THE OXFORD INSTITUTE FOR ENERGY STUDIES

The Energy Transition and Oil Exporters' Adaptation Strategies

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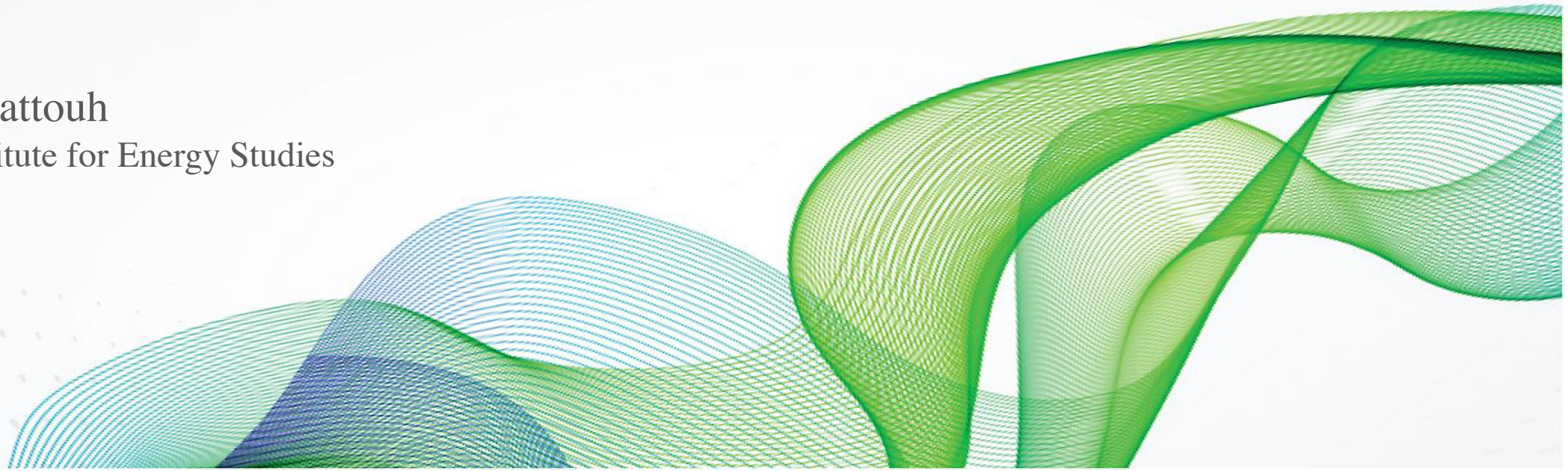
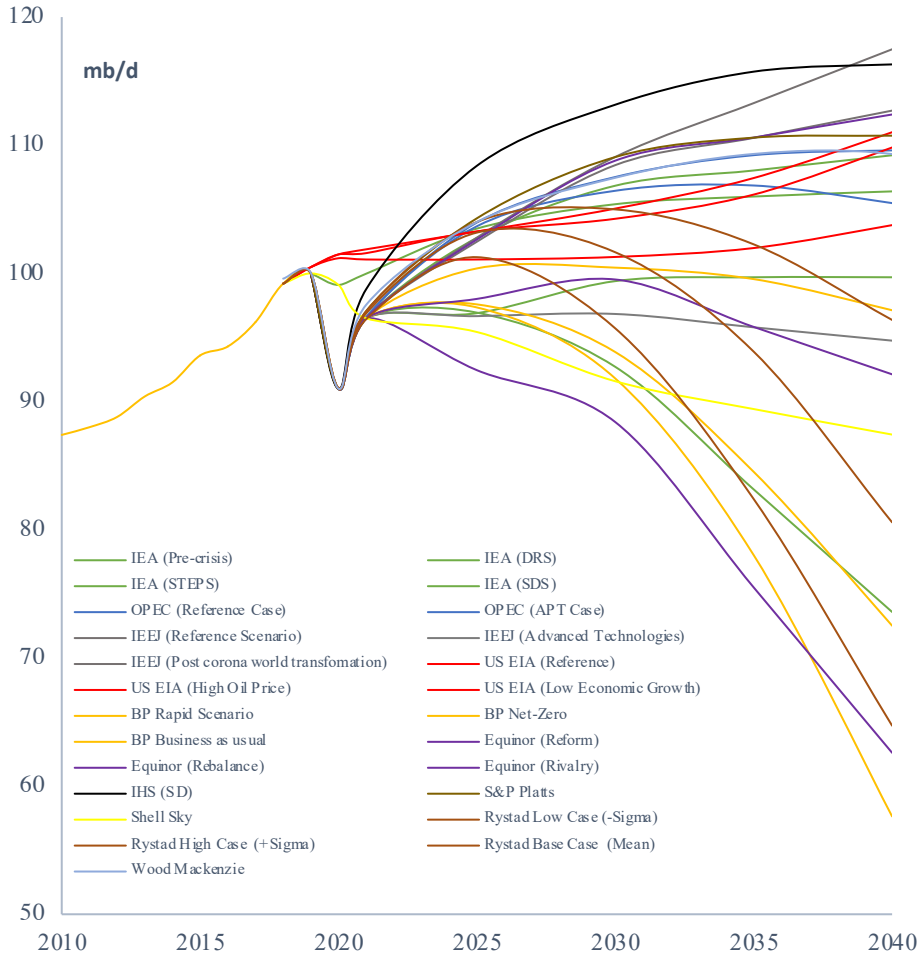


CAETS, September 2021

Peak Oil Demand and the Energy Transition

- Oil demand projections sensitive to underlying assumptions of the model (economic growth, population growth; transformations in transport, global carbon tax); by changing these assumptions one can push the peak forward or backward by decades
- Purpose of the exercise: Forecasting or backcasting (what it takes to achieve a certain outcome)
- Most scenarios predict one unique global peak
- Oil demand declines sharply after reaching that unique peak
- No consensus on many of the underlying assumptions
  - Some projections based on historical trends show fast transition in energy systems has rarely happened
  - Other projection based on transition is unique (fighting climate change, driven by government policies)
- Few features of the energy transition
  - Speed of the energy transition highly uncertain
  - Transition will not be uniform across the globe
  - Transition will not be linear (it could be disruptive, setbacks)
  - There is no single transition path

Global Oil Demand Scenarios, mb/d



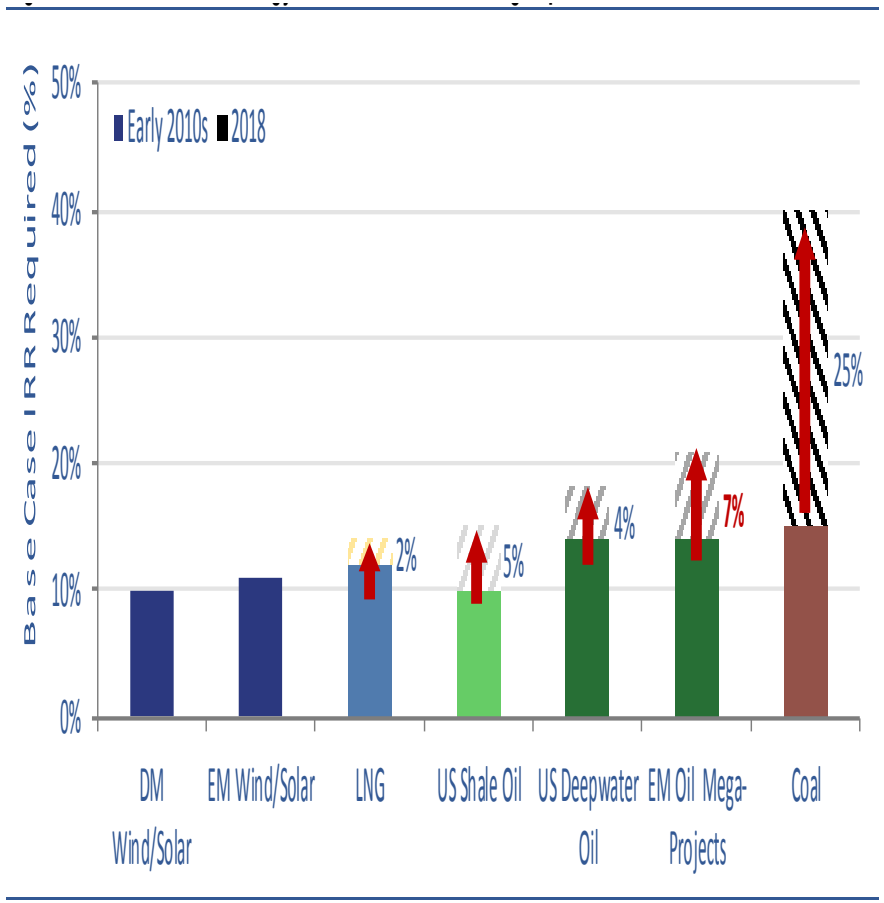
Regardless of its speed, impacts are already being felt

- Perceptions and players' behaviours shifting much faster than actual changes in energy mix and already shaping the energy industry and some key decisions

- Finance: Affecting investors' risk preference (financing costs and availability of finance for hydrocarbon projects)

- Players: IOCs are adapting their strategies
  - Incorporating climate related objective into their strategies (e.g. internal carbon price in investment decisions)
  - Reducing the share of oil assets in their portfolios
  - Increasing the share of gas & renewable
  - Announcing ambitious targets to reach net zero emissions by 2050

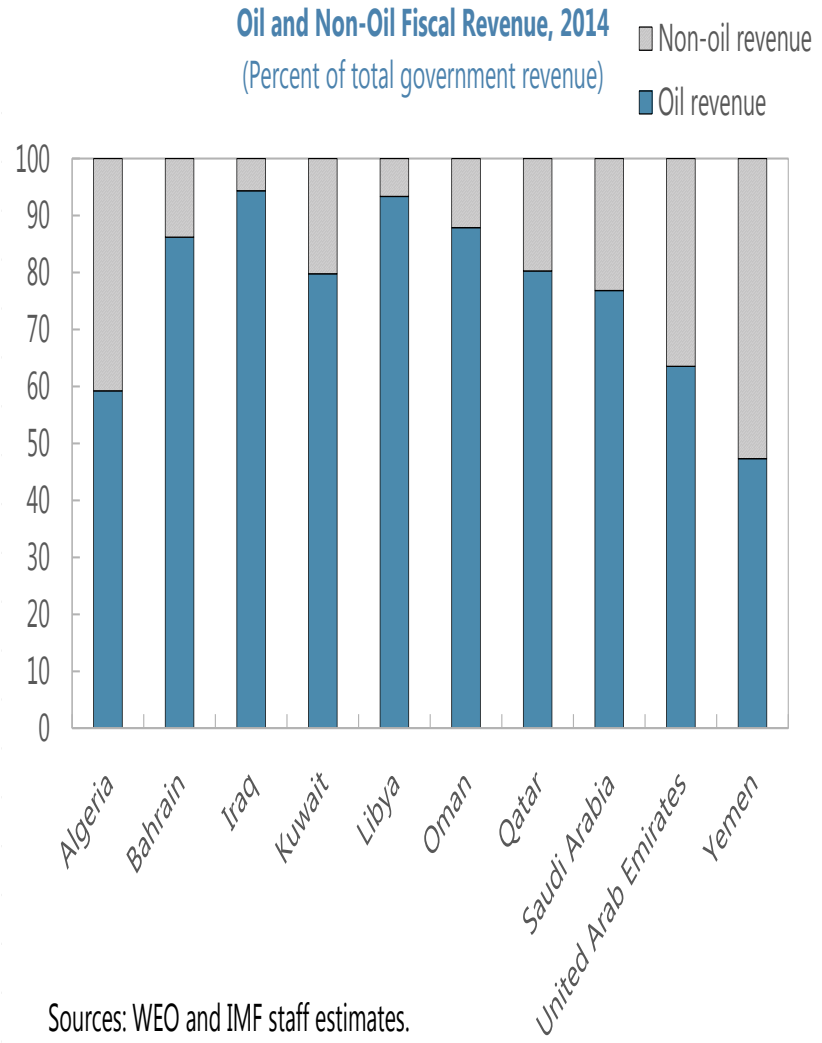
Fears over the energy transition are escalating capital costs for oil and coal



Source: OIES

Oil Exporters' Adaptation Strategies

- Oil exporters face a graver challenge than IOCs
  - Proved reserves-to-production ratios extend for multiple decades so they face challenge of monetizing large reserve base
  - Risk of losses in export revenues could disrupt their socio-economic wellbeing given the high reliance of their economies on oil revenues
- Key question: What adaptation strategies should oil exporters pursue given:
  - Domestic economic and political constraints
  - An energy transition which is changing the prospects of oil demand but whose speed is uncertain and whose impact is not uniform
  - Perceptions and policies are changing fast

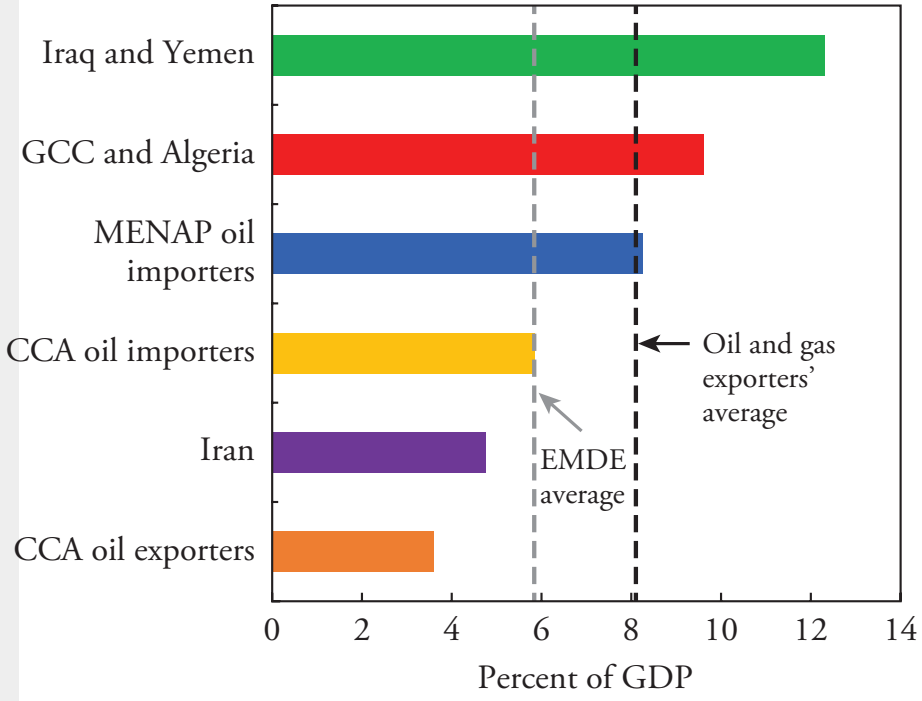


Sources: WEO and IMF staff estimates.

The Challenges of Fiscal Diversification

- Effective strategy is to diversify away from oil & gas sector
- But Real challenges to realise meaningful diversification (particularly fiscal diversification)
- There is uncertainty about how quickly or even whether such extensive economic and institutional reforms can be implemented in most oil and gas exporting countries
- Oil and gas sectors remain very profitable and still enjoy higher margins
- Reduced investment flows into the oil and gas sector can cause supply to fall faster than demand resulting in high margins at least for short periods of time
- Governments can leverage on oil and gas revenues to ease the pain of structural reforms
- Exiting too early from such an established strategic sector deprives the country of an important source of income and key source of competitive advantage

Figure 2.1. General Government Wage Bills, 2005–16
(Percent of GDP, period average)



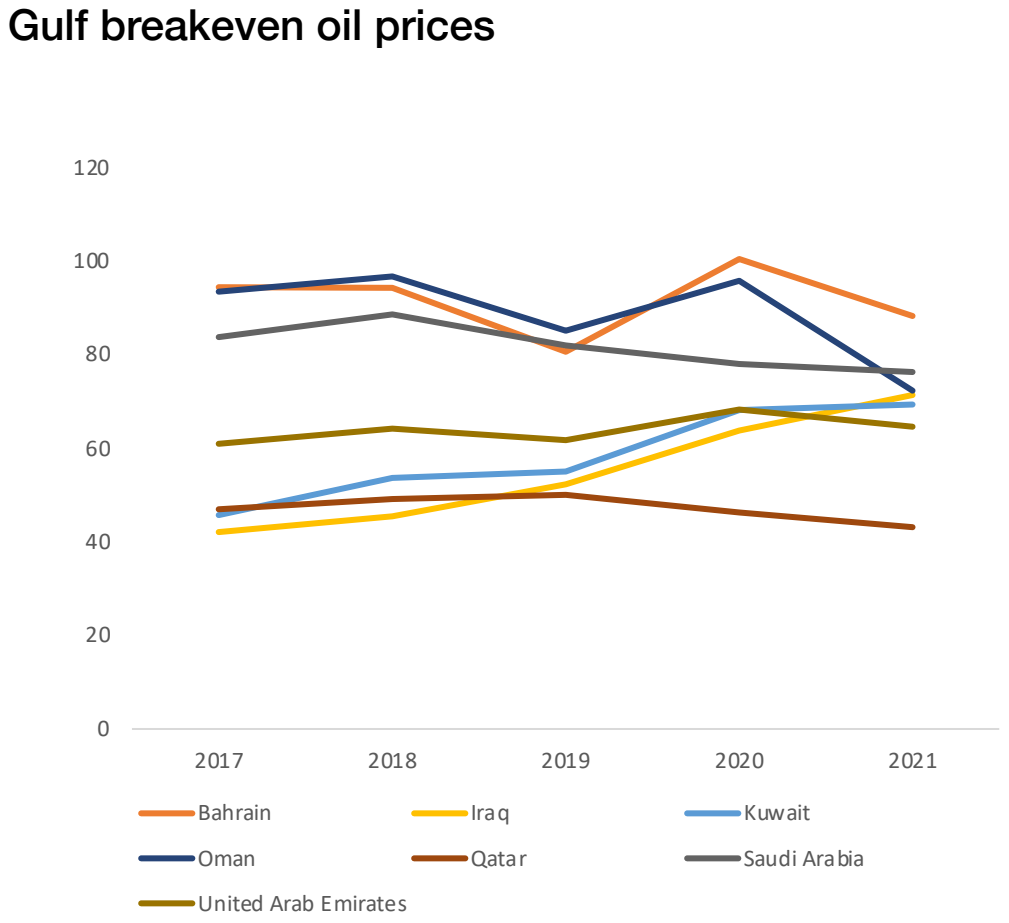
Sources: IMF, World Economic Outlook; and IMF staff estimates.
Note: CCA = Caucasus and Central Asia; EMDE = emerging market and developing economies; GCC = Gulf Cooperation Council; MENAP = Middle East and North Africa, Afghanistan, and Pakistan.

Source: World Bank

If diversifying from the oil and gas sector is sub-optimal & it can’t be achieved at a rapid pace, how to enhance the competitiveness and increase the resilience of the hydrocarbon sector in a world that is transitioning towards net zero emissions?

Cost Competition and Monetization Strategies

- Oil exporters can compete on cost and can take measures to improve the efficiency of production and lower these costs even further
- Adopt faster monetization strategies (Green Paradox)
- Lack of fiscal diversification and high 'social cost of production' acts as a constraint on this strategy (Increase in supply in face of slowing demand would result in lower revenues at least in short term; in longer term many higher but also lower cost producers could exit the market)
- Some importing countries may decide to implement high carbon taxes creating a wedge between the revenues generated by oil/gas exporters and revenues generated by consuming countries with latter capturing big part of the rent



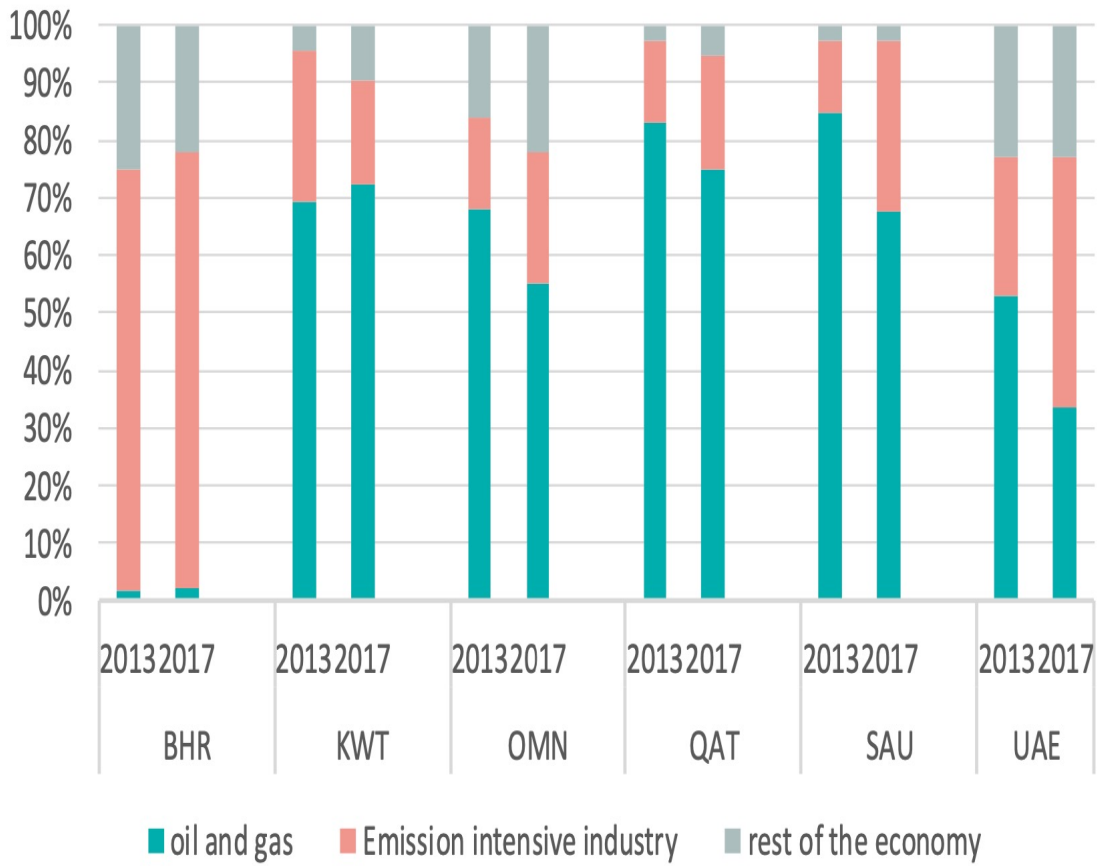
Source: IMF

Diversification within Energy Sector

- Diversification efforts into products and exports closely related to hydrocarbons and energy intensive industries (petrochemicals, steel, cement, and fertilizers)
- The wider range of higher-value-added products provide a hedge against price volatility; development of sectors which have technological spillovers
- But heavy industrialization into energy intensive industries increases domestic emissions of greenhouse gases
- Importers develop policies to account for carbon content of final goods and apply border carbon adjustment (BCA) measures again capturing part of the rent

GCC export shares by product category, 2013 and 2017

Source: World Bank, based on data from https://oec.world/en/resources/data/

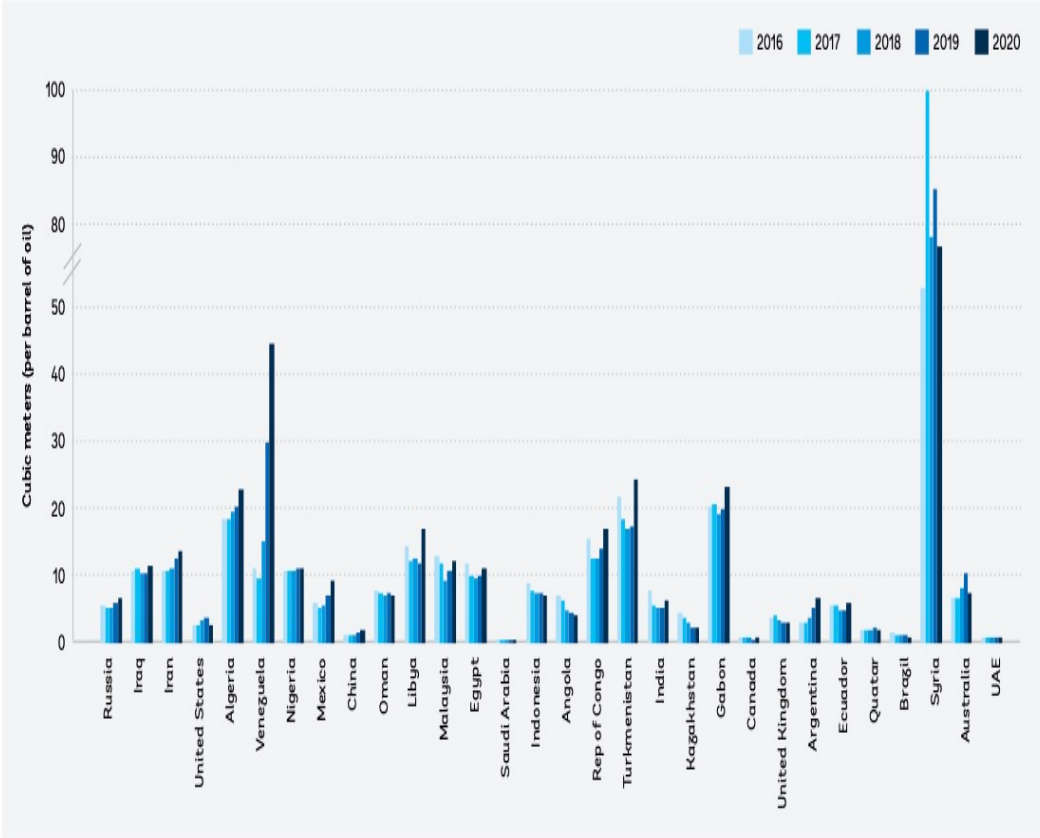


Source: World Bank, Gulf Economic Update, Economic Diversification for a Sustainable and Resilient GCC, Issue 5

Compete on dimensions other than cost: Emissions Reduction

- Exporters could work towards ensuring that their production processes and core hydrocarbon products can compete on the emissions front
- This involves reducing emissions in the production process (Scope 1 and Scope 2 emissions) and in the consumption of gas and products derived from crude and natural gas (Scope 3 emissions)
- Some oil and gas exporters such as Saudi Arabia in a relatively better position compared to other producers due to the low carbon content of their crude and their heavy investment in infrastructure to reduce gas flaring and methane emissions
- Real challenge lies in reducing emissions from consumption of final products

Flaring intensity for the top 30 flaring countries from 2016 to 2020 (Sorted by 2020 flare volume)"

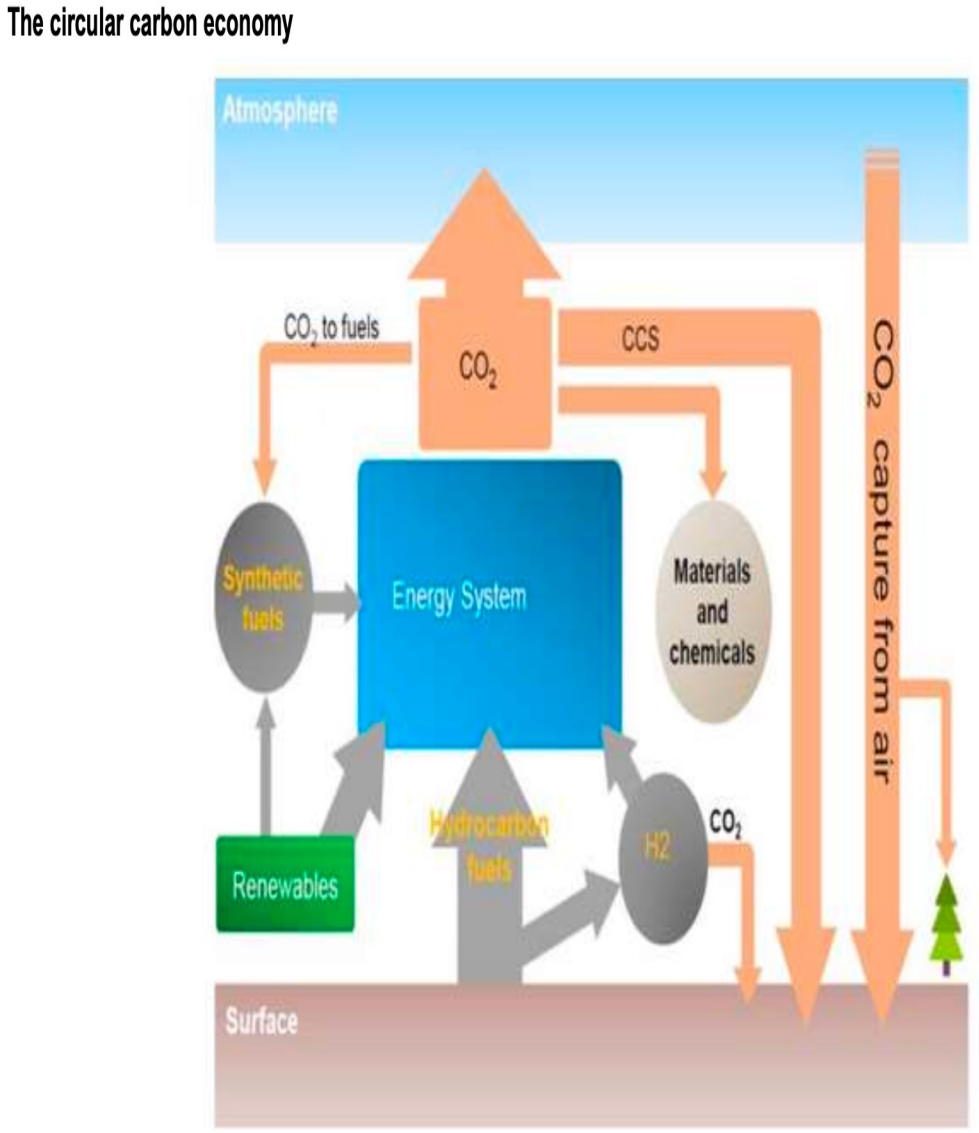


Source: NOAA, Payne Institute and Colorado School of Mines, GGFR

Note: Sorted by 2020 flare volume.
Source: NOAA, Payne Institute and Colorado School of Mines, GGFR

Carbon Capture, Utilization and Storage (CCUS)

- From an emisisons mitigation strategy, CCUS essential to reduce emissions from hard to abate sectors and reach net-zero targets
- Sector where some oil and gas exporters could have competitive advantage
- Maintain oil and gas in the energy mix for longer
- Increase competitiveness of their energy intensive industries
- Further integration of the energy sector
- Despite strategic interest for oil and gas exporters to lead on carbon-sink mitigation strategies most of CCUS projects are located in OECD countries
- Support schemes most developed in OECD economies



Source: Al-Khuwaiter, A., and Y. Al-Mufti. 2020. 'An Alternative Energy Transition Pathway Enables by the Oil and Gas Industry'. Oxford Energy Forum

Burden Sharing Mechanisms

- From an oil exporter, investment in CCUS lowers returns compared to existing strategy of exporting unabated oil and gas but this additional cost could be vital to improve resilience of the energy sector
- But shifting costs to oil and gas exporters alone is not viable especially if costs too high
- Producing countries most affected by the transition and competition for limited funds
- Burden sharing mechanisms should be developed to enable a more inclusive path (Wellhead carbon tax; CCS Clubs, Carbon Storage Units)
- Develop policy frameworks within the Paris Climate Agreement

Leading CCUS countries in 2020	Capture Capacity (Mtpa)	Number of operational projects	Type of storage (EOR / Geological storage / Utilisation)
United States	27,2	24	95% / 4%
Australia	4,3	5	93% / 7%
Canada	4,3	8	72% / 28%
Brazil	3,0	1	100%
China	2,3	12	85% / 15%
Norway	1,7	3	100%
Saudi Arabia	1,3	2	100%
United Arab Emirates	0,8	1	100%
Croatia	0,6	2	100%
Sweden	0,5	1	100%
Rest of the world	Not available	9	100%

Source: Kearney, Energy Transition Institute, Carbon Capture Utilization and Storage, Towards Net-Zero, 2021

Enabling Different Transition paths

- Some exporters willing to be part of the solution and lead on initiatives to fight climate change and OECD countries should build on this momentum
- Recognition of:
- National circumstances
- There will be various transition paths depending on starting points, core competencies and existing assets
- Insisting on a single path could delay the transition (not enable the use of the technical and financial resources of producers, perpetuate non-cooperative behaviour on negotiations, and increase cost of transition)
- Providing frameworks that don't discriminate against certain technologies or fuels and allow technologies to compete
- Developing burden sharing mechanisms between importers and exporters and integrate them into multilateral and bilateral frameworks
- But oil and gas exporting countries need to show leadership in mitigation technologies and push for frameworks that promote burden-sharing mechanisms