



The great compression: Implications of COVID-19 for the US shale industry

Shales peaked without making money*

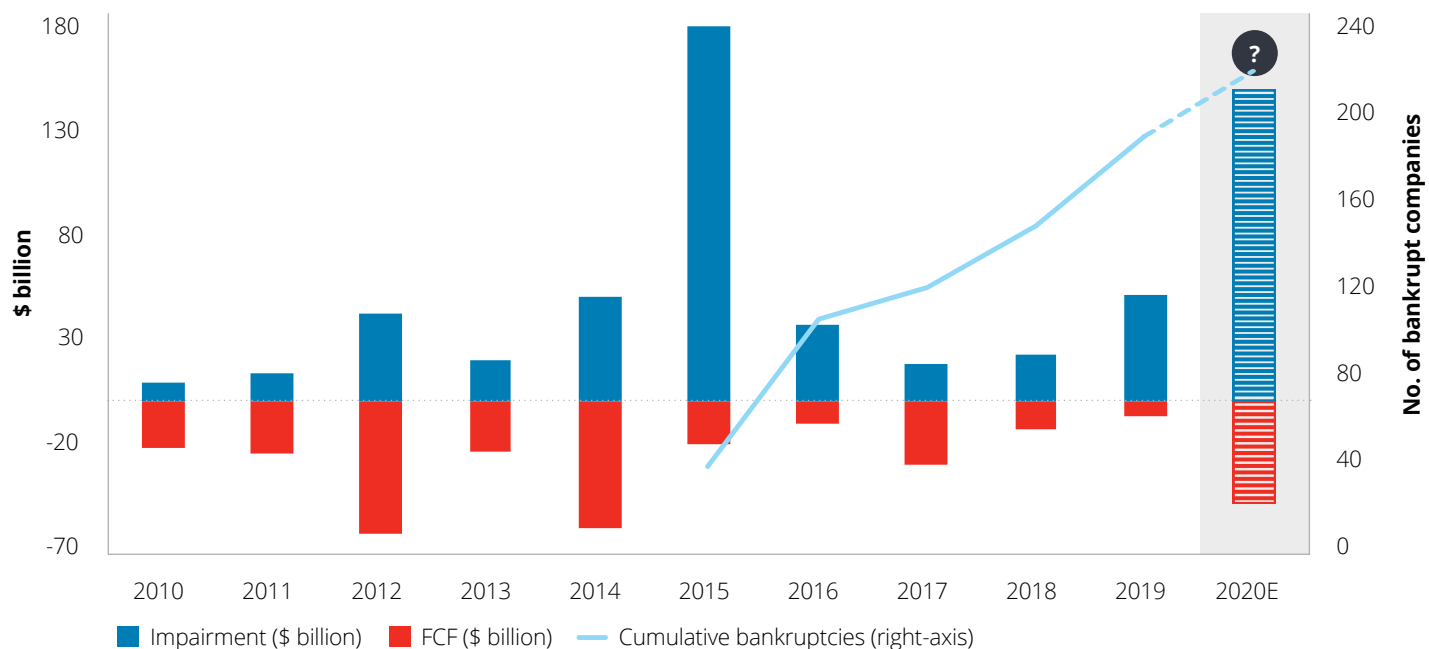
The year 2020 marks the 15-year anniversary of the US shale boom, which heralded an era of US energy independence and more than doubled tight oil production over the past five to six years.¹ However, beneath this phenomenal growth, the reality is that the shale boom peaked without making money for the industry in aggregate. In fact, the US shale industry registered net negative free cash flows of \$300 billion, impaired more than \$450 billion of invested capital, and saw more than 190 bankruptcies since 2010 (figure 1).²

It's not that the industry is ignorant of shale's cash flow problem and high capex requirements due to its high decline rates; in fact, operators increased productivity while lowering breakeven to about \$50/bbl.³ But new and unforeseen headwinds continue to jolt the industry's progress. Just when the industry was adjusting to the new normal of \$50–60/bbl and started becoming more financially disciplined, they encountered the COVID-19 pandemic and an oil price war among producers.

Starting March 2020, global oil supply and demand have diverged to an extent the world has never seen before. Petroleum demand, which was largely inelastic—changing by 1 to 3 percent annually—slumped by more than 30 MMbbl/d, or 30 percent of global demand, in April.⁴ Lockdowns of several nations across the world caused drastic changes in the crude oil market. Even the unprecedented deal between OPEC+ to cut production by 9.7 MMbbl/d could not soften the impact.⁵

The result: Oil prices decisively broke the new normal of \$50–60/bbl, with WTI May futures prices falling even below zero (-\$37/bbl) because of low liquidity and limited available storage.⁶ Although the sub-zero price was a temporary dislocation, this intense volatility highlights the fragile state of the industry.

Figure 1. Profitability of the US shale industry (upstream)



Note: Bankruptcy numbers are available from 2015 onwards.

Source: Capital IQ database; Haynes & Boone oil-patch bankruptcy monitor.

* Although this paper analyzes both tight oil and shale gas operators, the possible implications presented in this paper are more apt for oil-heavy operators seeing the structural changes in petroleum products demand and heightening volatility in oil prices due to the COVID-19 pandemic.

The great compression

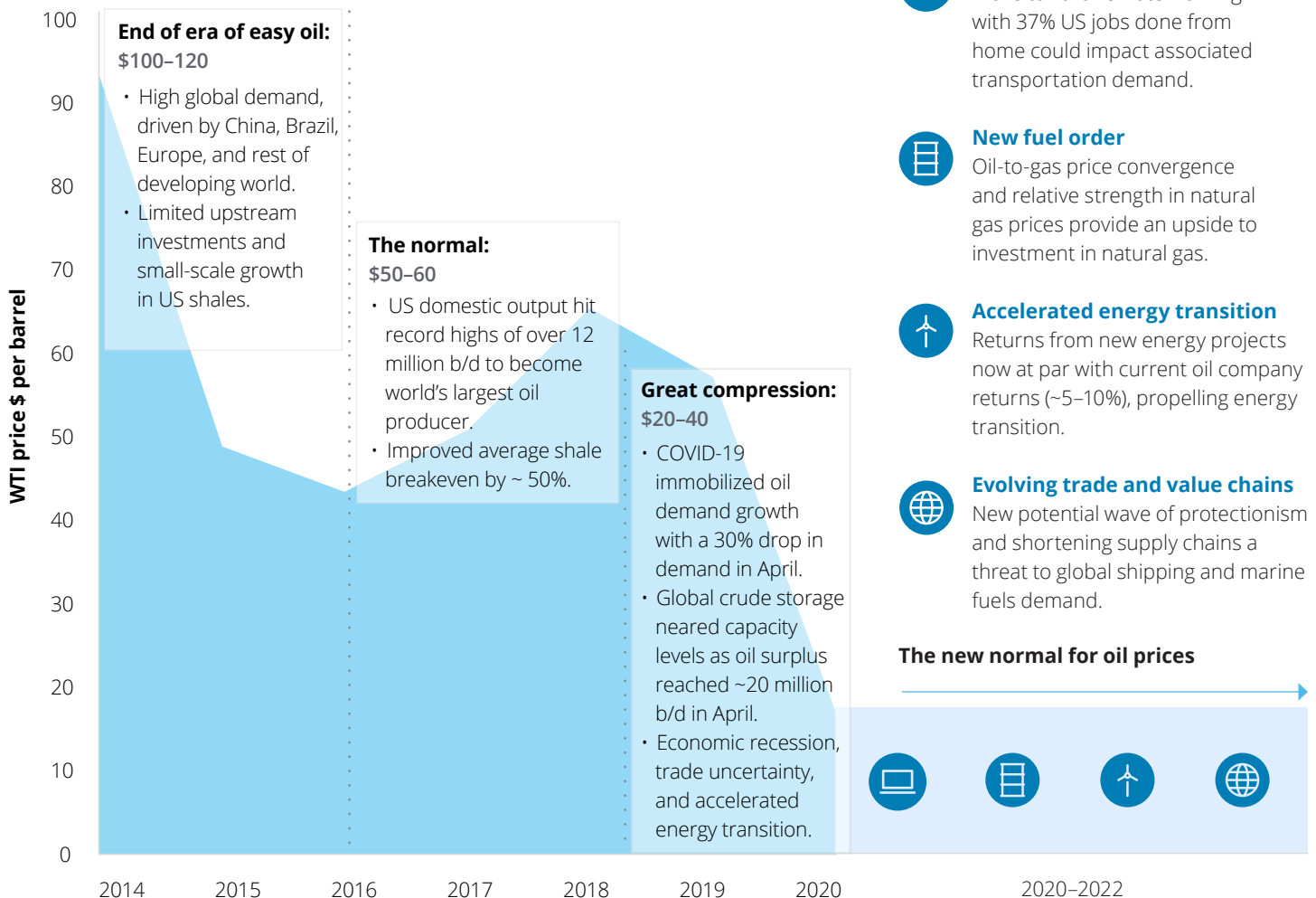
The oil industry is currently experiencing a “great compression” in which companies’ room to maneuver is restricted by low commodity prices, reduced demand, capital constraints, debt loads, and health impacts of COVID-19. Unlike in previous downturns, these effects are now simultaneous—creating a higher level risk of technical insolvencies and building intense pressure on the industry.

The oil market has lost nearly all the momentum it gained in 2019 after COVID-19 lockdown mandates started sapping petroleum demand, especially that of transportation fuels. With the virus’s impact expected to linger at least a few more months, if not quarters, expectations for economic growth—and oil market recovery—remain muted in 2020.

It is largely certain that 2020 will be a trying year for the oil and gas industry. The big unknown is the post-COVID-19 environment and OPEC’s role in balancing oil supplies. It remains to be seen if oil prices will return to the \$50–60/bbl range—despite easing of lockdowns in May, support from deep capex cuts of around 25 percent in 2020, and normal decline rates of 5.8 percent for mature oil fields.⁷

Oil demand, however, is not expected to return to pre-pandemic levels anytime soon due to the new norm of remote telecommuting, relatively stable and stronger prospects in natural gas, decapitalized and stable business profile of new energies, shortened supply chains, and regionalization of trade. Although agencies and analysts are still assessing the impact, initial estimates for 2020 global oil demand project a fall of more than 10 percent.⁸ The pandemic could revive the peak oil demand argument without ruling out 2019 as the peak year (figure 2).

Figure 2. Start of the Great Compression



Source: US Energy Information Administration, National Bureau of Economic Research, International Energy Agency, Deloitte analysis.



- **The new norm of telecommuting:** The large-scale (successful) experiment of COVID-19–compelled remote working has changed many perceptions, behaviors, and sentiments of employers and employees worldwide. For companies that have built and tested remote processes, it will likely be unreasonable to reverse these successful efforts. A new study from the National Bureau of Economic Research, for example, confirms the trend, as it expects 37 percent of jobs in the United States could be done from home.⁹ Similarly, the International Air Transport Association (IATA) expects airlines will need 25 percent fewer planes over the next five years.¹⁰ Thus, telecommuting in the future and the associated oil demand will not likely reach pre-pandemic levels anytime soon.
- **The new fuel order:** Oil's steep fall has narrowed the oil-to-gas price (WTI-Henry Hub) ratio from 50 in 2012 to less than 10 in April 2020.¹¹ Heightening volatility in the oil market, relatively stable industrial and electrification demand of natural gas, and a projected fall in associated gas production due to the cut in oil drilling will likely trigger an upcycle in natural gas prices in the medium term. For the first time in a decade, in fact, many analysts have become bullish on natural gas and natural gas–related equities. In March 2020, for example, stocks of many gas-heavy shale operators rose by 10 to 15 percent when their oil-heavy counterparts fell by more than 50 percent.¹²
- **The accelerated energy transition:** The crash in oil prices has ended the lucrative returns of above 20 percent enjoyed by upstream oil and gas companies, putting some of them at par (or even lower) with new energy projects.¹³ Along with heightened peak oil demand arguments due to the new norm of telecommuting, the industry could increasingly face tougher questions around its capital-heavy and high-entry-cost model. The decapitalized (less capex-intensive), decentralized (limited entry barriers and innovative business models), and, most importantly, stable and sustainable profile of new energy projects seems to have become more attractive given the volatility in the oil industry. In addition, many sustainability-conscious investors and Millennials in the workforce continue to urge the large oil companies to focus on clean energy and sustainability.
- **New and evolving trade and value chains:** One aspect that distinguishes the COVID-19 pandemic from the global financial crisis is the new role of trade and value chains. Companies should be ready for the impact of COVID-19 on economies worldwide, which will likely lead to regionalization of trade and people, shortening of supply chains, and potentially a new wave of protectionism—which could threaten global shipping and thus marine fuel demand.

Cheap prices may not boost demand in the near term

In the current environment, many nations will likely keep pump prices higher through increased taxes and duties on petroleum products to cover the COVID-19–led shortfall in revenues. Cheaper oil may not necessarily mean cheaper fuel bills for consumers, thus limiting upward demand movement due to the crash in oil prices.

An economic storm on the horizon

Investor disenchantment with US shale is not new—but it appears to have worsened in the COVID-19 environment. Operators, for example, are seeing the highest disconnect between the net present value (NPV) of their estimated future cash flows (SEC value), current carrying value of their reserves, and their market capitalization (figure 3).

In 2015–2016, at the start of the lower-for-longer downturn, the market seemed optimistic about shales—reflected in a higher market capitalization multiple of 2.8 (market cap/NPV).¹⁴ But in 2020, the double impact of COVID-19 and the oil price supply war seems to have led many investors to shun shale stocks, which initially appeared to be an extreme reaction, but not any longer, considering the record imbalance and extreme volatility in the oil market.

Challenging oil market conditions could prompt the shale industry to impair or write-down the value of their assets by as much as \$300 billion—with significant impairments expected in Q2 2020.¹⁵

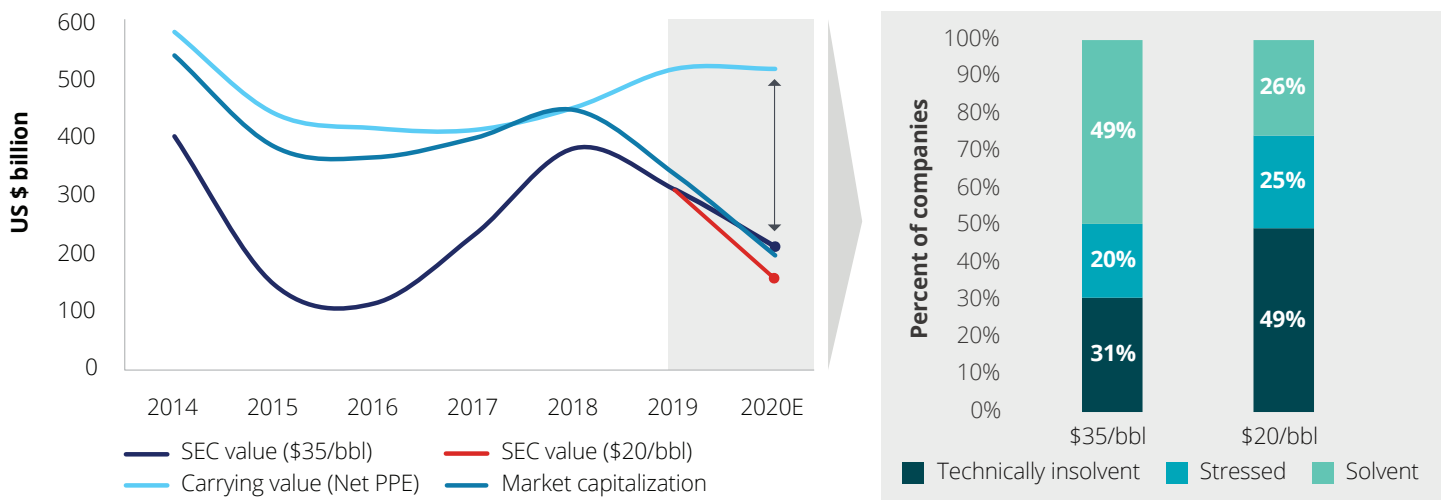
What will this shortfall translate into? Significant resource impairments and asset write-offs are expected to hit the industry, with a sizable charge starting in Q2 2020. Although each company

has its own impairment assessment criteria and follows different accounting methods, our analysis suggests that impairments in 2020 would be close to 2015 levels.¹⁶

One may argue against reading too much into this “noncash” impairment figure of companies. Yes, it is just an accounting adjustment. But it translates into writing off the invested shareholder’s equity and carrying a debt that may have been taken to develop or acquire the impaired asset. The result: an immediate increase in the industry’s leverage ratio from 40 to 54 percent, which can trigger many negative sequences of events, including bankruptcy.¹⁷ In fact, according to our analysis of the major listed US shale operators, about 30 percent are already “technically insolvent,” where their discounted future value at \$35/bbl is lower than their net liabilities.¹⁸ The insolvency proportion rises to almost 50 percent if oil prices average around \$20/bbl.¹⁹

Outside the companies that are technically insolvent, about 20 percent have stressed financials at an average oil price of \$35/bbl, and at \$20/bbl, that percentage rises to 25 percent.²⁰ All eyes are on this stressed group, as a longer continuation of the current trend would shift many of them to the insolvent group.²¹ Luckily, 25 to 50 percent of shale operators still remain solvent across the two price scenarios, largely due to their strict financial discipline and operational acumen gained over the past few years.²²

Figure 3. Financial state of shale operators, under two price scenarios



- Notes:
- SEC values represent net present value of future cash flows reported by companies in their 10-K SEC filings; SEC values for 2020 are calculated by applying the change in oil prices under two oil price scenarios for the next 3 years (\$35/bbl and \$20/bbl) over 2019 realized prices, assuming all other things constant. Natural gas and NGL prices are adjusted accordingly; Technically insolvent: 2020E SEC values are less than net liabilities (net debt plus current liabilities minus current assets)
 - Stressed: Technically solvent but with Debt/EBITDA>3.5 and Debt/Capital>0.5 (adjusted for impairments)
 - Solvent: Technically solvent and Debt/EBITDA<3.5 and Debt/Capital<0.5

Source: Deloitte analysis based on data accessed from Capital IQ database.

Consolidation is a necessity, and even an opportunity

The grim financial position of many companies and weak economic outlook could trigger deep consolidation in the US shale industry. Although being “adventurous” in today’s uncertain environment could be fatal, staying on the sidelines may not be an option anymore, either. The key question is what to buy and, more importantly, what not to buy. Any large acquisition or merger should be considered only if one plus one is greater than two on both operational and financial fronts.

According to our operational and financial analysis of major US E&P companies, value-accretive consolidation opportunities seem to be emerging across company sizes. Surprisingly, one of the smallest-company-size groups, mineral-and-royalty-rights-based firms, appears to have the strongest and most stable standing in today’s market (figuring in “the augmentors,” blue dots, in figure 4). Some players are the natural consolidators of the highly fragmented private minerals market, saving private and small-sized royalty holders. In fact, about 25 royalty deals took place in 2018 and 2019, the highest in any period.²³

Impairing the great shale play

In the first half of 2020, companies following the successful efforts (SE) accounting method will likely report significant impairment due to a lower future price strip. (As of late May, oil futures prices were in the \$30–\$45/bbl range for the next three years.) Either proactively or led by auditors and bankers, a significant portion of the SE companies’ carrying amount may not be recoverable and thus would need to be impaired immediately. In comparison, impairments for companies following the full-cost accounting method are expected to be more apparent in the second half of 2020 as they follow trailing 12-month oil prices.

The companies, along with their auditors, should evaluate the long-term impact on the recoverable volumes for shut-in assets and assess whether restart capital will be required once prices recover. Similarly, restricted access to capital to companies could reopen the assessment of undeveloped (PUD or PB) reserves, which may need to be moved within cash flows, outright removed, or even altered to reflect a new expectation of the business. Both companies and auditors would be judged for their fair-value disclosures, changes in accounting estimates, reserve adjustments, and early warning disclosures.



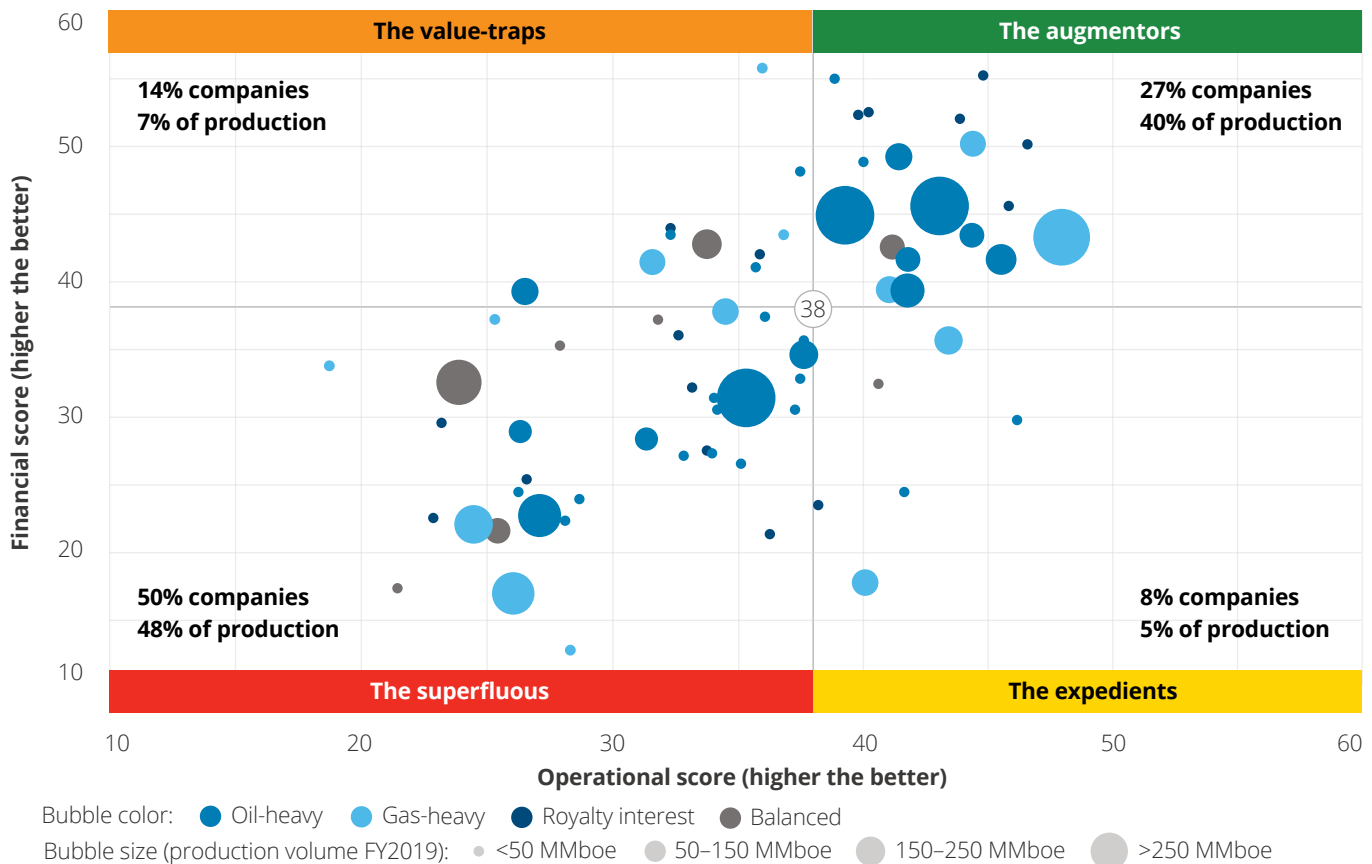
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The small-to-medium-sized group has both value-accretive and risky buys, and that’s also where the highest interest and uncertainty of potential buyers lies. Although 50 percent of the group falls in the avoidable category (*the superfluuous*), there are many sizeable nonroyalty operators with strong operational and financial profiles (*the augmentors*)—presenting opportunities to merge or making them suitable candidates for select IOCs.²⁴ At least five operators with cumulative production of over 2.1 MMboe/d have a healthy profile, with some even better than IOCs in terms of performance.²⁵

About 15 percent of the analyzed shale operators fall under the risky-buy category (*the value traps*) due to their below-average operational excellence and above-average financial strength—a tempting set of companies, but with hampered growth potential and operational agility.²⁶ “*The expedients*” category, on the other hand, presents exciting opportunities, especially for private-equity buyers, whose financial and management expertise could unlock gains from operationally strong shale operators.

Another new, interesting opportunity emerges when we categorize performance by fuel mix. Despite natural gas prices remaining low since 2012, a few gas-heavy operators have maintained a stronger profile than most oil-heavy operators. The recent narrowing of the oil-to-gas price ratio and a prolonged period of low oil prices have made the gas-heavy companies more attractive. Would having a balanced fuel mix or even reconsidering gas-heavy fields turn out to be a more effective strategy than the existing approach of “only oil, primarily Permian”?

Figure 4. Operational and financial benchmarking of US shale operators



Notes: Operational score (higher the better) is a relative normalized rank of a company’s efficiency and productivity parameters such as margins per boe, investment ratio, percentage of developed reserves, etc.; financial score (higher the better) is a relative normalized rank of a company’s financial resilience such as interest coverage, leverage, valuation, etc.

For more details, please refer to appendix.

Source: Deloitte analysis based on data accessed from Capital IQ database.

Respond. Recover. Thrive

Over the years, the oil industry's stable and determinable demand profile has helped it resist many economic and supply shocks. But the COVID-19 pandemic has abruptly fast-forwarded the specter of peak demand to the present.²⁷ Although demand for oil will sharply recover from the April lows and accelerated production shut-ins will help oil prices to recover from the sub-zero levels seen in the May futures contract, oil markets will likely remain volatile and uncertain. The lingering future of post-COVID-19 uncertainty requires a 360-degree tactical and strategic refresh from the industry.

Undoubtedly, the first imperative is to **respond** to the current market situation and safeguard the business by saving both capital and cost. With only 40 percent of the invested capital producing and the balance remaining undeveloped and thus non-revenue-generating, decapitalization should be the immediate priority of operators.²⁸ Similarly, operators should identify cost takeout opportunities that can permanently reduce their selling, general, and administrative (SG&A) spend and improve back-office efficiency and service delivery.

Progressing from *respond* to **recover** could entail a rigorous operational diagnosis that is powered by a new engineering mindset, metadata analytics, and sustainability measures. Additionally, breakthrough digital innovations for a complete transformation of operations may be required to turn the shale industry around once more. For example, integrating disruptive new-age innovations such as nanotechnology, besides tracer analytics, microseismic monitoring, and multidisciplinary advanced analytics for shale operations, could put companies on the recovery track.

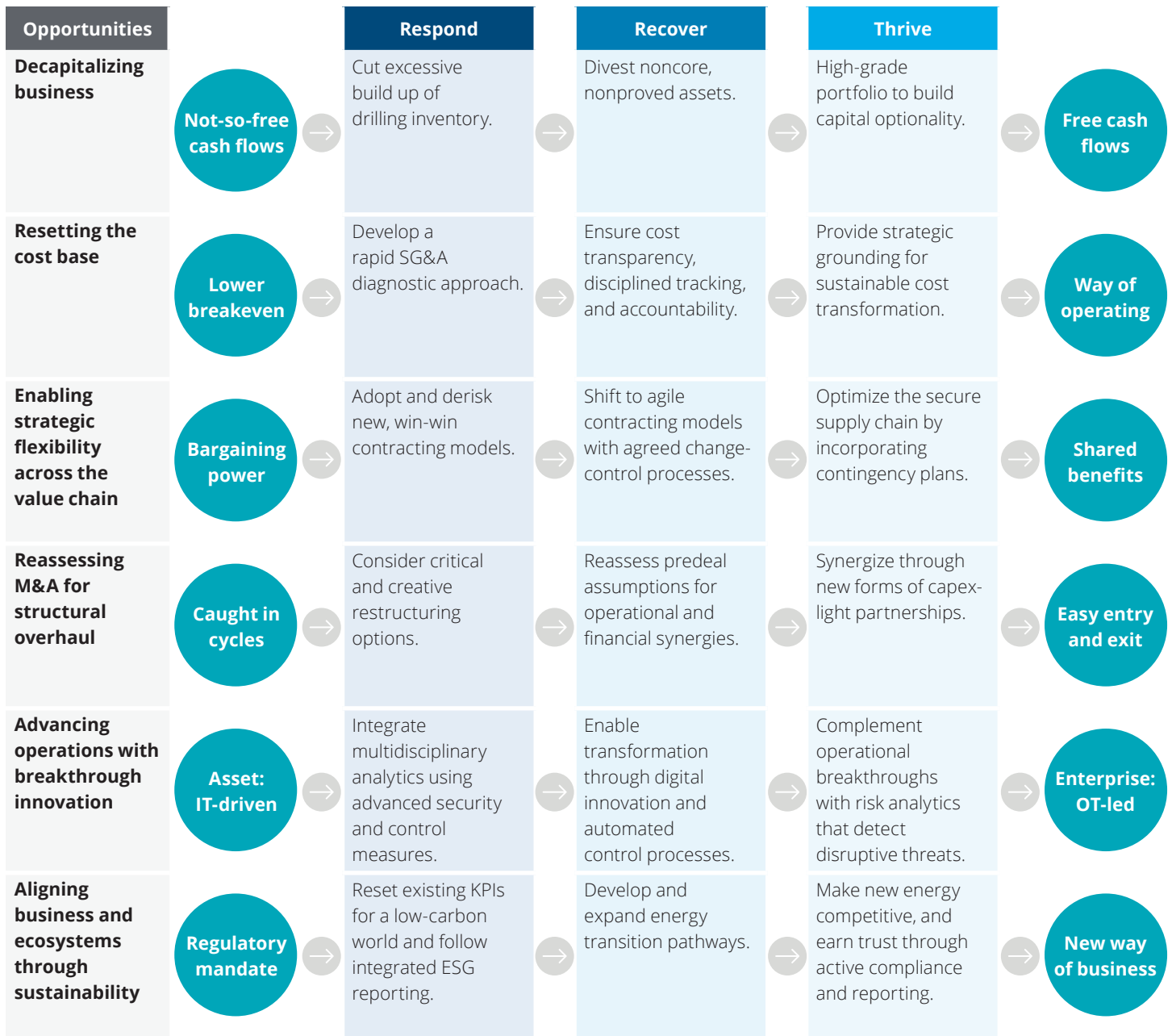
Operators should also work with their vendors to not only automate and digitize operations to realize new savings, but also to shorten value chains and create new pathways for the impending energy transition. Taking this path, however, would likely entail breaking away from the typical M&A strategy of buying only for resources to creating new capabilities, where “one plus one is greater than two” on all fronts.

Finally, operators emerging from the crisis would likely have to reinvent to **thrive** and possibly be the nexus of the “new normal” ecosystem. Companies should work toward transforming themselves from an IT-driven mindset to an operationally integrated organization (such as Shell's AI-driven reskilling program for its workers, focusing on the upkeep of the oil business supply chain and on alternative sources of energy).²⁹ Additionally, companies should learn to stay committed to making energy transition a way of business and find ways to make it competitive—for example, finding economic incentives in a reduced operational carbon footprint, leveraging big data analytics to satisfy environmental reporting requirements, and eventually optimizing performance while meeting such green goals.³⁰

The reverberations of the pandemic will extend beyond the US shale industry. Although US shales is less than 10 percent of global oil and gas production, it accounts for 40 percent of the global drilling activity and explains nearly 100 percent of the growth in US midstream and export-oriented refining and petrochemical sectors over the past 10 years.³¹ Thus, any major developments in US shales will likely have a domino effect on the global oil and gas industry.



Figure 5. Respond. Recover. Thrive



Source: Deloitte analysis.

Appendix

Operational and financial benchmarking of US shale operators is based on the below metrics using 2019 or the latest 12-month data. The performance of a company against each metric was normalized and stack-ranked, which was aggregated to come up with a consolidated operational and financial score.

Operational score: Average of all normalized scores								
Metric	Production margin	Return over DD&A expense	SG&A cost per boe	Developed acres ratio	Developed reserves coverage	Development and exploration cost per reserve added	Investment ratio	Production per productive well
Formula	(Avg. price realized per boe – production cost)/ Avg. price realized per boe	(Avg. price realized per boe – production cost)/ DD&A expense	SG&A cost/ Total oil equivalent production	Net developed acres/Total acres	Developed reserves/ Total oil equivalent production	Reserve additions (O,G,NGL)/ Development and exploration cost	Capital expenditure/ Cash from operations	Total oil equivalent production/ Net productive wells
Description	Margin realized over production costs (LOE) per boe	Gross margin realized coverage of noncash expense	SG&A cost in proportion to production	Portion of locked-up capital in undeveloped acres	Cover for production from developed reserves	Cost incurred for each additional reserve for the period FY 2019	Cash from operations' coverage capex spend	Productivity measure of operational wells
Ranking	Higher the better	Higher the better	Lower the better	Higher the better	Higher the better	Lower the better	Lower the better	Higher the better

Financial score: Average of all normalized scores							
Metric	Leverage ratio	EBITDA margin	Interest coverage	Cash from operations over DD&A	Price to book ratio	Return on capital employed	Basic defense interval
Formula	Total debt/ Capital	EBITDA/ Total revenue	EBITDA/ Total interest expense	Cash from operations/ DD&A expense	Stock price/ Book value as of March 31, 2020	EBIT/ (Total assets–Current liabilities)	(Total cash, short-term investments, receivables)/ (Total operating, interest, and tax expense)*365
Description	Measure of leverage on capital structure	Cash profit margin over revenues	Ability to repay outstanding debt from cash profits	Cash from operations' coverage of noncash expense	Market valuation of company over carrying value	Measure of profitability and capital efficiency	Number of days of liquidity buffer of current assets to meet expenses
Ranking	Lower the better	Higher the better	Higher the better	Higher the better	Lower the better	Higher the better	Higher the better

Sources: CapitalIQ, Rystad Energy, Bloomberg, Deloitte analysis.

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