KAPSARC
مركـز الملـك عبـدالله للدراسـات والبحـوث البتروليـة
King Abdullah Petroleum Studies and Research Center

Oil & Gas Investment Challenges Affecting the Industry

43rd IAEE INTERNATIONAL CONFERENCE

Julio M. Arboleda Larrea,

Co-author: Hamid Al Sadoon

Credit: Hufton+Crow

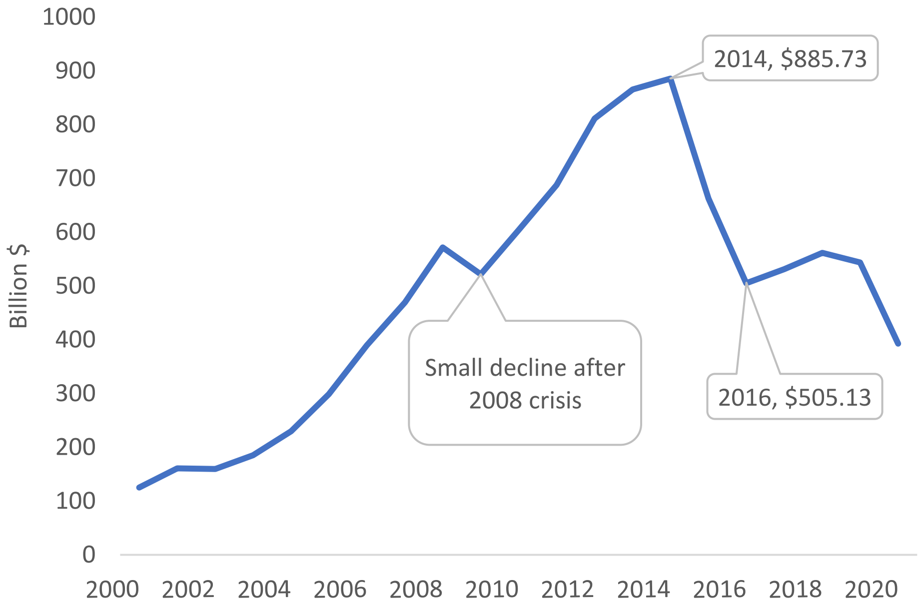
Outline

- Introduction to the investment situation in the O&G sector
- Price volatility
- Increasingly diverging long-term demand projections
- Evolving government climate regulations
- The lack of regulations makes environmental, social, and governance (ESG) unclear

Introduction to the investment situation in the O&G sector

- Investments in the O&G industry in problems since 2014.
  - Oversupply - shale oil and gas revolution
  - Demand crisis - geopolitical risks, and climate change pressure.
- December 2016, OPEC+.
- Recover in 2017 – Stable prices.
- Despite the increase in global O&G investment - capital spending below 2015 levels.
- COVID-19 pushed O&G capex down by 30% in 2020.

Figure 1. Historical oil investment 2000-2020, billion $ (nominal value).



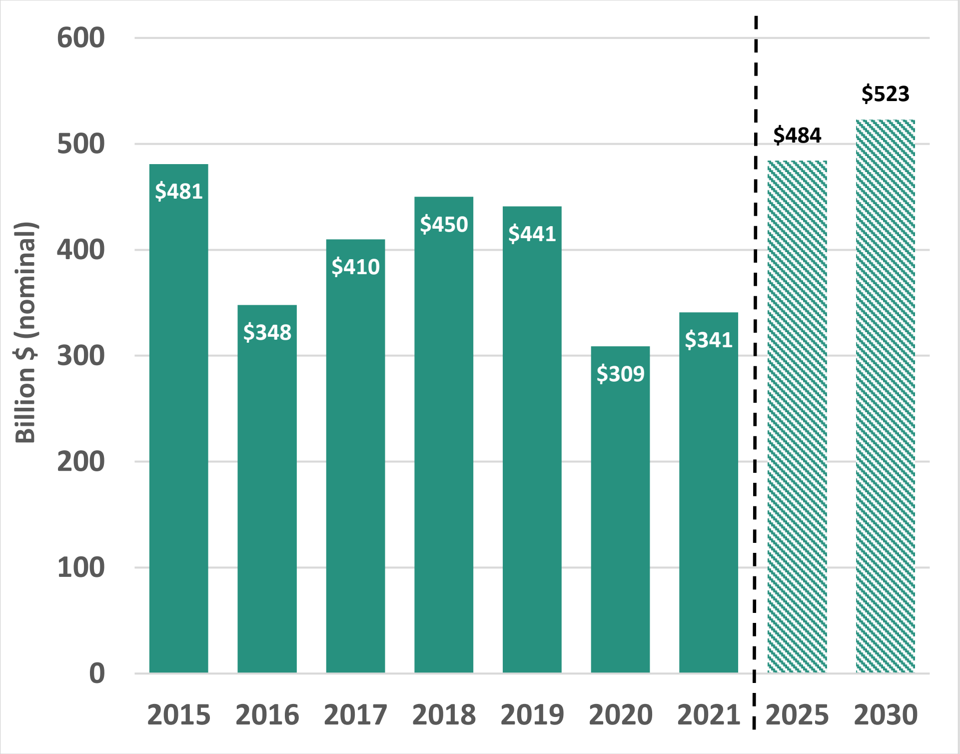
Source: KAPSARC, UCube Rystad 2021.

In 2014, oversupply driven by the shale oil and gas revolution, diminished attention to geopolitical risks, and increasing climate change pressure on fossil fuel producers led to one of the largest oil and gas demand and price collapses in modern history (Stocker, Baffes, and Vorisek 2018).

Introduction to the investment situation in the O&G sector

- COVID-19 consequences:
  - Price collapse in April 2020.
  - More than 20 MMb/d fall in oil demand.
  - Rapid adjustment of producers.
- In 2021, O&G upstream sector investments recovered, but $100 billion below pre-pandemic.
- Investments over the next two years will define an adequate supply of oil and gas.
- A substantial increment in investment in O&G is needed today to guarantee energy security from 2025 and beyond.

Figure 2. Global upstream oil and gas capex



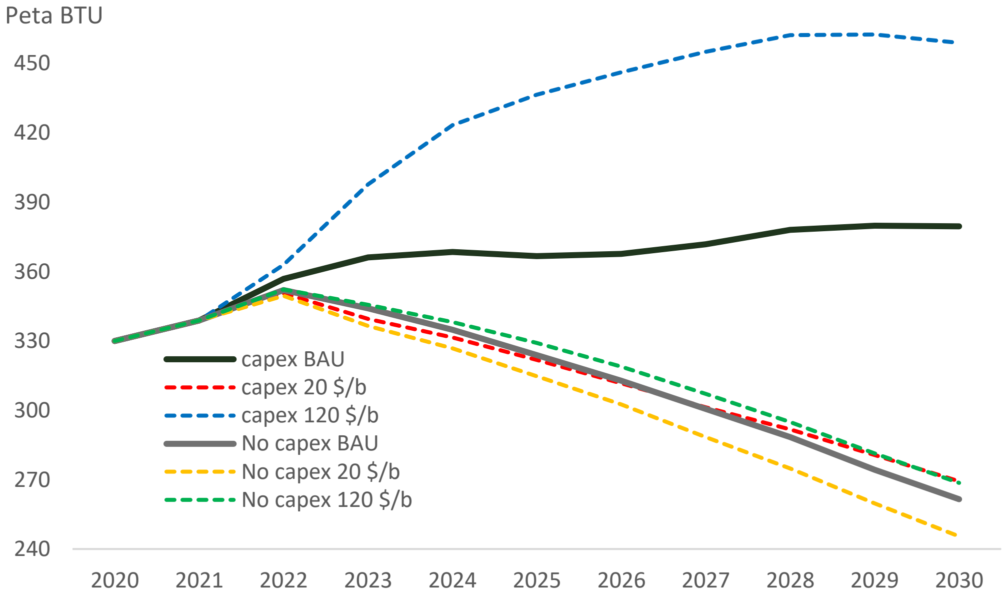
Source: IEF, IHS Markit, 2021.

The COVID-19 pandemic has made the oil industry's investment problems since 2014 more evident.

Introduction to the investment situation in the O&G sector

- Increasing risk of oil and gas shortfalls - upstream capex does not grow.
- Rystad UCube, KAPSARC developed three case scenarios (3 different price scenarios)
  - BAU default –similar to demand required.
  - Oil price of $20 per barrel (b).
  - Oil price of $120/b.
- O&G industry external discreditation through from environmentalists and social protectors.
- Challenges generating concerns:
  - 1) price volatility,
  - 2) uncertainties due to significantly diverging long-term forecasts,
  - 3) increasing climate change concerns, and
  - 4) the lack of regulation on environmental, social, and governance (ESG)

Figure 3. Oil and gas production capacity in different oil price scenarios with and without capex

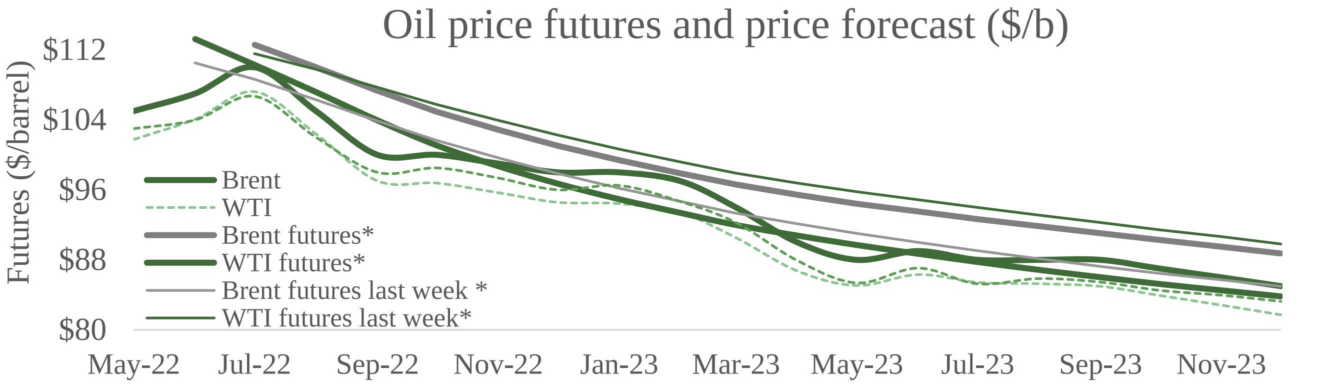


Source: KAPSARC, Rystad 2021.

Unfortunately, these projections are not very optimistic. Rystad estimates that global oil and gas investment, including midstream and downstream, will increase by just $26 billion this year (Rystad 2022).

Price volatility

- O&G recovered from $20/b (April 2020) to $ 120/b now - Investors optimism.
- Unstable and volatile price environment.
- Prices rise fast, but they drop rapid.
- During the past two years, high volatility and backwardation.
- Before COVID-19, OPEC+ interventions - stability to the market.
- CBOE Volatility Index (VIX) and CBOE Crude Oil ETF Volatility Index (OVX).



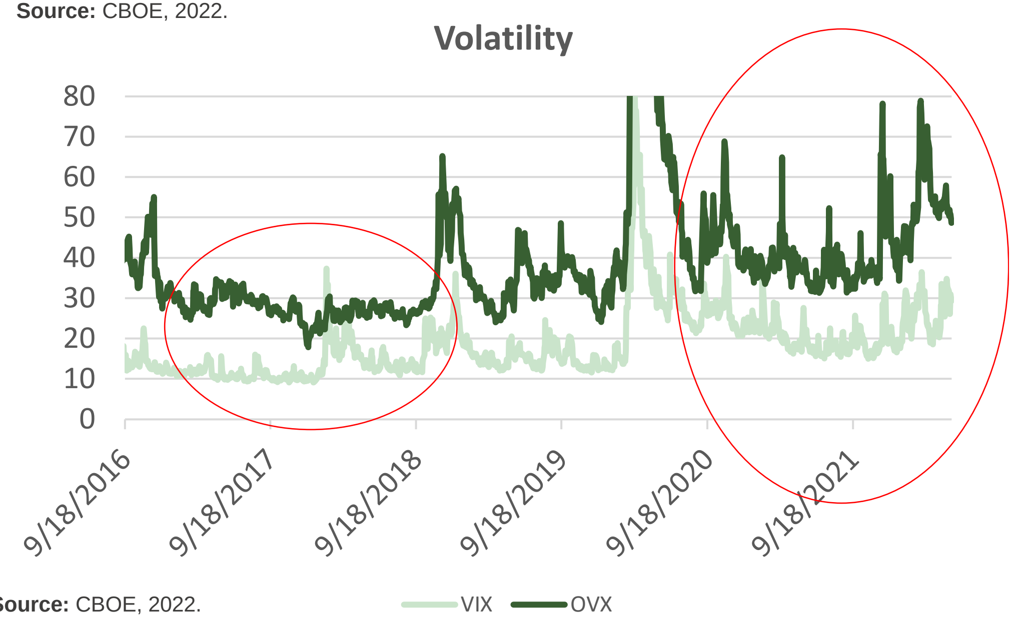
* WT and Brent futures reported here show the last update on May 20, 2022 obtained from CME Group website. Oil price forecast reported by S&P Global Platts.

Source: CME Group, S&P Global Platts Analytics

Table 1. VIX and OVX for oil prices

Date	VIX	OVX
Pre COVID-19 2010 average	17.9	34.3
Pre COVID-19 2017 average	14.4	30.8
COVID-19 (February 1 – March 8, 2020)	23.2	41.9
OPEC-Russia disagreement	40.7	113.8
Post-June 2020	21.7	39.6

Source: CBOE, 2022.



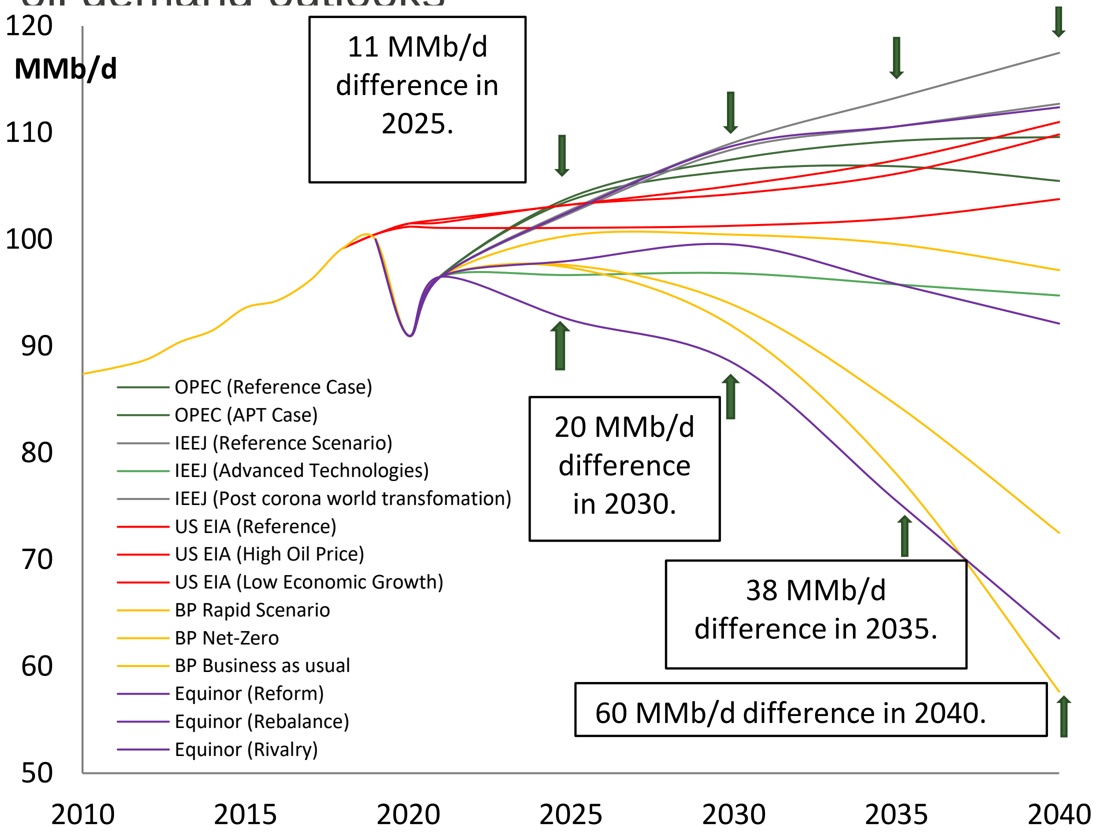
Source: CBOE, 2022.

Typically, a commodity with high price volatility is not the first option among value investors looking for steady gains or short-term wins.

Increasingly diverging long-term demand projections

- Gap within oil outlooks - investment scarcity and instability.
- Energy transition is starting.
- Oil and gas demand needs security of supply and capital.
- Diminished financing will result in supply crises.
- Long-term oil outlooks – assumptions - Climate policies vs. less climate assumptions.
- New lexicon - carbon budgets, unburnable carbon, energy transitions, peak demand, and stranded assets, among other items.

Figure 4. Diverging results from different global oil demand outlooks



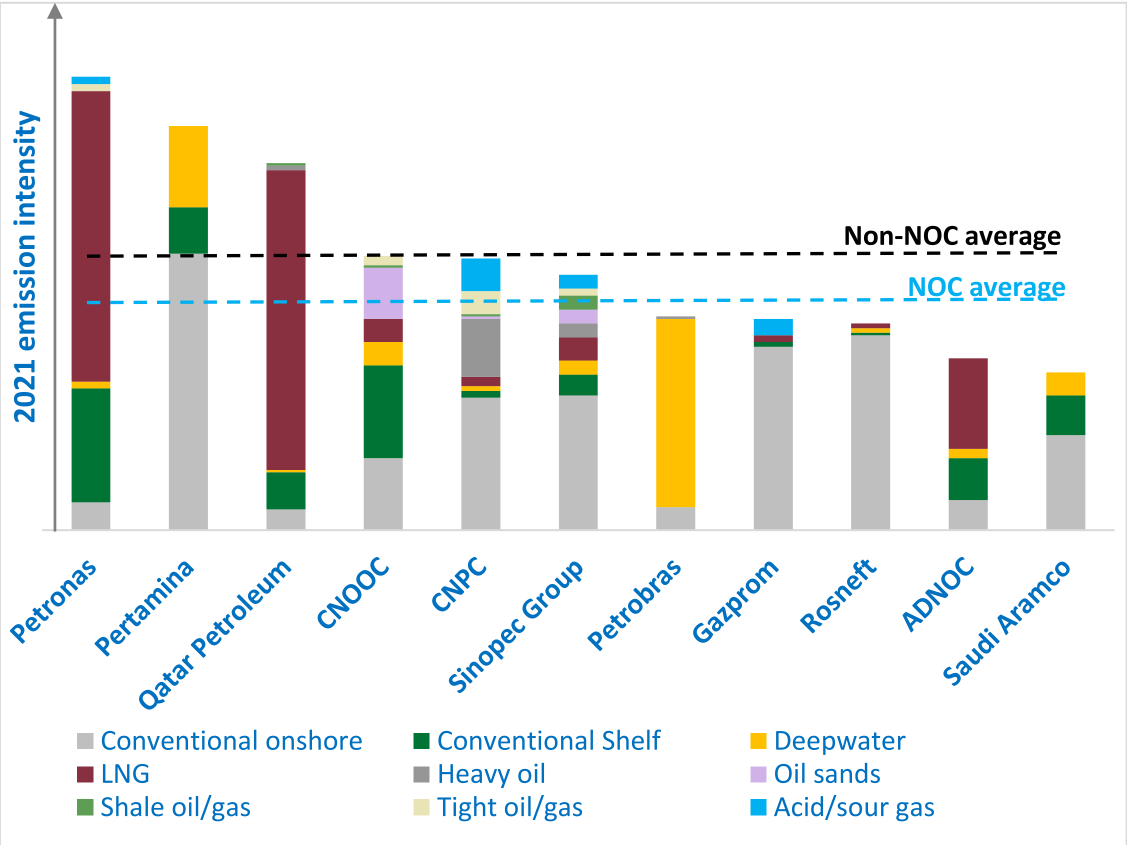
Source: KAPSARC based on OPEC, IEEJ, EIA, BP, Equinor, and Shell.

Many of the net-zero assumptions are conditional on the extensive and successful implementation of climate policies.

Evolving government climate regulations

- COP 26 “phasing down” – not “phasing out”
- Saudi Arabia, India, Russia, and several others set climate long-term targets in 2021.
- NOCs also join the movement.
- IOCs are pushed to follow similar path - (Investors pressure).
- Exxon Mobil and Chevron. Shell loses a landmark court case.
- Long-life conventional production, lower upstream emission intensities (Aramco).
- Average profit generated by IOCs in 2021 was $6.60/boe, compared to the $8.20/boe generated by NOCs.

Figure 5. NOCs with large conventional portfolios have lower corporate upstream emissions than many of their peers.



Source: Yates (2021)

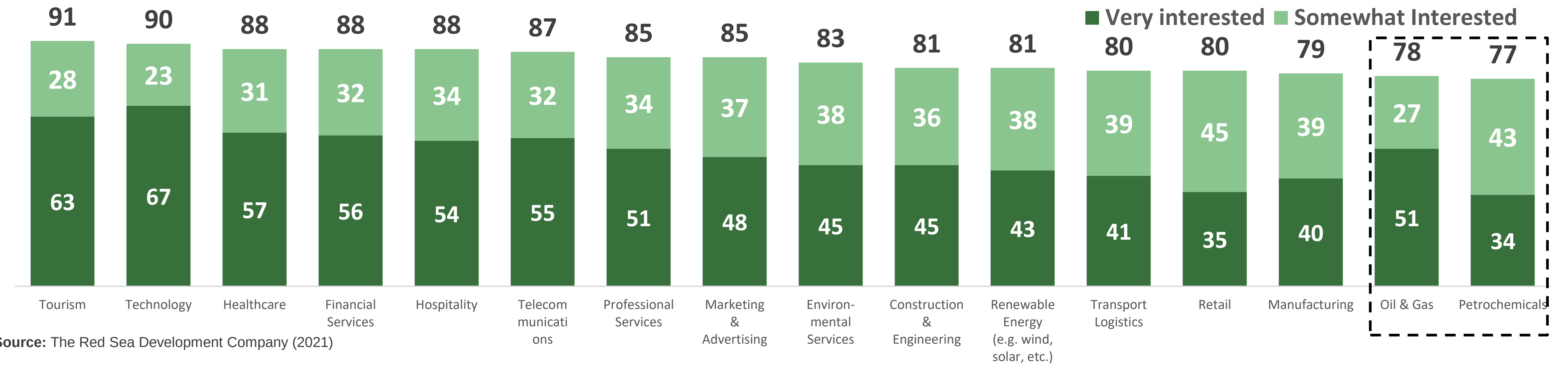
These interventions, which are becoming frequent in the industry, force IOCs to reconsider their long-term production plans.

The lack of regulations makes environmental, social, and governance (ESG) governance unclear

- Today, organizations are called to incorporate environmental, social, and governance (ESG) values and metrics.
- BlackRock will not support - not making sufficient progress sustainability-related.

- Environment (E) – not only climate change
- Social (S) - employment practices, community engagement, etc.
- Governance (G) new policies ESG.
- Attracting and retaining human talent

Figure 6. Prospective employees' views on sectors to work in in Saudi Arabia (%)



Source: The Red Sea Development Company (2021)

Findings

- ***Substantial increment in investment in O&G is needed today to guarantee energy security from 2025 and beyond.***
- High volatility and backwardation in oil market led investors to shy away from investing.
- A misinterpretation of O&G outlooks brings investment scarcity.
- Net-zero long-term scenarios are a guide, no outlooks.
- Long-life conventional production has lower emissions.
- Shareholders and environmentalists pushing IOCs to set net-zero targets.
- Private sector is the most vulnerable to climate policies.
- ESG in the O&G industry only environmental, not social.
- Attracting and retaining human talent is an issue.

Thank you