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Two Economies Collide

Competition, Conflict, and the Financial Case for Fossil Fuel Divestment

Executive Summary

The coal, oil and gas sectors have lost their financial rationale.

Competitive forces inside and outside the industry have undermined this once-mighty economic force. Politics now drives oil and gas prices, with the war in Ukraine serving as a vivid reminder of this stark reality. Market forces now favor fossil fuel competitors; cost efficiencies, innovation and public opinion are converging to move trillions of dollars to sustainable alternatives. Meanwhile, an increasing number of destructive weather events have underscored the destruction caused by climate change and increased public demands for solutions.

Investors should move away from fossil fuels because the coal, oil and gas sectors are confronted with competitive pressures that they are ill-prepared to navigate.

Competitors are mapping a sustainable way forward. From 2010 through the COVID-19 pandemic that began in early 2020, the energy sector faltered—lagging the Standard & Poor's 500-stock index in eight of those years and placing last of all sectors in five. Those years witnessed structural changes in the oil and gas sector. Fracking in the United States dramatically increased the world's oil and gas supply, driving down prices and exposing an obsolete oil and gas business model. Worldwide competition across the oil and gas industry's traditional markets in power, transportation and petrochemicals have taken market share. The outlook is for more of the same. The oil and gas sector's promised technological innovations, such as carbon capture and sequestration (CCS) technology, remain unproven, unreliable and unprofitable.

From a structural standpoint, two economies are emerging—one based on fossil fuels and one based on sustainability—that cooperate and conflict but ultimately integrate into one fragile, changing energy system. Sustainable economics is proving its mettle with innovations, profits, and new capital infusions that alternately compete and cooperate with a declining fossil fuel sector across the power, transportation, and petrochemical sectors.

Faced with this new robust competition, the strategies and tactics of the fossil fuel sector are now largely political, since the industry has lost its financial rationale. As coronavirus vaccines and public health initiatives allowed the world economy to emerge from the COVID-19 pandemic, supply and demand imbalances increased oil and gas prices. Then, Russia's invasion of Ukraine—a consummate display of raw political power—triggered a series of market bottlenecks that drove prices soaring. It also created an energy distribution network driven by support or opposition to Russia's goals of aggression. The results have been significant revenue increases for

all oil and gas producers, including state-owned enterprises and private oil concerns. The high prices have contributed to worldwide inflation, placing extraordinary pressure on developing countries with growing economies.

Death and destruction are at the root of rising revenues. ExxonMobil, for example, saw its revenues during the 2010s drop to the low-$200 billion level after hitting more than $400 billion consecutively for several years. With the Ukrainian invasion, its revenues are back up and may reach $400 billion this year.

Another factor in the energy scenario that has become amplified over the last five years involves the destructive impacts of climate change. The size and scope of floods, hurricanes, tsunamis, droughts, heatwaves, and wildfires are increasing. Large areas of the planet are being battered by destructive climate events. The violence of these natural events is the subject of often-violent disagreements over what to do about climate change.

While the impact of climate change is societal, the argument for divestment is also financial. Weak economic performance and an unstable future for fossil fuels have made it clear that divestment can be achieved without financial harm to any individual investment fund. Divestment is a defensive tool employed to protect investors from the loss of value—losses as certain as climate change's global reach.

This report addresses the many arguments against fossil fuel divestment and updates a 2018 IEEFA report. The opponents of divestment made a simple case that divestment would lose money. It was not true then, and is less true now as hundreds of funds adopting various paths of divestment have maintained their investment targets. Yet that argument persists, and new arguments are increasingly political. Opponents argue that divestment is just part of today's divisive, all-or-nothing political culture. Skeptics express concern that divestment will undermine potential solutions to climate change and that better solutions exist. Beyond the corporate bottom lines, opponents of divestment point to unintended generalized economic imbalances that may result in higher energy prices.

Many of these arguments raise important policy considerations but are beside the point. Climate risk is a financial risk. When a fiduciary acknowledges a risk, they are obligated to take action. Many investment funds are unwilling to consider life with a fossil-free portfolio. They prefer to dismiss divestment based on an unfounded fear of financial loss and a willingness to embrace unproven solutions from the fossil fuel industry, grasping for a past that cannot return. This is a significant fiduciary lapse. At this stage of its evolution, climate change and the current market responses to it require sober consideration of a fully divested portfolio. Fiduciaries can opt for different investment strategies to address climate risk, but without a plan that fully articulates a fossil-free portfolio, those strategies are devoid of a sound fiduciary basis for investment decision-making.

Today, we are told that the oil and gas industry is on its way back. The last few quarters have left the industry flush with cash; stock prices are rising and management is said to have finally learned the secret of capital discipline. Yet despite the political crisis that led to the recent price spikes, the market fundamentals for oil and gas remain weak. No one can say how the Ukrainian

conflict will end or predict the political re-alignments that will occur in its wake. For investors seeking a steady, stable investment, fossil fuels are an unreliable option. They offer volatility, spurious innovations and political calamity. In this sense, divestment is a defensive strategy designed to compel innovation in cleaner alternatives across the power, transportation and petrochemical sectors. Divestment has the potential to be a key ingredient for an emerging, sustainable and profitable economic order.

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I. The Long-Term Financial Performance of the Fossil Fuel Sector Has Been Weak and the Short-Term Outlook is Unsustainable

For decades, the fossil fuel sector powered the growth of the world economy. Coal was essential to the Industrial Revolution. During the early part of the 20th century, oil and gas leaped over coal, and the two fuel sources helped drive unprecedented economic growth.

Table 1: Standard and Poor's Top 10, 1980-2022

	1980	1990	2000	2010	2018	2020	2022 thru Sept
1	IBM	IBM	GE	Exxon*	Apple	Apple	Apple
2	AT&T	Exxon*	Exxon*	Apple	Microsoft	Microsoft	Microsoft
3	Exxon*	GE	Pfizer	Microsoft	Amazon	Amazon	Amazon
4	Standard Oil Indiana*	Phillip Morris	Citigroup	Berkshire	Facebook	Google (Alphabet A)	Tesla
5	Schlumberger*	Shell Oil*	Cisco Systems	GE	Berkshire	Google (Alphabet C)	Google (Alphabet A)
6	Shell Oil*	Bristol Meyers	Walmart	Walmart	JP Morgan	Facebook	Google (Alphabet C)
7	Mobil*	Merck	Microsoft	Google	ExxonMobil*	Berkshire	Berkshire
8	Standard Calif*	Walmart	AIG	Chevron*	Google (Alphabet A)	Visa	United Health
9	Atlantic Richfield*	AT&T	Merck	IBM	Google (Alphabet C)	Johnson & Johnson	Johnson & Johnson
10	GE	Coca Cola	Intel	Procter & Gamble	Johnson & Johnson	Walmart	ExxonMobil*

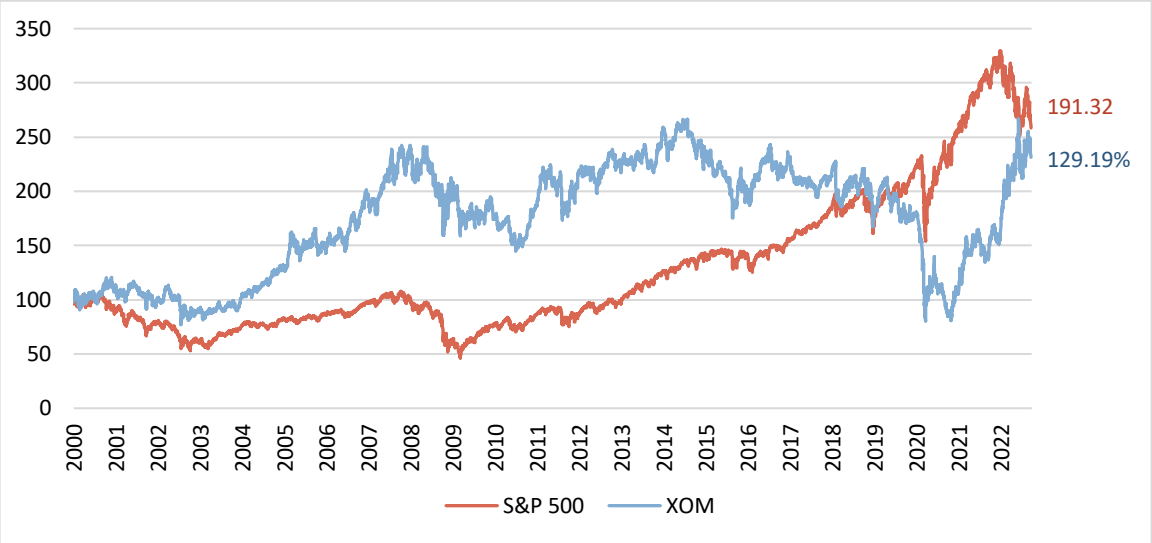
Source: S&P 500.
** Representative oil and gas companies.*

As the driver of the global economy, fossil fuel companies also led the stock market. In the 1980s, for example, seven of the top 10 companies in the Standard and Poor's 500-stock index were oil companies. By 2020, there were no fossil fuel companies in the S&P 500's top 10. In September 2022, ExxonMobil regained entry into the top 10.

Figure 1 illustrates the role of ExxonMobil as a driver of the market from 2000 through 2015. The energy sector led the economy, and ExxonMobil led the energy sector. The company's performance tracks industry performance. With the price collapse in 2014 and the subsequent decline in the industry in 2019, ExxonMobil—the last of the oil and gas companies in the top 10 of the S&P 500—lost its position.[1] Recent price spikes have pushed both its stock price up and the prices of the entire industry. In September 2022 the company re-entered the top ten.

[1] IEEFA. ExxonMobil's Fall From S&P 500 Top Ten: A Long Time Coming. August 2019.

Figure 1: ExxonMobil Growth Compared to the S&P 500, 2000 to Present



Source: Yahoo.com Finance.

The energy sector and ExxonMobil have recovered ground in the market as a whole since 2021. Supply and demand imbalances coming out of the pandemic sent prices up during 2021. The significant price jump in 2022 from the Russian invasion of Ukraine drove the energy sector to its current position of market leadership in 2021 and through September 2022.

Table 2: Standard and Poor's 500 Sector Weightings

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	YTD
ENRS 34.4%	CONS -15.4%	INFT 61.7%	REAL 32.3%	UTIL 19.9%	FINL 28.8%	COND 43.1%	REAL 30.2%	COND 10.1%	ENRS 27.4%	INFT 38.8%	HLTH 6.5%	INFT 50.3%	INFT 43.9%	ENRS 54.6%	ENRS 31.8%
MATR 22.5%	HLTH -22.8%	MATR 48.6%	COND 27.7%	CONS 14.0%	COND 23.9%	HLTH 41.5%	UTIL 29.0%	HLTH 6.9%	TELS 23.5%	MATR 23.8%	UTIL 4.1%	TELS 32.7%	COND 33.3%	REAL 46.2%	UTIL -0.6%
UTIL 19.4%	UTIL -29.0%	COND 41.3%	INDU 26.7%	HLTH 12.7%	REAL 19.7%	INDU 40.7%	HLTH 25.3%	CONS 6.6%	FINL 22.8%	COND 23.0%	COND 0.8%	FINL 32.1%	TELS 23.6%	FINL 35.0%	CONS -5.6%
INFT 16.3%	TELS -30.5%	REAL 27.1%	MATR 22.2%	REAL 11.4%	TELS 18.3%	FINL 35.6%	INFT 20.1%	INFT 5.9%	INDU 18.9%	FINL 22.2%	INFT -0.3%	S&P 31.5%	MATR 20.7%	INFT 34.5%	HLTH -8.3%
CONS 14.2%	COND -33.5%	S&P 26.5%	ENRS 20.5%	TELS 6.3%	HLTH 17.9%	S&P 32.4%	CONS 16.0%	REAL 4.7%	MATR 16.7%	HLTH 22.1%	REAL -2.2%	INDU 29.4%	S&P 18.4%	S&P 28.7%	INDU -16.8%
INDU 12.0%	ENRS -34.9%	INDU 20.9%	TELS 19.0%	COND 6.1%	S&P 16.0%	INFT 28.4%	FINL 15.2%	TELS 3.4%	UTIL 16.3%	S&P 21.8%	S&P -4.4%	REAL 29.0%	HLTH 13.5%	MATR 27.3%	MATR -17.9%
TELS 11.9%	S&P -37.0%	HLTH 19.7%	S&P 15.1%	ENRS 4.7%	INDU 15.4%	CONS 26.1%	S&P 13.7%	S&P 1.4%	INFT 13.9%	INDU 21.0%	CONS -8.4%	COND 27.9%	INDU 11.1%	HLTH 26.1%	FINL -18.7%
HLTH 7.2%	INDU -39.9%	FINL 17.2%	CONS 14.1%	INFT 2.4%	MATR 15.0%	MATR 25.6%	INDU 9.8%	FINL -1.5%	S&P 12.0%	CONS 13.5%	TELS -12.5%	CONS 27.6%	CONS 10.8%	COND 24.4%	S&P -20.0
S&P 5.5%	REAL -42.3%	CONS 14.9%	FINL 12.1%	S&P 2.1%	INFT 14.8%	ENRS 25.1%	COND 9.7%	INDU -2.5%	COND 6.0%	UTIL 12.1%	FINL -13.0%	UTIL 26.4%	UTIL 0.5%	TELS 21.6%	REAL -20.0
COND -13.2%	INFT -43.1%	ENRS 13.8%	INFT 10.2%	INDU -0.6%	CONS 10.8%	UTIL 13.2%	MATR 6.9%	UTIL -4.8%	CONS 5.4%	REAL 10.9%	INDU -13.3%	MATR 24.6%	FINL -1.7%	INDU 21.1%	INFT -26.9%
REAL -17.9%	MATR -45.7%	UTIL 11.9%	UTIL 5.5%	MATR -9.6%	ENRS 4.6%	TELS 11.5%	TELS 3.0%	MATR -8.4%	REAL 3.4%	ENRS -1.0%	MATR -14.7%	HLTH 20.8%	REAL -2.2%	CONS 18.6%	TELS -30.2%
FINL -18.6%	FINL -55.3%	TELS 8.9%	HLTH 2.9%	FINL -17.1%	UTIL 1.3%	REAL 1.6%	ENRS -7.8%	ENRS -21.1%	HLTH -2.7%	TELS -1.3%	ENRS -18.1%	ENRS 11.8%	ENRS -33.7%	UTIL 17.7%	COND -32.8%

Source: Novel Investor. Annual S&P Sector Performance. August 23, 2022.

As discussed elsewhere in this paper, the industry's current leadership position is driven by market bottlenecks precipitated by Russia's invasion of Ukraine. High

prices support short-term cash surpluses and a stock price surge. How long prices will stay high is unknown. A continuation of the war may put upward pressure on prices, but it also may compel affected countries and consumers to implement new, more defensive strategies pushing prices down. More volatility, political conflict and supply disruption are likely to drive markets in the short term.

The war and commensurate price jump have not reversed the forces that drove down prices or the fortunes of oil and gas stocks since 2014. Institutional investors use the Morgan Stanley Capital International (MSCI) World Index to guide trillions of dollars in investments. For more than a decade, the MSCI index without fossil fuels has outperformed the index with fossil fuels (See Figure 2).[2] This continues to be a fact even after the significant price increases of 2022.

Figure 2: Cumulative Returns of MSCI World Index vs. MSCI World Index ex Fossil Fuels, 11/2010 - 9/2022

ANNUAL PERFORMANCE (%)

Year	MSCI ACWI ex Fossil Fuels	MSCI ACWI
2021	18.53	19.04
2020	19.13	16.82
2019	28.19	27.30
2018	-8.92	-8.93
2017	25.45	24.62
2016	7.18	8.48
2015	0.03	-1.84
2014	6.60	4.71
2013	25.00	23.44
2012	18.69	16.80
2011	-7.01	-6.86

Source: MSCI World ex Fossil Fuels Index (USD).

Oil prices have been rapidly rebounding, from $40 per barrel in late 2020 to more than $100 barrel by the end of 2021. They jumped again in February 2022 from $100 per barrel to almost $125 per barrel by March 2022. The energy sector closed out 2021 with a 2.7% share of the S&P 500. By September 2022, energy's market share had increased to 4.5%.[3] This is a significant increase. The energy sector, however, held 28% of the S&P 500 in 1980.[4] The price surge has sparked renewed interest in energy stocks. At the same time, the market share of 4.5% suggests that investor appetite is still more short-term in its orientation.

Although these recent trends in the oil and gas sector have improved its position, the industry remains far away from the financial leadership role it commanded for

[2] MSCI, MSCI ACWU ex Fossil Fuels Index. MSCI ACWI ex Fossil Fuels Index (GBP). August 2022.
[3] S&P 500 Index. S&P Factsheet. September 2022.
[4] Sibils Research. S&P 500 Sector Weightings. August 2022. (Proprietary)

decades. As will be seen throughout the rest of this paper, the basis for this recent improvement is unsustainable.

A. How We Got Here: A Pandemic, War, Oil Prices and an Unstable Fossil Fuel Economy

High prices and surging stock values are the dominant topics in today's energy markets. Russia's invasion of Ukraine—the underlying cause of the high prices—has become little more than a euphemism in oil price discussions. The daily death count is ignored, a rude imposition on the genius ascribed to corporate leaders when dividends are increased. The $125-per-barrel price hit in March was unsustainable. Since June, prices have fallen into the $90-per-barrel range. When and how the bloodshed ends will reset the oil price, most likely lower than the $125-per-barrel peaks experienced this year. Meanwhile OPEC, the historic price-setter, struggles to maintain the $90 to $100 barrel price momentum created by the Ukrainian invasion.[5]

The mid-2014 collapse in global oil prices (see Figure 3) triggered the industry's financial woes and highlighted the structural issues driving it. Prior to that, oil prices regularly topped $100 per barrel. The market did not recover quickly from the 2014 price collapse. The new watchword was "lower for longer."

The low prices revealed a stunning contradiction: In the middle of an oil and gas production boom (driven by U.S. fracking), the industry's financial condition deteriorated.[6] The industry suffered a series of financial problems, including declining revenues; lower profits; major asset write-downs; rising long-term debt loads; and dwindling capital spending that foretold fewer opportunities for profitable growth. Industry leaders and analysts were bereft of any plan for a turnaround. The overproduction was destroying share value.[7] The industry needed a price increase.

Starting in the early 1980s—when the OPEC-driven oil shocks of the 1970s remained a fresh memory—global oil prices entered a period of decline and relative stability. Adjusted for inflation, oil prices generally trended down for nearly two decades, falling near all-time, inflation-adjusted lows in the late 1990s.

But in the early 2000s, global oil prices began to rise. Unlike the 1970s oil shocks, the increases were due more to geology than geopolitics. Production from larger and older oil fields had begun to decline, and new oil discoveries had grown scarce. Oil prices rose steadily as production growth slowed and new supplies became more expensive. The developments prompted many energy market analysts to conclude that the world had entered a new era of inexorable price increases.

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[5] New York Times, Saudi Arabia and Russia May Find Their Oil Pricing Power Limited. October 4, 2022.
[6] Wall Street Journal. Wall Street Tells Frackers to Stop Counting Barrels, Start Making Profits. December 13, 2017.
[7] The Texas Tribune. Texas' oil and gas regulators aren't ready to cut production yet. They're not even sure how it would work if they did. April 15, 2020.

For almost 15 years—interrupted only briefly by the chaos of the global commodity bubble and 2007-09 economic collapse—forecasts of scarce supplies and high prices gradually tightened their grip on global markets. Confident that oil prices would continue rising, oil and gas investors increasingly turned to capital-intensive "extreme oil" projects, including deepwater drilling, Arctic exploration, and tar sands extraction in Canada. Even under the best of circumstances, the projects would take decades to recover their upfront costs, let alone turn a profit. Still, convinced that global oil prices would continue to rise, investors believed that high-cost, extreme oil reserves ultimately would yield handsome returns.

Their convictions began to fall apart in mid-2014. Oil prices in June 2014 stood at $105 per barrel. By January 2015, however, they had dropped below $50 per barrel. The declines continued in fits and starts over the next year, with spot oil prices bottoming out in February 2016 at less than $30 per barrel.

The 18-month price shock stemmed neither from geology nor geopolitics, but from technology and investment. The preceding decade of high prices had encouraged smaller U.S. oil companies to experiment with new ways of coaxing oil and gas out of the ground.[8] Over time, the industry succeeded, combining and refining old technologies, including horizontal drilling, seismic imaging, and hydraulic fracturing, or fracking. Wall Street got wind of fracking's early successes and began to pour capital into the nascent tight shale industry. U.S. hydrocarbon production rose quickly—starting with natural gas in the mid-2000s, and later with oil in 2009.

Gas prices crashed. From 2008 through 2016 prices dropped from $17.86 to $2.02 per million British thermal units (MMbtu).[9] The price drop proved to be another nail in the U.S. coal industry's coffin. At the time fossil fuel to fossil fuel competition drove coal's market share down. Simultaneously the market for low-cost renewable energy improved and served as yet another factor in coal's decline.[10]

Initially, prices stayed high even as U.S. oil output grew. Oil prices did not fall immediately because some OPEC members trimmed production to keep supplies tight and oil prices elevated. But the continuing rise of U.S. oil production began eroding OPEC's market share, squeezing profits for governments that relied heavily on oil revenue. In mid-2014, the cartel unexpectedly fought back against the U.S. shale oil industry by refusing to cut production, keeping global supplies elevated.[11] OPEC oil ministers expected that the resulting price crash would undercut the finances of U.S. oil and gas companies, souring investors on U.S. shale oil, and eliminating a growing competitor.

The oil cartel's strategy worked, at least in the short term. The price crash did trigger a major realignment of oil industry finances. Many companies had no choice

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[8] For a lengthy discussion of the growth of the fracking technology and the inability of the industry to construct a business model to ensure profitability see: Daniel Yergin, *The New Map*. New York: Penguin Press, 2022, pp. 3-31.
[9] Macrotrends, Natural Gas Prices Historical Chart, (last checked October 5, 2022)
[10] Hydro Review, Renewables became the second-most prevalent U.S. electricity source in 2020, per EIA,. July 29, 2021.
[11] Vox. Oil prices keep plummeting as OPEC starts a price war with the US. November 28, 2014.

but to write off costly reserves and extreme oil projects launched during the era of high prices. Others sold assets for less than they had paid. A host of smaller product and service companies filed for bankruptcy. As revenues plummeted, stock prices and capital expenditures collapsed, and the industry took on massive debt to weather the storm.[12]

But OPEC's efforts to cripple the U.S. shale industry failed. The price collapse forced free-spending oil and gas companies to improve their financial discipline and drilling efficiencies. After a brief dip, U.S. oil output increased, surpassing 11 million barrels per day by the end of 2018.[13] Global oil prices topped $70 per barrel in 2019. Most analysts expected them to remain roughly at that level. Although many companies claimed they could produce profits at such low prices, stock values remained low. The energy sector was dead last in the stock market in 2019 for the third year in a row.

The low prices tracked lower through 2019. The low-price bottom was reached in 2020 with the onset of the COVID-19 pandemic and the shutdown of the market.[14] Prices dropped into the $20s and ran negative at some points.[15]

Figure 3: Oil Prices

Source: Trading Economics. Crude Oil WTI.

The pandemic shut down the economy in many places. Overall demand fell off as transportation crashed, although some demand increased in residential energy use as more people spent more time at home. Petrochemical demand increased in the

[12] Deloitte. 2016 Outlook on the Oil and Gas Industry.
[13] Daily Energy Insider. US Crude Production passes 11 million barrels per day for first time. November 5, 2018.
[14] Wall Street Journal. 2020 Was One of the Worst-Ever Years for Oil Write-Downs. December 27, 2020.
[15] BBC News. U.S. oil prices turn negative as demand dries up. April 21, 2020.

single-use packaging and medical plastics sectors but faltered in construction and other hard plastic sectors.[16]

OPEC and Russia failed to reach an agreement on oil production cuts. The ensuing dispute pushed already low oil prices to crisis levels in March and April 2020.[17] An agreement was subsequently reached and prices rebounded swiftly. As the economy began to recover from the pandemic, a new dynamic supplied the desperately needed price increase: Demand increased faster than supply.[18] Through most of 2021, prices increased. Demand driven by the reopening of the economy increased quickly but industry-wide problems slowed the increase in supply. The supply demand imbalance pushed prices up.[19]

Prices accelerated again with Russia's invasion of Ukraine in February 2022.[20] Russia's invasion of Ukraine created a series of bottlenecks that pushed oil and gas prices into the $120-per-barrel range, up from $100-per-barrel levels.[21] The February 2022 prices were far above the $22-per-barrel prices of April 2020. The International Energy Agency (IEA) estimates that the invasion increased the market price of oil by $8 per barrel.[22]

Peak prices near $130 per barrel receded after June 2022 as some market rebalancing occurred. Whether or not the war continues, oil and gas prices will remain volatile. Some argue that the markets will just revert to form.[23] If the war continues, there are likely to be additional political decisions that further disrupt markets.[24]

It is also unclear what impact the war will have on climate policy. One school suggests that countries will move more rapidly to achieve their climate objectives, motivated by the need to protect against national security risks posed by the new politics of oil.[25] Others suggest that renewed efforts to harden any security

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[16] U.S. Bureau of Labor Statistics Monthly Labor Review. From the barrel to the pump: the impact of the COVID-19 pandemic on pries for petroleum products. October 2020.
[17] MarketWatch. Why Oil Prices Just Crashed into Negative Territory – 4 Things Investors Need to Know. April 21, 2020.
[18] See for example: U.S. Bureau of Labor Statistics Monthly Labor Review. From the barrel to the pump: the impact of the COVID-19 pandemic on pries for petroleum products. October 2020.
[19] Reuters. Oil rises on economic recovery hopes, weaker dollar. September 2, 2021.
[20] Reuters. Russia's Putin authorises 'special military operation' against Ukraine. February 24, 2022.
[21] See for example: Al Jazeera. Russia-Ukraine crisis: When oil prices climb, Putin gets bolder. February 2, 2022, for explanation of the role of rising oil and gas prices in the geopolitical calculations of Russian leadership.
[22] IEA. Oil Market and Russian Supply. 2022.
[23] Forbes. The Oil Market After the War. April 18, 2022.
[24] The Guardian. Oil and gas prices have been highly volatile. What will happen next? July 5, 2022.
[25] The New York Times. Putin denounces the U.S. as a fading world power. June 17, 2022. Also see: Clean Energy Wire. War in Ukraine: Tracking the impacts on German energy and climate policy. September 13, 2022.

challenges to existing fossil fuels will result in more investment in fossil fuel infrastructure to the exclusion of climate initiatives.[26]

The takeaways from this recent history are clear. One, oil prices are singularly important to the fortunes of the oil and gas sector. Two, the domination of geopolitics as the principal driver of price is taking place at a time when new, fossil-free competitive industries are forming under the rubric of sustainability.

B. Sustainability: The Evolution of the Two-Energy Economy

The traditional energy sector is in a state of long-term decline. The decline can be mitigated by geopolitical and other market manipulations, but the trends move decidedly towards a lower use of fossil fuels. In direct competition with the traditional energy sector is an emerging sector built on sustainability. This newly forming sector is both climate-sensitive and profitable.[27] From a distance, there are two separate sectors of the energy economy of 2022. On closer examination, the two industries are not so separate: They compete, converge, conflict and cooperate. One, the sustainable sector, is growing; the other, the fossil fuel sector, is not. A crooked line connects the dots of past performance and most probable future pathways.

1. The Sustainable Economy Offers a Challenge

BlackRock CEO Larry Fink has said the company is concerned about climate change—not because company leaders are environmentalists, but because they are capitalists. Sustainability was seen a very short time ago as impairing profitability. Today, sustainability improves profitability.

The divestment movement is advancing against the backdrop of a declining oil and gas sector that is in search of a new financial rationale.

Substantial changes fueled by new investments in the electricity, transportation and petrochemical industries have created market challenges for fossil fuel producers. The three areas constitute the major markets where oil and gas are critical. Competitive forces within each of these fields challenge the dominant market share that oil and gas has historically enjoyed.

Looking at these three sectors together and separately demonstrates the size and speed of the changes taking place. It also further supports the contention that the oil and gas sector is not prepared to compete in a world with a diminished need for fossil fuels.

Electricity

Fossil fuels in the form of natural gas and coal have historically dominated global electricity markets. This is likely to continue but at a diminished level. The change

[26] Foreign Policy. Russia's War Is the End of Climate Policy as We Know It. June 5, 2022. Also see: CNBC. The Ukraine War Has Upended the Energy Transition – And It's Not Good News for the Planet. May 20, 2022.
[27] Larry Fink, BlackRock CEO. 2022 Letter to CEO's, January 2022.

being driven by renewable energy over the last decade is substantial and the outlook is positive. In 2020, fossil fuels supplied 59% of electricity worldwide and renewables 26%.[28] The U.S. Energy Information Administration (EIA) projects that in 2035, fossil fuels will have 44% of the market and renewables 46%.

The EIA 2035 projection is a substantial change in its view of the energy mix in worldwide electricity markets. In prior years, the outlook for renewable energy was dismal. For example, the EIA's 2008 forecast predicted renewable energy would capture 23% of the market and fossil fuels 61% in 2035.[29] The EIA's projections showing renewable energy with 46% market share in 2035 illustrates substantial reductions in both the natural gas and coal market.

These changing projections are an example of an industry model catching up with the pace of scientific, technological and business change. Wind and solar energy are growing at rates that exceed expectations on capacity additions and costs.[30] The trend is worldwide. Energy efficiency initiatives integral to the attainment of climate goals are also receiving ongoing support.[31]

Transport

In 2019, ExxonMobil CEO Darren Woods reiterated the company's long-held skepticism about electric vehicles.[32] ExxonMobil and other oil and gas leaders had previously argued that the growth in electric vehicle use would be slow and top out at between 3% and 4% of the automobile market.[33]

But in 2022, Woods reversed ExxonMobil's position. He said that by 2040, electric vehicles would replace the internal combustion engine. There will be a reduction in oil and gas consumption from this change. Woods pointed to petrochemicals as the next frontier for oil and gas expansion and growth, highlighting the integral role that fossil fuels play in the production of electric cars.[34] Fossil fuels provide the feedstock for the plastic that is used to make automobiles lighter.

If electric vehicles replaced electric cars today, it would eliminate more than 25% of global oil production. (Worldwide oil production in 2021 was 96.5 million barrels per day, and gasoline consumed 25.4 million barrels per day).[35] It is unlikely that the increase in oil and gas demand for petrochemicals can replace this level of demand reduction. The likelihood of near-term demand for petrochemicals will increase (see

[28] EIA. Net generation by region and fuel, International Energy Outlook. 2021. Also see: EIA. International Energy Outlook. March 2000, p. 113. In 1990, fossil fuels – oil, gas and coal accounted for 64% of world electricity supply and renewable energy (consisting almost exclusively of hydropower) made up 20%.
[29] EIA. International Energy Outlook 2011. June 10, 2013.
[30] IEA. Renewable electricity growth is accelerating faster than ever worldwide, supporting the emergence of the new global energy economy. December 1, 2021. See also: Utility Dive. 2022 Outlook: US solar and wind boom continues despite supply chain woes, Build Back Better uncertainty. January 21, 2022.
[31] IEA. Net Zero by 2050 Hinges on a Global Push to Increase Energy Efficiency. June 10, 2021.
[32] The Driven. Exxon boss says he doesn't get the point of electric vehicles. September 25, 2019.
[33] Reuters. Oil industry sees no threat from electric car. February 5, 2012.
[34] CNBC. How ExxonMobil is Planning for a Future of EVs. June 25, 2022.
[35] IEA. Oil 2021. March 2021.

below), but the sector faces many of the competitive risks now experienced by the electricity and transport sectors.[36]

Petrochemicals

The petrochemical space is seen as the third sector that the oil and gas industry can turn to as a source of demand in a changing environment. It is a vast and complex set of markets and commodities. The IEA, acknowledging the projected decline in use of fossil fuels for electricity and transport, found that most of the increased demand for oil and gas in the future will be for petrochemicals (ammonia, fertilizer, packaging, construction, textiles and appliance components).[37]

The petrochemical business is not one industry. As a source of emissions, it is complex. Many of the end products—clothes, plastic bags, construction, medical devices and packaging—are several steps removed from the sources of natural gas and oil that serve as feedstock in the production process and an energy source that powers manufacturing plants. The production process of most petrochemicals is energy-intensive, requiring significant amounts of electricity. The disposal of products at the end of their useful lives causes them to turn up in rivers, oceans and landfills, which poses additional environmental considerations.

The production process for petrochemicals is being viewed through a sustainability lens as part of the European Commission's taxonomy process. The action plans to be developed are founded on a comprehensive application of sustainable economic concepts. At a basic level, the taxonomy analysis focuses on:

- Increasing investment in product and production process design, and materials planning and application;
- Limiting or eliminating the use of fossil fuels as feedstock for the petrochemical process;
- Maximizing renewable energy and energy efficiency as the source of power for residential, commercial and industrial users;
- Capturing, refining and reusing emissions in the production process or as part of supply chains for other industrial applications; and
- Minimizing solid waste matter that reduces landfill capacity, and avoids incineration and risks associated with exposure to long term toxic materials.

The comprehensive treatment of industrial processes is coupled with various content restrictions and bans on fossil fuels. Production processes are reviewed against carbon footprints and other benchmark measures for similar facilities.[38]

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[36] IEA. The Future of Petrochemicals. October 2018.
[37] *Ibid.*
[38] For a specific demonstration of how the concepts of circular economics is being applied see: INEOS, EIA – Project One Antwerp. INEOS EIA, Section 14.4.2.1.1 CO2 Capture Project

The practical application of these processes supports a host of commercial and industrial innovations that are designed to reduce fossil fuel use and facilitate:

- Reduction or elimination of fossil fuels as feedstock in the production of polyester, acrylics and nylons;
- Elimination of single-use plastics or reduction/elimination of fossil fuels in the feedstock made from fossil fuels;
- Use of recycled and reused plastics as material in the production of new plastic products;
- Elimination of fossil fuel energy sources in the production process;
- Elimination and/or reduction of feedstock in petrochemical processes; and
- Capturing, storing and reusing emissions for industrial processes.

In 2022, 193 nations signed onto a treaty to begin a process to establish global environmental standards on plastics.[39] The treaty, under the auspices of the United Nations Environmental Programme, received support from important players in the plastics industry.[40] Some industry leaders see this as an opportunity to integrate plastics into the discussions on circular economics and sustainability.

In conclusion, in each of these sectors—electricity, transportation and petrochemicals—scientific and technical innovations are being developed as producers and investment managers redesign the businesses and legal structures needed to advance from concept to commercialization. Each competitive challenge to the oil and gas industry's current hold on market share, however, will confront substantial hurdles.

The scientific and technological discussions that will be taking place over the next several decades will move toward substantially less use of fossil fuels in the economy. Whole industries will rise from both the stable of existing fossil fuel companies, as well as new companies supporting sustainable innovation. The process will be bumpy and the precise outcome uncertain. Innovation will confront society with new ways of doing business and new ways of living.[41]

ONE/Conclusion. For complete context see Section 14 Climate including Section 14.4.2.1.1. (English Translation Proprietary).

[39] United Nations Environmental Programme. What you need to know about the plastics pollution resolution. March 2022.

[40] American Chemistry Council. UNEA takes big step toward global plastics treaty. March 2022. Also see: Plastics Industry Association. Plastics Industry Association reacts to United Nations environmental assembly resolution. March 3, 2022.

[41] The type of thinking needed to move forward is illustrated: BloombergNEF. Liebreich: Separating Hype from Hydrogen, Part One: The Supply Side. October 2020. Also see: BloombergNEF. Liebreich: Separating Hype from Hydrogen, Part Two: The Demand Side. October 2020. Also see: Leibreich Associates.

In each of these sectors, there is active consideration supported by public and private investments that are both profit and non-profit oriented. The investments are aimed at eliminating or minimizing carbon emissions. Some innovations are already in direct commercial competition with fossil fuel interests, as in the electricity sector. Here, renewable energy is competing with coal and natural gas. There is significant capital already invested, and more is being invested. In the transport sector, major car manufacturers are currently competing with each other for market share of the electric car market as prices and products improve. In the petrochemical sector, bans on plastic bags and other restrictions will reduce demand growth, a critical metric as companies seek financing. Major business consultants are urging businesses to pivot toward sustainable economics to manage the climate transition.[42]

Leading thinkers and practitioners are developing and tracking the competitive pressures on the oil and gas industry. There is a clear vision of a fossil-free economy, but there is no clear path in the electricity, transport or petrochemical space. Each sector's aspiration to become fossil-free must confront tough obstacles of a scientific, technological, political and financial nature, with some problems more manageable than others.

The argument for divestment is a clear vision to defend against an industry that is destroying share value and the planet. The industry has no financial rationale beyond an outdated business model that is based on an industrial economy that no longer exists. Its profits are currently propped up by the misfortunes of a global pandemic and the Ukrainian atrocity.

2. The Fossil Fuel Economy Responds. But Can Carbon Capture and Sequestration Compete?

The fossil fuel industry is working to remain competitive in a changing marketplace. It proposes to use carbon capture and sequestration technology as its lead solution to the climate change problem. If it can sequester and reuse enough carbon dioxide (CO_2), can it maintain its license to drill, even at significantly reduced levels?

The carbon capture and sequestration promise as a technology with wide application lacks credibility. The promises being made in its name do not match the record of accomplishments to date. The plans lack the strong foundation needed to tackle this enormous undertaking.

ExxonMobil, the fossil fuel industry and the Intergovernmental Panel on Climate Change (IPCC) have identified carbon capture and sequestration as an integral technology with multi-use applications across power, transport and petrochemical operations.[43]

ExxonMobil has asserted its leadership in the field due in large measure to its 40 years of experience with the company's CCS experiment at Shute Creek, Wyoming.

[42] McKinsey. The New Plastics Economy. 2016.
[43] ExxonMobil. Advancing Climate Solutions. August 2022.

Although the company's project has failed to meet its carbon capture goals, it continues to advance CCS as a core technology leading to the long-term solution to carbon emissions.[44] ExxonMobil claims that CCS is a ready-to-go technology:

> "Carbon capture and storage is a proven, ready-to-deploy technology that can help reduce emissions in some of the highest-emitting sectors and advance society's net-zero goals."[45]
>
> and
>
> "With a long history of innovation, combined with scientific and operational expertise, ExxonMobil has the technical readiness to lead in carbon capture and storage (CCS) technologies. Currently, CCS is one of the few technologies that could enable some industry sectors to decarbonize while also creating economic opportunities. The company has more than 30 years of experience in CCS technology, and is the first company to capture more than 120 million metric tons of CO_2 which is equivalent to eliminating the emissions of more than 25 million cars for one year.
>
> Carbon capture and storage can remove more than 90% of industrial CO_2 emissions and the technology capability is available today. It's one of the critical technologies required to achieve net-zero emissions and the climate goals outlined in the Paris Agreement."[46]

An analysis of the technologies and projects to date reveals a different picture.

1. The statement that CCS can remove more than 90% of industrial CO_2 emissions has not been substantiated for any period of time on publicly reported projects.[47] ExxonMobil's Shute Creek project, for example, never met its capture capacity, missing it by an average of 34% during almost 40 years of operation.[48] A detailed review of multiple projects found they fall short of this metric over any extended period of time. According to a March 2022 IEEFA report:

   > "The fundamental problem? CCS technology has been around for decades, yet its actual, real-world implementation in either the large commercial hydrogen production sector or the utility-scale power production sector has been unreliable and far below the 90 percent to 95 percent capture rate that is considered the industry's prime objective for CCS."[49]

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[44] IEEFA. Shute Creek – world's largest carbon capture facility sells CO2 for oil production, but vents unsold. March 2022.
[45] ExxonMobil. Neptune Energy ExxonMobil Rosewood and eBN to cooperate on L10 Carbon Capture and Storage. June 20, 2022.
[46] ExxonMobil. Advancing Climate Solutions. August 2022.
[47] IEEFA. Reality Check on CO_2 Emissions Capture at Hydrogen-From-Gas Plants. February 2022.
[48] IEEFA. Shute Creek – world's largest carbon capture facility sells CO2 for oil production, but vents unsold. March 2022.
[49] *Ibid.*

2. The majority of applications of CCS to-date, including Shute Creek, have been enhanced oil recovery (EOR) projects. According to the CCS Institute, 20 of the 27 commercially operating CCS facilities in the world are enhanced oil recovery projects.[50] Shute Creek is also one of the oldest and largest facilities, making ExxonMobil the industry leader in the field.

   EOR technology was born from a need to improve the efficiency of oil production. By capturing carbon dioxide and repumping it into existing wells, additional quantities of oil could be extracted.

   EOR was not a climate solution at its inception.

   The business model used by ExxonMobil in Shute Creek requires long periods of high oil prices. High prices and other business model limitations have resulted in the building of new models by CCS proponents to support wider industrial applications.[51]

3. Results to date for existing applications of CCS in coal-fired power generation and other industrial sectors are not encouraging and do not demonstrate a commercially viable technology:

   - The United States Government Accountability Office (GAO) has produced two reviews of federal efforts to promote carbon capture and sequestration. The most recent study released in 2022 reviewed 11 projects, a mix of industrial and energy applications of CCS. The GAO report identified a host of weaknesses, including poor project selection, cost control flaws and administrative oversight problems. The report found there were no clear examples of commercial success.[52]

   - In 2008, the GAO reviewed a series of program planning and early coal plant-related CCS applications. Cost, technological, environmental and administrative issues were identified. The review also touched on international efforts to develop the technology. The GAO estimated that cost and technological issues would probably not be resolved until the 2020s.[53] The 2022 audit referenced above strongly suggests that lessons learned were not effectively applied.

   - The GAO findings were consistent with research undertaken by IEEFA experts filed as part of the administrative review processes covering the Edwardsport and Kemper coal gasification with carbon capture and storage projects. IEEFA's extensive expert testimony between 2008 and 2017 identified technical and financial risks to the projects. Many of the

[50] Global CCS Institute. Carbon Removal with CCS Technologies. January 2021.
[51] At a policy level, the industry still seeks tax incentives for EOR. Congressional attempts to limit tax incentives to CCS to wider industrial applications beyond additional oil production (EOR) have been opposed by the industry. Canadian oil producers similarly wish to maintain tax credits for EOR.
[52] Government Accountability Office. Carbon Capture and Storage: Actions Needed to Improve DOE Management of Demonstration Projects. December 2021.
[53] Government Accountability Office. Climate Change: Federal Actions Will Greatly Affect the Viability of Carbon Capture and Storage As A Key Mitigation Option. September 2008.

risks materialized and ultimately led to the termination of the coal gasification and carbon capture aspects of the early experiments.[54]

- CCS retrofits of aging coal plants remain an unproven technology. Neither of the two existing projects in the United States and Canada have met their goals. Neither have met the 90% standard identified by industry proponents. In 2020, Pacific Corp., a CCS proponent, referred to the technology as "immature." The company has issued no further statements that would alter this conclusion.[55]

- In February 2022, IEEFA published a research brief that reviewed the statutory, regulatory, implementation and performance history of carbon capture and sequestration projects over the last several decades. The analysis showed there are a limited number of facilities in operation to draw data from; no consensus on what constitutes success; no evidence that the technologies are capable of meeting stated goals; the need for substantial subsidies; and an indication that private sector investors are skeptical. The IEEFA report, which reviewed self-reported and independent, third-party assessments of numerous experiments, found that CCS technology was failing to meet its own standards.[56]

- In September 2022, IEEFA released a study of 13 of the world's largest CCS projects. The report covered 55% of the world's capacity and found that with few exceptions, the projects failed to meet targeted standards. The study covered different technologies in a number of countries. Most of the projects were for enhanced oil recovery, a technology that extends the life of oil wells. The study also found that CCS might be viable, but only under very limited tasks and would fail as a broad-based climate solution.[57]

4. A recent proposal for CCS in the petrochemical industry also indicates that the technology is not commercially viable. INEOS proposed a new ethylene cracker in Antwerp, Belgium, and investigated using CCS to reduce carbon emissions. An INEOS environmental assessment concludes that CCS is not technologically or financially viable at this time.[58] It estimates the technology could meet commercial standards within 10 years. In the interim, INEOS is considering carbon credits and other initiatives to reduce emissions.

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[54] IEEFA. Fact Sheet: Edwardsport and Kemper. September 2017. For a more complete compilation of IEEFA reports and testimony, see: Edwardsport.
[55] Public Service Commission of Wyoming. Docket No. 20000-616-EA-22, David Schlissel, In the Matter of Rocky Mountain Power to Establish Intermediate Low Carbon Energy Portfolio Standards, Powder River Basin Resource Council's Pre-filed Direct Testimony, August 24, 2022, p.19.
[56] IEEFA. Blue Hydrogen: Technology Challenges, Weak Commercial Prospects and Not Green. February 2022.
[57] IEEFA. Carbon Capture Decarbonisation Pipe Dream. September 2022.
[58] INEOS EIA, Section 14.4.2.1.1 CO2 Capture Project ONE/Conclusion. For complete context, see Section 14 Climate including Section 14.4.2.1.1. (English Translation Proprietary)

5. The discussion over how CCS will be financed reinforces the high-risk conclusions that are apparent from reviews of the technical and program experiments discussed above.

   A worldwide price tag of $100 billion has been floated by industry leaders to provide CCS with resources necessary to contribute meaningfully to Paris-compliant solutions. The overall figure would fund a host of projects globally.

   The Global CCS Institute, an industry think tank, indicates this funding would be provided largely via corporate finance: "Most funding therefore takes place on the balance sheets of large corporations—the corporate finance model. This means CCS investment risks are not reflected in the cost of capital, but lenders have full recourse to corporate assets."[59] ExxonMobil financed Shute Creek on the balance sheets. The company has not produced any comprehensive financial or technical performance report beyond some basic data in its annual report.

   ExxonMobil, however, has made clear that its participation in the large-scale carbon storage hubs it is proposing in the North Sea and Houston will require financial contributions from other industry partners and the government.[60] The model proposed by ExxonMobil assumes a large number of partners involved with multiple delivery, storage and transport assets. The government is expected to supply policy and funding in support of the overall effort.

   The Global CCS Institute seems to argue that only smaller companies will need to utilize government subsidies. This is misleading, since large companies will also avail themselves of publicly financed assets.[61]

   The size, type, duration and purpose of governmental subsidies are vitally important to the development of CCS. Although there is significant experience with EOR for some companies, there is a need to diversify the risk for larger-scale projects to share the risk and costs. There is considerable risk in these projects, particularly from cost increases.

   For projects that have some degree of transparency, there were substantial cost increases incurred at the experimentation phase of coal gasification projects. The original business model of the Edwardsport and Kemper projects was to support financing through the customer rate base. The new technologies proved to be far more costly than what was suitable for a rate base. Significant cost increases resulted in the abandonment of the business model since rates would have been raised to prohibitive levels. In addition, the technology did not work. There are no reported results of Shute Creek's finances, but IEEFA researchers concluded that part of the reason it historically failed to achieve robust capacity utilization was because of fluctuating oil prices and the inability of the project to cover its costs.

[59] Global CCS Institute. Global Status of CCS 2021. 2021, p. 52.
[60] Upstream. Questions Remain on ExxonMobil Carbon Storage Hub, Economic Feasibility. May 2021.
[61] Financial Times. ExxonMobil declares new goals for carbon emissions per barrel. December 1, 2021.

In short, the evidence does not indicate that the technology is ready for wide application. The industry has more than 40 years of experience with this technology, yet it remains at risk levels that require ownership diversification and substantial government support. The industry shift away from EOR demonstrates that the most commonly employed CCS technology is now obsolete. The GAO and IEEFA reports, as well as recent testimony, identify lessons learned from coal gasification and some industrial applications. The technology remains unproven. The INEOS analysis of the project makes clear that the technology is not ready for wider application in the petrochemical field. The experience to date shows that CCS, regardless of industrial application, is a high-risk proposition, a conclusion that is reinforced by the discussion over how future CCS projects and infrastructure will be sponsored and financed.

The new wave of corporate interest in CCS is resulting in a significant pipeline of new projects and new applications of the technology. Misleading statements from industry groups and some companies regarding financing do not help build confidence. This is the fossil fuel industry's principal solution to climate change. The question of financial participation by ratepayers and taxpayers is at a crossroads. The industry's requests are now beyond demonstration projects. The problem is that the research to date barely justifies continued financing for demonstration projects. The answer to the request for large-scale public subsidies should be: Not yet. The answer here is: There are better alternatives.

C. Conclusion

The fossil fuel sector faces substantial challenges that it is failing to meet. The risks outlined in the rest of this paper and the broader debate on divestment make clear the bankruptcy of the fossil fuel investment thesis. The current price spike driven by the pandemic and Ukrainian invasion only underscore the weak financial rationale of the sector.

Fossil fuels are losing the innovation war. Innovation is driving the wind and solar industries to the forefront of electricity production worldwide, taking large chunks of fossil fuel market share. The emerging progress in the transport sector is causing fossil fuel leaders to acknowledge the rising significance of electric vehicles and diminishing market for gasoline. The large-scale discussions in the electricity field and the attempts to apply circular economics to the petrochemical industry portend further market share erosion for fossil fuels.

The reduced use of fossil fuels and the size of the industry leave it a smaller but still substantial player in all of these sectors over the next decade. Oil and gas company investments in carbon capture and sequestration, an attempt to stay ahead of the innovation curve occurring across traditional fossil fuel markets, do not instill confidence. The one cycle of growth in CCS—in the enhanced oil recovery space—has already run its course, and the lessons learned do not seem readily applicable to growth needs in other industrial applications. The technology has received attention from some companies for almost 40 years. The fact that it remains at the demonstration level in the electricity, transport and petrochemicals sectors is discouraging. The industry is making substantial claims for public support to

expand the use of carbon capture and sequestration, but the results from private investments do not inspire confidence that the industry is overcoming the many risks it faces.

II. The Financial Case for Divestment: Protecting Against Risks and Protecting Financial Returns

The financial case for divestment is strong. Climate change is creating significant material risks to institutional investment portfolios. Companies in industries like coal, oil, and natural gas are disproportionately exposed to the danger. The fossil fuel industry faces a constellation of risks that recent gains in the stock market have done little to change. The industry's long-term competitive position is weak. Fund managers have an obligation to assess the risk and to consider alternatives that eliminate it. The elimination of fossil fuels from an investment portfolio is an efficient method to defend against risk and protect returns.

A. Climate Risks: An Emerging Consensus

Our changing climate is no longer just an environmental or social issue. It is a financial one. It is no longer a long-term issue. It is now. As society mitigates and adapts to climate change, some sectors of the economy will win, and some will lose.

According to the Intergovernmental Panel on Climate Change (IPCC), the physical consequences of climate change include more frequent heat waves, droughts, wildfires, floods and storms.[62] Air pollution leads to deaths by the millions,[63] while rising sea levels and hurricanes threaten property losses and ruin communities. The results include massive disruptions to supply chains, geopolitical security, market stability, and human lives.

Market players also face a variety of transition risks resulting from the adjustment towards a low-carbon future. Changing governmental policies, market landscapes, consumer preferences, and more stand to drive significant uncertainty for those ill-prepared for the energy transition.

Scientists tell us that the ability to avoid the worst impacts of climate change remains within reach.[64] But achieving this will require swift and profound action on the political, technological, legal, and financial fronts. "It's now or never, if we want to limit global warming to 1.5°C (2.7°F)," as one IPCC scientist noted. "Without immediate and deep emissions reductions across all sectors, it will be impossible."[65]

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[62] IPCC. Summary for Policymakers, Climate Change 2022: Impacts, Adaptation and Vulnerability. Working Group II Contribution to the IPCC Sixth Assessment Report. 2022. ("Sixth Assessment")
[63] Environmental Research. Global mortality from outdoor fine particle pollution generated by fossil fuel combustion: Results from GEOS-Chem. April 2021. Also see: Harvard School of Public Health. Fossil fuel air pollution responsible for 1 in 5 deaths worldwide. February 9, 2021
[64] Sixth Assessment.
[65] IPCC. The evidence is clear: the time for action is now. We can halve emissions by 2030. April 4, 2022.

Regulatory recognition of this reality has matured in the past few years. Among U.S. financial regulatory and oversight bodies, a consensus has emerged that markets must do more to mitigate climate risk:

- The U.S. Financial Stability Oversight Council declared in 2021 that "climate change is an emerging threat to the financial stability of the United States."[66]
- The Federal Reserve Board noted in 2021 that "[c]limate change poses significant challenges for the global economy and financial system, with implications for the structure of economic activity, the safety and soundness of financial institutions and the stability of the financial sector more broadly."[67]
- The U.S. Securities and Exchange Commission (SEC) began an effort to codify climate risk disclosure standards in 2020.[68] Its proposal released in 2022 found "existing disclosures of climate-related risks do not adequately protect investors."[69]
- The New York Department of Financial Services implemented climate guidance for banks and insurers in 2021, noting that "[t]o continue to thrive in the face of global competition, it is essential that New York financial institutions integrate consideration of the financial risks from climate change into their governance frameworks, risk management processes, and business strategies and start developing their approach to climate-related financial disclosure."[70]

A shared discourse has emerged among peer institutions globally.

- The Bank of International Settlements published guidelines on climate-safe banking practices in 2022, noting that "[c]limate change may result in physical and transition risks that could affect the safety and soundness of individual banking institutions and have broader financial stability implications for the banking system."[71]
- The European Central Bank initiated supervisory climate-related stress tests in 2022 "to assess how prepared banks are for dealing with financial and economic shocks stemming from climate risk."[72]

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[66] Financial Stability Oversight Council. Report on Climate-Related Financial Risk. 2021.
[67] Board of Governors of the Federal Reserve System. Federal Reserve Board issues statement in support of the Glasgow Declaration by the Network of Central Banks and Supervisors for Greening the Financial System (NGFS). November 3, 2021.
[68] SEC. Statement: Public Input Welcomed on Climate Change Disclosures. March 15, 2021.
[69] SEC. The Enhancement and Standardization of Climate-Related Disclosures for Investors. April 11, 2022.
[70] New York State Department of Financial Services. Financial Risks from Climate Change. 2021.
[71] Basel Committee on Banking Supervision. Principles for the effective management and supervision of climate-related financial risks. June 2022.
[72] European Central Bank. ECB Banking Supervision launches 2022 climate risk stress test. January 27, 2022.

- Then-Governor of the Bank of England Mark Carney noted in 2019 that "[c]hanges in climate policies, new technologies and growing physical risks will prompt reassessments of the values of virtually every financial asset. Firms that align their business models to the transition to a net zero world will be rewarded handsomely. Those that fail to adapt will cease to exist. The longer that meaningful adjustment is delayed, the greater the disruption will be."[73]

- The Financial Stability Board wrote in 2021 that "a manifestation of physical risks as well as a disorderly transition to a low-carbon economy could have destabilising effects on the financial system …The breadth of climate-related risks—including their possible simultaneous crystallisation across multiple jurisdictions and sectors—also has implications for the resilience of the financial system."[74]

Major market players are increasingly signaling interest in moving towards a low-carbon future. Investors worth roughly $100 trillion have signed on to the United Nations Principles for Responsible Investment initiative, pledging to incorporate environmental considerations into decision-making.[75] Banks and other financial actors overseeing $130 trillion have joined the Glasgow Financial Alliance for Net Zero (GFANZ), promising to align their own operations with net-zero goals by 2050.[76] The Net-Zero Insurance Alliance (NZIA) has coordinated more than 20 of the world's leading insurers to pledge to align underwriting with net-zero and a maximum 1.5 degree target.[77] Meanwhile, many of the world's largest corporations have begun to partner with initiatives like CDP (formerly the Carbon Disclosure Project) to improve climate risk disclosure.[78]

Some net-zero pledges have been more substantive than others, but the broad proliferation of these pledges indicates a profound market shift. The warnings from the watchdogs of global financial stability are stark. The initiatives of trade consortiums urging greater alignment with climate goals underscore the urgency. Statements by investment leaders augur a shift in capital allocation as an inevitable but long-term objective. These are foundational and fundamental statements about climate change and the financial system. Nevertheless, the pace of destructive climate-linked disasters tells us that the necessary shifts in capital and technology must grow significantly in scope and scale to adequately address the unfolding crisis.

[73] Mark Carney. TCFD: strengthening the foundations of sustainable finance. October 8, 2019.
[74] Financial Stability Board. FSB Roadmap for Addressing Climate-Related Financial Risks. July 7, 2021.
[75] Principles of Responsible Investment. About the PRI. Last visited September 12, 2022.
[76] Glasgow Financial Alliance for Net Zero. About Us. Last visited September 12, 2022.
[77] U.N. Environment Program. Net Zero Insurance Alliance. Last visited September. 12, 2022.
[78] CDP. Climate Change. 2022.

All serious financial actors recognize that, in the words of BlackRock CEO Larry Fink, "climate risk is investment risk."[79] The job of a prudent investor is to consider how best to mitigate it in their own portfolio.

B. Fossil Fuel Companies' Structural Misalignment with a Low-Carbon Future

At the core of most national and corporate climate pledges is the 2015 Paris Agreement, which aims to limit warming to less than 2 degrees (optimally 1.5°C) Centigrade compared to pre-industrial levels.[80] But while many are taking this goal seriously, fossil fuel companies and most fossil fuel-producing nations have refused to meaningfully participate in the necessary energy transition. As a result, they are structurally unprepared for the low-carbon future.

According to the IPCC, fulfilling the goals of the Paris Agreement requires that global net carbon emissions fall by 45% by 2030, and to net-zero by 2050.[81] In such a world, global fossil fuel consumption will be almost 75% lower than today.[82] A Paris-compliant economy means fewer and smaller fossil fuel companies that create and distribute products for a smaller consumer market, with a greater market share going to fossil fuel alternatives.

One test of oil companies' transition readiness is the nature of their long-term capital commitments. Analysts often divide the industry into "upstream" and "downstream" activities, defined by their position in the supply chain. Investments in new upstream activities, such as exploration for new oil resources or developing new oilfields, tend to be long-term bets, given the intricacies of identifying fossil fuel deposits and building out the physical infrastructure needed for extraction. As a result, when a company commits capital to upstream oil and gas development that will take years or decades to mature, it represents a bet that fossil fuel consumption will remain strong for years.

According to the IEA, the new bets are financially and scientifically unsustainable. Achieving net-zero by 2050, in their modeling, leaves no room for the development of new oil fields, gas fields, or coal mines beyond those committed through 2021. "[N]o fossil fuel exploration is required,"[83] the IEA said, adding that no new projects merit approval: The "focus for oil and gas producers switches entirely to output—and emissions reductions—from the operation of existing assets."[84] Existing extraction projects are more than enough to power the transition; committing capital to new opportunities would be locking in emissions beyond what the energy transition can support.[85]

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[79] BlackRock. A Fundamental Reshaping of Finance. 2020.
[80] United Nations. Paris Agreement. 2015.
[81] IPCC. Special Report: Global Warming of 1.5ºC. 2018.
[82] IEA. Net Zero by 2050: A Roadmap for the Global Energy Sector. 2021.
[83] IEA, *op. cit.*, p. 160.
[84] IEA, *op. cit.*, p. 21.
[85] IEA, *op. cit.*

The capital investment strategies of the oil majors anticipate the production and consumption of fossil fuels above these production benchmarks and the IEA's baseline test of net-zero alignment. The following table provides a sampling of oil and gas exploration activities and approvals of new fields that exceed the IEA's standard for net-zero alignment.

Table 3: Selected Oil and Gas Majors: Net-Zero Capital Alignment

Company	Exploration Activities	Oil and Gas Field Approvals
IEA Alignment Standard[86]	No active exploration projects. $0 spent on exploration post-2021. No future fossil fuel exploration of any sort.	No new oil fields approved post-2021, and no intentions to approve new oil fields in future.
BP	In 2022, BP and its affiliates engaged in exploration efforts in Canada,[87] Angola,[88] and Norway.[89] In the first half of 2022, BP spent $3.8 billion on upstream oil and gas capital expenditures.[90] BP has pledged to avoid exploration in new countries only and provides no date for phase-out in countries in which it has recently operated.[91]	In 2022, BP and its affiliates moved to finalize investment in a number of extraction projects, including the NOAKA area in Norway.[92] BP has not made any pledges to avoid approving new extraction projects in the future.
Shell	In 2022, Shell and its affiliates engaged in exploration efforts, including in Namibia,[93] South Africa,[94] Brazil,[95] and the United Kingdom,[96] and filed plans to resume Arctic exploration in the near future.[97]	In 2022, Shell committed capital to projects such as the Jackdaw gas field in the UK.[100] Shell has not made any pledges to avoid approving new extraction projects in the future.

[86] IEA, *op. cit.* p. 51. The IEA states that no new fossil fuel exploration is required and no new oil and natural gas fields are required beyond those already approved for development. For further amplification on the implementation of the no new exploration and development standard see: Reclaim Finance. IEA Net Zero 2050. January 2022, p. 17. This list is not expected to be complete. The larger concern raised by the IPCC is that current commitments to net zero do not add up and will result in a failure of the world to meet emission targets and timeframes.
[87] BP. Newfoundland & Labrador Orphan Basin Exploration Drilling Project. May 2022.
[88] Energy Voice. Yinson wins BP option for FPSO deployment in Angola. July 28, 2022.
[89] Offshore Engineer. Aker BP to Drill More Exploration Wells in 2022. February 10, 2022.
[90] BP plc. Group results: Second quarter and first half 2022. August 2, 2022.
[91] BP plc. From International Oil Company to Integrated Energy Company: bp sets out strategy for decade of delivery towards net zero ambition. August 4, 2020.
[92] Offshore Energy. Aker BP becoming operator of all NOAKA discoveries to ensure efficient execution. May 5, 2022.
[93] Reuters. Shell hits oil and gas in Namibian offshore well. January 25, 2022.
[94] Associated Press. South Africa court to rule on Shell offshore oil exploration. June 2, 2022.
[95] Bloomberg. Shell Joins Exxon With $1 Billion Brazil Exploration Setback. May 16, 2022.
[96] Offshore Energy. Shell gets closer to drilling North Sea gas target this year. April. 25, 2022.
[97] Alaska Business. Extra Year for Shell's Arctic Offshore Plan. January 6, 2022.
[100] Shell. Shell invests in the Jackdaw gas field in the UK North Sea. July 25, 2022.

	In the first half of 2022, Shell spent $4.6 billion on upstream oil and gas capital expenditures.[98] Shell has stated that it has no plans to enter new frontier exploration areas after 2025, but provides no date for phaseout of exploration of non-frontier areas.[99]	
Exxon	In 2022, Exxon and its affiliates engaged in new exploration efforts, including in Guyana[101] and Brazil.[102] In the first half of 2022, Exxon spent $7.5 billion on upstream capital and exploration expenditures.[103] Exxon's sustainability plans make no mention of any future changes to exploration strategy.	In 2022, Exxon signed agreements for expansion in India[104] and Nigeria.[105] ExxonMobil has not made any pledges to avoid approving new extraction projects in the future.
Chevron	In 2022, Chevron and its affiliates engaged in exploration efforts, including in Argentina[106] and Egypt.[107] In the first half of 2022, Chevron spent $5.3 billion on upstream capital and exploration expenditures.[108] Chevron's sustainability plans make no mention of any future changes to exploration strategy.	In 2022, Chevron committed capital to projects, including at the Ballymore project in the Gulf of Mexico.[109] Chevron has not made any pledges to avoid approving new extraction projects in the future.

[98] Shell. 2nd Quarter 2022 And Half Year Unaudited Results. July 28, 2022.
[99] Upstream. Shell to oversee 'gradual managed decline' of oil output: Van Beurden. February 11, 2021.
[101] ExxonMobil. ExxonMobil makes three new discoveries offshore Guyana, increases Stabroek resource estimate to nearly 11 billion barrels. July 26, 2022. Further clarification on definition is required to understand how the net-zero pledge applies to this project. A final investment decision has been reached on Liza 1 and 2 and Payara prior to April 2021. Since then, ExxonMobil has given final investment decision on Yellowtail (April 2022) and more are anticipated in the future. See: ExxonMobil. ExxonMobil makes final investment decision on fourth Guyana offshore project. April 2022.
[102] Bloomberg. Shell Joins Exxon With $1 Billion Brazil Exploration Setback. May 16, 2022.
[103] ExxonMobil. Form 10-Q. August 3, 2022.
[104] Oil and Natural Gas Corporation. ONGC inks Heads of Agreement with ExxonMobil for Deepwater exploration in Indian East and West coasts. August 17, 2022.
[105] Offshore Energy. Nigeria to unlock untapped deepwater resources with oil majors. August 19, 2022.
[106] Reuters. Chevron granted shale exploration concession in Argentina's Vaca Muerta. April 11, 2022.
[107] Reuters. Egypt and Chevron agree to explore new East Med gas deal. June 21, 2022.
[108] Chevron Corporation. Form 10-Q. August 4, 2022.
[109] Chevron Corporation. Chevron Sanctions Ballymore Project in Deepwater U.S. Gulf of Mexico. May 17, 2022.

The supermajors' actions reflect the assumptions of the rest of the industry. Internal surveys suggest that most players in the upstream oil and gas business expect exploration to continue years into the future.[110]

This present reality is unsurprising given the long-term history of the industry. Fossil fuel companies were aware of the realities of climate change years before the general public. ExxonMobil's internal scientists understood as early as 1981 that it is "distinctly possible" that warming caused by fossil fuel emissions "will indeed be catastrophic (at least for a substantial fraction of the earth's population)."[111]

The advance warning provided an opportunity for realignment that would have allowed fossil fuel companies to seize the opportunity to diversify their core business model and lead the market on the energy transition. But no major company took advantage of the opening: ExxonMobil responded to its scientists' internal reports by defunding its climate science department and embarking on its first large-scale climate misinformation campaigns in the 1980s.[112]

Oil majors' strategies have explicitly rejected meaningful investments in renewables and clean energy.

- In 2013, BP closed down its "Beyond Petroleum" initiative, which had pledged to turn the company into a green power player but failed to result in any meaningful realignment of corporate strategy.[113]

- In 2021, after shareholders voted into office a new slate of directors that supported a new direction on climate change, ExxonMobil's Woods stated that the company "wouldn't see huge shifts in the strategy."[114]

- In 2020, Shell's annual report contained a disclosure noting that "Shell's operating plans, outlooks, budgets and pricing assumptions do not reflect our net-zero emissions target."[115]

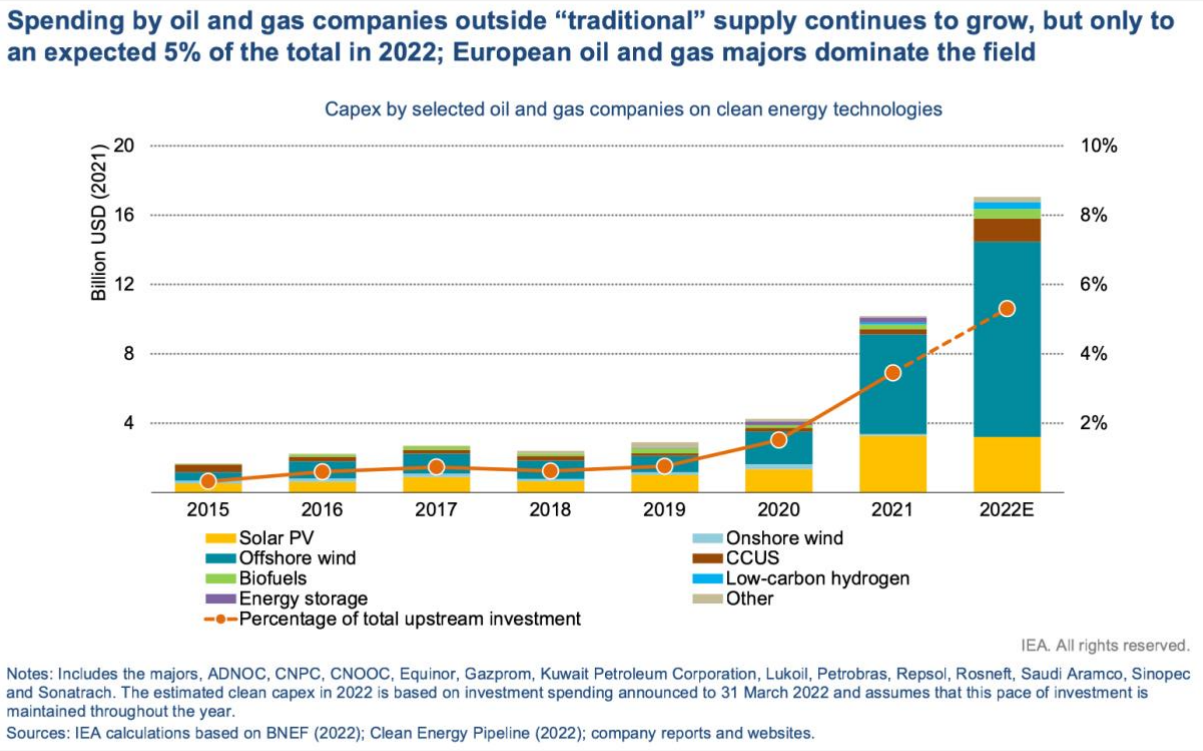
- In 2021, Chevron CEO Mike Wirth declared that "management in our company can't create value for shareholders by going into wind and solar," and that the company's profits should instead "go back to our shareholders and let them plant trees."[116]

This playbook is reflected in present capital allocation more broadly, as oil and gas companies overwhelmingly decline to diversify their business model in light of a

[110] Wood Mackenzie. Future of Exploration Survey 2022. May 2022.
[111] Inside Climate News. Exxon Confirmed Global Warming Consensus in 1982 with In-House Climate Models. September 22, 2015.
[112] Inside Climate News. Exxon Made Deep Cuts in Climate Research Budget in the 1980s. November 25, 2015.
[113] CNBC. 'Beyond Petroleum' No More? BP Goes Back to Basics. April 23, 2022.
[114] Financial Times. Exxon plans no 'huge shifts in strategy' after losing board fight. July 30, 2021.
[115] Shell. Disclaimer, Annual Report 2020. Last visited September 12, 2022.
[116] CNBC. Chevron CEO explains why the oil giant's lower-carbon investments look past wind and solar energy. September 15, 2021.

low-carbon future. As of 2022, only 5% of the sector's total spending is currently devoted to investments outside the traditional areas of fossil fuel supply.[117]

Figure 4: Spending on Renewable Energy, CCUS, Biofuels, Low-Carbon Hydrogen, and Energy Storage by Oil and Gas Companies



Source: International Energy Agency. World Energy Investment 2022.

This picture is similarly troubling by other metrics. Even considering technologies such as carbon capture and storage, hydrogen and biofuels, spending outside traditional oil and gas is estimated to comprise 8.5% of the sector's total capital expenditure in 2022.[118] Clean energy technologies made up approximately 10% of the industry's overall mergers and acquisition spending in 2021.[119]

These broad numbers do not reveal the whole picture. There is some divergence within the industry; European oil majors are broadly more responsive than American ones. Low-carbon investments made up 11% of Equinor's 2021 capital commitments; at Chevron, it was only 2%.[120] But even for the players that have pledged to allocate far higher percentages to clean energy in the future (BP, for example, pledges to spend 50% by 2030),[121] the opportunity cost of years of

[117] IEA. World Energy Investment 2022. June 2022, p. 19.
[118] IEA, *op. cit.,* p. 83.
[119] IEA, *op. cit.,* p.84.
[120] Equinor. Equinor annual and sustainability reports for 2021. March 18, 2022, p. 21. Also see: Chevron Corporation. Chevron Announces $14 Billion Capital and Exploratory Budget for 2021. December 3, 2020.
[121] BP. BP update on strategic progress. February 8, 2022.

minimal participation in the green economy will be difficult to fully recover. The renewables sector already has established market leaders. Even if fossil fuel companies do decide to change course and reallocate capital expenditures accordingly, they likely will enter new markets as laggards when it comes to the human capital, technological skill, and the market presence needed to thrive.

As a result, a consensus is emerging among market analysts that the fossil fuel industry is simply not aligned with international climate standards, and that the industry's net-zero pledges to date are simply not credible:

- The table (Table 3) above illustrates that four of the largest fossil fuel majors are not in line with the IEA's net-zero by 2050 standards.
- A 2022 Climate Action 100+ analysis found no single fossil fuel company was substantively aligned with the goals of the Paris Agreement.[122]
- As of 2022, Moody's Investor Services' Global Carbon Transition Assessment data ranks the fossil fuel industry at the bottom of all evaluated sectors when it comes to transition readiness.[123]
- Financial think tank Carbon Tracker found in a 2022 analysis that most fossil fuel companies remain far away from Paris alignment, with even the best climate plans containing significant loopholes and credibility gaps.[124]
- A 2022 peer-reviewed academic study found that none of the most prominent European or American oil and gas majors have financial strategies to back up their climate rhetoric.[125]
- A 2021 peer-reviewed academic study found that no major oil and gas company is Paris-aligned, and that their climate pledges to date are unlikely to deliver emissions reductions in line with international standards.[126]
- A 2022 report by research and advocacy group Oil Change International concluded that "no major oil and gas company considered in this analysis comes anywhere close to the bare minimum for alignment with the Paris Agreement."[127]

The behavior of fossil fuel companies stands in contrast to other industries facing transition questions. Unlike the minimal investments of many fossil fuel companies in renewables, automotive industry leaders have directed half or more of their

[122] Climate Action 100+. Companies. 2022.
[123] Moody's Investors Service. Carbon transition positioning is an increasingly important credit consideration as net zero pressure mounts. September 29, 2021.
[124] Carbon Tracker Initiative. Absolute Impact: Why Oil and Gas Companies Need Credible Plans to Meet Climate Targets. May 12, 2022.
[125] Mei Li, Gregory Trencher, Jusen Asuka. The clean energy claims of BP, Chevron, ExxonMobil and Shell: A mismatch between discourse, actions and investments. February 16, 2022.
[126] Financial Times. Big fossil fuel groups all failing climate goals, study shows. October 6, 2020.
[127] Oil Change International. Big Oil Reality Check. May 2022.

capital expenditures to electric vehicles in recent years.[128] In investor disclosures, General Motors cites the failure to "deliver new products, services, technologies and customer experiences in response to increased competition and changing consumer preferences in the automotive industry" as a material financial risk.[129] Ford's CEO has said that electric vehicles could make up all automotive retail sales in the future.[130] Although it remains to be seen whether these companies successfully reinvent their business practices, it is clear that they have recognized that markets are shifting and a material reliance on carbon will become a material risk. The automakers believe the energy transition is arriving, whether or not companies are ready.

There is an ongoing discussion among analysts and scholars over the extent to which the fossil fuel industry still possesses the structural agility to rapidly shift gears on climate while protecting shareholder value, and if so, the capital commitments that would be necessary.[131] For example, the World Benchmarking Alliance, in partnership with CDP (formerly Carbon Disclosure Project), estimates that around three-quarters of oil and gas capital expenditures should be devoted to low-carbon technologies if fossil fuel companies want to preserve the opportunity to be compliant with a 1.5°C pathway.[132]

Capital deployment is an important indicator of how seriously a company is taking the energy transition. Decades of a near-singular focus on traditional operations and numerous forgone opportunities to diversify business models mean the fossil fuel industry is positioned for success only in a high-carbon future.

C. Fossil Fuel Companies Face Outsized Future Risks

Climate risks, like fossil fuels, are woven into the fabric of the global economy. But the industry's structural misalignment with the energy transition means that it faces disproportionate exposure to climate-driven financial uncertainty. The physical and transition risks associated with climate change are having practical impacts on the current and future market position of this once-dominant player in the world economy.

1. Geopolitical Risks

The diminished financial rationale of the oil and gas industry is intensifying the role of geopolitics as a market factor. With nation-state agendas playing a driving role, and oil and gas serving as a tool of political leverage in global power bloc alignments, market volatility is likely to intensify, putting long-term capital plans and existing contractual arrangements at risk. The bottlenecks created by the

[128] Bloomberg. Automakers Are Investing in EVs Like They Mean It. August 5, 2021.
[129] General Motors Company. Form 10-K. February 2, 2022.
[130] The Verge. Seven CEOs and one secretary of transportation on the future of cars. January 25, 2022.
[131] For one analysis of the differing capital flexibilities among oil and gas companies, see: CDP. Beyond the Cycle. November 2018.
[132] World Benchmarking Alliance. Climate and Energy Benchmark in Oil and Gas Insights Report. July 21, 2021.

politicization of the world's oil and gas distribution networks put geopolitical actions at the top of the list of risks associated with the production and use of fossil fuels.

It is likely that oil and gas will remain the dominant energy source for the world for at least the next decade. It is also true that the terms, costs, tragic events and public opposition that come with that reality will subject the world to the risk of a decade of constant political upheaval. Using standard market tools, this industry should be avoided.

The new political alignments driving the oil and gas industry became crystal clear on February 24, 2022.[133] Russia's intervention into Ukraine created a series of bottlenecks that pushed oil and gas prices into the $120-per-barrel range, up from $100-per-barrel levels.[134] The elevated $100-per-barrel levels were driven by the economic recovery from the pandemic and were far above the $22-per-barrel prices of April 2020. The IEA estimates that the Russian invasion increased the market price of oil by $8 per barrel.[135]

Oil price increases propelled by military attacks are not sustainable unless the war is protracted and political leaders fail to bring about a period of peace and stability.

The roots of Russia's national security justification for the attack has major economic ramifications. The energy transition—the likely cause of a decline in the global growth of fossil fuels—poses a material risk to the economic and political stability of Russia. The country is unprepared for the energy transition.[136] Seizing part or all of Ukraine brings with it control of critical oil and gas infrastructure,[137] as well as new revenue streams based on the strengths of the Ukrainian economy and its people. Ukraine's agricultural leadership, for example, has received limited attention. Ukraine is a very significant global exporter of maize, wheat, potatoes, sunflower seeds, sugar beets, barley, grapeseed, cabbage, pumpkins, cucumber, carrots, dry peas, rye, buckwheat and walnuts.[138]

Agriculture plays an important role in the Russian economy as well. Russia and Ukraine control 25% of the world's wheat production.[139] A Russian victory would give it considerable economic clout beyond oil and gas. A takeover of Ukraine by Russia would give it a dominant market position in several other agricultural

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[133] Reuters. Russia's Putin Authorises 'special military operation' against Ukraine. February 24, 2022.
[134] For the role of rising oil and gas prices in the geopolitical calculations of Russian leadership, see: Al-Jazeera. Russia-Ukraine crisis: When oil prices climb, Putin gets bolder. February 4, 2022.
[135] IEA. Russian supplies to global energy markets. February 2022.
[136] Center for Strategic & International Studies. Climate Change Will Reshape Russia. January 13, 2021.
[137] For a reliable primer on natural gas markets, see: Agnia Grigas. The New Geopolitics of Natural Gas. Cambridge: Harvard University Press, 2017.
[138] The World Bank. Ukraine – Country partnership framework for the period FY17-21. June 20, 2017.
[139] The World Bank. Europe and Central Asia Economic Update. 2022.

commodity markets. A takeover of Ukraine by Russia diversifies Russia's economy substantially.

Rising oil prices improved the fiscal position of Russia and other producer nations, as well as the large and small private companies that control a much smaller portion of the world's oil markets.[140,141] Among the oil majors, ExxonMobil's 2012 revenues were $451 billion. By 2019—under pre-pandemic market conditions—the company's revenues fell to $255 billion. ExxonMobil could hit $400 billion in revenue again in 2022, bolstered substantially by the impact of the Ukrainian invasion.[142]

Rising prices and politically motivated disruptions in European gas deliveries serve as a potent weapon used by Russia to undermine opposition to its Ukrainian invasion. As war continued into the summer of 2022, high oil and gas prices continued to benefit oil and gas producers while consumer nations cowered and scrambled to cope with the onset of winter.

The invasion has major implications for climate change policy. Although considered the world's third- largest oil producer, the incursion propels Russia to the rank of leader of the global oil and gas industry. All producers benefit from the surging prices, and any consumer must fear the disruption of its energy supply if it opposes Russia.

While stock prices of oil and gas companies soar in the short term, the benefit is rooted in a political action that is causing the destruction of a country and its people. This is an extraordinary market manipulation that underscores the fundamental, long-term supply and demand imbalances in the organization of the fossil fuel industry. The impact of the Russian invasion offset the downward price spiral spurred by the dramatic supply increases from U.S. producers and the growing difficulty of enforcing OPEC production agreements as a method of price control.

Climate policy is now a shadow in the glare of national security concerns raised by the invasion. The contradictory pressures of the two-energy economy are readily apparent. National governments and the public must react to two forces. Each is immediate and requires substantial public outlays. On the sustainable energy front, European countries most immediately affected by the war are seeking to accelerate their transition agendas to move away from fossil fuels. Every oil and gas-consuming nation is receiving the same message: High oil and gas prices will continue to cause inflation, depleted currency, and trade and budget deficits. On the fossil fuel front, countries are securing their fossil fuel supplies and the financial and

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[140] Wall Street Journal. The Long Shadow of the Visible Hand. May 22, 2010.
[141] Centre for Research on Energy and Clean Air. Financing Putin's war: Fossil fuel imports from Russia during the invasion of Ukraine. Last visited Sept. 12, 2022. Also see: IEEFA. Russian oil volumes down, but revenues soar sky-high due to prices. June 13, 2022.
[142] ExxonMobil., 2Q 2022 Earnings Overview, Supplemental information. July 29, 2022. From Q2 2021 to the close of Q2 2022, ExxonMobil's oil revenues increased on a per-barrel basis from non-U.S. sources from $60.52 to $103.15. European natural gas revenues received increased from $6.76/kcf to $27.90/kcf. (kcf=1,000 cubic feet)

infrastructure supports that go with it. A series of announcements and initiatives hit the airwaves on an almost-daily basis.[143]

The buildup of fossil fuel infrastructure in response to the war at minimum slows emission reduction efforts. Longer term, the buildout of renewable and other green investments brings with it some security but also a new set of geopolitical risk considerations. Renewable energy, and electrification more broadly, require a substantial reliance on rare earth minerals. China controls much of the world's reserves.[144] Each country's climate transition planning will need to address this advantage for China in light of a growing reliance on this new natural resource.

It has taken a near-global conflagration to increase oil prices to profitable levels. This is a financial fact. The conditions are unsustainable, and the aftermath creates still greater energy uncertainty.

Like the tone of contemporary geopolitics, divestment is a blunt instrument with a sharp point. Divestment is a defensive market action to protect share value. The geopolitical landscape suggests significant volatility and uncertainty. Divestment is an independent intervention into the capital markets designed to assert a modicum of control for an investment fund in a time of geopolitical upheaval. It is not a new government regulation or a new project dependent on government largesse or the next election cycle. Divestment pushes capital away from fossil fuels and towards a broader regulatory and technological framework—one that is not only sustainable but also promises significant costs savings and realignment of energy market incentives that support national security goals, public demand and growth in new sectors of the economy.

The oil and gas sector is both a cause of geopolitical instability and affected by it. A global reliance on fossil fuels strengthens the hand of petrostates, kindling resource conflicts and energy wars. The instability resulting from geopolitical realignments can create global shocks in supply and demand for the commodity, resulting in immense price volatility.

Such uncertainty is a material risk for fossil fuel companies. The intensification of nation-state rivalries clashes with the global outlook of oil and gas companies within the energy sector. For the rest of the economy, it promises an unending stream of disruption that hinders long-term planning.

2. Competitive Risks

New scientific, technological and business innovations have taken market share from coal, oil and natural gas in each of the fuel's major end-use markets. The fossil fuel industries are at risk of losing more.

[143] Bloomberg. Germany Pushes for G-7 Reversal on Fossil Fuels in Climate Blow. June 25, 2022.
[144] The Breakthrough. Beijing's Green Fist. March 29, 2022.

Electricity Generation

Utilities are one of the fossil fuel industry's primary customers, with their products supplying about two-thirds of global electricity generation today.[145] In the IEA's net-zero pathway, the figure is expected to fall to about 10% by 2050.[146] Signs of a shift are already evident in the United States.[147] Coal, which once enjoyed a quasi-monopoly on the utility sector (especially from 1975 to 1990), has seen its dominance rapidly erode in recent years. In 2007, the United States consumed more than 1 billion tons of coal. Currently, coal consumption stands at 546 million tons and is expected to decline further.[148] Coal plants have been closing at historic rates; those that remain are often underutilized; and no new significant coal plants are planned. Large American utility companies are increasingly making net-zero commitments and coal plant retirement plans, with higher energy prices doing little to disrupt the profound erosion of coal's customer base.[149]

The Swiss bank UBS, an important financier of fossil fuels with a climate plan aimed at reducing emissions, has an analytical assessment that concludes that the use of coal as a source of fuel for power plants will be reduced to zero in the future.

As the fracking revolution drove down prices for energy, coal was originally edged out by competition from natural gas. But gas has hit its peak for American utilities. The superior affordability of renewables has largely choked off construction of new natural gas plants.[150] Since 2009, the levelized cost of energy for wind generation has fallen 72%, while the levelized cost of energy for solar is down 90%. The result is that on a per kilowatt-hour level, renewables are now cheaper than both coal and gas across a wide variety of uses.[151]

Utilities and other major participants in the electricity sector are increasingly confident in turning to battery storage as a means of firming renewables, paving the way for increased displacement of fossil fuels from the grid. Deployed battery storage in the U.S. almost tripled in 2021, from 1.6 gigawatts (GW) to 4.6 GW. The EIA expects storage capacity to triple again though mid-2023, to 13.9 GW.[152] Wood Mackenzie and the American Clean Power Association expect that significant storage additions will continue at least until 2026, with total capacity projected to reach 55 GW.[153]

Real-world experience and research increasingly show that high levels of green energy with battery storage can be integrated into the U.S. power grid while maintaining system reliability. A recent report from the National Renewable Energy

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[145] BP. Statistical Review of World Energy, 71st Edition. 2022, p. 51.
[146] IEA. Net Zero by 2050: A Roadmap for the Global Energy Sector (Summary for Policy Makers). May 2021, p. 9.
[147] IEEFA. U.S. 2022 Power Sector Outlook. April 2022.
[148] EIA. Monthly Energy Review, Coal Consumption by Sector. August 2022.
[149] IEEFA. Surge of coal-fired generation retirements looking like a reverse S-curve. July 13, 2021.
[150] IEEFA. Power sector gas consumption has likely hit its peak. February 16, 2022. Also see: IEEFA. Coal-fired power generation in freefall across southeast U.S. October 1, 2019.
[151] Lazard. Lazard's Levelized Cost of Energy Analysis – Version 15.0. October 2021, p. 19.
[152] EIA. Electric Power Monthly. June 2022.
[153] Wood Mackenzie. U.S. Energy Storage Monitor. June 2022.

Laboratory concluded that with sufficient storage, renewable generation (including solar, wind, hydropower, geothermal and biofuel resources) could meet as much as 94% of demand on an annual basis with "no unserved energy and low reserve violations, indicating no concerns about hourly load balancing through the end year of 2050."[154]

In addition to dispatchable power, batteries can also provide necessary grid services such as frequency regulation. Although most battery installations discharge for only several hours of duration, significant research investments are being made into various battery chemistries and non-chemical storage technologies that might offer long-duration energy storage.[155] Successful commercialization of such technologies would allow for significantly greater displacement of fossil-fueled baseload power from the grid.

Transportation

Electric vehicles (EVs) are seeing significant growth across all major markets and vehicle types. The pace of sales is torrid: The IEA reports about 120,000 electric cars were sold worldwide in 2012, but the same number were sold each week in 2021.[156] The growth has led BloombergNEF to estimate that internal combustion vehicle sales peaked in 2017. With the quickening adoption of EVs, BloombergNEF sees combustion vehicle sales in permanent decline globally. Although war and inflation are pushing the costs for battery raw materials higher in the short term, costs remain competitive as gasoline and diesel prices have also risen.[157]

- Light-duty vehicles are leading the way. The IEA reports that electric car sales reached 9% of the global car market in 2021, four times their market share in 2019 and accounting for all net growth in global car sales in 2021. There are now 16.5 million electric cars on the road, triple the 2018 figure. The number of available models has grown by five times since 2015.[158] Some of the world's largest automakers and brands have accelerated electrification plans and aim for sales of 100% EVs across some or all markets, including Lexus,[159] Volkswagen,[160] Volvo,[161] Mercedes,[162] and Ford.[163]

[154] National Renewable Energy Laboratory. Grid Operational Impacts of Widespread Storage Deployment. 2022.
[155] Lazard. Lazard's Levelized Cost of Storage Analysis – Version 7.0. October 28, 2021.
[156] IEA. Global EV Outlook 2022. Last visited September 13, 2022.
[157] BloombergNEF. EVO Report 2022. Last visited September 13, 2022.
[158] IEA, *op. cit.*
[159] Toyota. Video: Media Briefing on Battery EV Strategies. December 14, 2021.
[160] Volkswagen. Volkswagen is accelerating transformation into software-driven mobility provider. March 5, 2021. Also see: Volkswagen. New Auto: Volkswagen Group set to unleash value in battery-electric autonomous mobility world. July 13, 2021.
[161] Volvo. Volvo Cars to be fully electric by 2030. March 2, 2021.
[162] Mercedes-Benz Group. Mercedes-Benz Strategy Update: electric drive. July 22, 2021.
[163] Ford. Ford Europe Goes All-In On EVs On Road To Sustainable Profitability; Cologne Site Begins $1 Billion Transformation. February 17, 2021.

- There is also a significant market for two- and three-wheeled electric vehicles, predominantly in China. The vehicles account for about half of gasoline consumption in certain markets, such as China, Vietnam, and India. They tend to be cheaper to buy than internal combustion engine versions due to the simplicity of manufacturing and the small battery sizes required for a daily commute's range. About 10 million two- or three-wheelers were sold in 2021.[164]

- The aviation sector is increasingly a target of pressure to address its climate impacts. Change in the sector has been slow, since the solutions are not as simple as for mitigation of ground-level transportation impacts,[165] but it is in fact happening, and the pace may quicken. The U.S. Federal Aviation Administration launched an Aviation Climate Action Plan in late 2021 to boost the use of sustainable aviation fuel (SAF). The plan's target is to achieve a supply of at least 3 billion gallons of SAF per year by 2030, and sufficient SAF to meet 100% of aviation fuel demand—projected to be about 35 billion gallons per year—by 2050.[166] A group of major airlines and plane makers have committed to replace at least 5 percent of conventional jet fuel demand with SAF by 2030.[167] Electrification is an option for small, short-haul planes, with Cape Air—one of the largest commuter airlines in the United States—signing a letter of intent to buy 75 all-electric planes currently under development by Eviation.[168]

- Other segments of the transportation sector are also seeing development of electric alternatives. Electric heavy-duty trucks and buses continue to gain market share, with electric buses comprising 4% of the global bus fleet in 2021.[169] Maritime transportation is seeing research and development into zero-carbon fuels such as green ammonia and methanol, as well as global coordination of a net-zero strategy among shipping companies, regulators, and other stakeholders.[170]

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[164] IEA, op. cit.
[165] The burning of jet fuel at high altitudes has a direct impact on the climate system from emissions of CO_2, water vapor, sulfur dioxide and soot, but it also generates indirect climate impacts due to short-lived contrail cirrus formation and changes in ozone, methane and stratospheric water vapor caused by nitrogen oxide emissions. The indirect impacts are responsible for about two-thirds of the net radiative forcing of global aviation emissions. This means that buying carbon offsets to compensate for aviation's direct carbon emissions, after making technological efficiency improvements and demand reductions, mitigates only about 20 percent of the warming attributable to the aviation sector, largely because of the indirect effects. This means continued use of fossil fuel for aviation cannot be deemed climate-neutral even if the use of offsets makes it carbon-neutral.
[166] Federal Aviation Administration. 2021 Aviation Climate Action Plan. November 9, 2021.
[167] S&P Market Intelligence. Big corporations to drive demand for low-carbon technologies like hydrogen. November 30, 2021.
[168] Associated Press. Commuter Airline to buy 75 Washington-built electric planes. April 20, 2022.
[169] IEA, *op. cit.*
[170] Maersk. New research center will lead the way for decarbonizing shipping. June 25, 2020. Also see: University Maritime Advisory Services. A Strategy for the Transition to Zero-Emission Shipping. July 2022.

Petrochemical

- Fossil fuels are the principal feedstock for most petrochemicals. Market competition between fossil fuel-based products and alternatives is taking place as a function of price and product content. Users of plastic bags and other packaging are changing behavior and receiving policy support at many levels. Policy-driven changes pose additional risks to fossil fuel demand in textiles, plastics and a host of other applications.[171]

3. Regulatory Risks

Science, technology and new business models are changing development and operating assumptions across the fossil fuel landscape. Projects and business models once approved with minor conditions are now being rejected. The shifting tides are likely to pose increasing challenges to companies' abilities to find constructive support from environmental, financial and public utility regulators.

- **Infrastructure Environmental Permit Approval:** Although qualified approvals used to be the norm for new fossil fuel infrastructure, the uncertain future facing fossil fuels mean that such projects are increasingly being denied. A September 2020 Moody's report highlighted a trend noting that fossil fuel companies that mine, drill, transport and sell oil, gas and coal products and their derivatives are finding it increasingly difficult to bring announced infrastructure projects from design to commercial operation.[172] A recent opinion by Standard & Poor's noted a similar trend in the petrochemical sector, with a rapidly changing financial market putting projects and companies seeking to build new infrastructure at an elevated risk level.[173]

  Industry interests typically cite the abuse of enforcement of regulations as the risk to the industry. But as a 2019 analysis from IEEFA concluded, these objections are spurious at best: The increasing rate of denials is far from a misuse of the regulatory process. IEEFA's analysis found that regulatory changes taking place represent the oversight process catching up to scientific and technological changes.[174] The IEA's findings that new fossil fuel projects will exceed carbon budget standards is the kind of scientific message that is leading to regulatory decisions that reject projects outright.

- **Financial Oversight:** Regulatory efforts to improve carbon disclosure in the financial world are reshaping expectations about how companies report their carbon footprint and strategies to mitigate it.

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[171] Science. Switching out of Fossil Fuel Feedstocks. May 6, 2019. Also see: Recycling Today. IHS Markit analysis indicates need for more chemical recycling of plastics. October 11, 2021 and see petrochemical discussion in Section II: Background.
[172] Moody's Investor Service, Shifting environmental agendas raise long-term credit risk for natural gas investments, September 30, 2020. (Proprietary)
[173] IEEFA. S&P pushes Louisiana project cancellation as credit boost for Formosa. February 24, 2022.
[174] IEEFA. Response to the U.S. Chamber of Commerce Analysis of the "Keep it in the Ground" Movement. February 2019.

European regulators are developing a new taxonomy to serve as a road map to sustainable economic planning. The taxonomy aims to create a "common language between investors, issuers, project promoters and policy makers" regarding the definition of clean and dirty investments.[175] As the rules take shape, sustainability standards for economic growth are likely to become more consistent. The comprehensive nature of the discussion should have a long-term global impact.

Taxonomies are planned for additional countries and regions. China, Malaysia, Mongolia, Bangladesh and an Asian regional model are a few examples.[176] The essential purpose is to establish a working dialogue on sustainability and to use the definitions as guides to public and private investment allocations. The formation of the taxonomies and their ongoing implementation are a vital forum for identifying, focusing and resolving questions needed to realign industry investment with climate goals.

In April 2022, the SEC proposed rules to standardize corporate disclosure of climate-related risks. The rules aim to mandate more transparency regarding exposure to climate-related risks and transition plans and targets in company registration statements and periodic reports.[177] Fossil fuel companies assume that such disclosure poses risks to their investor appeal. They have spent considerable sums of money lobbying the SEC in the leadup to the announcement,[178] and are working to have the proposal withdrawn.[179] Improvements in disclosure related to carbon risk are meant to better educate investors about the increasing risks of holding fossil fuel stocks. The disclosures should also promote a process of corrective action strategies by the companies.

The debate over carbon disclosures in the United States crystallizes the policy dynamics driving divestment. There is a good-faith consensus that there is a need for uniform metrics and better data.[180] The fossil fuel industry gives voice to their support not only in advocacy positions in policy venues but also in active guidance to its members. The industry then acts in a manner opposing a final policy consensus. In the United States, the oil and gas industry in particular finds "significant flaws" when the SEC advances its

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[175] U.N. Principles for Responsible Investment. EU Taxonomy. Last visited September 12, 2022. Also see: European Commission. EU taxonomy for sustainable activities. Last visited September 12, 2022.
[176] IEEFA. Asian Hopes for Sustainable Finance Will Rest on More Credible Taxonomies. September 1, 2021.
[177] SEC. The Enhancement and Standardization of Climate-Related Disclosures for Investors. April 11, 2022.
[178] Financial Times. Fossil fuel groups step up lobbying of SEC to dilute climate reporting rules. August 1, 2021.
[179] American Petroleum Institute. API Urges SEC to Consider Alternative Approaches to Climate-Related Reporting Proposal. June 17, 2022.
[180] American Petroleum Institute. Climate Action Framework. Last visited September 12, 2022. For a broader, more academic discussion of the issues, see: Columbia University. ESG Investing and the US Oil and Gas Industry: An Analysis of Climate Disclosures. April 12, 2022. A review of the varying sides on the issues involved is available from Gibson Dunn. Energy Industry Reacts to SEC Proposed Rules on Climate Change. August 10, 2022.

approach to improving carbon disclosure. The industry works to have the guidelines quashed. Investors are wise to divest as the industry's support for emissions guidelines lack credibility, and there is little chance that the financial regulatory venue in the United States will produce concrete results. The policy exercise does, however, create a body of literature that supports actions by shareholders at individual companies and in other governmental venues. In other parts of the world where a different relationship exists between the state and economic activity, greater comity portends better results.

- **Public Utility Regulations:** Fossil fuel energy sources (natural gas, coal, oil) in the electricity grid are no longer least-cost options. The falling costs of renewables are contributing to changing energy markets. So are active regulatory efforts to hasten the transition to renewables. Around half of U.S. states possess some sort of binding renewable portfolio standard (RPS), requiring utilities to increase the proportions of renewable energy sources in their energy mix.[181] The RPS initiatives and other tools to modernize electricity grids are found in state-level integrated resource plans in the United States and are used around the globe.[182] These plans are how utilities plan for the future. They are designed to identify the optimal energy mix for a given jurisdiction by considering legacy assets, current capacity mix, demand scenarios, and new legal and regulatory trends. Depending on the rate-setting systems within a jurisdiction, the IRPs direct the type of projects that will be considered favorably as part of the rate base. The general planning process is normally open to extensive public participation and independent expert testimony; additional public input is sought as the rate levels change and as proposals for new grid management are introduced. The growth in renewables due to their financial benefits of low cost, no inflation, and an innovation curve that continues to produce efficiency gains is a worldwide phenomenon.[183] Planning and performance studies document the success thus far and chart a positive outlook.

- **End-Use Regulations:** Regulations that seek to limit use of fossil fuels at the consumer level may disrupt the industry's demand expectations.[184] One such example is the internal combustion engine phaseouts throughout the world. More than 30 countries and dozens of city, state, and regional governments, automakers, and automobile fleet owners have pledged to ban sales of new internal combustion engine vehicles by 2035 or 2040.[185] Fourteen countries

[181] National Conference of State Legislatures. State Renewable Portfolio Standards and Goals. August 13, 2021.
[182] U.S. Agency for International Development. Best Practices Guide: Integrated Resource Planning For Electricity. Last visited September 12, 2022.
[183] IEEFA. As fossil fuel prices skyrocket globally, renewables grow steadily cheaper. September 27, 2021.
[184] S&P Global Commodity Insights. Polymer's long-term demand prospects sharpens potential role for chemical feedstocks. September 8, 2021.
[185] U.K. Department for Transport. COP26 declaration on accelerating the transition to 100% zero emission cars and vans. Updated August 1, 2022.

have subsequently enshrined such targets in statute.[186] Major subnational markets for automobiles such as California have done so in administrative rules, and a number of U.S. states accounting for 40% of new car sales follow California's vehicle standards.[187] China has very similar goals and a program of action.[188] Each initiative comes with substantial risks but each also has the support of governmental policymakers. Similarly, initiatives to ban plastic bags and other single-use plastics may alter growth projections for the petrochemical industry.[189]

4. Litigation Risks

Increasing risks of legal liability are also likely to interfere with fossil fuel companies' ability to reliably manage shareholder wealth. Since 2015, more than 1,000 new climate-related litigation claims have arisen worldwide, with a number of high-impact cases targeting the fossil fuel industry directly.[190] A number of key developments in recent years highlight the risks:

- **Growing evidence of fossil fuel industry deception**: In recent years, academic scholarship and news investigations have uncovered evidence that certain fossil fuel companies knew of the climate risks of greenhouse gas emissions years before the general public, and took steps to conceal and manipulate this truth.[191] A subcommittee of the House Committee on Oversight and Reform held an oversight hearing on the topic in 2019. A former ExxonMobil employee and a former ExxonMobil consultant and other experts testified that much of ExxonMobil's public presentations that denied climate risks were contradicted at the time by the facts that ExxonMobil researchers and scientists had in their possession.[192] These issues have already factored into a number of climate-related lawsuits. As

[186] Bloomberg Net Zero Pathfinders. Internal Combustion Engine Vehicle Sales Phase-Outs. Last visited September 12, 2022.
[187] California Air Resources Board. California moves to accelerate to 100% new zero-emission vehicle sales by 2035. August 25, 2022. Also see: California Air Resources Board. States that have Adopted California's Vehicle Standards under Section 177 of the Federal Clean Air Act. May 13, 2022.
[188] Columbia University. Guide to Chinese Climate Policy: Electric Vehicles. Last visited September 12, 2022.
[189] Footprint Foundation. Single-Use Plastic Legislation: U.S. bans at a glance. Last visited September 12, 2022.
[190] Grantham Research Institute on Climate Change and the Environment and Sabin Center on Climate Change Law. Global Trends in Climate Change Litigation: 2021 Snapshot. July 2021.
[191] Environmental Research Letters. Addendum to 'Assessing ExxonMobil's climate change communications (1977-2014).' 2020. Also see: E&E News. Shell grappled with climate change 20 years ago, documents show. April 5, 2018. Also see: BBC. How the oil industry made us doubt climate change. September 20, 2020.
[192] Subcommittee on Civil Rights and Civil Liberties of the House of Representatives, Committee on Oversight and Reform. Examining the Oil Industry's Efforts to Suppress the Truth About Climate Change. October 23, 2019.

other climate-related lawsuits move forward, more revelations of this nature may surface.

- **Consumer protection suits move forward**: State laws prohibiting misleading statements to consumers and the public were essential in successful litigation against tobacco and opioid companies. Now, such laws are increasingly being levied in claims against fossil fuel companies for misinformation of climate science.[193] As of this writing, five U.S. states (Delaware, Vermont, Connecticut, Minnesota, and Massachusetts, along with Washington, D.C.) and seven U.S. municipalities have active suits against fossil fuel companies that include a consumer protection claim. Typically, industry defendants have sought to obtain removal of both consumer protection and state common law tort claims from state to federal court, which is seen as a more favorable jurisdiction. Recent attempts have failed in multiple federal circuit courts, however,[194] and the U.S. Supreme Court declined to hear one appeal of a federal court rejection of removal.[195] Some of these cases may come to trial in the coming years.[196]

- **Attribution science strengthens governmental tort claims**: Another key area of climate litigation involves lawsuits by municipalities and other government actors attempting to claim damages for the additional costs borne by governments as a result of climate change.[197] Such lawsuits may be brought to address costs related to rising sea levels, heat waves, severe storms and other events. Previously, some cases in this area have fallen short due to difficulties in establishing evidentiary linkages between global climactic trends and sea level rise or specific local extreme weather events. The science of quantifying the causal contributory effect of anthropogenic climate change on specific events, known as "extreme weather event attribution," has advanced substantially in recent years.[198] As these scientific advances filter into the legal arena, corporate liability may grow.[199]

- **Paris Agreement begins to have teeth:** The Paris Agreement is nominally a binding treaty. Until recently, enforcement actions have been limited. That may be changing, as a number of lawsuits around the world begin to create

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[193] American Bar Association. Climate Litigation Rising: Hot Spots to Watch. December 22, 2021.
[194] See *Mayor and City Council of Baltimore v. BP PLC,* 31 F.4th 178 (4th Cir. 2022). Also see: *County of San Mateo v. Chevron Corp*., 32 F.4th 733 (9th Cir., 2022). Also see: *State of Rhode Island v. Getty Petroleum Marketing*, 35 f.4th 44 (1st Cir. 2022).
[195] *Chevron Corp. v. City of Oakland*, 141 S. Ct. 2776 (2021). A petition to the U.S. Supreme Court to hear an appeal of the 10th Circuit's denial of removal in a case brought under state common law is pending. *Suncor Energy (U.S.A.) Inc. et al. v. Board of County Commissioners of Boulder County, et al.,* no. 21-1550, petition for certiorari docketed June 10, 2022.
[196] Law360. Circuits' remand of state climate suits may mean big liability. June 22, 2022.
[197] Such claims may be brought under state common law or under state or local property damage or injury statutes.
[198] Climate Risk Management. Inventories of extreme weather events and impacts: Implications for loss and damage from and adaptation to climate extremes. 2021. Also see: PLOS Climate. Operational extreme weather event attribution can quantify climate change loss and damages. February 1, 2022.
[199] The Lancet. How scientists are helping sue over climate change. May 2022.

precedents. In May 2021, a Dutch district court ruled that Shell must reduce its full-scope carbon emissions in line with the Paris Agreement.[200] Shell is appealing the ruling.[201] If sustained, the ruling will mandate a dramatic shrinkage of Shell's core business. Legal experts have speculated that it might provide a template for similar claims against other major market players.[202]

- **Human rights claims create pathways to industry liability:** In a landmark investigative report, the Philippines Commission on Human Rights recently found that oil companies' "engage[ment] in willful obfuscation and obstruction to prevent meaningful climate action" likely rises to the standards of human rights violations.[203] The report found that the global nature of climate change meant that a domestic body had the authority to hear claims regarding conduct largely committed in other countries, due to impacts within its own borders. It also specifically noted this creates routes to liability. If such findings are replicated by other national or international bodies, and if such claims enter the judicial system, fossil fuel companies could face another source of serious liability.[204]

5. Asset Risks

Market shifts and regulatory realignments increase the likelihood that the use and value of existing proven and probable reserves will become uneconomical. The vast majority of a fossil fuel company's valuation is tied up in its carbon and carbon-linked assets. A bet on the industry is predicated on the bet that economic growth will be advantageous to the continued growth of fossil fuels as an integral energy or feedstock source. Should market shifts or regulatory realignments result in this prediction failing, companies' balance sheets could be disrupted.

- **Infrastructure-derived risks:** When companies decide to develop a carbon-related physical asset—an oil platform or pipeline, for example—they do so on the basis of projections about the profitability over the course of the lifecycle of the asset. There is an unstable path for marginal assets. An illustration of this dynamic is taking place in Canada's oil sands. Imperial Oil, an ExxonMobil subsidiary, has since 2017 debooked, rebooked, debooked and rebooked its oil sands reserves. In its most recent iteration, ExxonMobil

[200] The decision requires the company to reduce its carbon dioxide emissions by 45 percent by 2030 from 2019 levels. *Vereniging Milieudefensie, et al. v. Royal Dutch Shell PLC*, no. C/09/5719321 / HA ZA 19-379 (English version), May 26, 2021. Also see: CNN. Court orders Shell to slash CO2 emissions in landmark ruling. May 26, 2021.
[201] Reuters. Shell filed appeal against landmark Dutch climate ruling. March 29, 2022.
[202] Shearman & Sterling. Milieudefensie v. Shell—A landmark court decision for energy and energy-intensive companies. June 1, 2021. Also see: IHS Markit. Shell Milieudefensie court ruling extends beyond Netherlands. June 21, 2021. Also see: Harvard Law School Forum on Corporate Government. What the Shell Judgments Mean for US Directors. July 22, 2021.
[203] Commission on Human Rights of the Philippines. Report: National Inquiry on Climate Change. May 2022.
[204] Commission on Human Rights of the Philippines. Report: National Inquiry on Climate Change. May 2022. Also see: Inside Climate News. In the Philippines, a landmark finding moves fossil fuel companies' climate liability into the realm of human rights. May 15, 2022.

has added 2.6 billion barrels to its worldwide reserves for 2022, about 14% of its worldwide portfolio. The current high price of oil allows them to make this claim. A long-term investor would see considerable volatility in the asset size of the company. The value of the company is inherently unstable.

- **Carbon-derived risks:** The amount of proven reserves available to fossil fuel producers is significantly larger than the amount of carbon that can be safely burned if the world is to remain within the bounds of the Paris Agreement.[205] To the extent that markets are valuing fossil fuel companies on an expectation that this extraction will take place unimpeded, unexpected and premature impairment could be a source of significant financial instability.

Under the prevailing value proposition of the industry, the next downcycle is always subsumed by the size and duration of the next upcycle. Should market shifts or regulatory realignments result in industry assets being prematurely retired before their expected value can be realized, write-offs and impairments will complicate company balance sheets. And should the next upcycle be smaller, shorter and more tumultuous than the one before, a more permanent risk is possible that seals the fate of company reserves.[206]

Recent demands by investors to improve dividend yields reflect the larger uncertainty that this could be the last time that prices rise to current levels.

6. Physical Risks

Climate change's physical impacts can also negatively affect company location, operations and supply chains. Many of the fossil fuel sector's assets lie in flood- or storm-prone regions—the equivalent of more than 600 billion barrels, or 40% of the global availability, of commercially recoverable reserves—and are at high or extreme risk of severe weather globally.[207] Meanwhile, rising temperatures and melting ice threaten the drilling projects and pipelines on which some fossil fuel majors have staked the future of their upstream business.[208]

Physical risk can shut down existing mines and wells, and/or increase the costs of gaining access to previously identified reserves. The timing of weather disruptions is unpredictable, and the impact swift and permanent. Depending upon how events evolve, there may be limited public interest or physical restrictions involved in

[205] Nature. Unextractable fossil fuels in a 1.5 °C world. September 8, 2021.
[206] IEEFA. ExxonMobil's 2020 financial report: "Re-de-booking" raises questions about actual size of reserves. March 2, 2021.
[207] Maplecroft. 40% of oil and gas reserves threatened by climate change. December 16, 2021. Also see: U.S. Department of Energy. Ethane Storage and Distribution Hub in the United States. November 2018. The Department of Energy indicates that a new petrochemical hub could be located in the western Pennsylvania/eastern Ohio region, in part because Gulf Coast weather events have become increasingly disruptive to shipping, refinery and other aspects of fossil fuel usage.
[208] Inside Climate News. Thawing Permafrost has Damaged the Trans-Alaska Pipeline and Poses an Ongoing Threat. July 11, 2021.

recovering impaired resources. Buying into fossil fuels at this time takes on all of these risks.

Moody's Carbon Transition Assessment Index, which ranks more than 400 issuers worldwide by preparedness for the energy shift, routinely ranks the oil and gas sectors last among all industries evaluated. The sectors, they note, "face a fundamental challenge to align themselves with a low-carbon future without major breakthroughs in solutions or changes to business models. Oil suppliers are particularly challenged by a lower demand future and strong ties to the fossil fuel value chain," making the industry less "able to benefit from opportunities and alignment strategies [that] could strengthen their credit profiles."[209]

All companies face material risks due to the energy transition. But when a sector faces this risk disproportionately, investors should ask whether such holdings are conducive to a climate-ready portfolio.

7. Capex Risk in a Carbon-Constrained Environment

For reasons of geopolitics, price cycles and technological trends discussed already the capital budgets of oil and gas companies are undergoing substantial changes.

Due to the invasion of Ukraine, the industry has been confronted with an opportunity. A high price environment has given fossil fuel companies record free cash flow—and the opportunity to decide how to allocate it.[210] Yet despite this historic opportunity, no cohesive or coherent vision for the future is emerging.

Many argue that the best next step for the industry is to return cash profits to shareholders and to not plan for a future that promises only failing investments and stranded assets. Others argue for the oil and gas companies to pivot and create long-term value from sustainable industry growth. Others suggest some investment in decarbonization but continued exploration and development of traditional fossil fuel resources.

The scope of choices being considered by the fossil fuel industry is muddled by the legacy of the fossil fuel economy.

Company investments and their traditional revenue streams are changing. The traditional industry playbook was to respond to high profits by leaning into the curve, meeting periods of increased demand and prices with increased investment in new fossil fuel production. The dynamic has taken on a different cast. In 2021, a turbulent year, the supermajors spent some $62 billion on capital expenditures (capex). In 2022, the figure is projected to increase to approximately $80 billion. By comparison, in 2013—the last time that oil prices were in a comparable range—the supermajors allocated some $166 billion towards capex. Much of the record profits today are instead being passed on to shareholders. In 2021, the supermajors

[209] Moody's Investors Service. Carbon transition positioning is an increasingly important credit consideration as net zero pressure mounts. September 29, 2021.
[210] Bloomberg. Big Oil Set for Record Profit as World Hit by Fuel Cost Pain. July 25, 2022.

devoted nearly $52 billion, or about half of their free cash flow, towards dividends and buybacks.[211]

Through a climate change lens, oil and gas expenditures exceed net-zero alignment.[212] As this report's analysis of major companies' compliance with the IEA's 2050 pathway shows, fossil fuel companies' pledges of net-zero are simply not credible. And as also discussed above, oil companies are not using their free cash flows to meaningfully invest in sustainable alternatives. Compared to other industries facing transition questions, the fossil fuel sector's expenditures in sustainability—even among purported market leaders—are dwarfed by investment in projects that undermine the energy transition.

To the extent that the fossil fuel industry is reallocating capital to profitable areas, some are emphasizing it may be to petrochemicals. "Resigned to more pedestrian returns," the *Wall Street Journal* noted in 2019, "integrated oil companies see a strong case for investing in a business that was once a sideshow."[213] The growth of competitive technologies in the transport and power sector is sending the message that the rate of growth of oil and gas demand, the key variable in the industries' business calculus, is slowing. ExxonMobil's CEO Darren Woods recently stated that he expects the company's operations will increasingly rely on petrochemical production as the increased market share of electric vehicles replaces the internal combustion engine and the fossil fuel demand that comes with it.[214] This swap—petrochemicals for oil and gas drilling and refining—represents a risky bet for fossil fuel companies.

The IEA finds that petrochemicals are rapidly becoming the largest driver of global oil demand.[215] Fossil fuel companies are responding by gradually shifting investment in this direction. As overall capital budgets shrink, the mix has shifted downstream. Among the five largest integrated oil and gas companies, downstream operations have seen their budget allocations rise from 22% in 2019 to 26% in 2021 (Table 3). The change may presage a broader shift.

IEEFA also observes a forecasted uptick in chemical capacities of oil majors in the next three years, particularly Exxon & Shell. They are constructing new plants (Figure 5). With gasoline consumption expected to fade, crude-to-chemicals complexes could dominate the petrochemical industry in the future. This view is rooted in the market assumption that the annual growth of plastics and petrochemicals, which typically is faster than gross domestic product, will continue.[216]

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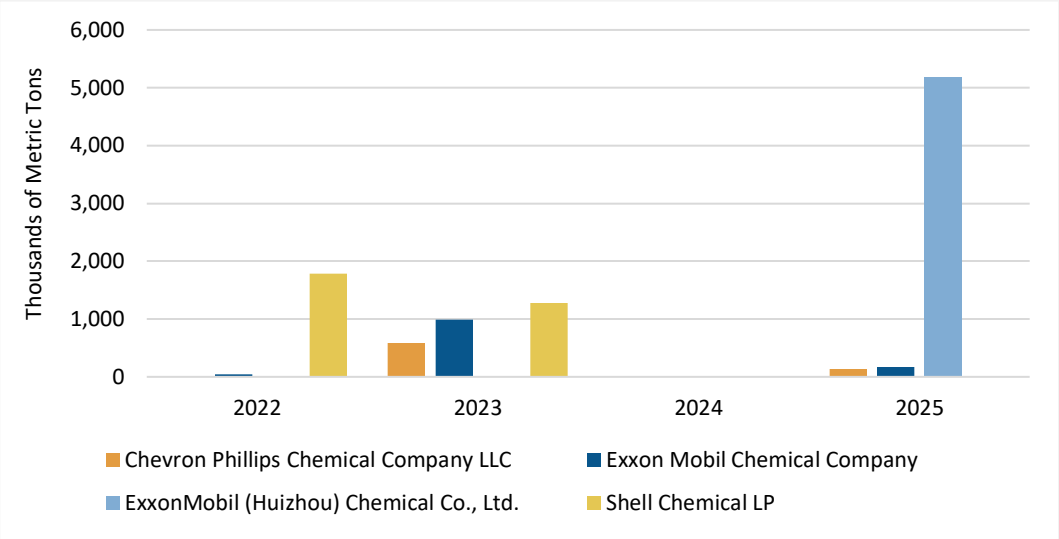
[211] IEEFA analysis of annual and quarterly reports of ExxonMobil, Chevron, Shell, BP, and TotalEnergies through the second quarter of 2022.
[212] Financial Times. Governments must seize the chance to transform our unsustainable energy systems. August 12, 2022.
[213] Wall Street Journal. Big Oil Flashes the Plastic. July 28, 2019.
[214] CNBC. Every new passenger car sold in the world will be electric by 2040, says Exxon Mobil CEO Darren Woods. June 25, 2022.
[215] IEA. The Future of Petrochemicals. October 2018.
[216] CNBC. Every new passenger car sold in the world will be electric by 2040, says Exxon Mobil CEO Darren Woods. June 25, 2022.

Figure 5: Petrochemical Capacity Additions by ExxonMobil, Chevron and Shell: 2022-25



Source: Company reports.

The anticipated growth in petrochemicals as a replacement for transport and power faces challenges. The European Union's comprehensive discourse on sustainable economics suggests that the use of petrochemicals as feedstock for various plastic production is being challenged. First, policymakers have targeted a reduction in single-use plastics. This means there is likely to be a reduction in demand for ethylene and polyethylene, significant components of plastics production. Europe currently accounts for 12% of world ethylene consumption and 12.5% of polyethylene. A 25% reduction in either would slow worldwide growth from its average of 3% annually to -0.5% annually. Second, it is very likely that hydrogen will become a feedstock alternative in plastics production. The evolution of technologies will determine the scope and rate of change related to fossil fuel replacement across the plastics landscape of single-use plastics, textiles and durables.[217] Third, in addition to product reductions from regulatory bans and feedstock swaps, fossil fuel demand is likely to be reduced in the petrochemical space by new investments in recycling.[218]

The vision that petrochemicals can serve as a demand replacement for transport and power sector fossil fuel reductions remains highly theoretical. The current policy and market trajectory is to reduce the use of fossil fuels in the production of plastics and reduce the use of plastics. The interventions are likely to slow or reduce demand. The level of innovation needed in the petrochemical space and the innovative potential of the fossil fuel sector ensure it will remain a source of supply for the petrochemical industry. Its role and size remain to be seen.

[217] Liebrich Associates. The Clean Hydrogen Ladder. August 15, 2021.
[218] HIS Markit Circular Plastics Service. IHS Markit Analysis Indicates Need for Multibillion-Dollar Capital Spending to Achieve a "Circular Plastics Economy" by 2050. October 11, 2021.

The current capex story tells us that the oil and gas sector exists in an unhappy medium. It is spending too little on oil and gas for investors to be comfortable with the status quo as a growth opportunity. It is spending far too much on oil and gas to be compatible with the market's movement towards net-zero. Meanwhile, its investments in sustainable and more diversified revenue streams such as renewables, petrochemicals or low-carbon businesses are considered to be at an early stage. The fact that it is largely choosing to pass on near-term profits rather than reinvest them signals the absence of a cohesive vision for using this window to position itself for future growth and long-term value.

8. Profit Risk in a Two-Energy Economy

The portrait of oil and gas companies emerging out of World War II was one of steady, stable, long-term profitability. Growth, the memory of growth, and its future prospects supported stable political structures that supported the development of both democratic and authoritarian state structures. Through war and recession, the business model could be depended upon to produce oil and gas, dividends, and an inevitable return to progress. The value thesis was rooted in the idea that long-term oil and gas interests aligned perfectly with the long-term actuarial needs of institutional investors.[219] The energy sector commanded the heights of the stock market.

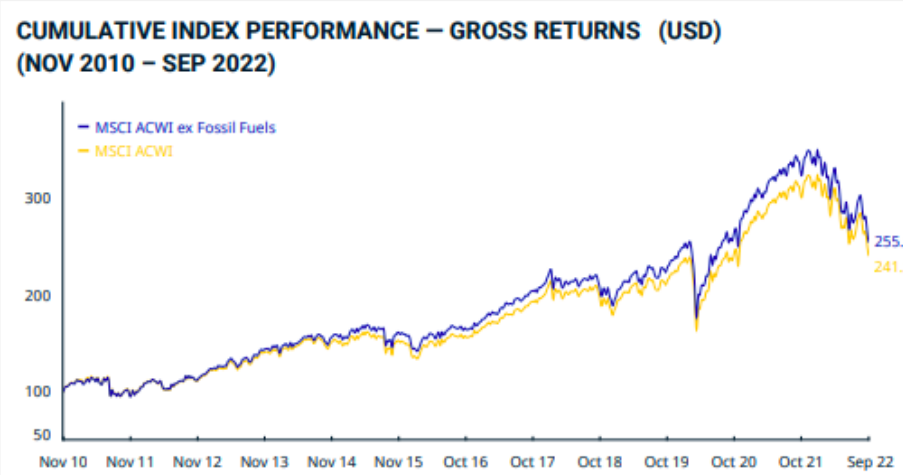
As the two energy economies—one sustainable and one fossil-fueled—have evolved, the structural outline of each is becoming clearer. The shape of the fossil fuel industry's decline is clear, while the growth of sustainable markets is moving forward.

For the most part, the last 10 years of the fossil fuel story is one of chronic underperformance, overproduction, new industry leaders, and unprecedented competition. The price increases of the last two years, driven by a worldwide pandemic and then Russia's invasion of Ukraine, have sent a message that high prices, even excessively high prices, are necessary for industry stability. The steady, stable, growth orientation of a bygone era has been cast aside in favor of quick cash from geopolitical manipulations as the industry matures and declines. The trends raise serious questions about the sustainability of continued exposure to oil, gas and coal.

The last two years have bolstered oil and gas stocks but not sufficiently enough to offset the last 10 years of decline and underperformance. The following graph represents a comparison of the MSCI ACWI and the MSCI ACWI index *excluding fossil fuels* over the past decade. Through 2014, the fossil fuel sector largely kept pace with the market, delivering neither extraordinary profit nor loss. Then, it diverged. While recent conditions (such as the initial pandemic response and Russia's invasion of Ukraine) have narrowed the gap, the long-term trends of underperformance stand out.

[219] Steve Coll. *Private Empire*. New York: Penguin Random House, 2013. Also see: Daniel Yergin. *The New Map*. New York: Penguin Random House, 2022.

Figure 6: Cumulative Returns of MSCI World Index vs. MSCI World Index ex Fossil Fuels, 11/2010 - 9/2022



ANNUAL PERFORMANCE (%)

Year	MSCI ACWI ex Fossil Fuels	MSCI ACWI
2021	18.53	19.04
2020	19.13	16.82
2019	28.19	27.30
2018	-8.92	-8.93
2017	25.45	24.62
2016	7.18	8.48
2015	0.03	-1.84
2014	6.60	4.71
2013	25.00	23.44
2012	18.69	16.80
2011	-7.01	-6.86

Source: MSCI World ex Fossil Fuels Index (USD).

The lag of oil and gas on an absolute basis can also be seen on a relative basis. In 1980, the fossil fuel industry commanded some 28% of the Standard & Poor's 500-stock index. Today, its weighting sits at 4.5%.[220] Once again, market disruptions in 2021 and 2022 led to some recovery, but not enough for the industry to regain its former position of market dominance.

This financial performance and the underlying factors driving it have combined with the climate issue to alter investor perceptions of the industry. To date, more than 100 globally significant banks, insurers, and reinsurers have begun to explicitly restrict financing of certain coal, oil, and/or gas projects, including giants such as Swiss Re and Allianz.[221] National policy, too, is contributing—in 2022, for example, G7 countries agreed to limit certain types of overseas fossil fuel development financing.[222] And the divestment movement has itself become a market factor. As companies like Shell have noted, investors' turn away from fossil fuels can materially limit their access to capital markets.[223]

Capital-intensive industries like oil and gas extraction rely heavily on access to financing instruments to expand their operations. Capital markets are beginning to shape the contours of the two-energy market scenario IEEFA is advancing. The restrictions on access to financing represent both an external judgment of the companies' current standing, and a material challenge to their future. The choices being made in the United States by utilities, for example, make clear that financing is moving toward renewable energy. Using announced capacity expansions, utilities

220 S&P Dow Jones Indices. S&P 500 Factsheet. August 31, 2022.
221 IEEFA. 100 and Counting.
222 G7. G7 Climate, Energy and Environment Ministers' Communiqué. May 27, 2022. Also see: Bloomberg. Germany Pushes for G-7 Reversal on Fossil Fuels in Climate Blow. June 25, 2022.
223 Shell. Annual Report 2021, Risk Factors.

are choosing wind and solar at a pace of 14 megawatts (MW) for every 1 megawatt of natural gas.[224]

D. Chronic Underperformance and Market Response

Financial underperformance and the loss of market share are the story of fossil fuels over the past decade. It is likely to continue. Out of these trends, a two-energy economy is evolving. The new landscape poses a set of questions for institutional investment fiduciaries that requires a review of the role of the fiduciary.

1. Underperformance and the Development of a Two-Economy Market

The decline in coal use in the United States provides one of the structural examples. Although there are significant differences between the coal and oil and gas industries, the erosion of confidence by financial underwriters is strikingly similar. In 2008, the U.S. Department of Agriculture's Rural Utilities Service (RUS) took an unprecedented step to cancel the financing of new coal plants. The RUS had been a primary source of financing coal plants, particularly to rural areas, since the New Deal. The cancellation occurred when the RUS and Office of Management and Budget (OMB) were unable to construct an interest rate that reliably reflected the risks associated with greenhouse gas emissions and rising construction costs.[225] This decision was made by a pro-fossil fuel administration. Both the president and vice president at the time came from pro-fossil fuel states. This decision was just one of many decisions by public and private financing sources that terminated support for a plan calling for 150 new coal plants in the United States.[226] It reflects the declining significance of coal.

Structural change is at the root of Norway, the second example. Oil and gas revenues provide 25 percent of the country's budget revenue. Government oil income from 1991 through 2016 was robust and sufficient to cover the annual budget deficit of the country.

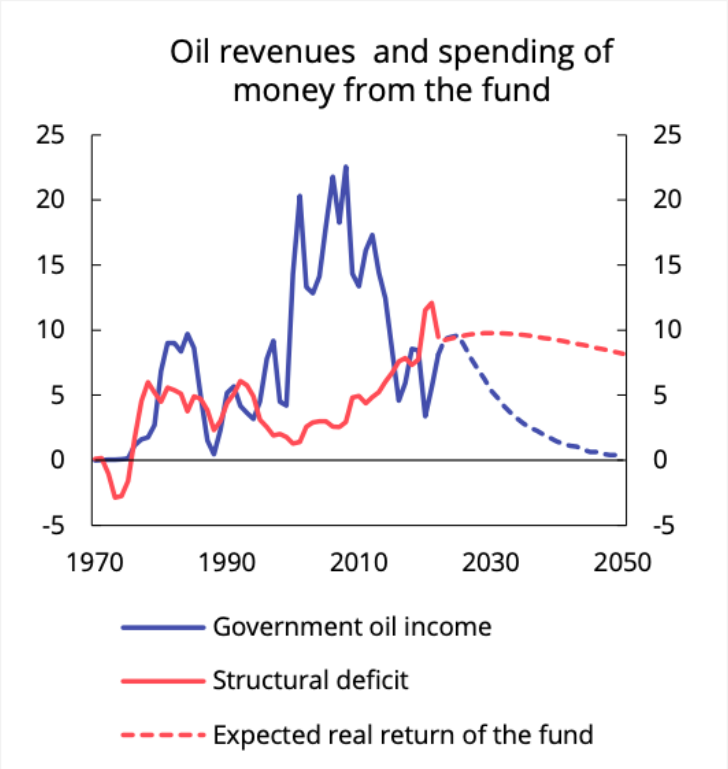
During those years, Norway's budget was structurally balanced. From 2016 through 2020, government oil income dropped and often was not able to cover annual budget deficits. Through 2050, the Norwegian government projects decreasing oil income and rising government costs. The erosion of oil and gas as a revenue source for Norway drives future structural budget deficits. The budget is now structurally out of balance; price volatility in the oil and gas industry will make the journey for oil and gas far more complicated than coal.

Perhaps one of the more important takeaways from the Norwegian example is that the country is not the only government that is heavily dependent on oil, gas and coal revenues. Other national governments like Russia, Saudi Arabia and Qatar face a

[224] Edison Electric Institute. 2021 Financial Review. Last visited September 13, 2022.
[225] Associated Press. Feds suspend loan program for rural coal plants. March 6, 2008.
[226] Mother Jones. How a Grassroots Rebellion Won the Nation's Biggest Climate Victory. April 2, 2012.

similar revenue outlook. Norway's budget practices are historically more transparent, however.[227]

Figure 7: Norwegian National Budget Projects Declining Oil Revenue



Source: Norway National Budget 2022.

The business model and set of relationships that supported coal and oil and gas have run their course. The declining fossil fuel model has recently received a revenue boost driven by a war. In the first quarter of 2022, for example, the largest oil and gas companies made almost $100 billion.[228] With quarterly profits up, some oil and gas leaders see evidence of the industry's future viability. The two economies, however, are evolving. High prices also make renewables more cost-competitive, hastening the shift away from carbon-based energy. U.S. utilities, for example, which have traditionally served as some of the industry's most reliable customers, have responded to higher prices by accelerating their shift from coal and gas to wind and solar.[229] Analysts at Moody's have suggested that prolonged tightness in coal markets is likely to incentivize more investment in energy storage, transmission, and fossil fuel alternatives worldwide.

[227] For example, in the wake of sanctions in Russia, the government had decided to curtail the reporting of certain budget data. See: Reuters. Russia to restrict budget data in response to western sanctions. June 14, 2022.
[228] The Guardian. Largest oil and gas producers made close to $100bn in first quarter of 2022. May 13, 2022.
[229] IEEFA. U.S. 2022 Power Sector Outlook. April 24, 2022.

When an entire industry has dragged down passive indices for the last decade—and when the substantive factors limiting its future prospects have remained largely unchanged even in a higher price environment—it is time for investors to ask some questions.

The energy sector has gone from a reliably consistent, stable, blue-chip contributor to institutional investment funds to a high-risk set of companies and national governments with a speculative investment rationale and a negative long-term financial outlook. The business model no longer works. Based on this history, investors should carefully consider whether their interests and the industry's interests still align.

2. Underperformance, Climate Change and the Role of the Fiduciary

The uncertain future facing fossil fuel companies poses real risks to the long-term stability of portfolios with fossil fuel holdings. If climate change is a financial risk, then responding to this risk is no longer optional. There is a range of responses available to institutional investors. Which option will most effectively satisfy fiduciary duties in the context of the changing global economy? And how can an investor ensure their decisions make an impact in the broader push for a decarbonized world?

This paper argues that there is a broad consensus that climate change creates a financial risk for investment portfolios. One of the more obvious choices to address it is to envision a portfolio without fossil fuels, which eliminates the risk from the portfolio. This is the divestment option. A board or trustee must decide to pursue this option. Once the decision is made, the exercise should be worked through to its conclusion. Since divestment is complicated, it may be tempting for some members of a board to relitigate the matter. At this point, where the board has decided to give the full divestment option a complete vetting, attempts to relitigate are counterproductive and premature.

Can a fund achieve its financial targets without fossil fuels in the portfolio? To answer this question, a review must be made of the portfolio, starting with its current fossil fuel holdings.

The next step of the exercise is to remove the fossil fuel holdings and substitute a basket of non-fossil fuel equities (and/or bonds, private equity or other investments) consistent with the philosophy, asset allocation and return strategy of the fund. The specific fossil fuel holdings to be removed are based on a series of policy decisions made by the board. Some funds opt to divest all coal, oil and gas stocks. Some opt for more targeted divestments of coal, certain sectors within the oil and gas industry, or geographic targets like Canadian oil sands.[230]

[230] Stand.earth *et al.* Invest-Divest 2021: A Decade of Progress Towards a Just Climate Future. October 26, 2021.

This is an empirical exercise. Once it is complete, some thought needs to be paid to various implementation considerations, such as timing, benefits and costs. At this point, trustees are fully aware of the divestment idea as applied to the portfolio that is their responsibility. They possess a policy-based divestment strategy and an implementation plan that addresses important cost/benefit and timing considerations.

Boards have used consultants to assist with the procedural steps needed to implement the policy decision to consider divestment. Any exercise by a board that is not based on the details of the specific portfolio that they are responsible for runs a risk of being flawed. Outside opinions, studies, reports (including this one), models or even contracted reports addressing related questions are inadequate.

Once armed with facts, the board then should move to a rational, dispassionate consideration of the divestment of the assets of the fund. Upon conclusion of deliberations, the board can vote yes or no, make amendments, or table a discussion within the rules of the board. In the end, it is the board members who are accountable for fiduciary compliance—not consultants, not staff, not outside groups, not legislatures and not executives of governing bodies. Board trustees or a sole trustee must exercise independent judgment based on the facts.

Rejecting divestment without undertaking this level of empirical exercise runs the risk of interjecting bias and other flaws into the decision-making process. Once a risk has been identified (particularly one with the scope of implications related to climate change), a full assessment of the issue is warranted. The need for a full assessment as described herein flows from a well-known case involving fiduciary responsibility, *Chao v. Merino*.[231] The case offers a pointed reminder of the fiduciary obligation. The case affirmed that once a fiduciary is aware of a risk, action must be taken to address it. The mitigating actions should not be delayed. The mitigating actions must also be precautionary in outlook and protect against predictable adverse outcomes. A full assessment of divestment, even if fiduciaries ultimately adopt another strategy, needs to be on the table to satisfy the type and nature of climate risk.

Institutional investors face legal requirements to act in a responsible manner. State pensions are primarily subject to standards outlined in state statutes. The mandates for university endowments often derive from the Uniform Prudent Management of Institutional Funds Act (UPMIFA). For private employer retirement benefit plans, relevant laws can include the Employee Retirement Income Security Act (ERISA) and the Uniform Prudent Investor Act (UPIA). Other laws may govern funds in specific situations. Legal counsel for the fund is needed for this guidance. Counsel can assist, but does not replace the decisions of the board or sole trustee. Counsel is guided by a few key principles that fiduciaries should know.

The **duty of prudence** holds that pension and endowment managers must act with "care, skill, and caution" of an ordinarily responsible actor in the same situation. Trustees are required to engage in robust consideration of questions regarding the

[231] United States Court of Appeals, Second Circuit. Chao v. Merino. 452 F.3d 174 (2d Circ. 2006). June 21, 2006.

sustainability of their investment strategies. They must do so with an eye towards protecting the fund in the long run and must do so while avoiding investments where risks outweigh expected returns. Difficult questions about the long-term economic prospects of a market sector cannot be ignored; rather, the trustees have a responsibility to evaluate the soundness of their strategies in an active and ongoing manner. Coupled with this is the **duty of loyalty**, under which trustees must carry out their duties with the sole and undivided interest of the fund and its beneficiaries in mind.[232]

Pensions must give special attention to the **duty of impartiality**, which requires trustees to serve the interests of all beneficiaries, rather than a select few. This requires careful actuarial study of the impact of fund decisions across beneficiary classes, including across generations. A decision that impairs the ability of future beneficiaries to receive the same benefits as current beneficiaries may run afoul of the requirement.[233] Endowments, meanwhile, face the duty to consider an investment's relationship with the institution's **charitable purposes**.[234] Within the bounds of prudence and other relevant duties, a trustee must consider the investments that might aid or hinder the organization's broader mission-driven, social, or ethical commitments.

These duties have rendered unquestioning continued exposure to fossil fuels incompatible with a fund's financial or legal obligations. Fossil fuel companies are far from the only sector exposed to climate-related risk, and a prudent trustee must be willing to ensure climate preparedness on a portfolio-wide level. But the limited growth outlook facing these companies means that a portfolio exposed to fossil fuel companies faces disproportionate climate risk. Prudent investors have no choice but to develop strategies for addressing this reality.

An investment strategy that recognizes the long-term trends facing the sector but seeks to time the peak, exiting before any significant destruction of shareholder value occurs, is likewise inappropriate. As defined for pensions and endowments, the standard of prudence holds that an institutional investor necessarily operates with a long-term outlook. Managers should avoid decisions that sacrifice a fund's future financial well-being in pursuit of short-term returns. Institutional investors are not positioned to act as short-term speculators, and the risky dynamics of this tactic—combined with the ample opportunities to meet financial expectations via other investment strategies—make a reliance on it hard to square with fiduciary standards.

Investors are also discovering the difficulties of a "shareholder engagement" strategy that fails to consider divestment at any point. Properly considered, divestment is an integral part of the toolkit that investors have when seeking to deploy their power as a shareholder. Viewed along a continuum of administrative steps, the continuum can start with phone calls between companies and shareholders, and then proceed along a path that includes shareholder resolutions,

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[232] CIEL. Trillion Dollar Transformation. January 2017.
[233] *Ibid.*
[234] Bevis Longstreth. Outline of Possible Interpretative Release by States' Attorneys General Under The Uniform Prudent Management of Institutional Funds Act. January 29, 2016.

votes on directors, legal actions, and—when other efforts to persuade a company to act fall short—divestment. The elimination of any one step from the outset, including divestment, undermines the integrity and power of the overall process.

For prudent investors, climate risk requires careful and rigorous consideration of divestment. Fulfilling fiduciary duty in the 21st century requires defending a portfolio against climate risk. Shedding fossil fuel holdings means eliminating exposure to companies that create (and face) climate risk at disproportionate levels. As a fiduciary matter, it would be a lapse in expected diligence to not ask and answer the questions, "What would a portfolio look like when it is fossil free? And how can such a portfolio be constructed to meet investment targets?" The failure to develop this level of consideration is tantamount to ignoring climate change.

Because of their proprietary nature, such studies are not usually released. One important study, however, answered these questions in the affirmative. A recent study by leading investment advisor BlackRock,[235] commissioned by New York City pension funds, found that the adoption of sustainable investment standards is not penalized by the market. Among its key findings:

- Divestment is prudent: "… no investors found significant negative performance from divestment but rather, have reported neutral to positive results."

- Full divestment is warranted: "The broadest of all [divestment] options … outperforms all other options and the benchmark portfolio on both a standalone cumulative and standalone annualized return basis."

- Divestment is practical to implement: In all scenarios analyzed for the funds, BlackRock found nothing to suggest outsized implementation fees, little risk to diversification prospects, and "minimal impact on costs and tracking error."

- Failure to divest means significant potential peril: "The potential transition to a low-carbon economy presents investment risks to fossil fuel reserve owners, raising the possibility that fossil fuel reserves—which may be unusable in a low carbon scenario—will face precipitous devaluation or become 'stranded assets.'"

A parallel study commissioned by the New York City funds from investment house Meketa independently reached similar conclusions.[236] It is important to note these studies were commissioned after the pension funds had conducted a number of studies and consulted widely with the investment industry. The boards of the funds decided to consider the divestment option but needed to answer the question of whether or not they could continue to reach their investment targets. It was only after the boards compiled this body of information and analysis, including the

[235] BlackRock. Investment and Fiduciary Analysis for Potential Fossil Fuel Divestment. March 2021.
[236] IEEFA. Major investment advisors BlackRock and Meketa provide a fiduciary path through the energy transition. March 22, 2021.

BlackRock and Meketa contributions, that it fashioned a divestment strategy tailored to its portfolio and investment philosophy.

Failure to meaningfully consider divestment, on the other hand, may even create fiduciary concerns. Entities subject to trust law, pensions and endowments are legally required to function as long-term investors. The industry's speculative investment thesis and uncertain future prospects risk running afoul of the care and caution mandated under this framework by the prudence standard.[237] For pensions, the long-term effects of fossil fuel companies' actions could potentially fail tests of impartiality, especially in regards to future beneficiaries.[238] And for endowments, the social consequences of climate change raise tough questions about these investments' compatibility with a fund's charitable purpose.[239]

Fiduciary duty is not a valid reason for investors seeking to avoid considering divestment. In the current environment, when it is generally agreed that climate risk is a financial risk, consideration should be given to eliminating that risk from the portfolio.

Former SEC Commissioner Bevis Longstreth, who was influential in the drafting of much of modern trust law, has similarly noted that "the fossil-fuel industry's business model is now so misaligned with scientific and financial reality that betting on these companies … is not just misguided. It is negligently wrong as a matter of law."[240]

The financial roadblocks to divesting are negligible in the modern market. A significant number of fossil-free indices and low-fee index funds are available in the marketplace, as are solutions for other asset classes. Likewise, fiduciary requirements entirely permit—and at least in some contexts, seem to strongly counsel towards—shedding fossil fuel investments. For investors looking to harden their portfolio against climate risks, divestment is a logical defensive move.[241]

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[237] Longstreth, *op. cit.*
[238] IEEFA. Fiduciary Duty and Fossil Fuel Divestment. October 22, 2019.
[239] Longstreth, *op. cit.* Also see: Grist. The campus divestment movement has a sophisticated new legal strategy. February 16, 2022.
[240] Project Syndicate. Finance Must Combat Climate Change – Or Else. November 2022.
[241] CIEL, *op. cit.*: "[a]midst this changing landscape, it is increasingly likely that some asset categories (e.g., coal mining companies) would be deemed *de facto* imprudent to own already, or will be made so by the continuing evolution of society's response to climate change. Given both the global commitments to climate action and the clear necessity of additional regulatory action to reduce emissions, many fossil fuel and other highly climate-vulnerable companies will at some point be subject to devaluation ... For those most-vulnerable assets, avoidance may be the only appropriate action."

E. Investing Beyond Fossil Fuels and the Energy Transition

For an investor looking to secure a fund's long-term profitability, divestment decisions are often coupled with investment programs in sustainable investments. These are separate steps in fund management. Each decision within the processes of divestment and any subsequent sustainable investments must pass separate diligence reviews.

Conventional wisdom has been that the transition to sustainability will be costly and slow. Market realities are proving this false. Clean energy capacity has been surging worldwide, with 2021 seeing record acceleration.[242] New renewable generation is now cheaper than fossil fuels across a wide range of uses.[243] For example, low-carbon energy was the only source that experienced demand growth amid the pandemic.[244] The question is not whether sustainable investing will grow, but how fast and how smoothly. To date, renewable energy analysts have underestimated its growth.[245]

A study from Oxford University recently concluded, "The combination of exponentially decreasing costs and rapid exponentially increasing deployment is different to anything observed in any other energy technologies in the past, and positions renewables to challenge the dominance of fossil fuels within a decade."[246]

A recent McKinsey analysis found that by 2030, demand for net-zero offerings could generate more than $12 trillion annually across 12 key value pools (including transport, power, and buildings), creating "significant growth potential for climate technologies and solutions."[247] By that same time, the renewables sector is forecast to create as many as 25 million new jobs.[248] By 2050, in a net-zero aligned world, renewables will have largely supplanted fossil fuels for electricity, generating as much as 90% of the world's power needs.[249] The long-term outlook for fossil fuels faces a basket of risks that suggests much slower growth. The trends regarding renewable energy are positive.

In addition to guarding against risk, divestment also helps open opportunities to develop portfolios for other climate-safe investments. A number of the most prominent divestment announcements to date have been coupled with the announcement of new investments in the energy transition:

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[242] IEA. Renewables 2021. December 2021.
[243] Lazard. Levelized Cost Of Energy, Levelized Cost Of Storage, and Levelized Cost Of Hydrogen. October 28, 2021.
[244] IEA. Renewables are stronger than ever as they power through the pandemic. May 11, 2021.
[245] Vox. The International Energy Agency consistently underestimates wind and solar power. Why? October 12, 2015.
[246] Oxford Institute for New Economic Thinking. Empirically grounded technology forecasts and the energy transition. September 14, 2021.
[247] McKinsey. Accelerating toward net zero: The green business building opportunity. June 14, 2022.
[248] IRENA. Renewable Energy Jobs Reach 12 Million Globally. October 21, 2021. Also see: IRENA. Global Renewables Outlook: Energy transformation 2050. April 2020.
[249] IEA. Net Zero by 2050. 2021.

- When Harvard University committed to divesting, it also announced the "building [of] a portfolio of investments in funds that support the transition to a green economy" and investments in efforts "to accelerate the development of technologies that promise to address the challenges posed by climate change."[250]

- When the Ford Foundation announced plans to phase out fossil fuel investment, it noted that "going forward, the foundation has pledged to invest in funds that address the threat of climate change, and support the transition to a green economy."[251]

- Shortly after the New York State Common Retirement Fund pledged to shed fossil fuel assets, it announced plans to invest hundreds of millions in additional investments in renewable energy.[252]

- When the University of California's portfolios succeeded in becoming fossil-free, the funds also announced more than $1 billion in clean energy investments.[253]

In shifting money from fossil fuels to clean energy, portfolio managers are actively helping to spur innovation in environmentally sustainable technologies. Proponents of renewable energy and other sustainable industries, however, face a multi-tiered bottleneck slowing growth. According to the IEA, "Investment to bring more clean and affordable energy into the system is rising, but not yet quickly enough to forge a path out of today's crisis or to bring emissions down to net zero by mid-century—a critical but formidable challenge that the world needs to overcome if it is to have any chance of limiting global warming to 1.5°C. Without a massive surge in spending on efficiency, electrification and low-carbon supply, rising global demand for energy services will simply not be met in a sustainable way."[254]

Investments by portfolio managers in the energy transition are made consistent with overall fund investment strategies. Generally, as funds from the sale of stocks are freed up (whether or not part of a divestment plan is irrelevant), fund managers reinvest consistent with the broad outline of an asset allocation plan. Rebalancing is done by every fund to maintain consistency with its overall sector weightings. The cost of rebalancing is part of every fund's routine administrative budget.

The costs of investing in any sustainable strategy are a largely separate matter from divestment and rebalancing. Sustainable investing, like any investing, must be considered fiduciarily sound and be consistent with investment return objectives. The risk profile of renewable investments covers many of the same areas of

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[250] Harvard University. Climate Change: Update on Harvard Action. September 9, 2021.
[251] Ford Foundation. Ford Foundation Announces Plan to End Investments in Fossil Fuels. October 18, 2021.
[252] Office of the New York State Comptroller. DiNapoli: NYS Pension Fund Announces $400 Million in Sustainable Investments. April 20, 2021.
[253] University of California Office of the President. UC's investment portfolios fossil free; clean energy investments top $1 billion. May 19, 2020.
[254] IEA. World Energy Investment 2022. June 2022.

conventional energy investment such as trade and tariffs, politics, tax policy and subsidies. And there are risks that are particular to the industry, such as prices and accessibility to rare earth metals, liabilities related to wind and solar equipment operations, and natural disasters.[255]

Divestment is part of a shareholder's toolkit to protect the value of a portfolio. It is also part of the investment process. Investment is the other, bigger tool that allows a fund to participate in the marketplace, scientific and technological innovation, and new business models.

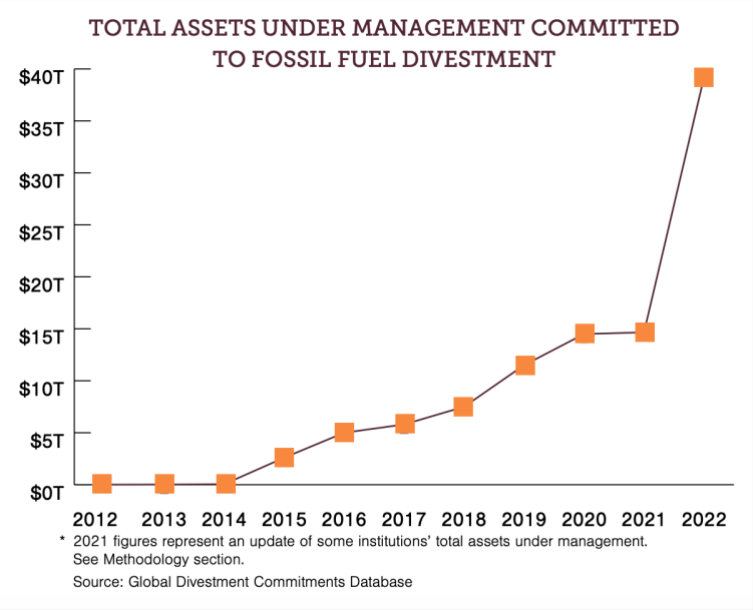
F. Conclusion

As the climate continues to change, the business paradigms that have guided investment decisions over the past 50 years are unlikely to be adequate for addressing the next half-century. The task of a prudent institutional investor, then, is to ask how best to prepare for the diverse, sustainable, and profitable energy economy of the future.

In light of this reality, leading financial actors are increasingly choosing divestment.[256] As of 2022, funds worth more than $40 trillion have committed to some form of divestment. Across the board, they have found that divestment is practical and prudent. Many have found themselves better off in the process.

[255] Risk and Insurance. 7 Critical Risks in Renewable Energy. March 20, 2019.
[256] An interesting and important treatment of divestment can be found in the Global CCS Institute 2021 Status Report. The institute favors shareholder engagement between investors and company management in the coal, oil and gas industries because it sees the CCS option as an effective technological mechanism around which consensus can be forged. The institute, however, treats divestment as one of a series of logical choices. Many proponents of engagement see the divestment option as a substantial deviation from sound investment practice. See: Global CCS Institute. Global Status of CCS 2021. 2021, p. 51.

Figure 8: Total Assets Under Management Committed to Fossil Fuel Divestment



Source: Invest-Divest 2021: A Decade of Progress Towards A Just Climate Future.

They are doing so because divestment moves the needle. The impact of divestment on financial flows is acknowledged by fossil fuel companies as a material market factor. In shifting capital from carbon-intensive companies and towards the larger economy, including renewable energy and other climate-conscious investments, divestment has proven itself an essential building block of financial logic that opens the door for a decarbonized economy.

Additionally, investors are moving toward divestment because divestment protects their bottom line. Once upon a time, fossil fuel companies were a reliable contributor to long-term economic growth. That is no longer the case. Today, fossil fuels are a speculative and risky investment rooted in the assumption that markets and society will largely fail to deliver on the energy transition. The fossil fuel industry is poised to find itself poorly positioned to manage shareholder dollars as the world confronts the physical damage from climate change and the transition that the changing climate imposes.

Climate change poses material risks to the financial system. Fossil fuel companies face outsized exposure to these risks. As a result, their long-term outlook is negative. The mandate of institutional investors is to invest in a way that is prudent in the long run. In line with this mission, fossil fuel divestment is an option that must be considered. The adoption of any plan to divest from fossil fuels represents a responsible choice to manage risk and protect returns.

III. The Arguments Against Divestment Do Not Hold Up Under Scrutiny

When IEEFA first prepared this report in 2018, the central argument we refuted was that fossil fuel divestment would lead to a diminution of portfolio value. Industry arguments opposing divestment flowed from market models used to show the historic contribution of the fossil fuel industry, market theories of optimal results from diversification, concerns that a financial replacement for fossil fuels could not be found, and a view that high fees and costs would offset any gains. The arguments did not hold up under close examination then, and the arguments have even less credibility today. The facts simply do not support them.

Over the last few years, the arguments against divestment continue to include false financial assertions but have expanded to include other dubious contentions as well. We have organized those arguments into four categories:

- Politics: Support for fossil fuels fosters a diverse energy system to combat authoritarian attempts to politicize supply.
- Solutions: There are better solutions to the climate problem than divestment.
- Finance: Divestment will lose money.
- Economics: Divestment creates economic imbalance that pushes prices higher.

The financial reason to divest rests on the premise that the coal, oil and gas sectors do not have a value-building business case to support investment. The problems for industry over the last 10 years are based on the growth of competitive industries in the electricity, transport and petrochemical sectors. These market forces improve the outlook for sustainability and have cast a cloud over the future of fossil fuels.

A. Politics

1. Authoritarian Regimes and International Instability

Oppose Divestment: *Support for fossil fuels fosters a diverse energy system to combat authoritarian attempts to politicize supply.*

Favor Divestment: *The failure to divest supports international instability, aggression and upheaval as the driver of oil and gas pricing and production.*

As the financial case for divestment has strengthened, politics has largely replaced financial considerations in discussions of oil and gas reserves, profit-and-loss and capital expenditures. These issues are often couched in financial terms, but politics dominates the markets and the discourse—and politics are at a fever pitch.

The geopolitical impact of military aggression has arrived just in time as the driver of a momentous turn-around in profits and budget surpluses. The Russian invasion of Ukraine—an action that has caused oil and gas prices to rise precipitously—is about politics. Much time and energy may be spent speculating on Russian motivations and strategic intentions. The results of the intervention, however, are not speculative.

The high prices triggered by the invasion have increased the revenues for virtually every oil company in the world. They have also increased the governmental coffers of countries that produce oil and gas. The tragedy and horror for the people of Ukraine is cause for celebration in the capitols of certain oil-producing nations—and seemingly callous dismissal in the boardrooms of companies that are part of the oil and gas industry. Quarterly earnings and budget reports tell the story.

Large and small emerging countries that import oil and gas face an accumulation of financial risks that deepen as prices remain high. As oil prices remain high, the expectation is for slower growth. Generalized inflation has severe impacts on food and energy security and industrial production. Budget deficits grow as governments seek to offset impacts of inflation on consumers. Trade imbalances drive currency inflation, disrupting economic growth.[257]

As long as the market disruption persists, oil prices will remain high and dominate international trade.

Opponents claim that divestment represents the politics of division and polarization. They assert that the need to reduce fossil fuel use is the wrong issue, at the wrong time, in the wrong place. They argue that more oil and gas production is necessary for economic stability and continued economic growth.

Yet the current business cycle demonstrates that the acceleration of profits, the so-called turnaround in the industry, is driven by military aggression and human slaughter. The typical tools to smooth out the bumpy cycles created by oil and gas markets—compromise, global agreements, and distribution strategies aimed at rebalancing supply and demand—are nowhere to be found.

2. Divestment and Environmental Social and Governance Policy

Oppose Divestment: *Divestment is just an environmental, social and governance (ESG) campaign pushing corporations to take positions that weaken profitability.*

Favor Divestment: *Divestment is justified, given the powerful force of climate change. ESG is a proper risk management tool, that is legally sound and consistent with long-term institutional fund interests.*

ESG policies have become a target of business and political interests. As the controversies have intensified the purpose of ESG has been distorted. The ESG

[257] S&P Global Ratings. Risks Accumulate as Conflict lingers, Credit Conditions of Emerging Markets, Q3 2022. June 28, 2022 (Proprietary). Also see: Reuters. World Bank official says war driven oil price hikes slash growth of big importers. March 9, 2022.

policy rubric covers a loose set of largely unrelated issues that requires companies to pay attention to issues that, if left unattended can cause liabilities for companies.

The ESG acronym is used in the glossary of the corporate world to cover varied environmental, social and governance issues. These issues do not appear immediately and directly on corporate balance sheets.

For example, a company with offshore oil drilling assets that cuts corners on employee safety and vessel maintenance might improve quarterly financial filings. It could also result in an oil spill that prompts regulators to enforce existing rules and levy significant fines or become the catalyst for public campaigns to tighten laws on oil spills. When this happens, the short-term solution has become a permanent tarnish on the brand, a decades-long liability and a source of industrywide negative branding.[258]

Or, another company might be doing business in a market that has a historic tolerance for prejudice and discrimination. The company, while reflecting some of the social mores of its market region, may run afoul of discrimination laws and become a poster child for discrimination, costing the company dollars, embarrassment and part of its customer base.[259]

The list of ESG issues is long and getting longer. Topics range from obscure ones like the rights of shareholders in a company to headline-grabbing issues like climate change, environmental safety, pharmaceutical pricing, tobacco and improper lobbying. All are finding their way into corporate boardrooms.

As the list has grown, opposition has mobilized from the business community. In some cases, the criticisms made by opponents of ESG are accurate. The issues raised are sometimes vague, goals at times are unclear and reforms may be costly to implement. Government regulation, taxation and other governmental tools may be better equipped to offer solutions. [260] In such circumstances, asking a company to address an issue may be unfair to its senior managers and board of directors.

Even where corporate complaints are valid, however, they do not discredit the fundamental issues involved or absolve a company or board member from taking action. When a person assumes a leadership position in any organization with economic and political importance, the position does not come with an established set of immutable issues; quite the opposite, since leadership is about handling challenges.

Climate change is similar to other ESG issues in that oil, gas and coal companies would rather ignore it. Almost all opponents of ESG fail to acknowledge that climate

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[258] National Geographic. Exxon Valdez changed the oil industry forever—but new threats emerge. March 22, 2019.
[259] N. Rane. Twenty years of shareholder proposals after *Cracker Barrel*: An effective tool for implementing LGBT employment protections. U. Penn. Law Rev. 162:930-977. 2014.
[260] For an ongoing discussion of the ESG, see: The Economist. Our latest coverage of climate change: Analysis of the science, politics and economics of the climate. Visited September 9, 2022. The July 23-29 issue of the magazine covers the ESG issue from several angles. The Economist. Special Report: ESG investing—A broken idea. July 23, 2022.

change must be taken seriously.[261] When shareholders form organized efforts with assets in the trillions, dismissive responses by corporate management are seen as arrogance. Bad faith has been evident, as well. Some fossil fuel companies have acted in a manner that treats the shareholder process with derision.[262]

But climate change differs substantially from most other ESG issues in three important ways:

- It is a problem that is growing rapidly in scope. The climate change issue is big, not vague. The impact of climate change on communities is increasing in intensity, geographic expansion, loss of life and destruction of property. Ignoring it or treating it with token gestures quickly unravels with the next significant climate event, wildfire, tornado, hurricane or tsunami.

- The scale of the problem is directly related to corporate conduct, particularly to the actions of the companies that own, extract, process, ship and sell fossil fuels—the high-carbon emitters. A company's contribution to global warming can principally be measured through emissions, although there are other methodologies that require resolution by government. The concern for a uniform system of emissions accounting and classification for companies that emit carbon is central to the management of such companies. The European Commission's work on taxonomy and circular economics, as well as the SEC and U.S. Department of Labor's efforts to establish regulatory oversight of carbon disclosures with fact-based disclosure rules, are two presently ongoing efforts to create uniform systems. There may be debates over policy direction, but rejecting these discussions out of hand as vague, without goals or based on political agendas is without merit.[263]

- Investors want to understand the issue better and discern how it is changing stock performance and company market behavior.[264] Credit agencies like Moody's and Standard and Poor's (despite their own history of being soundly criticized for actions during the 2007-09 financial crisis) are engaged in the climate issue because of the serious debt consequences

[261] One of the more recent examples of this is former Attorney General William Barr's support of anti-ESG state officials. Barr argues that because anti-ESG officials are speaking out that this constitutes a financial risk to those funds and companies that are responsive to ESG issues. To adopt this position, Barr must ignore climate change as a risk. By equating the efforts by state officials to punish those who consider ESG as a risk equivalent to the impact of wildfires, storms, agricultural destruction and faltering financial prospects of the fossil fuel sector, he has engaged in a form of wordplay that is bizarre. This argument, which has no foundation, merits some consideration as the raw power of elected state officials to act arbitrarily must ultimately be tested in the courts in the short term and at the ballot box in the long run. See: Wall Street Journal. ESG Can't Square With Fiduciary Duty. September 6, 2022.
[262] Ceres. New Exxon report is a step forward for investor disclosure on climate change, but falls short on detail. February 5, 2018.
[263] See: European Commission. Circular Economy Action Plan. Adopted March 2020. Also see: SEC. SEC Proposes Rules to Enhance and Standardize Climate-Related Discolsures for Investors. March 21, 2022.
[264] The Economist, *op. cit.*

involved.[265] If they miss the climate issue, as many of those opposed to divestment would have it, their credibility will be harmed forever.

The social issues involved expose divisive issues of global development, income inequality and mass migration, among other matters.

One need not accept the full menu of ESG offerings to reach a conclusion regarding the viability of divestment as a sound investment response to climate change. Investors in coal, and oil and gas companies face a unique situation. Fossil fuel companies were once generally accepted as engines of world economic growth. Today, each company in the industry stands alone, its financial condition and climate change strategy judged accordingly. Many of its lines of business are rapidly declining, and some uses will be reduced to zero over time.[266]

People from many communities where fossil fuel companies have historically been an economic mainstay face challenges. The situation is exacerbated by the unwillingness of political structures to adjust economic development policies and investments to address the effects of changing energy market forces.[267] Shifting investment to technologies and enterprises that have a viable future would be beneficial, especially if vulnerable communities are made priority targets for such resources.[268]

ESG issues have given rise to a well-worn tool kit of tactical options available to shareholders seeking redress. Central to the ESG process is communication between shareholders and management. The communication can be as informal as a phone call, or as complex and formal as sworn statements or depositions in administrative or judicial proceedings. As communication tools are deployed, a picture emerges of corporate responses to the issue. If successful, the ESG process results in a monitoring system to assess the quality of corporate follow-up.

Investors who assess the financial performance and risks associated with holding financial positions in oil and gas companies (having exhausted the engagement process) and conclude that divestment is proper have a time-tested mechanism to assist them with prudent management: the exclusion list. The rationale for exclusions is generally product- or behavior-based.[269] A proper exclusion list stresses high standards. Companies should know why the divestment took place, and those seeking reinvestment or developing new products and business lines need clear rules for obtaining reinvestment.

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[265] One such example: Moody's Investors Service. Explanatory Comment: New scores depict varied and largely credit negative impact of ESG factors. January 18, 2021.
[266] UBS. UBS Sustainability Report. 2021, p. 127.
[267] Policies and programs exist to assist communities that are being harmed by market forces that are depressing the economic support that fossil fuel businesses once provided. See: IEEFA. A Transition Plan for Communities Affected by the Closings of Navajo Generating Station and Kayenta Mine. June 6, 2017. Also see: IEEFA. A Choice in Upstate New York as NRG Closes Its Huntley Power Plant. September 22, 2015.
[268] See for one approach to transition investment facing communities where coal plants close. IEEFA. Transition plan communities affected closings Navajo Generating Station. June 1, 2017.
[269] See: Store Brand Funds. Conduct-based exclusions. Visited September 9, 2022.

The ESG toolkit has developed "exclusion lists" that identify companies for which engagement procedures have not been successful. These are lists of companies excluded from consideration for investments by funds based on specific objectionable business practices. These lists have been developed by most major funds that have decided to adopt some form of fossil fuel divestment.[270]

ESG issues have recently been the subject of overt politicization. Fossil fuel companies have enlisted state elected leaders to push back on climate change issues.[271] This has come in the form of state legislation designed to punish companies that have adopted policies that such legislation defines—typically using vague language—as "boycotting" energy companies. Under such legislation, political strategy replaces financial analysis as the motivating driver of industry business conduct.

These state-sponsored efforts seek to overturn long-held investment principles that see value creation as a long-term proposition that are shaped by and shape macroeconomic trends, and rest on sound constitutional and legal reasoning and ample precedent. A recent paper Martin Lipton, from Wachtell Lipton Rosen & Katz (WLRK), one of the world's leading corporate law firms, summarizes the position:

> "We continue to believe it is essential that boards operate under a governance model that permits consideration of ESG principles and sustainable investment strategies, with the support of investors and asset managers, to promote long-term corporate value and to fortify the enterprise against relevant risks. There should be no doubt that the law in Delaware and in every other U.S. jurisdiction empowers boards to follow this course for responsible corporate stewardship and corporate success."[272]

Much is at stake. The continued failure of corporations, political systems and interest groups to shift investment policies to address the market forces transforming the energy sectors' reliance on fossil fuels will only worsen political and societal divisions. Understanding these highly destructive forces at work strengthens the case for divestment. Despite the current level of conflict, the shareholder process—including divestment and reinvestment—stands as a far better mechanism to move the economy toward a profitable, sustainable energy transition than stilted and largely ineffective governmental investment programs.

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[270] See: Norges Bank Investment Management. Observation and exclusion of companies. Visited September 9, 2022.
[271] The New York Times. How Republicans are "weaponizing" public office against climate action. August 5, 2022.
[272] Martin Lipton. ESG, Stakeholder Governance, and the Duty of the Corporation. September 18, 2022.

3. State Anti-ESG Legislation and Divestment

Oppose Divestment: *Fossil fuel states are retaliating aggressively against banks and investment houses to punish them for taking actions to defend their loan and investment portfolios.*

Favor Divestment: *These actions are politically motivated, and devoid of a principled application of law and sound pension and procurement practice.*

Several state legislatures have passed or are considering bills that target financial actors seen as hostile to the fossil fuel industry.[273] The bills, laws and administrative implementation actions are part of a broad and coordinated attack on policies and organizations supporting solutions to climate change.[274] Texas, Arkansas, Louisiana, West Virginia, Oklahoma, Wyoming and Kansas each are considering, have adopted rules or laws, or are implementing policies that require state finance officials to divest or prohibit contracts with companies that the states identify as engaged in boycotting energy companies.[275]

The initiatives punish financial companies for using lending and investment criteria that purportedly harm the fossil fuel industry. A host of other rationales appear among these statutory efforts, including desires to bar companies that harm a state's economy, cause joblessness, or conduct business with Russia or with Chinese manufacturers or military operations. These are identified as valid reasons to support divestment or contract prohibitions.[276]

The boycott determinations are typically made by a state finance officer and reported to various public finance agencies (pension funds, treasurers, procurement officers) that are instructed to initiate a divestment or contract prohibition. For the purpose of understanding how these policies and state laws are operationalized, this report reviewed the West Virginia statute and subsequent follow-up actions by the West Virginia state treasurer.

[273] Politico. Climate investing boycott bills flood state capitals. February 15, 2022.
[274] New Republic. Conservatives have a new bogeyman: Critical energy theory. December 7, 2021.
[275] Politico, *op. cit.*
[276] See: Arkansas Democrat Gazette. Arkansas state treasurer yanks about $125M out of accounts managed by BlackRock. March 17, 2022.

How the West Virginia Statute Operates

West Virginia adopted legislation (S.B. 262) in 2022, requiring the treasurer to develop a target list of financial services companies that potentially are boycotting the "energy" sector, which the statute defines as the fossil fuel sector.[277] The treasurer is directed to notify companies that they are on a list and at risk of being denied the right to participate for banking service contracts. The treasurer must solicit the views of the targeted companies and review the responses and other publicly available data. The treasurer then makes final determinations whether the targeted financial services companies are excluding or restricting investments in energy companies solely because, in the treasurer's judgment, the energy companies are producers or transporters of fossil fuels.

Once the treasurer has determined that a targeted financial services entity is boycotting an energy company, the name of the offending company is placed on a list posted on the treasurer's website. The treasurer has authority to bar any such listed company from participating in bidding on contracts for "banking services" that fall within the statutory province of the treasurer.[278] The law exempts contracts with the West Virginia Investment Management Board.[279]

To date, West Virginia has issued exclusion notices to five companies: BlackRock, Goldman Sachs, JPMorgan Chase, Morgan Stanley and Wells Fargo.[280] The state treasurer is not required to provide any details regarding the determination that the companies were boycotting fossil fuel companies. The operational standards used to make these determinations are not articulated in the statute or in any subsequent implementation documents issued by the state treasurer. Also, the treasurer has made no clarifications that identify the contracts for banking services that are covered by the statute.

The statute raises a number of concerns that will complicate implementation and may expose the state to challenges, if not liabilities. A few examples of such concerns follow.

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[277] West Virginia Legislature. S.B. 262. Effective date: June 10, 2022. See definition in section 12-1C-1(a)(2).

[278] The state treasurer is empowered to act on behalf of the state generally in matters pertaining to cash management. See: West Virginia Law Chapter 12-1-7, Public Moneys and Securities.

[279] The West Virginia investment Management Board is charged with the responsibility of managing and investing state and local government assets. The board is responsible for the state's various employee retirement and benefit programs, local government cash accounts and some state government cash accounts. Neither the statute nor the websites of the state treasurer specify which contracts are covered by the statute. The top advisors are UBS Asset Management, Sterling Capital and Hermes Federated.

[280] West Virginia State Treasurer. Restricted Financial Institutions List. Visited September 9, 2022. Also see: West Virginia State Treasurer. Press Release: Treasurer Moore Publishes Restricted Financial Institution List. July 28, 2022.

The Statute Sets No Standards for Identifying Target Companies for Review or Evaluating the Identified Companies

The West Virginia treasurer is an elected official. Without clear standards, procedural protections and a transparent public process, actions under the statute are highly vulnerable to backdoor lobbying. Yet West Virginia's law sets no standards regarding how the treasurer should select target companies for notification that they are under suspicion of boycotting energy companies or how to evaluate the targeted companies.

The statute refers to harm done to the West Virginia economy by financial service companies boycotting energy companies, yet does not establish or require the treasurer to provide a link between financial service company actions and harm to West Virginia, its businesses or its economy. How, for example, would a bank or investment house placing a coal producer in India on an exclusion list harm the West Virginia economy? The statute also does not provide guidance on how to evaluate the degree of harm, or how to consider whether the financial services companies actually implemented boycott policies.[281]

The statute does not require the treasurer to record and publish the findings of the review and the substantive basis for the boycott determination.[282] For example, the treasurer's press release discloses that U.S. Bancorp was originally assumed to be a business that boycotts energy companies but was not included in the final list.[283] What were the conditions that were specific to U.S. Bancorp that removed it from the list? Such a record would be essential for any company on the list looking to improve its practices to be removed from the list, or to companies looking to do business with the state. Instead, the process leaves many unanswered questions.

The West Virginia Treasurer's Decision-making Appears to be Unjustified and Arbitrary

How the treasurer is to gauge a specific company's culpability is a serious question, and the treasurer's actions so far appear to show arbitrariness in the selection of companies.

- The treasurer initially targeted Morgan Stanley, JPMorgan Chase, BlackRock, Wells Fargo, Goldman Sachs and U.S. Bancorp. Yet thousands of banks and investment houses in the world have climate policies,[284] and most major banks have developed climate policies with regard to lending and other forms of investment in coal, oil and gas companies.[285] There is no publicly

[281] Capital Monitor. Banks still supporting fossil fuels to the tune of billions. April 5, 2022.
[282] The Texas statute, in contrast, provides for the filing of several reports that identify the rationale for an action.
[283] West Virginia State Treasurer, *op cit.*
[284] There are approximately 4,600 bank holding companies in the United States as of 2021. Wikipedia. List of largest banks in the United States. Visited September 9, 2022.
[285] IEEFA. Coal Divestment. Visited September 9, 2022.

available information that describes why six companies were originally targeted.

- The treasurer's process then resulted in only five companies being excluded. No publicly available information explains why the five companies met the definition of a company boycotting energy companies.

Substantial information indicates that the investment houses identified by the treasurer are not boycotting the energy sector as defined in the statute—coal, oil, gas or other companies that process, transport or use fossil fuels.[286] To the contrary, all the companies cited by the West Virginia treasurer have been criticized by organizations that monitor banking policy related to fossil fuels. The criticisms are based on the fact that the companies continue to lend substantial amounts to fossil fuel companies, and some of the loans are contrary to the loan programs adopted by the banks and investment houses to defend against climate risk.[287]

For example, BlackRock is on the West Virginia list as an offending party. Yet BlackRock is also the target of a worldwide campaign by climate activists precisely because its policies are unresponsive to the issue of climate change.[288] The statements of its chief executive, Lawrence Fink, have been clear that the company will continue to finance clients engaged in the extraction, processing and transporting of fossil fuels.[289] BlackRock has also advised clients to take certain steps to defend against climate risks. The company has not advocated divestment of fossil fuel companies generally.

Although all of the companies have established various net-zero goals that align their business strategies by 2050 or earlier,[290] none of the targeted companies have adopted policies that contain a wide-ranging policy to divest from fossil fuels (oil, gas and coal) or utilities that burn fossil fuels to create energy.

Rather, the companies have adopted modest programs that defend the financial condition of the banks and their investors from declining coal mining companies, financially strapped coal power plants and other bad investments. Some have limited investments in Arctic drilling and Canadian oil sands investments. But all of these decisions were made after several years of financial underperformance. For example, the actions in the Canadian oil sands came only after billions of dollars of share value were lost due to substantial market decline.[291]

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[286] The New York Times. Targeting 'woke capital'. July 29, 2022.
[287] Rainforest Action Network. Fossil Fuel Report Card 2022. May 30, 2022.
[288]EcoWatch. Climate activists criticize BlackRock CEO for supporting a slow green energy transition away from oil and gas. January 20, 2022.
[289] BlackRock. Larry Fink Letter to CEOs. January 2022.
[290] United Nations Environment Programme. Net-Zero Banking Alliance members. Visited September 9, 2022. Also see; Bloomberg. JP Morgan joins net-zero banking alliance with emissions pledge. October 8, 2021. Also see: Goldman Sachs. 2025 ESG and net-zero commitments. Visited September 9, 2022. Also see: BlackRock. BlackRock's 2030 net-zero statement. Visited September 9, 2022.
[291] Yale Climate Connections. Canada's oil stands industry is taking a big hit. March 5, 2021.

Concern for the overall financial health of the industry is justified. Consider:

- In 1980, energy sector stocks commanded 28 percent of the market. Today, they command 4.7 percent.[292]
- Before the Russian invasion of Ukraine, the energy industry hit a low of 2.3 percent of the market.
- For eight of the 10 years between 2012 and 2021, the energy sector lagged the market; in seven years it placed last or near last.[293]

These financial facts would be reason enough for any investor to inquire about the performances of companies in an industry that has lost so much share value.

Coal mining companies have been in decline for most of the last decade, with several going bankrupt more than once. Coal power plants are closing in the face of competition from natural gas and renewable energy; both alternatives produce electricity at substantially lower prices than coal power plants.[294]

Yet even in this context, the companies restrict rather than entirely rule out investments. For example:

- BlackRock prohibits lending to companies that derive more than 25% of revenue from coal activities.[295]
- Wells Fargo states it will only do business with coal companies under strict conditions.[296]
- Morgan Stanley will only finance new mines or coal-fired power generation by meeting strict enhanced diligence. Morgan Stanley is reducing its exposure to companies with more than 20% of revenue from coal.[297]
- Goldman Sachs will only allow new investment in coal mining and coal power generation under certain conditions requiring an enhanced diligence process.[298] The company has one of the more specific plans related to achieving a no-coal portfolio over time.[299]

[292] Fidelity. Sector Weightings and Recommendations. Last visited September 14, 2022.
[293] Novell Investor. Annual S&P Sector Performance. Last visited September 27, 2022.
[294] IEEFA. U.S. 2022 Power Sector Outlook: The renewable energy transition takes off. April 2022.
[295] S&P Market Intelligence. Investment giant BlackRock marks a major milestone in coal divestment movement. January 22, 2020.
[296] Wells Fargo. Environmental and Social Impact Management. 2022.
[297] Morgan Stanley. Environmental and Social Policy Statement. Updated March 2022.
[298] Goldman Sachs, Environmental Policy Framework. Updated December 2019.
[299] Rainbow Action Network. Goldman Sachs adopts strongest fossil finance policy by a major U.S. bank. December 15, 2019.

The financial companies' positions evidence a prudent risk management approach, not bias.

In this context, the fact that UBS is not included on the West Virginia list raises questions. UBS, a major financial advisor to the West Virginia pension systems,[300] and a services provider to the state's cash pool management,[301] has an aggressive climate change program.[302] Like the companies on the treasurer's exclusion list, UBS has a net-zero pledge by 2050. The net-zero pledge contains policies that increase UBS restrictions on coal. It tightens the revenue thresholds for coal mining and coal plant operators to less than 20% of revenue from these sources. UBS also has tightened its standard for global wealth management asset managers to 5%, portfolio-wide:[303]

> "Asset Management has applied an exclusion of companies that generate more than 20% of their revenues from thermal coal mining or oil sands extraction across all equity and fixed income strategies. We also apply an exclusion of companies with more than 20% of their revenues from thermal coal-based power generation across our sustainability focus and impact investing strategies. We believe that these companies will face the most significant climate-related financial risks in light of the low-carbon transition.
>
> "At the portfolio level, companies with more than 5% revenue exposure to thermal coal are excluded from sustainable investing single security portfolios managed by Global Wealth Management on a discretionary basis. Looking ahead, we are working to build more detailed carbon footprint data into our research and reporting toolkits."[304]

The net-zero commitment contains analytical statements. UBS has concluded that coal-fired power generation will be reduced to zero, worldwide.

> "According to the International Energy Agency, approximately 35% of global power generation today is coal fired. As the world transitions to a low-carbon economy, reliance on coal-fired power generation will reduce significantly, eventually to 0%. Risks embedded in this transition are found with clients that have a significant reliance on coal-fired power plants in their own asset portfolios."[305]

The company publishes an exclusion policy that provides the policy rationale for excluding coal mining and oil and gas companies, as well as coal-burning utilities.[306]

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[300] West Virginia Board of Treasury Investments. Respected Advisors. Visited September 9, 2022.
[301] S&P Global Ratings. Pool Profile: West Virginia Government Money Market Pool. March 25, 2021.
[302] UBS. Sustainability and Impact: Get all the facts. Visited September 9, 2022.
[303] UBS. UBS Climate Report 2021.
[304] *Ibid.*, p. 26.
[305] UBS. UBS Sustainability Report. 2021, p. 127.
[306] UBS. Sustainability Exclusion Policy. September 10, 2021.

In short, UBS has many of the same policies as those companies that were put on the boycott list. All have net-zero targets by 2050. JPMorgan Chase and BlackRock, for example, each have revenue cut-offs that are less restrictive than UBS. Texas Comptroller Hegar has labeled UBS a company that boycotts energy companies; UBS is West Virginia's principal advisor.[307]

The statutory basis for such disparate treatment of companies is not at all apparent.

Unclear Outcome and a Potentially Chilling Effect

The West Virginia statute declares that the treasurer's findings do not reflect on the reputation of the company, but this appears to be little more than wishful thinking. Placement on the exclusion list can send a message to other states that the company engages in questionable business practices. BlackRock, for example, has been targeted in several states.[308] The statute does not even clarify whether companies on the exclusion list are actually barred.[309] It states only that the treasurer may deny a company on the list an opportunity to participate in competitive bidding processes. Are such companies banned from all banking service contracts? This results in a lot of negative publicity for companies based on no clear decision-making standards and no clear outcome.

The divestment movement encourages banks, investment houses and investment funds to base divestment decisions on the size, type and corrective action climate programs of companies. The policy intervention ties the specific product and company behavior to specific investment decisions of a fund. Companies have an opportunity to obtain reinvestment. The divestment movement also presses for maximum transparency within proprietary bounds. The West Virginia statute, in contrast, provides no rational basis for targeting companies, no standards for determining if objectionable behavior has taken place, no process for making distinctions among companies based on objective measures, and no transparency.

The lack of standards and transparency in state laws like the West Virginia statute could have a chilling effect on the ability of financial services companies to make investment decisions based on sound financial judgment.

4. Anti-ESG Laws and Litigation Risk

Oppose Divestment: *The passage of several state laws has led 19 state attorneys general to argue that consideration of ESG constitutes a legal risk to investment portfolios and fund fiduciaries.*

Favor Divestment: *These arguments are without legal foundation and embrace power politics as a substitution for sound corporate governance and investment policy.*

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[307] Texas Comptroller. Financial Companies that Boycott Energy Companies. August 2022.
[308] The New York Times. Targeting 'woke capital'. July 29, 2022.
[309] The state maintains a list of debarred and suspended vendors but these companies are not currently on the list. West Virginia Purchasing Division. Debarred and Suspended Vendors. Visited September 27, 2022.

An op-ed by former U.S. Attorney General William Barr offers a poorly reasoned defense of efforts to stop finance professionals and fiduciaries from considering EGS factors, especially climate change, when making investment decisions.[310] His purpose is not to convince; it is to indoctrinate readers to the new way that political power will be used in modern society.

A commentary from Wachtell Lipton Rosen & Katz offers a strong, carefully reasoned institutional rejoinder to anti-ESG arguments.[311] WLRK's arguments, while compelling, miss the main strategy behind the efforts of Barr and his allies.

Barr and his allies are seeking a major power shift within the U.S. system of checks and balances. If successful, the current legal consensus on investment principles and fiduciary duty could be stood on its head. Climate change is only a stalking horse for Barr. His arguments will create further upheaval and chaos in energy markets.

Barr claims investment trustees and corporate board directors who take ESG principles into account when making investment decisions are contravening their obligations as fiduciaries. He contends, for example, that investment funds that hire advisors who take climate change into consideration when making investment choices are in legal breach of their fiduciary duties. He points to a statement by a group of 19 state attorneys general,[312] which he contends moves the argument from that of a policy dispute to that of a litigation risk.

Based on Barr's argument, a charitable trust, pension fund or university board that retains a fund advisor that considers ESG risks—including leading firms such as UBS, Federated Hermes, or BlackRock, for example—may subject the members of those boards to personal liability.

Barr's position lacks grounding in law and precedent.

The WLRK memo, in contrast, explains that consideration of ESG risks rests well within long-established legal principles of corporate fiduciary duties. WLRK points out that the short-term orientation espoused by ESG opponents rests on their notion that the sole purpose of a company is profit maximization. This view, WLRK explains, is too limited and is inconsistent with a long-term view of company value creation.

The purported consensus Barr and the 19 attorneys general claim actually lies outside the broader consensus bounded by existing statutes, case law and corporate practice. WLRK's memo concludes (referring to ESG consideration in the investment decision-making process): "There should be no doubt that the law in Delaware and

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[310] Wall Street Journal. ESG can't square with Fiduciary Duty: State attorneys general issue a strong warning to investment managers and retirement fund trustees. September 6, 2022.
[311] M. Lipton. ESG, stakeholder governance, and the duty of the corporation. Harvard Law School Forum on Corporate Governance. September 18, 2022.
[312] Arizona Attorney General Mark Brnovich, *et al*. Letter to Laurence D. Fink, CEO, BlackRock, Inc. August 4, 2022. Also see: Ken Paxton, Attorney General of Texas. AG Paxton Demands BlackRock Account for Its Underperforming, Potentially Illegal 'ESG' State Pension Fund Investments. August 8, 2022.

in every other U.S. jurisdiction empowers boards to follow this course for responsible corporate stewardship and corporate success."[313]

IEEFA makes the following observations on the two positions:

> **To accept Barr's anti-ESG logic one must deny climate risk is a financial risk. To deny that climate risk is a financial risk is a breach of fiduciary duty.**

The risk that Barr is talking about is the one that fiduciaries face because they are taking into account baseless factors like climate change in the investment decision-making process. The authentication of the risk for Barr is the statement by the attorneys general who presumably serve as the arbiter of what is and is not law within their respective states. To Barr, their warning transcends geography with "seismic implications."

Barr appears to believe almost all ESG issues are frivolous. His focus on BlackRock, ExxonMobil, PetroChina and oil make it clear that climate change is a prime example. One cannot make sense of Barr's argument unless one embraces his prior argument that denies the financial risks of climate change. Even though climate change is well-recognized as a financial risk, Barr rejects it.[314]

Barr's argument cites *Chao v. Merino,* which holds that a fiduciary who becomes aware of a risk is required to take steps to address the risk. He posits that the 19 attorneys general have alerted fiduciaries that they risk being sued for violating new state statutes. The new state statutes forbid the fiduciary from considering climate change as a factor in their investment decision making. If they fail to deny ESG policy and, for example, hire BlackRock— a perceived offender—to manage investment capital they may be charged and convicted.

WLRK, on the other hand, concludes that incorporating ESG considerations into investment strategies does not generate risk because statutes and case law indicate that courts will rule in favor of corporate decision-making that considers ESG principles. Climate risk is a financial risk to WLRK; as such, it is protected by the volume of precedent questioned by Barr. Any litigation, if brought, will fail when the issues are reviewed in a court.

Further to WLRK's point, a careful review of the actions trustees must take to respond to risk shows that failure to adopt ESG policies to reduce financial risk is unacceptable. A fiduciary must take "precautionary steps" once a risk becomes known. Adopting a "wait-and-see" approach is imprudent. A trustee must protect the fund from exposure to predictable adverse outcomes. In *Chao v. Merino*, the offending party had taken a chance that the risk would not materialize, but the risk did materialize, resulting in a finding of negligence and liability.

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[313] M. Lipton, *op. cit.*

[314] See: SEC. SEC proposes Rules to Enhance and Standardize Climate-Related Disclosures for Investors. March 21, 2022.

An investor looking to put money into fossil fuel companies is now stepping into a dilemma wrapped in a quagmire.

Barr's claim that ESG funds underperform financially is not supported by his examples.

Based on a *Harvard Business Review* article,[315] Barr states that ESG investments do not show superior performance. The Harvard article relied on an academic study published in the *Journal of Finance* that looked at investor responses to sustainability ratings.[316] Its treatment of financial performance was a secondary consideration to the research, and a matter for which the authors warn more research is required. The second study cited by Barr addressed whether ESG funds actually selected companies with good ESG track records. Returns were once again a secondary consideration.[317] Each study lacked a definitive conclusion with regard to ESG fund financial performance. Barr fails to mention that other treatments of the issue published in the *Harvard Business Review* article show positive correlations between ESG and financial performance.[318]

Recently, two prominent economists analyzed whether anti-ESG laws like the ones Barr is defending lost money. They found the Texas law cost taxpayers hundreds of millions of dollars.[319] The economists cited nine articles that positively correlated returns and ESG ratings, a fact Barr neglected to mention.

Further, Barr attacks ESG generally while ignoring evidence of positive results of fossil fuel divestment. Reviews of institutional fund portfolios that look at divestments of fossil fuels tend to show positive or neutral results.[320] A recent review published by a California fund of its divestment track record showed that overall, the fund lost money on tobacco divestments—but made money on its other ESG-related divestments, including on coal divestment.[321] Similarly, MSCI published data showing that over an 11-year period, a fossil fuel-free, broad market portfolio outperformed traditional portfolios.[322]

The ESG debate is not about free market—it's about power.

In one important respect, WLRK misses the mark. WLRK's commentary provides an erudite treatment of distinguished scholarship on both sides of the legal thicket involved with ESG issues. Barr's editorial, rather than being grounded in an intellectual tradition, appears to be based on the raw power on display when a bevy

[315] Harvard Business Review. An inconvenient truth about ESG investing. March 31, 2022.
[316] S, Hartzmark and A. Sussman. Do investors value sustainability? A natural experiment examining ranking and fund flows. *Journal of Finance*. 74(6):2789-2837. 2019.
[317] A Raghunandan and S. Rajgopal. Do ESG funds make stakeholder-friendly investments? *Review of Accounting Studies*. 27:822-863. 2022.
[318] Harvard Business Review. Yes, investing in ESG pays off. April 13, 2022.
[319] D. Garrett and I. Ivanov. Gas, guns, and governments: Financial costs of anti-ESG policies. July 11, 2022.
[320] IEEFA. Major investment advisors BlackRock and Meketa provide a fiduciary path through the energy transition. March 22, 2021.
[321] CalPERS. Five-Year Divestment Review, Attachment 1. March 2021, p. 4.
[322] MSCI. MSCI ACWI ex Fossil Fuels Index (USD) Index Factsheet. August 2022.

of attorneys general gangs up to tell a money manager or corporation the risks they can or cannot consider when making an investment decision and warn of dire liability consequences should they run afoul of anti-ESG state statutes.[323] That is quite an intrusive use of government power[324]—one that free market public intellectuals would likely have criticized.

WLRK cites Chicago economist Milton Friedman's work as the intellectual basis for opposition to ESG. Friedman's writings articulated a view that companies had only one purpose—to make money. Wachtell Liddell shows how the position has been reshaped overtime both practically and intellectually, citing landmark studies by Adolf Berle,[325] the World Economic Forum and the Business Roundtable. The WLRK analysis presumes the debate is about markets and capitalism. JPMorgan Chase CEO Jamie Dimon, who leads the world's largest bank (by market capitalization), and others have pointed out the same flaws in the anti-ESG rationale identified by WLRK.[326]

Wachtell Liddell errs in assuming that the exchange is only a debate over meritorious ideas about free market capitalism. WLRK would have us believe that these exchanges are part of a rational process designed to order the body of facts required for civil discourse. It is not. For Barr and his allies, the issue is about the seizure and use of political power by 19 attorneys general who have set out to punish adversaries. Barr's assumption is that a group of attorneys general are willing to take legal action on this issue through the court system, presumably up to the Supreme Court, to stop investors from considering the financial risks related to climate change. He is no doubt cognizant of the efforts of the last several years to pack the court with judges beholden to the partisan leaders who appoint them. Wachtell Liddell's formulation—however well founded as jurisprudence—is less relevant if the goal is systematic nullification of time-tested precedent.

The principles cited by WLRK in support of ESG policies are only relevant if the courts adhere to the strictures set out in existing law. If a group of attorneys general contests these foundational principles and finds support from a pliable judiciary, the end result could very well be a systematic nullification of fundamental investment principles. A major power shift within the U.S. system of checks and balances could occur and, with it, the current legal consensus on investment principles and fiduciary duty could be stood on its head.

That the oil and gas sector has become the battlefield for this fight adds a level of instability to the industry that it can ill-afford, given the already mounting constellation of risks it faces. For investors seeking a steady, stable source of profits,

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[323] A recent review of Claremont, a nonprofit think tank, identifies a trend in certain intellectual circles where the principal goal is to undermine republic-based political institutions and target existing constitutional constructs for deconstruction. New York Times. How the Claremont Institute became a nerve center for the American right. September 9, 2022.
[324] Bloomberg. Republicans don't appear to understand climate change, capitalism.. September 6, 2022.
[325] See: Adolf Berle, The Modern Corporation and Private Property, Routledge, Taylor and Francis Group, London and New York 1991.
[326] Financial Times. Stakeholder capitalism is 'not woke,' says JPMorgan's Jamie Dimon. June 1, 2022.

this route is fraught. The ESG venue, for all of its complications and contradictions, provides a way to order difficult societal questions like climate change risk when it finds its way to corporate boardrooms. Profits in the oil and gas sector today are driven by price spikes caused by the invasion of Ukraine. Barr's argument, though far more subtle and benign, nevertheless repudiates basic principles of governance.

5. Divestment and Alienation of Stakeholders

Oppose Divestment: *Divestment will alienate key stakeholders like faculty alumni.*

Favor Divestment: *No evidence exists that alumni have reduced contributions, and the issue raises important ethical issues about the role of the university in an era of the energy transition.*

The issue of divestment and climate change is a political issue, in the best and worse sense of the term. In its positive form, politics is the art of governance, the aspect of the decision-making structure that provides for compromise and non-violent resolution of conflict. In its worst form, politics tends toward the subjugation of one group or another by various forms of dubious or illegitimate manipulation and coercion including violence.

A fund's decision to no longer invest in fossil fuels could be deemed unfair punishment of a company that is providing a needed product or service. A fund's decision to divest may withhold needed investment capital from a company involved in a legitimate business. Divestment opponents argue such an action could alienate key stakeholders who are needed to find solutions to pressing problems like climate change. A 2016 report commissioned by Dartmouth, for example, opined:

> "[T]here are a number of prominent Dartmouth alumni who are leaders in the oil and gas industry who may be affronted by a decision by Dartmouth to divest from the companies with which they are associated. It is possible that this could lead to withholding potentially sizable gifts to the College."[327]

Other times, the stakeholders of concern are fossil fuel companies themselves. In rejecting a faculty motion in favor of divestment, for example, Harvard President Lawrence Bacow wrote that "we cannot risk alienating and demonizing possible partners" in the fossil fuel sector.[328]

Such concerns, however, have largely failed to materialize. Many prominent institutions that have divested—including Oxford, the University of California system, and (as of fall 2022) Dartmouth and Harvard—have continued to engage in leading academic scholarship while raising massive sums of money from alumni.

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[327] Dartmouth Alumni for Climate Action. Report to the President on the Considerations Involved in Divesting the Dartmouth College Endowment from Directly Held Fossil-Fuel Related Assets. April 2016.
[328] Harvard. A message from President Bacow on climate change. April 21, 2020.

Aside from the practical issues involved, these issues raise critical ethical issues for the university community. Should donors expect they can direct research or classroom content based on their contributions? Should universities accept donations that are conditioned upon donor veto rights over certain academic projects? Like many issues raised by climate change, the questions delve deeply into the current order of the global economy and its fundamental organizing principles.

Investors, faculty, administration and board trustees should consider the possibility that failure to divest may pose a bigger source of alienation to key stakeholders. For example:

- Former United Nations climate chief Christiana Figueres has called on celebrities to decline honorary degrees from universities that fail to divest;
- Alumni at several universities have pledged to withhold donations until divestment; and
- Peer-reviewed research has concluded institutions that divest tend to enjoy higher reputational standings compared to those who do not.[329]

The divestment issue can be divisive. It is not inherently divisive. Obtaining a more sustainable energy model for the world is a question of the alignment and realignment of power blocs, and divestment is a defensive financial tool to protect portfolio value. It seems ill-advised for individual funds that must protect themselves in this environment to restrict their choice of investment strategies.

6. Government as the Proper Venue for Climate-related Issues.

Oppose Divestment: *Government is the proper venue for climate change policy. Boardrooms are the wrong place to raise the issue.*

Favor Divestment: *Government has not met the challenge leaving it to boards, companies and the stakeholder communities they encompass to generate solutions.*

This paper attempts to address the divestment issue from a global lens. The political dynamic taking place in the United States plays a critical role. While some argue the proper venue for demanding corporate action on climate is in statehouses and Washington, D.C., relying on taxation, law and regulation,[330] the U.S. fossil fuel industries have taken a largely anti-regulatory position on environmental and climate policy.

The industry's position on environmental and climate regulation is extraordinary. It has proven to be counterproductive to the industry's interests on fundamental

[329] The Chronicle of Higher Education. We won't speak at your commencement—and hope no one else will either. April 12, 2019. Also see: Divest Princeton. No donations until divestment. Visited September 10, 2022. Also see: Cambridge University Press. Mutual reinforcement of academic reputation and fossil fuel divestment. 2021.
[330] See: Yale Environment 360. Divestment is no substitute for real action on climate change. March 20, 2014.

issues. Regulatory opposition is so persistent that the coal industry, for example, opposed Clean Air Act amendments in the 1970s that supported new air pollution technology. The new technology ultimately bailed out coal mining in the Midwest.[331] This contributed to a broad industry expansion that grew the industry from annual U.S. production in the 1960s of 400 million tons to more than 1.1 billion by 2007.[332] In another example, the oil and gas industry successfully opposed climate legislation in 2010, arguing it would be detrimental to the industry's health.[333] The resulting 10 years witnessed one of the longest periods of financial decline in the industry's history.

Government policies also tend to shift based on the election cycle, and the climate issue represents one of the most telling examples of how inconsistent and ineffectual the federal government can be. Former President Obama actively worked to make the U.S. an international supporter of climate change action. When he left office, former President Trump canceled the United States commitments. The latest round of climate talks and new legislation in Washington represent progress but can be unraveled after the next election.[334]

Investors cannot afford to think in four-year cycles. They must look at the long-term trends and impacts. From 2010 to the pandemic, the industry struggled. The industry lagged the market eight times from 2010 through 2020, finishing in last place five times.[335] Even during the four-year Trump administration, when support for the fossil fuel sector was at its zenith, the coal industry declined, and the oil and gas industry struggled.

The divestment movement does not eschew actions directed at the federal and state government. Rather, it prudently shifts its emphasis from the federal government to corporate boards. Fossil fuel companies are facing strong challenges from the energy transition. Investment decisions will have to be made. Public input through various forms of investor actions, including divestment, is directed at the source of capital.

A consensus appears to be emerging that the U.S. government will support energy transition policies once the private sector has arrived at a profitable business model that supports sustainable growth. Although some countries are trying to develop the contours of an economic plan with sustainability at the center, the United States is not. Divestment proponents are in corporate boardrooms and on Wall Street because that is where major decisions about capital allocation are made—and those decisions will drive climate policy and the actual energy transition.

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[331] Reuters. Coal makes a comeback in Illinois Basin in U.S.. May 11, 2012. Power Engineering. Scrubber myths and realities. January 1, 1995. Also see: Pew Trust. Industry Opposition to Regulation. March 2011.
[332] United States Energy Information Administration, Annual Energy Review, Table 7.2 Coal Production, 2011.
[333] Grist. Oil companies and special interests spend millions to oppose climate change legislation. September 2010.
[334] White House, Inflation Reduction Act, White House Climate Task Force, January 2022.
[335] Novel Investor. Annual S&P Sector Performance. Last visited September 14, 2022.

B. Solutions

1. Superior Solutions to Divestment

Oppose Divestment: *There are better solutions to climate change than divestment.*

Favor Divestment: *Divestment as an action option increases the likelihood that shareholders will be effective.*

One body of arguments opposing divestment comes from people who see other paths being more productive. Many investors argue that the shareholder tools of engagement with fossil fuel companies is more productive than simply divesting, or that society should simply have confidence that the fossil fuel companies are already pursuing climate transition plans and allow them time to implement these plans. Beyond any individual company, the argument goes, the climate issue is better served if the movement concentrates on positive solutions, enabling the good and letting the bad effectively wither on the vine.

These arguments against divestment represent a shift from people who have historically not supported a climate change agenda. They are qualitatively different because they acknowledge that climate risk is a financial risk. Nevertheless, the arguments fall short.

2. Corporate Engagement and Divestment

Oppose Divestment: *Engagement with fossil fuel companies and working with them to implement climate solutions represents a more fruitful path than divestment.*

Favor Divestment: *Fossil fuel companies have proven to be particularly resistant to shareholder engagement. Divestment is a potent and responsible step in the face of historic recalcitrance.*

Many investors who see climate change as a problem argue that the best path is to work with fossil fuel companies to implement solutions. The argument is particularly attractive to long-term institutional investors who typically take a broad look at economic change and its impact on portfolio value. Their argument, however, creates a false dichotomy between engagement and divestment.

Shareholder options exist on a continuum. This allows actions to vary based on specific circumstances. Investors are better served by more strategic options. Shareholders who rule out divestment from their strategy only tie their own hands, weakening the efficacy of their overall suite of options and reducing the seriousness with which their demands will be considered. The question is not one of divestment versus engagement, but the form of shareholder action most likely to protect the value of the portfolio.

Investors who seek to use their institutional power to influence a company have a range of tools at their disposal. At the most basic level, they can raise concerns with a company's management and directors through meetings, calls and letters. If the

responses are unsatisfactory, investors can use their voting power as shareholders in certain ways:

- At annual meetings, investors can vote against executive compensation packages or against the election of certain directors.
- Shareholders can also propose or support climate change resolutions at a company's annual meeting. A majority vote of shareholders at an annual board meeting is a significant event for management and usually engenders formal follow-ups in the form of reports or consideration of policy changes.[336]

Although many prefer not to do so, investors can also use the courts. They can initiate derivative action against management or commence class-action litigation to recoup losses.[337]

Where engagement tools fall short, investors can divest their shares of a company. Divestment protects a portfolio from the risk associated with an intransigent company or industry.

Figure 9: Continuum of Shareholder Actions

Source: IEEFA.

Properly understood, divestment is a component of a broader engagement toolkit. To preclude this step from the outset is to weaken an investor's ability to manage risk and protect share value.

The evidence to date suggests that for investors to defend against risk and make change in the context of fossil fuels and climate, divestment needs to be on the table. Shareholder engagement alone can be effective for certain types of issues, but climate change does not rank among them. The difference lies in the extent that the issue touches on the company's business model, as opposed to its business operations.

Deliberative forms of shareholder engagement have been successful in matters of workplace equity, labor practices, corporate governance and even emissions

[336] As You Sow. Unlocking the Power of the Proxy, July 2004. See Chapter Two for a discussion of the implications of significant shareholder votes on company resolutions.
[337] Lexicology. Shareholder Activist Strategies in USA. Last visited September 14, 2022.

reduction for non-fossil fuel producing companies.[338] Constructive agreements have generally been reached on matters of operational business strategy. In matters of operational business strategy, the interests of shareholders and companies can be brought into alignment through engagement. Shareholders are given an opportunity to lay out reforms to practices that are in line with the company's broader goals, and companies are given time to assess and become comfortable with proposed changes.

Such tactics are far less effective, however, when it comes to issues of the fundamental business model.

When investors demand the disruption or elimination of a company's basic core business and a shift of capital allocation and corporate priorities to new areas, there is less immediate incentive for companies to cooperate. The fossil fuel industry is an example of the second category. The outsized climate risk facing fossil fuel companies arises from the fact that their corporate operations rely on selling a product at levels and in a form that is incompatible with the long-term interests of investors and society. Remedying this problem will require a realignment of the industry's business model that must be done rapidly. When achieving the goal of concerned investor demands—not the rearrangement of tangential corporate operations, but rather transformative change—pushback is not surprising.

Shareholder engagement to seek emissions reductions and speed the energy transition can be an effective tool to combat climate change.[339] This is especially true for any company that can achieve financial savings from reduced reliance on fossil fuels.

Fossil fuel industry leaders have repeatedly spurned good-faith efforts to manage the issues.[340] After years of efforts to persuade the ExxonMobil board to address climate change issues, stockholders in 2021 elected several directors from a climate-focused slate.[341] The vote, which added a number of new board members, was hailed as a victory for shareholder engagement—but the new board has so far acted much the same as the old.[342] The bottom line is that despite years of boardroom lobbying and proxy votes, no fossil fuel producer analyzed by the

[338] An effective leading shareholder advocacy organization in the United States, As You Sow, offers interactive tools for shareholders that covers the history of shareholder resolutions, current proposed resolutions and status and various studies to assess shareholder responses to proxy resolutions. As You Sow. Shareholder advocacy. Visited September 10, 2022.
[339] Climate Action 100+. 2021 Year in Review: A Progress Update. January 2022.
[340] These efforts accelerated in the wake of the Exxon Valdez oil spill. In 1990, some New York City pension funds and their lead administrator, New York City Comptroller Elizabeth Holtzman, asked shareholders to support resolutions at Exxon to reduce emissions, create an environmental affairs committee and adopt the Valdez Principles. The shareholders rejected the proposal. The Valdez Principles were later transformed into the CERES principles and launched the CERES organization. CERES is a leading voice on sustainable investment worldwide. See, Ceres. About us. Visited September 10, 2022.
[341] New York Times Magazine. The little hedge fund taking down big oil. June 23, 2021.
[342] IEEFA. Months after tumultuous ExxonMobil annual meeting, no substantial change expected. August 6, 2021.

shareholder engagement collective Climate Action 100+ is fully aligned with the goals of the Paris Agreement.[343]

Many institutional investors who devoted extensive time and energy in negotiations with fossil fuel companies have concluded that divestment is necessary:

- When Rockefeller family philanthropies divested from fossil fuels in 2014,[344] they did so after first trying and failing to persuade the companies to take more affirmative climate action.[345]

- In 2021, the New York State Common Retirement Fund, which had for years engaged with fossil fuel companies, turned to divestment in what State Comptroller Tom DiNapoli termed the "disappointing, frustrating" response of companies like ExxonMobil to investor engagement efforts.[346]

- Dutch pension giant ABP made a similar call that same year, declaring that "we [are parting] with our investments in fossil fuel producers because we see insufficient opportunity for us as a shareholder to push for the necessary significant acceleration of the energy transition at these companies."[347]

Neglecting to consider divestment after the engagement process has proven futile fails to defend the portfolio from investment risk related to climate change.

Divestment is a cautious, step-by-step process. Deliberation on the question of divestment consists of a clear set of institutional actions that include the following:

1. Passage of fund resolutions or other executive actions that establish the intention of a fund to divest its fossil fuel holdings;

2. Engagement of investment professionals under contract with a fund to design a set of investment strategies (a divestment plan) that divests a fund of its fossil fuel holdings by a certain date and does so in a manner that allows the fund to continue to meet its investment targets;

3. Full consideration of the plan as evidenced by one or a series of board committee and full board meetings; and

4. A vote on all or part of the divestment plan, including a vote that could table the plan for future deliberations.

The existence of the divestment plan and the potential or actual implementation of part or all of it significantly increases the leverage of any fund approaching a

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[343] Climate Action 100+. Who's involved: Companies. Visited September 10, 2022.
[344] The Guardian. Heirs to Rockefeller oil fortune divest from fossil fuels over climate change. September 22, 2014.
[345] The Guardian. Rockefeller family tried and failed to get ExxonMobil to accept climate change. March 25, 2015.
[346] The New York Times. New York's $226 billion pension fund is dropping fossil fuel stocks. December 9, 2020. Updated August 11, 2021.
[347] Reuters. Dutch pension giant spurns fossil fuels as funds shift before COP26. October 26, 2021.

company regarding climate change. Conversely, lack of institutional seriousness is evident to any company that precludes divestment from its action plan. If divestment is taken off the table, the responses from oil and gas companies to active shareholders are likely to remain weak and ineffective—because the shareholders essentially have no place to go in the negotiation process.

Full or partial divestment of fossil fuel assets from a portfolio has been approved by hundreds of boards. It has met both procedural and substantive considerations. Some of the studies that contain fiduciary and investment analyses prepared for board consideration have been made available to the public; most have not.[348]

Finally, divestment opens the door to a new set of positive policy actions. Divestment does not end with selling a stock. Funds can be redirected to profitable yet sustainable investments. The opportunity for reinvestment by a fund that has divested can also be a force for change as corporate policies are adjusted.

Investors should maintain the full suite of tools to influence companies—ranging from simple communication to divestment. This means a willingness to engage where it is likely to push a company towards climate action. And it means a willingness to evaluate where engagement alone is unlikely to be effective, as with the fossil fuel industry.

Other investors argue that working with the companies is a more effective strategy. Here, the anti-divestment argument is that oil and gas companies have gotten the message and must be given time and patience to change. According to this argument, shareholders should not divest. They need only to voice their concerns and to support people within companies who are working for positive change. Proponents of this theory urge that the world's governments, organizations, and private oil and gas companies work together to find solutions. They argue that making it harder for oil and gas companies to obtain capital (public and private) will hinder the ability of the companies to maintain robust research and development programs.[349]

All major companies have adopted transition emission goals.[350] For the most part, technological progress that advances alternatives to fossil fuels has advanced. Investment strategies must take the technology from its current state of commercialization and move to the next step that supports greater market penetration. For example, technological systems in the power sector designed and run with 100 percent renewable energy are within conceptual reach, but face a series of tough obstacles.[351] Electric vehicle market penetration is to the point where ExxonMobil has acknowledged internal combustion engines aren't likely to

[348] IEEFA. BlackRock Investment and Fiduciary Analysis for Potential Fossil Fuel Divestment. March 2021.
[349] Michael Leibreich, former CEO of Bloomberg New Energy Futures, provides an ongoing discussion of issues related to innovation, finance and government that is timely and insightful. See: Liebreich Associates. Writing. Visited September 10, 2022.
[350] A global emission goals tracker prepared by IHS Markit (proprietary) contains emission strategies for 98 companies.
[351] See Liebrich Associates. BNEF: The Quest for Resilience—What Could Possibly Go Wrong. March 1, 2022.

be sold in another 20 years.[352] The aggressive push behind Europe's ongoing policy discourse on circularity is driven by a vision of substantial reduction—if not elimination—of fossil fuels in the petrochemical space.[353]

Nevertheless, most progress in addressing climate change has been achieved only in the face of active opposition from the same companies. A look at industry leader ExxonMobil provides abundant reason for concern that the needed partnership is unlikely to materialize.[354]

- ExxonMobil's shareholders voted in a slate of new board members over management's objections in 2021.[355] The new board members represented a new climate change-oriented influence. Within a month, ExxonMobil announced stepped-up drilling in Guyana, and CEO Woods said he expected no major changes.[356]

- Despite statements that the company will be increasing its low-carbon investments during the first six months of 2022, 79 percent of ExxonMobil's capital expenditures have gone for upstream drilling.[357]

Other than performance shortcomings in each of these areas and the problems with carbon capture and storage, it is clear the industry has no uniform and reliable system of carbon accounting and reporting.[358] This shortcoming has been identified by both opponents and proponents of divestment. Several different systems are being discussed but no consensus exists. The absence of such an accounting approach increases the risk of any investor with fossil fuel holdings.

Some fossil fuel companies have taken more steps toward the energy transition than most members of their industrial sector, which is a positive development. Even these market leaders, however, aren't moving fast enough. BP, for example, leads many of its competitors in renewables capex spending. Yet in 2021, the vast majority of its capital expenditures were still spent on fossil fuels, and it engaged in exploration efforts incompatible with the IEA's net-zero pathway.[359] It also remains a member of trade groups actively lobbying against renewable energy and environmental protection regulations.[360]

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[352] CNBC. ExxonMobil at the crossroads: Every new passenger car sold in the world will be electric by 2040, says Exxon Mobil CEO Darren Woods. June 25, 2022.
[353] European Commission. EU Taxonomy for sustainable activities. Visited September 10, 2022.
[354] The historical efforts by ExxonMobil to deny and oppose progress on climate change have been well documented. See Inside Climate News. Exxon: The road not taken. A multi-part series of investigative articles from September 15 through December 22, 2015.
[355] IEEFA. Months after tumultuous ExxonMobil annual meeting, no substantial change expected. August 6, 2021.
[356] *Ibid.*
[357] ExxonMobil. 2Q 2022 earnings overview. July 29, 2022. See Capital and Exploration Expenditures.
[358] Allison Herren Lee, SEC Commissioner. Playing the long game: The intersection of climate change risk and financial regulation. November 5, 2020.
[359] BP. Update on strategic progress. February 8, 2022.
[360] Offshore Engineer. PB to remain API member after climate stance shift. May 10, 2021. Also see: The Guardian. How a powerful US lobby group helps big oil block climate action. July 19, 2021.

The energy transition requires fossil fuel producers to expedite decarbonization investments even as they manage existing fossil fuel reserves and portfolios of assets. Determining whether or not a fair balance exists between the two efforts for any given company requires a level of investor analysis that is time- and cost-prohibitive. Industry leaders have provided ample reason to treat fossil fuel company claims of progress toward climate change with a high degree of skepticism.

Investment funds are confronted with a dilemma of trying to assess the claims of many companies about their progress on climate change initiatives. The financial rationale for fossil fuels is at best uncertain, efforts to address climate change are evolving, and competitors in various businesses have taken market share from fossil fuels. For many years, oil and gas companies were steady, stable, blue-chip stocks with limited competition. This is no longer the case.

The financial case for divestment is principally a defensive one—and the reasons to be defensive are substantial. Divestment strategies adopted by most funds allow for re-investment in companies that adopt credible programs with measurable outcomes. The history of fossil fuel companies has too many announcements that have never been brought to fruition.

3. Divestment and Net-Zero Portfolio Pledges

Oppose Divestment: *Many investors have adopted net zero portfolio pledges that demonstrate a clear program with targets to achieve investment goals consistent with emissions reduction standards.*

Favor Divestment: *Net-zero portfolio pledges are not an acceptable alternative to divestment. Few net-zero pledges contain divestment provisions and it strains credulity that net zero emissions can be achieved without substantial reductions in the amounts of fossil fuels in investment portfolios.*

Faced with divestment calls, many investors have proposed net-zero pledges instead. A more prudent and pragmatic approach is to include divestment as one aspect of a broader net-zero strategy.

If designed effectively, a net-zero portfolio pledge can be a worthy goal. Fossil fuel use is currently integral to the economy, so it will take multiple strategies over time for investment funds and companies to reduce their dependence. Net-zero targets, depending on the funds or companies involved, rely on a series of mitigation actions (emission reductions or efficiency steps), investment redirection and carbon-trading activities. Large-scale commitments by institutional investors to reducing the footprint of their holdings, such as the Climate Action 100+ initiative, send a signal to companies about the direction of global markets in the coming decades.

It is unrealistic to expect that a meaningful net-zero portfolio can be accomplished while retaining significant fossil fuel holdings. Fossil fuel companies, as discussed above, are uniquely misaligned when it comes to the energy transition. The sector has vested interests in delaying the shift to a net-zero economy, and is actively

placing bets on sustained carbon extraction long into the future. For such commitments to be credible, divestment must be on the table. Many investor institutions have paired their divestment commitments with broader net-zero pledges, precisely because the former complements the latter.[361]

4. Economy-Wide Change and Divestment

Oppose Divestment: *Divestment improperly singles out fossil fuel companies when the problem is economywide.*

Favor Divestment: *Divestment is a strategy that works in tandem with other efforts to address the broader global and economy-wide problems of climate change.*

Climate risk is systemic. Some assert it is unfair to employ a strategy that singles out a specific industry when action is needed on an economy-wide basis.

One 2013 editorial published in Institutional Investor, for example, acknowledges the deleterious impact that fossil fuels have on the climate and environment, but asserts that fossil fuels "are deeply woven into the economic fabric and global infrastructure."[362] The writers observe that fossil fuel use has been a mainstay of economic growth for decades and has created the material basis for social order, scientific advancement and cultural development.

The idea that the solution to climate change is to abandon ties with fossil fuels is unsatisfying to the authors because of the intimate role fossil fuels play in society. Individually, we all currently benefit from the use of fossil fuels in our world. Every institution is connected in intricate ways to fossil fuels, as well as the goods and wealth they have produced.

The authors of the Institutional Investor editorial ask: How does one extract oneself from or change a system that provides substantial material comforts in a manner over which the beneficiary had no input but where continued unquestioned participation poses risks to the future well-being of others, if not also to oneself?[363]

It is a thoughtful question, but the commentary lacks an understanding of innovation and how it takes place. The commentary also lacks a robust discussion of the rapidly advancing energy alternatives that already are meeting a large portion of new energy demand or the growing initiatives to reduce and more efficiently manage energy demand and curb plastic waste. The writers insist that no "similarly affordable, readily available" renewable alternatives with associated infrastructure exist to replace them today.[364] Yet even when the 2013 article was published, substantial advancements had been made in renewable energy and energy efficiency measures. Today, renewable energy accounts for 24 percent of U.S. utility-

[361] See: University of Cambridge. Cambridge to Divest From Fossil Fuels With Net Zero Plan. October 1, 2020.
[362] Institutional Investor. Why endowments should resist fossil fuel divestments. September 17, 2013.
[363] *Ibid.*
[364] *Ibid*.

scale electricity generation—up from 21% in 2021—and the EIA declares, "Renewables are the fastest-growing electricity generation source in the United States."[365] In light of these facts, the argument does not stand up that investors should continue to support fossil fuel expansion because the social order depends on it.

Divestment efforts go hand-in-hand with proactive policies to achieve sustainable energy practices. Continued investments in fossil fuels will crowd out new investment in other alternatives.

5. Divest and Supply and Demand Impacts

Oppose Divestment: *Divestment is aimed at supply side solutions when the central problem is the public demand for fossil fuels.*

Favor Divestment: *The divestment campaign is not aimed only at the supply side of the issue—it is actually a divest-invest effort to transform both supply and demand.*

Opponents argue divestment is misguided because it only addresses fossil fuel supply. Instead of being distracted by divestment, investors should use their influence to address demand for fossil fuels.[366] The supply/demand criticism, however, is based on a series of false assumptions.

These arguments would be compelling if they accurately reflected the focus of the divestment effort, but they do not. The divestment movement is an integral component of the climate movement, which addresses both supply and demand side dimensions of the problem. The central focus of the divestment movement is a divest-invest program of action. It is a defensive move to protect investment portfolios from the short- and-long term value destruction facing oil, gas and coal companies—but also a proactive tool to promote positive energy transition investment.

The climate movement utilizes divestment as a supply-side tool that diminishes capital flow to companies in combination with several other policy tools. Divestment is a defensive financial technique. Most notably, the climate movement has successfully used a combination of environmental and financial analysis to demonstrate significant weaknesses facing new fossil fuel infrastructure projects. For example, careful scrutiny of traditional assumptions about market demand resulted in the rejection of the Northeast Enhancement Supply pipeline in New York.[367] Moody's and Standard and Poor's have each concluded that many fossil fuel

[365] Energy Information Administration. In the first half of 2022, 24% of U.S. electricity generation came from renewable sources. September 9, 2022.
[366] Boston Globe. Harvard endowment is on the path to net-zero greenhouse gas emissions—While the calls for divestment from fossil fuels are well intentioned, they fail to address the demand side of the equation. February 26, 2021.
[367] New York Times. New York Rejects Keystone-Like Pipeline in Fierce Battle Over the State's Energy Future. May 15, 2019.]

infrastructure projects once considered assets now fail to meet traditional metrics in the face of evolving conditions related to the energy transition.[368,369]

The invest side of the equation, in turn, puts divestment advocates in support of economic activity that furthers emission reduction goals. This requires changing the mix of supply-side assets to reduce emissions. It also supports efforts to reduce demand—the consumption of fossil fuels—throughout the economy and society.[370]

The invest aspect of the divestment movement is spelled out in formal analysis, and the evolution of its efforts are chronicled in periodic reports by the Global Fossil Fuel Divestment Commitments Database.[371] The invest strategy challenges the owners and operators of oil, gas and coal reserves and related infrastructure and power systems to adopt climate solutions. The reforms that are supported span the full scope of fossil fuel production and consumption across the globe and the relationships that businesses and industries have with the fossil fuel sector.

Within the work of the divest-invest collaborative and—more importantly—the network of its supporters, a robust policy discussion is underway, addressing a comprehensive body of reforms that support:

1. Paris-aligned company and industry emission reduction strategies;
2. Elimination of fossil fuel subsidies;
3. Carbon taxes and other financial tools;
4. Energy efficiency;
5. A full array of wind and solar power innovations;
6. Support for alternative transportation policy and capital investments in electric vehicles;
7. Support for alternative production processes, feedstock design and composition and waste disposal in the plastics and petrochemical sector;
8. Societal reforms that support a just transition for individuals and communities harmed by market changes;
9. Support for political and governmental structures that coordinate and collaborate on solutions; and

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[368] Moody's. Shifting Environmental Agenda raises long-term credit risk for natural gas investments, Sector In Depth, Regulated Electric and Gas Utilities. September 30, 2020 (Proprietary)
[369] Standard and Poor's. Ratings on Formosa Plastics Corp. and Three Associated Companies Affirmed BBB+ on low debt leverage; Outlook Stable. October 7, 2021.
[370] Global Fossil Fuel Divestment Commitments Database. Invest-Divest 2021—A Decade of Progress Towards a Just Climate Future. October 26, 2021
[371] *Ibid.*

10. Investment in companies that adopt sustainable practices.

The divestment campaigns active on college campuses, corporate and philanthropic boardrooms and state capitals place immediate pressure on sources of capital to find alternatives to fossil fuels. At the same time, the campaigns serve as education tools that help set the stage for changes in consumer and business behavior that are needed over the long term.

It is easy for opponents to dismiss the divestment movement if the depiction of its aims, strategies and tactics can be distorted and made simplistic. Most of the simplistic arguments are not meant to stimulate dialogue and discussion. The supply-demand dichotomy assumed by those who make this case imply that strategic initiatives must be either supply- or demand-oriented. The climate movement's evolution, however, recognizes that the supply and demand aspects of the economy interact.

On the demand side, policies that reduce or eliminate fossil fuel combustion and incentivize the shift to alternatives play a role in consumer behavior and market expectations. This is particularly true in the electricity sector, where renewable energy is taking market share away from coal, challenging natural gas and reshaping the market through price competition. The demand by homeowners for solar panel installation is increasing, as is demand for utility-scale investments in solar and wind.[372]

On the supply side, policies that scale down the dirtiest forms of energy production while building out alternatives will ensure that the energy supply is ready to meet the needs of the future.[373] The multi-year effort that stopped 150 new coal plants from being built in the United States paved the way for development of cheaper alternatives like wind and solar.[374]

Climate scientists are clear that both demand side and supply side approaches are necessary to transition away from fossil fuels and toward renewables.[375] It's not or, but and.

Misinformation campaigns,[376] lobbying efforts,[377] and attempts to undermine clean energy[378] have all played a role in restricting the availability of green energy to

[372] Rocket. 67% of non-solar households are interested in solar, so what's stopping them? March 5, 2022.
[373] Stockholm Environment Institute. Supply-side climate policy: The road less taken. October 21, 2015.
[374] Mother Jones. How a grassroots rebellion won the nation's biggest climate victory: Activists have imposed a *de facto* moratorium on new coal—and beat the Obama EPA to the punch. April 2, 2012.
[375] Resources for the Future. Partners, Not Rivals: The power of parallel supply-side and demand-side climate policy. April 2022.
[376] PBS. Exxon Denies Pushing Misinformation on Climate Change. October 28, 2011.
[377] Center for American Progress. How oil lobbyists use a rigged system to hamstring Biden's climate agenda. September 30, 2021.
[378] House of Representatives. Transcript of Hearing before the Subcommittee on Civil Rights and civil Liberties of the Committee on Oversight and Reform. October 23, 2019.

consumers. That impact can still be felt. Despite these efforts, however, long-term new capital investment in the U.S. energy grid continues to favor renewable energy over coal and natural gas. Table 4 shows that United States utilities are planning to build renewable assets at a rate of 6 MW of renewable energy to every 1 MW of fossil fuels.

Table 4: Edison Electric Institute Projections of Capacity Additions: U.S. Energy Grid, 2022-26

Stage of Announced Capacity Additions (MW) 2022-2026								
Fuel	**Proposed**	**Feasibility**	**Application Pending**	**Permitted**	**Site Prep**	**Under Construction**	**Testing**	**Total**
Coal	95	–	–	–	–	–	–	95
Natural Gas	15,993	876	5,245	11,917	–	11,828	2,410	48,269
Nuclear	4,753	1,600	–	219	–	–	2,200	8,772
Wind	58,915	2,412	13,146	9,051	352	12,026	1,101	97,003
Solar	102,063	200	31,106	34,825	545	20,081	2,049	190,869
Other	2,321	8,777	719	1,851	6,511	–	5	20,184
Total	**184,140**	**13,865**	**50,216**	**57,863**	**7,408**	**43,935**	**7,765**	**365,192**

Source: Edison Electric Institute.

Another offshoot of the anti-divestment, supply-demand argument stresses that reducing capital from large investors will either allow less reputable investors to step in and become shareholders or provide an incentive to state-owned enterprises like Russia and Saudi Arabia to gain greater market share and leverage. State-owned oil companies already control 75% to 80% of worldwide reserves.

When looking at this argument from the private sector side, the loss of investor confidence in the oil and gas industry has resulted in a long-term decline of the energy sector's market share from 28% to 4.7%. The numbers show that investors are not flocking to snap up oil and gas stocks once investors decide to unload them. The recent increase in market share from a low of 2% of market share in October 2020 to 4.7% is driven by pandemic-related bottlenecks and military aggression.[379] Neither is sustainable.

Further, the sale of assets to less-reputable owners is an issue for governmental leaders. The lack of better enforcement of environmental laws, particularly those related to mine and well closures and recommendations, is a long-standing problem.[380] These issues more typically find resolution in bankruptcy proceedings where burdens are passed along to taxpayers.[381]

Buying and selling oil and gas assets are driven by market players.[382] Concern about the quality of ownership is a matter for future regulation. Although research and

[379] For October 2020, see: S&P Dow Jones Indices. Fact Sheet, S&P 500 Equity. October 30, 2020 (available upon request).
[380] United States Government Accountability Office. Abandoned Hardrock Mines. March 2020.
[381] Grist. How bankruptcy helps oil and gas companies evade cleanup rules. June 2021.
[382] International Comparative Legal Guide. Oil and Gas Practice, Section 3.8. Last visited September 17, 2022.

dialogue are needed in this area, regulatory intervention of this nature is unlikely. In the absence of regulatory intervention, investors have the blunt instrument of divest/invest as protection.

The issue of divestment resulting in state-owned entities grabbing more market share is a realistic concern.[383] It is equally clear that most major state-owned entities already rely heavily on the technologically superior capacity of the world's private companies to make major advances. A new cycle of exploration based on the substantial cash infusions stemming from the invasion of Ukraine requires the expertise of major private oil companies.[384] They seem ready and willing to collaborate. Most of the private oil majors have project agreements in place today with major state-owned operations. Also, many major state-owned entities are traded on the stock market. Russian companies Rosneft and Gazprom are publicly traded. Parts of Saudi Aramco are traded, as is Coal India. When the links and interconnections are this tight, an argument of one being morally superior or politically more approachable is not credible.

Beyond the broad entanglements of the private oil companies and state-owned enterprises, a reduction in the overall demand for oil and gas will have a negative impact on both state-owned and private companies, absent an international collaboration designed to address the institutional and human toll involved.

Only by casting the divestment movement in a misleading manner can analysts conclude that the movement naively only seeks to address supply-side strategies. The divestment movement—as one part of the climate movement's multi-pronged, long-term vision—is an integral part of a comprehensive global effort to bring about a growth strategy rooted in sustainability.

6. Divestment and the Carbon Tax

Oppose Divestment: *The best solution is a carbon tax in combination with other regulatory solutions.*

Favor Divestment: *Campaigns in support of a carbon tax have not succeeded in passing legislation, though they are important for raising issues. Posing it as a solution is a false option.*

Some pundits have claimed that divestment is a distraction from efforts to establish a carbon tax or other government regulations that they believe would more likely effect change.[385] Peer-reviewed academic research, however, emphasizes that climate finance movements complement active climate change strategies.

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[383] The Conversation. Fossil fuel divestment will increase carbon emissions, not lower them. Here's why. November 25, 2019. Also see: World Resources Institute. 4 ways to shift from fossil fuels to clean energy. January 15, 2019.
[384] The National. Oil is back on the menu as energy majors return to exploration. August 8, 2022.
[385] See: Climate & Capital Media. Tariq Fancy: 'ESG' and 'sustainability investing' are deadly distractions in the climate crisis. April 20, 2021.

- A 2017 study credited the divestment movement specifically for increasing popular awareness of a carbon tax, while pushing concepts like "stranded assets" and "carbon bubble" into the mainstream discourse.[386]

- A 2015 OECD report concurred, noting that divestment has "put stranded assets on the public policy agenda."[387]

- Another study on the attitudes of opinion leaders showed a change in perspective regarding the implementation of a carbon tax. At the initiation of the study, most survey participants thought the likelihood of a carbon tax was unlikely. After debates in Congress and the failure to pass a bill, the opinion leaders increasingly believed that a carbon tax was inevitable.[388]

The societal efforts to successfully combat climate change will need to be varied, continuous and intense. Divestment is one part of an overall program. It is meaningful as a tool to redirect investment and also as an educational vehicle to focus attention on the urgency of the issue.

C. Finance

1. Divestment and Lost Value

Oppose Divestment: *Divestment has a proven track record of losing money—evidence shows investors lost money, and sound econometric modeling proves it. Furthermore, the potential for higher fees will eliminate any gains.*

Favor Divestment: *Divestment from fossil fuels has not lost money, and econometric models do not comport with basic investment guidance. Administrative costs for divestment are not burdensome and are becoming more convenient as more funds divest.*

The financing opposition to divestment from fossil fuels is based on the premise that it will lose money. Some argue the money has already been lost with other types of divestments and the industry's history of strong returns will recover. Others point to econometric models that demonstrate certain losses. They argue that divestment has no meaningful impact on a company and that it will increase investor costs in terms of fees and monitoring.

These arguments do not withstand scrutiny.

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[386] T. Schifeling and A. Hoffman. Bill McKibben's influence on U.S. climate change discourse: Shifting field-level debates through radical flank effects. *Organization and Environment*. 32(3). September 2019.
[387] Organisation for Economic Co-operation and Development. Divestment and Stranded Assets in the Low-Carbon Transition: Background paper for 32d Roundtable on Sustainable Development in Paris. October 28, 2015.
[388] M.J. Barradale. Investment under uncertain climate policy: A practitioner's perspective on carbon risk. *Energy Policy*, 69. June 2014, pp. 520-525.

This analysis focuses on the fundamental question behind all of those arguments: Can an investment fund that divests from fossil fuels continue to reach its financial targets?

California's Study on Divestment Showed Losses From Tobacco Divestment but Gains From Coal Divestment

Opponents of divestment make several arguments that conclude it will result in a loss of portfolio value. One line of argument is practical: Funds that have divested lost money. The prime example provided is the California Public Employees Retirement System (CalPERS). But this simple assertion fails to drill down into the details, incorrectly lumping all divestments together and concealing the real cause of the loss.

CalPERS has reviewed the impact of divestment decisions on its portfolio.[389] CalPERS and the California State Teachers' Retirement System (CalSTRS) contend that their funds have lost money through divestment. Overall, CalPERS reports losses of $2.1 billion.[390] But these losses occurred because after California sold its tobacco holdings, the value of the tobacco shares increased.[391]

The California funds have been directed by the California Legislature to divest from a number of stocks and industries over time: Sudan, firearms, U.S. and non-U.S. thermal coal, private prisons and tobacco. The five-year review posted in March 2021 shows that tobacco stocks gained value since the fund made its initial decision in 2001. In other words, CalPERS lost money by divesting its shares of tobacco stocks. All the remaining six divested shares, including those of U.S. and non-U.S. thermal coal, lost value since divestment. Of thermal coal, the report also presented a decidedly negative outlook. The losses posted by CalPERS were unrelated to the thermal coal divestments.[392]

California's experience with fossil fuel divestment supports the view that the fund financially benefited from the move away from coal. The divestment proposition today relates to the specific historical circumstances related to holding fossil fuel stocks and the negative outlook on the stocks' future value.

The CalPERS financial results from coal divestment are consistent with BlackRock's findings based on a wider sampling of portfolio performance. BlackRock performed a study under contract for New York City in 2020. The report surveyed institutional

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[389] CalPERS. Five-Year Divestment Review (Attachment 1). March 2021, p. 4.
[390] CalSTRS files a report annually with the California Legislature. The report is meant to meet statutory requirements. The most recent report places the losses between $3 billion and $8 billion. The methodology used in these studies is not as transparent as CALPERS.
[391] CalPERS. Five-Year Divestment Review (Attachment 3). March 2021, p. 4.
Although the tobacco divestment analysis commenced with actions taken in 2001, the overall divestment portfolio figures for CalPERS include its South Africa divestment actions taken in the mid-1990s. The losses from the South Africa divestment are carried forward.
[392] CalPERS. Five-Year Divestment Review (Attachment 1). March 2021, p. 12.

funds that had divested from fossil fuels and found in each case that either the fund benefited financially or the performance was neutral.[393]

Long-term Results Show Fossil-free Portfolios Outperform Standard Indexes

Another way to look at the issue of whether or not portfolios lose value from fossil fuel divestment is to compare a standard global equities index to a fossil-free index. As discussed above, Morgan Stanley Capital International (MSCI) provides a comparison of its global stock portfolio with its fossil-free index.[394] MSCI's exclusion list is driven by a company's ownership of fossil fuel reserves.

Figure 10: Cumulative Returns of MSCI World Index vs. MSCI World Index ex Fossil Fuels, 11/2010 - 9/2022

ANNUAL PERFORMANCE (%)

Year	MSCI ACWI ex Fossil Fuels	MSCI ACWI
2021	18.53	19.04
2020	19.13	16.82
2019	28.19	27.30
2018	-8.92	-8.93
2017	25.45	24.62
2016	7.18	8.48
2015	0.03	-1.84
2014	6.60	4.71
2013	25.00	23.44
2012	18.69	16.80
2011	-7.01	-6.86

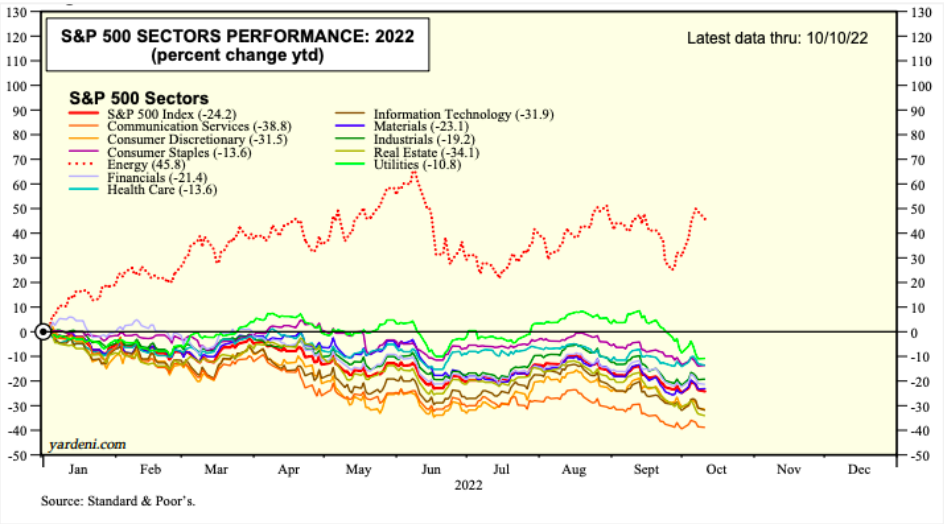
Source: MSCI World ex Fossil Fuels Index (USD).

Since November 2010, the fossil-free index has experienced superior performance to MSCI's global equity portfolio. The oil and gas industry has seen substantial volatility during the period. ExxonMobil, for example, started the period with a market capitalization of $329 billion and reached a peak of $448 billion in 2013. The company hit a low of $139 billion in 2020, and stands today at $377 billion. From a strictly analytical standpoint, fossil fuel stocks dragged overall returns down.

While investment portfolios are more than the results of the stock market, the two indices provide a reasonable comparison, and the period offers a broad enough frame to speak to the actuarial considerations of long-term institutional investors.

[393] BlackRock. Investment and Fiduciary Analysis for Potential Fuel Divestment. Phase 1: survey of divestments of fossil fuel identification of securities issues. 2020.
[394] MSCI. MSCI ACWI ex Fossil Fuels Index (GBP). November 2010–August 2022.

Figure 11: Standard and Poor's 500-Stock Index By Sector: October 11, 2022



Source: Yardeni Research. Performance 2022: S&P 500 Sector and Industries. October 11, 2022.
Note: The Yardeni S&P sector performance is updated several times per week.

The long-term decline of the oil and gas sector contrasts with the current market realities discussed above. Today's high oil price environment has boosted stock values for oil and gas companies, and investors are showing signs of returning to the oil and gas sector. In October 2020, energy stocks captured 2.0% of the S&P 500.[395] By July 2022, the position of energy stocks increased to 4.4%.[396] While still far removed from the industry's high point of 28% in the 1980s, the improvement is significant.[397]

The current price and stock value upswing is driven by bottlenecks created in the wake of the depths of the pandemic and Russia's invasion of Ukraine. The broad market conditions that had led to depressed prices and markets before these events included:

- The substantial rise in green alternatives in the power sector;
- Growing investments by manufacturers in electric vehicles (EVs);
- The oversupply of plastic resins from U.S. cracker facilities; and
- Various policy initiatives to curb single-use plastics growth.

These market factors are still in play, and place a cloud over industry growth scenarios despite the price hikes stemming from specific intervening world events.

Few expect the oil and gas industry to return to its stable, market-leading, high-return past. If the high price environment persists, as some predict, it is expected

[395] S&P Global. Fact Sheet. October 2020. The S&P Fact Sheet updates its web presentations on a monthly basis. October 30, 2020, is available from IEEFA upon request.
[396] *Ibid.*
[397] Sibilis Research. Sector Weightings. 1980-2020 (proprietary)

that market and government policy will accelerate the growth of alternatives to fossil fuels to support a more diversified energy market that protects investor value and national security. The drive by countries like Germany, for example, to simultaneously accelerate green investments and build up its control of existing supplies of fossil fuels is likely to depress fossil fuel growth scenarios and alter the current share distribution of fossil fuel production and consumption among countries.

The overarching market theory that portfolio diversification is the most efficient mechanism to distribute risk and rewards is changing. The long-term implication of the MSCI data suggests that broader diversification into fossil fuels will result not in value maximization, but in value losses. The energy sector, a major sector of the economy, is in a period of transition. The oil, gas and coal industries, once engines of economic growth, no longer offer the same expectation of stable, high rewards and relatively low risks. Sustainable economic models will continue to rely on diversification as fossil fuels become less dominant and other alternatives take market share. Investment portfolios need to act defensively to protect value against this long-term decline and the realignments needed to adjust to lower or eliminate fossil fuel use.

Studies Showing Misallocations of Reinvested Money Are Unsubstantiated and Based on Totally Implausible Models

One other argument contends that investors will misallocate capital that becomes available as a result of divestment actions. The argument, advanced by Global Analytics, a financial services company, asserted to a New York employee association that divesting from fossil fuels would lose money for the New York State Common Retirement Fund (NYSCRF).[398]

The 2017 industry-funded report made certain misleading assumptions. Under one scenario, the study assumed that existing fossil fuel investments yielding 8% would be replaced by investments yielding 6% returns. A second scenario assumed that existing fossil fuel investments that were yielding 8% would be replaced by investments yielding 3% returns.[399] The rebalancing of the NYS Common Retirement Fund, however, requires investment managers to seek out investments that are likely to achieve the fund's annual investment return target of 7%.[400] The Global Analytics study fails to explain why the NYSCRF would rebalance its portfolio by specifically targeting investments with returns of 3% and 6%—both less than the fund's target of 7%.

It is widely understood that when funds reinvest freed-up capital, they do so based on the needs of the fund and how it can best achieve its targeted rates of return.[401]

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[398] Independent Petroleum Association of America. Impact of Divestment on NYC Pension Funds. July 2017

[399] *Ibid*.

[400] Office of the New York State Comptroller. 2017 Comprehensive Annual Financial Report for the New York State and Local Retirement System (NYSLRS) for Fiscal Year Ended March 31, 2017. September 30, 2017, p. 13-14.

[401] Meketa Investment Group. Achieving Your Target Return. October 2021.

The assumption that a money manager would be retained by the fund to find investments below its annual investment target is spurious.

The claim that divestment will result in value loss to investors is unsubstantiated. The question is: Can investment portfolios exclude oil, gas and coal stocks and still achieve investment targets? The answer is: Yes.

Markets have changed. In the long term, the quasi-monopoly, politically protected markets that had favored large, private fossil fuel producers are more complex. Oil prices, oil and gas company revenues and stock values tell us that the world is witnessing a major change. These market components are now highly politicized, less responsive to supply-and-demand issues, and more reliant on nation-state agendas.

Several studies have analyzed this question in light of more recent market realities. With a more complete understanding of climate risks, they have come to the opposite conclusion: Divestment is not associated with any significant losses. On the contrary, it can create modest gains.[402]

Long-term Modeling Studies Assume That Markets Will Repeat Performance Over the Next 50 Years, a Premise That Violates Basic Principles of Investment.

Daniel Fischel, a professor of law and business, argues that fossil fuel investments showed prodigious investment performance over the last 50 years. He assumes this performance will continue and concludes that divesting from fossil fuels will result in suboptimum financial performance of a fund.[403] The fact that fossil fuel investments drove worldwide investment returns for most of the last 50 years is accurate—but his conclusion is wrong.

Fischel does not attempt to address any risks facing the fossil fuel industry in his paper, and he ignores the striking departure of fossil fuel performance from historical norms. Even aggressively optimistic estimates of future oil and gas demand are showing considerable uncertainty.

The Fischel argument is provocative in an academic environment because it runs afoul of basic tenets of financial disclosure. SEC regulations warn that a representation about future investment performance that implies that future gain or income may be inferred from or predicted based on past investment performance may constitute a materially misleading statement. Such claims are prohibited.[404]

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[402] IEEFA. Major investment advisors BlackRock and Meketa provide fiduciary path through the energy transition. March 22, 2021

[403] D. Fischel, *et al*., Compass Lexicon. Fossil Fuel Divestment and Public Pension Funds. June 2017. Note: The study was commissioned by the Independent Petroleum Association of America.

[404] U.S. Code of Federal Regulations. 17 C.F.R. §230.156(b)(2): Investment company sales literature.

SEC Rule 156 Language on Use of Past Performance[1]

2) Representations about past or future investment performance could be misleading because of statements or omissions made involving a material fact, including situations where:

(i) Portrayals of past income, gain, or growth of assets convey an impression of the net investment results achieved by an actual or hypothetical investment which would not be justified under the circumstances, including portrayals that omit explanations, qualifications, limitations, or other statements necessary or appropriate to make the portrayals not misleading; and

(ii) Representations, whether express or implied, about future investment performance, including:

(A) Representations, as to security of capital, possible future gains or income, or expenses associated with an investment;

(B) ***Representations implying that future gain or income may be inferred from or predicted based on past investment performance; or***

(C) ***Portrayals of past performance, made in a manner which would imply that gains or income realized in the past would be repeated in the future.***

[1] U.S. Code of Federal Regulations. 17 C.F.R. §230.156(b)(2): Investment company sales literature.

A change in the financial performance of fossil fuel companies has taken place over most of the last decade. The change indicates that the future will not be like the past. As noted above, fossil-free portfolios have outperformed the market for more than a decade, and the world economy is witnessing substantial changes within the energy sector.

2. Divestment as Superficial Action

Oppose Divestment: *Divestment is a waste. It is largely symbolic and has no real-world impact on the companies that produce and use fossil fuels.*

Favor Divestment: *Divestment campaigns have successfully sounded a strong warning concerning the cumulative risks facing the fossil fuel sectors.*

Opponents argue that divestment is not resulting in an increase in the cost of capital to companies, making it a symbolic gesture but delivering little in the way of real-world impact.[405]

[405] Bill Gates is among the more prominent figures who have made this argument. Financial Times. Fossil fuel divestment has 'zero' climate impact, says Bill Gates. September 17, 2019. In 2021, however, Gates predicted in a briefing at the COP26 Climate Summit that oil companies "will be worth very little" in 30 years. See: CNBC. Bill Gates predicts oil companies 'will be worth

This argument is incorrect because oil, gas and coal companies acknowledge that the divestment movement specifically and the climate movement generally are having a material impact on the willingness of institutional investors and banking establishments to make and hold investments in the sector.[406]

Opponents of divestment who offer these arguments ignore the risk profiles provided by fossil fuel companies to their investors. These profiles are contained in the formal filings made by large oil, gas and coal companies to the SEC and most other securities regulators around the world. The risk factors identified by the companies can affect share value.

The following three examples from Shell, ExxonMobil and Peabody Energy identify divestment as a risk that may affect the company. The references identify investor-driven divestment campaigns or actions taken by investors to alter corporate strategy by limiting access to capital.

- **Shell:** "Certain investors have decided to divest their investments in fossil fuel companies. If this were to continue, it could have a material adverse effect on the price of our securities and our ability to access capital markets. Stakeholder groups are also putting pressure on commercial and investment banks to stop financing fossil fuel companies. According to press reports, some financial institutions have started to limit their exposure to fossil fuel projects. Accordingly, our ability to use financing for these types of future projects may be adversely affected. This could also adversely affect our potential partners' ability to finance their portion of costs, either through equity or debt."[407]

- **ExxonMobil:** "Political and other actors and their agents also increasingly seek to advance climate change objectives indirectly, such as by seeking to reduce the availability or increase the cost of financing and investment in the oil and gas sector and taking actions intended to promote changes in business strategy for oil and gas companies. Depending on how policies are formulated and applied, such policies could negatively affect our investment returns, make our hydrocarbon-based products more expensive or less competitive, lengthen project implementation times, and reduce demand for hydrocarbons, as well as shift hydrocarbon demand toward relatively lower-carbon alternatives."[408]

- **Peabody:** "There have also been efforts in recent years affecting the investment community, including investment advisors, sovereign wealth funds, public pension funds, universities and other groups, promoting the divestment of fossil fuel equities and also pressuring lenders to limit funding to companies engaged in the extraction of fossil fuel reserves. The impact of

very little' in 30 years—here's why. November 6, 2021. He further reports that he himself is divesting from fossil fuels. B. Gates. How to Avoid a Climate Disaster. February 2021.

[406] Forbes. The case for fossil fuel divestment. February 20, 2021.

[407] Shell. Powering Progress: Shell plc Annual Report and Accounts for the year ended December 31, 2021. 2022, p. 23.

[408] ExxonMobil. Solutions: 2021 Annual Report. 2022, p. 4.

> such efforts may adversely affect the demand for and price of securities issued by us, and impact our access to the capital and financial markets."[409]

In addition to these company-based acknowledgements, the business community has taken strong exception to climate and environmental organizations that challenge individual projects sponsored by fossil fuel companies.

A successful project challenge could be termed a "project-specific divestment," given the amount of investment typically involved in challenged projects. Also, these challenges—whether successful or not—shape market perception of climate risk. In short, these project-specific divestments serve in the aggregate as a trend that is redefining the ideas of regulatory and political risk.

In 2018, the U.S. Chamber of Commerce issued a report critical of environmental regulators and elected officials for delaying or cancelling 15 fossil fuel infrastructure investments. The report was also critical of the imposition of a fracking ban in New York. The report erroneously concluded that the project delays and cancellations were caused by abuses of the regulatory process.[410]

Generally, the Chamber report failed to address the changing nature of environmental regulation as climate risk has intensified. The paper also did not consider the economic and financial backdrop; many projects were cancelled because they were no longer financially viable.[411]

Climate risk and the response by companies and regulators is a growing issue of concern in the debt markets. The ability of fossil fuel companies and their partners along the economic chain to obtain capital make them sensitive to the views of credit-rating agencies. The agencies offer regular reporting on the creditworthiness of companies generally, often for project-specific financing.

A September 2020 Moody's report highlighted a trend showing that fossil fuel companies that mine, drill, transport and sell oil, gas and coal products are finding it increasingly difficult to bring planned infrastructure projects from design to commercial operation.[412] Moody's cited eight examples of cancelled or at-risk projects that highlighted the market and societal forces forming the basis of the credit risk (including projects mentioned in the Chamber report cited above).[413] Companies that announce infrastructure investments, particularly pipelines, place the company's credit rating at risk during the development process. Until the project is completed, in operation, and producing revenue, it runs a risk of cancellation. The projects, companies and industry face increased risks in a rapidly changing financial

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[409] Peabody Energy Corporation. Form 10-K. February 25, 2015, p. 30.
[410] U.S. Chamber of Commerce Global Energy Institute. Lost: Why American Cannot Afford to Keep It in the Ground. December 18, 2018.
[411] IEEFA. IEEFA Response to U.S. Chamber of Commerce Analysis of the 'Keep It in the Ground' Movement. February 1, 2019.
[412] Moody's Investor Service. Shifting environmental agendas raise long-term credit risk for natural gas investments. September 30, 2020. Proprietary.
[413] *Ibid.*

market frequently coupled with an atmosphere of vigorous public opposition to expanded fossil fuel use.

A similar opinion offered by Standard and Poor's addresses financial risks in the petrochemical sector, echoing these issues. In an opinion on a planned Formosa petrochemical hub in Louisiana, S&P concluded the company faced considerable risk if it pursued the project.[414] In addition to regulatory issues raised at the local and federal level, the analysis pointed to rising construction costs and labor shortages as part of the risk profile. The analysis did not stop there, however. It noted that any company looking to locate a petrochemical hub will face opposition for many of the same reasons Formosa's plant has been delayed. The climate and related environmental concerns are worldwide.[415]

Fossil fuel extraction is capital-intensive, meaning that companies rely on access to capital to extract and sell carbon. When capital access is placed at risk—when divestment hikes the price of capital by limiting the universe of buyers for debt instruments or driving down the price of stocks they plan on using as collateral in a financial transaction—the ability of fossil fuel companies to pursue their core business model is constrained.

The dismissive manner used to describe divestment as symbolic misses the nature of modern communication. When institutional actions take place—such as changes in law or regulation, judicial rulings, governmental budget appropriations, credit agency opinions or private company capital allocations—they are a result of organizational processes and decision-making. They take on a symbolic meaning as indications of a gain or loss of public confidence and trust. In the context of divestment, the loss of investors has global consequences that are identified in formal financial disclosures, trade reports and credit opinions. The loss of investors is also a factor in the more complex calculation of a company's reputational status.[416]

3. Fossil Fuel Risk Is Already Factored Into Stock Values; Divestment Is Unnecessary.

Oppose Divestment: *Fossil fuel risk is already factored into market valuations and credit risk.*

Favor Divestment: *The history of industry misinformation regarding climate change makes it difficult to determine if valuations have been appropriately adjusted. Recent market responses to Ukraine make it clear that fossil fuel stock valuations are increasingly driven by volatility in the price of oil.*

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[414] S&P Global Ratings. Ratings on Formosa Plastics Corp. and three associated companies affirmed at 'BBB+' on low debt leverage; outlook stable. October 7, 2021.
[415] IEEFA. S&P pushes Louisiana project cancellation as credit boost for Formosa. February 24, 2022.
[416] Edelman, Murray. The Symbolic Uses of Politics. University of Illinois Press. 1985. For an introduction to the use of symbols in modern society see: Hebert Blumer. Symbolic Interactionism: Perspective and Method. University of California. 1986.

Divestment opponents argue that companies and industries involved with fossil fuel production, processing, transport and use are responding to problems created by climate change. One variation on this argument is that markets are already pricing in the climate risk, and divestment is not needed to correct any market imbalance. Such arguments, however, are based on a simplistic understanding of the marketplace.

The Efficient Markets Hypothesis—a theoretical premise that, in a free market, information is available and distributed equally and in a timely fashion to all players—drives much of this set of assumptions about climate change and pricing. Economists have long recognized that basic market failures like information asymmetries can undermine the functioning of efficient markets.[417] When such asymmetries manifest in a sector as a whole (as in the case of the fossil fuel industry and its well-documented record of attempting to mislead the public), serious doubts can arise regarding the applicability of the efficient market theory. And as a financial matter, the theory does not absolve any institutional fund from performing due diligence.

In addition to the industry's history of misleading information, no standards exist for uniform disclosure on emissions. This leaves stock analysts without data that is uniformly accepted and can serve as the basis for quantitative assessments. The need for uniform accounting on emissions and other related climate risk matters is at the core of recent efforts by the SEC and the European Union.[418,419]

4. Divestment and Transaction Fees

Oppose Divestment: *Divestment requires significant transaction and monitoring fees. It is expensive and reduces profitability.*

Favor Divestment: *A critical empirical study by BlackRock reflecting a survey of funds that have divested shows that fees are within budgetary ranges. The market for information on climate change, emissions and links to company performance is now more available, lowering the costs of the research and administrative issues.*

This argument has been advanced most forcefully by Henrik Bessembinder, an economic consultant at Compass Lexecon and professor at Arizona State University. In a report commissioned by the Independent Petroleum Association of America, Bessembinder claims that because many endowments and funds are commingled or part of mutual funds, unwinding the investments would incur transaction and rebalancing costs.[420]

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[417] K. Lofgren, *et al*. Markets with asymmetric information: The contributions of George Akerlof, Michael Spence and Joseph Stiglitz. *The Scandinavian Journal of Economics*. 104(2): 195-211. June 2022.
[418] SEC. SEC Proposes Rules to Enhance and Standardize Climate-Related Disclosures for Investors. March 21, 2022.
[419] European Commission. EU taxonomy for sustainable activities. Visited September 12, 2022..
[420] H. Bessembinder. Frictional costs of fossil fuel divestment. June 2016.

The conclusion is another result of an academic approach that lacks familiarity with how actual funds are managed. Not every cost incurred by a fund represents a new budgetary expense. Every investment fund has policies, procedures and normal budgeting that assume ongoing transactions must take place to account for necessary rebalancing of the fund over time. Any claim that divestment will cost money must first take into consideration whether a fund moving to fossil-free status must exceed normal expenditures for fees related to rebalancing and other typical administrative outlays.

Also, while a range of fees is charged to funds, all fee structures are settled by negotiations in a dynamic and highly competitive marketplace. Bessembinder assumes that endowments or funds are charged every time they request a service. But fee structures are settled by negotiation, with the final terms and conditions determined by specific businesses responding to the needs of customers and to their own internal business models, strategies and timing. When demand for a new service increases, service companies tend to provide the new service to customers, lest they lose the relationship and the revenue that comes with it. As more funds demand the new service, existing service providers adapt to providing cost-effective solutions, and new service providers enter the market providing services at a low cost to secure the business. There is little to suggest that the fees of implementing a divestment decision would exceed the fees associated with any of the many other comparable questions that managers and directors regularly ask third-party consultants.[421]

In a recent study for the New York City pension funds, BlackRock performed an empirical historical analysis that found the impact on "historical performance, transaction costs, and active risk" to be "relatively minimal" across narrow and broad divestment strategies alike.[422] Their conclusion matches what investors have long known: Portfolios regularly rebalance holdings based on changing market conditions, have found ways to do so without significant friction, and there is no reason to expect that shifting away from fossil fuels would be any different.

As more investment funds adapt portfolios to changes related to decarbonization, investment managers large and small are likely to find new and better ways to reduce fees to customers.[423] For example, IHS Markit has recently launched an innovative carbon emissions platform—Corporate Emissions Solutions—that has the ambitious goal of tracking fossil fuel assets around the world, as well as carbon emissions and emissions intensity. The raw data produced under proprietary terms offers an important resource.[424]

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[421] See: IEEFA and Sightline. The Financial Case for Fossil Fuel Divestment. July 2018.
[422] BlackRock. Investment and Fiduciary Analysis for Potential Fossil Fuel Divestment, Phase 3. 2021.
[423] What also needs to be discussed is whether the impact of fees on returns from fossil free investments is any different than fees charged by traditional funds. For the most part, fees have a negative impact on returns whether a fund is fossil free or not. See, *e.g.*: Meketa Investment Group. Sustainability: A new sector in Private Markets. 2021.
[424] IHS Markit. Corporate Emissions Solution: Identify, track and benchmark corporate greenhouse gas (GHS) emissions across value chains and portfolios. Visited September 12, 2022.

One method that is becoming popular is the use of well-researched information provided by non-profit organizations as source material. Information provided for educational purposes has been used by companies like BlackRock to prepare and submit findings to private clients.[425] The data and analyses are usually financed with philanthropic support and offered to improve industry transparency. The research meets professional standards and is usually disseminated without charge.

Urgewald has designed and constructed two databases: The Global Coal Exit List (GCEL) and the Global Oil and Gas Exit List (GOGEL), covering 506 coal and 887 oil and gas companies. The lists have 600 registered users including companies, analysts and trade press and is publicly available.[426] The research and data have been used by a host of publicly traded companies, allowing them to track the carbon footprint of their holdings. The data is organized in an accessible manner and offers significant savings to any fund or manager needing to serve the needs of an investment client. The website is meticulously maintained, and the organization is available to discuss research needs of specific investors.[427]

Large funds are also beginning to rely on trade association reports, data and recommendations to guide policy.[428] There is now an abundance of information and analysis on climate change and corporate finance available to institutional investors. Financial research tells us that the fees related to divestment are not outside the bounds of normal administration budgeting. Advice to the contrary is misleading.

D. Economics

1. Divestment and Harm to the Economy

Oppose Divestment: *Divestment ultimately harms the economy, causes oil and gas prices to rise and introduces more risk into the market.*

Favor Divestment: *These arguments rest on poor assumptions about markets.*

In contrast to longstanding arguments that divestment has no market impact, some fossil fuel investors have recently sought to blame divestment for high energy prices.[429] This argument has been made most forcefully by leading investment houses BlackRock, Blackstone and JPMorgan Chase. Although the companies now

[425] See BlackRock report on the City of New York Volume One, p. 4. The company utilizes the data compiled by 350.org on the number and type of investment funds that have divested. See also: The December 2021 report from the $2.4 trillion investor Coalition United for a Responsible ExxonMobil (CURE) utilization of research and analysis prepared by As You Sow and the Institute for Energy Economics and Financial Analysis (IEEFA).
[426] See: Urgewald, Coal Exit List (last visited September 27, 2022) and Urgewald, Oil and gas Exit List, (last visited September 27, 2022)
[427] Interview with Heffa Schucking, Urgewald. August 15, 2022.
[428] TIAA CREF has recently embarked on an in-depth look at its climate investments. An important reference point used by the fund is the work of the Net-Zero Asset Owners Alliance. TIAA. 2021 Climate Report. December 2021, p. 18.
[429] See: The New York Times. With climate pledges, some Wall Street titans warn of rising prices. November 5, 2021.

shield some of their portfolios from fossil fuels, the companies nevertheless publicly oppose divestment.

This argument claims that the sizes of alternative markets—wind and solar, electric vehicles and petrochemicals—are insufficiently developed from a technical, supply chain and political standpoint to support an accelerated reduction in the amount of capital going to fossil fuels. The result could be a poorly timed market that results in bottlenecks and rising energy prices. This view asserts that reducing capital to fossil fuels results in too little capital available for research at a critical time, resulting in hasty closure of power plants, internal combustion engines and petrochemical investments before affordable and reliable alternatives are available. They argue the result could be major increases in the price of energy and energy-related products.

The timing issue is real. It is difficult to coordinate capital allocation to meet long-term public needs. The chief executives of leading investment houses are well aware of the tendency of the capital markets to oversupply and underinvest. Overall, the need for a mine, well, pipeline or other asset in the extractive industries is often unregulated. In most places, some semblance exists of regulation of fossil fuel use in electricity production and heating. Some CEOs have called on the world's leaders for greater coordination and planning.[430]

Several current market drivers, however, undermine the validity of the argument that divestment causes an increase in energy prices:

- Forces much larger than divestment were at play in November 2021 when energy prices rose rapidly. Oil prices had been increasing since late 2020, caused by the COVID-19 pandemic, not divestment.[431] Bankers and investment houses benefited from rising oil prices. Their argument that divestment caused the higher prices as if this were a negative outcome strains credulity.

- The argument ignores the fact that the growth trajectory of renewable energy is exerting a downward pressure on prices, a net benefit for the economy.[432] It is deeply troubling that the investments made in this arena are consistently referred to as some kind of undue cost, when what is happening is a transition from one form of profitable energy to another. Neither BlackRock nor Blackstone mentioned the existence of growing markets in fossil fuel alternatives.[433] JPMorgan's CEO was more balanced, explicitly arguing for greater planning and coordination, as well as a careful integration of fossil fuel alternatives during this transition.

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[430] *Ibid.*

[431] Brookings Institution. 11 facts on the economic recovery from the COVID-19 pandemic. September 29, 2021.

[432] Forbes. Renewable energy prices hit record lows. How can utilities benefit from unstoppable solar and wind? January 21, 2020.

[433] BlackRock does mention the value of renewable energy in other contexts. See discussion above on CEO Larry Fink's support for sustainable energy. The company performs several services for clients on all sides of the energy transition. This inherent conflict in their business model requires them to frequently explain contradictions in their investment positions.

- The divestment movement has arisen in large part due to the failure of large institutions to create a coherent, comprehensive framework for energy transition. A plea by JPMorgan Chase for more coordination and planning implies the climate and divestment movements have not been actively pursuing every possible path to a sound climate policy. This is not true. The divestment issue surfaced and is sustained by the failure of national and international institutions to develop and implement long-term, effective action.

- Divestment did not cause the recent prices spikes. Although market responses have been causing energy prices to rise generally in early 2022, the invasion of Ukraine by Russia disrupted markets worldwide, causing price spikes to ripple through the economy.

Conclusion

This paper offers a defensive strategy and financial rationale to protect a portfolio from climate risk. Almost every fund manager in the world acknowledges that climate risk is financial risk.

The divestment option instructs a fund to make no new investments in fossil fuel stocks, bonds, private equity or other investment instruments. Additionally, managers should seek to order existing portfolio investments in fossil fuels with a goal of exiting those investments where prudent.

A divestment plan assumes the steps taken are consistent with the targeted return assumptions governing the enterprise.

The case for divestment developed in this paper is a financial one. For most of the last decade, the fossil fuel industry has been a poor financial performer—a striking departure from the coal, oil and gas engine that grew the world economy and propelled financial markets for most of the last century.

The coal, oil and gas sectors that came out of World War II contributed to world economic growth. The industry's basic thesis was that the manufacturing sectors drove the world economy, and fossil fuels powered the manufacturing sector. As the economy grew, so did the fossil fuel sector. The ups and downs of the business cycle allowed the industry to garner massive cash profits in an upcycle, buffering the industry during down times and allowing it to buy additional oil and gas reserves from small cash-strapped companies. The constant replenishment of reserves provided an appropriate metric to ensure that a company's asset base could maintain supply as growth occurred.

Through recession and war, this business model sent the oil and gas sector to the top of the financial markets. For most of the last half of the 20th century, fossil fuel companies were an integral part of the Standard and Poor's 500-stock index. Coal worked in tandem with oil and gas as it grew from a regional player to a contributor to the nation's economic growth. With supportive governmental policies, the sectors became quasi monopolies.

The last decade revealed a paradox within one of the industry's greatest innovations: Hydraulic fracturing. This new technological process allowed the industry to create more oil and gas faster and more efficiently, but the business model was poorly aligned, and one company after another teetered financially. The oversupply forced oil and gas prices and profits down. As one company official put it at the time, the industry had no plan. In 2020, the COVID-19 pandemic and a dispute between Russia and Saudi Arabia drove prices even lower, creating a worldwide crisis. As the economic impacts of the pandemic faded and recovery set in, prices spiked and then spiked again with Russia's invasion of Ukraine.

But the competitive landscape facing the oil and gas industry was changing before the pandemic. Competition in the electricity, transport and petrochemical sector was reshaping the market. The competitive conditions facing the industry prior to the invasion persist. Its most recent plan to respond to climate change with carbon capture and sequestration technology is unproven. Fossil fuel companies today face an unsustainable industry that requires geopolitical manipulations to prop up oil and gas prices. While most of the industry was driven by principles of supply and demand, it now follows the command and control activities of Russian leadership. Russia's invasion sparked a price increase, and the benefits have provided a lifeline to the oil and gas industry broadly and to other governments heavily dependent on production.

No one knows when the war will end or how countries will react to its energy implications. The market framework that is emerging supports a two-economy scenario: On one side, a fossil fuel sector facing stiff competition and long-term risk to market share; on the other, sustainable economics in the electricity, transport and petrochemical sector. Sustainable economics will continue to push prices down and drive investment away from the fossil fuel sector.

Divestment is a defensive measure to protect investment portfolios from volatility and value destruction. It is also an acknowledgement of the unprecedented competition being driven by concerns over climate change and the opportunity to develop new markets to replace fossil fuels.

About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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