



CRA Insights: Energy

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Beyond greenwash A supermajor renewable portfolio challenge

The largest private-sector oil and gas companies have signalled an intention to increase their investments in lower carbon energy sources and technologies. This is not the first time. However, the increasing drumbeat arising from new climate change accords, investor activism, and shifts in public opinion suggest that the larger energy firms may find that without demonstrable activity, their “social licence” to operate comes under increasing pressure.

Some industry forecasters predict that oil demand may peak and decline as soon as the 2030s – less than the lifetime of an upstream project starting up today. For the foreseeable future, however, oil and gas companies will have to find the right balance between continuing to seek returns from their historic oil and gas businesses while increasing their participation in an inherently different alternative energy industry.

In this paper, we look at the potential scale of investment in renewables and questions that arise as companies organise around this challenge.

The scale of the challenge

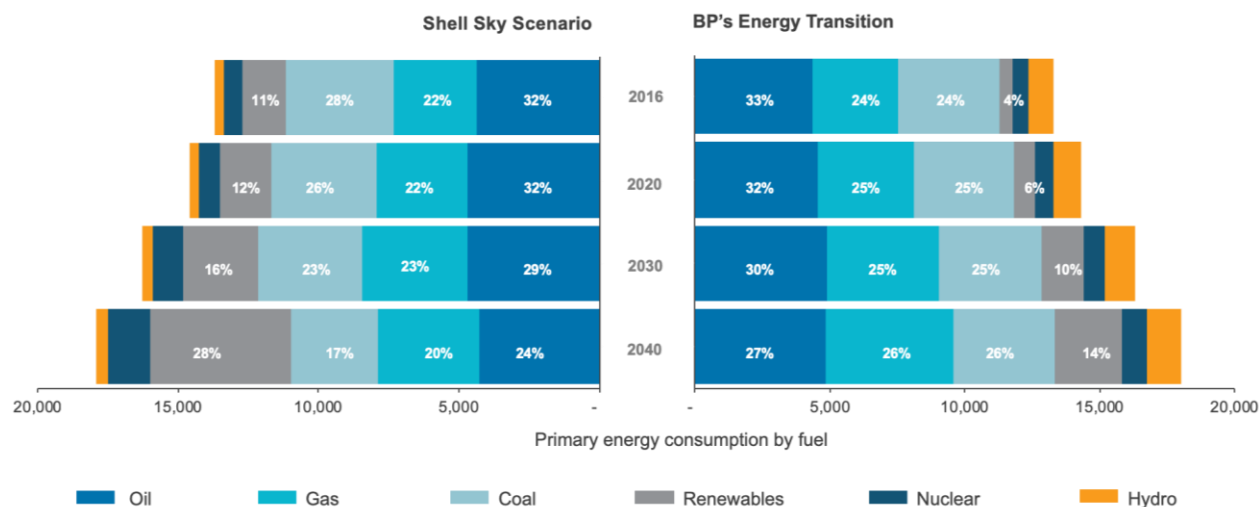
The supermajors¹ currently make up around 6% of total primary energy consumed.² Two of these firms, BP and Shell, present different scenarios but both forecast the renewable share of energy consumption will grow approximately three-fold by 2040 (see Figure 1).³

¹ Here defined as: BP, Shell, Exxon, Total and Chevron.

² Based on annual reports and BP and Shell statistics of energy consumption in 2016.

³ BP considers a number of scenarios in its projections. The evolving transition scenario is the more conservative scenario presented by BP. Other scenarios result in renewable projections similar to Shell's Sky Scenario.

Figure 1: Peak oil demand not until the 2030s, mn tonnes oil equivalent



Source: BP, Shell and CRA analysis

Even modest ambition in the renewables sector could transform today's capital budgets and bring a significant challenge to the institutional capacity of the supermajors.

If they simply invested to maintain their share of total energy demand, it is likely to lead to substantial increases in gas production and reduced oil production by 2040. Some companies could take the view that falling oil production, in line with market demand, comprises a strategy that is consistent with overall trends and, as such, is most likely to preserve shareholder value – provided that alternative investments can be found to fill the gap left by oil's decline.

Using the projections in Figure 1 for illustrative purposes, if renewable energy projects filled the gap left by falling oil demand, we estimate that the supermajors would need to capture about 3%–4% of total renewable energy supply by 2040 to maintain their overall share of energy consumption.⁴ This could require as much as US\$50 billion of average annual investment by the four supermajors if focussed on renewable electricity generation. To put this in context, total supermajor capital expenditures in 2016 and 2017 was roughly US\$100 billion, with less than 2%–3% of that being allocated to low carbon investments.⁵ This illustrates that even limited adjustments mean the scale of investment would need to be significant in terms of investment plans for the major oil companies.

A more ambitious shift away from oil and gas—rebalanced with greater amounts of renewable energy supply—would further increase the requirement for capital expenditure in renewable generation. For example, if the supermajors reduced their share of total oil and gas production by a quarter, whilst holding their overall share of primary energy constant, we estimate they would need to capture around

⁴ Holding their percentage share of oil and gas supply constant, we estimate the percentage of total renewable energy supply (by reference to BP and Shell's forecasted renewable energy supply in 2040 shown in Figure 1) that would be required to leave their overall share of energy (oil, gas, renewables) constant.

⁵ Sourced from annual reports. Shell excludes BG acquisition. Low carbon investment percentage (2010–Q3 2018) sourced from *Financial Times*, 27 December 2018, available at <https://www.ft.com/content/9421ea96-01e1-11e9-9d01-cd4d49afb3e3>.

10%–15% of forecast renewable energy supply by 2040 at an average annual capital cost of US\$70–US\$120 billion if focussed on electricity generation.

Whilst the balance sheets and access to capital for the supermajors may facilitate these levels of expenditure, the risk and return of alternative energy investments is inherently different from traditional oil and gas investments. Critically, the number of alternative energy projects will likely need to be greater to generate an equivalent energy supply impact to that of a single oil and gas project.

As an illustration, in 2017 BP delivered seven major oil and gas upstream projects from which its share of peak production was equivalent to one hundred times the possible contribution of the world's-largest offshore wind farm.⁶ If we looked at other large oil and gas companies we would expect to see a similar pattern. Upwards of a thousand similar renewable projects would be required to reach just 3%–4% of market share in 2040. Mega renewable projects like the Gansu onshore wind farm in China may reach a capacity of 20,000 MW, far more than the average project size observed to date, but these investment opportunities may be limited in number and not always accessible to foreign oil companies.

How alternative energy changes the relationship between supermajors and host governments

Without a global market for electricity it will be difficult to avoid participating along the entire value chain, right down to the final customer. The larger oil and gas companies have a great amount of experience dealing with a wide variety of host governments and this will bring a sharp appreciation of political risk. However, host nations for oil and gas projects see such projects as an attractive source of revenue; in contrast, renewable projects, some of which still enjoy subsidies, can represent a financial burden on governments. If supermajors increase their participation in alternative energy projects, the relationship between the company and the host government may change from benefactor to beneficiary.

On top of this, as various renewable technologies mature, there will be fewer subsidies on offer for developers. Zero-subsidy offshore wind farms and solar farms are already proposed and being developed.⁷ In our experience, the larger oil and gas companies seek investments which are sufficiently advantaged that they remain economically viable even with significant downturns in price. That is less likely with renewables, at least in the short term. Whilst we anticipate continued declines in alternative energy technology costs, significantly cost-advantaged renewable projects (relative to electricity market prices) are still some way off. Market price risk, therefore, will be more significant.

The evolving investor case

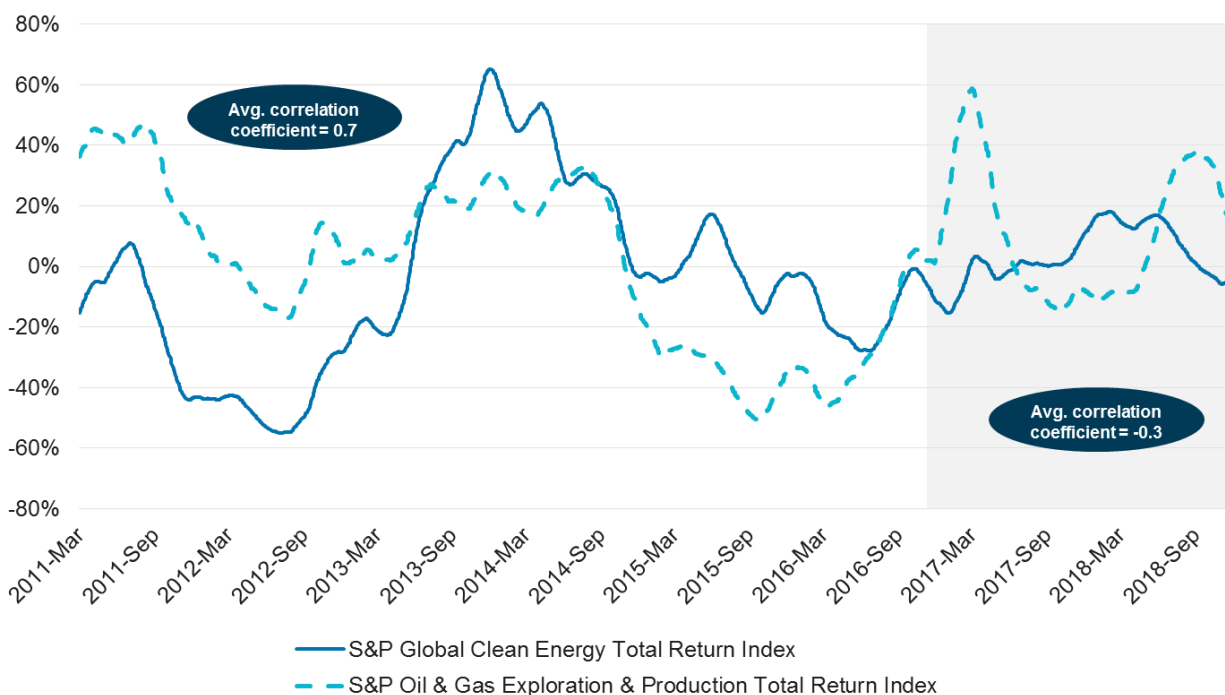
A greater share for renewables in the supermajors' portfolio will also change their investor cases. There have been periods of both stronger and weaker correlation between the oil and gas upstream and renewable industry valuations. For example, Figure 2 shows the three-month moving average of the annual change in the S&P Clean Energy Total Return Index and the S&P Oil & Gas Exploration &

⁶ BP 2017 Annual Report, Net Peak Production from Taurus & Libra (Egypt), TROC (Trinidad), Quad 204 (UK), Persephone (Australia), Juniper (Trinidad), and Khazzan Phase 1 (Oman). Annualised volumes from reported daily peak production. The current largest offshore wind farm in the world (the Walney Extension located in the Irish Sea), however, has a 660MW capacity. Assuming a 45% capacity factor, this would represent only 0.22MTOE per year or equivalent to just 0.002% of total world energy consumption in 2016.

⁷ For example, in May 2018, Engie announced that it would develop 300MW of wind energy in Spain without government support. (See <https://www.engie.com/en/journalists/press-releases/300-mw-wind-project-spain/>). In addition, Bloomberg New Energy Finance reported that in 2018, there was at least 676MW of subsidy-free solar capacity commissioned or under construction in Europe.

Production Index. Whilst changes in shareholder returns from the oil and gas sector have been correlated with those achieved in the renewables sector, they have exhibited quite differing levels and since the beginning of 2017, the future of the observed relationship is uncertain.

Figure 2: S&P Clean Energy Total Return Index vs. S&P Oil & Gas Exploration & Production Index



Source: Bloomberg, CRA analysis

The importance of natural gas-fired generation in many markets, with early adoption of renewable energy, has meant that the market value of renewable projects is positively correlated with natural gas prices particularly in regions with well-developed electricity markets. An increase in gas prices makes renewable energy more cost-competitive in supply of electricity. Therefore, more investment in renewables would increase the supermajors' exposure to gas prices.

The future nature of this correlation is, however, uncertain and will only continue to hold if gas-fired plants retain a price-setting role in electricity markets. As renewable shares grow, electricity prices may track gas prices to a lesser extent; this means that the value of renewable investments is less well correlated to gas prices and renewables could start to diversify portfolio risk.

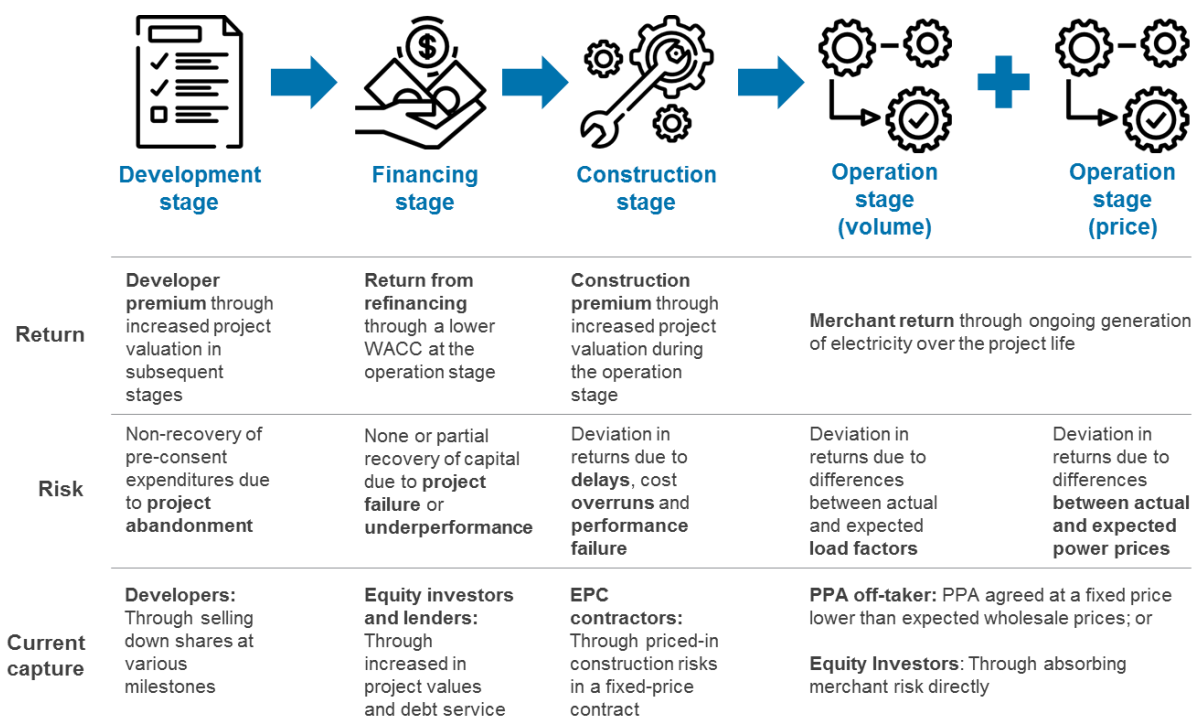
Participation choices

Given the uncertainties going forward, what are the options for supermajors? In the short run, a logical portfolio choice is projects which reduce emissions arising from existing and future oil and gas production. This builds upon existing institutional skills and capabilities. However, this approach does not deliver the "green" credentials in the same way as direct investment in renewable projects. Beyond this, the challenge for the supermajors is to identify new investment opportunities that provide an acceptable combination of growth, risk and returns.

For those that commit to an asset-based response to the energy transition, an emerging question will be whether achieving any significant scale in renewables should be actioned through organic growth rather than substantial acquisitions. Certainly, companies looking to establish themselves in this market ahead of their rivals will look for faster ways to grow their portfolios than is probable from organic growth alone. The local and disaggregated nature of renewable energy assets and the expertise required in mastering new market segments and regulatory risk (as in the electricity market), point to advantages for M&A-driven growth rather than organic growth, as utilities should already possess the relevant capabilities and relationships. However, it would also bring significant integration challenges.

Growth model aside, we identify five stages on the value chain in Figure 3. Each stage offers different risk and return profiles and an opportunity for the larger oil and gas companies to participate.

Figure 3: Renewable value chain opportunities



Source: CRA analysis

The answer will be different for each firm depending on their relative institutional capabilities. In our view, however, they can derive significant competitive advantage from the strength of their balance sheet and an institutionally long-term planning horizon.

Whilst there will be a temptation to show green credentials through direct ownership of assets, these companies are also well-placed to finance and bear the risk of renewable investments and so may be in a position to do so for others in addition to their own projects (for whom it could provide critical cost advantages). This could allow the supermajors to substitute for the current funders who are less comfortable, post-subsidy, with merchant price and credit risk.

Finally, with an inherently long planning horizon and experience of managing long-term projects which can take years from inception to generate positive cash-flows, the supermajors may be competitively advantaged to invest in renewable technologies which are further from market-parity (like carbon

capture and hydrogen) and to which they can bring existing R&D capabilities in chemistry, material sciences and geophysics. We will address some of these opportunities in further papers.

About CRA's Energy Practice

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