

## SWS Energy & Industrials Team Industry Report

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### Description

The energy industry includes the total of all industries involved in the production and sale of energy, including fuel extraction, manufacturing, refining and distribution. It includes the petroleum industry, gas industry, electrical power industry, coal industry, nuclear power industry, and renewable energy. Renewables are the fastest growing energy source. By 2040, coal, natural gas and renewable energy sources will provide roughly equal shares of world electricity generation.<sup>1</sup> The Global Industry Classification Standard<sup>2</sup> used by Morgan Stanley define the energy industry as comprising companies primarily working with oil, gas, coal and consumable fuels, excluding companies working with certain industrial gases. Many also divide the industry into upstream – oil and natural gas drilling, midstream – pipelines and processing, downstream – chemicals and refining. Between 1985 and 2018 there have been about 69,932 deals in the energy sector. This cumulates to an overall value of 9,578 bil USD.<sup>3</sup>

### Natural Gas & Oil

#### Overview

US is one of the leaders in production and supply of energy, as well as consumption of energy. Some characteristics that are true for the energy sector are sensitivity to political events, huge expenditure and presence of macro-economic drivers. Availability of renewable energy has a cyclical cycle in nature often because of weather and changing seasons which plays a role in determining demand for energy sources like Petroleum. The energy industry also has very large capital expenses with respect to R&D, legal expenses, expenses related to drilling and shipping of oil etc. This industry is also greatly affected by macroeconomic factors such as GDP, increased access to natural resources, changes in disposable income etc. It is also deeply influenced by instability in global affairs, as seen in 2018 and

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<sup>1</sup> <https://www.computerworld.com/article/3068599/renewables-fastest-growing-energy-source-feds-say.html>

<sup>2</sup> [https://en.wikipedia.org/wiki/Global\\_Industry\\_Classification\\_Standard%22\\_%5Co\\_%22Global\\_Industry\\_Classification\\_Standard](https://en.wikipedia.org/wiki/Global_Industry_Classification_Standard%22_%5Co_%22Global_Industry_Classification_Standard)

<sup>3</sup> [https://en.wikipedia.org/wiki/Energy\\_industry](https://en.wikipedia.org/wiki/Energy_industry)

which mostly will continue to impact the world energy complex even after 2018 saw oil markets reach four-year highs.<sup>4</sup> A big thing in the energy industry currently is the challenge of supply disruption. In countries like Venezuela, this is related to geopolitical issues, while in others it is due to the fact that OPEC decided to cut down on the production of oil.<sup>5</sup>

## Trends

Recently, there has been more of a focus on the importance of environmental sustainability, especially due to increasing awareness of global warming and other environmental issues. There is also an increasingly prevalent use of energy efficient equipment, and various major companies are publicly declaring their energy efficiency targets, including a reduction of energy usage and a focus on switching to sustainable energy sources. These factors all contribute to a slow rate of growth for electricity demand.<sup>7</sup>

This step towards cleaner sources of energy correlates to why there's been a shift from coal to natural gas, which burns in a cleaner way.<sup>6</sup> This shift to renewables can also be seen for companies on the consumption end of the spectrum. For example, utilities like NextEra Energy get a lot of its revenue from renewable sources of power, and companies like Tesla are moving to build electric automobiles. The potential to save energy and cut carbon emissions will be transformative for the energy complex.<sup>7</sup>

There is also an increasing demand for innovations and advancements in technology. Especially with the recent popularity of smart devices such as Amazon's Alexa and Google Home, consumers are interested in the development of other smart solutions to increase energy efficiency.<sup>7</sup> Additionally, as the industry continues to evolve, new business models are needed for companies to keep up with the ever-changing developments.<sup>8</sup> Another change in the energy industry is

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<sup>4</sup> (<https://www.energydigital.com/renewable-energy/open-energy-market-top-10-trends-2019>)

<sup>5</sup> <https://www.nytimes.com/2018/12/07/business/energy-environment/opec-russia-oil-prices-production.html>

<sup>6</sup> <https://www.eia.gov/todayinenergy/detail.php?id=37193>

<sup>7</sup> <https://www.energydigital.com/renewable-energy/open-energy-market-top-10-trends-2019>

<sup>7</sup> <https://www.strategyand.pwc.com/trend/2017-power-and-utilities-industry-trends>

<sup>8</sup> [https://www.ey.com/Publication/vwLUAssets/EY-five-key-trends-are-impacting-the-energy-industry-which-will-drive-significant/\\$FILE/EY-five-key-trends-are-impacting-the-energy-industry-which-will-drive-significant.pdf](https://www.ey.com/Publication/vwLUAssets/EY-five-key-trends-are-impacting-the-energy-industry-which-will-drive-significant/$FILE/EY-five-key-trends-are-impacting-the-energy-industry-which-will-drive-significant.pdf)

<sup>9</sup> [https://openarchive.cbs.dk/bitstream/handle/10398/9251/mapping\\_report\\_d1\\_offshore.pdf?sequence=1](https://openarchive.cbs.dk/bitstream/handle/10398/9251/mapping_report_d1_offshore.pdf?sequence=1)

the increasing installation of smaller plants, leading to a decentralization of the industry and an increased usage of greener technology.<sup>8</sup>

The macroeconomic drivers for this industry include global economic growth, technology development, the prices of energy sources, and countries' differing energy policies.<sup>9</sup> Often, increasing demand for energy accompanies economic growth, while technological development also affects the energy usage. To some extent, different energy sources can be substitutes for each other based on their relative prices. However, the energy infrastructure often limits the choices of energy sources, also making it difficult to fully shift from one energy source to another. Additionally, as mentioned before, there is an increasing concern about environmental sustainability, causing countries to continue to develop energy policies to help limit global warming and pollution.

### Major Current Events

US energy and industrial manufacturing deals activity experienced a healthy 2018 and may lead into 2019 with positive outlooks. Mergers and acquisitions for industrial manufacturing seem positioned for a strong 2019, primarily driven by continued business confidence and an increasing focus of US firms to enhance their geographic presence and strengthen their product portfolios. The Tax Cuts and Job Act signed in December 2017 is likely to lead to enhanced M&A activity in 2019 as manufacturers accrue cash and look for ways to invest. Further, manufacturing firms are also expected to repatriate cash from foreign countries and look to expand their production capacity and resources in the United States, driving reshoring initiatives. This could lead to new factories, as well as smaller players and suppliers being acquired.

The 2019 energy industry is expected to increasingly include long-term issues. Sustainability is no longer a niche issue for energy companies. It is moving to the centre of strategy and investment decisions. Major oil companies are investing in renewable energy; natural gas producers, shippers, and consumers are increasing their focus on mitigating methane emissions; chemicals producers are ramping up their efforts to find solutions to plastic waste, through recycling and use of new materials and processes. Some countries are also stepping up efforts to reduce the environmental and carbon footprints of their energy and industrial sectors, with China, in particular, taking major steps to close down polluting factories and shift towards cleaner energy. Moreover, technology is not standing still—the scope and

pace of growth for low-carbon energy, autonomous and electric vehicles, energy efficiency, and distributed energy are becoming not just topics for futurologists, but factors for decision-making throughout the energy and chemicals value chains.

## Key Players

There are several key major players within the Energy Industry. By market cap, the list of the biggest energy companies (in the order from largest to smallest) is Exxon, Chevron, Total S.A., BP, and PetroChina. The following diagram gives a comprehensive overview of the major companies, ticker symbols, country of origin, subsector. As one may be able to see, the integrated oils and oil/gas production subsectors dominate the energy industry. Integrated oils include discovering, obtaining, producing, refining, and distributing oil and gas. More in-depth discussions and analyses of several of the companies shown will be discussed in further sections.<sup>8 9</sup>

Name	Symbol	Market Cap	Country	IPO Year	Subsector
Exxon Mobil Corporation	<b>XOM</b>	\$332.6B	United States	n/a	Integrated oil Companies
 <a href="#">XOM Stock Quote</a>	 <a href="#">XOM Ratings</a>	 <a href="#">XOM Stock Report</a>			
Chevron Corporation	<b>CVX</b>	\$228.57B	United States	n/a	Integrated oil Companies
 <a href="#">CVX Stock Quote</a>	 <a href="#">CVX Ratings</a>	 <a href="#">CVX Stock Report</a>			
Total S.A.	<b>TOT</b>	\$147.33B	France	n/a	Oil & Gas Production
 <a href="#">TOT Stock Quote</a>	 <a href="#">TOT Ratings</a>	 <a href="#">TOT Stock Report</a>			
BP p.l.c.	<b>BP</b>	\$143.53B	United Kingdom	n/a	Integrated oil Companies
 <a href="#">BP Stock Quote</a>	 <a href="#">BP Ratings</a>	 <a href="#">BP Stock Report</a>			
PetroChina Company Limited	<b>PTR</b>	\$122.26B	China	n/a	Oil & Gas Production
 <a href="#">PTR Stock Quote</a>	 <a href="#">PTR Ratings</a>	 <a href="#">PTR Stock Report</a>			

Source: NASDAQ

1. Exxon Mobil Corp
  - a. Earnings

<sup>8</sup> <http://fortune.com/fortune500/exxon-mobil/>

<sup>9</sup> <https://www.nasdaq.com/screening/companies-by-industry.aspx?industry=Energy&sortname=marketcap&sorttype=1>

According to Forbes, due to a lack of capital investment, ExxonMobil did not grow as fast as its other competitors in 2017, but has nonetheless remained very successful as demonstrated by their earnings in 2018: The Nasdaq reporting of Exxon earnings (as shown by the figure below) shows how Exxon has exceeded EPS forecasts for consecutive quarters. In 2018, their earnings per share continued to growing surprising analysts and proving stable and sustainable profitability, despite this rate not being incredibly fast.

Quarterly Earnings Surprise History				
Fiscal Quarter End	Date Reported	Earnings Per Share	Consensus EPS* Forecast	% Surprise
Dec2018	02/01/2019	1.51	1.08	39.81
Sep2018	11/02/2018	1.46	1.21	20.66
Jun2018	07/27/2018	0.92	1.26	-26.98
Mar2018	04/27/2018	1.09	1.14	-4.39

	DEC 2018	SEP 2018	JUN 2018	MAR 2018
(USD)			Dec 2018	Y/Y
Revenue			68.25B	4.5% ↑
Net income			6B	28.4% ↓
Diluted EPS			1.41	28.43% ↓
Net profit margin			8.79%	31.49% ↓
Operating income			5.39B	34.85% ↑
Net change in cash			-2.63B	-
Cash on hand			3.04B	4.25% ↓
Cost of revenue			44.85B	3.14% ↑

In addition to these impressive financials, they had a 151% year-over-year earnings gain for 2017 on revenues of \$244 billion (Fortune 500). However,

the chart below shows a more worrisome summary of the company's most recent earnings as reported by Google Finance. Exxon's net profit margin and net income have decreased significantly. It is also worthy of noting the 68.25 billion dollars of revenue compared the previous \$244 billion in 2017. However, what is perhaps most peculiar is that analysts according to Yahoo finance are expecting Exxon's revenues to shoot back up to \$307 billion by 2020. The P/E ratio of Exxon is currently 16.39, indicating that the stock may be undervalued.<sup>10</sup>

b. News:

Exxon was recently in a large accounting lawsuit during the end of last year due to incidences of accounting fraud and apparently maintaining two sets of books. Their reputation was greatly damaged and could attribute to why investors are looking less favorable upon them.

2. Chevron Corp

a. Earnings:

Although much smaller in comparison to Exxon, Chevron's revenues are also expected to increase by the end of this year. Financially speaking, Chevron has been struggling to increase profits back to historical levels as well as ROE.<sup>11</sup>

b. News:

Chevron has recently made key investments in new refineries in Pasadena as well as sold other fields. It seems that Chevron is actively taking measures to remedy the previously described issues. They also have promising upstream projects and are working to increase cash flows as an attempt to better their margins. These tactics seem to work as Chevron beat their profit expectations as annual oil and gas output hits record numbers.<sup>12</sup>

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<sup>10</sup> <https://www.nasdaq.com/screening/companies-by-industry.aspx?industry=Energy&sortname=marketcap&sorttype=1>

<sup>11</sup> <https://www.cnbc.com/2019/02/01/chevron-q4-2018-earnings.html>

<sup>12</sup> <https://www.forbes.com/sites/greatspeculations/2019/01/31/expect-much-improved-results-from-chevron-despite-headwinds/#12caab0f2a1c>



3. B.P. p.l.c

a. Earnings:

BP has been known for its efforts toward renewable energy and the support for environmentally friendly, carbon initiatives. Unfortunately, their earnings per share did not reflect the positivity of their reputation as shown by the figure below. The last column is notable because investors were surprised to see this dip.<sup>13</sup>

Quarterly Earnings Surprise History				
Fiscal Quarter End	Date Reported	Earnings Per Share	Consensus EPS* Forecast	% Surprise
Dec2018	02/05/2019	1.04	0.78	33.33
Sep2018	10/30/2018	1.15	0.86	33.72
Jun2018	07/31/2018	0.85	0.85	Met
Mar2018	05/01/2018	0.78	0.67	16.42

In terms of P/E ratio, these three companies are actually very close, but BP is leading. In terms of financial health, It appears that Exxon is dominant in the industry.

Valuation

<sup>13</sup> <https://www.nasdaq.com/earnings/report/bp>

The debt level is a key factor to keep in mind when evaluating a company in energy and industrials. The energy industry is capital-intensive, so a company must have good credit ratings in order to increase their capital. Specifically, the Debt-to-EBITDA leverage ratio, which measures the amount of debt to earnings, is an important measure for evaluating the ability of a company to manage its debt. It shows a company's ability to pay interest on outstanding debt. This is important in the Energy industry in specific because oil and gas companies typically have large amounts of debt on their balance sheets. A ratio of over 3 generally indicates a low ability to pay off debt.<sup>14</sup> Debt-to-capital ratio is used to evaluate a firm's financial structure and its financing operation. The oil industry also has a 40% debt-to-capital threshold, and past that, debt costs increase significantly and is considered to have higher default risk.<sup>15</sup> These metrics vary based on company size, and with the decentralization of energy companies, so they should be observed in aggregate.

For the energy sector, using the industry price-to-earnings ratio of 16.38 as a benchmark does not show the whole picture. The EV/EBITDA ratio is a better metric because it limits the effects of differences in a company's capital structure. If a company has a low ratio compared to the industry averages of 10.19 for integrated oil/gas, 7.70 for oil/gas production and exploration, and 14.41 for oil/gas distribution, it may be undervalued.<sup>16</sup>

When valuing a company in the energy industry, it is important to compare companies that produce similar types of energy. Oil and gas companies also tend to have the highest cost of debt among energy companies. In addition, recent tariffs on non-renewable energy companies can have a significant effect on their value. Many countries in Europe are beginning to place high tariffs on oil and gas companies in order to promote renewable energy sources.

### Valuation Metrics<sup>17 18</sup>

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<sup>14</sup> <https://www.investopedia.com/terms/l/leverageratio.asp>

<sup>15</sup> [https://www.investopedia.com/articles/fundamental-analysis/12/4-leverage-ratios-used-in-evaluating-energy\\_firms.asp](https://www.investopedia.com/articles/fundamental-analysis/12/4-leverage-ratios-used-in-evaluating-energy_firms.asp)

<sup>16</sup> [http://pages.stern.nyu.edu/~adamodar/New\\_Home\\_Page/datafile/vebitda.html](http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/vebitda.html)

<sup>17</sup> [https://csimarket.com/Industry/industry\\_growth\\_rates.php?rev&s=600](https://csimarket.com/Industry/industry_growth_rates.php?rev&s=600)

<sup>18</sup> [https://eresearch.fidelity.com/eresearch/markets\\_sectors/sectors/sectors\\_in\\_market.jhtml?tab=learn&sector=10](https://eresearch.fidelity.com/eresearch/markets_sectors/sectors/sectors_in_market.jhtml?tab=learn&sector=10)

Quick Ratio	0.8
Working Capital Ratio	1.2
Leverage Ratio	0.95
Gross Margin %	53.78%
Operating Margin %	18.24%
Net Profit Margin %	10.58%
Return on Equity	15.35%
Return on Investment	10.36%
Return on Assets	5.59 %
Revenue Growth	24.75%
EPS	\$3.95
EPS Growth	156.07%

## Coal

### Overview

Coal had been expanding output, more than doubling since the 60s until around 2009 when it began to decline. Environmental regulations are often cited as a key reason for the decline of the coal industry due to the pollution caused by mining coal. Fracking has also driven down the prices of natural gas and oil, making coal, which is more expensive by comparison, a less competitive energy source. Similarly, the expansion of renewables has also driven down coal production. The market share is also concentrated in the east, due to their much greater labor productivity in coal mining. Coal mining is generally seen as a poor investment choice due to these trends from the past decade.<sup>19</sup>

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<sup>19</sup> <https://siepr.stanford.edu/research/publications/what-killing-us-coal-industry>

## Trends

Since April 2011, many US coal producers have lost more than 92% of its value amid historically weak coal market conditions.

According to the U.S. Energy Information Administration (EIA) report, coal consumption in 2019 in the US will decline to 652.3 million short tons, which shows a 5.6% decline from expected 2018 levels and are also the lowest level seen since 1979.<sup>20</sup>

The domestic use of coal is dropping. However, wide availability and low prices of coal compared with other alternative sources of energy make it a popular source of energy among developing nations. Therefore, the EIA report forecasts coal exports to rise.<sup>21</sup>

## Major Current Events

Per a World Coal Association report, 37% of electricity and 74% of steel worldwide is produced utilizing coal as an energy source.<sup>22</sup>

Coal companies in the US are beginning to lose ground as renewable energy begins to amass greater preference over coal to satisfy energy needs. This shift in trends has come up due to increasing concerns about pollution and emission and its effect on human health. For example, households in the US are installing their own solar energy panels, which is expected to grow by 44% in the coming two years - also decreasing the popularity of coal as an energy resource.<sup>23</sup>

The Trump administration is pro-coal and has slashed regulations on coal with an aim to revive the coal industry. The administration has also planned to reverse policies made under Obama's government on coal emissions to make it easier to bring in new coal plants. Trump also decided to exit the Paris Climate Agreement to promote usage of coal and revive the industry.<sup>24</sup>

## Key Players

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<sup>20</sup> <https://www.zacks.com/commentary/198799/coal-industry-stock-outlook-gloomy-days-ahead>

<sup>21</sup> <https://www.zacks.com/commentary/198799/coal-industry-stock-outlook-gloomy-days-ahead>

<sup>22</sup> <https://www.zacks.com/commentary/198799/coal-industry-stock-outlook-gloomy-days-ahead>

<sup>23</sup> <https://www.nbc-2.com/story/40187587/more-bad-news-for-coal-wind-and-solar-are-getting-cheaper>

<sup>24</sup> <https://www.zacks.com/commentary/198799/coal-industry-stock-outlook-gloomy-days-ahead>

**Top ten coal-mining companies in the United States, 2014**

Rank ↕	Company ↕	Million short tons/Year ↕	Percent of total production ↕	Notes ↕
1	Peabody Energy	189.5	19.0%	Declared bankruptcy in 2016
2	Arch Coal	135.8	13.6%	Declared bankruptcy in 2016
3	Cloud Peak Energy	85.8	8.6%	
4	Alpha Natural Resources	80.1	8.0%	Declared bankruptcy in 2015 <sup>[27]</sup>
5	Murray Energy	62.8	6.3%	
6	Alliance Resource Partners	41.0	4.1%	
7	Westmoreland Coal Company	35.6	3.6%	Declared bankruptcy in 2018 <sup>[28]</sup>
8	CONSOL Energy	32.2	3.2%	
9	NACCO Industries	31.6	3.2%	
10	Energy Future Holdings	29.7	3.0%	

Annual owned production, 2014. Source:<sup>[29]</sup>

In 2014, the production owned by the top ten companies was 72.6% of total US coal production.<sup>[29]</sup>

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Worldwide, the top 5 coal mining companies that are managing to achieve significant revenues and have a competitive stance in the industry are <sup>26</sup> :

1. Coal India - It is the single largest coal producer in the world and crossed the threshold of half-a-billion tonnes in 2016, both in coal off-take and production
2. BHP Billiton limited - With coal as one of its 4 strong pillars including copper, iron ore and petroleum, BHP has operations in over 8 countries
3. Shenhua Group - it is the most prominent coal mining company in China with the largest distribution worldwide
4. Arch Coal - it is one of the leading coal producers and is well positioned in the US representing 13% of US's coal supply

<sup>25</sup> [https://en.wikipedia.org/wiki/Coal\\_mining\\_in\\_the\\_United\\_States#Companies](https://en.wikipedia.org/wiki/Coal_mining_in_the_United_States#Companies)

<sup>26</sup> <https://blog.technavio.com/blog/top-5-largest-coal-mining-companies>

5. Anglo American PLC - one of the most diversified mining companies

## Valuation

The quick ratio is important to the mining industry due to the large capital expenditures needed for mining operations. Generally, a ratio lower than one indicates poor financial health and ability to meet short-term obligations. Operating profit margin is also important due to the changes in energy market prices that result in demand fluctuations. Coal producers must adjust their production levels regularly to manage costs and maintain revenue. For this reason, the ROE ratio is also a key financial indicator to measure the profitability of the company. Average ROEs in the mining industry are between 5 and 9%.<sup>27</sup>

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<sup>27</sup> <https://www.investopedia.com/articles/active-trading/082615/key-financial-ratios-analyze-mining-industry.asp>

## Solar (Renewable)

### Overview

The solar energy industry seemed to gain a lot of attraction, especially from oil production companies in recent years. As electric cars are becoming more and more popular, oil and gas companies are turning to new forms of investments and joining the trend of using more sustainable energy. However, federal regulations seem to be impeding on the success of this industry, especially tariffs. In fact, domestic and international legal policies are crucial to consider when discussing the solar energy industry.

### Trends & Major Current Events

Major oil companies have begun investing in renewable energy, especially solar. The global solar energy industry is expected to reach \$422 billion by 2022.<sup>28</sup> Exxon, for example, agreed to contracts to buy 500 megawatts of solar and wind power in the Permian Basin, the fastest growing U.S. oilfield.<sup>29</sup> Additionally, Petroleum Development Oman said it signed a deal to buy solar energy on the Arabian peninsula. Most recently, there is a possibility that BP is in talks with a solar developer it partially owns, Lightsource BP, to buy power in the U.S. In 2017, BP even declared that it would invest \$200 million in Lightsource BP over three years for a 43 percent stake.<sup>30</sup> BP believes it is important to keep growing while minimizing their carbon footprints, especially after pressure from shareholders about complying with the Paris Climate Accords.

20,000 domestic solar energy jobs were lost to Trump's 30% tariff on foreign-produced solar panels. The solar industry heavily relies on cheap imports, so this has a large effect on the industry.<sup>31</sup> There were also patent disputes between two of the largest solar panel makers. Hanwha filed its case earlier this

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<sup>28</sup> <https://www.alliedmarketresearch.com/solar-energy-market>

<sup>29</sup> <https://www.bloomberg.com/news/articles/2019-03-19/bp-explores-buying-solar-energy-to-power-operations-in-the-u-s>

<sup>30</sup> <https://www.bloomberg.com/news/articles/2019-03-19/bp-explores-buying-solar-energy-to-power-operations-in-the-u-s>

<sup>31</sup> <https://www.forbes.com/sites/jamesellsmoor/2019/02/24/under-trumps-tariffs-the-us-lost-20000-solar-energy-jobs/#5e7739ad76ba>

month, accusing JinkoSolar Holding Co., Longi Solar, and REC Group of importing highly efficient solar cells into the U.S. that infringe one of its patents.<sup>32</sup>

### Key Players

Company	Market Cap	Performance
TerraForm Power (TERP)	\$2.38 billion	-1.84%
Ormat Technologies Inc. (ORA)	\$2.83 billion	-7.14%
First Solar, Inc. (FSLR)	\$5.38 billion	-8.50%
Pattern Energy Group Inc. (PEGI)	\$2.06 billion	-9.17%
SolarEdge Technologies Inc. (SEDG)	\$2.04 billion	-10.58%

### Valuation

Fair market value is one of the most common metrics, representing the literal price of a solar asset.<sup>33</sup> Solar assets are interesting in that there is no readily available or quoted asset price. Therefore one method for valuing these assets is by the reproduction or replacement cost methods. Another valuation method is an income approach where a DCF is used to discount the expected future payments the asset will bring. Renewable energy companies also tend to have a lower cost of equity than oil and gas companies due to lower capital investment.

<sup>32</sup><https://www.bloomberg.com/news/articles/2019-03-21/nextera-con-ed-warn-patent-dispute-could-roil-u-s-solar-sector>

<sup>33</sup> <https://www.seia.org/research-resources/valuation-solar-generation-assets>

## Wind (Renewable)

### Description

In the 1970s there was an oil shortage in the United States that encouraged the development of other forms of energy. The federal government began supporting the research and development of large turbines and in the 1980s thousands of large turbines were installed in California. In the 1990s and 2000s, the government established incentives for the use of renewable energy sources due to a growing concern for the environment.

Renewable energy is a growing industry worldwide. The wind energy market is growing fastest in the United States with the government providing incentives for the use of wind energy as well as incentives for investment in wind energy. Worldwide wind energy is being heavily invested in. Incentives in Europe and investments in Asia have resulted in a large increase in energy generated by wind worldwide.<sup>34 35</sup>

Currently, China has the highest annual wind capacity additions in the world. The United States is ranked second, but currently, China is vastly outpacing the US. Incentives in Europe have resulted in countries such as Denmark, where wind energy provides 48% of all energy demand.

### Valuation

The largest expenses incurred by the wind industry include the cost of sale and operating cost.

Due to the large cost of producing and installing wind turbines, wind energy companies tend to have high fixed assets. Quick ratio for this industry tends to be slightly over 1, indicating that wind energy companies are liquid enough to fulfill short term liability obligations. Similarly, the current ratio hovers around 2 for the wind energy industry, showing that wind energy companies tend to have twice the amount of current assets than current liabilities. Due to the high costs of installing

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<sup>34</sup> [https://www.eia.gov/energyexplained/index.php?page=wind\\_history](https://www.eia.gov/energyexplained/index.php?page=wind_history)

<sup>35</sup> [https://www.energy.gov/sites/prod/files/2018/08/f54/2017\\_wind\\_technologies\\_market\\_report\\_8.15.18.v2.pdf](https://www.energy.gov/sites/prod/files/2018/08/f54/2017_wind_technologies_market_report_8.15.18.v2.pdf)

and maintaining wind turbines, the EBITDA/Revenue ratio is about 8% for the industry.<sup>36</sup>

### Trends

In 2018, there was a 9.8% increase in new installations of wind power. There also was stronger growth in the wind industry in several Asian countries, some African countries, and Brazil. The world wind capacity also reached 600 GW, which is enough to cover almost 6% of the global electricity demand.<sup>37</sup>

As companies develop their technology, wind turbine performance has increased and the price of wind technology is expected to decrease.<sup>38</sup> Other elements that have driven the wind industry include related cost reductions, as well as governmental policies and a push for a focus on renewable energy.<sup>39</sup>

### Major Current Events

Recently, the UK passed the Offshore Wind Sector Deal, which stated that more than 30% of UK electricity would be generated by offshore wind. This deal will provide money to companies developing wind technologies and will also provide money to several Asian countries to help them to create offshore wind technologies.<sup>40</sup>

### Key Players

*General Electric Company (GE)*

(\$MM)	4TH QUARTER			TOTAL YEAR		
	Q4'18	Q4'17	V%	TY'18	TY'17	V%
<b>GE REN</b>						
<b>Orders (\$MM)*</b>	3,854	3,252	19%	10,894	10,368	5%
<b>Orders (MW)**</b>	3,028	2,813	8%	8,591	7,933	8%
<b>Revenue</b>	3,361	2,618	28%	9,533	9,205	4%
<b>Op Profit</b>	67	138	(51)%	287	583	(51)%

\*All Renewable Energy \*\*Onshore Wind Only

News:

#### ONSHORE WIND

<sup>36</sup> <https://www.energy.gov/science-innovation/energy-sources/renewable-energy/wind>

<sup>37</sup> <https://wwindea.org/information-2/information/>

<sup>38</sup> <https://www.energy.gov/eere/articles/top-4-trends-us-wind-market>

<sup>39</sup> <https://emp.lbl.gov/sites/default/files/lbnl-1005717.pdf>

<sup>40</sup> <https://www.renewableenergyworld.com/articles/2019/03/uk-in-deal-to-unlock-offshore-wind-boom-and-green-jobs.html>

- Closed a deal with Scout Clean Energy to supply 120 GE 2.5 MW wind turbines for the 300 MW Ranchero wind farm in Crockett County, Texas.
- Will provide 60 1.7-103 units to the 100 MW Kipeto wind farm in Kenya, providing enough electricity to power the equivalent of 40,000 homes.
- Selected to supply equipment for the first commercial integrated solar-wind hybrid power generation project in the US, a 2 MW community based renewable energy project in Minnesota.
- Signed an agreement to supply 32 3.83 MW turbines to the 122 MW Los Teros wind farm in Argentina's Azul province of Buenos Aires.
- Announced an \$11 million four-year research partnership with UK's Offshore Renewable Energy (ORE) Catapult to improve reliability, drive down operating costs and improve the safety of offshore wind operations – reinforcing company's commitment to one of largest offshore wind markets in the world.<sup>41</sup>

*Vestas Wind Systems A/S (VWDRY)*

	Americas	Europe, Middle East, and Africa	Asia Pacific
Revenue	EUR 3,903m	EUR 3,354m	EUR 1,208m
Order intake – firm and unconditional orders	6,271 MW	5,599 MW	2,344 MW
Deliveries	4,996 MW	4,128 MW	1,723 MW
Order backlog – firm and unconditional orders	6,038 MW	7,023 MW	2,585 MW
Installed wind turbines in	10 countries	23 countries	6 countries

- Organic growth of 13 percent in Service compared to 2017; EBIT margin of 25.2 percent
- Highest ever order intake of 14.2 GW across 43 countries; up 27 percent compared to 2017<sup>42</sup>

*Siemens Gamesa*

<sup>41</sup> <https://www.ge.com/renewableenergy/about-us/2018-earnings>

<sup>42</sup> [https://www.vestas.com/~/\\_media/vestas/investor/investor%20pdf/financial%20reports/2018/q4/190207\\_03\\_annualreport2018.pdf](https://www.vestas.com/~/_media/vestas/investor/investor%20pdf/financial%20reports/2018/q4/190207_03_annualreport2018.pdf)

€m	Q1 18	Q2 18	Q3 18	Q4 18	Q1 19	Var y/y.
Revenue	1,840	1,973	1,827	2,207	1,904	3%
Onshore	1,197	1,277	1,052	1,349	1,103	-8%
Offshore	643	696	775	858	801	25%
Volume (MWe)	1,997	1,830	2,137	2,409	2,129	7%
Onshore	1,651	1,397	1,703	1,926	1,520	-8%
Offshore	346	432	434	483	609	76%
EBIT pre PPA, I&R costs	69	129	86	109	51	-27%
EBIT margin pre PPA, I&R costs	3.8%	6.5%	4.7%	4.9%	2.7%	-1.1 p.p.

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### Goldwind

- Leading wind turbine provider

Prepared by: Xinjiang Goldwind Science & Technology Co., Ltd.

Unit: RMB

Items	For the Period of 1 January to 31-Mar-18	For the Period of 1 January to 31-Mar-17
I. Total operating income	3,859,685,676.80	3,583,893,365.04
Including: Operating income	3,859,685,676.80	3,583,893,365.04
II. Total operating costs	3,790,435,301.98	3,409,315,936.19

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### Conclusion

The energy sector has been changing rapidly in the past decade. The coal sector has been declining due to fracking and renewable energy technology that allows energy prices to be driven down. As a result, oil & gas, solar, and wind companies have not seen the declines that coal has faced. Additionally, in some countries, government regulation and the general population have been increasingly supporting renewables due to air pollution and other environmental concerns. The different sub-sectors of energy are interconnected due to the interchangeability of energy sources (for example, solar energy can generate power, as can oil.) Furthermore, wind and solar energy are heavily affected by weather patterns, which could, in turn, affect the entire industry. For example, when weather patterns are not favorable, wind and solar farms may not generate enough power to meet demand, leading to an increase in oil & gas usage.

<sup>43</sup> [https://www.siemensgamesa.com/en-int/-/media/siemensgamesa/downloads/en/investors-and-shareholders/periodic-information/2019/q1/q1-19-informe-de-actividad\\_en-vf.pdf](https://www.siemensgamesa.com/en-int/-/media/siemensgamesa/downloads/en/investors-and-shareholders/periodic-information/2019/q1/q1-19-informe-de-actividad_en-vf.pdf)

<sup>44</sup> <http://106.38.64.54:8080/goldwind-en/upload/files/20180507163016TRye5RO3.pdf>