Sustainable Energy Mix and Power Trade for the GCC countries

GCCIA 2nd Regional Power Trade Forum

“Towards Regional Prosperity: Activating the GCC Power Market through the Interconnector”

Leila Benali, PhD., Director
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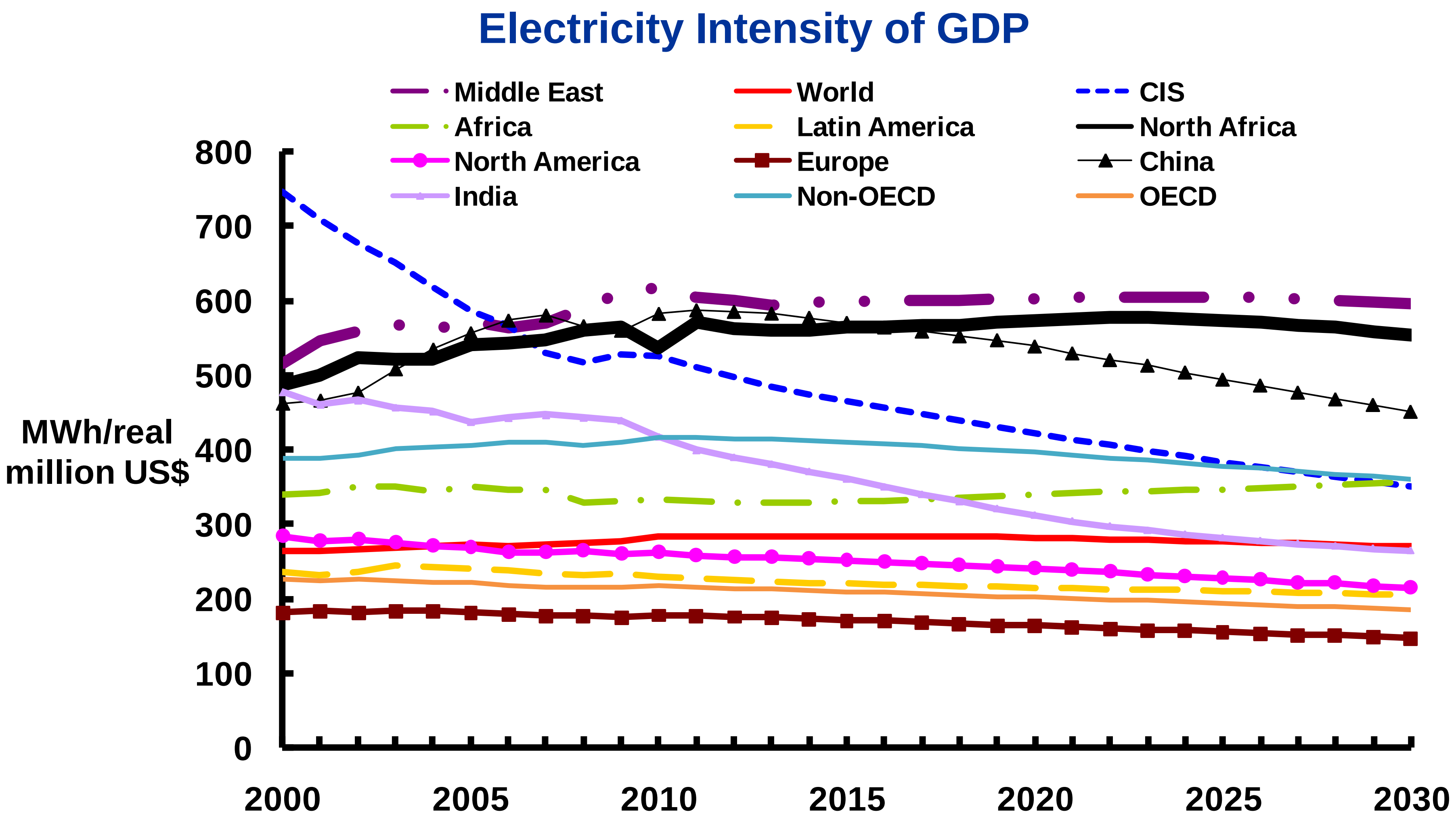
Key Messages

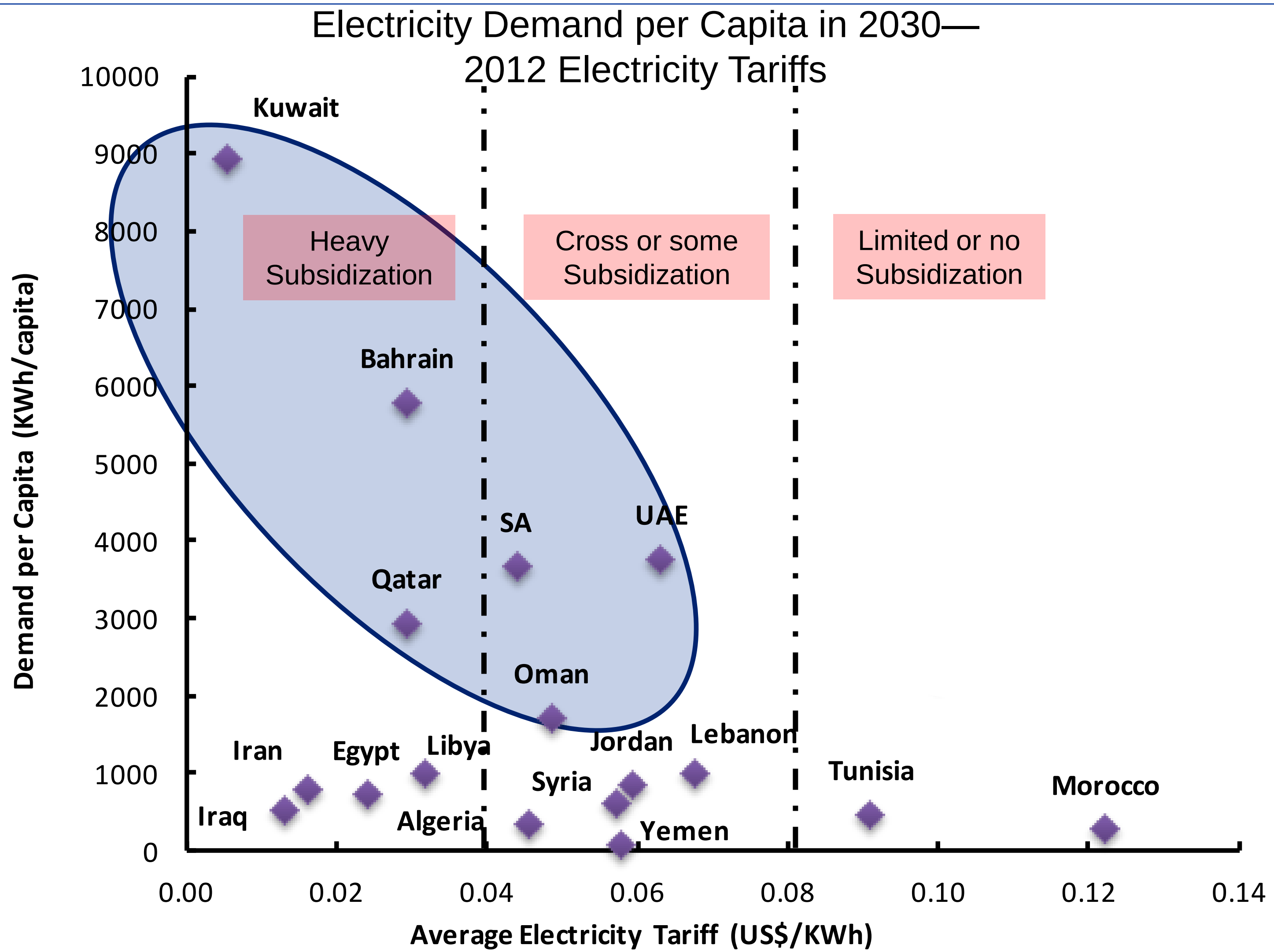
- Energy viewed as National Strategic Asset - How to demystify?
- Strong drivers toward increasing connectivity (balance supply and demand mismatches), however, self-sufficiency, political agendas and commercial drivers impediments.
- Adoption of interruptible supply arrangements may ameliorate S/D imbalances. Electricity trade more acceptable.
- Energy prices will reflect a mix of national priorities (industrial competitiveness, HC exports) and increasingly different (and growing) supply costs.
- Oil/gas-fueled power continue to be most competitive for baseload. Solar PV progressively competitive for peak with diesel and then gas, and later for baseload vs. marginal gas costing. CSP (and nuclear?) most expensive- Case for energy highways and bilateral agreements?

MENA Electricity Consumption in a Global Context



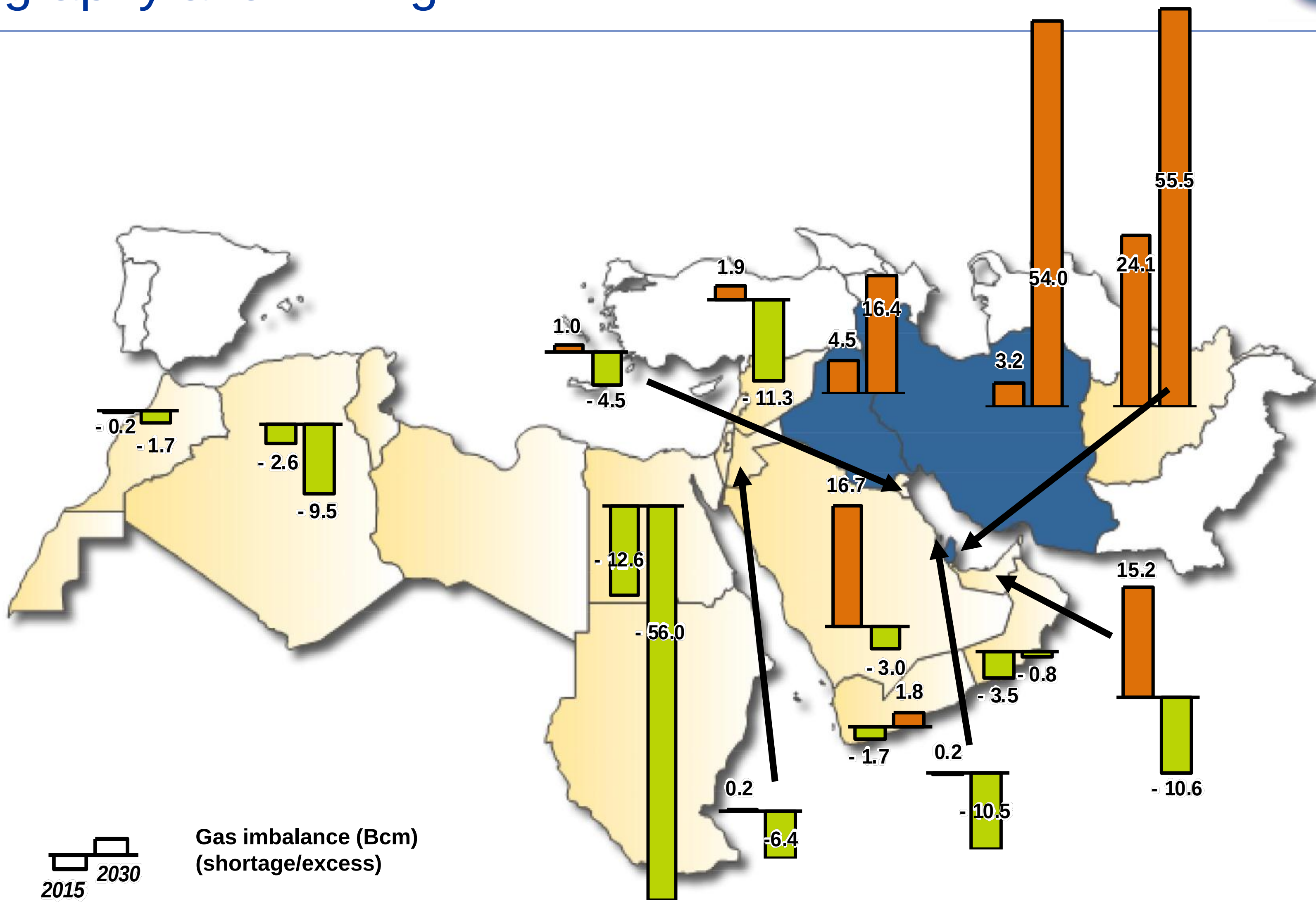
Source: IHS CERA and IHS Global Insight.
Real 2010 US dollars.

Residential Electricity Demand and Pricing



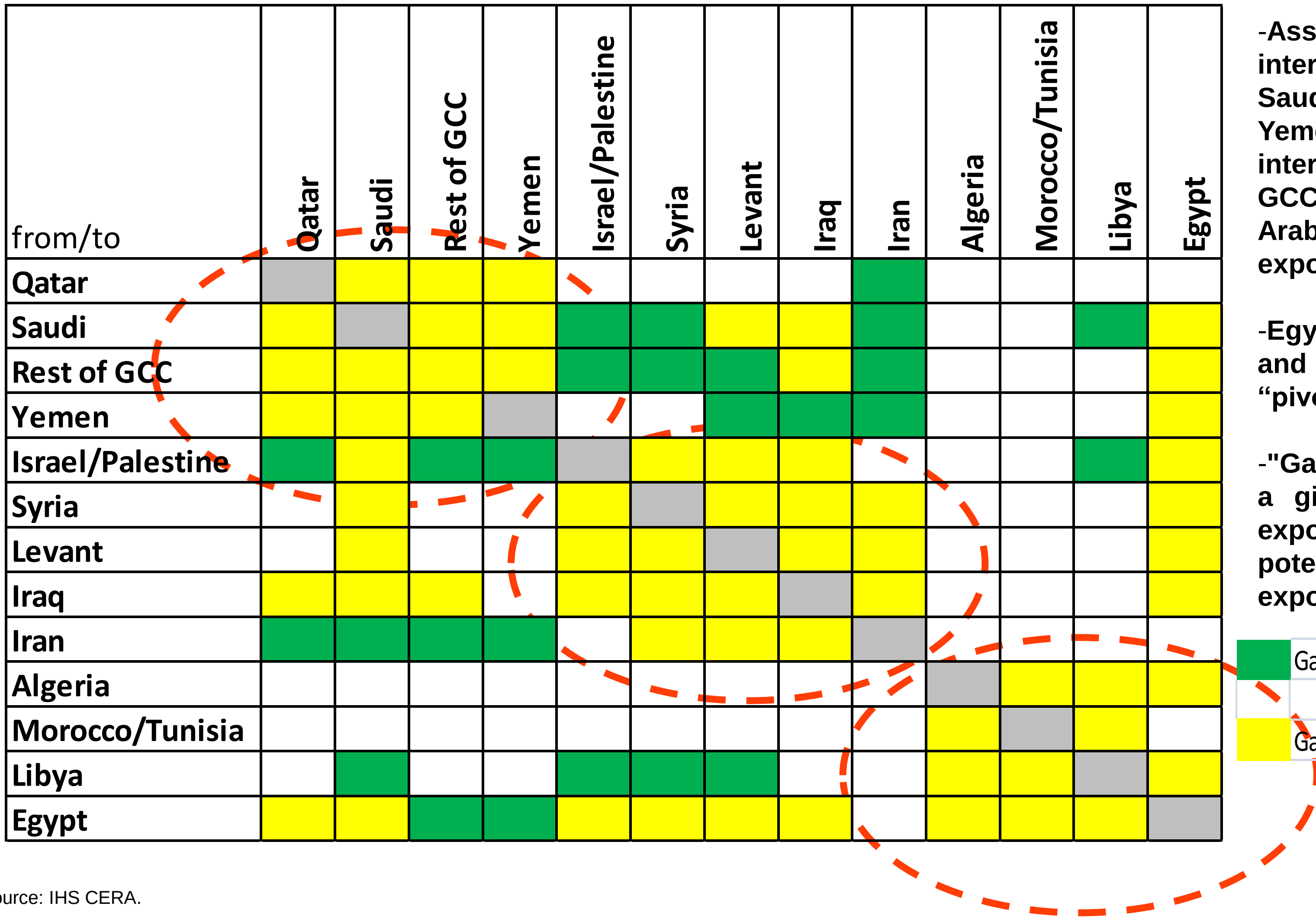
Source: IHS CERA and Electric Utilities Annual Reports.

Strong Drivers towards Connectivity – Gas Imbalances, Geography and Timing



Source: IHS CERA Thirst for Growth Study.

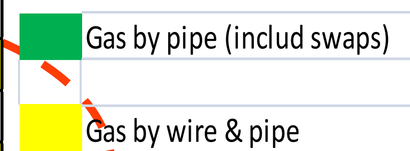
Potential for Connectivity (unconstrained)



-Assumes Egypt interconnected with Saudi Arabia, Yemen interconnected with GCC, and Saudi Arabia does not export LNG.

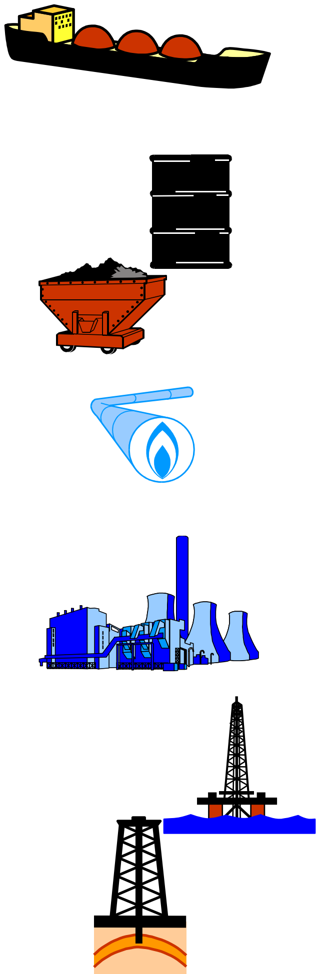
-Egypt (or Levant) and Saudi Arabia “pivot countries”

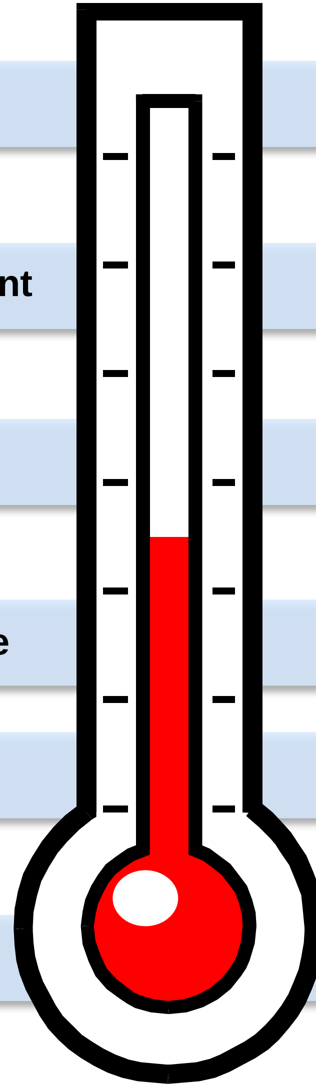
-"Gas by waves" is a given from LNG exporters or potential LNG exporters.



Source: IHS CERA.

Indicative Gas Valuation Hierarchy in MENA

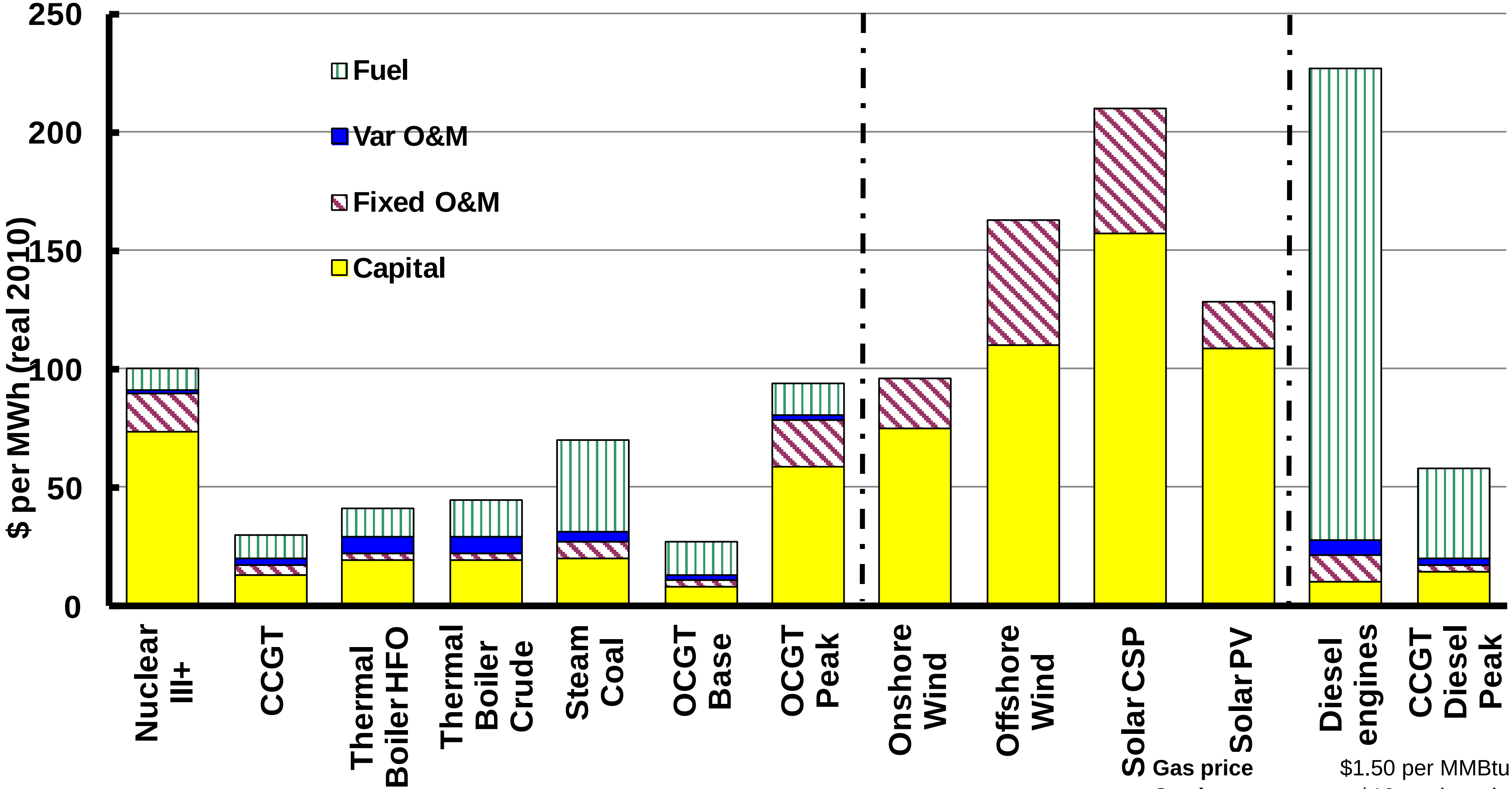




	Dollars per MMBtu
International LNG imports	$12 –$18
Coal/oil in power cost-equivalent	$8–$16
Export netback costs	$4–$10
Industrial competitive gas price	$3.75–$6.60
Marginal production costs	$1–$6+
Legacy production costs*	$0.50–$1.50

Source: IHS CERA.
*Excluding Fiscal terms.

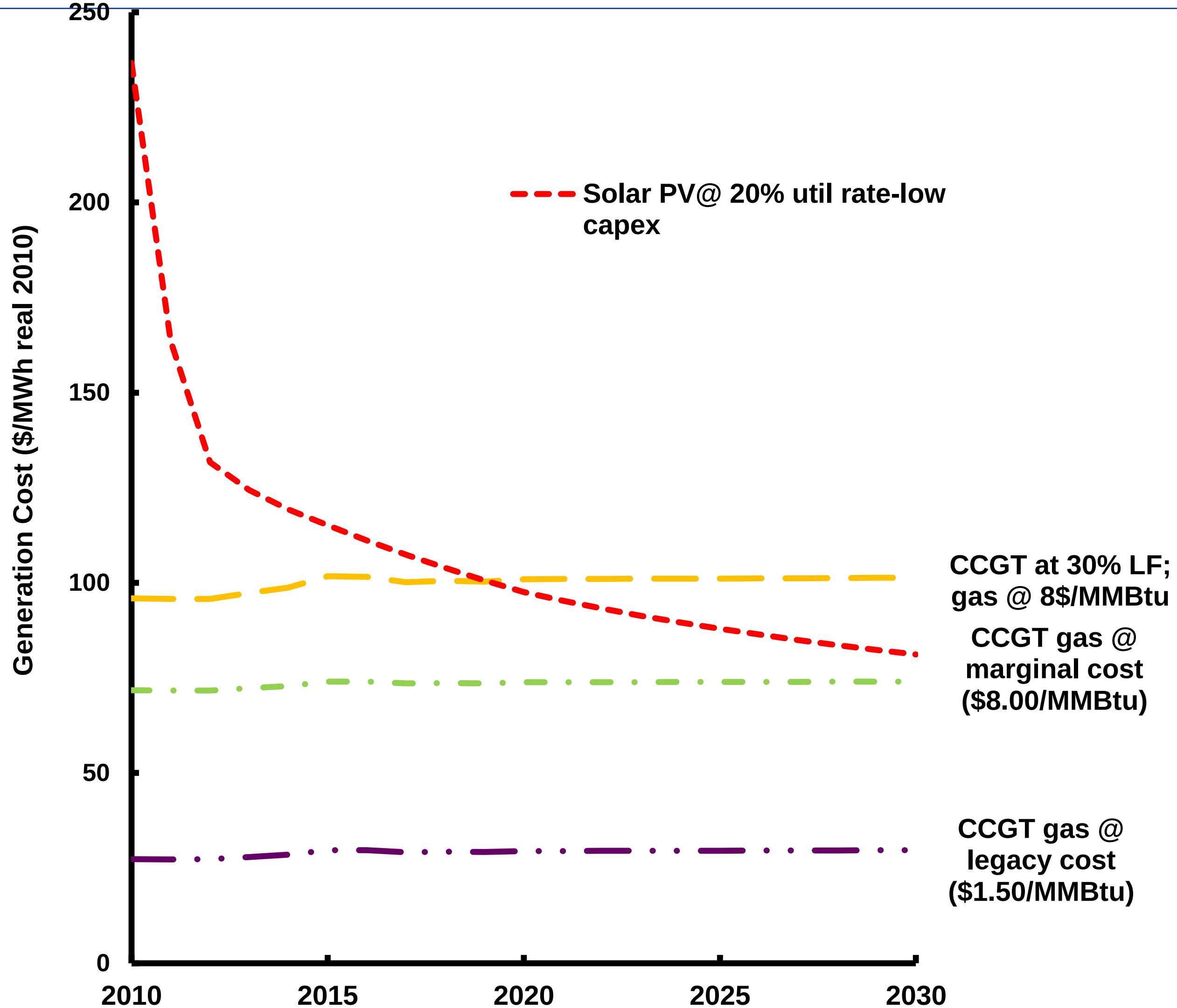
Levelized Costs of Electricity for Conventional and Renewable Technologies—The Gulf 2013



Gas price	$1.50 per MMBtu
Crude	$10 per barrel
Gasoil	$958 per ton
HFO	$58 per ton
Coal CIF ARA	$117 per ton

Source: IHS CERA.
Note: CCGT Diesel Peak refers to a baseload CCGT running on gas during 80% of the time, and on diesel during 20% of the time. OCGT peak has a capacity factor of 11%.

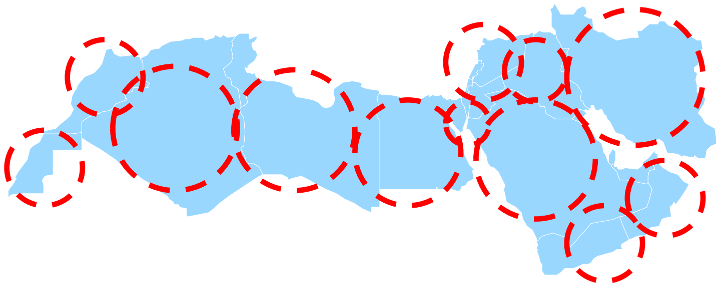
Can Gulf solar PV compete with fossil-fuel power?



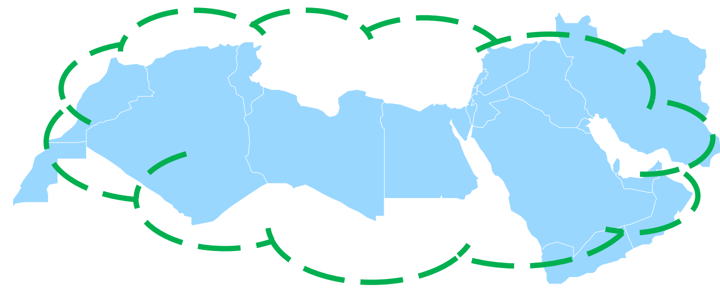
Source: IHS CERA.

- Solar PV competitive with baseload CCGT only at marginal gas prices in Gulf and not until around 2030
- Competitive with peaking gas capacity earlier
- Already competitive with diesel/LNG peakers

Connectivity—Potential Models

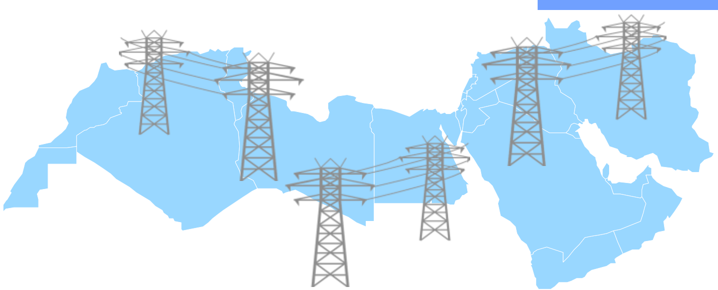


Gas Islands

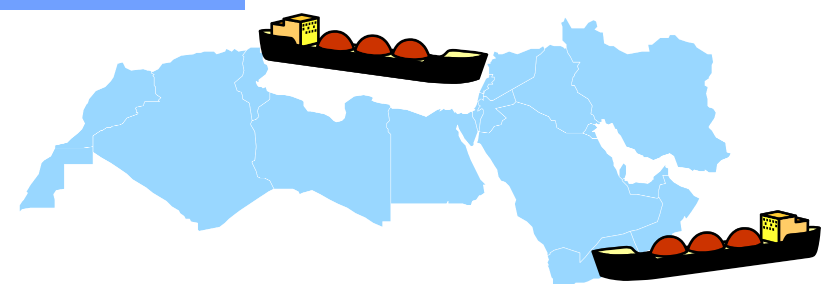


Gas by Pipe

Potential for another model: Shared plants-Energy highways?



Gas by Wire



Gas by Waves

Source: IHS CERA.

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IHS Customer Care

800 447 2273 (IHS CARE)

+44 (0) 1344 328 300

CustomerCare@ihs.com

Leila Benali, Director, Middle East Africa

+33176760003

leila.benali@ihs.com