Renewables in the MENA region

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Moroccan Pavillion at COP21
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Innovation is driving costs down

The future arrives for Five Clean Energy Technologies. Changes since the time of COPenhagen are facilitating COP talks in Paris.

Source: Ernest Moniz, US Secretary of Energy, IEA Ministerial, 18 November 2015
Renewables set to dominate new global generation capacity...but not in MENA

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Net additions to power capacity 2014-20, world vs MENA region

Renewables set to account for almost two thirds of global net capacity growth over the medium-term, but in MENA they comprise less than 15%
Lowest wind and PV prices now found in MENA countries

Long-term contract prices for new renewable power to be commissioned in 2016-2018

Price competition, long-term contracts, good resources and financial de-risking measures create lower-cost deployment opportunities in newer markets.
Even with low oil and gas prices, renewables can be competitive

Weighted average annual renewable investment costs, historical and projected

USA: avg HH spot, Jan 2015
EU: avg NG import, Jan 2015
Japan: avg contracted spot LNG, Jan 2015
Japan: avg contracted spot LNG, Mar 2014

Note: Based on EGC median case, LCOE for OCGT is calculated using a 15% capacity factor and 7% discount rate and LCOE for CCGT is calculated using a 65% capacity factor and 7% discount rate. No carbon pricing is included in LCOEs.
Increasing momentum for solar and wind

MENA historical and forecasted non-hydropower capacity additions

Non-hydro renewables grow by almost half over 2014-20, driven by fast growing power demand, excellent resources, diversification needs and increasingly attractive economics.
But progress concentrated in a few key markets

Countries where meeting power demand relies on imported fuels have been the first-movers in creating a supportive enabling environment for renewables

Forecast additions (2014-20) versus growth under renewable power plans

80% of MENA non-hydro renewable growth

*Combined estimate for Dubai and Abu Dhabi

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Drivers depend on expected demand growth, self-sufficiency in meeting total energy demand, reliance on fossil fuels.

Energy security very strong driver for RE in importing countries.
MENA expected to emerge as one of the fastest growing PV markets

Solar PV annual capacity additions (GW)
Variable RE will need more flexibility

System-friendly design ↔ Flexibility of other power system components

Conventional turbine configuration
System-oriented turbine configuration

Grids
Generation
Storage
Demand Side

Share of annual generation [%]

Monday Tuesday Wednesday Thursday Friday Saturday Sunday
Solar thermal electricity:
Morocco leads on the south shore

Noor 1 (160 MW) at Ouarzazate soon to be inaugurated.
Noor II and Noor III (Tower) to follow
Heat storage: CSP plants deliver electricity on demand

Built-in thermal storage allows to generate solar electricity when the sun sets and customers turn the lights on.
Solar heat takes off cautiously

Solar heat has great potential in the MENA region but deployment is still limited to a few countries

Solar water heaters in Israel

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Solar heat for industry is not a new concept

1907, Egypt (Shuman)

2014, Morocco (Italcementi)
Solar ovens for artworks

- Potteries from Safi (Morocco) cooked in the solar oven at Mont-Louis (French Pyrenees)
Mirrah, 1 GWth under construction

Parabolic troughs protected from winds & dust in greenhouse (Glasspoint)

... for enhanced oil recovery operations
IEA supports 10 Technology Collaboration Programmes dedicated to renewables and hydrogen, and is ready to support new initiatives

*including 4 through sponsors

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A decisive moment for the future of renewables

- With enabling frameworks and excellent resources MENA countries have the potential to leapfrog to very affordable renewables – as Morocco demonstrates as with solar thermal and wind power.

- But the low oil price environment can pose a risk to policy commitments, particularly in energy exporters.

- Overall, greater policy ambitions are needed to realise the region’s huge renewable potential.

- A more secure and sustainable energy system requires continued progress in phasing out fossil fuel subsidies and clear policies.

- Technology cooperation is key to promote innovation; the IEA stands ready to cooperate with MENA countries.