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The Energy Transition and Oil Exporters' Adaptation Strategies

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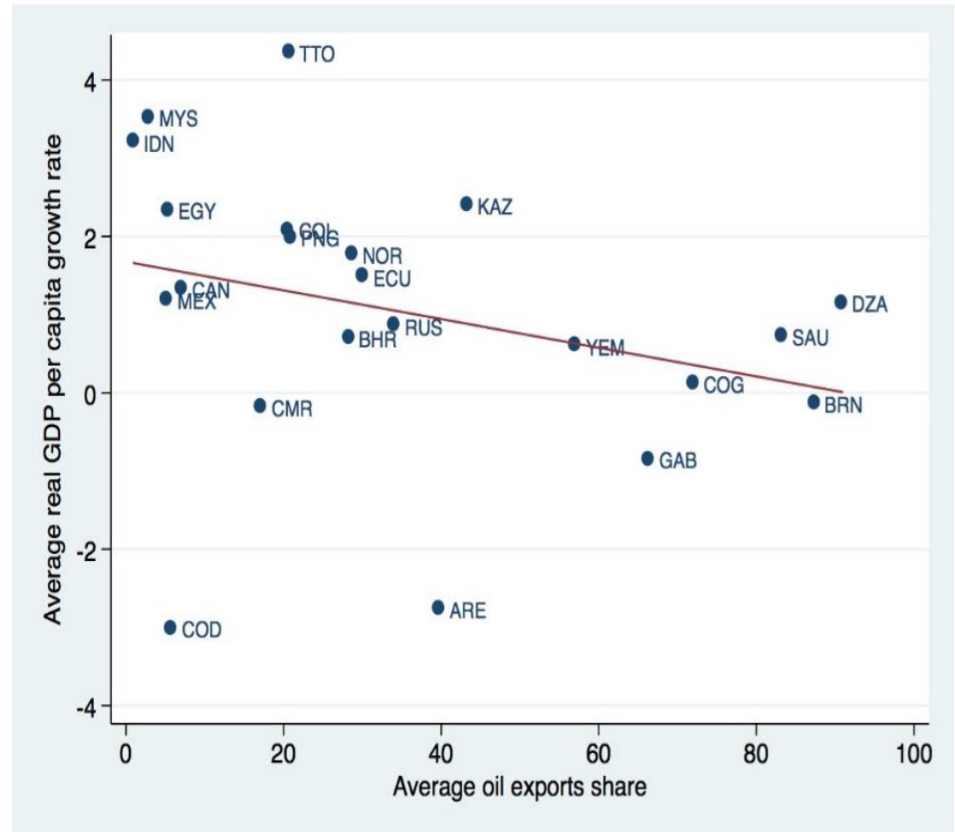
Saudi Association for Energy Economics (SAEE), 24 June 2021



Heavy dependency on oil revenues

- Oil rents have brought massive economic benefits to oil exporters as reflected in most socio-economic development and human capital indicators (though at varying degrees)
- But heavy reliance on oil revenues has also created its own economic and institutional challenges
 - Instability and volatility of oil revenues contributed to macroeconomic instability and volatile growth
 - The distribution of oil rents contributed to weak institutional environment and many economic distortions (weak private sector, rigid labour markets, inefficiencies, subsidies which distort production and consumption decisions)
 - Reflected in relatively weak economic growth and declining GDP per capita over time
- These challenges will become more pronounced as the prospects for oil demand are becoming more uncertain due to energy transition and decarbonization policies

Average growth rates of real GDP per capita and average oil exports share in total exports



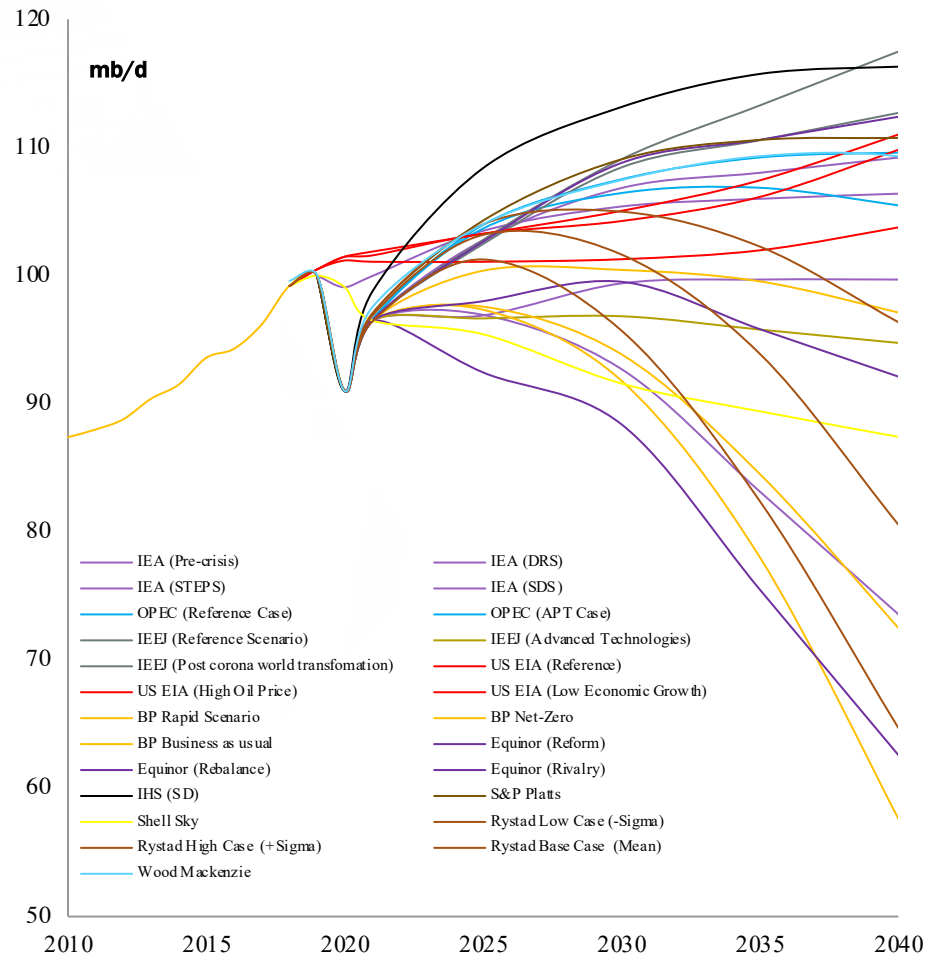
Note: The averages are computed over 1991 to 2012 period.
Source: E. Kakanov & H. Blöchliger & L. Demmou, 2018. 'Resource curse in oil exporting countries', OECD Economics Department Working Papers, No. 1511



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 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 policy)
- 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

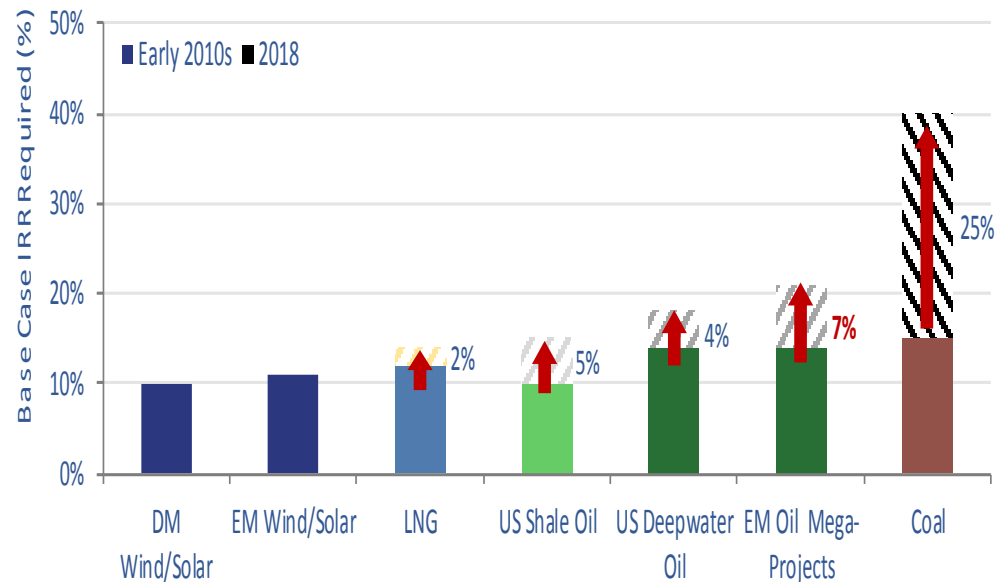




Regardless of its speed, impacts are already being felt

- 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 gas



Fattouh, Bassam, Poudineh Rahmatallah, and Rob West. 2019. Energy Transition Uncertainty And-the Implications of Change in the Risk Preferences of Fossil Fuel Investors, OIES Energy Insight.

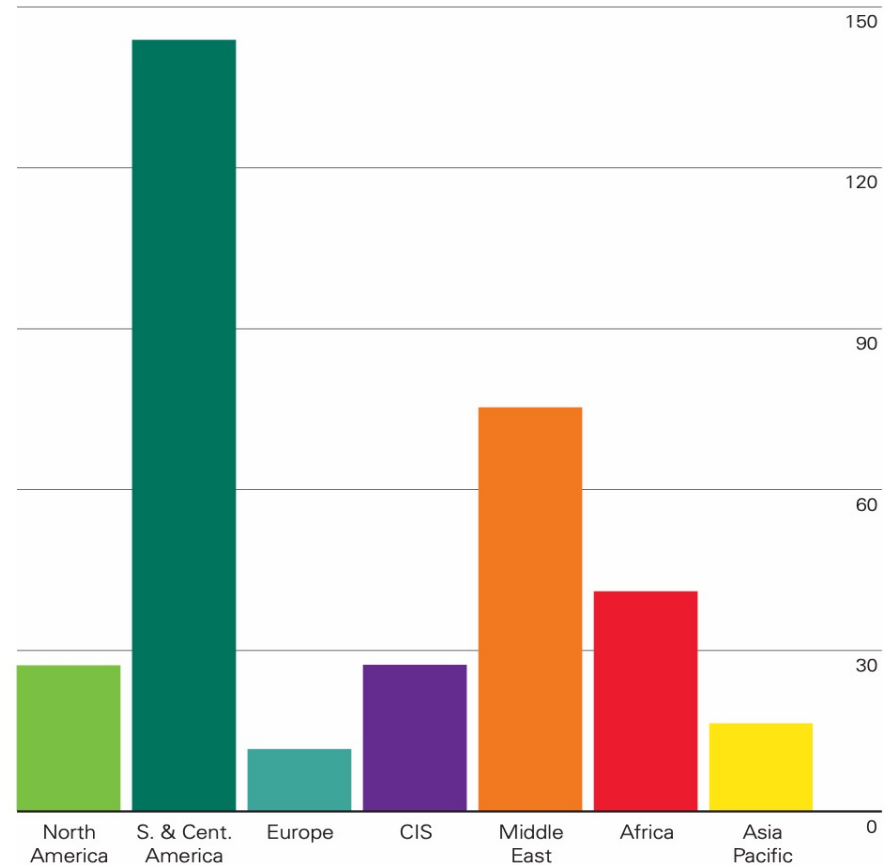


Oil exporters' adaptation strategies

- 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

Reserves-to-Production Ratios, years

2019 by region



Source: BP

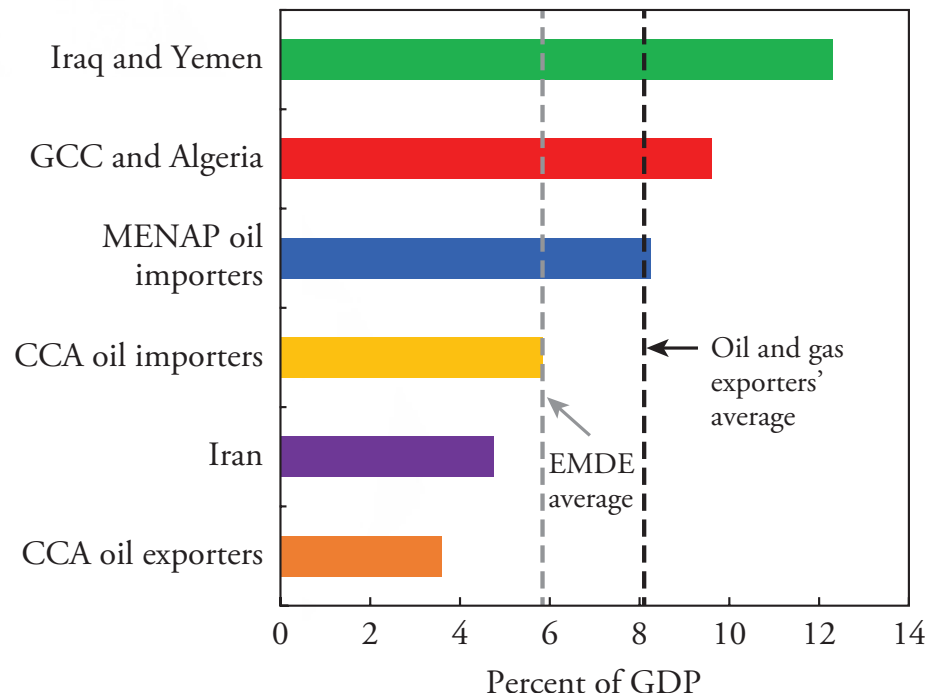


The challenges of fiscal diversification

- Effective strategy is to diversify away from oil & gas sector
- But real challenges to realise meaningful diversification (particularly fiscal diversification):
 - Only successful if it offers risk reduction by pooling uncorrelated income streams
 - Diversification into different areas away from their core competitive advantage runs risk of failure of establishing viable non-resource export sectors
 - Achieving diversification requires building human capital and improving education system & extensive reforms to improve the business environment, transparency and governance; and removing barriers to private sector participation
- 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

General government wage bills, 2005-16

(Percent of GDP, period average)



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: Tamirisa N.T. and Duenwald, C. (2018), Public Wage Bills in the Middle East and Central Asia, IMF Departmental Paper No. 18/01



Risks of exiting too early for oil exporters

- Oil and gas sectors remain very profitable and still enjoy higher margins than any new industries or sectors that governments in oil and gas exporting countries aim to establish
- 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 by developing compensation mechanisms to offset the adverse impacts on households and firms
- Exiting too early from such an established strategic sector deprives the country of an important source of income and key source of competitive advantage
- So suggesting that oil and gas exporters move away from this sector is not realistic nor optimal



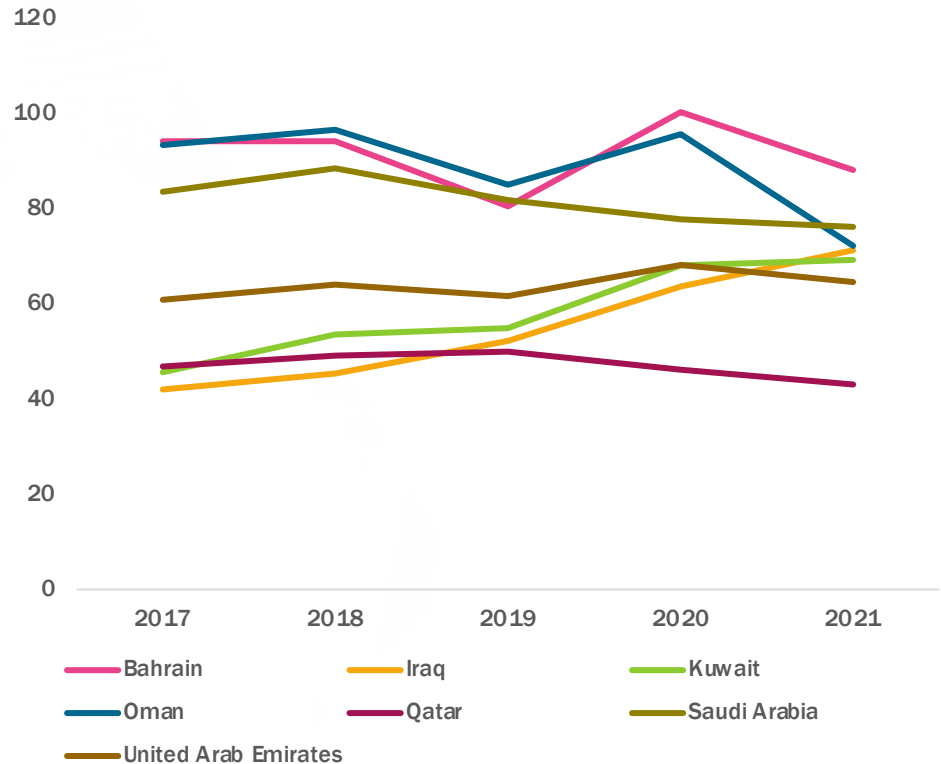
If diversifying from the oil and gas sector is sub-optimal and it can't be achieved at a rapid pace, how to enhance the competitiveness and increase the resilience of the hydrocarbon sector in a world that is transitioning towards net zero emissions?



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

Gulf breakeven oil prices



Source: IMF



Diversification within the 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



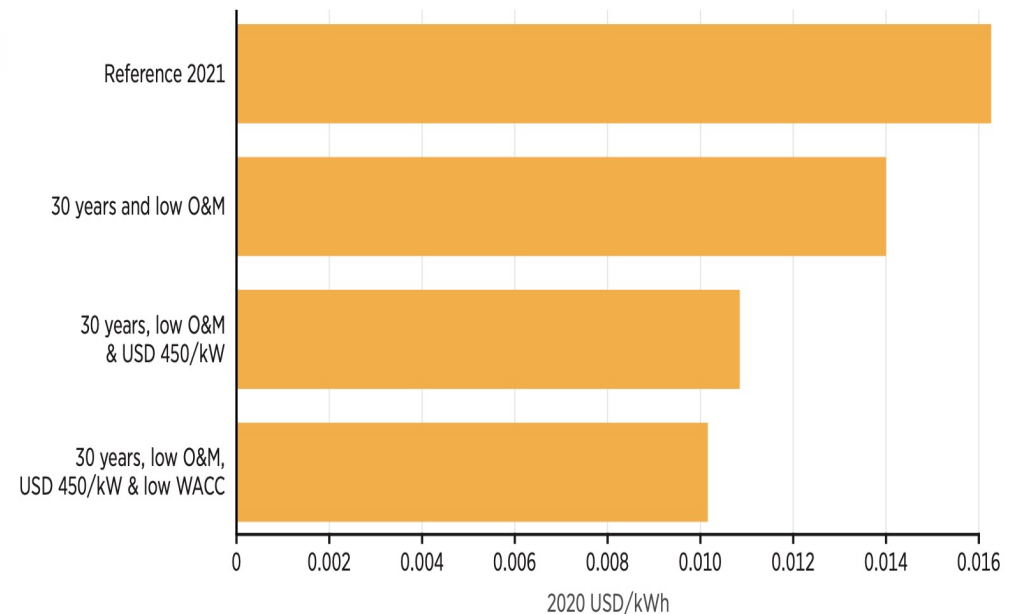
Source: World Bank, Gulf Economic Update, Economic Diversification for a Sustainable and Resilient GCC, Issue 5



Compete on dimensions other than costs: Emissions reduction

- Invest in renewables & integrate renewables with existing hydrocarbon infrastructure to reduce emissions in production
- Improving the efficiency of domestic use of energy and optimising the energy mix
 - Energy efficiency programmes
 - Energy pricing reforms
 - Changing the energy mix towards gas/renewables
- But margins in renewables can't fully substitute for rents generated by hydrocarbon sector

Scenarios for utility-scale solar PV LCOE under different input assumptions in Saudi Arabia



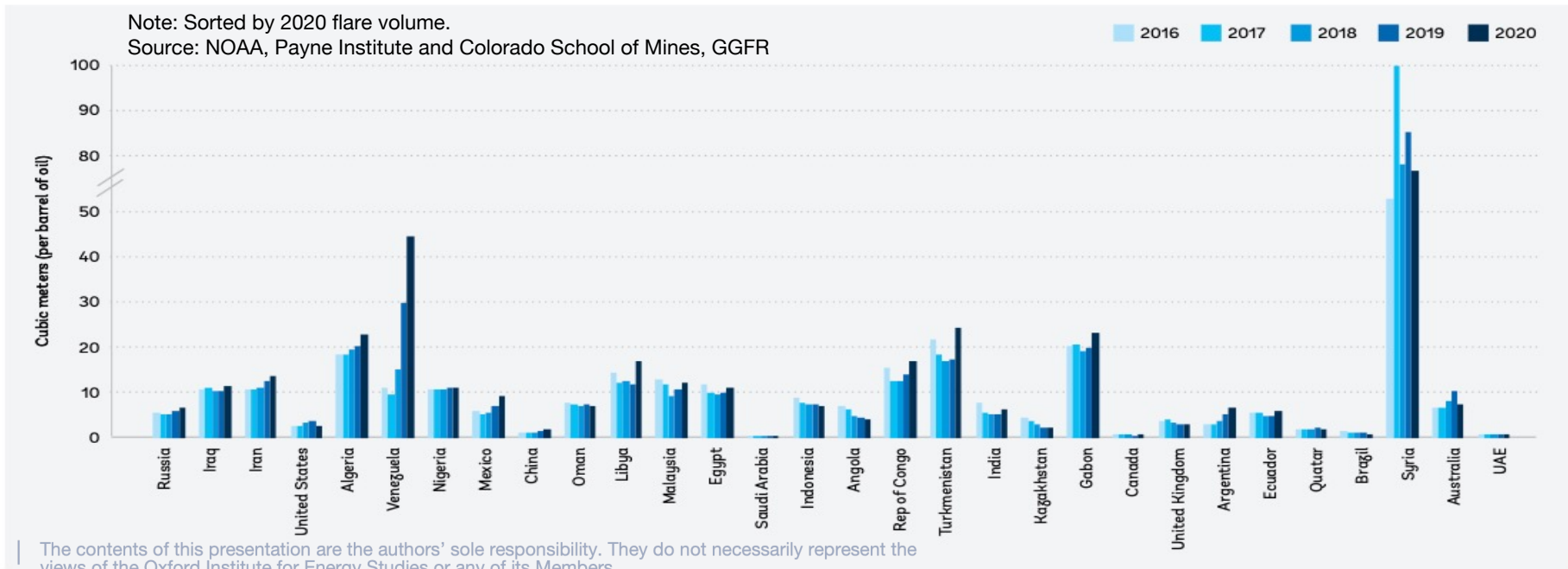
Source: IRENA, Renewable Power Generation Costs in 2020



Strategy to reduce emissions in hydrocarbon sector

- 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

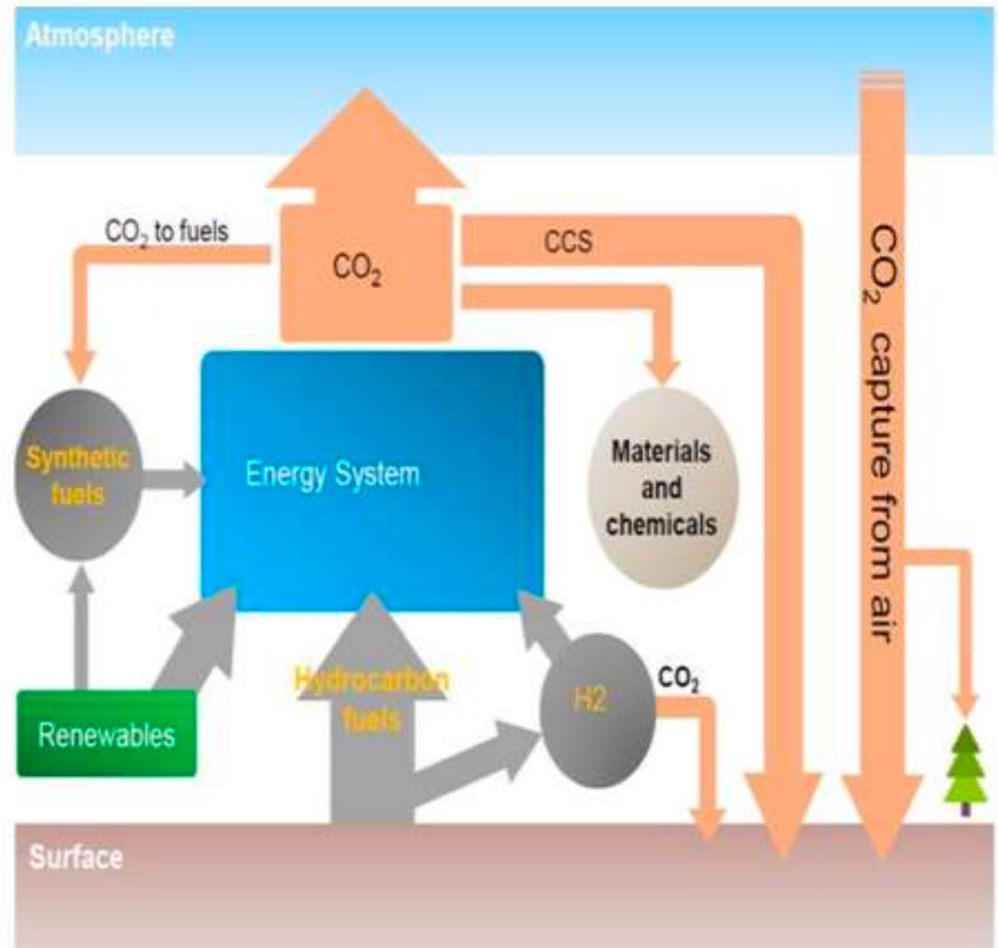




Circular Carbon Economy (CCE)

- CCE and its 4Rs is one strategy to deal with the challenge of emissions reduction
- CCUS and establishing carbon sinks is the most important element of the CCE framework
- 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
- From an emissions mitigation strategy, CCUS essential to reduce emissions from hard to abate sectors and reach net-zero targets

The circular carbon economy



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

- 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
- 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:

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
- But 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, and increase cost of transition)
- Providing frameworks that don't discriminate against certain technologies or fuels and allow technologies to compete and not shift costs to oil and gas producers alone
- Importance of developing burden sharing mechanisms and integrate them into multilateral and bilateral frameworks
- Strategic for oil and gas exporting countries to show leadership in mitigation technologies such as CCUS and establishing carbon sinks and push for frameworks that promote burden-sharing mechanisms



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June 2021



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