Tim Buckley, IEEFA Director Energy Finance Studies
Kathy Hipple, IEEFA Financial Analyst
Tom Sanzillo, IEEFA Director of Finance
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Institute for Energy Economics and Financial Analysis
IEEFA.org

General Electric Misread the Energy Transition: A Cautionary Tale

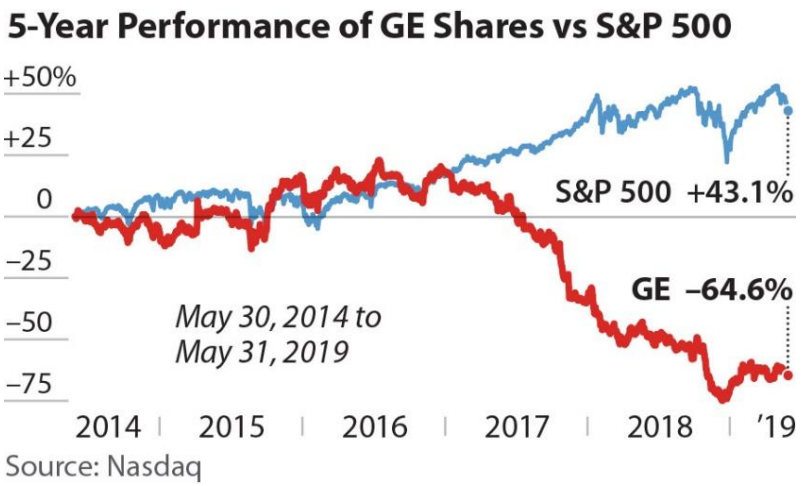
General Electric's Investors Misjudged the Company's Ability to Navigate the Transition and Lost Hundreds of Billions

Executive Summary

General Electric Company (GE) is a case study in how rapidly and unexpectedly the global energy transition away from fossil fuels travels up the economic chain and destroys value in the power generation sector.

The recent collapse of the company's Power division comes alongside a string of other management missteps over the past several years, leading to a cash flow and earnings crunch, financial distress, ongoing corporate restructuring and dividend cuts.

GE destroyed an almost unprecedented US$193 billion (bn)[1] or 74% of its market capitalization over 2016-2018.



This value destruction was driven in large measure by the collapse of the new thermal power construction market globally—a collapse which caught GE entirely by surprise.

GE's largest shareholders—Vanguard, BlackRock, State Street and Fidelity—were also caught by surprise.

GE badly misjudged the energy transition.

Its investors lost billions.

With its 5.7% stake, BlackRock investors suffered a $16bn loss between 2016-2018 related to its holding in GE, much of which was passively held on behalf of investors who buy BlackRock Exchange Traded Funds (ETFs), for example.

[1] All figures are US$ unless noted.

Was this epic failure of corporate governance preventable by investors?

NOT TOO LONG AGO, GE WAS THE MOST VALUABLE COMPANY IN THE WORLD. Today, GE has a current market capitalization of $87bn.

GE has lost more than a half-trillion dollars in market value since its all-time high of $600bn, back in 2000.

Much of GE's precipitous drop came in 2016-2018, when it badly misjudged the acceleration of the energy transition post-Paris Agreement.

GE assumed wrongly that demand for natural gas and coal would continue to track global economic growth.

The misstep forced CEO Jeff Immelt into early retirement and cost his successor, John Flannery, his job after less than a year. (The average tenure of a GE CEO, prior to Flannery, had been over 12 years.) And for the first time in its history, the company did not hire from within, selecting Larry Culp, former CEO of Danaher, to right the ship.

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GE Makes a Massive Bet on the Future of Natural Gas, and Loses

GE entered 2015 a global powerhouse, an industrial sector conglomerate with revenues of $107bn.

GE's largest segment was its thermal Power division which represented 20% of its total revenues in 2014. With 19.4% profit margins, the Power division was one of the highest in the company. Revenues from the division had increased 11% over the prior year, and as recently as 2016, the Power division equated to 50% of GE's pre-tax profit.[2]

GE's Power division built, installed and maintained gas, coal and nuclear power plants for utilities, independent power producers and numerous industrial applications, ranging from small, mobile power to utility-scale plants.

GE'S CORE WAS MANUFACTURING LEADING-EDGE GAS TURBINES that cost hundreds of millions of dollars. In addition to GE's world-leading wind turbine manufacturing (housed in its smaller, separate Renewable Energy division), GE also provided technology for power conversion, automation and control across the electricity industry, plus grid integration.

The Power division's Long-Term Service Agreements (LTSAs) provided coal- and gas-turbine clients ongoing equipment servicing and parts. Managed properly, these service contracts provided GE with an extremely profitable and steady long-term revenue stream once equipment had been sold.

In 2016, GE's Power division equated to 50% of GE's pre-tax profit.

(Financial analysis of the service contracts is difficult because GE's financial statements offer little detail on individual contracts. The U.S. Securities and Exchange Commission (SEC) is currently investigating GE's accounting practices and is said to be scrutinizing the Power division's LTSAs.[3])

The Acceleration of Bad Decisions: Buying Alstom

During the second quarter of 2014, GE offered to acquire the Thermal, Renewables and Grid power businesses of French company Alstom for €12bn ($13bn).

Alstom's power assets dovetailed with GE's and included turbines for coal, gas and nuclear power plants. Though Alstom also manufactured turbines for wind farms,

[2] Reuters.com. How GE gambled on fossil fuel power, and lost. Alwyn Scott. February 22, 2018.
[3] MotleyFool.com. GE's latest SEC filing raises more questions than it answers. Samaha Lee. November 30, 2018.

wind power was small within the broader deal.[4] (For example in 2014, GE installed 4,624 megawatts (MW) of wind capacity of which 2,912MW was in the U.S., compared to Alstom's 286MW worldwide wind capacity.)[5, 6]

The deal, which some within GE considered ill-advised, was completed in November 2015, well over a year after the initial offer in April 2014.[7]

GE paid a huge premium for Alstom's Thermal, Renewables and Grid power businesses, well above the book value of Alstom's power assets. (Regulators had not allowed GE to purchase Alstom's Service business, despite services being a material component of GE Power division's revenues and profits.[8])

The acquisition was a costly bet that global utilities would choose gas and coal-fired power far into the future.

Three joint ventures (JVs) were formed during the acquisition which gave Alstom the right to sell its stake to GE for a pre-determined price. The JVs represented $3.2bn and included Alstom's renewables (offshore wind and hydro), grid, nuclear and French steam power businesses.

It was GE's largest-ever industrial acquisition. It had taken nearly two years and had received regulatory approval from more than 20 countries and regions.[9]

Reflections on GE's Acquisition of Alstom

The acquisition of Alstom's thermal power division was ill-advised and ill-timed.

Although GE nearly doubled its fleet of large turbines in coal plants to 1,500,[10] the acquisition was a costly bet that global utilities would choose coal-fired power far into the future.

(GE is a leading supplier of coal-fired power plants worldwide and recently won a contract to construct and equip a 500MW coal-fired power plant in Kosovo. The World Bank had earlier denied financing for the project noting the costs of

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[4] RenewableEnergyWorld.com. Wind energy implications of the Alstom and GE deal. Jesse Broehl. September 15, 2015.
[5] US Department of Energy. 2014 Wind Technologies Market Report. August 2015.
[6] Alstom's offshore wind business was not part of the acquisition of the thermal power division. GE and Alstom created a 50/50 JV for the offshore wind business. In May 2018, Alstom announced it would exercise its right to sell GE its stake in three JVs related to the 2015 acquisition, including the offshore wind business.
[7] Though announced in April 2014, the deal had been discussed between the two companies much earlier. WSJ.com. GE powered the American century. Then it burned out. Thomas Gryta and Ted Mann. December 14, 2018.
[8] Fortune.com. What the hell happened at GE? Geoff Colvin. May 24, 2018.
[9] GE.com. GE acquires Alstom's power and grid businesses. November 2, 2015.
[10] WSJ.com. GE wants to bring more life to coal. August 17, 2016.

renewables are cheaper than coal. See page 19, *Stop GE before it Kills (Value)...Again*).

The acquisition was also a bet on the future of natural gas generation.

"Gas generation remains stable in the long-term...positioned to win in short-term" was a key but flawed message GE made to investors, even in presentations on renewable energy.[11] Indeed, this belief in the primacy of natural gas as a crucial fuel source for electricity generation had become conventional wisdom at the time of the Alstom acquisition in 2015.

The rationale for the acquisition assumed that power plants supplying electricity would:

- continue to buy new gas turbines that cost hundreds of millions of dollars and have a 25-year life,
- commit to multi-year contracts to service these turbines,
- upgrade ageing gas-fired power plants to counter intermittency of wind and solar, and
- require a steady volume of repairs for natural gas plants.

Each of these assumptions would quickly prove to be too optimistic.

Following Purchase of Alstom, GE Doubles Down on Thermal Power

With the completion of the Alstom acquisition in November 2015, GE significantly expanded its exposure to the thermal power market. That year, GE was the world leader in manufacturing gas turbines.

GE, Siemens, and Mitsubishi Hitachi Power Systems control roughly 80% of the global market in natural gas turbines. GE's turbines, along with its other power generation equipment, produce one-third of the world's electric power, according to the company.[12]

The $13.7bn acquisition price was far more than the book value of Alstom's assets.

The $13.7bn acquisition price (which included costs to acquire Alstom's stake in three JVs created during the acquisition that were later sold to GE for $3.2bn), was

[11] GE's investor presentations were filled with statements that confirmed this conviction. For example, SeekingAlpha.com. GE Power and Renewable Energy Investor Meeting. March 8, 2017.
[12] E&ENews.com. The wonder and woes of GE's turbine business. Peter Behr. March 15, 2018.

far more than the book value of Alstom's assets and thus included significant intangible assets and "goodwill," much of which would ultimately be written off.[13]

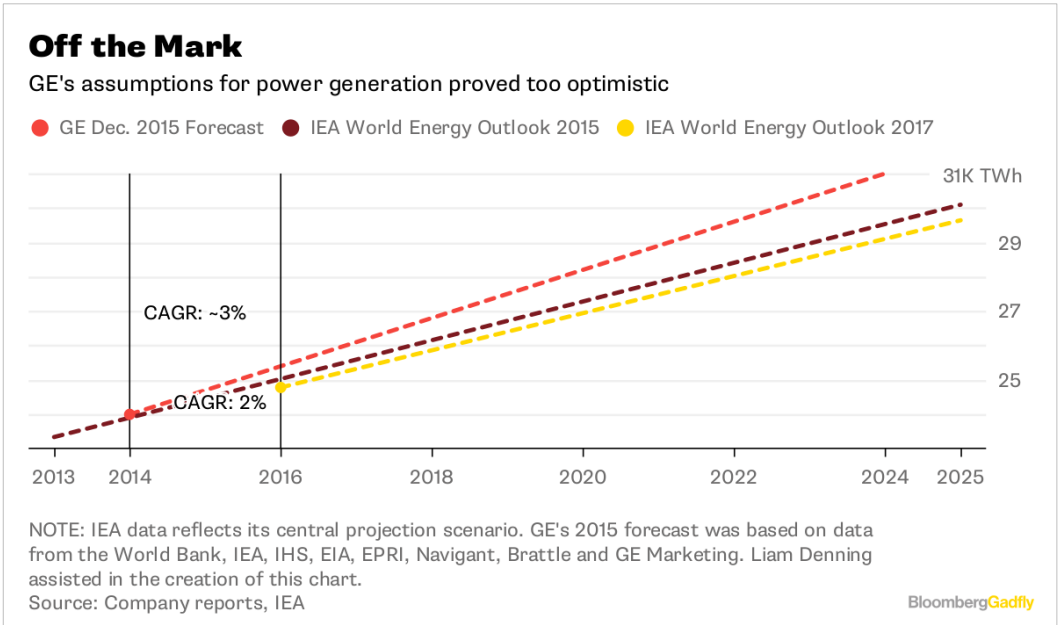
Management continued to increase the goodwill on GE's balance sheet relating to the Alstom acquisition long after the deal closed as the company 'capitalized' these unexpected losses rather than expensing them through the profit & loss statement.

For example, in 2016, GE increased the value of the goodwill related to the deal to $17.3bn, citing unfavorable customer contracts, legal reserves and tax issues related to the deal causing GE to retrospectively increase its goodwill associated with the deal.[14] This allowed the company to avoid a write-down at that time that would have hit earnings, a practice now being scrutinized by the U.S. SEC.

GE's Overly Robust Assumptions About Power Generation

Under the leadership of then-CEO Jeffrey Immelt, GE was optimistic about the growth of electricity power generation and particularly optimistic about the role of natural gas.

Figure 1: GE's Assumptions for Power Generation Proved Overly Optimistic



[13] Goodwill, as an accounting practice, is often misunderstood. It arises only when a company acquires another business and pays more than book value for its tangible assets. A company can only have goodwill on its balance sheet after it has bought another company, at more than the price its assets were valued on the financial statements before the sale.
[14] Bloomberg.com. GE's 23 billion writedown stems from a bad bet on fossil fuels. Brooke Sutherland. October 22, 2018.

Though renewables were growing, natural gas was thought to be essential to balance the intermittency of wind and solar power. The potential excess capacity of natural gas plants was for the most part ignored.[15]

In 2015, GE assumed a 3% compound annual growth rate (CAGR) for power generation over the coming decade. This was higher than the 2% CAGR forecast by the International Energy Agency (IEA) in its 2015 World Energy Outlook.[16]

GE Power division's CEO Steve Bolze forecast 5% annual sales growth for the division, in a 2015 presentation. History has shown this forecast to be directionally wrong.

Two years later, GE continued to forecast electricity generation growth of 2-3% per year, "led by gas and renewables." Company presentations noted that gas remained the "most economical energy source today." [17]

Gas Turbine Demand Was Plummeting

Weakening demand for gas turbines was masked in 2016 because of the Alstom acquisition, which helped lift revenues in the Power division to nearly $27bn and provided an order backlog of $85bn.[18]

By the end of 2016, GE's then-CFO Jeff Bornstein noted in an earnings call that the Alstom integration had "performed well this year with total orders of $10bn, building a backlog that is up 18%."[19]

In 2017, global demand for gas turbines unexpectedly collapsed.

In 2017, global demand for gas turbines unexpectedly collapsed (See Figure 2).

GE misjudged the magnitude of the gas turbine decline and its ripple effect on major revenues, profits and cashflows in its largest segment, as well as associated losses in GE Capital, a financier of thermal power plants.

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[15] While there may have been signs of trouble with the Alstom deal, they were perhaps buried. In a footnote in Alstom's 2014 annual report which was published before the Alstom deal closed in late 2015, management cautioned there was "excess capacity in developed markets," which could impact demand for its power business.

[16] Bloomberg.com. GE's 23 billion writedown stems from a bad bet on fossil fuels. Brooke Sutherland. October 22, 2018. The IEA forecast also proved to be overly optimistic on the growth of power generation which grew less than 2%. IEEFA would note the global opportunities in energy efficiency to continue the decoupling of energy and economic activity is a key to achieving the Paris Agreement.

[17] SeekingAlpha.com. GE Power and Renewable Energy Investor Meeting. March 8, 2017.

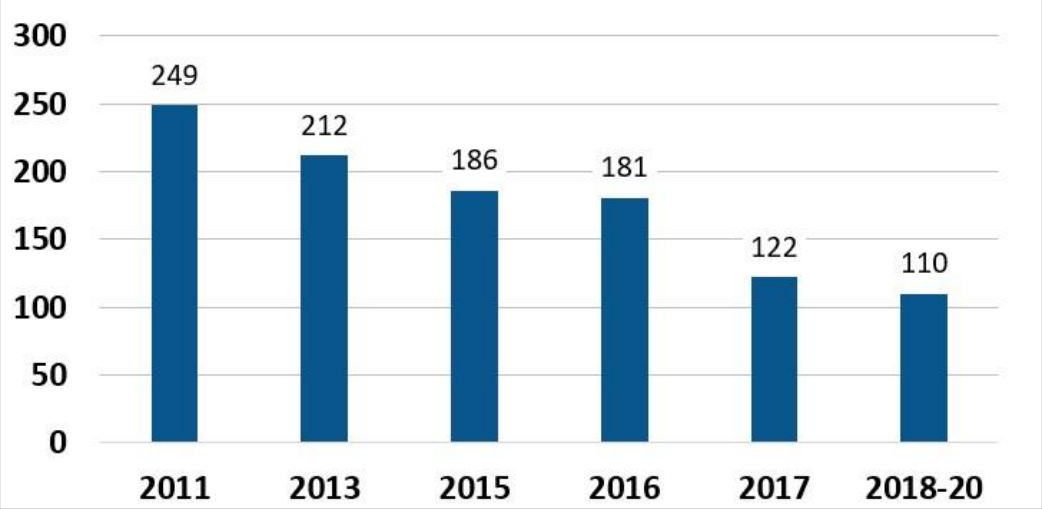
[18] Ibid.

[19] SeekingAlpha.com. General Electric's (GE) CEO Jeff Immelt on Q4 2016 Results - Earnings Call Transcript. January 20, 2017.

During an investor presentation in March 2017, GE forecast new plant orders (annual average sales) of approximately 78 gigawatts (GW) for 2017-2026.[20]

By the end of 2017, GE had slashed its sales forecast for that year to just 40GW, the lowest level for twenty years, and 40% below the 2000-2015 average of 68GW/year.

Figure 2: Number of Large Gas Turbine Units (>100MW) Sold Worldwide[21]



Source: Siemens.

The decline in natural gas turbine sales affected service revenues that were packaged into new orders.

The LTSAs, or service contracts - a crucial source of profit for the Power division, represents payments from power generators to maintain turbines. Service contracts were designed to be flexible to allow for technological innovations that might improve performance.

As sales of gas turbines declined, the pressure was on to boost profitability elsewhere in the Power division. The billions of dollars tied up in existing LTSAs offered a prime opportunity.

As the Wall Street Journal noted, service contracts were renegotiated to boost profitability.[22] GE changed underlying assumptions and incentivized customers to

[20] SeekingAlpha.com. GE Power and Renewable Energy Investor Meeting. March 8, 2017 (slide 16).
[21] Seimens Annual Press Conference. Targets achieved – Another outstanding year for Siemens. November 9, 2017. p. 14.
[22] WSJ.com. GE powered the American century. Then it burned out. Thomas Gryta and Ted Mann. December 14, 2018.

extend service contracts out to 2050.[23]

Despite these efforts to boost profits through "aggressive" accounting with its service contracts, the Power division's profits in 2017's fourth quarter plunged by 88% from the previous year. Compared to prior periods and the level of assets employed, it made a minuscule $260m profit on sales of $9.4bn that quarter.

The targeted $3.6bn of annual synergies by 2020 relating to the Alstom acquisition almost entirely failed to materialize.

Natural Gas Turbines Sales Collapse Accelerates in 2018

In 2018, the natural gas turbine industry saw its worst year since 2002, according to McCoy Power Report surveys.[24] (McCoy data tracks 35 individual data points for each equipment piece or service award.)

That same year, global demand for gas turbines greater than 30MW had shrunk by 50% from 2015 levels.

While GE's sales of gas turbines still led the industry, the overall pie had shrunk.

While GE's sales of gas turbines still led the industry, the overall pie had shrunk.

The three primary players dominating the sector: GE, Mitsubishi Hitachi Power Systems (MHPS) and Siemens all responded by reducing margins to win business.

Increasing GE's worries in 2018, MHPS dominated sales of advanced turbines over 100MW with 41% of sales compared to GE's 28% and Siemen's 25%.[25] (In 2018, GE

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[23] The services landscape also offered a glimmer of hope. GE Power's services backlog grew from $44bn in 2014 with a retention rate of 96% to $63bn in the third quarter of 2017 with a retention rate of 99%. Yet, GE Power CEO, Russell Stokes noted a number of challenges this segment could face owing to a laxer U.S. market, tough pricing dynamics, overcapacity of service vendors, and lower outages of steam utilization based on the retirement of coal plants. LTSAs had been a material source of profits for both the Power and the Oil & Gas divisions. In 2018, GE had service backlogs of more than $307.6bn, and $89.1bn of these were in these two divisions. The $23bn impairment charge for the Power and Oil & Gas segments included service contract impairment charges.

Service Backlog ($ billions)

Segments	**2018**	**2017**
Power	$67.6	$71.8
Renewables	$8.7	$6.9
Aviation	$185.7	$166.1
Oil & Gas	$21.50	$21.9
Healthcare	$11.2	$11.7
Transportation	$12.9	$13.3
Total	$307.6	$291.7

[24] WSJ.com. GE powered the American century. Then it burned out. Thomas Gryta and Ted Mann. December 14, 2018.

[25] Reuters.com. GE wins most 2018 gas turbine orders. Mitsubishi wins on new technology: Report. Alwyn Scott. February 12, 2019.

continued to dominate sales of an older model of natural gas turbines, the F-Class units, beating out rivals Siemens and MHPS.)

GE lagged its rivals in newer advanced turbines, while sales were plunging for even its most technologically advanced and efficient HA turbine.

Described as a "950,000-pound assemblage of fan blades, combustion chambers, nozzles and igniters…it is a massive jet engine with a drive shaft down the middle,"[26] the HA turbine went on sale in 2014. GE had spent $2bn developing this new turbine technology.

In 2018, sales for GE's large gas turbine (defined as more than 100MW) dropped 60% from 102 units in 2017 to just 42 in 2018, and the backlog for new orders of large turbines dropped 23%.[27]

Large natural gas turbine sales and power services are the main revenue and profit drivers in the Power division. In 2016 for example, gas turbine sales and services represented $10bn and $15bn respectively of Power's $27bn revenue. Services, including repair revenues and deliveries of its performance-enhancing Advanced Gas Path (AGP), designed to improve the performance of older gas turbines, represented roughly half of the Power division's revenue.

Here again, GE appears to have misjudged how the growth of renewables would derail its business.

In March 2017, GE forecast it would sell 160 units of AGP in 2018. In November 2017, it reduced its estimates by 75% to "a number closer to 40." Owners of older gas-fired power stations had become better at managing the intermittency of wind and solar, and had less incentive to use AGP, which would have allowed them to increase the volume of gas.

Increasing the impact of GE's massive misjudgment concerning the growth of gas-fired power, repairs to gas-fired power plants also declined. Many turbine sales include long-lived support contracts as part of the price, which further magnified the losses.

In short, declining demand for new large natural gas turbines and related service contracts, enhancements for older gas turbines, and lower repairs were a trifecta that torpedoed GE Power.

In 2018, GE Power reported revenue of $27.3bn despite additional sales that were supposed to have come from the Alstom acquisition. The Power division also reported a record loss of $808mn in 2018, a massive decline in just two years from the $4.19bn record profit booked in 2016 (which had included a loss from Alstom of $0.3bn on $13bn of revenues).

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[26] E&ENews.com. The wonder and woes of GE's turbine business. Peter Behr. March 3, 2018.
[27] The order backlog represents orders that have not yet been recognized as revenue. Order for large gas turbines are not recognized as revenue until the turbine is delivered, which can be one to three years later.

Unfortunately, GE had become increasingly more leveraged to the Power division just as the underlying market unraveled, precipitously.

Since 2014 GE had been divesting from many of its financial businesses related (mostly) to GE Capital's assets. As a result, its Power division, which from 2012-2015 had produced a steady stream of revenues (ranging from $19.3-20.6bn) and operating profits ($4.3-4.5bn), represented a greater percentage of the company's total revenues in 2016. Indeed, by the second quarter of 2018, the Power segment represented roughly 45% on total revenues, making GE increasingly dependent on profits from it.

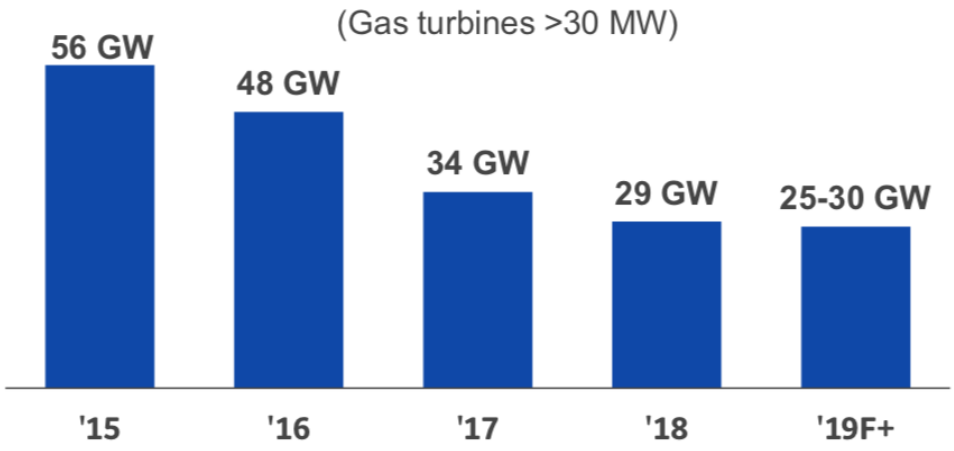
A Whopping $23bn Write-Down, Double the Cost of the Ill-Fated Acquisition

In 2018, GE booked a $23bn write-down for the goodwill balance in its Power division, more than the entire investment in Alstom just three years after the acquisition was completed.

When announcing the massive impairment charge, GE noted that its Power division's goodwill balance, then roughly $23bn, would be nearly erased. The impairment charge primarily related to GE's acquisition of thermal power assets from Alstom in 2015. (This $23bn write-down was separate from additional write-downs related to its exit from the financial services business, described in the sidebar.)

A write-down of more than the original purchase price is highly unusual and is among the reasons the SEC is investigating GE, while the Justice Department is conducting a criminal probe.[28]

Figure 3: Gas Turbine Industry Orders



Source: GE 2018 Annual Report.

[28] WSJ.com. GE slashes dividend; discloses criminal probe. Shares sink. Thomas Gryta. October 30, 2018.

Also in 2018, GE suffered much publicized technical problems with its advanced turbines in Texas. A production issue had caused problems with the blades, and power plants equipped with the new turbines had to be shut down. The necessary repairs for its global fleet, the company noted, may cost half a billion dollars.

It was perhaps a fitting end for 2018, a notoriously difficult one for GE.

GE Was Blind to the Changing Energy Landscape

As the industry leader in gas turbine sales, it is hard to fathom why the drastic slowdown in its largest division caught the company by surprise.

In retrospect, collapsing demand for gas turbines was blamed on energy efficiency gains and increasingly affordable alternative energy.[29] GE's management commentary to the SEC in 2019 noted: "market factors such as increasing energy efficiency and renewable energy penetration continue to impact our view of long-term demand. These conditions have resulted in downward revisions of our forecasts on current and future projected earnings and cash flows at these businesses."[30]

From early 2014, when GE was under the leadership of then-CEO Immelt, head of business development and eventual CEO Flannery began to consider the acquisition of Alstom. When the deal closed in November 2015, the costs of wind turbine per watt had declined roughly 15% and solar costs had dropped more than 30% according to Lazard.[31] A longer perspective of rapid price declines is provided in Figure 4.

American GDP has entirely decoupled from energy demand.

The mean levelized cost of energy continued to drop in 2018. Utility-scale PV technologies were down approximately 13% from 2017, and the levelized cost of onshore wind declined by 7%.[32] Renewable energy costs are expected to continue to fall, according to the National Renewable Energy Laboratory (NREL).[33]

Energy efficiency also played a role, as noted by GE in its investor commentary to the SEC. Electricity demand had been largely flat in the U.S. over the last ten years,

[29] Bloomberg.com. GE's 23 billion writedown stems from a bad bet on fossil fuels. Brooke Sutherland. October 22, 2018.
[30] MotleyFool.com. GE's latest SEC filing raises more questions than it answers. Lee Samaha. November 30, 2018.
[31] Lazard.com. Perspective: Levelized cost of energy and levelized cost of storage – 2018. November 8, 2018.
[32] Ibid.
[33] Forbes.com. Plunging prices mean building new renewable energy is cheaper than running existing coal. Megan Mahajan. December 3, 2018.

driven largely by electricity efficiency programs.[34] These programs have had a ripple effect on investment, including the future of electricity generation.

Further, global gross domestic product (GDP) had long been a reliable proxy for the power market.[35] GE's losing bet on gas and coal perfectly illustrated how that has changed. For a decade, American GDP has entirely decoupled from energy demand.

Figure 4: Levelized Cost of Energy (LCOE) Wind and Solar: Lazard[36]

Source: Lazard.

Another Bad Bet on Fossil Fuels

In 2017, GE's $30bn acquisition of 62% of Baker Hughes, an oil services company, was another bad bet on fossil fuels. It followed nine other acquisitions in the oil and gas industry between 2010 and 2014, when oil prices were roughly $100 a barrel.[37]

In 2016, GE agreed to combine its Oil & Gas division with Baker Hughes. Buyer's remorse set in early. In fact, despite a requirement to hold the stock for at least two years, GE was trying to offload its ownership after just a year.

In late 2018, GE and Baker Hughes came to an agreement for GE to sell 12% of Baker Hughes for a third of what it had paid, prompting some analysts to describe

[34] Greentechmedia.com. What does the future hold for utility electricity efficiency programs. Chuck Goldman and Lisa Schwartz. February 6, 2019.
[35] WSJ.com. GE powered the American century. Then it burned out. Thomas Gryta and Ted Mann. December 14, 2018.
[36] Ibid.
[37] Fortune.com. What the hell happened at GE? Geoff Colvin. May 24, 2018.

GE's sale as "desperate," or potentially a red flag that GE may be in worse shape than investors suspect.[38]

The GE Capital Exit Plan

GE Capital was designated as a non-bank systemically important financial institution (SIFI) in 2013, meaning GE Capital was deemed too big to fail without introducing systemic financial system risks.[i]

In April 2015, the GE Capital Exit Plan was announced whereby GE agreed with U.S. regulators to progressively exit its $500bn financial services businesses. GE estimated it would incur $23bn in after-tax charges through 2016 as a result.

Once a source of strong earnings, GE Capital reported a net segmental loss of a cumulative $8.5bn over 2016-2018. GE's Insurance division recorded an unexpected increase in future policy benefit reserve requirements of $8.9bn, and $0.6bn of related intangible asset write-offs at the end of 2017.

In 2019, as a clear admission of the failure of management controls, GE Capital confirmed it will pay the United States government a $1.5bn civil penalty to settle the Department of Justice (DOJ) investigation of violations of the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 by WMC Mortgage Corporation, GE's U.S. residential mortgage business. This is a clear admission of the failure of its management controls.

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[i] GE Capital was designated as a non-bank systemically important financial institution by the US Financial Stability Oversight Council in 2013 under the 2010 Dodd-Frank Act, which was a response to the 2008 financial crisis, when largely unregulated institutions such as American International Group Inc. (AIG) required large taxpayer-funded bailouts.

Excessive Financial Leverage Saw the Thermal Power Decline turn into a GE Rout

In December 2016, GE was a company with significant leverage on leverage on leverage: the balance sheet debt was in addition to the financial leverage in GE Capital as well as the $36bn underfunding of its pension plans, while GE's equity base was eroded by write-downs and massive share buybacks and equity spin-offs.

While financial leverage drove the collapse of GE's value over 2016-2018, the trigger was the halving of global thermal power equipment sector demand.

[38] MotleyFool.com. Is GE getting desperate with its Baker Hughes stake sale? Adam Levine-Weinberg. November 15, 2018.

The impact on shareholders was compounded by multiple levels of financial leverage.

Unfortunately for GE shareholders and employees, GE bought back 128mn shares over 2016 at $30.30 per share at a cost of $24.7bn, adding financial leverage at a stock price three times the market value three years later.

The timing could not have been worse. GE exited 2017 with $135bn of total borrowings, leveraging the operating performance meltdown. The buyback was fortuitous only for shareholders who sold into it. Remaining investors were saddled with increased financial leverage.

The loss of value in GE Capital over 2016-2018 was also magnified because of this additional financial leverage.

GE has seen a series of belated credit rating downgrades after the collapse of its share price and massive write-downs. On October 31, 2018, Moody's lowered the credit rating of GE's long-term debt down two notches from A2 to Baa1, putting it just two notches above the non-investment grade cut-off.

By the end of 2018, U.S. financial markets were pricing in a material probability of bankruptcy for GE.

In November 2018, Fitch lowered the credit ratings of GE from A to BBB+, with a Stable outlook. Then in February 2019, Fitch changed its outlook for GE from Stable to Negative. By the end of 2018, U.S. financial markets were pricing in a material probability of bankruptcy.

In 2018, GE reported a loss of $22.8bn after reporting a net loss of $8.9bn in 2017, down from $6.8bn net profit in 2016.

In March 2019, GE announced a further downgrade on earnings expectations. It noted excessive financial leverage, combined with expectations that the global gas turbine market was now expected to run at a range of 25-30GW annually for the foreseeable future, was leaving excess capacity across industry and driving down Power's revenues and margins even further.

GE flagged that the entire industrial group would have a negative free operating cashflow in 2019.

After the spin-off of its U.S. Residential Mortgages business - Synchrony Financial, GE had an issued ordinary capital of 9.38bn shares. With the share price at $30 per share at the start of 2016, GE had an ordinary equity market capitalization of $280bn.

By the end of 2018, GE's share price (in **red**) was down to $7.75 per share, giving a market capitalization of $67bn (see Figure 5). GE shares have since recovered to US$10.35 consistent with the overall 2019 equity market rally.

To the end of 2018, GE's drop in share price represented a 74% decline, a destruction of shareholder wealth of a staggering $193bn. The U.S. S&P 500 index (in **black**) increased 33% in this same three-year period.

GE investors not only faced a huge absolute loss, but also a significant opportunity cost in terms of market returns forgone.

Figure 5: GE Share Market Underperformance Since the Start of 2016

Source: Yahoo Finance, ChartIQ (accessed 3 May 2019, GE benchmarked against the S&P 500).

Its largest shareholder BlackRock owned 530 million shares or 5.7% of GE at the start of 2016—a position worth $16bn. Three years later, BlackRock had lost $11bn on this single position, representing in effect a huge stranded asset loss.

The relative loss was even more significant. If BlackRock had instead invested $16bn in the S&P500 at the start of 2016 instead of GE, BlackRock investors would have received a $5bn capital gain from 2016 to 2018.

The opportunity cost to BlackRock investors was therefore a staggering $16bn (the combination of the $11bn capital loss and $5bn opportunity cost).

The Majority of Stranded Asset Risks Are Still Ahead for Global Investors

IEEFA would conclude with a warning from GE's experience.

Much of the global energy system's stranded asset risks are still in front of global investors. The equity and debt write-offs seen at GE, and in the European utility sector and Indian thermal power generation sector over the last decade, are just a taste of the potential stranded asset losses to come.

The IEA estimates that current energy policies globally put the world on a 2.7°C or worse trajectory. Either the Paris Agreement fails, or investors should expect further, major energy sector disruptions.

The Bank of England Governor Mark Carney has repeatedly highlighted the magnitude of climate change risks, and in April 2019 quantified stranded asset losses at an estimated $20 trillion.[39]

Further, global investors managing $32 trillion released a policy statement in December 2018 calling for a global price on carbon and an accelerated coal phase-out:[40]

"Expert analysis shows that to meet the Paris Agreement goals of limiting the increase in global temperatures by 2°C, while striving to limit the increase to 1.5°C, a coal phase-out is needed by 2030, in the OECD countries and in the European Union; by 2040, in China; and by 2050, in the rest of the world."

A rapid and dramatic realignment of global investments in energy markets is required.

Despite this, the majority of financial institutions and global investment managers have until recently given little more than lip service to the financial implications of the Paris Agreement.

A rapid and dramatic realignment of global investments in energy markets is required to reorient the world to be consistent with the 1.5-2°C target agreed to under the Paris Agreement.

And like GE back in 2015, as the first among equals, in IEEFA's view, BlackRock today remains almost entirely unprepared for the stranded asset risks related to climate change.

It is time to end the rhetoric of annual CEO letters and actually take action.

[39] Bank of England, Avoiding the storm: Climate change and the financial system, April 15, 2019.
[40] IGCC, Briefing Paper on the 2018 Global Investor Statement to Governments on Climate Change, December 2018.

Stop GE Before It Kills (Value)...Again

GE has announced it will build a coal-fired power plant in Kosovo, providing financing that even the World Bank has backed away from. For investors who hoped the new CEO, Larry Culp, had learned lessons about investing in state-subsidized fossil fuels, especially uneconomic coal-fired power plants, it is a deeply puzzling move.

Earlier this month, GE was selected to build and equip the 500MW coal-fired plant in Kosovo. The cost is expected to be $1.3bn, with subsidized government funding provided by the Overseas Private Investment Corporation (OPIC) and a mix of export credit agencies. The Balkan country sits on a vast amount of lignite coal which is considered the most polluting and highest emitting form of coal, and environmentalists have fought the plant for some time.

For many years, IEEFA had questioned the financial rationale for the Kosovo plant, concluding that it would never be economic. In our 2016 report: The Proposed *New Kosovo Power Plant:* An Unnecessary Burden at an Unreasonable Price, IEEFA suggested that instead of investing in a coal-fired power plant, the World Bank, which had in 2015 agreed to support the power plant with financial subsidies, should instead invest in the development of renewable energy and energy efficiency. IEEFA also called on the U.S. government to discontinue its support for the project.

In 2018, the World Bank reversed course and said it would not fund the coal-fired plant because the plant operators had not considered renewables. Its President, Jim Yong Kim said the lender had made "a very firm decision" not to go forward with funding. "Because we are required by our bylaws to go with the lowest cost option and **renewables have now come below the cost of coal**…so, without question, we are not going to do that," he said during the meeting, broadcast live on the World Bank's website.

GE, it appears, has reached a different conclusion. Or perhaps the company plans to limit its financial exposure by only constructing—and not owning—the power plant.

Owning coal-fired plants has not worked out well for GE.

Homer City is a case in point. It was not that long ago that GE owned part of Homer City, a coal-fired plant in Pennsylvania, U.S. In early 2019, it sold its share of the plant. Homer City has been through bankruptcy twice, in 2012 and then 2016/2017. It is headed for a hat trick—a third bankruptcy.

The plan for re-emerging from bankruptcy in 2016/2017 was based on extremely unrealistic assumptions about future operating costs and performance, and energy market prices. All of these assumptions have been

proven wrong, based on modelled plant costs, though the actual plant's Operations and Maintenance (O&M) is not available.

Clearly, the Homer City power plant was not competitive. It operated at only a 39% capacity factor in 2016, and an even lower 31% capacity factor in 2017 and 2018.

The plant is sitting near some of the lowest priced natural gas in the U.S. and in a region (PJM) that is awash with efficient new and low-cost natural gas combined cycle plants.

Its future looks dim, to say the least.

About IEEFA

The Institute for Energy Economics and Financial Analysis conducts research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

About the Authors

Tim Buckley

Tim Buckley, IEEFA's director of energy finance studies, South Asia/ Australia, has 30 years of financial market experience covering the Australian, Asian and global equity markets from both a buy and sell side perspective. Tim was a top-rated Equity Research Analyst and has covered most sectors of the Australian economy. Tim was a Managing Director, Head of Equity Research at Citigroup for many years, as well as co-Managing Director of Arkx Investment Management P/L, a global listed clean energy investment company that was jointly owned by management and Westpac Banking Group.

Kathy Hipple

A financial analyst at IEEFA, Kathy Hipple teaches the finance sequence at Bard's MBA in Sustainability and is the founding partner of Noosphere Marketing. Hipple has written extensively about sustainable, responsible and impact finance and investing. As vice president at Merrill Lynch for 10 years, she placed fixed income securities with international institutional clients, and advised international life insurance companies and pension funds. She later founded Ambassador Media, a local search firm in New York City, and served as its CEO. She has served on several boards, including the national Local Search Association and Bennington County's Meals on Wheels.

Tom Sanzillo

Tom Sanzillo, director of finance for IEEFA, is the author of several studies on coal plants, rate impacts, credit analyses and public and private financial structures for the coal industry. He has testified as an expert witness, taught energy-industry finance training sessions, and is quoted frequently by the media. Sanzillo has 17 years of experience with the City and the State of New York in various senior financial and policy management positions. He is a former first deputy comptroller for the State of New York, where he oversaw the finances of 1,300 units of local government, the annual management of 44,000 government contracts, and where he had oversight of over $200 billion in state and local municipal bond programs and a $156 billion pension fund.