WELLS FARGO Asset Management

INVESTMENT PERSPECTIVES

The aspirational investment case for integrated energy

By Wells Fargo Asset Management's Climate Change Working Group (CCWG) and Energy Sector Analysts

Executive summary

Energy has been the worst-performing sector in the S&P 500 Index over 3-, 5-, and 10-year periods.

Integrated energy[1] lost 64% of its equity market capitalization between 31 December 2018 and 23 March 2020 and also underperformed markedly in credit markets during that period. While valuations have recovered since March, integrated energy shares remain down more than 40% since the end of 2018.

How we got here: Four major events explain most of the underperformance.

The end of the commodity supercycle, the advent of shale and other unconventional production, the energy transition, and the strain on integrated energy's social contract all played important roles in the decline.

The great pivot: Integrated energy is responding.

Firms are taking three specific actions to improve their value proposition:

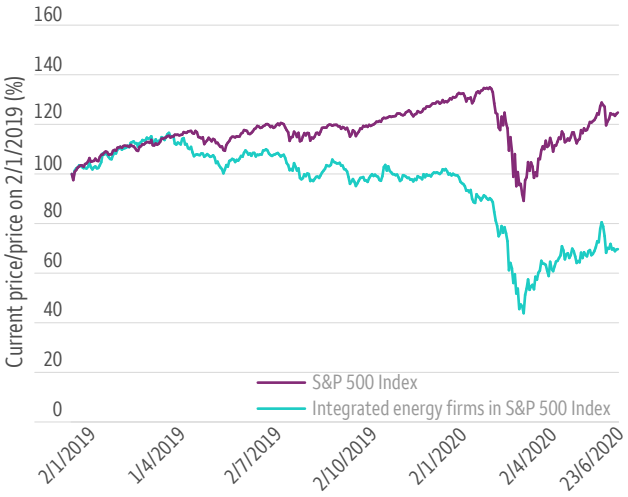
1. Establishing convincing long-term strategies for a decarbonizing economy
2. Strengthening governance practices, especially related to capital allocation and climate risk management
3. Redoubling stakeholder relations initiatives

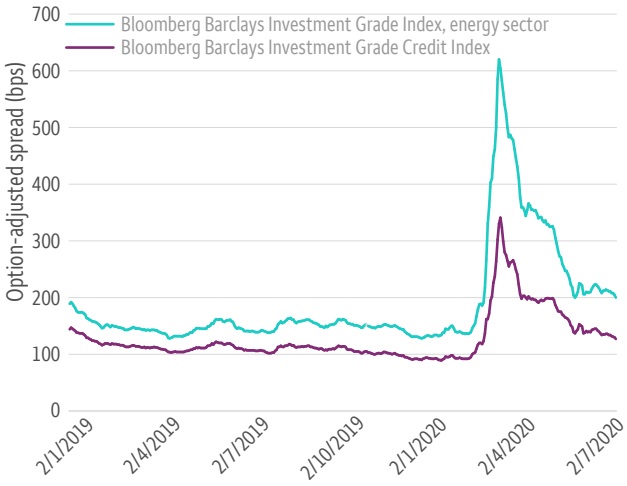
The prize: The aspirational investment case for integrated energy.

Quickly attaining these goals would be a major challenge, to be sure. But firms are making increasingly deliberate efforts to do so. Thus, while substantial execution risk remains, investors can benefit from evaluating outperformance potential and higher sector weightings over the longer term. We quantify this potential—with attention to emerging changes in prevailing valuation practice—using Norwegian energy firm Equinor ASA (formerly Statoil ASA) and Galp Energia, SGPS, S.A., as examples.

1. The integrated oil and gas industry explores, produces, refines, markets, and distributes oil and gas. The integrated energy firms evaluated in this report operate globally and have large market capitalizations. These characteristics differentiate them from firms that focus discretely on any one of these activities.

Figure 1: Energy shares' discount to the S&P 500 Index has mounted … as has energy credit's spread premium





Sources: WFAM and Bloomberg

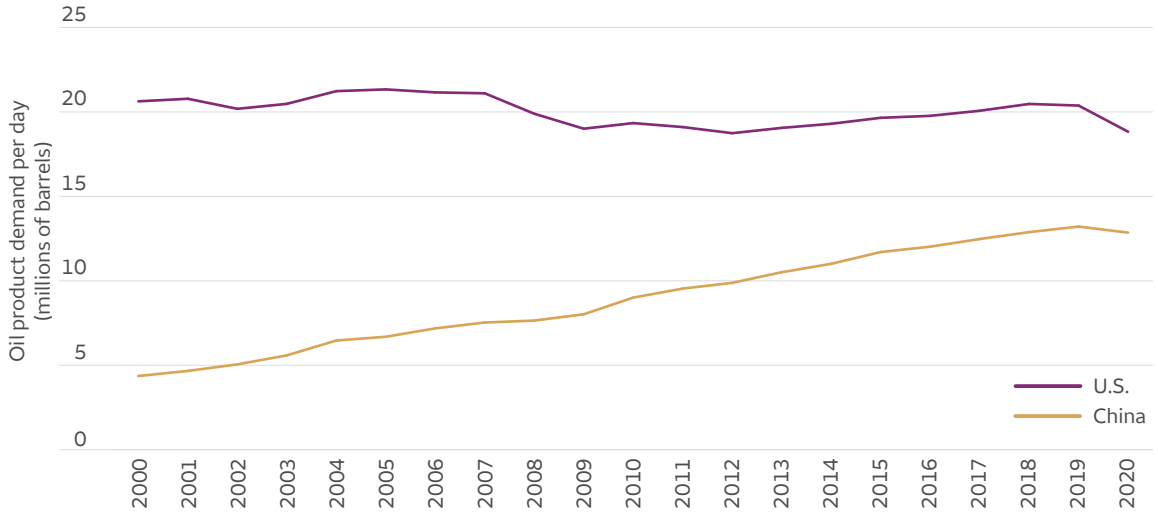
bps = basis points (100 bps equals 1.00%)

How we got here: Four major events explain most of the underperformance

1. The end of the commodity supercycle

The most recent commodity cycle began in the early 2000s as China's economic growth accelerated. China's demand for diesel fuel to power growth in mining, construction, and associated long-haul trucking drove global consumption for the following decade.

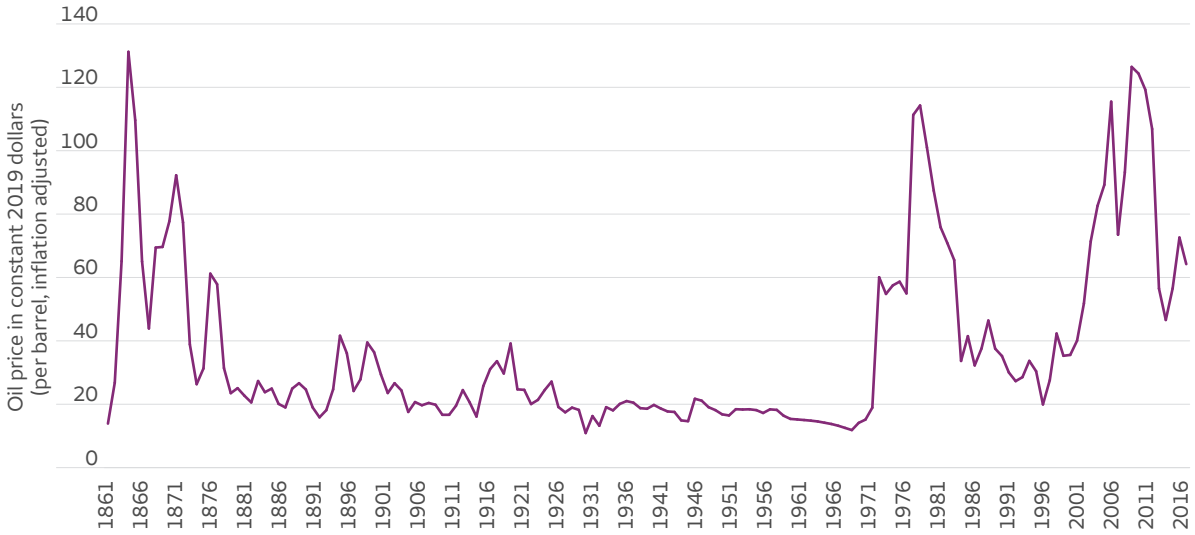
Figure 2: China and U.S. oil product demand



Sources: WFAM and Wood Mackenzie (2020)

China's demand, which could not be met by an equal supply response, led to rapidly increasing oil prices. Initially, nearly the entire energy industry prospered. Prices raced higher while costs were slow to catch up, leading to strong financial performance and equity returns. Over time, however, cost inflation as well as operating and capital inefficiencies led to underperformance relative to broader market indices.

Figure 3: China's demand drove oil prices to historically high levels during the 2000s

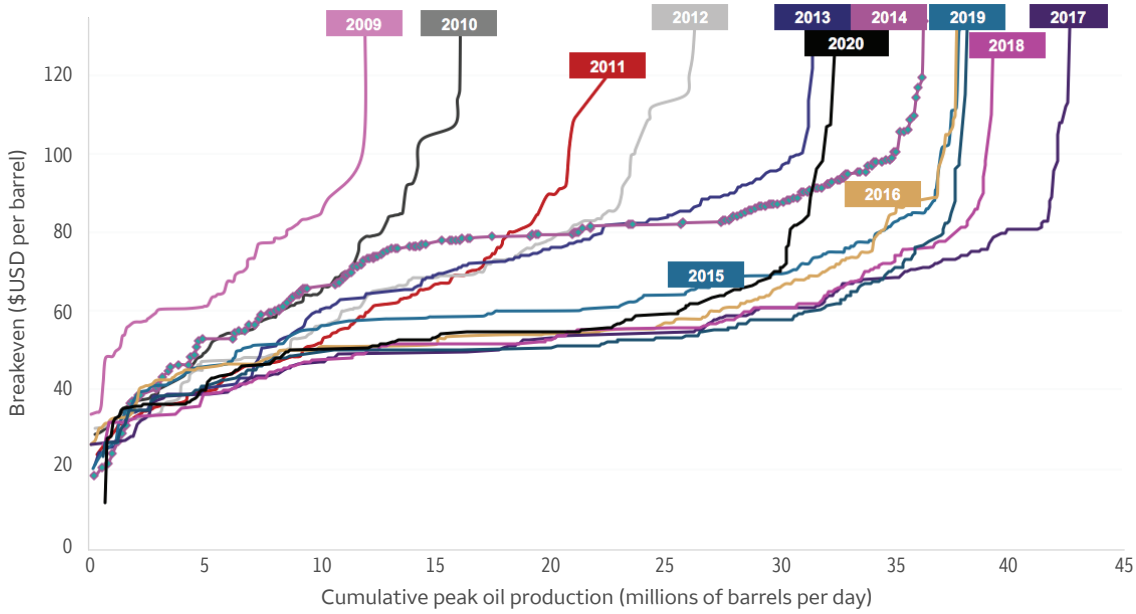


Sources: WFAM and BP p.l.c. Statistical Review of World Energy 2020

2. The advent of shale and other unconventional production

In the early 2010s, China's demand slowed and the energy intensity of major Western economies was on the decline. Also, the Arab Spring took millions of barrels per day of production offline throughout the Middle East. Reduced production more than offset slowing Chinese growth. The price increases that resulted made it economically feasible for a new, transformational competitor to establish a foothold: U.S. shale. Shale production initially stabilized the supply-demand balance and then pushed the market into oversupply beginning in 2015. In response to lower oil prices, the industry cut costs and focused on more cost-competitive portfolios. This caused oil supply curves to flatten and extend during 2009–2017, as shown in Figure 4. Improved cost efficiency also improved profitability until the COVID-19 pandemic caused an abrupt contraction in demand.

Figure 4: Rising shale production helped flatten oil-supply curves from 2009–2019



Sources: WFAM and Goldman Sachs Investment Research ("Back to the Future: A New '1990s' Oil Equilibrium"; Michele Della Vigna, CFA; Goldman Sachs International; 20 May 2020)

3. The energy transition

The world is now experiencing a transition from a system based on fossil fuels to one based on renewable energy. This transition—essential to create a sustainable economy—compounds integrated energy's challenges. Clean energy production and consumption technologies are increasingly cost competitive, particularly in power generation. Regulators are requiring decarbonization across energy value chains. Energy commodity cycles of the past can't be counted on in the future. It appears that permanent, secular shifts away from fossil fuel consumption are unfolding. Whether today's integrated energy producers can adapt and thrive in the decades to come remains to be seen.

4. Social contract under strain

Propelled by technology—especially the internet—a combination of ubiquitous media coverage and heightened societal expectations for corporate behavior have relentlessly challenged large companies across industries. Integrated energy faces especially intense scrutiny. This makes sense given integrated energy's enormous responsibility to manage environmental and social risks. Until recent decades, integrated energy firms were among the largest firms globally. The prolific amounts of cash flow historically (if not recently) generated—juxtaposed with poor treatment of the global environment and local communities in which the sector operates—generated an increasingly negative perception of the sector.

In many cases, including the catastrophic spill in the Gulf of Mexico's Macondo Prospect, the sector failed to manage its responsibility successfully. In particular, integrated energy's inexperience in managing increasingly pervasive digital media communications exacerbated negative impacts on public perception. This disadvantage continues to weigh on integrated energy.

To secure its place in the future economy, integrated energy needs to make fundamental changes to better align its value proposition with societal goals.

The great pivot: Integrated energy is responding

The major events outlined above often lend themselves to bearish investment cases. But what if integrated energy firms established convincing long-term strategies for a decarbonizing economy; strengthened corporate governance, especially related to capital discipline and climate risk management; and reinforced stakeholder relations?

This scenario is aspirational, to be sure. But firms are making increasingly deliberate efforts along these lines. The upside for stock and bond values is potentially considerable and shouldn't be ignored.

1. Establishing convincing long-term strategies for a decarbonizing economy

Throughout its history, integrated energy has continuously adapted to technological change and associated shifts in energy demand patterns. New production, treatment, and transportation technologies—particularly related to liquefied natural gas—represented marked departures from what had been the sector's core business. We believe the sector must continue to adapt its competitive expertise in response to society's decarbonization imperative.

Integrated energy companies have a versatile repertoire of capabilities to draw from to meet this challenge. These firms already have substantial and growing expertise in a range of areas:

- Gas and power—including retail and electric vehicle charging
- Hydrogen-based power as an extension of natural gas expertise
- Renewables
- Biofuels
- Chemicals
- Carbon capture, use, and storage

Figure 5: Clean energy diversification: Areas of emerging competitive expertise

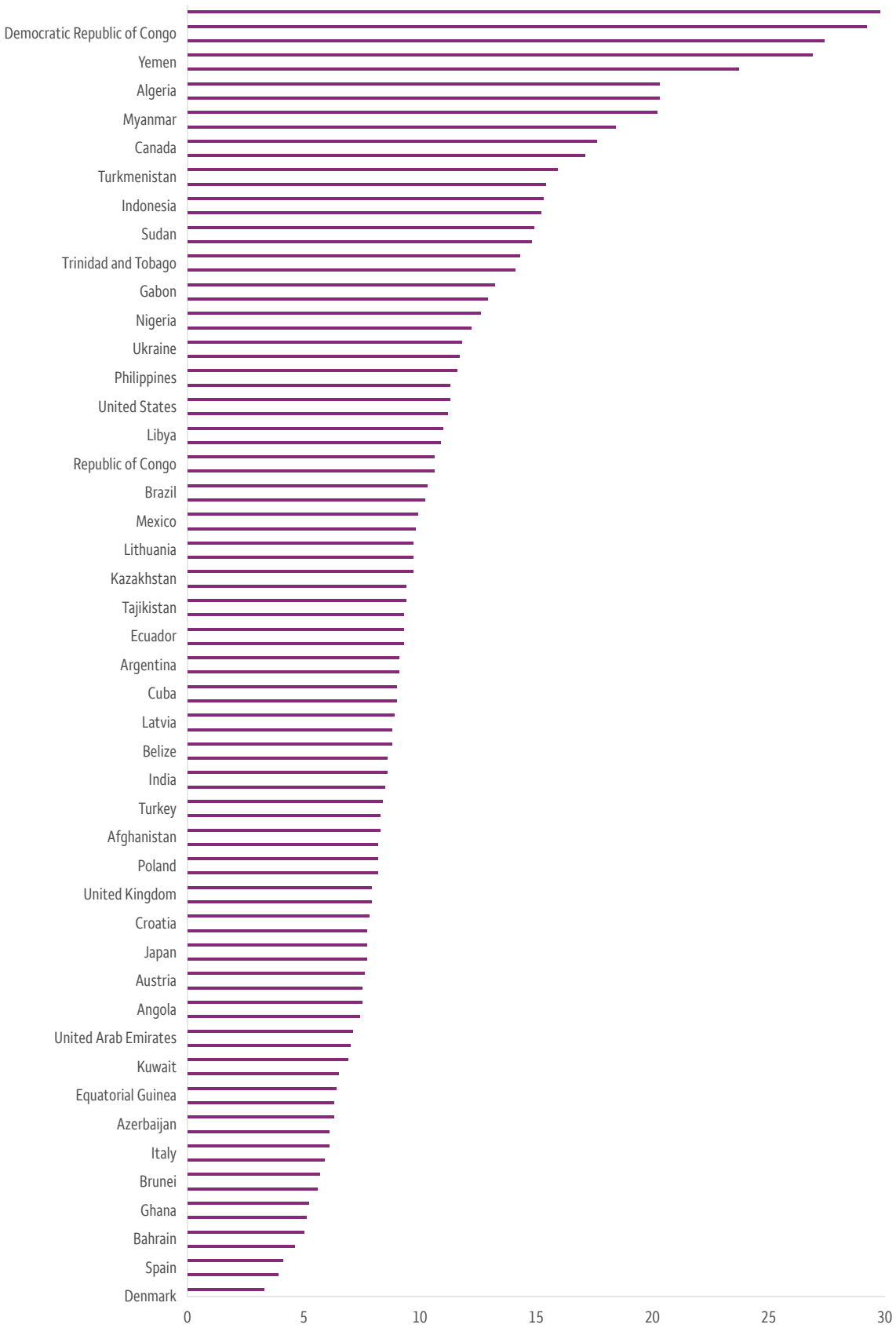
Decarbonization	Oil to gas	Reduce flaring & emissions	Energy efficiency
Action	Adjust plans for future production and mix	Promote developments that use and conserve gas	Incorporate renewable power into process
Adoption of new energies	**Renewables**	**Green hydrogen**	**Biofuels**
Action	Invest in large-scale renewable power	Explore development of new fuels like green hydrogen	Adopt strategy for biofuels to lower scope 3 GHGs
Circular solutions	**CO_2 capture, use, storage**	**Reforestation**	**Plastics recycling**
Action	Implement new CCS for future operations	Invest in natural ecosystems to reduce CO_2	Adopt tech to convert plastic into synthetic oil

Sources: WFAM; information compiled from International Energy Agency and dozens of company materials published in 2019 and 2020

This transition may render the more carbon-intensive parts of the value chain uneconomical, including oil sands production and refineries serving industrial segments that are quickly decarbonizing.

Figure 6 highlights the fact that many heavy oil plays and others that rely on flaring are among the most carbon intensive. The sensitivity of their economics to stricter decarbonization policies must be carefully considered, especially in the case of expensive new development. But this doesn't mean exiting oil and gas! On the contrary, hydrocarbons will likely continue to generate the bulk of near-term earnings. However, strategic adaptation appears set to remain necessary for the industry to thrive. The chart below presents the carbon intensity of upstream production by country, highlighting regions that would be exposed to higher cost in the event of a global carbon tax.

Figure 6: Upstream carbon intensity by country (grams CO_2 equivalent per megajoule)



Sources: WFAM and Science Magazine, 31 August 2018

Competitive advantages vary across firms. For example, Equinor, to its credit, has established expertise in offshore wind; Neste Oyj is the European leader in green biofuels; and Royal Dutch Shell PLC has made impressive progress in producing and transporting hydrogen to power transportation and other industrial activities. However, some firms likely will find it hard to succeed in clean energy. Independent upstream firms may not have worthy competitive advantages in producing clean energy, like renewable electricity and non-fossil transportation fuels. Instead, these firms may rely on decarbonizing their own operations and striving for cost leadership in fossil fuels to survive over the long term. In this sense, integrated firms are leading the energy transition more proactively than most upstream producers are.

It's important to not dismiss integrated energy companies' ability to leverage their existing assets to create value in clean energy. These firms generally have a deep network of government and global industry relationships that can be instrumental in partnering to develop clean energy projects. Recent examples include Total SE's solar contracts in Qatar and India and Shell's joint venture with Dutch government-owned N.V. Nederlandse Gasunie to develop large-scale, wind-powered hydrogen production. Natural gas processing and transportation can share a broad range of infrastructure with hydrogen. Further, in the downstream business, the integrated energy sector benefits from being extremely customer centric. For example, Royal Dutch Shell PLC, operator of 47,000 retail sites, has a global brand that's consistently ranked as one of the world's most valuable.[2]

Figure 7: Firms are responding: Power and new fuels play a greater role in integrated energy strategy

	Traditional business	New energies	
	Top transition goals	Investment goals	Renewables, biofuels, hydrogen, electric vehicles
BP	Reduce BP operations emissions 30% to 35% by 2030, upstream 35% to 40% by 2030, carbon intensity of products sold >15% by 2030	>$500 million annual investments in low carbon increasing to $5 billion by 2030	Develop 50 gigawatts of renewables by 2030, including renewables, bioenergy, hydrogen, CCUS, and rapid charging
Chevron	By 2023, reduce upstream emissions intensity by 5% to 10% for oil, 2% to 5% for gas, and 25% to 30% reduction in flaring	Initial $100 million set aside for clean technology within Future Energy Fund	Initial $100 million set aside for clean technology within Future Energy Fund
ENI	Production volumes to decline after 2025 and net zero emissions by 2040	>12.5% group capex 2020–2023 (€4 billion), with €2.6 billion in renewables	2023: 3GW, 2030: 15GW, 2050 > 55GW; 5% decarbonized products by 2025, 25% by 2035, 100% by 2050
Equinor	At least 50% reduction in direct plus indirect emissions intensity by 2050	Gross capex before project financing: $0.5 billion to $1.0 billion in 2020–2021	4–6 gigawatts renewables by 2026; 25% of research and development on low carbon, energy efficiency; ~10% returns on producing 6% to 10% pipeline
Exxon	Reduce 15% in methane emissions and 25% reduction in flaring by 2020	Not disclosed	Focus on methane emissions reduction, flaring reduction, carbon capture and storage, advanced biofuels, and energy-efficient manufacturing
Repsol	Reduce carbon intensity of 10% by 2025 and net zero emissions by 2050	Target equity IRR 10+%	7.5 gigawatts low carbon electricity generation; 600,000 tons/year biofuels by 2030
Shell	Reduce net carbon footprint of energy products by 65% by 2050 and 30% by 2035; firmwide, net zero by 2050	Capex: $2 billion to $3 billion pa 2021–2025	5 gigawatts operational by 2025, 15%+ returns in biofuels, 400 electric vehicle fueling stations by 2023
Total	Reduce scope 1 to 2 emissions from facilities -13% by 2025, 25% to 40% by 2040	$1.5 billion to $2 billion investments per year in low carbon and $0.3 billion in downstream carbon solutions	25 gigawatts by 2025, $4 billion gross capex per year, 400 electric vehicle fueling stations by 2023, 150,000 charge points in Europe by 2025

Sources: WFAM and dozens of company materials published in 2019 and 2020

2. Oil & Gas 50 2020: The annual report on the world's most valuable and strongest oil & gas brands, Brand Finance, January 2020

2. Strengthening corporate governance

The financial community, including the media, often accuse energy producers of failures in corporate governance. Consider the recent *Financial Times* article titled, "'Atrocious' governance in oil and gas allows huge rewards for failure."[3] The article maintains that "Chief executives at large independent producers earned 138% of target bonus pay over the last three years—suggesting they outperformed their agreed goals—according to research by Evercore. Yet over that period total returns to shareholders fell 55%."[3]

While integrated energy governance is generally seen as more robust than that of independent upstream firms, these perceived failures hurt energy valuations in many ways—including direct cash losses and higher perceived risk in future performance. The latter reduces value through higher risk premia reflected in the cost of equity and debt finance. We'll revisit the powerful impact of these factors in the next section.

To identify solutions, let's start by evaluating the larger problems. A useful definition of corporate governance, provided by the Corporate Governance Research Initiative at the Stanford Graduate School of Business, is: "… a set of processes or organizational features that, on average, improve decision-making and reduce the likelihood of poor outcomes arising from strategic, operating, or financial choices, or from ethical or behavioral lapses within an organization."[4] How can integrated energy firms improve these processes? The investors with whom we've discussed the topic focus on three main items:

1. **Capital discipline.** Inefficient capital allocation has delivered subpar returns during times of both low and high oil prices, including the years following the great financial crisis as oil prices reached $100/barrel. Integrated energy firms have begun to place a higher priority on free-cash generation, as evidenced by reduced development budgets and 2020's historic decisions by several of these companies to cut dividends. Despite these changes, many credit investors continue to be dissatisfied with balance sheet management within the integrated energy sector. Year to date, integrated energy firms in the U.S. alone issued more than $50 billion of debt, partially to fund dividends and negative free cash flow. This, of course, is unsustainable. In August 2019, investment research group Evercore ISI (a division of independent investment bank Evercore Inc.) argued that boards must successfully implement several initiatives to attract generalist investors back to the sector. The CCWG believes these initiatives remain essential today. The initiatives include:[5]

    a. **Establish annual pay factors that correlate with total shareholder return and more challenging performance thresholds for CEOs.**

    b. **Stop the trend of allowing CEOs to make or exceed annual target pay almost every year (which has generally been the case, especially among U.S. upstream firms).**

    c. **Require CEO performance measurement on value-based metrics, such as return on capital employed and economic value added (common in other cyclical sectors).**

    d. **Raise the performance bar for energy CEOs to be closer to the performance expectations set for CEOs in other cyclical industries (materials, industrials, technology) by requiring that integrated energy companies' total shareholder return be benchmarked to that of the S&P 500 Index.**

3. "'Atrocious' Governance in Oil and Gas Allows Huge Rewards for Failure," Myles McCormick, *Financial Times*, 26 June 2020
4. Loosey-Goosey Governance: Four Misunderstood Terms in Corporate Governance, David F. Larcker and Brian Tayan, 7 October 2019, Stanford Closer Look Series, gsb.stanford.edu
5. "Energy Shareholder Alignment Review: Leveling the Playing Field," Doug Terreson, Steve Richardson, and James West, 8 August 2019, Evercore ISI

2. **Climate risk management.** Stakeholders are generally dissatisfied with the integrated energy sector's climate and environmental practices. We believe the sector is only beginning to meaningfully respond to stakeholder concerns in this context. Net-zero emissions objectives are now increasingly common, especially among European firms (and even in these cases require more definition to be credible). A great deal still needs to be delivered to allow investors to have confidence that the sector is on a sustainable course. Indeed, we think it's essential to scrutinize decarbonization targets, particularly their feasibility and the credibility of firms' commitments to achieve them. However, we take a positive view that the sector is becoming more focused on decarbonization.

3. **Lobbying practices.** Many integrated energy firms fund trade organizations that lobby aggressively against decarbonization policies. Energy firms historically have disclosed limited details about how much is being spent and to which organizations the funding is being channeled. In September 2019, more than 200 institutional investors representing more than $6.5 trillion in assets, including CalPERS and the California State Teachers Retirement System, called on Chevron Corp. and 46 other major U.S. corporations to align their lobbying activities with the Paris Agreement. In their letter, the investors stated, "Corporate lobbying activities that are inconsistent with meeting the goals of the Paris Agreement present several financial risks to investors," and they listed the potential regulatory, systemic economic, reputational, and legal risks that could result due to the lobbying efforts.[6]

    Convincing improvements in lobbying practices would simultaneously help build trust in firms' ability to create value and rapport with investors. We note that BP is taking steps to eliminate lobbying that's inconsistent with the firm's net-zero emissions goals. CEO Bernard Looney spoke to this directly after assuming his role in 2020.

3. Improving stakeholder relationships

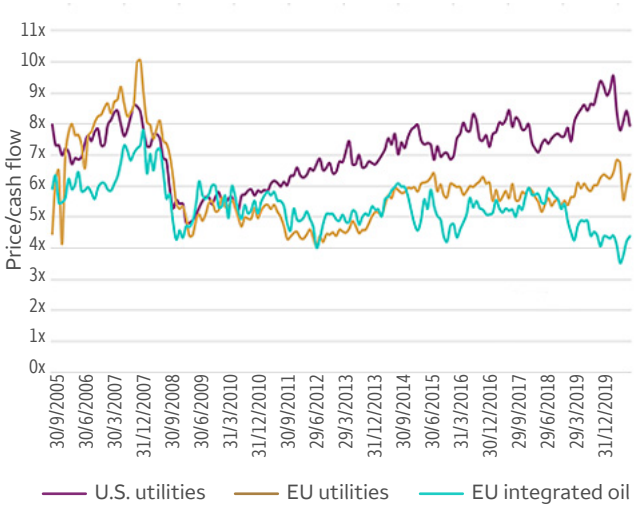
Even in a hypothetical case where the integrated energy sector delivered convincing long-term business and corporate governance strategies, there would be a tangible benefit to strengthening stakeholder relationships.

- **The problem.** Many competitive strategy experts argue that to create long-term value, firms must take into account the interests of all stakeholders. The needs of firms' customers, suppliers, and employees can't be ignored.[7] As noted in the ***Financial Times*** article quoted earlier, investors believe their interests have been subordinate to those of energy firm executives for an extended period. So, too, do various communities—local and global—that have suffered environmental degradation due to the negative impacts of energy industry operations.

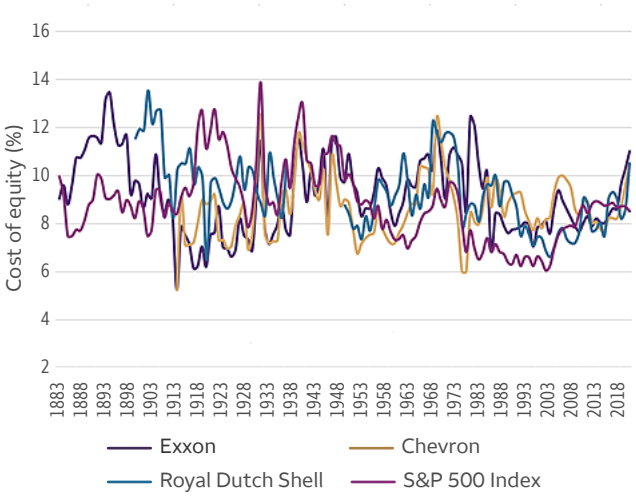
There's evidence that strained stakeholder relationships may be manifesting in ways that are negative for energy firms' values. In Figure 8, the lefthand chart shows that the rise of environmental, social, and governance concerns during 2017–2020 coincided with a sharp contraction of integrated oil valuation multiples relative to those of utilities. The righthand chart illustrates the marked increase of the integrated energy sector's cost of capital during the same period.

6. "200 Investors Call on U.S. Companies to Align Climate Lobbying with Paris Agreement," Ceres press release, 16 September 2019, Ceres website. For more detail, see https://www.ceres.org/news-center/press-releases/200-investors-call-us-companies-align-climate-lobbying-paris-agreement
7. "The value of value creation," Marc Goedhart and Tim Koller, *McKinsey Quarterly*, 16 June 2020

Figure 8: Energy price/cash flow multiple lags utilities … while the sector's cost of equity has risen versus the market



Sources: WFAM and Alliance Bernstein data; as of 18 June 2020



Sources: WFAM and Alliance Bernstein data; as of 18 June 2020

Investors aren't the only stakeholders expressing fundamental disagreements with energy firms. Communities, governments, and regulators are taking an increasingly firm stand against new energy infrastructure viewed as harmful to the environment and to communities that would be negatively affected by construction. For example, on 6 July 2020, a federal judge ruled that the Dakota Access Pipeline—an oil route from North Dakota to Illinois—called into question whether the pipeline can stay open pending a new environmental review. On the same day, the U.S. Supreme Court rejected a request from the Trump administration to allow construction of parts of the Keystone XL oil pipeline that had been blocked by a federal judge in Montana.

Proxy activity reflects pressure to adapt strategy, governance, and stakeholder relationships:

Let's start with investors. In recent years, investors have emerged as primary drivers of the climate change debate. Proxy activity reflects this leadership:[8]

- Climate-related shareholder proposals have almost doubled from 2011–2020.
- The percentage of investors voting in favor has tripled over the same time period.
- 2020 climate-related shareholder resolutions exceed 2019's on an annualized basis.
- Thus far in 2020, the percentage vote in favor has increased year over year by more than 30%.

8. "Carbonomics: The Future of Energy in the Age of Climate Change," Michele Della Vigna, Goldman Sachs Equity Research, 16 June 2020

- **The opportunity.** Aligning business and governance strategies more evenly across stakeholders is a necessary first step. But such actions can be more effective if developed collaboratively with stakeholders. For example, in December 2018, Royal Dutch Shell announced it would set specific targets for reducing carbon emissions every three to five years with the goal of shrinking its net carbon footprint by about half by 2050. Shell said it would also ask shareholders to tie executives' compensation to their success in managing a transition to cleaner energy.[9] Shell has acted on many 2018 pledges. For example, today the company has targets that cover not only emissions from its own production of oil and gas but from all vehicles and factories that eventually burn these fuels. Shell is also reviewing its ties with lobbying groups known to undermine action on climate change.

  We note that Shell's announcement marks a striking reversal to positions the firm took very recently. Its chief executive, Ben van Beurden, recently criticized long-term binding targets on carbon as "foolhardy" as they would expose the firm to lawsuits if it missed the goals. But after engaging with Robeco Institutional Asset Management US, Inc.; the Church of England Pensions Board; and others, Shell agreed to set short-term goals in the service of a longer-term ambition. Other firms, including Exxon Mobil Corp., which have so far not given in to stakeholder demands for similar actions, have failed, in our opinion, to match Shell's progress in bolstering stakeholder support.

The prize: The aspirational investment case for integrated energy

Imagine an integrated energy firm that has aligned its business, governance, and stakeholder strategies with its constituencies' objectives. How much value can these actions create for the firm in the credit and equity markets? We believe the value potential is substantial. To be clear, significant execution risk still remains. However, we believe investors can benefit from evaluating increased weightings to the sector over time.

Current situation: Prevailing valuation methodology doesn't fully capture clean energy value

Until recently, integrated energy firms' clean energy activities had very little impact on most analysts' estimates of the firms' values. The largest and most obvious/important reason for this is that clean energy businesses had been small relative to fossil operations. However, firms have begun to invest increasingly larger sums in clean energy. Some analysts estimate that clean energy—as a percentage of integrated energy's overall capital expenditure—should rise from roughly 15% in 2014 to more than 25% by 2021. This would make clean energy's capex larger than upstream oil and gas's capex for the first time in history.[10] In our view, the rising prominence of clean energy has yet to be fully reflected in equity and credit security values.

9. "Staring Down the Barrel: Royal Dutch Shell Tries to Reckon With Climate Change," *The Economist*, 8 December 2018
10. "Carbonomics: The Green Engine of Economic Recovery," Michele Della Vigna, Goldman Sachs Equity Research, 16 June 2020

Emerging change: Independent valuation of clean and fossil businesses shows potential upside

What can integrated energy companies do to help investors see this value? Those that execute the business, governance, and stakeholder strategies discussed above stand to create significant value if they:

- Provide clearer guidance on the forward cash generation profile of their clean energy businesses. Today, few firms provide a detailed breakout of clean energy financials. Instead, many clean energy businesses are consolidated into larger fossil divisions that have weaker growth prospects. What's more, most clean energy businesses are nascent and/or growing quickly. The heavy investments they've been making often lead to negative near-term cash generation, which can prevent full visibility into their true potential impact on valuations when based on a multiple of next year's cash flow or dividend (a measurement many analysts use today).

- Demonstrate the relatively low risk nature of many clean energy businesses. At the subsidiary level, the major events outlined above create divergent risk and growth outlooks. Our CCWG's preferred approach to valuing integrated energy companies is through sum-of-the-parts (SOTP) analysis that uses discounted cash flow (DCF) to determine the value of upstream and clean energy businesses. The reasons we favor SOTP include:
  - — SOTP provides more accurate treatment of different streams of cash and their respective costs of capital. For example, natural gas presently has a more robust growth outlook than oil.
  - — Many investors view renewables as having more robust growth potential than oil or gas.
  - — Cash flow volatility is much lower and leverage capacity is much higher relative to fossil businesses, especially for renewables businesses that sell output at stable prices via long-term contracts with creditworthy counterparties.

Clean energy businesses are now being valued similarly (or identically) to fossil businesses. Valuing them independently can often deliver much higher valuations.

We illustrate potential impacts below by focusing on Equinor. Its wide-ranging activities include exploration, development, and production of oil and gas, solar, and wind power on the Norwegian continental shelf and in both Americas. With a presence in more than 30 countries, Equinor is a major supplier of crude oil and the second-largest supplier of natural gas in the European market. Norway's government is Equinor's majority owner with a 67% stake. According to Bloomberg, Equinor has proved oil and gas reserves of approximately 6,200 mmboe and has been producing more than 2,000 mboe/day.[11]

We expect renewables to produce an insignificant proportion of Equinor's 2021 operating income and free cash flow. In fact, renewables' free cash flow is likely to be negative. As such, multiples-based approaches should indicate little value for renewables.

However, if we model multiple decades of renewables' forward free cash flow and properly reflect their relatively low risk and cost of capital, we get a different picture. From this perspective, initial phases of heavy investment are more than offset by steadily growing free cash flow over time, even after accounting for the time value of money.

Valuations can rise substantially at both the clean energy subsidiary and firm level, as illustrated in Figure 9. The table on the left presents a hypothetical renewable project requiring a $100 million investment and paying out $10 million per year for 20 years. Applying the assumptions shown on the upper right, the net present value (NPV) totals $37.8 million. In the middle on the right, the NPV sensitivity table shows the striking benefit that renewables can deliver via lower cost of debt and higher levels of leverage. The table on the bottom right compares the NPV result with a multiples-based valuation alternative applied in the first year of renewables development, when the cash flow is negative. In this extreme example, the result is negative $500 million. In reality, this result would be less severe assuming a portfolio of projects with varying but very young ages.

11. 1 mmboe = one million barrels of oil equivalent; 1 mboe = one thousand barrels of oil equivalent

Figure 9: Discounted cash flow valuations can reveal higher valuations for early-stage renewables
($ million, except as indicated)

Discounted cash flow profile

Year	Capex	CFO	FCF	Discount	PV
0	-100		-100	1.00	(100.0)
1		10	10	0.96	9.6
2		10	10	0.93	9.3
3		10	10	0.89	8.9
4		10	10	0.86	8.6
5		10	10	0.83	8.3
6		10	10	0.80	8.0
7		10	10	0.77	7.7
8		10	10	0.74	7.4
9		10	10	0.71	7.1
10		10	10	0.69	6.9
11		10	10	0.66	6.6
12		10	10	0.64	6.4
13		10	10	0.61	6.1
14		10	10	0.59	5.9
15		10	10	0.57	5.7
16		10	10	0.55	5.5
17		10	10	0.53	5.3
18		10	10	0.51	5.1
19		10	10	0.49	4.9
20		10	10	0.47	4.7
Total	**-100**	**200**	**100**		**37.8**

Discounted cash flow assumptions

Cost of equity	10.0%
Cost of debt	2.0%
Tax rate	40.0%
Debt/cap	70.0%
WACC	3.8%

NPV sensitivity to leverage (x axis) and cost of debt (y axis)

	25%	50%	75%
2.0%	(0.3)	18.5	43.4
2.5%	(0.9)	17.1	40.5
3.0%	(1.5)	15.6	37.7
3.5%	(2.0)	14.2	35.0
4.0%	(2.5)	12.9	32.4
4.5%	(3.1)	11.5	29.8
5.0%	(3.6)	10.2	27.3

Compare to 12-month cash multiple

Year 0 free cash flow	(100.0)
Multiple	5.0
Value	(500.0)

Source: WFAM Climate Change Working Group. For illustrative purposes only.

The exhibit in Figure 10 summarizes how the same dynamic could play out in the case of Equinor. Using conventional debt-adjusted cash flow (DACF) multiples and an SOTP approach using DCF at the subsidiary level, we compare valuations of Equinor's major subsidiaries: Exploration and Production (Norway and International); Marketing, Midstream, and Production (MMP); and New Energy Solutions (which includes renewables).

To highlight the disparate implied renewables values, we hold constant the Exploration and Production and MMP values. Consistent with common market practice, we consolidate renewables' cash flow in the MMP segment in the multiples analysis. In the SOTP analysis, we remove renewables cash flow from MMP's and value it separately. This unit's small size prevents it from having significant impact on the former valuation and adds greatly to the latter valuation.

Figure 10: DCF-based based analysis implies 7.4% higher net asset value than does 2021 DACF multiple analysis
Figures in $ million except as indicated

	A: Multiple-based	B: SOTP/DCF-based	A less B	Notes
Upstream	61,986	61,986	—	We assume equal value in both cases
Refining and Marketing	13,764	14,604	840	Multiple-based includes renewables' negative 2021 cash flow
Power	—	4,747	4,747	SOTP valuation/DCF values renewables independently
Value to Equinor	75,750	81,337	5,587	Independent renewables valuation delivers 7.4% higher valuation
ADRs outstanding	3,258	3,258		
Net asset value (USD per share)	23.25	24.97		

Sources: WFAM CCWG estimates, company materials. For illustrative purposes only.

Is Equinor exceptional in its ability to create value in renewables? We do believe it has among the most proportionately valuable renewables businesses among global integrated energy firms. However, it's not alone. Galp's recent announcement that it would acquire a portfolio of Spanish renewables assets from Actividades de Construcción y Servicios, S.A., revealed a similar valuation inefficiency. Following the deal's closure, some investment banks have valued the assets independently, leading to a 50% increase in assigned value.[12]

Renewables play a proportionately smaller role for firms like Shell, BP, Total SE, and others. However, each of these firms has been investing heavily in clean energy. More deliberate valuation techniques should serve investors well, especially when evaluating the integrated firms leading the energy transition.

12. "Galp Energia: Analysing the Potential of the Solar PV Business," Morgan Stanley Research, Sasikanth Chilukuru, CFA; Martijn Rats, CFA; and Rachel Fletcher, Ph.D., 23 June 2020

Conclusion

Few would disagree that the past two decades have been tumultuous for the integrated energy sector. The end of the commodity supercycle, the advent of shale and other unconventional production, the energy transition, and the strain on integrated energy's social contract each caused seismic shifts in the sector's cost structure and relationship with its primary stakeholders. In retrospect, we can see that integrated energy firms and their investors underestimated the profound importance of these major shifts that set the sector up for its extended underperformance.

Looking ahead, we think it's clear that to thrive in a decarbonizing economy, integrated energy companies must take three specific actions: adapt to align with society's shift away from carbon fuels, strengthen their corporate governance practices, and improve relationships with their stakeholders. These efforts will be advantageous, if not necessary, to succeed.

The potential rewards are striking. By establishing a convincing path forward and by rebuilding support with its network of stakeholders, integrated energy can drive a shift in the market's awareness of its value-creation potential. This prospect is already becoming evident as illustrated in the Equinor and Galp examples summarized above.

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