# Preparing the E&P Sector for the Energy Transition: A New Business Model


## Summary

The US E&P industry is in a time of crisis. Low equity returns have caused capital to flee the space, stretching balance sheets and creating distress. E&Ps are the worst performing sector in the market over the past decade, and energy now represents less than 4%[1] of the S&P 500 Index (SPX), an all-time low. The industry's response so far has been to hunker down, change little about the business model, and hope for a cyclical recovery. We believe this is a mistake. What is happening is more than a cyclical low, it is a response to a decade of poor capital allocation choices made with a mindset of growth for growth's sake, which has only hurt public equity investors. The central issue is that the business model of shale was based on resource scarcity, and that premise drove capital allocation decisions, executive compensation schemes and valuation methodologies. Instead, the abundant production from shale has turned the notion of scarcity on its head. To make matters worse, this era of plentiful supply is concurrent with growing uncertainty around the trajectory of long-term demand growth. We believe that the world will inevitably transition away from fossil fuels and the US public E&P sector is woefully unprepared. Companies should be selling assets, cutting costs, repairing balance sheets and returning capital to shareholders at an accelerating pace. Despite all the forces that are conspiring to make the E&P sector uninvestable today, we remain optimistic that prospective returns can be attractive if the appropriate actions are undertaken by the industry with the immediacy and voracity that they demand.


## Energy 1.0: The Scarcity Mistake and Growth at All Costs

The US E&P industry from 2010 to 2020 has suffered a lost decade. The share price of the SPDR S&P Oil & Gas Exploration and Production Index (XOP), the industry index, declined 39%, while the SPX gained 185% (**Figure 1**).

**Figure 1: XOP vs. SPX Performance[2]**


At first glance, one could be tempted to blame E&P underperformance on commodity prices. After all, over the past decade oil prices fell from $80/bbl for WTI to $50/bbl and gas prices fell from $5.83/mcf to

[1] Bloomberg; S&P 500 Energy Index as a percentage of the SPX as of 2/21/20

[2] Source: Bloomberg

$2.00/mcf. However, in recent years public energy companies have performed worse than the commodity decline would imply. We believe this underperformance reflects wider structural and behavioral challenges.

To understand the drivers of the industry's underperformance, it is worth stepping back to the beginning of the decade and looking at energy markets as seen in 2010. Over the prior decade US production had been in decline, global supply growth had been very low, and markets had been tightening as a result of both factors. Over this period, oil prices had climbed steeply from $25/bbl in 2000 to nearly $80/bbl at the end of the decade (**Figure 2**). While the 2008 financial crisis briefly derailed this trend, many perceived it as a bump in the road to higher prices as resources became scarcer in the face of growing Chinese and Indian demand.

**Figure 2: Oil Price 2000-2010**

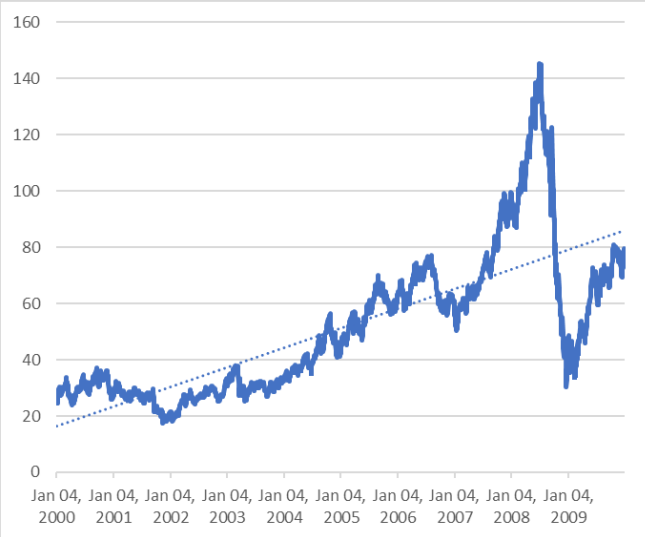
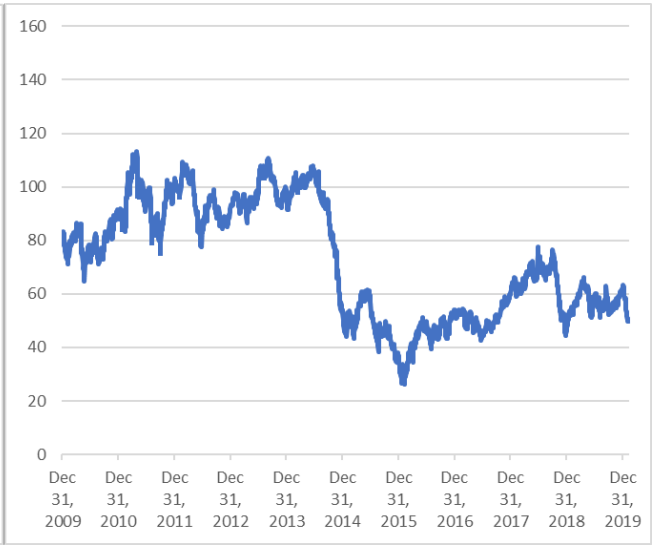



**Figure 3: Oil Price 2010-2019**




Source: Bloomberg

The same had been true in the natural gas market. In the middle of the decade the development of the Barnett, Fayetteville and Marcellus shales had begun to demonstrate that "unconventional" reservoirs could fill this supply gap. But many in the industry believed that this was a once-in-a-lifetime land grab and that the winners would be those who could secure the resources.

This thesis appeared set to continue into the next decade with the shale revolution. Company after company emerged, leasing land in new plays (Bakken, SCOOP/STACK, Eagle Ford and Permian), drilling initial test wells and selling the assets on to companies that had not been nimble enough to participate. To justify ever-rising land prices, operators increasingly shifted their reporting away from earnings and GAAP returns to non-GAAP metrics like EBITDA and NAVs, and eventually to more tailored metrics with names like "pre-tax cash wellhead IRRs" or "half-cycle economics". As long as investors believed in scarcity, inventory was valuable, land prices kept rising and E&Ps became more and more aggressive in paying for future resources.

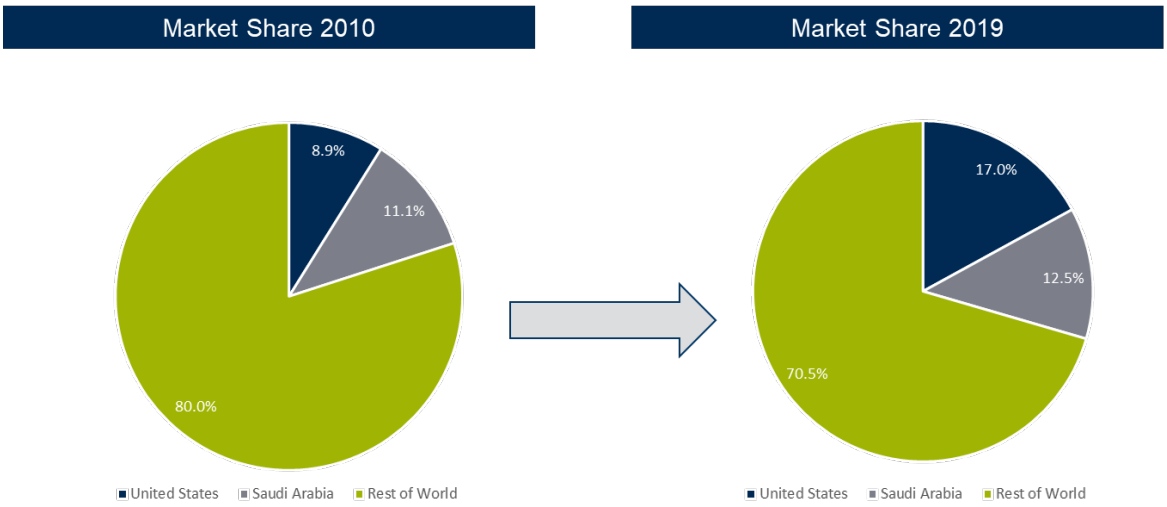
As the decade progressed, data started to emerge that would challenge this thesis, and the commodity flattened (**Figure 3**). The first issue was that well performance continued to improve, especially in

natural gas, and the idea that the resource was scarce started to seem less believable. Initially, unconventional gas was such a small percentage of the market that even if it grew quickly, it would be too small to make a dent. Early into the decade, it was clear that it was no longer small, and the dent would be very big.

Second, it became apparent that the well-level IRRs that companies were reporting were not translating to corporate level returns, and that the promised era of free cash flow was further away, or perhaps never to materialize. Despite this, the market's troubles were explained away by the US gas market being a local closed system, and in response, the industry focused instead on oil that could be exported into a growing global market. Shale gas might never have produced meaningful cash flows, but oil would, or so the argument went.

Over the last decade US oil supply grew meaningfully. The US took market share on the global market, nearly doubling from 8.9% to 17%. Saudi Arabia remained flat and the rest of the world declined (**Figure 4**).

### Figure 4: Change in Global Market Share for Oil



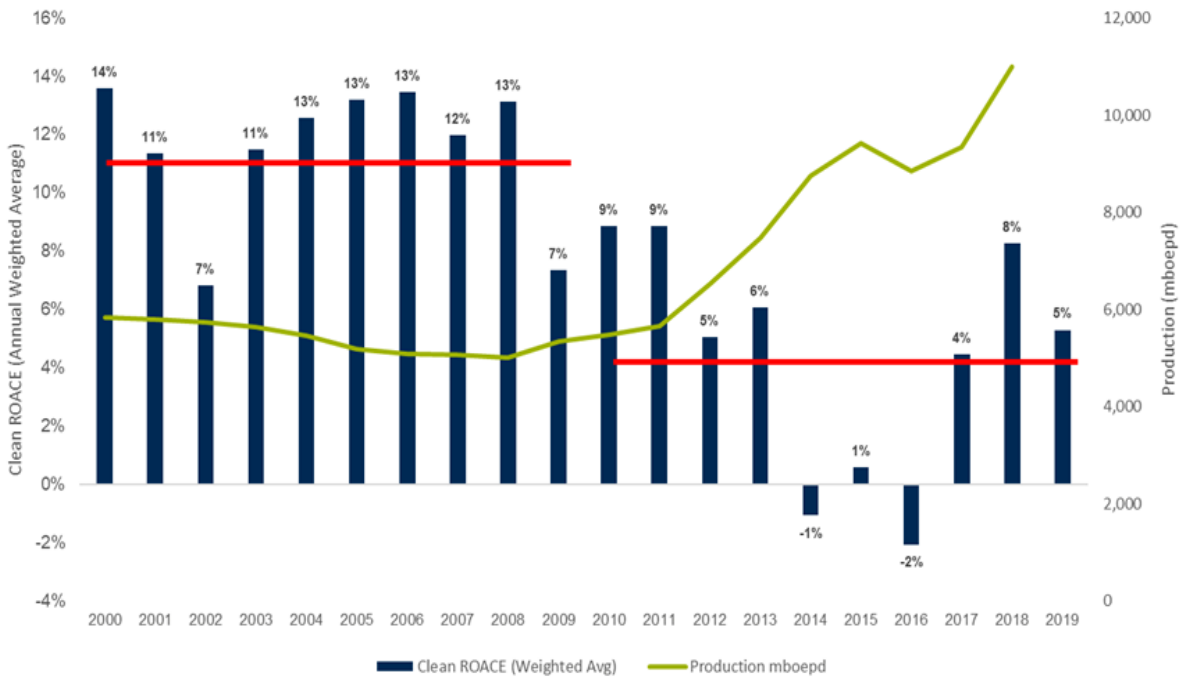

Source: EIA Data

**But What About Returns on Capital?**

While US production grew and took global market share, the US oil market came to look just like the gas market: lots of volume, not a lot of profits (**Figure 5**). Despite reported well-level IRRs over 100%, the sector delivered an average ROACE from 2010 to 2020 of 4%[3], well below the industry weighted average cost of capital (WACC).

[3] Based on Kimmeridge internal model

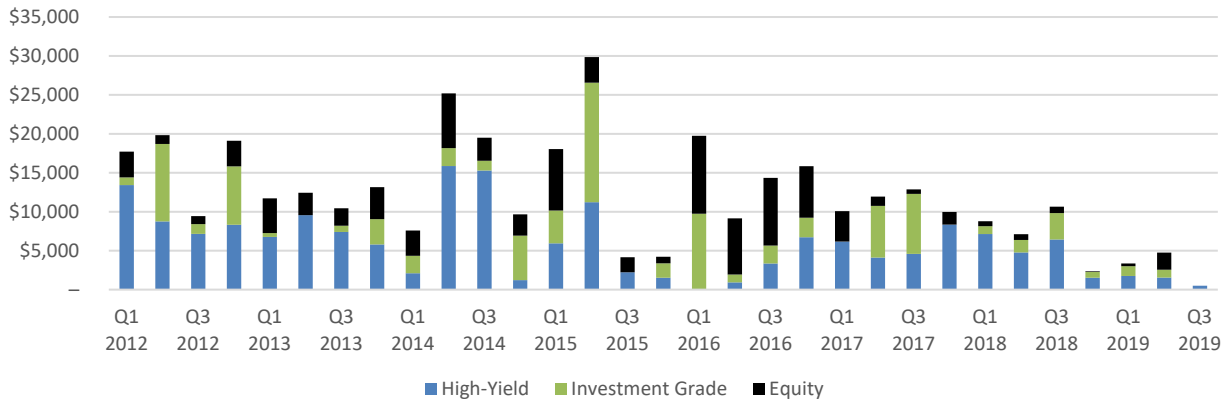
## Figure 5: US E&P ROACE vs. Production




Source: Kimmeridge internal data including financial and operating results for approximately 80 publicly-listed US E&Ps (Kimmeridge Model). 2019 ROACE estimate sourced from external data on a subset of 20 E&P companies with overlap to the Kimmeridge Model. *4Q2019 results have not been reported in full for the peer group.

Growth in production was fueled not just by equity capital, but also by debt from banks and from high yield offerings (**Figure 6)**. First principles show a simple equation: when an industry adds large amounts of expensive debt and has returns on capital below the cost of the debt, the result is an erosion of equity value. This is indeed what happened, and the destruction in value was reflected in the capital markets.

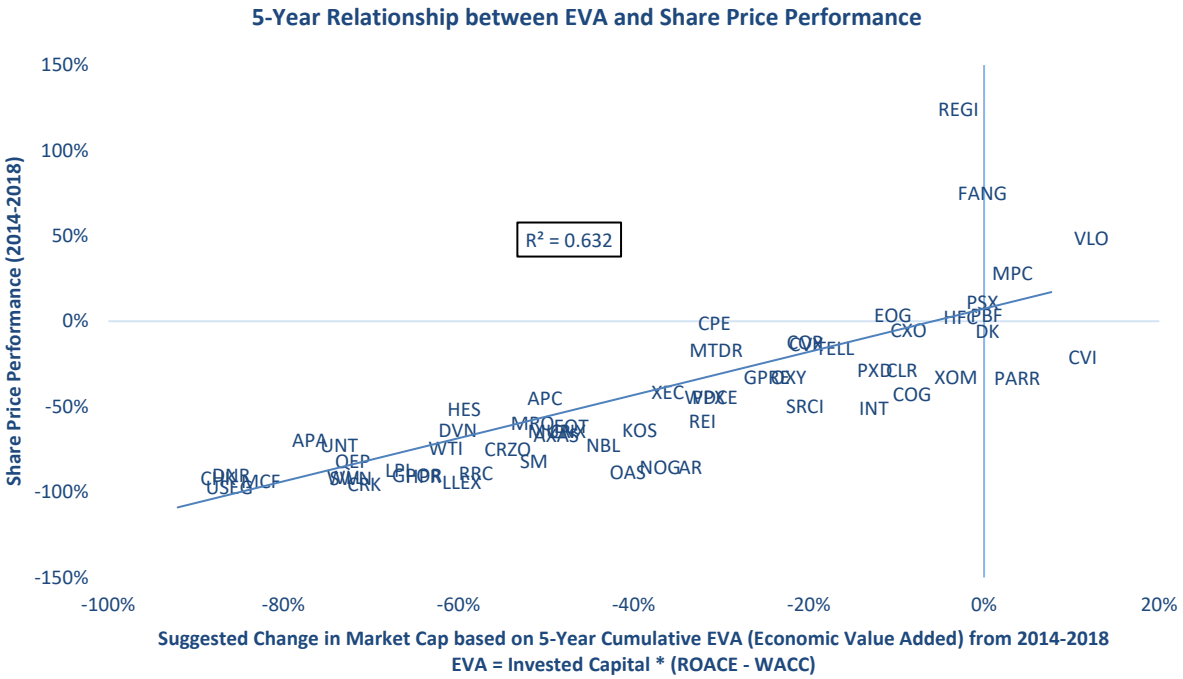
## Figure 6: E&P Capital Issuance by Quarter[4]




[4] Data provided by Credit Suisse

Based on our research, for every $100 of cash flow generated by the E&P space, 15-20% was spent on SG&A, while the residual was invested with a very low return on capital. With a cost of capital of 10%, significant economic value was destroyed (**Figure 7**). Individual companies saw their market capitalizations fall in line with the economic value they destroyed. The sector also wrote off over $300 billion of book value from 2010-2018 as the value of investments fell short of the cost of their addition.

**Figure 7: Economic Value Add vs. Share Price Performance for the E&Ps & Refiners**




Source: Bloomberg

**The Net Asset Value Fallacy**

One of the reasons that investors didn't focus on ROACE as the shale boom took off was the reliance on Net Asset Value (NAV). NAV has long been utilized as a valuation tool within resource extraction industries. It provides meaningful informational value as it is the only metric which accounts for the underlying decline rate of the business as well as the quality and duration of a company's future reinvestment opportunities. But there were a few issues with the application of NAV to the E&P model. First, NAV models typically ascribe value to future drilling locations but often do not consider the finite nature of leases that expire and need to be renewed. During 2000-2010, billions of dollars of capital were spent to maintain leasehold positions to keep NAV flat, and that capex was largely ignored.

A second, but more fundamental problem is that E&P management teams built their corporate strategies and capital allocation philosophies around solving for NAV. But by maximizing reinvestment rates to solve for NAV, there is a perpetual deferral of free cash flow into the future. Today, in an environment where investors are increasingly concerned about the transition away from fossil fuels, the market is either implicitly or explicitly ascribing a higher discount rate to long-term cash flows within the

sector. NAV calculation provides no information as to the timing of when the free cash flow is generated or how it will be returned to investors.

**Shouldn't It Have Ended by Now?**

Why would value destructive behavior of this magnitude continue? It is a good question with an unsatisfying answer. As share prices and multiples decline, corporate finance theory dictates that operators should reduce spending, limit investment and reduce supply. However, this didn't happen in the E&P space and the main reason is that the underlying incentive programs that emerged for boards and management teams were not aligned with the interests of shareholders. First, C-suites were increasingly compensated on metrics related to reserve growth, production growth, resource capture and operational efficiency. This reflected the mindset of resource scarcity. In some cases, management was even compensated for hitting capital expenditure targets, as if this in itself was a challenge. Metrics related to cash returns, net income, returns on capital and total shareholder returns became rare. Compensation plans were supposed to create alignment by paying teams and boards in stock, but both were allowed to sell most of the stock they received immediately, which they often did. For many of these teams, maximizing their own personal wealth meant spending shareholder money and getting bigger. Return on capital or total absolute shareholder return was irrelevant.

One particularly harmful component of E&P compensation plans was the use of relative performance. Those compensation plans that used share price performance as a metric almost all used relative TSR, as if the underperformance of peers was a good excuse for losing investors' money. That has created an environment where management teams can receive substantial financial payouts for simply being 'less bad' then their self-defined peer group. That provides little incentive to radically evolve the business model. As recently noted in a Pay Governance memorandum, "Pay Governance experience and academic research have found that Relative TSR use is not causal to improved company performance."

> *"Relative TSR is an output—comparing a company's TSR to a peer set—without a specific connection to the financial and operational measures in the company's business plan. This minimizes the incentive impact, resulting in a game of chance with reversion to the mean (i.e., consistent use of the same comparator group will inevitably result in periods of underperformance and outperformance due to TSR fluctuations in the comparator group)."*

Source: https://corpgov.law.harvard.edu/2019/08/25/relative-performance-and-incentive-metrics/

Management teams were successful at forming compensation metrics that they could hit. In 2018, for instance, the average E&P CEO earned well over 100% of their target performance, while delivering massive share price underperformance. 2018 was not a unique year (**Figure 8**).

**Figure 8: Short Term Compensation Earned vs. Total Stock Return**


Source: Corporate Reports, Wolfe Research

**The News Gets Worse: Long-Term Demand Growth**

The oversupply and compensation alignment issues on their own would be enough to create massive headwinds for the E&P sector. But as an added challenge, the backdrop of increasing pressure on companies to reduce carbon emissions and cut fossil fuel use has created significant long-term uncertainty for the oil demand outlook. While there are clearly many different opinions on the penetration rate of electric vehicles and what is a reasonable date for peak oil demand, both of those concepts are now widespread, and investors increasingly look at the sector as one whose terminal value may be at risk.

**A New Business Model and a Necessary Reckoning: Cash Returns and Preparing for the Transition**

The good news for investors is that despite the decade of lost performance, attractive E&P assets that produce significant cash flows do exist. The problem is that many of these assets are trapped within companies with over-leveraged balance sheets run by management teams with misaligned incentives and histories of poor capital allocation. Fixing this will not be easy. To find a playbook designed to fix the problem, we can look at two different sectors that radically pivoted their business models in the face of similar challenges: refining and tobacco. Both the refining and tobacco sectors, for different reasons, have entered periods where reinvestment opportunities do not present good return scenarios and where growth is not going to be rewarded. The solution for both industries has been lower capital reinvestment rates, higher distributions to shareholders and better alignment.

Taking its cue from similarly situated businesses, Kimmeridge believes that to make the sector investable again, E&Ps must:

1. Provide visibility into returning 100% of the enterprise value to shareholders through dividends and buybacks within ten years
2. Commit to reinvesting less than 70% of cashflow at strip pricing and place a cap on annual reinvestment rates at 80% in the case of better price environments
3. Reduce balance sheet leverage targets to 1.0x ND/EBITDA or below
4. Align management compensation with the interests of shareholders through lower cash base salaries, higher equity ownership, pay for absolute share price performance and tiered change of control payments that reward selling and consolidation
5. Make capital allocation decisions with an understanding of the environmental impact, including the discontinuation of freshwater use for fracking, zero gas flaring and a commitment to carbon neutrality

We believe that a significant proportion of the industry will not be able to achieve these targets. A review of the US cost curve from 2016 to 2019 shows that just 63% of the peer group had a recycle ratio over 100% at $53/bbl, which is barely enough to stand still, let alone return cash while running flat or growing.

However, the challenge is not as drastic as it may appear. In **Figure 9** we show the metrics for a stylized company that has EBITDA of $1,000M and trades at a 3x EBITDA multiple. If the company is spending 16% of its cash flow on SG&A, which is common in the space, but moves to a low growth model, it could reduce SG&A significantly. If it took SG&A from 16% to 4%, it would free up $120M of new cash flow each year, bringing EBITDA to $1,120M. Reducing capex from initially spending 100% of EBITDA to 80% of EBITDA means scaling back to $850M. Combined, this leaves $270M of cash for investors, or a 9% yield, allowing a company to return its EV in only 11 years.

**Figure 9: Stylized E&P Example Generating FCF while Reducing SG&A and Capex**

**Example Case Study**

| | |
|---|---|
| EV/EBITDA | 3X |
| EBITDA | $1,000 |
| EV | $3,000 |
| SG&A as % of EBITDA | 16% |
| Current SG&A | $160 |
| Revised SG&A | $40 |
| New EBITDA | $1,120 |
| Current Capex | $1,000 |
| Target Capex | $850.00 |
| Incremental FCF generatior | $270.00 |
| FCF/EV | 9% |
| Debt to EBITDA | 1.5X |

- For a company at 3X EBITDA, returning 100% of EV can be achieved by reducing SG&A by 70% and reducing capex by 15%.
- Multiple E&Ps have SG&A of $30-40M per active rig, while the best in class is $5-6M.
- Even with the repayment of debt in line with covenants, this results in a 9% dividend yield to investors and a 13% IRR, exclusive of any multiple expansion.

| Return to equity | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Terminal Company |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Debt | 1500 | 1365 | 1230 | 1095 | 960 | 825 | 690 | 555 | 420 | 285 | 150 |
| CF to Equity Investor | -1500 | 135 | 135 | 135 | 135 | 135 | 135 | 135 | 135 | 135 | $2,850 |

Note: Assumes 50% of FCF is used for debt repayment and 50% for dividends

| | |
|---|---|
| IRR | 13% |
| NPV | 2.71X |

NoteII: IRR rises to 20% if the underlying multiple expands with higher returns

With the high decline rate inherent to shale assets there is always going to be concern that a 15% reduction in capex would lead to a declining production base. The illustrative example below (**Figure 10**) highlights our view that by eliminating the 5% growth target currently pursued by the average US E&P, production levels could be sustained. This only assumes a 5% improvement in capital efficiency associated with high-grading, though Kimmeridge's analysis of 2019 drilling campaigns in the Permian across a diverse cross section of companies shows that eliminating the bottom quintile of wells (as measured by cumulative 90-day oil production per lateral foot) could result in even greater improvement in productivity.

### Figure 10: Impact of High-Grading on Production

| **Illustrative Example** | |
|---|---|
| 2019 Production | 100,000 |
| *Decline Rate* | *37%* |
| *2020 Growth Rate* | *5%* |
| Gross Adds | 42,000 |
| 85% of activity | 35,700 |
| 5% productivity high-grading | 37,485 |
| 2020 Production | 100,485 |
| *Adjusted growth* | *0.5%* |

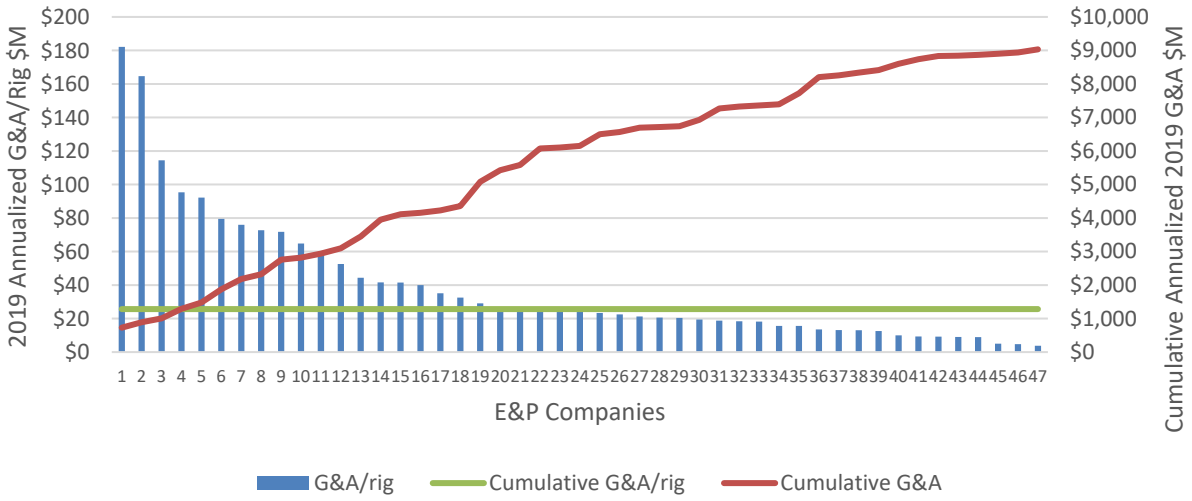
Source: Kimmeridge estimates, public records and RS Energy data.

**Is This Realistic?**

As a direct operator of oil and gas assets, Kimmeridge believes these numbers are not fanciful and that it is possible to run an E&P business with SG&A that is far lower than the average in the public space of over $20M as shown by the chart below[5] (**Figure 11**). Additionally, many companies have invested millions if not billions in unproductive assets (Columbia River Basin, SCOOP/STACK, TMS, LA Chalk) and fringe acreage, suggesting that implementing capital constraints and spending a lower percentage of cash flow is achievable if management teams are forced to high-grade capital deployment and work harder to avoid acreage train wrecks.

[5] Annualized 2019 G&A using the first nine months of data, sourced from Bloomberg. Rig count as of 2/18/20 sourced from DrillingInfo. Based on 47 publicly-listed E&Ps who are currently running at least one rig.

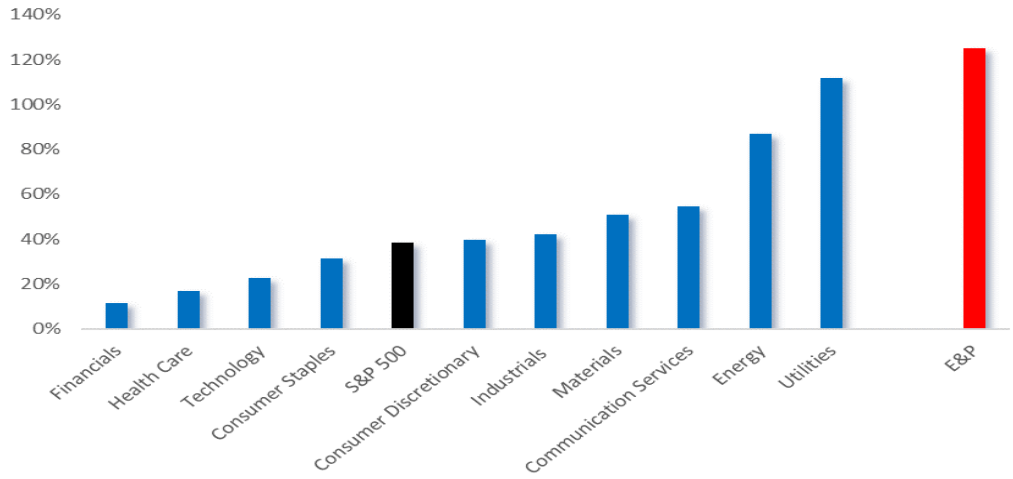
**Figure 11: Annualized G&A per Rig for the US E&P Industry**




Source: Bloomberg, Corporate Reports & Kimmeridge internal research estimates

It should also be noted that a reinvestment rate of 70% is still very high. The average S&P 500 company only reinvests 40% of cash flow each year (**Figure 12**). That is why it is not surprising to us that an industry that has reinvested over 100% of its cash flow while generating a ROACE below its cost of capital is not attractive to most generalist investors.

**Figure 12: Reinvestment Rates Across Industries (Capex/Cash Flow) 2010-2019**



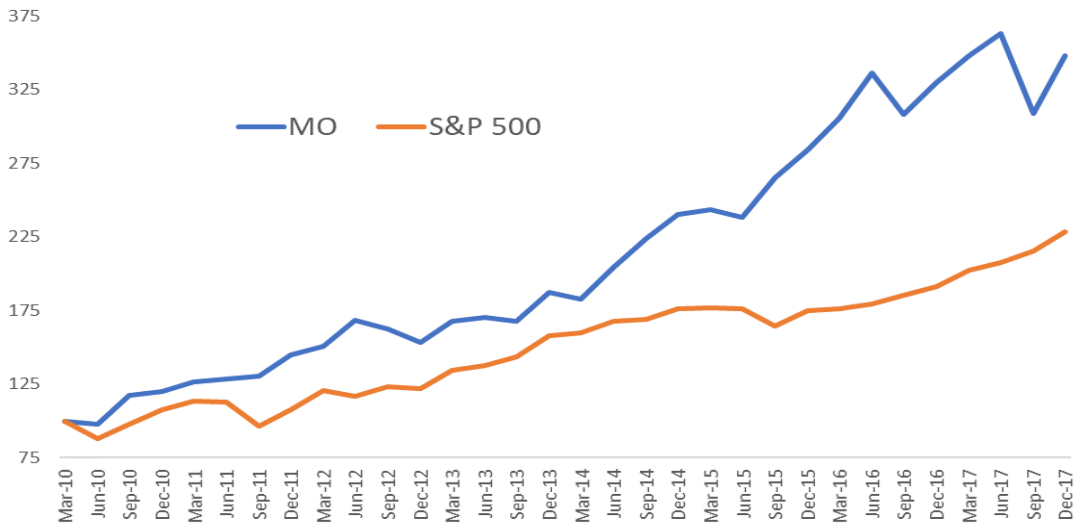

Source: Bloomberg

**It's Been Done Before I: Tobacco**

As we've discussed, the playbook we have outlined above is not new. Our optimism around prospective returns for the E&P sector stems from the dramatic outperformance of a sector like tobacco (**Figure 13**)

where there were similar questions around terminal value and the industry found itself on the wrong side of social pressures. From 2010-2017 Altria Group (MO) materially outperformed the SPX even though the world was aware of the disastrous health effects associated with smoking and global cigarette volumes peaked in 2012.

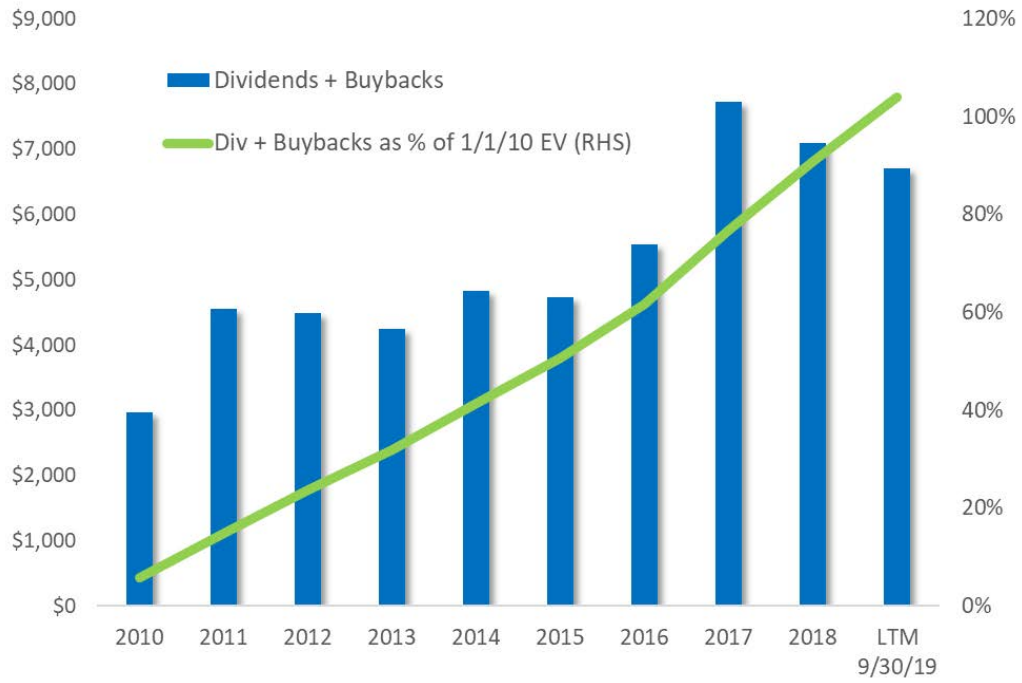
**Figure 13: Share Price Performance of Altria Group (MO) vs. the S&P**




Source: Prepared by Kimmeridge using publicly available data on Altria Group, Inc. (Altria) over the seven-year period ended 12/31/17. Provided for illustrative purposes as an example of how a particular company showed improved financial results by implementing needed changes. Results could differ if measured over different time periods.

While a company like Altria retained pricing power given the concentrated industry structure and addictive nature of their product, revenues only grew 2% p.a. over those seven years. It was not a high-growth strategy that drove the outperformance. Rather it was the dramatic return of capital that forced investors to pay attention. Over the past decade Altria has returned $53Bn to investors through dividends and buybacks, which represents 104% of the company's enterprise value at the beginning of 2010 (**Figure 14**). With that return of capital, the market was able to view any cash flows beyond those ten years as option value on the sustainability of the business.

**Figure 14: Altria Dividends and Buybacks as a Percentage of Starting Enterprise Value**

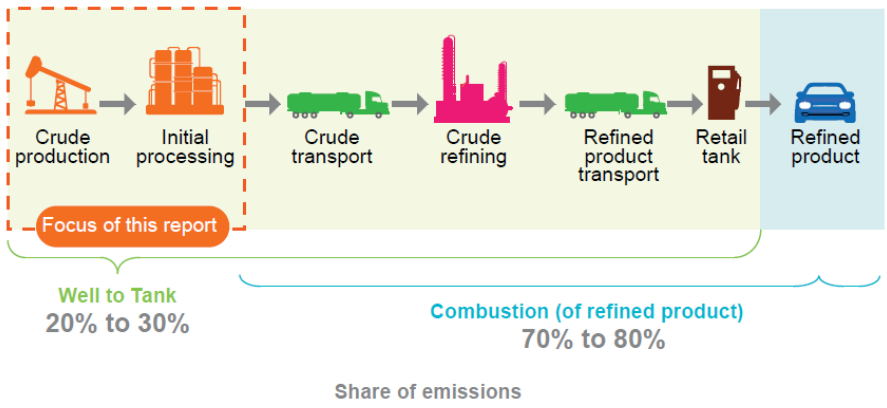



Source: Prepared by Kimmeridge using publicly available data on Altria from 1/1/10 through 9/30/19. Provided for illustrative purposes as an example of how a particular company showed improved financial results by implementing needed changes. Results could differ if measured over different time periods.

**It's Been Done Before II: Refining**

Another example exists closer to home in the US refining space. US refiners largely sell gasoline domestically where the growth outlook is challenging. US gasoline demand should peak well before global oil demand given expected EV penetration rates in the country coupled with the maturity of the vehicle fleet, but very few investors worry about terminal value risk associated with a US refinery. Similarly, even though the refining process and ultimate combustion of their products is responsible for 70-80% of the GHG emissions from the petroleum industry (**Figure 15**), there is much less ESG pressure to avoid refining stocks relative to E&P stocks.

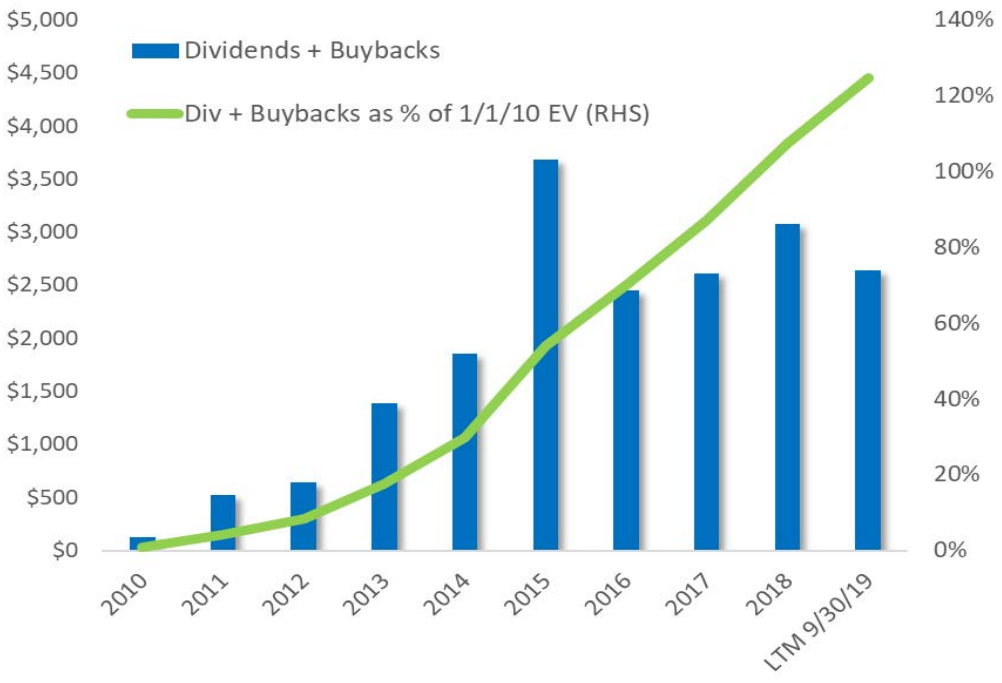
## Figure 15: Life-Cycle GHG Emissions of Petroleum Fuels




Source: IHS Markit

In fact, a US refining company like Valero has seen its valuation multiple expand while materially outperforming the S&P 500 over the past decade (**Figure 16**). How is that possible? Because Valero stopped reinvesting at high rates into a business with little to no visibility into end demand growth for its products and returned 100% of the enterprise value (at the beginning of 2010) through dividends and buybacks.

## Figure 16: Valero Dividends and Buybacks as a Percentage of Starting Enterprise Value




Source: Prepared by Kimmeridge using publicly available data on Valero from 1/1/10 through 9/30/19. Provided for illustrative purposes as an example of how a particular company showed improved financial results by implementing needed changes. Results could differ if measured over different time periods.

We believe that by making these changes and following the same playbook, the E&P industry could reduce the risk of equity ownership for investors with visibility toward 100% of capital returned in a decade with a retained option on the asset base should energy demand continue to grow.

**Putting the E, S and G into the E&P Sector**

In our view, the aversion to investing in the E&P sector has only been exacerbated by the growing ESG pressures within the investment management industry. Between the destructive environmental footprint, including excessive water consumption and wasteful methane emissions, and the failure of corporate governance that has overseen a destruction in shareholder value of epic proportions, the E&P sector consistently finds itself on the wrong side of any ESG investment framework. For many this has led to calls to divest from the sector and divesting from a sector plagued by poor performance has not been a tough sell.

However, while divestment is one strategy, we believe that engagement is more valuable. Divesting could leave the sector increasingly concentrated in the hands of ETFs and passive funds that are structurally inclined to vote with management on key issues of governance. In the case of contested proxy fights, many management teams defend their poor performance by highlighting the risks to changing boards, changing pay and introducing new ideas. At the same time, they lean on relative TSR to argue that while they may have destroyed value, they are not the worst offenders. We fear that divestment by active managers will let management teams continue to make these arguments. Without a realignment of management incentives, the drive for volume over returns will continue, as will wasteful production and more flaring, coupling poor economic outcomes with poor environmental outcomes.

At Kimmeridge we advocate for these changes:

- **Governance**: Align interests between shareholders, boards and investors. Tie compensation to absolute performance. Lower cash compensation, limit board terms and require board compensation in stock to be held until exit.
- **Environmental**: Target zero flaring of gas, which is both environmentally irresponsible and uneconomic. Target 100% recycled water for fracking. Plan to achieve net zero emissions.
- **Social**: Position companies for the future energy transition that is upon us. This should include an honest assessment of whether declining the asset base and returning cash is the right strategy. Play a leadership role across jurisdictions. The support and trust of communities impacted by energy development is essential.

**Conclusion: Radical not Incremental Change is Required to Make the Sector Investable Again**

The US E&P Industry is in crisis. After suffering a lost decade, the peer group risk repeating their mistakes of the past. Continuing to drill uneconomic wells will do little but destroy what is left of shareholder equity, while charting a path to bankruptcy. Hiding behind the industry's cyclicality and hoping for a recovery is not a strategy and is unlikely to work. **The industry needs to embrace a new business model focused on lower reinvestment rates (70%), lower growth, lower costs, returns above the cost of capital and cash returns to shareholders (100% of enterprise value over 10 years).**

Investors will need to drive this change. With management and boards compensated to maintain the status quo, few will embrace the changes needed, irrespective of the economic and industrial logic. Making these changes represents good corporate stewardship, is consistent with a responsible ESG framework and only highlights the need for engagement over divestment. Improving governance and alignment is essential. Lower investment rates will reduce production for production's sake, and will reduce flaring, which is both harmful to the environment and economically irrational. Strong boards should also stand up for reduced freshwater use, limiting wastewater injection and best-in-class transparency.

The fight will not be easy but the payoff for investors, industry participants as well as the environment will justify the efforts in making the sector investable again.

This paper represents the views and opinions of Kimmeridge Energy Management Company, LLC and its employees and affiliates (Kimmeridge) as of the date hereof and is subject to change. The opinions expressed herein are not representative of our views on any particular company, rather they reflect our views on the US energy industry as a whole. All data used in this paper has been sourced from public filings of US E&P companies unless otherwise noted and, while based on sources we consider to be reliable, we do not represent that the information presented herein is entirely accurate or complete and it should not be relied on as such. This paper is provided for informational purposes only and is not meant to be relied upon in making any investment or other decision. Nothing herein is designed to be a recommendation to purchase or sell any security, investment product or vehicle. There is no guarantee that implementing the views presented in this paper will yield positive results for any individual E&P company or the energy industry as a whole. Certain examples provided in this paper contain the performance results of one particular company and results could differ depending on the particular company used in the example or whether a particular group of companies was used in the comparison. The price and value of investments referred to in this paper may fluctuate. Past performance is not indicative of future results. Nothing in this paper represents investment performance of Kimmeridge or any Kimmeridge-sponsored fund. Investing in any sector involves significant risks.