

# IEF-KAPSARC Thought Leaders Roundtable

Riyadh, February 2019

## Sustainable and Competitive Energy Supply: The role of Efficiency and Innovation

### Efficiency Drivers and Gains in Hydrocarbon Supply Chains

What are the economic imperatives and constraints that energy markets face today? How will efficiency gains impact the way the oil and gas industry will operate in future?



ابيكورب  
APICORP



## Efficiency gains in Hydrocarbon Supply Chain: Increased Focus

**North America & Europe:**  
lead innovation - consumers  
or prosumers

**Asia:** proof of concept at large scale  
For almost every form of energy

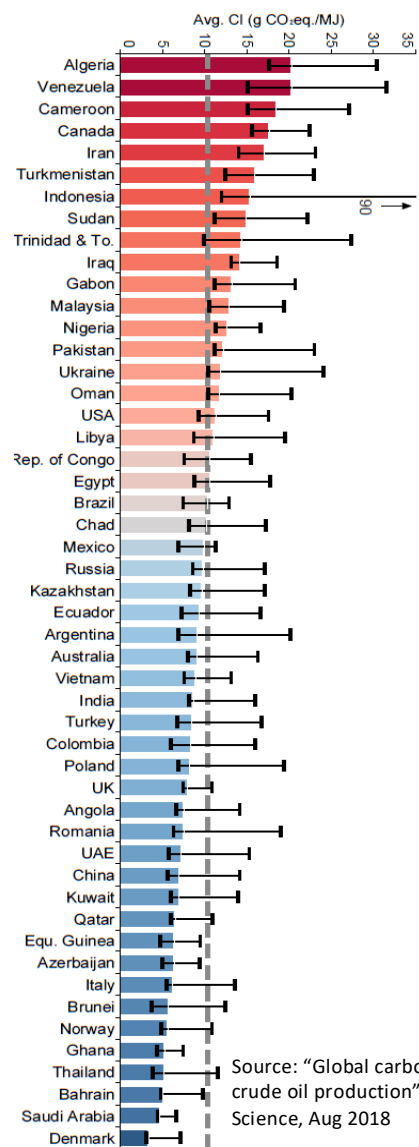
**MENA:** DSM, increasing focus  
on supply-side/Hydrocarbons

**India & Australia:** experiments  
of decentralized, digital energy,  
storage

- Focus on Demand-side Management : Efficiency and decarbonization
  - Conservation & Efficiency, Price reforms, Renewables & Electrification
- **Increasing focus on supply-side: low cost/low carbon Hydrocarbons**
  - CCS from power & Industry (e.g. with EOR), O&G sourced hydrogen
  - Longer term, “carbon-free” oil – convert water and CO<sub>2</sub>, where difficult to electrify



# Efficiency gains in Hydrocarbon Supply Chain: 3 Battles

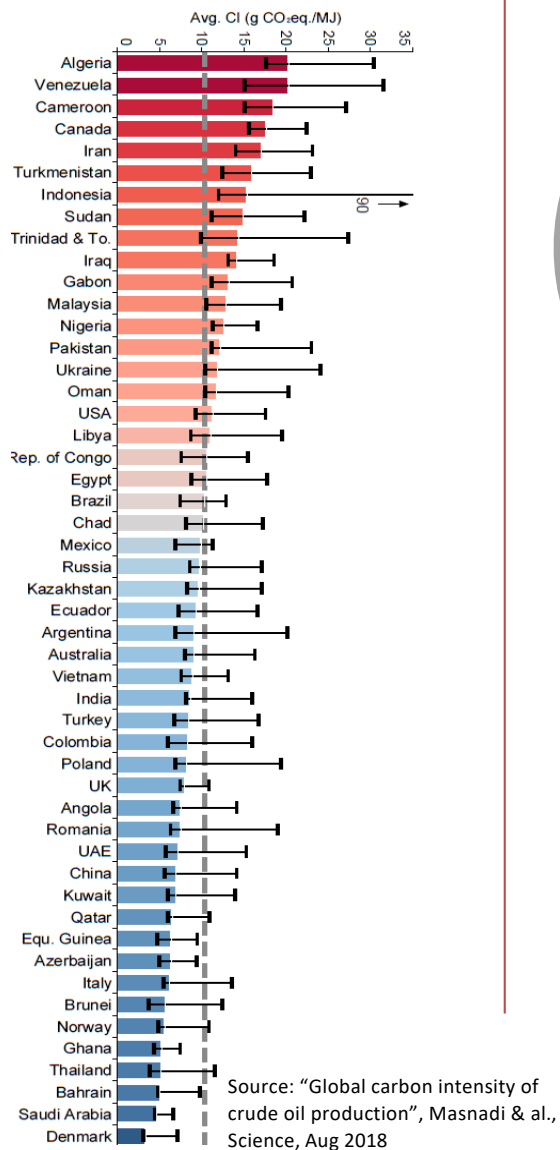


Source: "Global carbon intensity of crude oil production", Masnadi & al., Science, Aug 2018

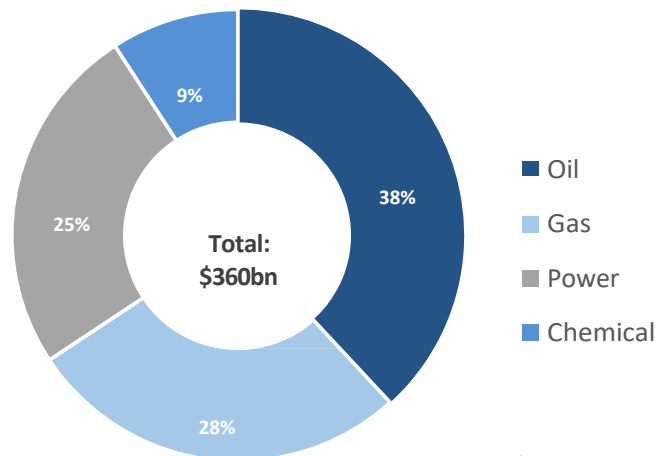


# Efficiency gains in Hydrocarbon Supply Chain: 3 Battles

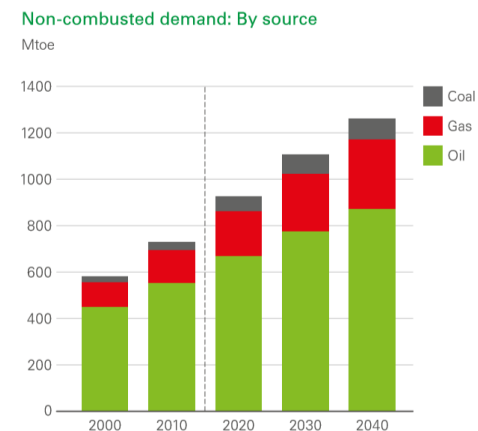
## Carbon



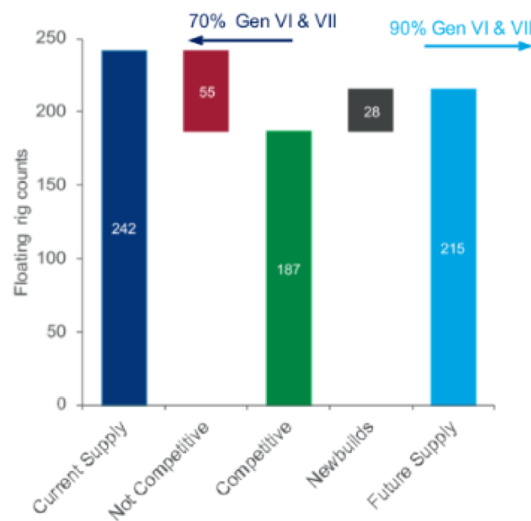
## Cost



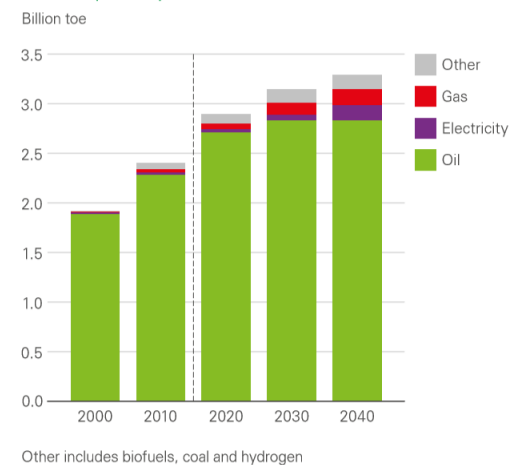
## Market share



## Global floating rig supply outlook



## Final energy consumption in transport: Consumption by fuel





## Implications for players

---

### Industry

- De-integration upstream downstream, spin-offs
- Service companies with squeezed margins, technology offering key (AI, machine learning, Big Data) - M&As, consolidations

### Governments

- Policy intervention through tax breaks, price signals, funding incentives
- Government-led investments but interdisciplinary private sector key (Local content drive: focus on technology services, associated manufacturing)
- Natural gas “advocacy” – gasification or electrification of industry?

### Investors

- “Death valley” still an issue for financing innovation
- However, industry involvement key in selecting applications (CCS/EOR, Hydrogen, intelligence, storage)

# THIRD IEF EU ENERGY DAY

Riyadh, February 2019

THE ECONOMICS OF NEW ENERGY TECHNOLOGIES:

LESSONS LEARNT AND FUTURE VISIONS FOR COOPERATION BETWEEN EUROPE AND THE GULF

## Government and Industry Cooperation to Foster Energy Sector Trade, Investment and Innovation

The role of new technologies to remove/make use of carbon in the value chain. How does policy intervention



ابيكورب  
APICORP



# Policy Intervention and Innovation

---

**North America & Europe:**  
lead innovation - consumers  
or prosumers

**Asia:** proof of concept at large scale  
For almost every form of energy

**MENA:** DSM, increasing focus  
on supply-side/Hydrocarbons

**India & Australia:** experiments  
of decentralized, digital energy,  
storage

- Focus on Demand-side Management : Efficiency and decarbonization
  - Conservation & Efficiency, Price reforms, Renewables & Electrification
- Increasing focus on supply-side: low cost/low carbon Hydrocarbons
  - CCS from power & Industry (e.g. with EOR), O&G sourced hydrogen
  - Longer term, “carbon-free” oil – convert water and CO<sub>2</sub>, where difficult to electrify



# Policy Intervention and Innovation

## Supply-side

Low cost Hydrocarbons:

Costs, AI, machine learning

Taxation

Electricity:

Intermittency of RE, Storage

Pricing/Valuation

## Demand-side

Demand Management

Smart meter., Distrib. Gen, MaaS

Pricing

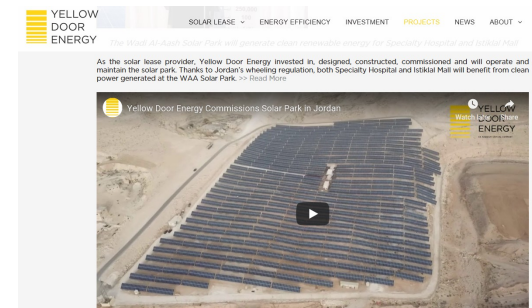
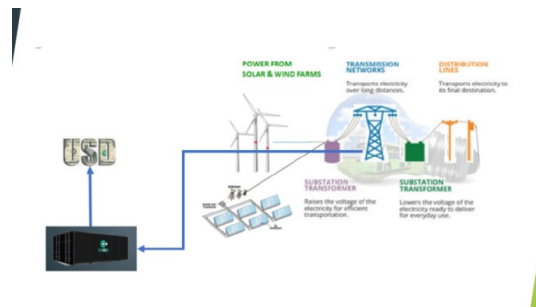
Gasification or electrification?

Networks

Regulation/Clarity

## Innovations at confluence of sectors

Two intertwined value propositions: intelligence/value capturing, flexibility services (e.g. storage) and versatility







## Implications for players

---

### Industry

- De-integration upstream downstream, spin-offs
- M&As, consolidations
- Service companies with squeezed margins, technology offering key

### Governments

- Policy intervention through tax breaks, price signals, funding incentives
- Government-led investments but interdisciplinary private sector key (Solar for EOR, crypto/RE)
- Natural gas “advocacy” – gasification or electrification of industry?
- Local content drive: focus on technology services, associated manufacturing

### Investors

- “Death valley” still an issue for financing innovation
- However, industry involvement key in selecting applications (CCS/EOR, Hydrogen, intelligence, flexibility)