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Unlocking The Value In The Oil And Gas Industry- Techno Commercial Strategies And New Technologies For Enhanced Profitability

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Abstract:
The outbreak of the coronavirus led to a significant decrease in worldwide oil consumption and prices, prompting major oil and gas firms to reduce their spending and postpone project timelines. Firms embarked on digital transformation, asset optimisation, and predictive maintenance, along with net-zero strategies, leveraging financial tools like NPV and IRR for recovery. Technological advancements such as AI, IoT, smart drilling, and modern seismic techniques have enhanced productivity and environmental friendliness. In general, the pandemic hastened technological advancements and sustained long-term economic benefits within the oil and gas sector. The novel coronavirus, SARS-CoV-2, is a respiratory illness that spreads through airborne transmission, first detected in 2019.

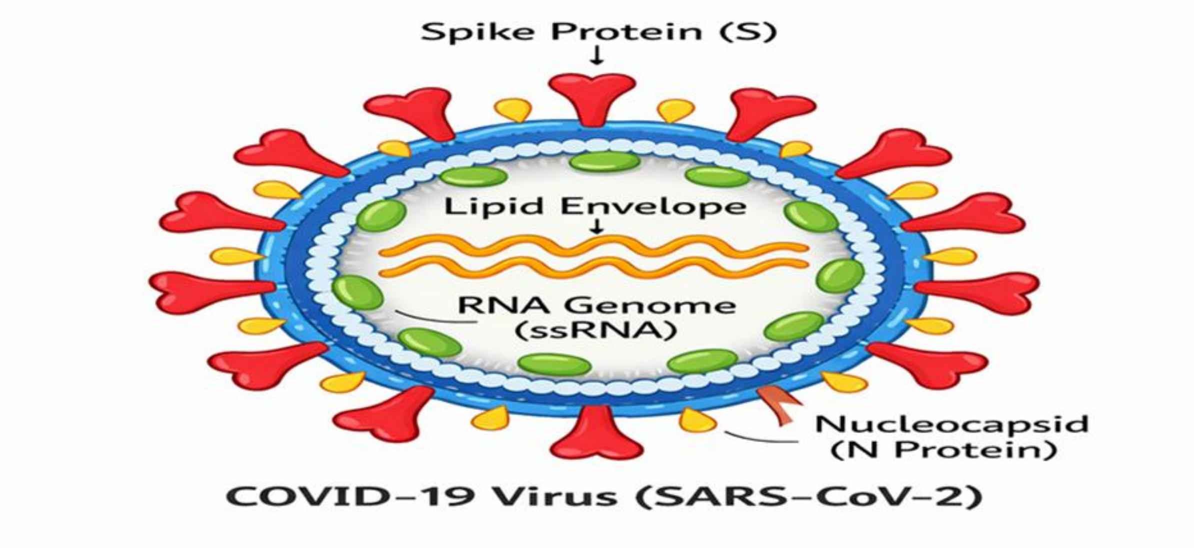

FIG 1: Covid -19 virus (SARS-CoV-2) that caused a global pandemic and dropped oil prices

The pandemic triggered a significant decline in global energy consumption, leading to unprecedented drops in oil prices, budget reductions, and project postponements. Oil and gas firms embraced digital tools, cost reduction techniques, and environmentally conscious approaches to enhance their ability to withstand challenges.

Keywords: Oil and gas, Covid-19 impact on oil and gas, strategy adaptation, weighted analysis

I. INTRODUCTION:

Global oil and gas operations were significantly disrupted by the COVID-19 pandemic, resulting in a decline in demand, project delays, and financial strain. However, it ensured company continuity by accelerating digital transformation through automation, artificial intelligence, and remote operations. Businesses optimized OPEX, CAPEX, and implemented techniques to stabilize performance that are cantered on resilience. In the end, the crisis spurred sustainability and innovation, opening up new opportunities for profitability and value in the post-pandemic energy sector. High-skilled positions in data analytics, remote operations, and maintenance are being created by new technologies like artificial intelligence (AI), automation, and digital oilfields, which are boosting productivity and job development in the oil and gas sector. This project aims to investigate how new technology and creative approaches in the oil and gas industry improve productivity, generate skilled jobs, and uncover more sustainable and economic value.

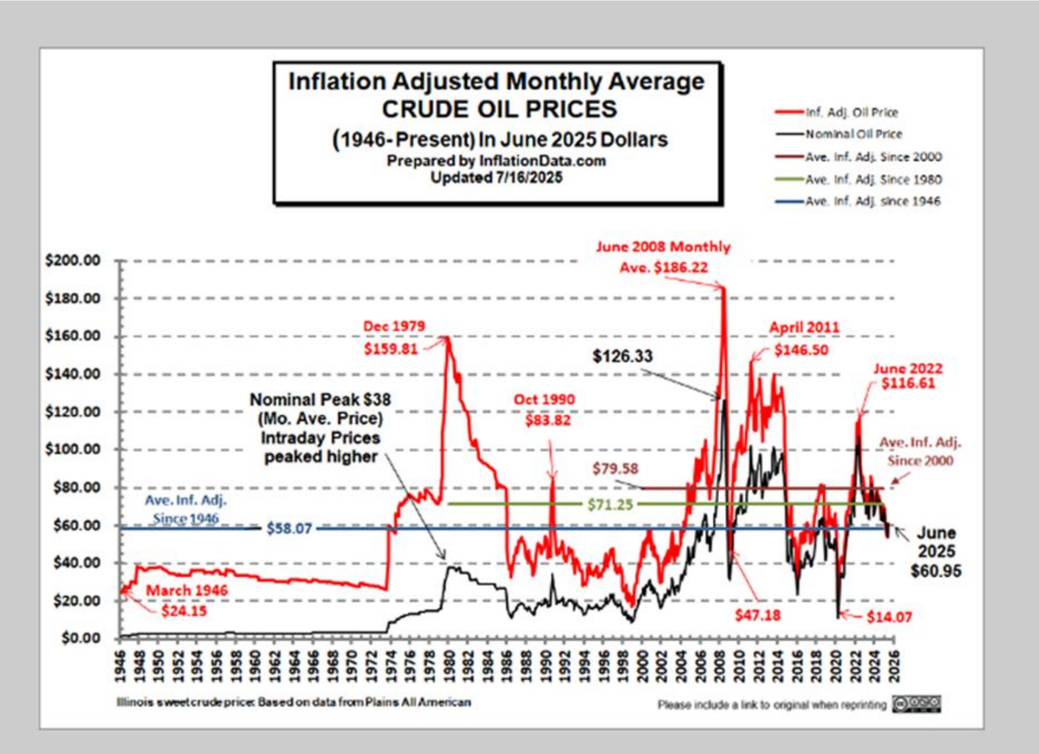

Fig 2: Brent vs WTI — Long-Term Price Comparison

OIL PRICE TRENDS FROM 2000 -2025: The table below shows average Brent crude oil prices (in nominal U.S. dollars per barrel) at the end of each year or average for the year, illustrating long-term trends: YCharts+1

Year	Brent Crude Price (Approx. US$/bbl)
2000	~$28–29 (YCharts)
2001	~$24 (YCharts)
2002	~$25 (YCharts)
2003	~$29 (YCharts)
2004	~$38 (YCharts)
2005	~$54 (YCharts)
2006	~$65 (YCharts)
2007	~$72 (YCharts)
2008	~$97–100 (YCharts)
2009	~$61 (YCharts)
2010	~$79 (YCharts)
2011	~$111 (YCharts)
2012	~$111 (YCharts)
2013	~$108 (YCharts)
2014	~$99 (YCharts)
2015	~$52 (YCharts)
2016	~$44 (YCharts)
2017	~$54 (YCharts)
2018	~$71 (YCharts)
2019	~$64 (YCharts)
2020	~$42 (YCharts)
2021	~$71 (YCharts)
2022	~$101 (YCharts)
2023	~$82 (YCharts)
2024	~$80 (YCharts)
2025 (est.)	~$70–72 (Scribd)

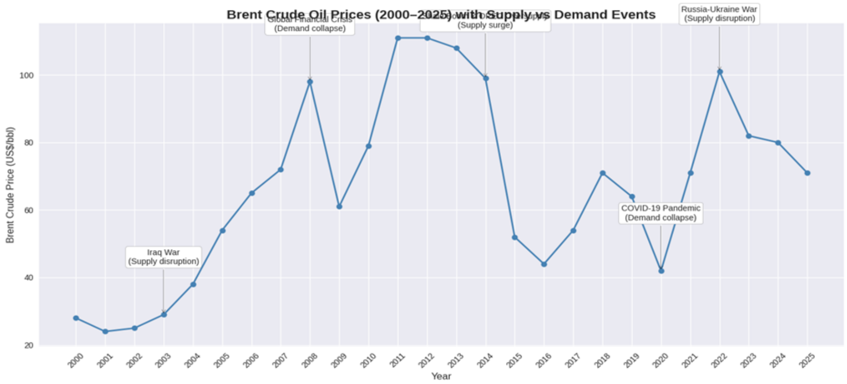

FIG 3: Here's the visualisation of Brent crude oil prices from 2000 to 2025, showing the supply vs demand dynamics reflected in price movements.

Oil Price Trends and Supply–Demand Dynamics (2000–2025)

Period / Year	Average Oil Price (US$/bbl)	Supply–Demand Condition	Key Market Drivers
2000–2003	$24–29	Balanced supply and demand	Stable global growth, adequate OPEC supply
2004–2008	$38–100	Demand > Supply (tight market)	Rapid demand growth from China & emerging markets, limited spare capacity
2009	~$61	Demand < Supply	The global financial crisis reduced industrial and transport demand
2011–2014	~$100–111	Demand ≥ Supply	Strong global demand, Middle East geopolitical tensions, and OPEC discipline
2015–2016	~$44	Supply > Demand (oversupply)	U.S. shale oil boom, OPEC's decision not to cut production
2018–2019	$64–71	Near balance	Moderate demand growth, OPEC+ supply coordination
2020	~$42	Severe demand collapse	COVID-19 lockdowns, travel restrictions, storage constraints
2021–2022	~$71 → $101	Demand > Supply	Post-pandemic recovery, supply constraints, Russia–Ukraine conflict
2023–2025	$70–82	Balanced to slight surplus	Slower global growth, rising non-OPEC supply, and energy transition effects

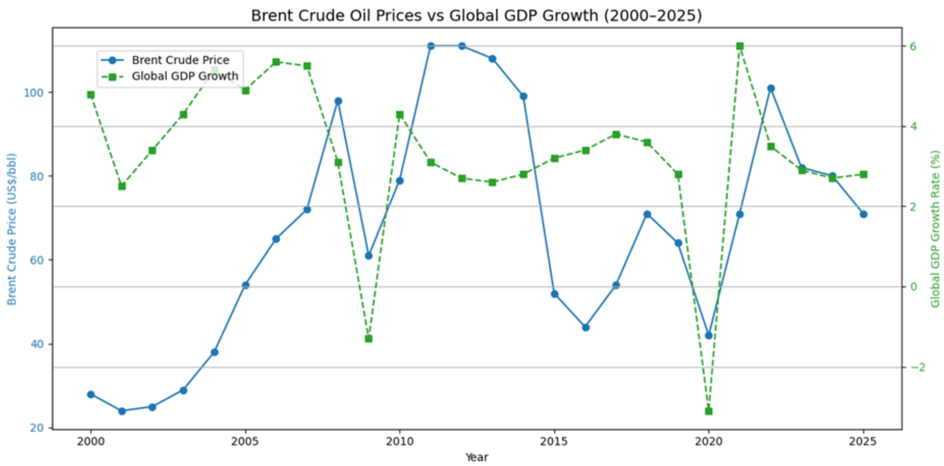

Fig 4: Brent crude oil prices versus global GDP growth rates from 2000–2025:

What the Chart Reveals

• Strong correlation: Oil demand (and prices) often rise during periods of robust global GDP growth (2004–2007, 2010–2013).

• Demand shocks: The 2009 financial crisis and 2020 pandemic show sharp GDP contractions paired with oil price collapses.

• Supply-driven spikes: In 2011–2012 and 2022, prices surged above $100 despite moderate GDP growth, reflecting supply disruptions (Middle East tensions, Russia–Ukraine war).

• Stabilisation: By 2023–2025, both GDP growth ($70–82) settled into a more balanced range

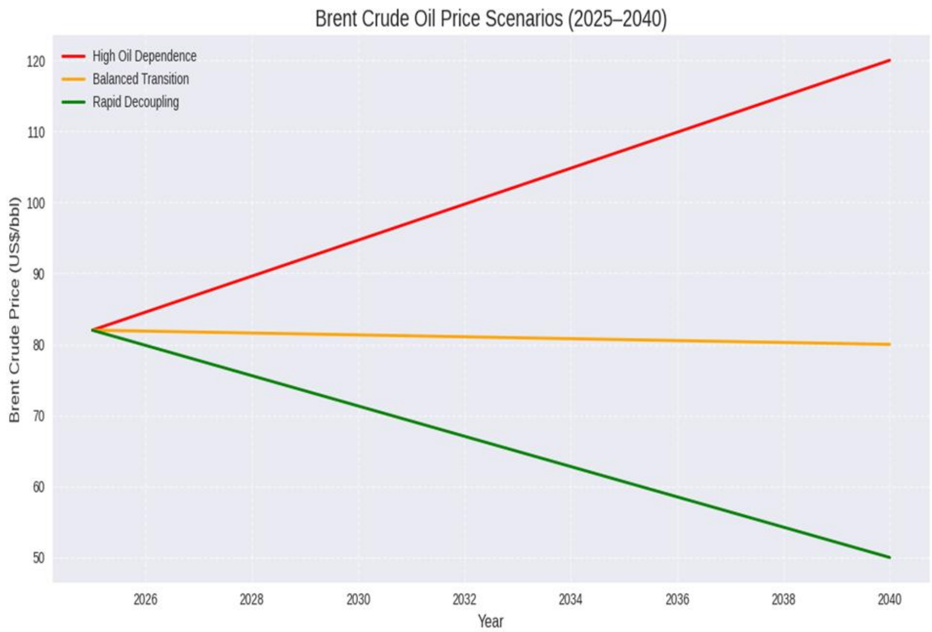

Fig 5: Crude oil price scenario (2025-2040) under three possible futures:

Future Oil Price Pathways (to 2040)

Pathway	Line Colour (Graph)	Oil Demand Trend	Energy Transition Pace	Key Assumptions	Expected Oil Price by 2040 (US$/bbl)
High Oil Dependence	Red	Strong and rising	Slow renewable adoption	Continued fossil fuel reliance, limited EV penetration, and high geopolitical risk	**~$120**
Balanced Transition	Orange	Stable to slowly declining	Moderate transition	Gradual renewable growth, OPEC+ supply control, mixed energy portfolio	**~$80**
Rapid Decoupling	Green	Sharp decline	Fast clean energy adoption	Aggressive climate policies, rapid electrification, strong EV and hydrogen uptake	**~$50**

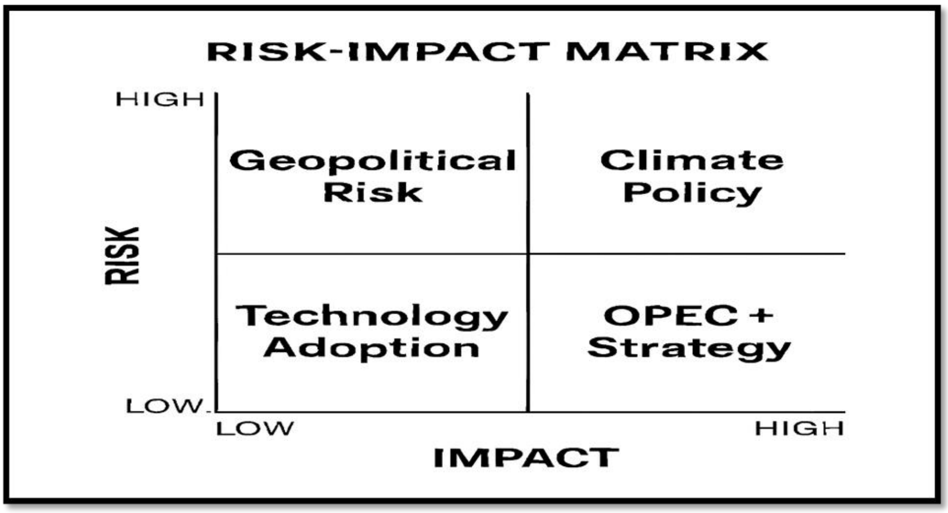

Fig 6: "Risk -Impact Matrix''-The risk–impact matrix for Brent crude oil futures (2025–2040)

This matrix shows how four major factors influence oil price scenarios:

- Geopolitical Risk → High risk, lower long-term impact.
- Climate Policy → High risk, high impact (strong decarbonization pressure).
- Technology Adoption → Low risk, low impact (gradual but steady).
- OPEC+ Strategy → Low risk, high impact (direct control over supply).

It's a clear way to visualise which forces could push prices toward the High Dependence, Balanced Transition, or Rapid Decoupling pathways.

II. CONCLUSION

Unlocking value in the oil and gas industry in an era of heightened volatility, energy transition pressures, and capital discipline requires a fundamental shift from volume-driven growth to techno-commercial optimisation. This study demonstrates that enhanced profitability is no longer determined solely by resource endowment but by the strategic integration of advanced technologies, economic optimisation, and market-aligned business models.

The analysis highlights that digitalisation, data analytics, automation, and AI-enabled decision systems significantly improve asset productivity by reducing lifting costs, enhancing recovery factors, and minimising non-productive time. When combined with advanced reservoir management, enhanced oil recovery (EOR) techniques, and real-time production optimisation, these technologies unlock latent value in mature and marginal fields, extending asset life while improving capital efficiency. Importantly, technology adoption delivers maximum returns only when embedded within robust commercial frameworks, including dynamic pricing strategies, optimised supply chains, and risk-adjusted capital allocation.

From a strategic perspective, techno-commercial tools such as portfolio rationalisation, ABC cost control, BCG-aligned asset prioritisation, and competitive positioning using Porter's Five Forces enable firms to systematically redirect capital toward high-value, resilient assets while divesting or transforming low-return segments. The findings further underscore that financial optimisation models, including discounted cash flow, constrained optimisation, and real-options thinking, enhance investment resilience under oil price uncertainty and regulatory risk.

New technologies also play a critical role in aligning profitability with sustainability imperatives. Carbon-efficient operations, emissions monitoring, carbon pricing integration, and selective investments in CCUS and low-carbon hydrocarbons mitigate transition risks while preserving long-term shareholder value. Firms that proactively internalise environmental costs and regulatory constraints demonstrate superior strategic flexibility and reduced downside exposure.

In conclusion, the future competitiveness of the oil and gas industry lies in its ability to synchronise engineering excellence with economic intelligence. Companies that adopt integrated techno-commercial strategies—leveraging digital technologies, optimising capital deployment, and embedding sustainability into core decision-making—will be best positioned to unlock enduring value, sustain profitability across cycles, and remain relevant in a rapidly evolving global energy landscape.