenues: BNEF estimates that at $1.5/watt of solar and $108/barrel of oil, Saudi solar power IRR = 22% from ‘liberated’ oil for export
  - At $94/barrel, IRR still around 20%

KSA 2032

- 16 GW of PV
- 25 GW of CSP
- 9 GW wind
- 3 GW waste-to-energy
- 1 GW geothermal
The case for gas importers (especially LNG)

Gas pricing evolution

- Long history of $1/MMBtu in the GCC; <$3/MMBtu in other MENA countries
- New domestic production often estimated at $5-8/MMBtu
- LNG imports at $12-20/MMBtu
  - North American shale would be $6-8/MMBtu in dream scenario
- Current LNG importers: Kuwait, Dubai
- Upcoming LNG importers: Bahrain, Abu Dhabi, Oman?

IRENA and Masdar Institute estimate that **PV is competitive at more than $8/MMBtu** (for new combined-cycle plants)

For gas peaking units, PV is competitive at $4/MMBtu
The case for gas exporters

Opportunity cost landscape

- Gas can be produced for $1-3/MMBtu in some MENA countries (namely Qatar)
- Can be sold to Asia for $10-18/MMBtu on long-term, oil-indexed basis
- Spot cargoes sometimes sold for $25+/MMBtu

Q-Max LNG carrier
The GCC transformation: market moving from ‘visionary’ to commercial impetus

2008: 0 MW
2013: 200 MW
2020: 28 GW
2032: 60 GW

RE Capacity Additions

* Date may indicate first available reporting of installation
The other domestic RE industry: overseas investment

UAE example: maintain energy leadership through fund management and project development

- Masdar, Taqa, and IPIC: quickly growing RE portfolios
  - World’s largest offshore windfarm (UK), breakthrough solar energy storage (Spain)
  - $540 million in venture capital
- Emergence of Saudi’s ACWA as important RE investor (e.g., in Morocco)

Masdar investment: London Array, world’s largest offshore wind farm, commissioned in 2013
RE as development assistance

- UAE allocates over $500m in 2013
  - Soft loans for IRENA-reviewed projects: Ecuador, Maldives, Sierra Leone, etc.
  - 15 MW PV in Mauritania
  - 6 MW wind in Seychelles
  - 10 Pacific island projects
  - Extensive PV in Egypt
- $180 million Islamic Development Bank programme for RE-based energy access
- Interest from Kuwait and KSA

UAE-funded projects in Mauritania and Seychelles
Verdict: RE power is coming at scale, but with a lag

Barriers

- RE competitiveness is very recent: mindset change just starting
- Local capacity is often limited (banks, regulators, project developers, etc.), slowing pace and upping cost of capital
- Higher gas prices aren’t always passed on to utilities, skewing investment
- Consumer subsidies curb solar water-heating and distributed generation
- Conflict and instability

Potential near-term outlook

- Saudi first round of tenders in the next few years
- Further growth in Morocco: success begets success
- Expansion in Egypt and Jordan (facilitated by GCC funding)
- LNG imports in GCC will accelerate RE deployment (already happening in Dubai)