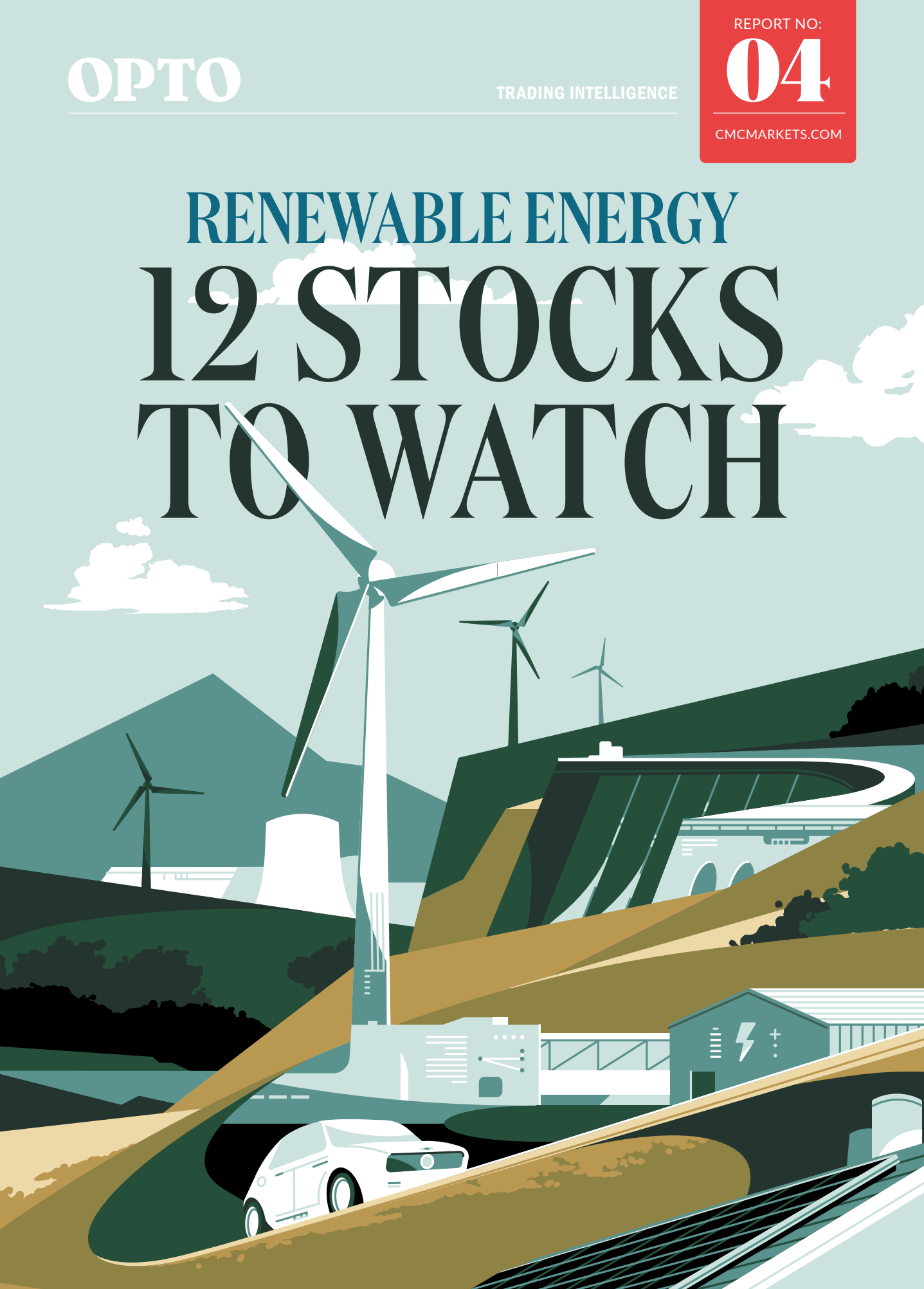


RENEWABLE ENERGY 12 STOCKS TO WATCH



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ENERGY: A NEW FRONTIER

As more corporations recognise the need to produce clean energy, changes to investment, market and business models are beginning to transform how the world stores, distributes and generates power.

Words: **Amelia Schwanke**
Illustration: **Edward Tuckwell**

BETWEEN DISCUSSIONS WITH political and business heavyweights at this year's World Economic Forum in Davos, Total's [FP] CEO Patrick Pouyanné declared natural gas and renewables as a "recipe for future growth". "We don't look to renewables to be green," he said. "We look to renewables because it's the best way."

Pouyanné's comments reveal a big shift within the fossil-fuel industry. Some of the major oil companies, particularly those in Europe, are making early steps towards the transition from full dependence on oil to delivering alternative energy such as natural gas, wind and solar. Total has incrementally increased its \$2bn investment in low-carbon electricity every year since 2015.

Boosted by recent developments in battery storage, 50% of the world's energy will come from wind and solar by 2050, with the leading companies set to benefit hugely from the shift, according to Bloomberg New Energy Finance.

Due to both impressive growth opportunities, and a realignment of values and money, impact investing is also now building momentum. In the wake of rising global temperatures, energy companies are under immense pressure from investors over the impact that oil and gas majors are having on climate change, leading to \$6tn being divested from companies such as BP [BP] and Shell [RDSA].

Responsible investments

One of the biggest milestones came in 2006 when an international group of institutional investors agreed to the UN-backed Principles for Responsible Investment. Today the group has more than 2,000 signatories from 60 countries, representing \$80tn in assets.

Since then, aligning the financial industry with the long-term interests of the planet has increased

50%
Projected share of global energy production to come from wind and solar by 2050

\$210bn
Projected value of the global green bonds market by the end of 2019

due to the growing opportunities within the renewable-energy market. From lower-risk assets such as solar parks and wind farms, to more high-risk assets such as storage and wave energy, there are some compelling opportunities.

Take the utility giants NextEra Energy [NEE] and Ørsted [ORSTED]. Both have seen strong share price gains over the past three years – almost 58% and 82%, respectively – after demonstrating strong financial performances as the price of producing renewables continues to fall; while the first terawatt (one trillion watts) of energy produced from wind and solar (a milestone reached in 2018) cost \$2.3tn, the next terawatt is projected to cost just \$1.23tn to produce.

Angus McCrone, chief editor at BloombergNEF, tells *Opto* that the business case for investors is to make a stable yield from a relatively low-risk asset, "in excess of that available on many other types of infrastructure assets".

"GIVEN THAT IT'S STILL QUITE EARLY, THE RATE OF RETURN ON RENEWABLE ASSETS IS RELATIVELY HIGH"

– EDOUARD ENAULT, ALPHAValue

Renewable energy funds

The global green bonds market, which was pioneered by the European Investment Bank in 2007, is forecast to grow from \$180bn to \$210bn this year, with the potential to reach as much as \$240bn, according to Swedish bank and green bonds specialist, SEB.

The top 5% of green funds achieved returns of 22% and higher in 2018, with the average ►



generating net returns of 5.8%, according to the Global Impact Investing Network.

“Given that it’s still quite early, the rate of return on renewable assets is relatively high,” says Edouard Enault, an analyst at Alphavalue.

Environmentally responsible exchange traded funds like Brookfield Renewable Partners, BlackRock Global Funds and Pattern Energy have kicked off 2019 with gains of between 6% and 12% in January.

Wind, solar and hydro

Indeed, environmental awareness has gone mainstream with businesses seeing spikes in share price following any announced commitment to going green.

After global stock markets suffered their worst losing streak in five years in October of last year, investment in global clean energy had declined 8% (or \$331bn) compared to 2017, according to BloombergNEF.

But despite the global stock market’s woes, companies such as Vestas Wind Systems [VWS], Suzlon Energy [SUZLON], Siemens Gamesa

ABOVE: Xinyi photovoltaic power station in Songxi, China.

[SGRE] and GE’s Wind Energy [GE] performed well in 2018, as investment in wind farms rose by 3%.

In China, 24 offshore wind farms scheduled to be built in the Jiangsu province made up the largest investment in renewables in 2018 at about \$18bn.

Solar heavyweights such as Canadian Solar [CSIQ], Jinko Solar [JKS] and SunPower [SPWR], which is 56% owned by Total, saw their share prices take a tumble in 2018. Even First Solar [FSLR], a big winner in 2017, found itself in the red.

The combination of US trade tariffs, China ending subsidies and a glut in photovoltaic solar panels following the bumper sales in 2017 served to send solar investment down 53% to \$40.4bn in 2018. Most solar companies have, however, gone on to now experience an uptick since the start of 2019.

Businesses leaders

Perhaps the biggest shift in relation to the climate crisis is how businesses are starting to behave. From Bill Gates’ Breakthrough Energy Ventures to the RE100 initiative, corporate leadership is accelerating the adoption of climate ▶

action plans. Fortune 500 companies such as Apple [AAPL] and Google [GOOGL] are now running parts of their operations on 100% clean energy.

The Microsoft billionaire has even stepped into the largely hypothetical world of geo-engineering by funding a startup that is working on capturing carbon dioxide from the air. The company, Carbon Engineering, raised \$11m in its first round of funding in July 2018.

Utility giants such as NextEra Energy, Eletrobras [ELET6], Engie Group [ENGI] and Ørsted are also collectively championing sustainable finance and impact investing.

“Ørsted, a Danish utility that used to be an oil and gas company that diversified its business to invest in mainly offshore wind, is now a clear world leader of offshore wind capacity,” Alphavalue’s Enault said. “It’s just one of the success stories in the market.”

Investment opportunities in renewables

Even the fossil-fuel industry has committed to working towards net-zero emissions through projects like the Oil and Gas Climate Initiative. Legacy energy companies such as Shell, BP, Total, Exxon [XOM] and Eni [ENI] are investing billions into renewable assets.

Since 2016 Shell has – like Total – spent \$2bn a year investing in biofuel, hydrogen fuel and solar, as well as backing various renewable companies through its foundation portfolio, including a unique smart-energy metering startup called SparkMeter.

The Anglo-Dutch company is also investing heavily in electric storage – expected to be the next big boom in the market – in order to make

86%

Ørsted's stock price gain since IPO

\$2bn

Amount Shell has spent on renewable energy investment per year since 2016

the clean energy produced from renewables economically viable.

Unsurprisingly, investors are following this emerging growth industry with interest, especially considering the storage capacity is expected to grow to a cumulative rate of almost one terawatt by 2040, attracting \$620bn in investments, according to BloombergNEF. Currently, the world has a capacity to generate just over six terawatts of on-grid power per year.

CORPORATE LEADERSHIP IS ACCELERATING THE ADOPTION OF CLIMATE ACTION PLANS, WITH APPLE AND GOOGLE ALREADY RUNNING PARTS OF THEIR OPERATIONS ON 100% CLEAN ENERGY

“Energy storage is becoming more dominant, providing ancillary services to the grid to maintain grid stability and increasingly displacing gas peaking plants,” says Tom Harding-Newman, senior strategy analyst at Renewable Energy Systems (RES).

Battery-storage technology offers a solution to the grid parity issue, as well as energy surplus, making the race to become the market leader very competitive. The likes of ABB [ABBN], LG Chem [LGCHEM] and upstart Ice Energy, which recently secured \$40m from Argo Infrastructure Partners, are vying for the top spot. ▶

BELOW: CEO of France's state-run utility company EDF Jean-Bernard Levy (L) and French oil giant Total's CEO Patrick Pouyanne (R) attend the closing debate of a French Electricity Union event in Paris in November 2018.



A similar contest is going on in the electric vehicles market, with Tesla [TSLA] coming up against the industry's incumbents such as Audi [NSU] and Jaguar [TMM], which have all released cutting-edge battery-driven cars.

And then, of course, there's China. The country accounts for 35% of all electric cars sales in the world, partly thanks to generous tax incentives, subsidies and gasoline restrictions that have



LEFT: Scott Keogh, president of Audi of America speaks during a launch event of the new Audi AG E-Tron battery-powered crossover SUV in California, in September 2018.

boosted sales in the country. Its cheap, compact electric cars have been enormously popular and are beginning to expand into the US and Europe.

To service the growing electric vehicle market, Rishi Madhani, sustainable finance lead at RBS, tells *Opto* that 2019 will see charging points increasingly becoming a new investment opportunity, especially as companies look to tackle grid scarcity, among other issues. "We noted that up to three million commercial and industrial charge points are needed to fill the demand by 2040, unlocking what we value as a £6bn investment opportunity," he said.

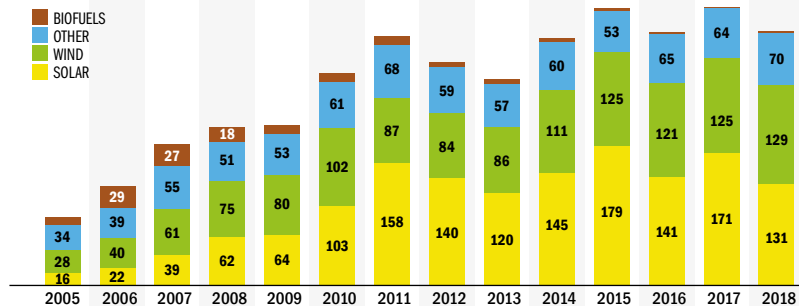
A green future?

While renewable energy did ultimately grow in 2018, it did not keep pace with the 2.7% global rise in carbon dioxide, which was largely driven by an increase in coal use by China and emissions from cars, trucks and planes.

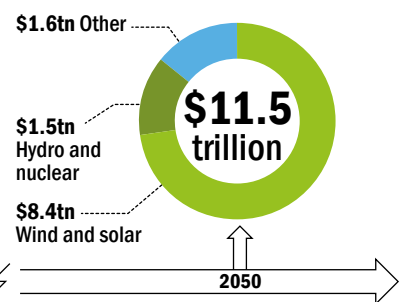
The transition to clean energy still faces challenges, from international trade wars that levied 30% on Chinese-made solar equipment, to President Trump pulling out of the Paris Climate Agreement. But with an average 5-10% rate of return and strong growth prospects, investors and traders stand to benefit in more ways than one.

Marlene Motyka, global renewable energy leader at Deloitte, says that things are changing fast: "We see wind and solar as not just mainstream energy sources but preferred energy sources." Renewable-energy projects are becoming not only necessary but big business. ▶

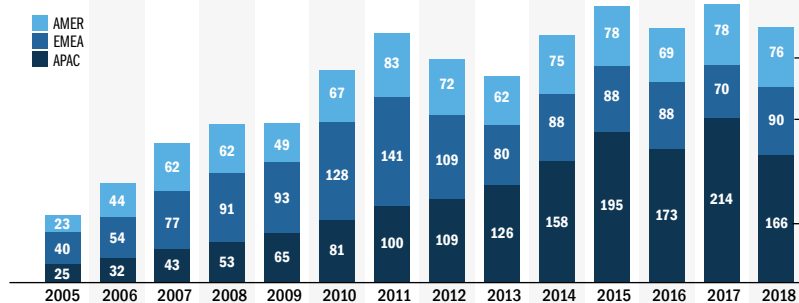
GLOBAL NEW INVESTMENT IN CLEAN ENERGY, BY SECTOR (\$BN)



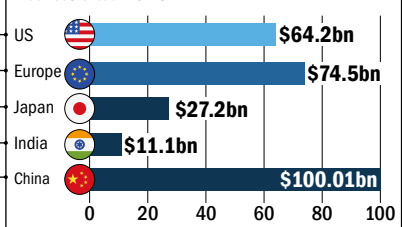
PROJECTED INVESTMENT RENEWABLE ENERGY



GLOBAL NEW INVESTMENT IN CLEAN ENERGY, BY REGION (\$BN)



COUNTRIES INVESTING IN CLEAN ENERGY IN 2018



THE RENEWABLE ENERGY COMPANIES

Major energy producers and utility companies are increasingly going green, driving up the demand for wind farms, solar parks, hydropower plants and renewable tech. And with this growth come opportunities for traders and investors. Across the sector, engineering firms, manufacturers, power companies and startups are providing strong contenders for momentum, income, growth and value stocks. Here are some of the best to look out for across solar, wind and utility providers.



THE SOLAR SUPPLIERS

SOLAR IS PULLING in the most investment in the clean-energy market, attracting \$131bn in 2018, an increase of 400% from \$26bn in 2010.

But last year was an ugly one for solar stocks. Due to a supply glut in panels, cuts in Chinese subsidies and tariffs imposed as a result of the US-China trade war, the Ardour Solar Energy Index, which tracks a dozen of the biggest global solar companies, fell almost 44%, while the Invesco Solar ETF fell 26%.

However a comeback is brewing, with the solar market expected to grow nearly 30% in 2019.

1 CANADIAN SOLAR

Like most solar stocks, shares in Canadian Solar [CSIQ] – one of the world’s largest solar-panel manufacturers by revenue – were down more than 15% in 2018. This was largely due to tariffs on imported solar panels hitting its US sales hard and damaging investor sentiment.

Despite these headwinds, the solar manufacturer has remained consistent in turning a profit, reporting net revenue of \$768m in the third quarter of 2018, up 18% from \$650m in the second quarter. The company expects total net sales to be in the range of \$3.6-3.8bn for 2018 when it announces figures in March. So far, the stock has gained 36.5% in 2019, and is up 64% off its 12-month low.

Alongside its supply deals, Canadian Solar has made a big push into energy storage – a growing sector-wide trend due to falling battery prices – when it signed a new deal to supply a solar-power system with battery storage in the largest project of its kind in California, capable of powering up to one million homes.

The company’s CEO, Shawn Qu, remains cautious in expanding production capacity due to projected volatility in demand, but says the

company will “ramp up the volume for unconventional innovative products, such as bifacial [double-sided panels], that command price premiums”. It’s a move that is seen as an effort to close its high debt level of \$2.13bn.

Goldman Sachs research analyst Brian Lee sees “green shoots” emerging in solar in 2019. While the industry may not be out of the woods yet, Lee argues that demand is on the rebound as average selling prices stabilise, a development that will further aid Canadian Solar’s sales.

2 FIRST SOLAR

Despite being excluded from tariffs due to its domestic market and silicon-based product, US-based First Solar [FSLR] still experienced a sell-off in May 2018 after sales didn’t quite benefit from its advantage as much as analysts had expected. After a bumper year of sales in 2017 across the industry, the demand simply wasn’t there.

Having gained 110% in 2017, the company is now trading more than 30% off its 52-week high, but has the strongest balance sheet in the industry with net sales at \$676m for the third quarter of 2018, up 38% year-on-year. Combined with net sales expected to reach \$3.45bn for 2019 and a forward P/E ratio of 20, analysts are now bullish on the stock.

Travis Miller, equity strategist at Morningstar, tells *Opto* that he believes the stock was oversold in 2018 and is now underpriced. He expects First Solar to make a lot of investment in its production lines, which use a manufacturing process that is less capital intensive than most competitors. For Miller, short-term challenges for the company include meeting its commitments to signed projects, while in the long run it will need to ensure that its product remains at the forefront of the industry. ▶

BELOW: Shawn Qu, president and CEO of Canadian Solar, during the International Economic Forum Of The Americas conference in Toronto, Canada.





Courtesy of First Solar

3 JINKOSOLAR

China dominates the renewable-energy industry, having become the largest producer of solar power in 2015, and now owns about 75% of all solar manufacturing globally. And although 2018 did see the country’s solar boom cool off due to its government cutting subsidies, investment still totalled \$58bn – surpassing \$29bn in the US and \$16bn in Europe.

NYSE-listed Chinese solar giant JinkoSolar [JKS] managed the domestic decline well by selling to overseas markets and now stands to benefit as

ABOVE: First Solar’s manufacturing plant.

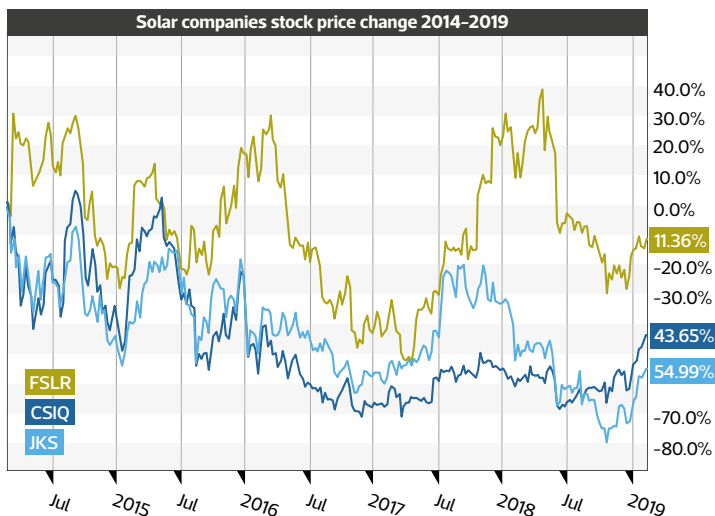
prices of Chinese-made solar panels are “about to see an upward swing” of 10-15% due to smaller producers closing or consolidating following the end of subsidies, according to Eric Luo, CEO of China’s GCL System Integration Technology.

JINKOSOLAR EXPECTS PRODUCTION TO RAMP UP IN 2019; ITS SHARE PRICE HAS GAINED NEAR 60% SINCE THE START OF THE YEAR

JinkoSolar’s overseas sales mean revenue jumped 80% in the third quarter of 2018, reaching \$974.8m. It was also named the most “bankable” solar-panel manufacturer by BloombergNEF.

JinkoSolar has operations in more than 80 countries and was the first foreign panel manufacturer to announce an expansion to the US. The company has a pilot plant running in Florida and has won a supply deal with the Dau Tieng solar plant in Vietnam, which will be the largest solar-power project in Southeast Asia once completed.

With a range of markets and deals the company expects production to ramp up in 2019, while its share price has gained near 60% since the start of the year. It’s also projected to post continued strong earning results through the year. ▶



Source: Yahoo Finance 12.02.19



THE WIND ENGINEERS

WIND POWER COMES a close second to solar in terms of investment, but it is also five to 10 years ahead of solar in terms of cost effectiveness, according to Morningstar’s Miller. And, despite a drop in total investment in wind power in 2017, the global offshore wind market is set to continue to grow 16% a year through to 2030, with China predicted to overtake the UK as market leader by 2022.

BELOW: Vestas wind turbine installation in Macarthur, Australia.

VESTAS WIND SYSTEMS HAVE INSTALLED 100GW OF TURBINES IN 79 COUNTRIES – ENOUGH TO POWER MORE THAN 25 MILLION HOMES, THE MOST OF ANY COMPANY TO DATE

The First Trust Global Wind Energy ETF, which has a weighted average market cap of \$18.4bn, was down 14% over 2018, but has already rebounded 13% since the start of the year.

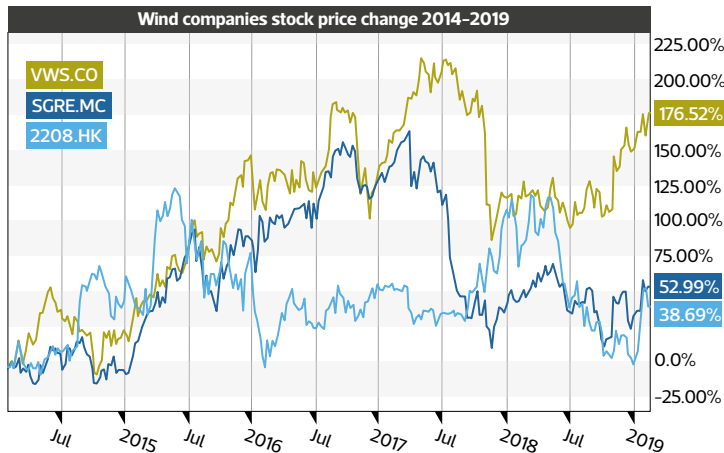
1 VESTAS WIND SYSTEMS

Vestas Wind Systems [VWS] is one of the few companies to exclusively focus on wind energy, having installed 100GW of turbines in 79 countries – enough to power more than 25 million homes, the most of any company to date. The Danish manufacturer is a market leader in onshore wind services and installation.

Financially, the company has performed considerably well, reporting a 1.7% year-on-year rise in revenue to €10bn for 2018 and the stock gaining 14% across the year. However, the revenue is slightly below 2016’s €10.2bn. ▶



Courtesy of Duke Energy



Source: Yahoo Finance 12.02.19

Vestas' key to success lies in its ongoing portfolio strengthening through R&D and acquisitions, including recent takeovers of UpWind Solutions and Availon for \$60m and \$95.8m, respectively. One of its biggest milestones was the launch of its Kennedy Energy Park in Australia, which marked the world's first gridded hybrid power plant. Looking ahead, Vestas' \$100m acquisition of energy analytics and digital solutions software firm Utopus will help it better harness and use data.

Its vision to become a global leader in sustainable energy solutions has led it to focus on expanding into emerging markets, which are set to accelerate the pace of the renewable energy sector, giving it an edge over its competitors.

2 SIEMENS GAMESA

Siemens' renewable energy arm Siemens Gamesa [SGRE] was founded in 2017 after a merger of Siemens Wind Power and its biggest European competitor, Gamesa. Heymi Bahar, analyst at the International Energy Agency, says that the merger was an "important consolidation in the market" as it brought optimisation and more cost-effective production and manufacturing.

The company has quickly grown since then and is now capable of generating almost as much energy as Vestas from a combination of on and offshore production.

As part of a larger push to unlock its potential growth, Siemens Gamesa began investing in hybrid power and storage in 2018, an essential area of the market that CEO Markus Tacke says is the "missing part" to creating a more consistent source of power.

The Spanish company, which is listed on the Bolsa de Madrid, operates in more than 90 countries, has €9bn in annual revenue and a market cap of €8.9bn. The firm has consistently beaten earning estimates since the merger and ▶

€9bn

Annual revenue of Siemens Gamesa

79

Number of countries Vestas has installed wind turbines in



SHAKING UP THE WORLD'S \$1.8TN ENERGY MARKET

The startups challenging incumbent utility giants to make energy simple.

Bulb

In just three years, Bulb, a UK energy startup, signed up more than 870,000 households across the country and remains one of the most competitively priced 100% renewable energy providers in the market with prices up to 20% lower than its competitors. Its founders, Hayden Wood and Amit Gudka (pictured), hope to add another million members in 2019, making it the fastest growing energy provider by customers. The company was valued at close to £500m following £60m of growth funding in August, and reported £182m in revenue for 2018.

BuffaloGrid

There are more than 1.2 billion people around the world without access to electricity, according to Daniel Becerra, CEO of BuffaloGrid, a UK-Indian startup helping enterprises in rural areas bring mobile power and the internet to users. Launched in 2011, the startup reached a milestone in December 2018 when its technology went live in villages across rural India. The company is now backed by the UK government, Microsoft and some of Europe's leading venture funds, recently securing €3.8m in funding.

Ovo Energy

Ovo Energy is another tech-centric energy provider with an easy-to-be-green focus and a compelling business model. Founded in 2009, the UK-based firm has more than a million customers and reached £717m in revenue for 2016. Founder and CEO Stephen Fitzpatrick's goal is to make energy greener, cheaper and simpler with its Home Energy Storage battery, which can buy power straight from the grid. The company has also taken over supplying the 290,000 customers of its competitor, Sparke Energy, and now has a UK market share of 4.9%.

Courtesy of Bulb

CHINA HAS STRUGGLED WITH INTEGRATING RENEWABLE ENERGY INTO THE GRID SYSTEM AND MUCH OF THE POWER GENERATED FROM THE GANSU WIND FARM IS NOT BEING USED

ended the first quarter of the fiscal year with revenue increasing 6% year-on-year, to €2.2bn. Its financial security looks solid, having logged orders worth €11.5bn in the past 12 months. The results led the firm to raise growth projections for 2019 to 8.5%, up from 7%.

One of its biggest upcoming projects is a wind turbine capable of generating 30% more energy annually than its predecessors. And with market prices for turbines beginning to stabilise, Siemens Gamesa is expecting new orders in the first quarter of 2019 to at least match those for the same period in 2018.

3 GOLDWIND SCIENCE & TECHNOLOGY

For the past two decades, Hong Kong-listed Goldwind [HK2208] has had the largest wind farm capacity in China – the world’s largest renewable energy producer – and was the world’s leading manufacturer in installed capacity in 2015.

But a recent slowdown in new deals has seen it fall behind competitors. A major blow came last year when a contract for an offshore wind farm in China, valued at \$1.4bn, was won by state-owned competitor CGN New Energy Holdings. The stock lost 48% through 2018.

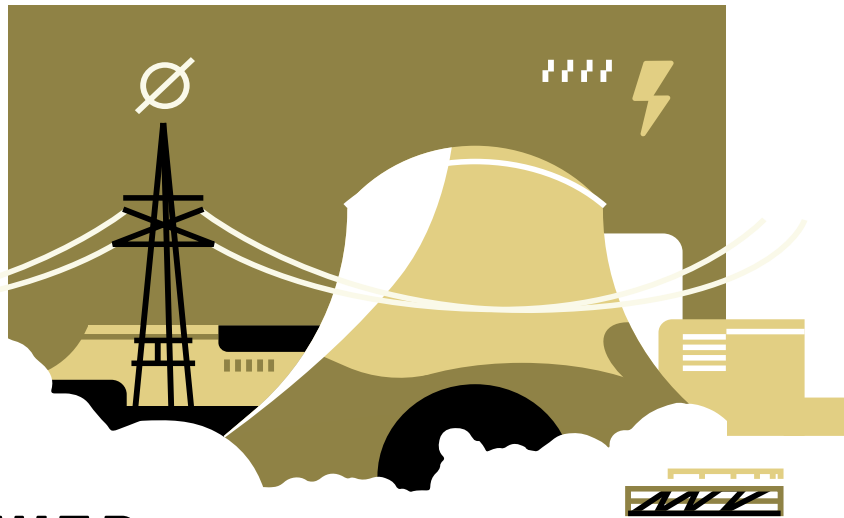
At the height of China’s wind bubble in 2015 – when the country was said to be building two wind turbines per hour – Goldwind benefited hugely as it supplied hundreds of turbines across the country, including to the Beidaqiao Wind Farm, part of the world’s biggest wind farm in Gansu, which generates enough energy to power a small country.

However, China has struggled with integrating renewable energy into the grid system, and much of the power generated from the Gansu Wind



ABOVE: A worker assembles wind turbines at Goldwind Science & Technology in Urumuqi, China.

Farm is not being used. Goldwind is attempting to combat this by funding a series of smart micro-grid projects that will tap into the growing grid development market – which is forecast to reach \$14.33bn by 2022 – meaning a return to growth could be on the cards: at the time of going to press, its share price has already gained 43.5% in 2019. ▶



THE POWER PROVIDERS

A MAJOR SHIFT has taken place in the energy utilities sector. The old model of large-scale, centralised power stations pumping out electricity to passive customers through a monopoly of established suppliers is increasingly becoming dated.

Renewable energy has been a big factor in the shake-up of the industry, with new challenger companies as well as established players sourcing power exclusively from renewable energy. Technological advances have enabled supplies of green energy to flow into countries' national grids easily and more cheaply than ever.

1 ØRSTED

Ørsted [ØRSTED] is a Danish utility company that pioneered the world's first wind farm in 1991 and bills itself as the world's most sustainable energy company. It has built the world's largest offshore wind farm in the UK, which is also its 11th in Britain, bringing total investment to £8bn.

Founded in 2006, Ørsted is one of the market's best success stories, says Edouard Enault, analyst at Alphavalue. The share price has been on a positive trend since its IPO in June 2016, which was the largest ever in Denmark both in deal size and market cap.

Ørsted expects more than 99% of its energy to be generated from renewables by 2025 (it's currently at 72%) and to be completely coal-free by 2023.

In 2018, the company exited its residential-customer businesses and acquired Lincoln Clean Energy and Deepwater Wind in a bid to beef up its portfolio in the US. Since then it's reached a record profit of \$2.9bn, and currently pays a dividend of \$1.50 per share. Its market cap stands at \$30bn.

"Towards 2030, it is our strategic ambition to reach an installed capacity of more than 30GW of renewable energy," said Thomas Andersen, chairman of Ørsted. With a 25% share of the global offshore wind market and plans to expand into bio-

99%
Amount of energy output Ørsted expects to come from renewables by 2025

100m
Number of people Iberdrola supplies energy to globally

ØRSTED EXPECTS MORE THAN 99% OF ITS ENERGY TO BE GENERATED FROM RENEWABLES BY 2025

energy, Ørsted has transformed itself from a utility with significant oil and gas reserves to one focused on becoming a major force renewable energy.

2 NEXTERA ENERGY PARTNERS

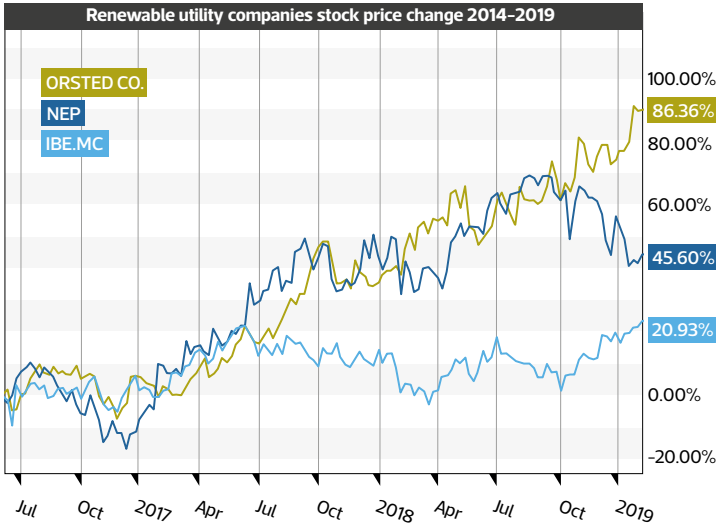
Although NextEra Energy [NEE] has its roots in oil and coal, it has pivoted since 2001 to become the world's largest generator of energy from wind and solar. While it still burns non-renewable resources, it now looks to natural gas for powering these plants, with oil and coal being used in just 2% of its production.

NextEra is also the world's largest energy company by market cap at \$87bn and is planning to invest a further \$40bn in infrastructure by 2020.

The company announced a net income of \$6.65bn for 2018 in its most recent earnings; its stock hit an all-time high of \$182.98 on 12 December. Upholding its reputation for delivering above-average earnings growth, NextEra Energy had its best year ever for winning new renewable energy projects in 2018.

3 IBERDROLA

Iberdrola [IBE] is a global leader in the utility sector, as well as one of the biggest utility companies in the world with a market cap of €46bn. The Spanish company supplies electricity to more than 100 million people across four continents; it's the third largest wind energy producer in the US and the number one wind energy provider in the UK and Europe. ►



Source: Yahoo Finance 26.02.19

CEO Ignacio Galán’s strategy to boost sustainable energy projects has seen him allocate another €32bn to renewables, smart grids, transmission and storage until 2022, which he says will increase the company’s profits by more than €3.5bn.

Iberdrola’s renewable energy business boosted its €6.72bn earnings for the nine months to September 2018 by 22.5% and, since then, the company’s stock has risen nearly 15% to €7.23.

Meanwhile, Iberdrola’s subsidiary, Scottish Power, has become the first major utility company in the UK to use 100% renewable energy and Iberdrola has also started supplying clean electricity to Nike’s European offices. In another display of innovation, the company has used blockchain technology to track the supply of energy generated between two of its wind farms. With 20 years’ experience in investing in renewables, Iberdrola has maintained its position at the forefront of the clean energy movement. ▶



BIG OIL GOES GREEN?

As the economic case for building new oil and coal facilities begins to crack, the fossil fuel industry is beginning to realign its long-term strategies to ensure relevance and profitability.

MAJOR OIL COMPANIES have had a somewhat love-hate relationship with renewables. After forces within the industry spent years lobbying against the emission quotas and the existence of man-made climate change, firms then made some early ill-fated investments into green energy before pulling back.

Now, under pressure from governments and shareholders – and with clean energy predicted to account for 40% of the world’s total energy use in the next five years – the likes of BP, Shell and Total are making large investments in the space. The oil sector does, for the most part, continue to be more follower than leader, with oil still making up the vast majority of expenditure and profits.

But with renewables becoming cost-competitive compared with fossil-based electricity generation, going green is becoming increasingly attractive for the firms and the production of new oil and gas plants is now slowing – “particularly in regions where fossil resources are expensive or carry a risk premium,” explains energy analyst Matthew Pellow.

In a somewhat counter-intuitive example of this renewables’ cost-effectiveness, Exxon Mobile, which is investing up to \$1bn a year in renewable research, now powers its Permian Basin oil field through renewable energy provided by Ørsted.

As well as being representative of big oil’s difficult relationship with renewables, the growth of the Permian Basin field (the fastest in the US) shows that oil is here to stay. Prices have stabilised and grown recently, and the US is now the largest producer of crude in the world, with

\$3.4bn
Amount Shell, Total and BP spent on renewable energy projects in 2018

1.3%
Fraction of budgets the top 24 publicly traded oil companies spent on low carbon energy last year

President Donald Trump determined to have oil consumption remain at the heart of the US economy.

Shell, BP and Total all smashed earnings estimates for 2018 and, collectively, generated close to \$10.4bn in cash flow from operations, the highest in more than four years. In the same time, the three spent \$3.4bn on renewable energy businesses and projects. All in, the world’s top 24 publicly traded oil companies spent just 1.3% of total budgets on low carbon energy in 2018. Despite this, most of the firms continue to make noises and take action around renewable energy, with the European companies including BP, Shell and Total making some of the biggest strides.

“With less domestic pressure to diversify, US companies have not embraced renewables in the same way as their European peers,” climate research firm CDP said in a recent report.

ROYAL DUTCH SHELL

With a market cap of \$227bn, Shell towers over its European peers. The oil incumbent has faced mounting pressure from activist shareholders in the last two years to push its commitment on climate change goals. While it did commit to reducing its net carbon footprint by half by 2050 in 2017, that same year saw it increase its CO₂ emissions by 4.3% year-over-year to 73 million tonnes due to “existing fields ageing and new production”.

The oil major did finally yield in December 2018 when it announced that, in 2019, executive pay would be linked to carbon emissions targets. In the meantime, Shell is hitching long-term climate goals to hydrogen-powered aeroplanes, carbon capture deployed on a grand scale and reforestation an area the size of Brazil in a plan called Sky.

During Shell’s 2018 earnings announcement, CEO Ben van Beurden told investors and analysts that, while Shell does plan to change the makeup of its portfolio to meet Paris climate goals, “it doesn’t mean we can’t sell oil and gas”.

Shell’s New Energies business, which includes the venture capital arm Shell Ventures, has seen ►

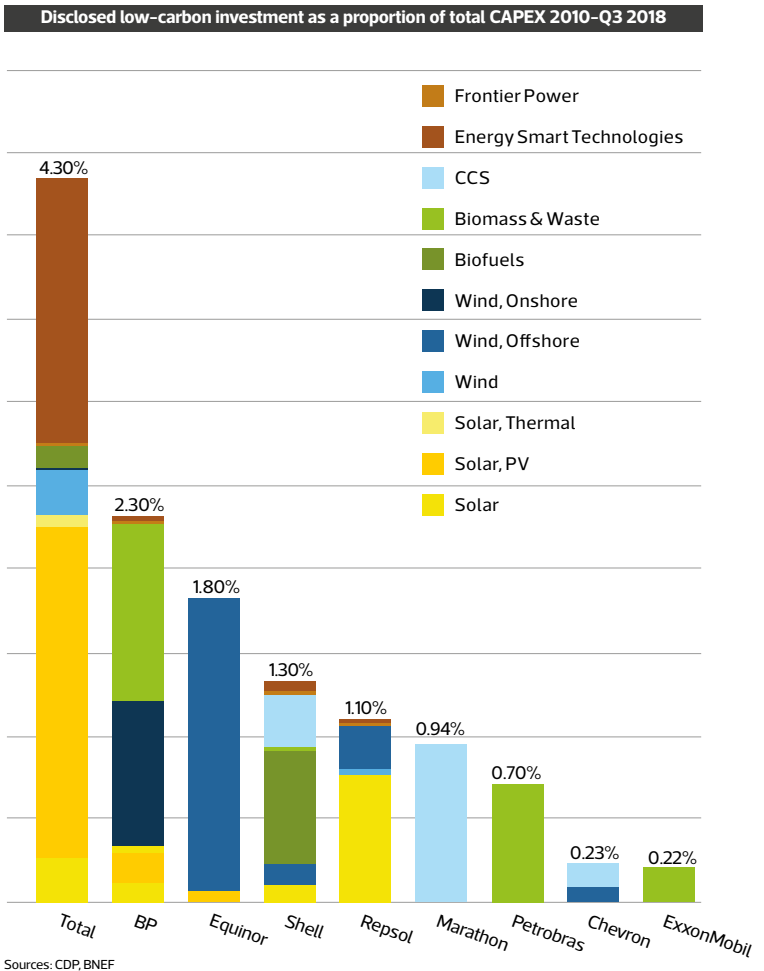
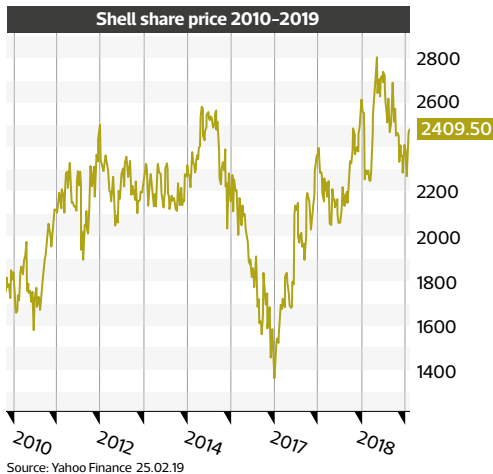


RIGHT: Ben Van Beurden, CEO of Royal Dutch Shell.



its budget climb to \$1-2bn a year since launching in 2016 due to developing new projects in renewable energy. However, that is still a drop in the ocean compared to its \$25-30bn capital expenditure budget. Its full-year profit reached \$21.4bn in 2018 - its highest since 2014 - mainly driven by the opening of a series of new deep-water wells in the Gulf of Mexico.

The renewables division has been “super busy”, says Mark Gainsborough, executive vice president of the department, investing and acquiring a lot in the space. Shell’s acquisition of the Dutch car-charging network New Motion means it now operates Europe’s largest electric car network. It also sells clean energy through First Utility and has made a sizeable investment into one of the world’s most innovative residential battery energy storage firms, Sonnen. ▶



**“IT’S NOT A RACE TO RENEWABLES,
IT’S A RACE TO LOWER GREENHOUSE
GAS EMISSIONS. THE WORLD IS
GOING TO REQUIRE OIL AND GAS FOR
SOME DECADES TO COME”**

– BOB DUDLEY, BP



BP

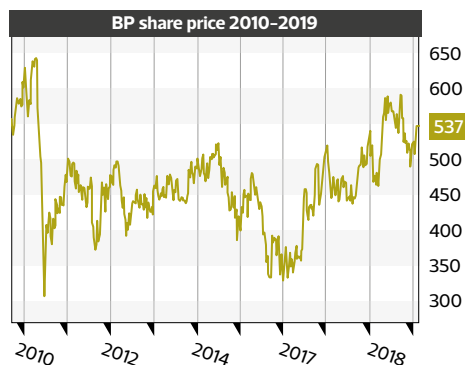
Looking back, BP was the first oil and gas major to diversify into renewables in the early 2000s when it rebranded to Beyond Petroleum, spending \$8bn in alternative energy. However, it shut down its Alternative Energy headquarters in 2009 and reduced its renewable energy budget from \$1.4bn to \$500m a year due to its funds being restricted by the Deep Water Horizon oil spill. Clean energy investments currently amount to \$500m of its \$15-17bn capital expenditure.

In a renewed push to acquire more green energy firms, BP returned to solar power six years after it quit the sector, with a \$200m stake in Europe’s largest solar developer, Lightsource, and is reportedly eyeing other bigger solar investments. The firm has also made moves to diversify in its consumer fuel business, with an acquisition of the UK’s biggest electric car charging network, Chargemaster, for £130m.

While chief executive Bob Dudley said the industry was in a period of major change, he made clear that hydrocarbons would remain the core of BP’s business. A doubling in profits to \$12.7bn in 2018 was driven by its record oil and gas production, which rose to 3.7 million barrels per day, an 8% year-over-year gain.

Having been stagnant for some time now, 2018 also saw BP’s share price performing well, reaching its highest level since 2010.

“It’s not a race to renewables, it’s a race to lower greenhouse gas emissions. As fast as renewables



Source: Yahoo Finance 25.02.19

8%
Amount BP’s oil
production increased
in 2018

\$6bn
Value of Total’s
renewable energy
businesses

and clean energy can grow – faster than any fuel in history – the world is going to require oil and gas for some decades to come,” Dudley said. “There are just so many different possibilities that this low carbon energy transition will happen in.”

TOTAL

Held up by its superior refining segment, Total’s performance during the three-year downturn of the oil market that began four years ago was far better than its peers. During this period, in which oil prices fell up to 70%, the earnings per share of Total fell only 49% whereas those of Exxon Mobil and Royal Dutch Shell plunged 75% and 87%, respectively, with BP posting \$6.5bn in losses in 2016.

The French oil company’s impressive \$13.6bn in revenue for 2018, “reflects the strong growth of more than 8% for the group’s hydrocarbon production,” chief executive Patrick Pouyanné said. The company accelerated its growth in low-carbon electricity, notably with the €1.4bn acquisition of the French utility Direct Energie. Total is also eyeing up Dutch utility Eneco Group, which Shell may also bid for.

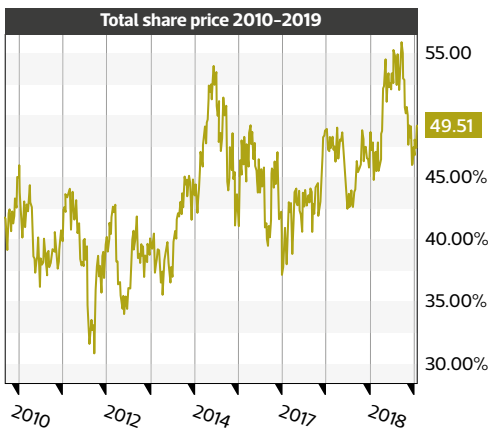
Total runs \$6bn worth of renewable businesses. The French oil giant began investing €150m in 20 renewable energy startups in 2008 through its Total Energy Ventures fund and allocated \$900m to R&D projects in 2017. It has also acquired five solar plants that generate about \$15m a quarter in adjusted operating income.

In addition, the firm is a pioneer in bioenergies. It’s been producing biofuels for more than 20 years and in 2016 invested \$14m with philanthropist Bill Gates in a new biomass conversion technology made by clean tech startup Renmatix.

In 2017, Total allocated \$900m to developing low carbon projects and plans to launch a new segment within its business called Integrated Gas, Renewables and Power as part of its responsible growth initiative, which has helped lower its greenhouse gas emissions by 30%. The oil major has also been investing in gas-fired power stations in developing countries such as Myanmar to entrench demand.

Low-carbon businesses are projected to account for near 20% of Total’s activities by 2035. ►

ABOVE: Robert ‘Bob’ Dudley, CEO of BP.



Source: Yahoo Finance 25.02.19

A SLOW TRANSITION

Drilling oil from the ground is by no means over quite yet. Globally, around 100 million barrels are pumped every day, the highest in history, as companies continue to ride oil’s gravy train.

Indeed, oil and gas account for almost 70% of the world’s energy use today and while rising global demand is a key driver for high oil prices, concerns over the outlook for the global economy are causing wild price swings in oil.

Divestment from coal, oil and gas stocks by investment funds is also becoming a growing issue. A significant \$6tn has been taken out of the industry in recent years, with the insurance industry alone moving \$3tn out of carbon-producing companies. Shell has cited the divestment movement as a “material risk” to its business.

The pace of change has accelerated. Less than 30 years ago, big oil was in climate change denial, and actively lobbying against the existence of man-

20%
Projection proportion of Total’s activities that low-carbon businesses will account for by 2035

\$12.7bn
BP’s profits in 2018, driven by record oil and gas production

made climate change. Shell was producing public global warming documentaries in 1991 about rising global temperatures while it was still investing heavily in new oil drills, and the likes of Exxon went as far as to found a group in 1989 – the Global Climate Coalition – that challenged regulations to reduce emissions and the science behind climate change.

Today, Shell, Exxon, BP and Total are all part of the Oil and Gas Climate Initiative, which compels 30% of the global market’s oil and gas producers to unilaterally reduce their output or diversify their portfolio into renewables.

Set up in 2014, the initiative has invested \$6.3bn in developing low carbon technologies with chairman Jérôme Schmitt, who’s also a senior vice president at Total, working to build a clear pathway and structure to fight climate change.

Ultimately, considering the fossil fuel industry is the most carbon intensive industry in the world, it is also home to some of the largest low-carbon energy initiatives, with Europe’s oil majors accounting for around 70% of the sector’s renewable capacity. With Total making the biggest strides and capital allocation commitments, it looks to benefit from a more immediate pivot in consumption trends. Shell, meanwhile, has the most available cash and is making some of the biggest investments, and therefore will be well placed to take advantage of a more gradual transition.

The race to clean energy is only going to speed up, putting oil incumbents at a crossroads. While some are scooping up alternative energy assets others are transitioning to power generation all in an effort to answer the big question: will established oil and gas companies be able to produce such high profits from renewable energy in the future? And will oil demand and profitability ever be over? ☐

ABOVE: Total’s engineers extracting data from rock samples in the main Centre Scientifique et Technique Jean Feger.



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