

The Energy Transition: From Oil & Gas Majors to Sustainable Energy Leaders



Abstract

Energy transition is accelerating, and the first thread is visible in the shift from fossil fuels to sustainable sources of energy.

Europe has led the global sustainability agenda by adopting the Paris Agreement in December 2015 and with the announcement of the European Green Deal in December 2019. The movement is gathering global momentum, with China, the largest emitter of greenhouse gases, committing to net zero emissions by 2060. Major economies such as the US, Japan, South Korea, and Canada have announced net-zero targets for 2050.

The COVID-19 pandemic initially caused a drop in renewable installations due to supply-chain disruptions and global economic uncertainty. It also created a need for stimulus, and investment in carbon footprint reduction is seen as a great tool for economic recovery by many governments. For example, to meet the 2050 net-zero commitment, the UK government announced a green industrial revolution plan in November 2020, and expects the plan to create 250,000 jobs.

Building on the belief that sustainable energy is the key requisite for global transition to net zero emissions, we look at the characteristics of energy transition for oil and gas companies.

Core drivers for sustainable energy

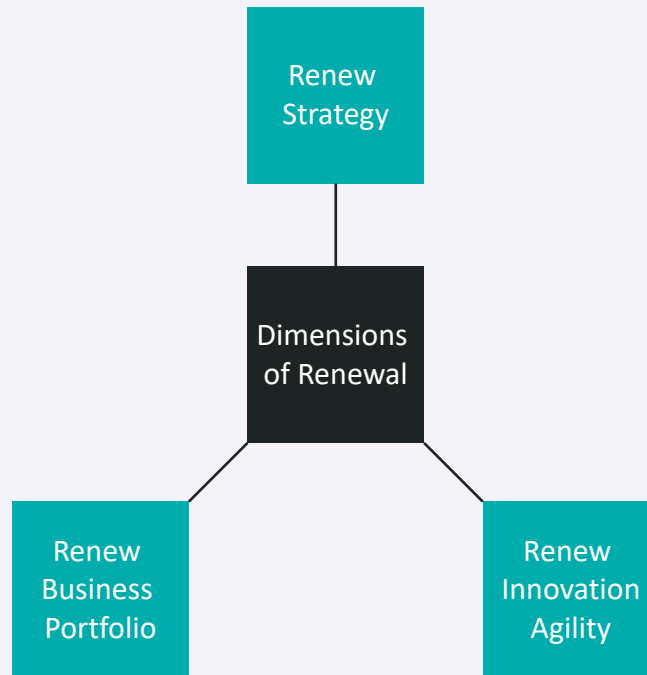
The forces driving the shift to sustainable energy are compelling.

1. The need for greater affordable access to energy is the primary driver for growth in energy demand. World demand for energy and materials is expected to rise as the population increases from 8 billion to 10 billion by 2050.
2. Rising climate risks make it necessary to decarbonize our energy portfolio.
3. Social and regulatory mandates for sustainability are being set into policy and law. Governments are exploring financial models to incentivize acceleration of energy transition.
4. Investor concerns and climate risk disclosures are changing the behavior of capital flows that power our energy industry. Affordable renewables, energy storage, electric and autonomous vehicles, and energy efficiency are some of the factors driving investors to question the future of oil & gas companies.

We believe many oil and gas majors will seek to transform into sustainable energy companies, and will have to find ways to do so in a financially sustainable manner. This will be the second thread towards energy transition- the forthcoming renewal of oil and gas companies to become sustainable energy leaders.

Dimensions of renewal for oil and gas companies

In order to face the future and emerge successful, oil and gas majors will navigate a process of renewal across three dimensions: **strategy**, **business portfolio**, and **innovation agility**. Several oil & gas firms have already begun the process.



A. Renew strategy

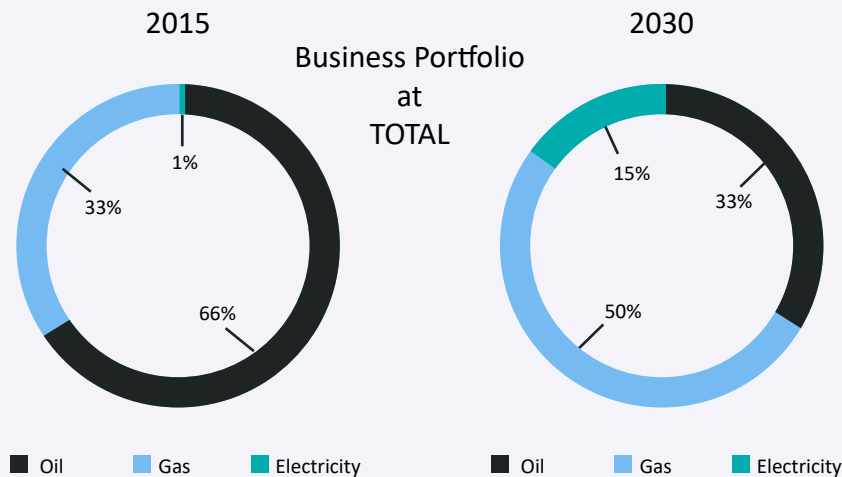
- Oil & gas firms are taking a strategic relook at their future business models.
- We believe strategy renewal will lead to a diverse set of choices for the future energy mix. So far, while European oil & gas firms are pursuing a broad energy mix with greater investments in renewable power, most companies from North America or the Middle East continue to focus on oil and gas. Several Australian firms have also set their sights on growth in natural gas as a low-carbon transition fuel, while exploring hydrogen strategies for the future. Beyond the general trends, every oil & gas company will make their own decisions towards a strategy for the future.
- Oil and gas companies need plans for extensive and regular dialog about the energy transition strategy with policymakers and regulators, citizens and consumers, and industries that depend on their products. Investors, too, must be convinced of the merits and financial sustainability of plans.

B. Renew business portfolio

Strategy renewal has obvious implications for business portfolio restructuring.

Here's a look at examples from two oil and gas leaders:

- BP¹ aims to reduce oil production by 40% by 2030, grow its renewables portfolio 20 times to 50 GW, double the LNG portfolio, and expand the bioenergy business 4.5 times.
- In 2015, two-thirds of TOTAL² business was crude oil. By 2030, two-thirds of the business will be natural gas and renewable electricity.



We believe renewal of the business portfolio for energy transition will create three visible impacts for oil and gas firms:

- restructure for a new energy mix,
- adopt hyper-efficient operations, and
- seek new markets and ecosystems.

B.1. Restructure for a new energy mix: This will become evident in the following ways:

- M&A activity will rise, as each energy company divests and acquires assets to match its preferred future energy mix.
- Siloed organizational structures of upstream, midstream, and downstream may need to integrate to compete with 'new energy' divisions. Oil & gas corporate leadership will focus on creation of new management operating systems and culture.
- Asset and product portfolios may shift dramatically to align with projected scenarios for a firm's future energy mix.

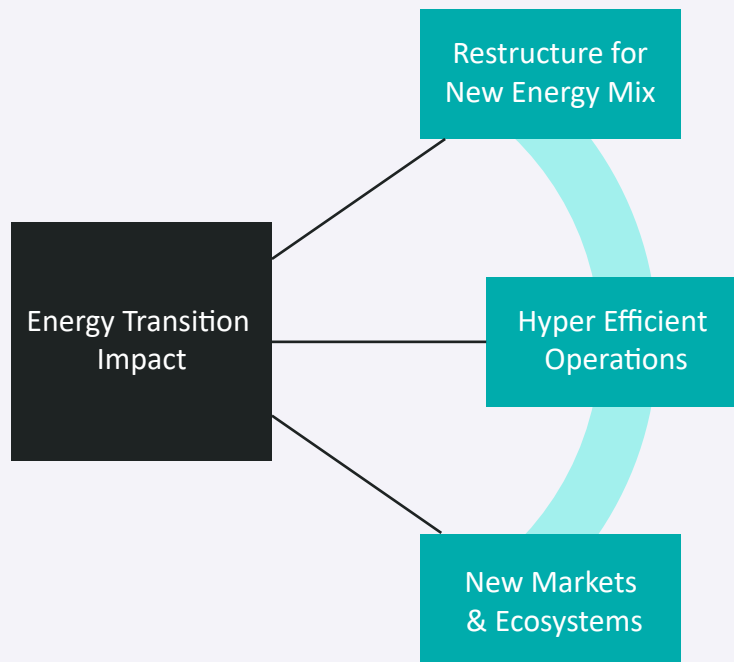
The refining and petrochemicals asset portfolio may witness major shifts on both ends of the supply chain:

1. On the products side, a greater share of oil and gas will likely be converted to petrochemicals
2. The input feedstock may change to implement a circular economy focus towards biofuels, recycled petrochemicals, and polymers.

Fuel retailers will want to optimize the value of each product, and diversify revenue mix towards non-fuel services such as food and beverages. Further, the trading desks will include power and carbon, in addition to oil and gas products. The existing products may need to acquire new characteristics, e.g., natural gas may evolve into carbon-neutral LNG, with offsets and carbon trading.

[1] bp strategy presentation Aug 2020, bp week presentations Sep 2020.

[2] Total's Getting to Net Zero report Sep 2020.



B.2. Hyper-efficient operations: Some of the key traits will be visible in the following ways:

- Only the cleanest and most profitable barrels of oil and gas may remain competitive in the future, as oil & gas demand peaks and then goes into a long-term decline. Financially, existing investments in some of the high cost, high carbon assets risk being stranded, as sustainable energy becomes more affordable and preferred by regulations.
- Retained oil & gas assets will need to be operated at their most efficient, not only to preserve capital and reduce operating costs, but also to lower emissions- green for the environment and green for profitability. Of course, these retained oil & gas assets cannot be considered sustainable unless they meet the demands of safety and security. Transparency in measurement of emissions will help establish credibility with regulators and society.
- The need for hyper-efficient operations will affect companies differently, depending on the competitiveness of their asset mix, convictions about their future strategy, and financial capacity to diversify. Easy-to-produce, low-cost oil and gas fields may have continued relevance, if they can largely eliminate emissions and work with customers to offset emissions at the consumption stage.
- Electrification, energy efficiency, and capturing fugitive emissions are pathways to low-emissions operations. In upstream, offshore oil rigs and production facilities can be connected to grid power or offshore renewables. Refining and petrochemicals may see energy efficiency as key to both emissions and competitiveness. About half the cost of refining is energy, and refining produces about half the emissions in the production-to-retail value chain.
- Digital assets and technology improvements will allow highly efficient production of oil and gas. Advancements in analytics and AI, IoT, robotics, remote operations, and cloud will help reimagine operations by leveraging Business 4.0 principles.

B.3. New markets and ecosystems: Oil and gas companies have set up 'new energy' divisions to focus on renewables, electricity, energy storage, carbon capture, utilization and storage (CCUS) and circular economy, hydrogen, and natural gas as a low-carbon transition fuel. We see the need to develop new markets and ecosystems across growth opportunities in energy:

- **Renewables:** Solar and wind power have their own characteristics for siting and installing new projects, a new set of suppliers compared with oil and gas asset OEMs, and very different financial dynamics related with costs, profitability, and return on investment. For example, exploration risk is non-existent in renewables. Creating a capital-efficient, global scale wind energy business may need regional supply chains, with designs suited to local needs.
- **Electrification** presents large new opportunities for growth.
 - a. **Electric vehicles:** Electric Vehicle (EV) charging will be a massive growth segment for the next decade or longer. Companies are acquiring EV charging networks and investing to scale the business. Some EV charging networks could also become EV leasing and rental companies of the future, capturing the value from low fuel and maintenance costs into smaller all-inclusive payments for consumers.
 - b. **Energy grids and storage:** Electrification may become the norm in building heating, and also play a big role in reducing emissions in industrial processes, such as steelmaking (through electric arc furnaces). The large investments needed in transmission grids and energy storage will nudge some oil and gas companies to become power utilities. Deep integration of renewables, smart grids, batteries, and long-term energy backup solutions is an ecosystem play. Energy storage coupled with demand response and smart home/smart building technology can create new 'Energy Cloud' models such as virtual power plants and energy efficiency services, enabled via a new digital experience.
- **Hydrogen:** It is proposed as an energy carrier for long-distance trucking, shipping, and aviation. Industrial processes that need chemical properties of hydrogen may present another opportunity. The reduction of iron ore into iron and steel is an interesting use case as steelmaking accounts for 7-8% of global carbon emissions.
- **Circular economy:** Reverse supply chains may need to be built and scaled up with a variety of ecosystem partners. Waste management firms can provide feedstock for waste-to-energy/waste-to-fuels projects. Plastic waste can be segregated and recycled. Farming and agro-commodities firms can provide bio feedstock for renewable fuels, and used vegetable oils can be processed into bio-diesel.
- **CCUS and offsets:** Oil and gas companies can work with businesses in hard-to-abate sectors (such as steel and cement) for partnerships to capture carbon at source, or to offset it via nature-based solutions. Collaborative partnerships and cross-value-chain tracking of carbon are needed to deliver innovations such as carbon-neutral LNG. Success will also depend on policy and finance ecosystems, e.g. in areas such as carbon pricing and trading. Carbon pricing needs to be fair, and the economically weakest sections of society cannot pick up the bill.

About 85–90% of oil & gas carbon footprint lies outside the oil & gas industry, at the point of consumption of products sold. For example, emissions produced when we use fuel to drive a vehicle. Decarbonization of energy-consuming sectors poses a threat to oil & gas product demand. On the other hand, working with customers to adopt alternatives or to capture emissions provides new business opportunities to companies willing to make the transition. Businesses can accelerate adoption using models that spread costs over time, and bring forward the benefits.

We believe oil and gas companies will find opportunity in a 'carbon handshake' across value chains and ecosystems, in the race to net zero. Growth will come from new operating models in new market ecosystems.

C. Renew innovation and agility

Energy transition is a foundational change at a global scale. It will offer new 'once in a generation' opportunities that we may not fully foresee at the beginning of the transition. The oil & gas sector will also need to learn a whole range of new skills, and attract and retain new talent. For example, new energy models feature consumer adoption and experience as essential to success, whereas Oil & Gas has traditionally focused more on geoscience, petroleum engineering and asset optimization. New energy ecosystems will need new data streams in addition to new physical value chains. We believe the energy transition context will remain dynamic, making innovation and leadership agility pivotal.

- Policy, technology, and business model challenges will be in areas beyond traditional oil and gas strengths. This will call for multidisciplinary approaches and new ecosystems of partners.
- Regulatory frameworks, competitive strength of technology choices powering the energy mix, consumer adoption, and its impact on energy business models will all be dynamic. For example, regulations on open access and standards for power and data interface for all EVs and charging providers can completely transform the dynamics of EV charging. EV adoption can rise faster, and captive EV charging networks do not offer any competitive advantage to car makers in such a scenario.
- The transition will take a long time, yet it may be faster than expected. A 20-30 year energy transition (2020-2050) will be 2x-3x faster compared with previous energy transitions. Oil took 60 years to hit 40% of the world's energy supply after it reached 5% in 1915.
- We are likely to see major inflection points and non-linear effects during the energy transition. Several oil and gas leaders have announced 2030 and 2050 targets, and we should expect a substantial review of the strategy in the 2023-2025 timeframe. Underlying trends such as cost of renewables and storage, and adoption of EVs may hit inflection points by then in several markets.
- In most deployment scenarios, the electric route is far more efficient, requiring much less energy. This can lead to exponential adoption curves, especially as initial capex drops, or cheap funding allows per-unit costs to drop below conventional options. It also implies that the new market size could turn out to be smaller than the legacy business it replaces. Besides, we may get used to measuring energy production or sales in petajoules instead of million barrels of oil equivalent.
- Across industries, growth in new business models often leads to new players winning over incumbents. A part of this result comes from the desire to protect legacy investments, but the baggage of old ways of working can also be an unappreciated bottleneck.

Conclusion

We believe oil and gas companies will need to demonstrate extraordinary leadership conviction and agility to successfully navigate the energy transition. Business and innovation leaders will drive a renewed organization culture, and frequently re-evaluate the changing context of energy to allocate capital to competing options for technology and market development. Business 4.0 and digital innovation are vital to the evolving energy ecosystem. New data streams and new digital experience will accelerate new value chains. Companies may invest in multiple competing ideas, both internally and with partners, and scale up the ones that demonstrate traction in key markets.

Ambitious goals have a way of becoming self-fulfilling prophecies because they send out a powerful signal to society, employees, partners, and regulators and policymakers to work towards these goals. The momentum is shifting towards increasingly ambitious goals for action against climate change, to drive an accelerated energy transition. The time to act is now.

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