Trends in Investments & Innovation for Energy Transformations

Flexibility, scale, and mobilization of financial resources

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Leila R. Benali

ARAB PETROLEUM INVESTMENT CORPORATION

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APICORP

2019 game changers, profound transformations for +2020

1. **Non-traditional surgical warfare** on energy installations / infrastructure

2. **Escalation of trade wars** (US with China and Europe, Japan-Korea…)

3. **Public backlash** against economic policy issues in several countries

4. **2019 lowest oil demand growth since 2008** (+1 MMbd vs +800,000 bd)…
   Wait to see 2020 (+700,000 bd?)**!**

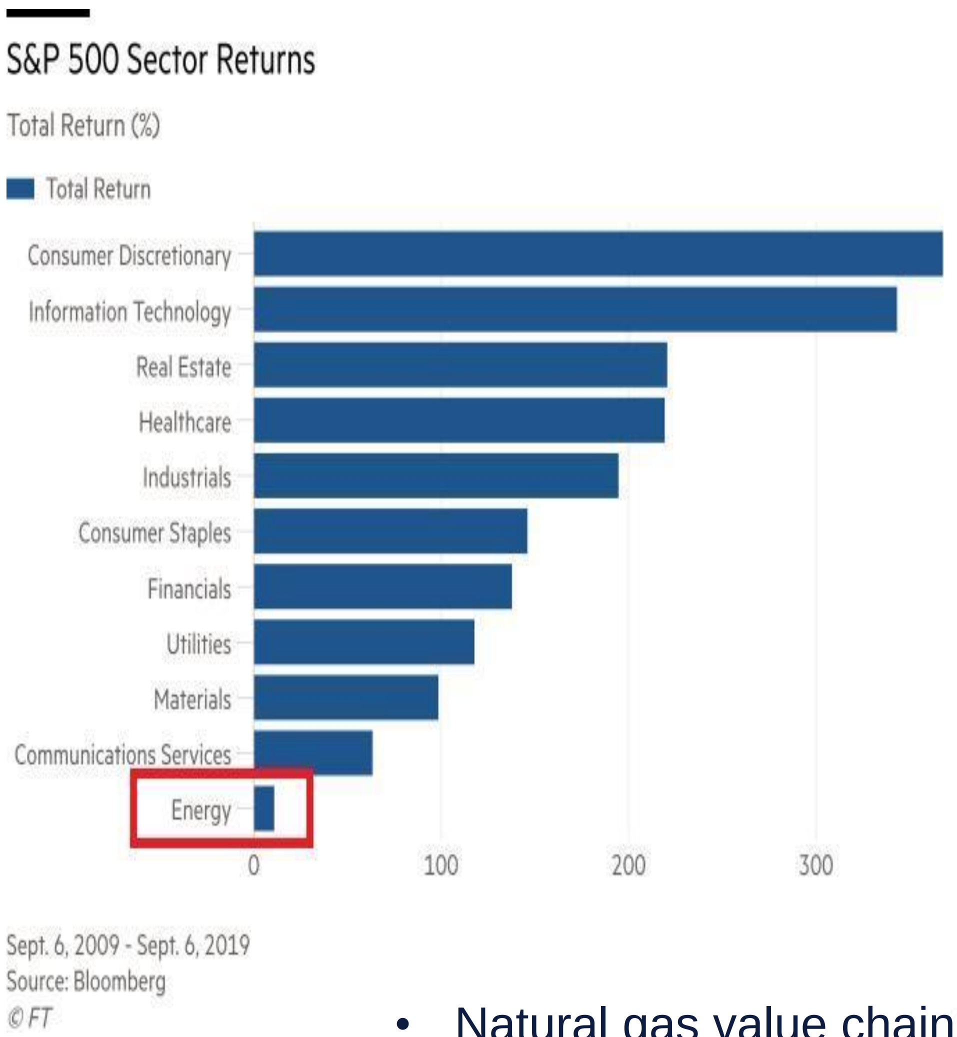
Key signposts to watch for the market:

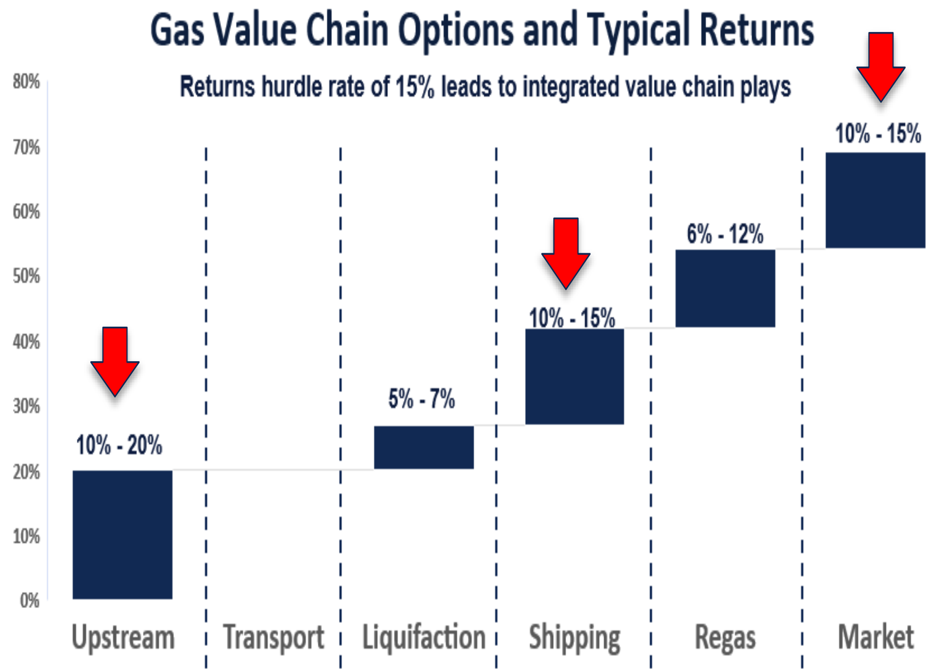
Desperately looking for signals on ambiguous issues, 3 might last for some time:

- Macroeconomic complacency (loose monetary policies),
- Climate change (aka carbon pricing),
- Tit-for-tat retaliation between the US and Iran.

Source: IMF

The dilemma of the energy sector: Need more integration

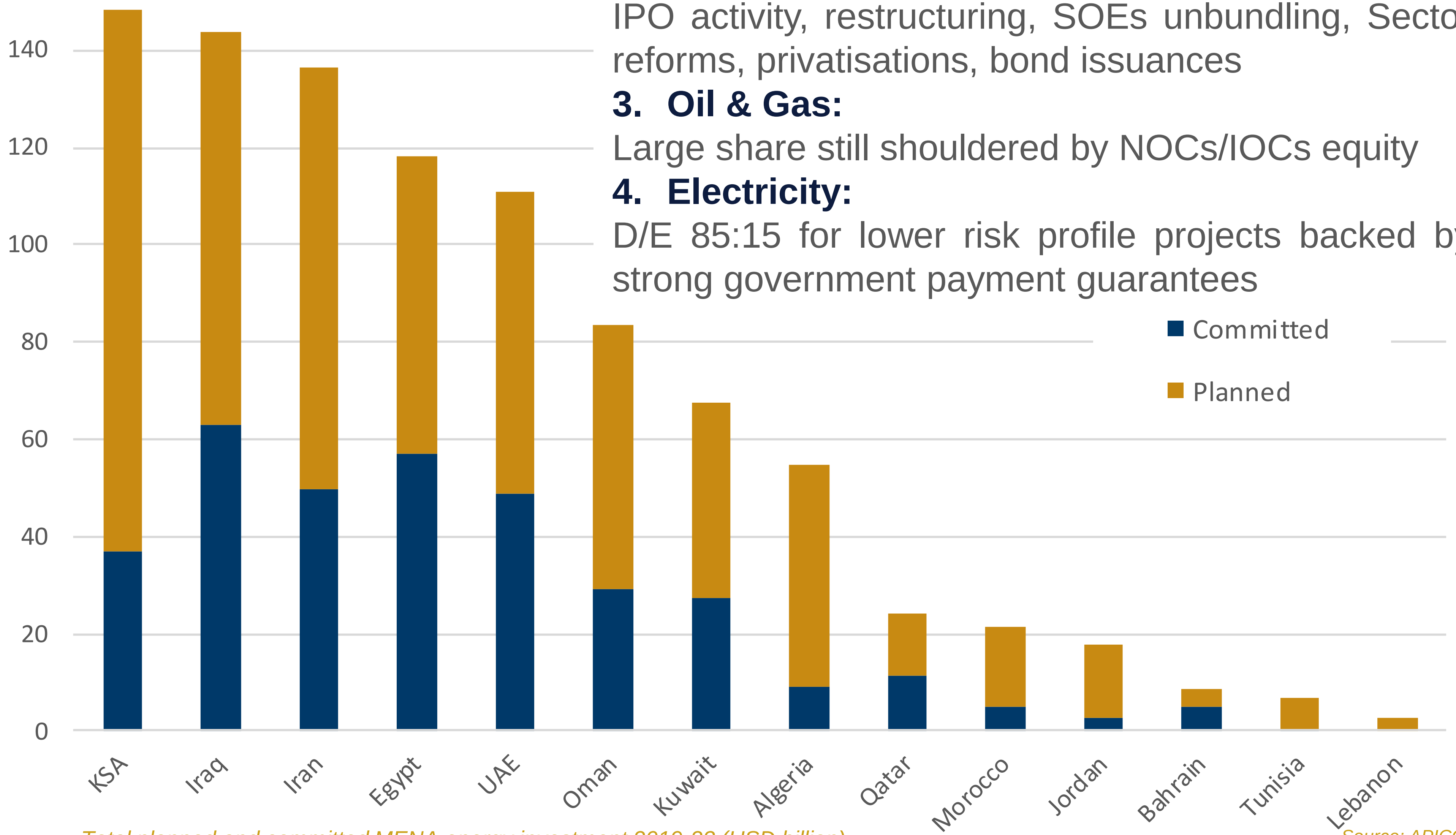




- Natural gas value chain and trading
- Vertical integration into refining and petrochemicals,
- Higher conversion of hydrocarbons produced,
- CCUS and low-cost low emissions fuels/engine technologies

MENA energy investments: $961 billion in next 5 years

1. **Private sector share:** slow growth
2. **Sector reforms & balance sheet optimization:** IPO activity, restructuring, SOEs unbundling, Sector reforms, privatisations, bond issuances
3. **Oil & Gas:** Large share still shouldered by NOCs/IOCs equity
4. **Electricity:** D/E 85:15 for lower risk profile projects backed by strong government payment guarantees



Total planned and committed MENA energy investment 2019-23 (USD billion)

Source: APICORP

NOCs’ key differentiators: budget autonomy, ability to invest

SWF	Financial backing	Investment strategy	Link with “NOC”	Fiscal/contracts	IPO
Qatar Investment Authority ($170 bn)	Excess oil & gas revenue	Undisclosed – significant stakes in foreign companies, participates in buyouts	CEO of QP on QIA’s board. QIA’s subsidiary Qatar Holding invests in energy globally	QP pays to MoF tax (35%), no royalties, profit sharing. State receives dividends from QP’s affiliated companies. PSAs.	e.g. Gulf International Services (30% QP- 2008)
Government Pension Fund ($847 bn)	SDFI, petroleum taxes, dividends from Statoil	Global asset allocation: 60% equities, 40% global fixed income	3% ownership Folketrygdfondet (largest institutional investor on OSE)*	Equinor pays dividends, taxes (25%) and exploration fees. No royalties on fields post-jan 1986, or 8-16%.	2001. 67% government-owned today.
Khazanah Nasional Berhad ($37 bn)	Ministry of Finance sole shareholder; “non-commodity”, bonds/sukuk.	Investments in diverse sectors (aviation, financial services, power, telecoms, HC). 90% in strategic industries in Malaysia.	No link. Prime Minister chairman of KNB board.	Petronas free to operate alone or with IOCs. PSAs. Taxes (38%) and royalties (max 10%). Dividend Payout Ratio 55-70%.	Considered 2010-2011. Subsidiaries floated.

Dynamics of governance between selected SWFs and the NOCs in the same country, and the fiscal terms governing the relationship between the NOCs and their governments

Fiscal regimes: example of Saudi Aramco

Fiscal regime applied to Saudi Aramco (effective Jan 1 2017)

- Income tax **reduced from 85% to 50%**
- Royalties based on **production rather than sales,** recorded as **expense** rather than reduction in revenue;
- **Equalization mechanism** for revenue foregone for selling crude, kerosene, diesel, HFO and gasoline in Kingdom at regulated prices.

Also, effective from 1 January 2018,

- **20% rate** applies to taxable income related to E&P of **NAG**
- Crude oil and condensate production value is based each month on the Company's OSP for each destination market.
- Effective royalty rate determined based on **baseline marginal rate of 20% applied to Brent prices up to $70 per barrel**, increasing to 40% when Brent ≥ $70 and 50% when Brent ≥ $100.
- Production royalties due on natural gas, ethane and NGLs calculated based on a **flat royalty rate of 12.5% applied to a factor** established by MEIM. (As date of Prospectus, $0.035/MMBTU for NGLs (propane, butane, natural gasoline), $0.00/MMBTU for natural gas (methane) and ethane)."

Excerpts from Saudi Aramco's Base Prospectus dated 1 April 2019, Global Medium Term Note Program

What is next for (highly leveraged) utilities / Renewables?

Selected project financing details

	Capacity, technology	PPA	Investment	conditions
	(MW)	(years)	(USD million)	
Shams 1	100, CSP	25	765	22 year, 80% debt
MBRAMSP II	200, PV	25	326	27 year, 86% debt, avg 180 bps over Libor
MBRAMSP IV	700, CSP & 250, PV	35	4,360	70% debt
Noor Abu Dhabi	1177, PV	25	870	26 year, 75% debt, +120 bps over Libor
Al Dur II IWPP (CCGT)	1500	20 (PWPA)	1,050	23 year, 75% debt
Tanajib IPP (gas, cogeneration)	850-940	20 (Energy conversion agreement)	1,000	22/23 year, 85% debt

Source: APICORP

What is next for utilities/renewables? The private sector’s counterpart risk

Dependant on the private sector

- **Solar, wind, distributed energy:** need storage (technology choices/tendering)
- **Energy efficiency, ESCOs, decarbonizing industry**

Distributed Generation- Market diversification & Counterpart risk
(example- sanitized for confidentiality)

Offtaker	Rating	Maturity (years)	Size (MW)	Industry / Sector	Commercial Operation Date
	5 (Euler) 6 (Ellipro)	13	3,7	Food & Beverage	December 2019
	5 (Euler) 6 (Ellipro)	20	0,301	Cooling Service Provider	DONE v
	5 (Euler) 6 (Ellipro)	20	0,69	Premium Glass Manufacturer	DONE v
	NA	20	0,508	Lubricants	January 2020
	5 (Euler) 6 (Ellipro)	20	3,38	Logistics	April 2020
	5 (Euler) 6 (Ellipro)	20	2,739	Logistics	November 2019
	5 (Euler) 6 (Ellipro)	20	1,42	Food & Beverage	January 2020
	5 (Euler) 6 (Ellipro)	20	2,5	Plastic Manufacturer	June 2020
	5 (Euler) 6 (Ellipro)	20	0,107	Plastic Manufacturer	June 2020
	5 (Euler) 6 (Ellipro)	20	0,5	Surf Board Manufacturer	June 2020
	5 (Euler) 6 (Ellipro)	20	0,5	Logistics	May 2020
	5 (Euler) 6 (Ellipro)	20	3,043	Logistics	June 2020
	5 (Euler) 6 (Ellipro)	20	2,4	Luxury Retail	August 2020
Total		**21,78**		**Granularity**	**7,7%**