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# The future O&G sector, now

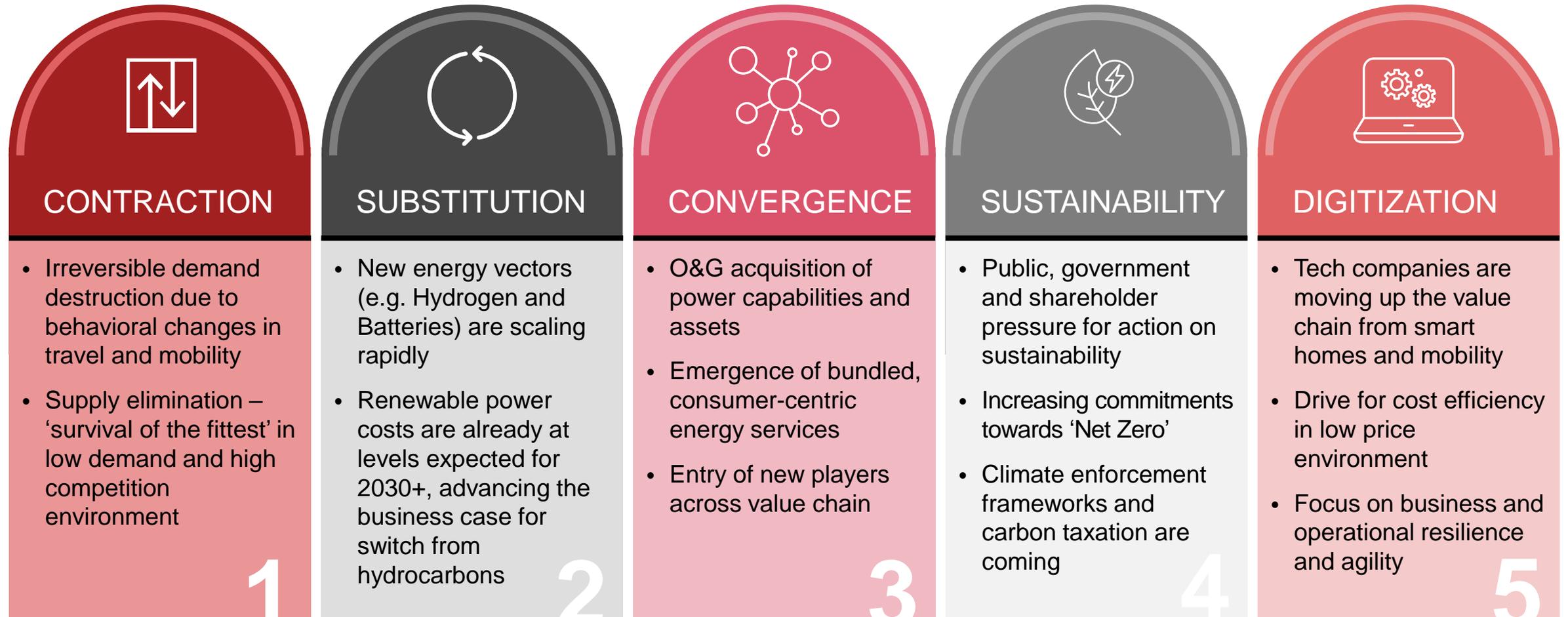
*Five unstoppable forces  
will permanently change  
the O&G landscape*

May 2020



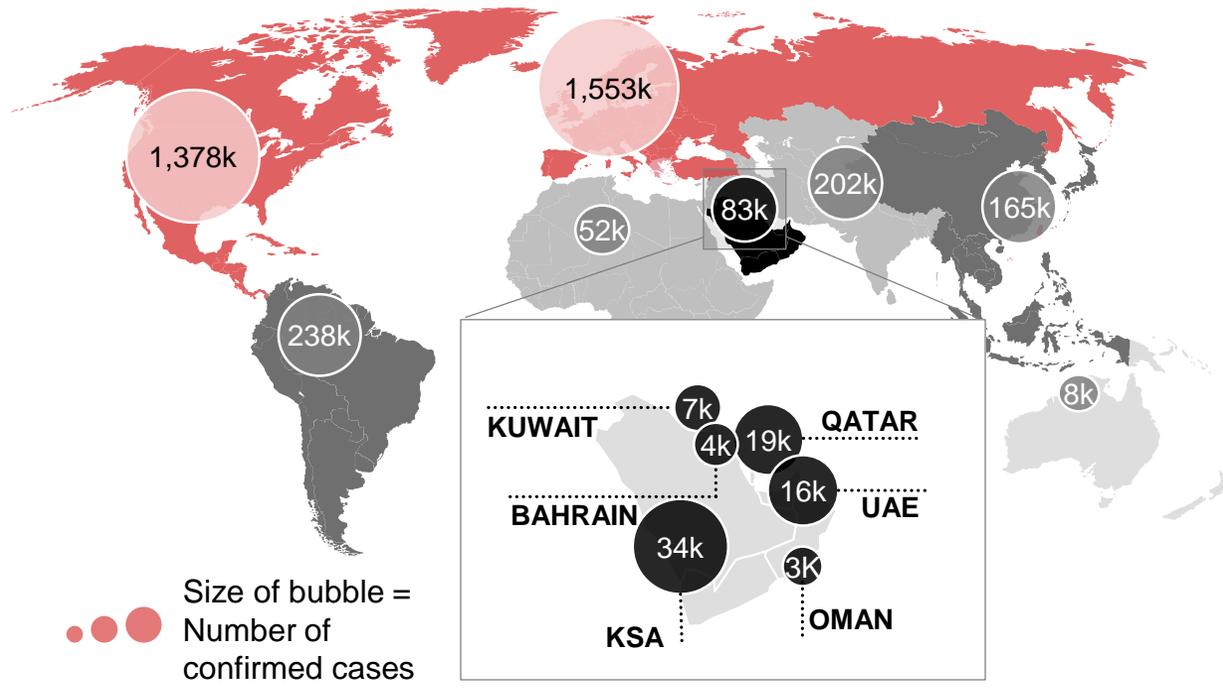
# Five unstoppable disruptive forces are gaining momentum and changing the energy landscape as we currently know it

## Five Disruptive Forces

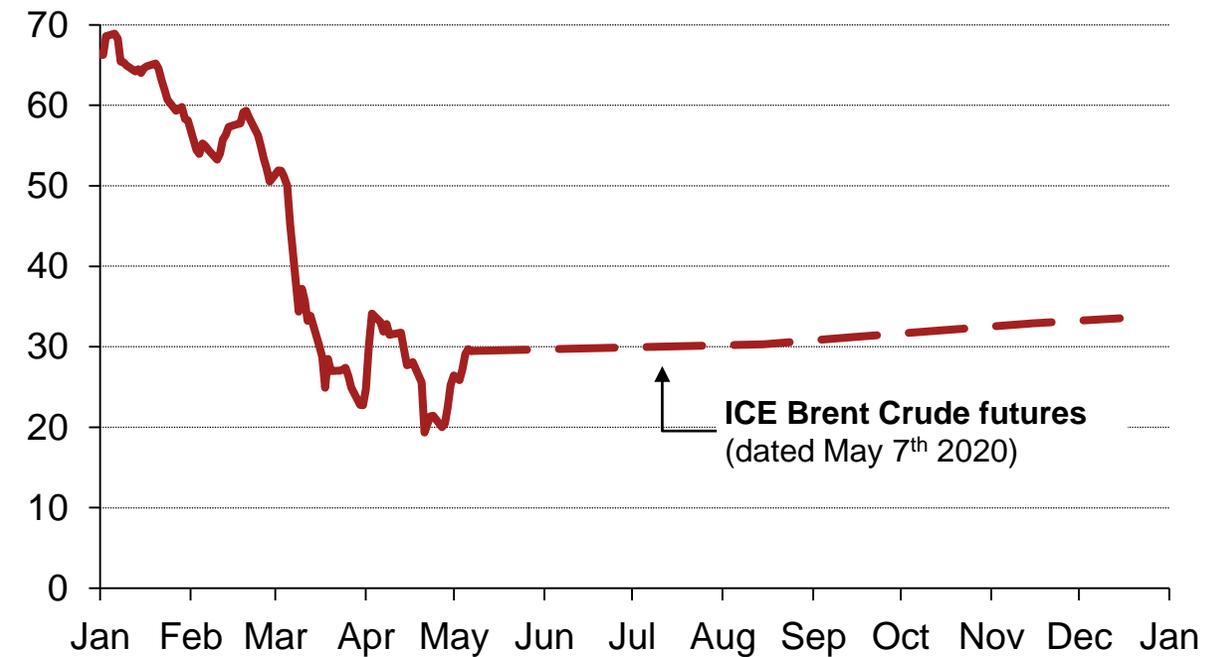


# The “dual shock” of COVID-19 and collapse in oil prices will only accelerate the impact of the five forces

**Global COVID-19 Pandemic** (as of May 7<sup>th</sup>)



**Drop in Oil Prices** [\$/bbl Brent Crude daily price, 2020]



**Permanent impact of Dual Shock**



**Change in travel and mobility patterns**



**Localization of supply chains**



**Focus on business and operational resilience**

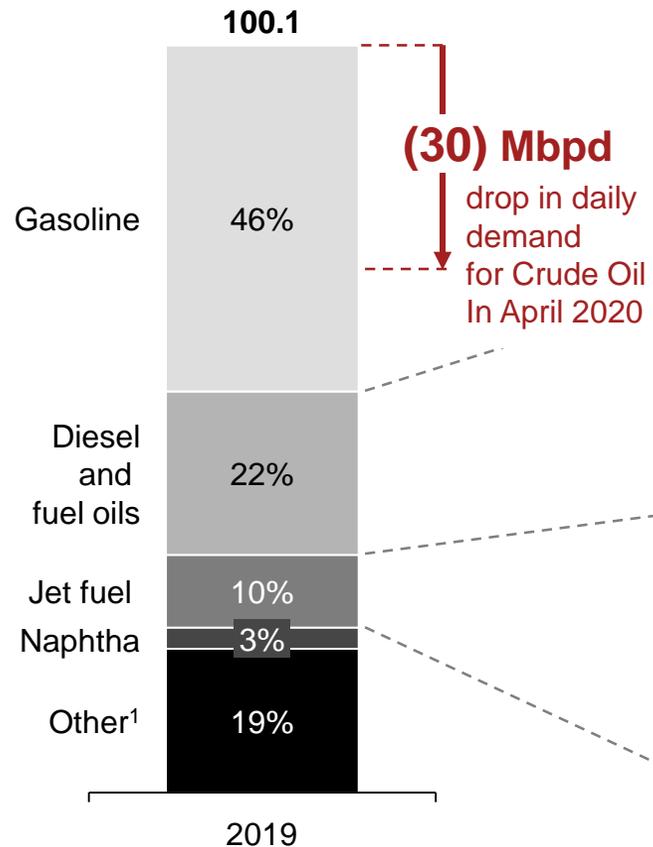


**Government stimulus focus on green energy**

# Oil demand may never fully recover from its post COVID-19 slump due to permanent structural changes in mobility patterns

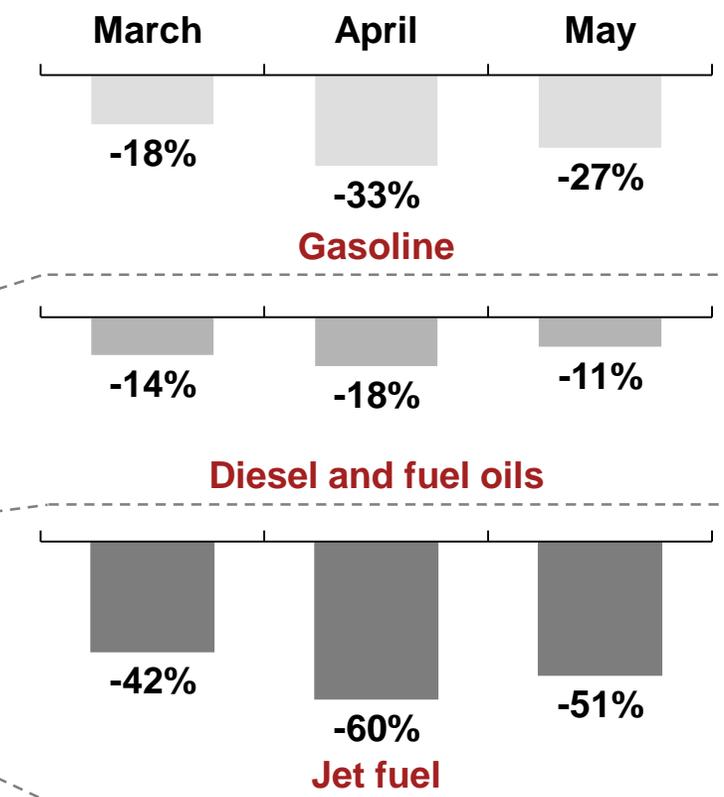
## Crude Oil Breakdown

[Mbpd, % by products]



## Transport Fuels Consumption Drop

[2020, % drop in consumption – YoY basis]



## IMPLICATIONS

- **Fuels demand unlikely to fully recover** due to **behavioral changes** post COVID-19 in local and international mobility
- **Competition will increase** among **suppliers to secure access to end-markets**
- **Unviable supply will be eliminated** based on revised market balance and pricing forecasts, leading to permanent contraction of oil and gas markets

1) Other refined products comprise of LPG, coke, lubricants etc.  
Source: IHS Markit; Rystad, Strategy& analysis

# Batteries are already substituting hydrocarbon demand, with electric vehicles rapidly gaining competitiveness

## Applications

### Transport

- Battery Electric Vehicle (BEV)
- Hybrid Electric Vehicle (HEV)
- Plug-in Hybrid Electric Vehicle (PHEV)

### Renewables

- Capacity Firming
- Time Shift

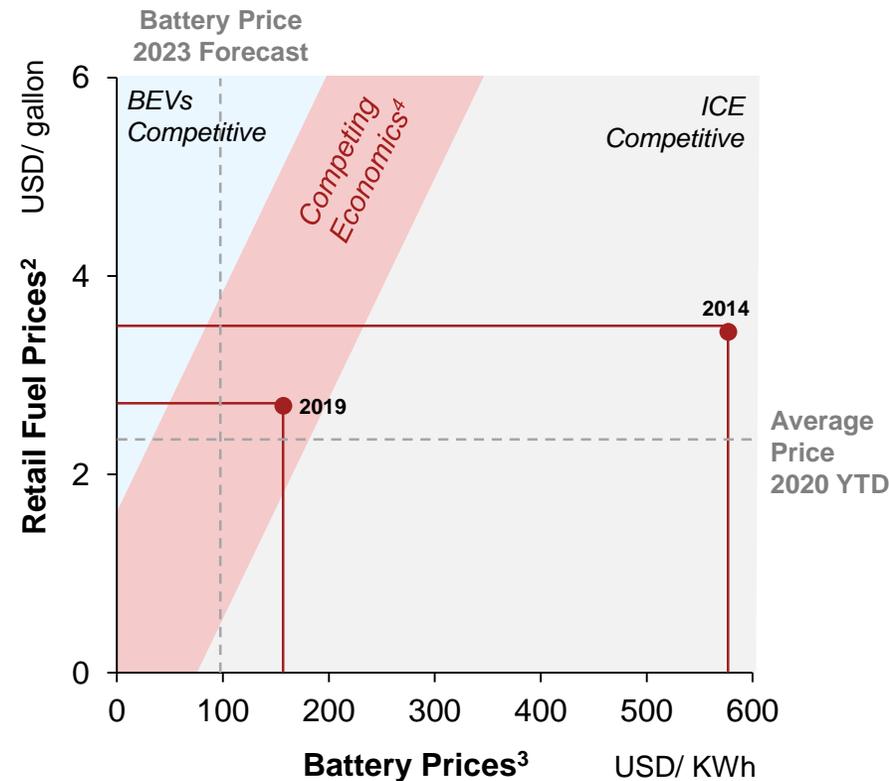
### Grid Balancing/ Optimization

- T&D Deferral
- Frequency Regulation
- Load Levelling

### Power Back-up

- Uninterrupted Power Supply (UPS)
- Diesel Genset Replacement/ Fuel Optimization

## BEV vs. ICE<sup>1</sup> Vehicles Competitiveness



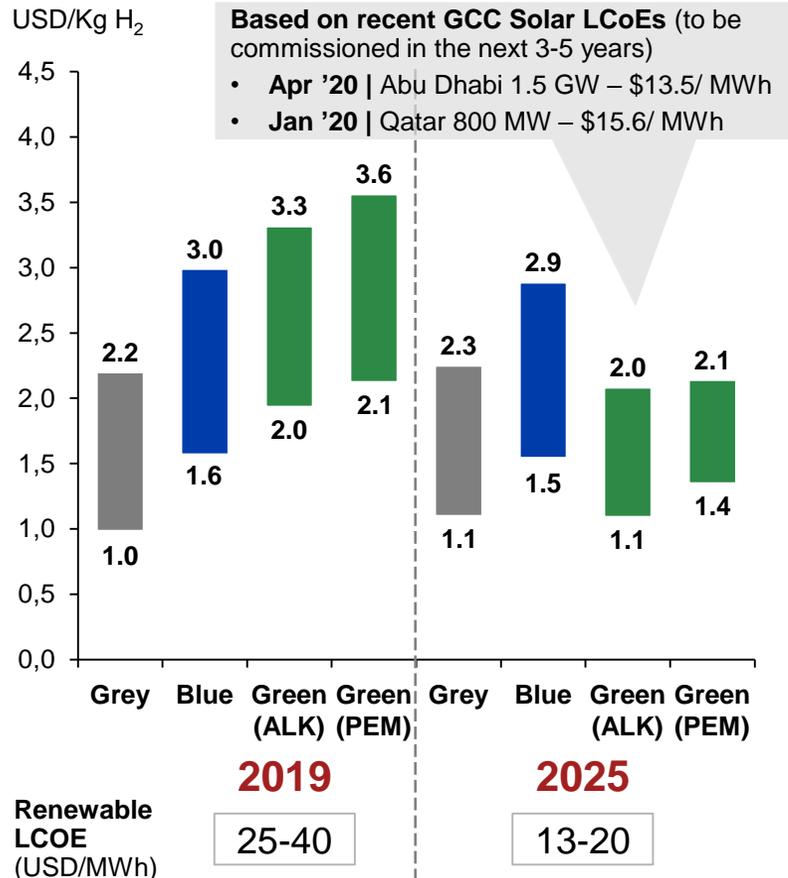
## IMPLICATIONS

- Rapid reduction in battery costs in recent years have making **EVs increasingly competitive**
  - **Incentives** (subsidies, public procurement) and **infrastructure** being introduced in most markets **to encourage EVs uptake**
  - **Carbon taxes** will further **strengthen economics** of EVs
  - At current battery prices, **lower oil prices** are **unlikely to slow down or reverse shift to EVs**
- Applications for **stationary energy storage** also rapidly gaining traction led by **growth of renewables** and **smart grid**

1) Battery Electric Vehicles; 2) US prices – average all grades gasoline (PADD 1-5) – nominal USD; 3) Lithium ion battery pack global prices – real 2018; 4) Based on total cost of ownership of C-segment (Compact), D- (midsize) and E-segment (full-size) vehicles  
Source: EIA, European Commission, Bloomberg New Energy Finance, Strategy& analysis

# Hydrogen as a new energy vector is becoming competitive with hydrocarbons faster than expected, driven by renewables costs

## Hydrogen Production Cost



## Applications

- Transport fuel**
  - Road transport (FCEV)
  - Maritime and aviation (Synth. fuel)
- Heat and power fuel**
  - Industrial/Commercial/Residential heat
  - Power generation
- Feedstock/Chemical agent**
  - Steel
  - Methanol
  - Refining
  - Ammonia

## Transportation methods

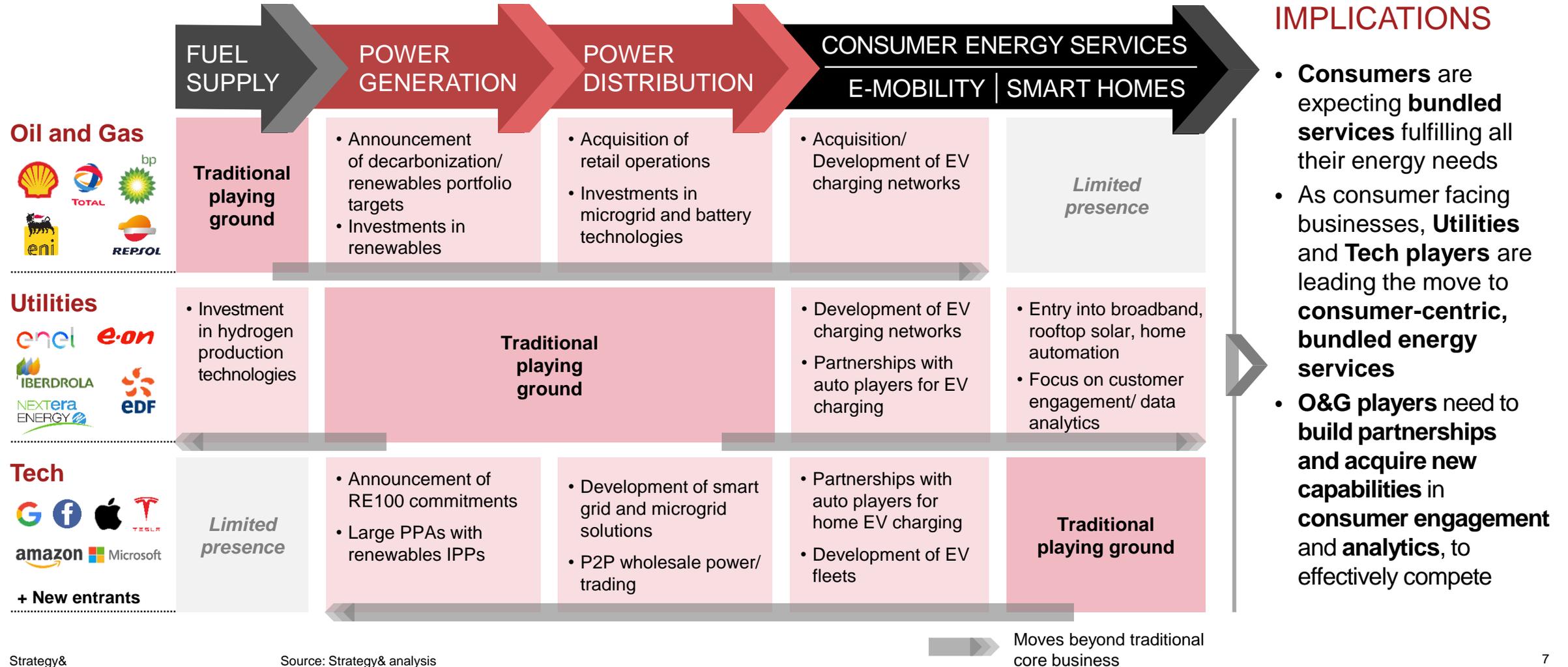
<b>Hydrogen</b>	As compressed or liquefied Hydrogen	} via ship or pipeline
<b>Ammonia</b>	In the form of ammonia as energy carrier	
<b>LOHC<sup>1</sup></b>	By hydrogenation of an organic carrier molecule	

## IMPLICATIONS

- **Hydrogen** emerging as a **new energy vector** with potential to **substitute hydrocarbons**
  - Significant **overlap** in Hydrogen **applications** with **hydrocarbons**
  - High potential to use **existing infrastructure**
  - Green Hydrogen **production cost decline accelerating** based on reducing **renewables LCOEs**
- Reduction in Hydrogen costs, combined with **increase in carbon taxes** will **rapidly erode the cost advantage of hydrocarbons**

# The traditional hard delineation between oil and gas, utilities and technology companies is already eroding

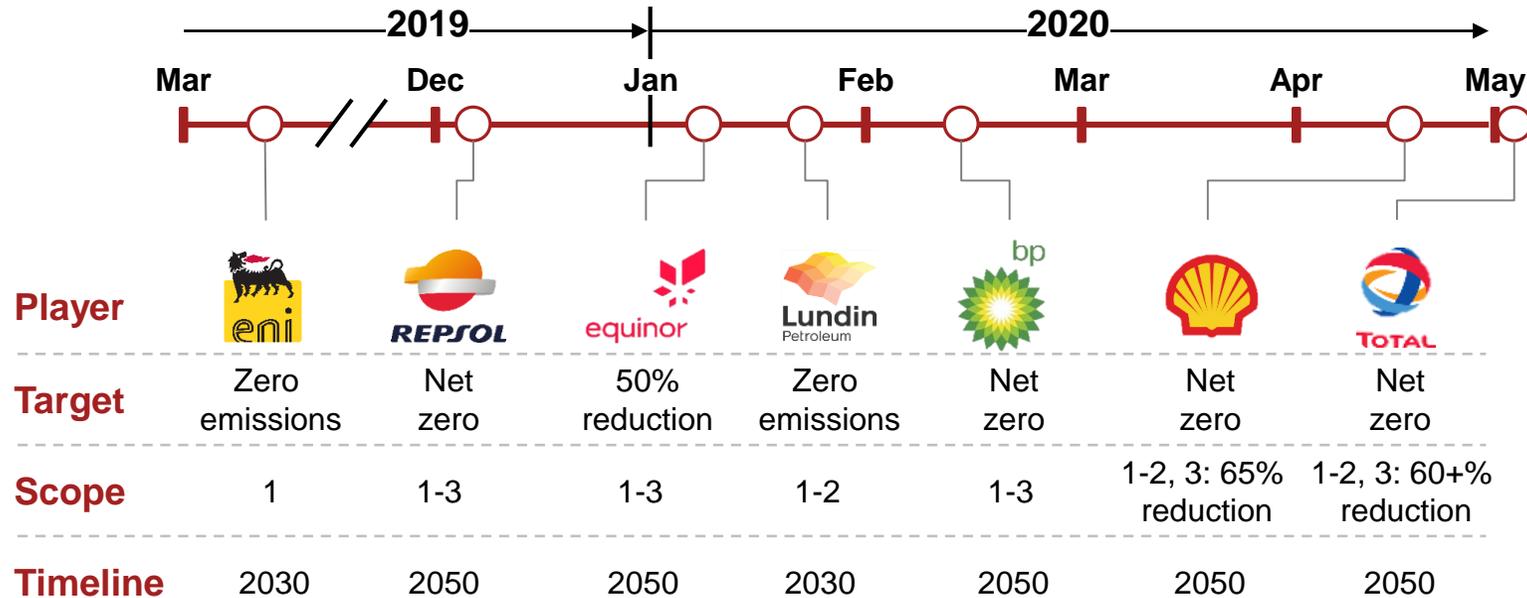
## Convergence along Energy Value Chain



# Climate legislation and shareholder pressure is compelling major players to make big sustainability commitments

## 'Net Zero' Targets Announcements

### Oil and Gas

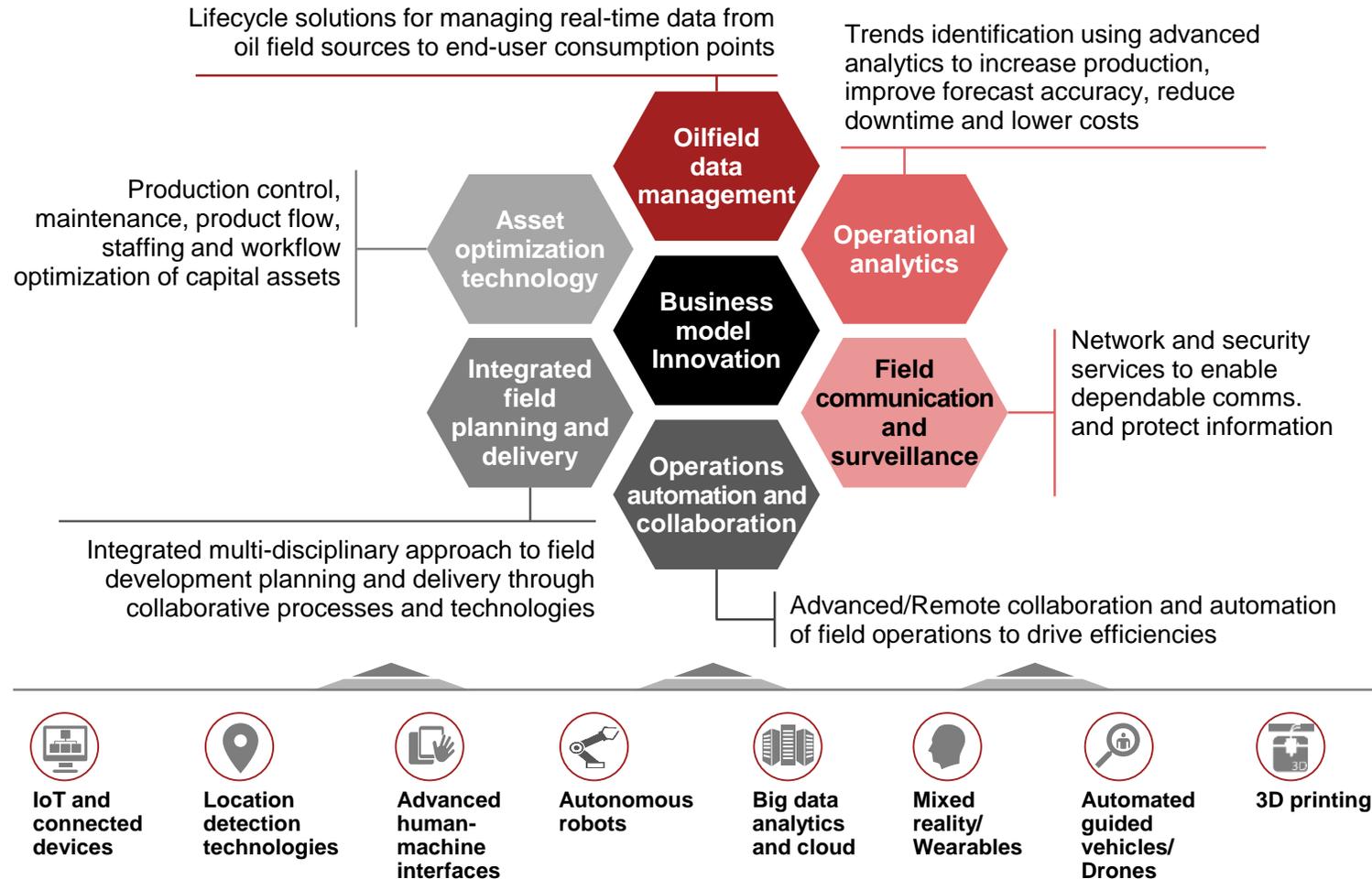


### IMPLICATIONS

- **Climate targets** set in the **Paris Agreement (COP21)** have called for **reduction in emissions**
- **Government targets** and **shareholder pressure** have led an increasing number of companies to announce **emissions reduction/‘Net zero’ targets**
- **European O&G majors** have announced **ambitious targets** in recent months, with **others likely to follow suit (e.g. Total)**
- **Sustainability agenda will accelerate** in response to the **dual shock**, driven by **stimulus packages** focused on **green technologies**

# After decades of investment in digital technology, it is now finally disrupting ways of thinking and working

## Digital Applications and Technologies in O&G



## IMPLICATIONS

- **Digital** technologies and tools are shifting from incremental efficiency improvements and starting to be **disruptive**:
  - **Automation** removing manpower from safety-critical situations
  - **IoT** and **Big Data** analytics creating real-time insight and optimization
  - **Predictive maintenance** and **3D printing** are shortening supply chains for parts and materials
- Digital will be critical for **cost leadership, value chain optimization** and **customer insight and responsiveness**
- **Existing talent** will need to be **reskilled** to **adapt to changes** in ways of working

# The energy sector has dealt with heavy shocks in the past, but we believe it is very different this time

	Past shocks	Current shock
Impact on Oil & Gas	<ul style="list-style-type: none"><li>• Temporary reduction in economic activity leading to demand-supply imbalances</li><li>• Rebound to pre-shock levels in 2-5 quarters</li><li>• Industry reorganized, consolidated and cut costs to offset impact on margins</li></ul>	<ul style="list-style-type: none"><li>• Structural destruction of demand for transport fuels due to permanent behavioral changes</li><li>• Doubling down on clean energy through stimulus packages focusing on new technologies</li><li>• Limited further room for efficiency and productivity improvements</li></ul>
Source of impact	<ul style="list-style-type: none"><li>• Geopolitical events</li><li>• Financial crises</li></ul>	<ul style="list-style-type: none"><li>• Behavioral shifts in travel and mobility</li><li>• Acceleration of energy transition</li></ul>

Nature of impact



**Temporary shift**



**Structural shift**

# Many players are not ready to respond to these five disruptive forces and must now act fast

## Current Situation of Major Energy Players

	1	2	3	4	5
	 <b>CONTRACTION</b>	 <b>SUBSTITUTION</b>	 <b>CONVERGENCE</b>	 <b>SUSTAINABILITY</b>	 <b>DIGITIZATION</b>
 <b>National Oil Companies (NOCs)</b>	<ul style="list-style-type: none"><li>• Natural production cost advantage is being eroded</li><li>• Heavily reliance on long-term crude contracts limits agility in volatile markets</li><li>• Renewable power, energy efficiency and digital initiatives are siloed and sub-scale</li></ul>				
 <b>International Oil Companies (IOCs)</b>		<ul style="list-style-type: none"><li>• Highly diversified portfolios, but downstream hedge doesn't protect against overall value contraction</li><li>• Consumer interface is limited to retail fuel stations</li><li>• Big commitments on sustainability and digital, but limited at-scale disruptive traction</li></ul>			
 <b>Service Companies (EPC, O&amp;S and M&amp;O)</b>			<ul style="list-style-type: none"><li>• Large base of services are rapidly being commoditized and localized</li><li>• Even high-end, technology-led revenues are extremely sensitive to oil prices</li><li>• Focused on maximizing extraction of oil and gas rather than value creation and sustainability</li></ul>		

# Resource-rich NOCs will need to drive de-carbonization and take steps to squeeze value from their resource base

## Key Actions for NOCs



**Maximize value from existing resources**

### Protect natural cost advantage

- Embrace digitization – Prioritize focus areas, transform operating model, reskill the workforce
- Aggressively identify and contain sources of cost creep across the value chain

### Secure 'short' positions

- Aggressively internationalize trading, marketing, distribution and retailing capabilities
- Further invest in downstream chemicals and power to build long-term natural hedges



**Drive de-carbonization agenda**

### Reduce domestic hydrocarbon consumption

- Lobby government to drive legislation to reduce domestic consumption of hydrocarbons to reduce environmental impact and maximize availability for export
  - Electric vehicle uptake and infrastructure
  - Carbon, capture and storage (CCS)
  - Renewables for power-intensive sites/Processes

### Lead development of green hydrogen

- Develop clear action plan for development of a Hydrogen economy
- Pilot Hydrogen production to build capabilities, demonstrate viability and test use-cases
- Influence government to drive utility-scale renewables capacity
- Take lead in deployment of distribution, storage and end-application technologies

# IOCs will need to choose between two distinct paths – Oil and gas specialists or energy leaders – as hedging bets won't work

## IOCs Today

### Diversified Portfolio Players

- **Diversified portfolio** along the value chain
- **Typically cash-rich** due to the nature of their upstream investments
- Advanced capabilities in **resource evaluation and development**
- Experienced in dealing in **challenging political, economic and physical environments**

## IOCs in the Future



### Oil and gas specialists

- Hyper-efficient vertically-integrated hydrocarbon value chain operators
- Aggressively accessing and extracting economic resources, adding value through refining and petrochemicals and distributing to customers



### Energy leaders

- Integrated energy services players seamlessly combining multiple fuel/power sources to meet consumers' needs
- Rapid incubation of energy generation, storage, trading, marketing and distribution, based on deep end-consumer insight

## Key Actions

- Vertically (re-)integrate along the oil and gas value chain
- Divest non-core assets
- Implement digital-led cost and value chain optimization
- Develop lean operating/Financing models
- Integrate along the power value chain – Utility-scale M&A
- Invest in renewables and H<sub>2</sub>, storage and distribution assets
- Partner with tech players on data analytics
- Transform operating model and build digital capabilities focused on consumer insight

# Services companies will need differentiate and diversify to demonstrate the value of their independence

## Key actions

### Service companies

Maintenance, Modifications, and Operations (MMO)

Oil-Field Services (OFS)

Engineering, Procurement and Construction (EPC)



### Differentiate

- Differentiate on core technology offerings through selective consolidation and M&A
  - Support customers' narrative of value chain optimization
  - Demonstrate cost/Efficiency leadership
  - Be a digital leader and enabler
  - Demonstrate sustainability advantage



### Diversify

- Follow customers into hydrogen, renewables and power sectors
  - Augment and showcase existing capabilities that can be leveraged across sectors (e.g. Seismic and subsea services for offshore wind)
  - Invest in development of new capabilities (e.g. Emissions monitoring, carbon capture and storage, hydrogen, geothermal, wind and batteries)
  - Build partnerships to develop new innovative solutions (e.g. Offshore floating concrete wind platforms, modular utility scale PV deployment)

**Demonstrate value of independence or face:**

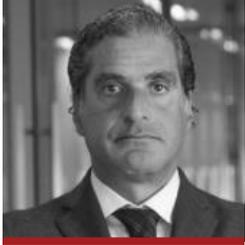
- **Commoditization**
- **Localization**
- **Consolidation**

# In summary, the five unstoppable forces are accelerating and the energy sector needs to act



- **Five unstoppable forces** will change the energy landscape as we currently know it
- The “**Dual Shock**” of COVID-19 and collapsing oil prices has accelerated these forces and will cause a structural shift in the market
- In order to survive, energy players need to act now:
  - **Resource-rich NOCs** must drive the **decarbonization agenda** in their host countries and take steps to **maximize value** from their hydrocarbon resources
  - **IOCs** will need to choose between **two distinct paths** – Being Oil and Gas specialists or energy leaders
  - **Services companies** will need **differentiate** and **diversify** to demonstrate value of independence or face consolidation, localization and commoditization

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# Thank you

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