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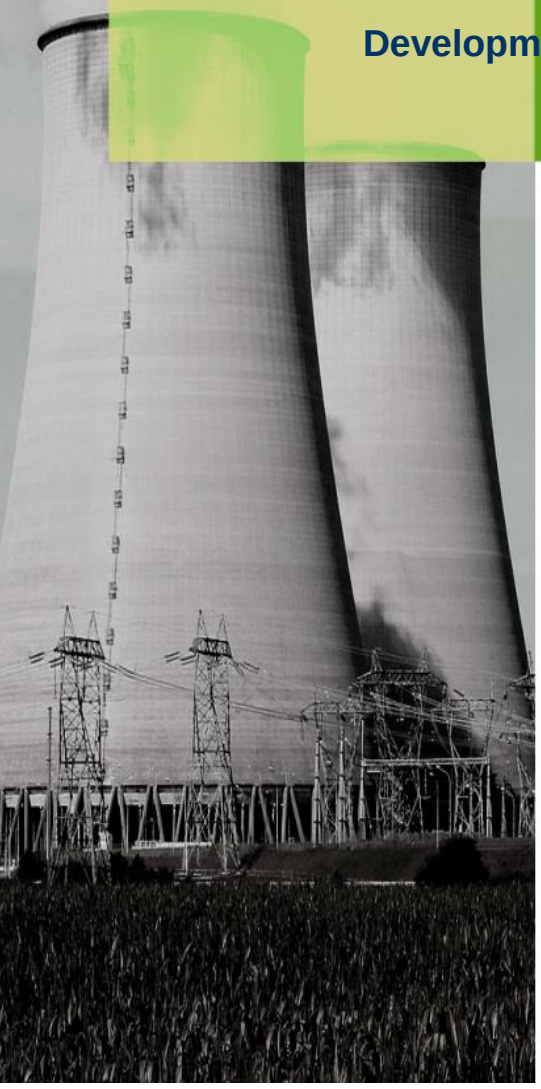
Industry report

Energy, Environment & Cleantech



Developments in the energy, environment & cleantech industries
EEC Industry Group
May 2020 edition

The low-carbon energy transition will get traction from the coronavirus crisis

- **The coronavirus pandemic is the biggest shock the energy sector has seen since the Second World War**, and it could have a devastating impact on demand especially for coal, oil and gas, according to the International Energy Agency (IEA). Energy demand could plunge 6% this year, the largest in 70 years in percentage terms and the largest ever in absolute terms, equivalent to losing the entire energy demand of India.

- On Monday 20th of April 2020 for the first time in history the WTI crude price went negative closing at -$37.63/bbl. The crash was primarily caused by the collapse of demand caused by the lock-down measures implemented around the world and high levels of storage utilisation in US.

- While the economic slowdown could delay investments and projects in renewables and clean technologies, in fact lockdown measures have been driving a major shift towards low-carbon sources of electricity including wind, solar PV, hydropower and nuclear.

- Scope deals will gain momentum vs scale deals in the context of the low-carbon energy transition in particular among oil & gas market players.

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M&A WORLDWIDE
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OPINION

By Giuseppe Sangiovanni

The outbreak of Covid-19 has caused a social, economic and financial shock at the global level that is unprecedented in peacetime. Around 4.2 billion people representing almost 60% of the global GDP was subject to complete or partial lockdowns and nearly all of the global population has been affected by some form of containment measures.

The SARS-CoV-2, the virus causing the disease known as Covid-19 (that we will call also simply coronavirus) has an animal source, the bats (although the virus passed through another animal species before infecting humans), as animal sources had viruses such as HIV, Ebola, SARS-CoV, and MERS-CoV.

The animal source of these viruses and the seemingly increasing frequency of their relative outbreaks should raise major questions on the role interactions between humans and animals and more in general between humans and the environment play in the appearance of such pandemics.

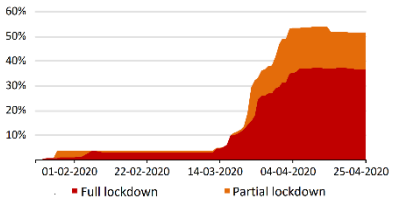
There is a growing consensus in the scientific community and at various levels of the society in developed countries that climate change and its harmful consequences on ecosystems are to be considered key factors in the creation of the conditions that increased the probability for the SARS-CoV-2 to infect humans and potentially for other viruses to trigger new pandemics in the near future.

This strong argument in favour of the environmental cause adds to the plenty of others accumulated to date (not last the devastating fires of last summer in Amazonia and the more recent ones in Australia) and stresses the importance and urgency of climate action and clean energy transition for governments, industrial players and financial investors.

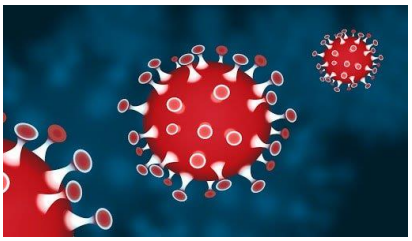
We believe a major implication of the crisis produced by the Covid-19 will be the acceleration of the investments, financing and dealmaking in the direction of the low carbon energy transition by the energy market players and in particular by the oil & gas and coal industries.

In terms of M&A transactions, this means shifting from deals based on scale economics rationales (scale deals) to deals based on scope orientation. This trend was already visible before the Covid-19 crisis in response to the disruption of old business models and to the need of getting into faster-growing lines of business or acquiring new capabilities.

Share of global primary energy demand affected by mandatory lockdowns



Sources: IEA 2020



On the other side and as highlighted by the International Energy Agency (IEA) in its report *Global Energy Review 2020*, the major implications of the Covid-19 on global economies turned to have a dramatic downward impact on energy demand and temporarily on CO2 emissions. The latest data from the IEA show that the drastic curtailment of global economic activity and mobility during 1Q20 pushed down global energy demand by 3.8% vs 1Q19 and it could lead to a 6% drop of the annual energy demand if recoveries are slow.

In this situation energy market players are feeling the financial impact throughout value chains and losing substantial revenues as they are being hit twice, first by lower demand for their products, including oil, gas, coal and electricity, and again by lower prices of these products.

THE BIG M&A PICTURE

Before the Covid-19 outbreak

Over the full year 2019 (FY19) global M&A activity totalled about $3.9 trillion in deal value, according to Refinitiv[1]. While this figure represents a slight decrease of 3% compared with 2018, it kept global deal value at the top of the $3 to $4 trillion range entered in 2014.

Worries about the global economy and a potential downturn dominated executive and investor discussions in 2019. This was mainly due on one side to the very high valuation multiples and high volatility reached in the markets and on the other side to an increasing uncertainty on the macroeconomic environment driven by some major geopolitical issues as the chaotic path to Brexit and the US-China trade tensions.

Despite this context created expectations for a slowdown of M&A activity in 2019 the year turned out to be surprisingly resilient. By number of announced deals worldwide, deal making in 2019 declined of 5% y-o-y to about 49k deals.

Strong megadeal activity in the US in H1 2019 was balanced out by a slower second half. In Europe and Asia, the opposite occurred: the year started slowly and then picked up.

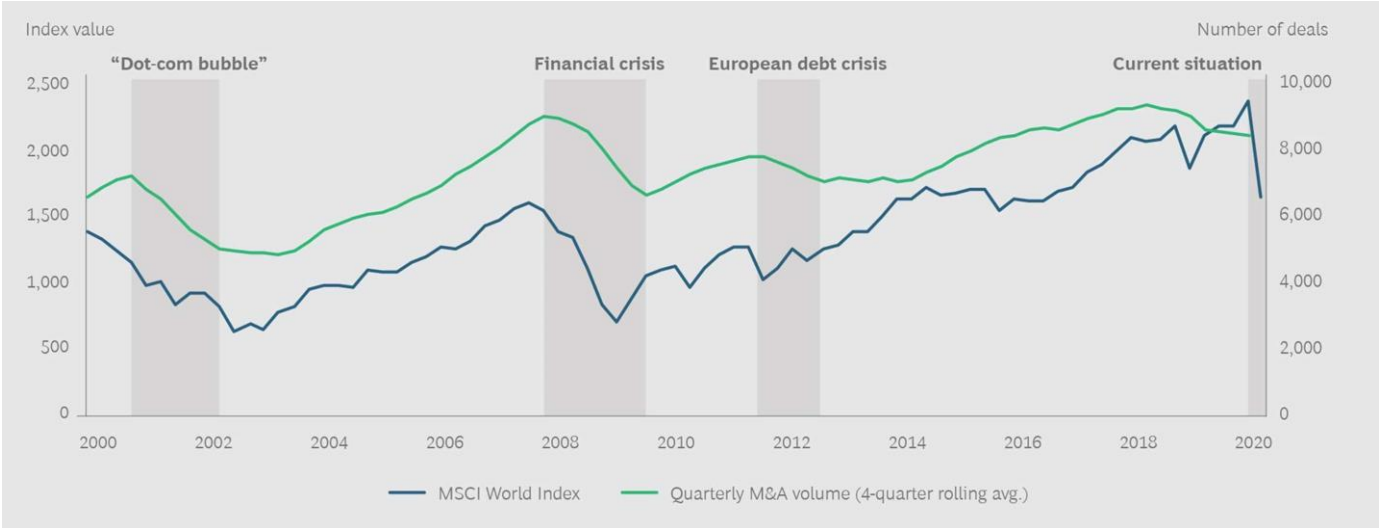
The energy sector accounted for 2 out of the 10 largest megadeals during 2019:

- **Saudi Aramco** majority stake acquisition of **Sabic** for $69Bn;
- **Occidental Petroleum Corporation** outbidding of Chevron for **Anadarko** for $38Bn.

Prior to the Covid-19 outbreak, in 2019 and beginning of 2020, the number of M&A deals globally was already on a slight downward trend. This trend is likely to speed up, at least in the short term according to BCG.

Historically, M&A activity has correlated strongly with stock prices and risk, as measured by implied volatility. From 2000 through 2019, the correlation between the value of the MSCI World index and M&A volume was approximately 80%.

Global M&A activity closely follows capital markets



Sources: Refinitiv; S&P Capital IQ; BCG analysis

Note : the total of 600,606 M&A transactions comprises pending, partly completed, completed unconditional, and withdrawn majority deals announced between 2000 and 2019.

[1] Global Mergers & Acquisitions Review, Full Year 2019

THE BIG M&A PICTURE

After the beginning of the Covid-19 outbreak

Throughout January and February, financial markets did not anticipate dramatic potential fallout from Covid-19. As reported by BSG in its report: *COVID-19's Impact on Global M&A,* a predominant part of investors believed the virus could be confined primarily to China and would not hit as hard the most developed countries. And, even if the disease were to become a global pandemic, they expected a similar reaction of markets as that to prior virus crises like SARS and MERS: with a small dip followed by a quick rebound.

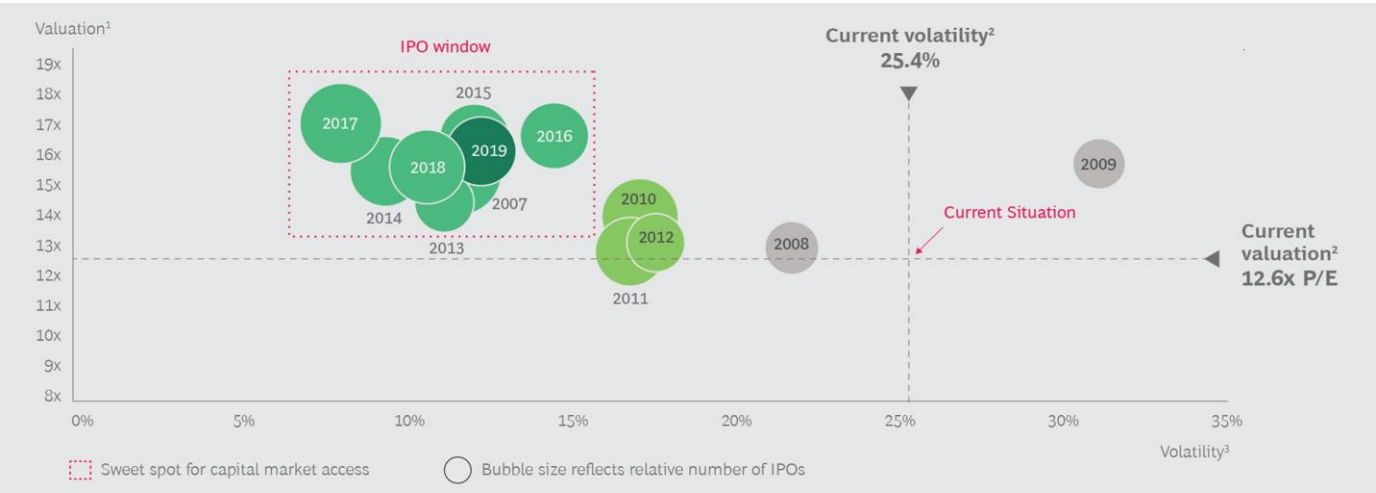
By early March, it was clear the Covid-19 crisis would play out differently. The financial markets are now pricing in significant fallout from Covid-19 on the global economy, anticipating a potentially strong recession in the forthcoming months and quarters.

Just as the spread of Covid-19 was accelerating around the world, global equity indices reached historic peaks. The MSCI World, S&P 500, and STOXX Europe 600 indices all closed at record highs on February 19, 2020. In a matter of weeks, the situation changed dramatically. From their peaks through March 18, 2020, these benchmarks lost around 35%. At the same time, volatility went through the roof, with the VIX index reaching 83% - a level last seen after the Lehman Brothers collapse in 2008.

While the large losses obviously impact investors currently holding risky assets, it also means that the window for capital market access (known as the "IPO window") closed rapidly. Although 2019 still offered decent market conditions, virtually all IPOs planned for early 2020 have been shelved for now as current levels of valuations and volatility make listings unfeasible.

At the same time, the market for leveraged debt financing seems to be closed for now, and private-equity firms are telling their deal teams to stand down.

The global IPO window closed quickly in early March 2020



Sources: Bloomberg; Refinitiv; BCG analysis

Note: analysis is based on 15,538 IPOs listed between 2007 and 2019. Simultaneous IPOs on several exchanges were treated as one IPO. Excludes listings by trusts and financial holding companies.

[1] MSCI All Country World Index forward P/E ratio (current market share price over earnings per share)
[2] As of March 18, 2020
[3] MSCI ACWI 180-day historical volatility

FOCUS ON THE OIL & GAS SECTOR

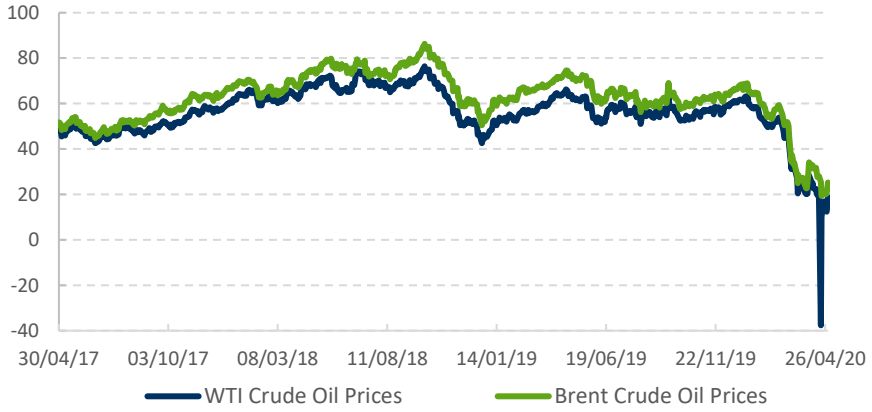
Coronavirus:
Very strong impact (- - - -)

The oil & gas sector is highly impacted by the economic crisis caused by the coronavirus pandemic. Crude oil prices fell from around $60/bbl at the beginning of 2020 down to respectively $10-15/bbl for WTI and around $20/bbl for Brent at the end of April. On Monday 20th of April for the first time in history the WTI crude price went negative closing at -$37.63/bbl and sending shockwaves through the entire energy sector worldwide. Indeed the negative price was reached by the May WTI futures contract expiring the day after while contracts for delivery in June were still trading above $20 a barrel.

The oil price crash has been primarily caused by the collapse of demand led by the dramatic economic slowdown resulting from the lock-down measures implemented around the world to tackle the spread of the Covid-19 pandemic. The global oversupply of crude oil is then accompanied by high levels of storage utilisation in the United States (and in particular at the WTI contract's delivery point of Cushing, Oklahoma). While the OPEC+ members agreed earlier in April to an historic production cut of 9.7 Mbbl/day this cut results to be less than half of the global daily oversupply.

LNG prices have declined to all-time lows in European and Asian markets which were abundantly supplied even before the Covid-19 further slashed a demand for natural gas already depressed by historically mild temperatures in the northern hemisphere. Natural gas prices have gone negative in parts of the US dragged down by a sharp decline of 18% in residential and commercial demand.

Crude oil prices per day 2017-2020, $



Source: Refinitiv

Trends before and beyond Covid-19

Oil prices

Up to the end of 2019, oil prices were relatively stagnant trading in a narrow range (between $52 and $64 for WTI crude). But these prices were lower of around 11% with respect to 2018 in terms of annual average.

Oil prices experienced some important volatility during the first quarters of 2019, when OPEC countries aimed at driving oil prices up by keeping production relatively low.

Then, in the last months of 2019, the Middle East went through a doomy and gloomy situation, notably because of the terrorist attacks on Saudi Aramco facilities in September, which caused Saudi Arabia production to decline from 9.9 Mbbl/day in August to 8.5 Mbbl/day after the attacks. The country was able to tackle the issue thanks to its large reserves that contributed to reassure the market and to keep the impact on prices lower than expected at the end of 2019.

FOCUS ON THE OIL & GAS SECTOR

Appetite for capital

While capital raised by oil & gas companies grew in value in 2019 vs 2018 it decreased in volume and debt (loans and bonds) continues to account for a large portion of the financing.

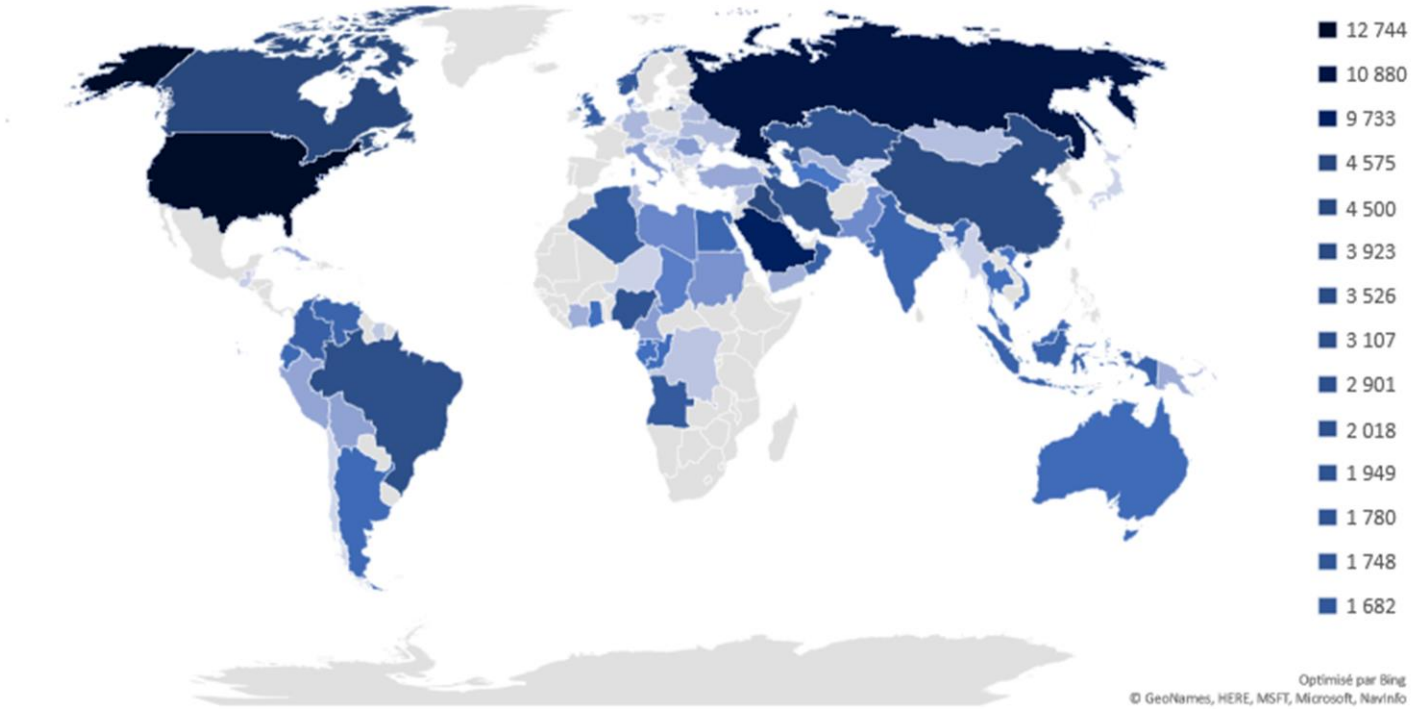
The need for new capital is driving consolidation in the oil and gas industry, and alternative funding sources are gaining prominence. Private equity (PE) and infrastructure funds are becoming important sources of capital. Oil & gas producers are also exploring creative ways to raise capital, such as asset-backed securities related to wells or joint ventures, including farm-outs and “DrillCo” transactions in which an investor funds drilling costs in exchange for a share in a lease or well.

Energy transition

Oil & gas companies are facing dual pressure from investors to deliver returns and future-proof their businesses amid the energy transition. There is growing consensus on the need for urgent and bold steps to mitigate climate change and growing pressure on investment banks and PE players to make climate-conscious lending or investment decisions. Therefore, it is becoming increasingly important for oil & gas companies to position themselves to the investment community in the context of the energy transition.

Beyond gas, the oil majors in particular are grappling with investments in renewables, electric vehicles and battery technology. They are considering if and how they transition from being oil & gas companies to being energy companies and what it would mean for capital allocation. They must balance the relative scale, risk and returns of their investments and acquisitions across their entire portfolios.

Crude oil production per country (thousand barrels per day)



FOCUS ON THE OIL & GAS SECTOR

Upstream

The upstream sector segment led global oil & gas M&A deals in 2019 accounting for the bulk of value and volume.

According to the *EY's global oil and gas transactions review 2019*, total deal value was up by 17.6% and reached $160.5Bn in 2019. But the increase was mainly due to the acquisition of Anadarko by Occidental Petroleum Corporation for $57Bn. If this acquisition is excluded, total global deal value decreased 24.2%. The total deal count declined by more than 20%, while average deal value for 2019 was similar to the prior year ($122 M).

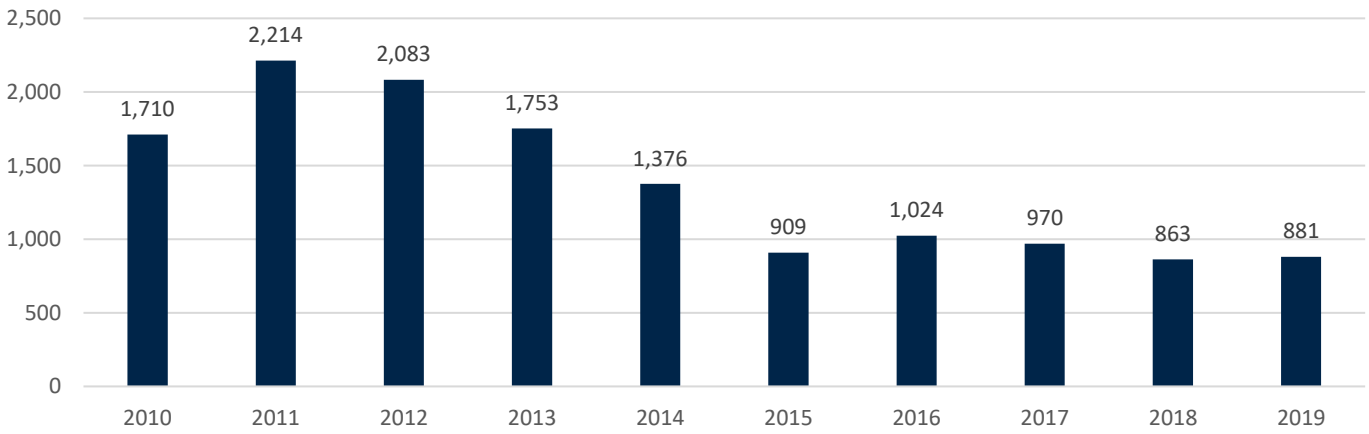
According to *the Deloitte's 2020 oil and gas M&A outlook*, in 2019 the US dominated the M&A upstream activity with 60% of both total global deal value and volume. However, sensitivity to oil prices and weak market sentiment drove the contraction in basin specific deals in the US with most of the deals taking place across multiple basins or, absent that, focused solely on the Permian basin where the lower oil prices pushed the smaller players to invest.

In fact, weak equity markets and continued volatility in oil prices pushed companies to redirect their near-term strategies to focus on cash flow, not in production growth. Asset-focused deals accounted for $25Bn which represents a fall of 50% y-o-y.

The dense activity in Brazil is also to be noticed representing 13% of global deal value in 2019. This is largely due to the transfer of rights sale of Buzios and Itapu fields by the Brazilian government to Petrobras, CNOOC and CNPC for $17.5Bn. The activity in Canada remained dense representing 7% of global deal volume but deals value sharply dropped due to the low oil prices and represented only 3% of global deal value.

Europe, particularly the North Sea, also saw notable deal activity in 2019 (worth $13Bn) as supermajors and large independents like ConocoPhillips divested their noncore North Sea assets to optimize their portfolio. Buyers were almost exclusively regional small-to-mid-size independents, including several PE backed companies such as Chrysaor.

Number of upstream oil and gas transactions worldwide from 2010 to 2019



Source: EY - Global Oil and Gas Transactions Review 2019

FOCUS ON THE OIL & GAS SECTOR

Midstream

The midstream segment transaction value and volume cooled off in 2019 according to the *EY's Global oil and gas transactions review 2019*. Total midstream deal value declines 54.8% y-o-y to $83.2Bn whereas total deal volume rose by 1.6% to reach 127 deals. Midstream transactions peaked in the second quarter of 2019 in both deal and volume. This trend is due to as a major wave of corporate simplifications that was completed in 2018.

One of the biggest midstream deals of 2019 was not a stand-alone transaction: the acquisition of Anadarko by Occidental Petroleum Corporation included Western Midstream Partners, which had a market cap of about $12Bn as of transaction closing.

North America remains the leader in the sector with 75% of total deal value and 16 of the top 20 transactions by value. However, the two largest asset deals occurred internationally including ENGIE and CDPQ acquiring 90% in the TAG pipeline from Petrobras for $8.6Bn and BlackRock and KKR's acquisition of 40% in ADNOC pipelines for $4Bn.

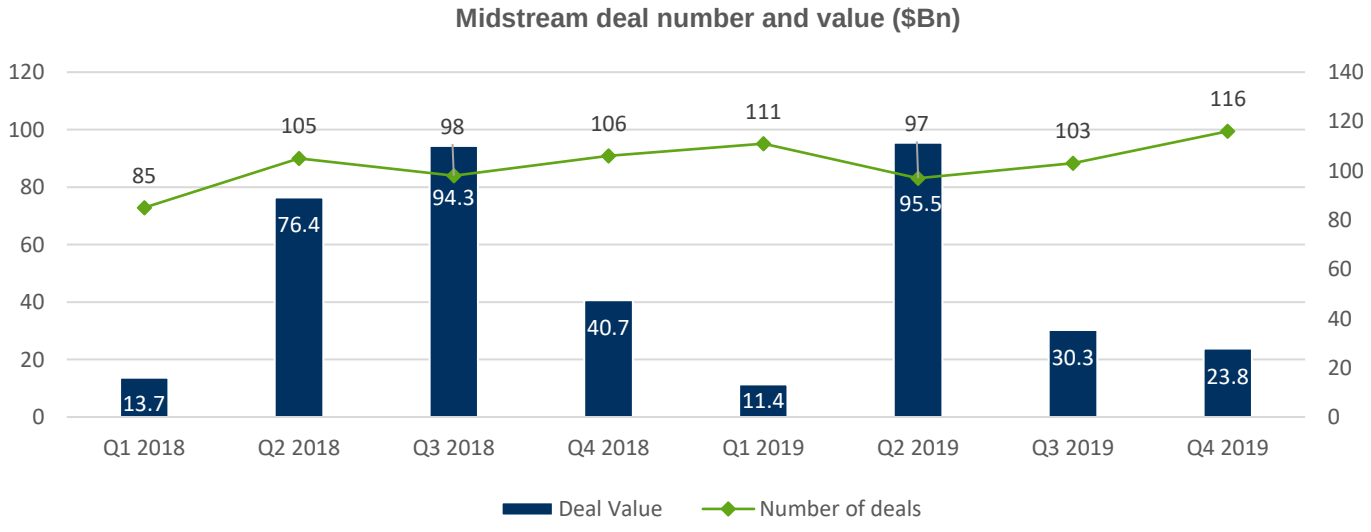
Over the past three years, an upsurge in LNG transactions had helped existing players consolidate their positions. Strong growth in LNG demand renewed interest in sanctioning LNG projects globally, leading to record sanctions in 2019 (led by newly sanctioned projects in Africa).

Two major themes from midstream transactions in 2019 were:

- continued PE and infrastructure fund (IFF) investment, albeit with more capital discipline;
- declining LNG transactions amid a changing environment.

PE and IFFs continue to invest in midstream assets around the world; half of the top 10 deals had PE or IFF buyers. Debt reduction remains a key priority for midstream players, and PE and IFF buyers can provide needed capital while seeking stable, reliable returns.

Outside the US, IFF buyers, as well as pension funds, continue to invest in natural gas infrastructure in emerging countries, as India and Brazil.



Source: EY - Global Oil and Gas Transactions Review 2019

FOCUS ON THE OIL & GAS SECTOR

Downstream

The downstream M&A also was very active according to the *EY's Global oil and gas transactions review 2019,* The total deal value reached $123.8Bn in 2019, which represents an expansion of 42.7% compared to 2018 whereas total deal volume fell to 170, 9.6% compared to 2018. However, Saudi Aramco's acquisition of SABIC for $69.1Bn account for more than half of total deal value. Thereby, if we exclude this deal, total deal value decreased by 31% and volume by 10%.

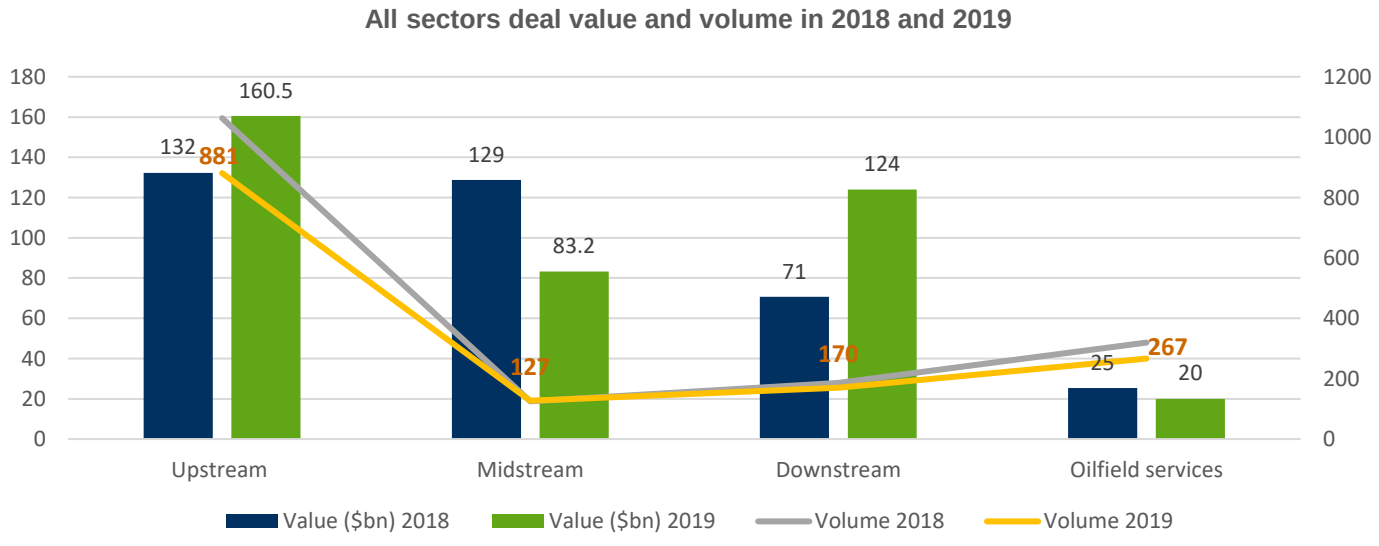
This trend is particularly due to the 70% decrease in deals value in North America and Europe. In the US, this is driven primarily by the large-scale consolidation in domestic capacity in recent years and limited opportunities in this sector. There were a few notable trends in M&A activity involving storage terminals during 2019. Storage operators continue to rebalance their portfolios. For example, Vopak sold its terminals in Algeciras, Amsterdam and Hamburg to First State Investments.

Also, infrastructure funds are showing continued interest in storage terminals. In addition to First State Investments, Aberdeen Standard Investments acquired Unitank and Oikos Storage (from Challenger Life).

In terms of PE interest, Carlyle acquired a minority stake in Cepsa from Mubadala during 2019, and Buckeye Partners was taken private in a deal valued at over $10Bn.

The petrochemical segment accounted for the two largest downstream transactions during 2019. Saudi Aramco acquisition of a 70% stake in SABIC (previously mentioned) and a 20% interest in Reliance's O2C division ($15Bn) as part of its downstream crude-to-chemicals strategy.

The focus of companies and investors over the year was on integration and the desire to strengthen the cash flows and returns. The activity has also developed in the retail and marketing segments.



Source: EY - Global Oil and Gas Transactions Review 2019

FOCUS ON THE OIL & GAS SECTOR

Oilfield services

Total OFS deal value reached $20Bn in 2019 which is 26.8% less than in 2018. This is due to a reduced demand for services, an oversupply and the difficult access to capital. 2019 was the third consecutive year when the numbers of deals declined, by 20% compared to 2018.

The sector is less attractive to outside investors because overall margins are less than a third of what they were pre-2015. Due to low market capitalization, reduced demand for key services and stressed balance sheets, the amount of oilfield services consolidation shrank.

US-based sellers accounted for more than 60% of total value. Unlike previous years, there were few large deals in 2019: only 4 deals over $1Bn. The largest transaction was GE's divestment of $3.1Bn of Baker Hugues stock in September.

OFS companies continued to adjust their portfolios to align with customer portfolio rationalizations. That is why one-third of 2019 transactions are divestments of non-core assets and that large OFS firms have not expanded scale or scope of operations as it is traditionally the case.

GE's secondary sale of its stake in Baker Hugues and Sandvik's divestment of the majority of its drilling and completion business (Varel) illustrate this trend.

According to EY, cost pressure and demand from customers pushed OFS companies to digitize. Several large and midsized OFS companies strengthened their digital capabilities via a mix of JVs, partnerships and acquisitions in order to diversify their offerings. This can be illustrated by the Newpark's acquisition of Cleansorb Limited in 2019, an innovative reservoir chemistry company that develops oilfield chemical technologies.

EY argues that the trend is likely to accelerate in the coming years with the digitalization.

FOCUS ON POWER & UTILITIES

Coronavirus:
Very strong impact (- - - -)

Lockdown measures have significantly reduced electricity demand, affecting in turn the power mix. Increases in residential demand were far outweighed by reductions commercial and industrial operations.

According to the IEA most recent report *Global Energy Review 2020*, global electricity demand decreased by 2.5% in 1Q20 vs 1Q19 though lockdown measures were in place for less than a moth in most countries. The IEA estimates global electricity demand to fall by 5% in 2020.

Dealmaking in 2019

Renewables have driven the Powers & Utilities (P&U) M&A in 2019. Globally, there were 832 deals in the energy and utility industry during 2019, down 5% on 2018 (although 2019 was still the third-best year on record). Deal value fell more sharply, by 32% to US$150.6Bn. Increasingly, however, the renewables sector accounts for a growing share of this activity.

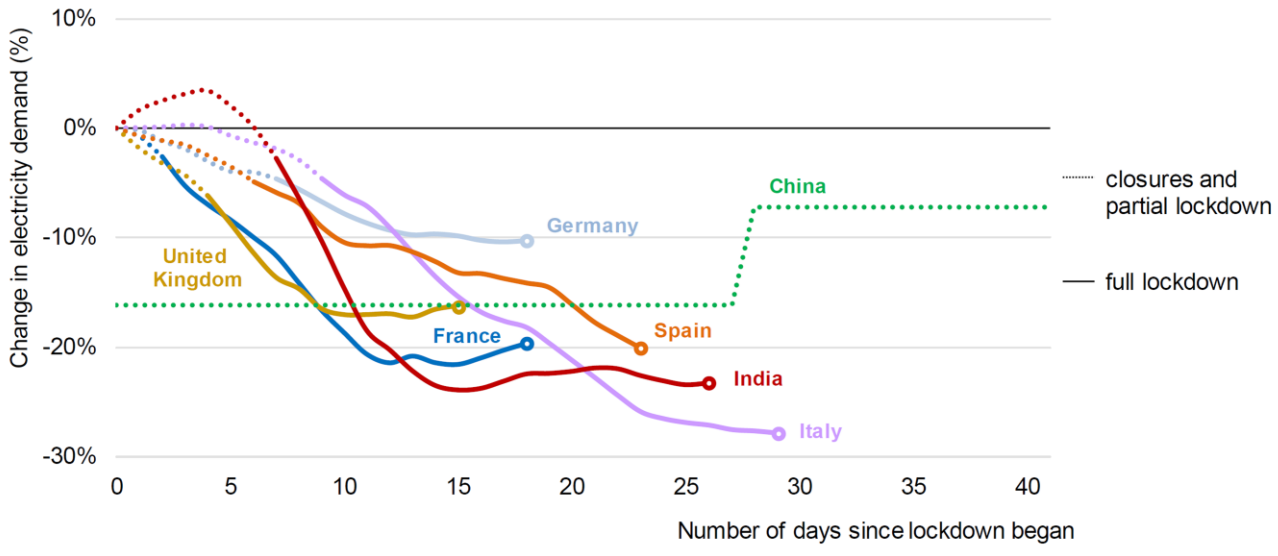
The importance of renewable energy assets in driving energy industry M&A reflects the ambition of stakeholders throughout the value chain to increase exposure to renewables and to raise renewables' share of the energy mix.

Americas

[**Coronavirus impact on demand:** Midcontinent ISO (MISO) officials, monitoring the high-voltage transmission system in the Midwest United States and Manitoba in Canada, said the grid operator has seen peaks in March down 18% compared to March 2019. These declines will result in lower revenues for generators].

Total deal value fell for the third year reducing to $43Bn and 52 deals. It represents a decrease in deal value of 41% and in volume of 24%. But, after the low third quarter ($7Bn), there was a rise in the fourth quarter with $16Bn. Q4 2019 was the strongest quarter on a deal value basis since Q2 2018.

Reductions of electricity demand after implementing lockdown measures in selected regions, weather corrected



Source: IEA

FOCUS ON POWER & UTILITIES

North America continues to develop its P&U sector through its strong interest in renewables. Indeed, significant investments are being made, representing 43% to total deal value for the quarter.

The largest transaction of the year was the Canada Pension Plan Investment Board's (CPPIB) acquisition of Pattern Energy Group Inc. for a deal value of $6.3Bn during Q4.

Europe

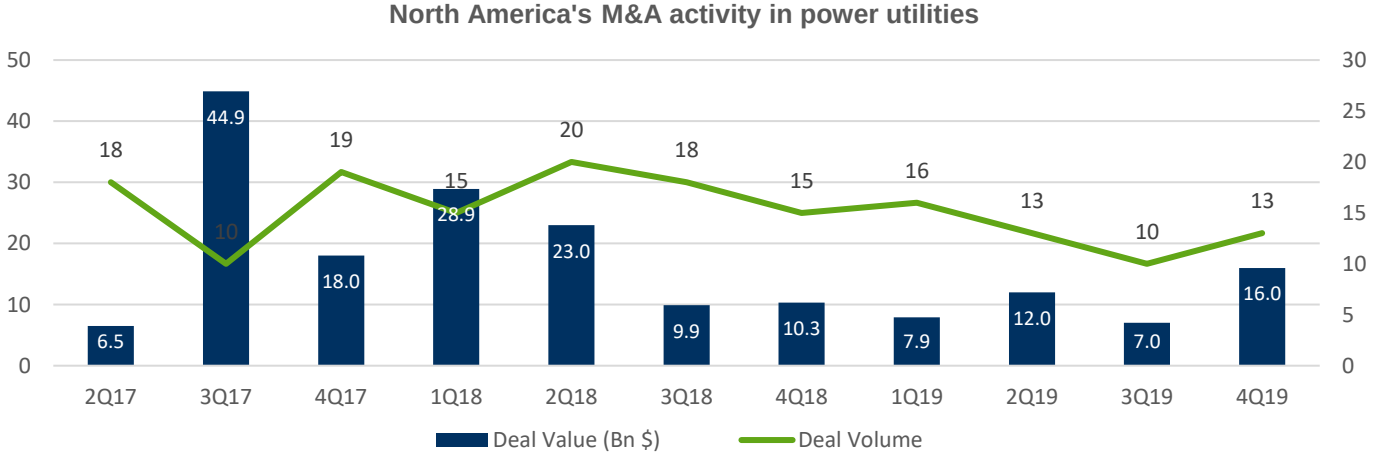
[**Coronavirus impact on demand:** according to EPRI data, five to seven days after Italy's lockdown began, the country saw an 18% to 21% reduction in peak demand and energy use on y-o-y basis. According to Refinitiv, in both Italy and France, the demand in week 12 was more than 17% below normal levels, but while in France the effect was almost equally divided between weather impact (8.5%) and Covid-19 impact (9.3%), in Italy the reduction due to Covid-19 was equal to 17.8% with respect to normal levels, while the weather accounted only for 2%].

Total value of the top 15 deals amounted to EUR31.5Bn in the Q4 2019. According to the KPMG's *European P&U report Q4 2019*, the top deals are constituted by power generation, distribution and renewable companies that are focused on geographical expansion, internal growth, energy transition and expansion of current portfolio. The EU is engaged in reducing emissions and promoting renewable energy sources. The biggest transactions of Q4 2019 are the acquisition of Eneco Group B.V. by Mitsubishi Corporation and Chubu Electric Power Co. and the acquisition of 20.5% of Knight Vinke Asset Management and Elliott Asset Management's stake in Uniper SE by Fortum Oyj AB.

Asia-Pacific – zoom on China

[**Coronavirus impact on demand:** China was the first to adopt containment measures, in mid-January, and experienced the world's largest demand reduction in 1Q20 of 6.5% according to the IEA].

According to Global Data in 4Q19 the P&U industry in China accounted for 36 M&A deals with M&A being again the leading deal category in China's power industry with total deals worth $690.91 M, whilst private equity deals totalled $10.06 M. China's top five P&U deals accounted for 62.4% of the overall value ($437.15m) during the period.



Source: PwC - North American Power and Utilities Deals Insights Year-End 2019

FOCUS ON POWER & UTILITIES

The coal industry

Coronavirus:
Very strong impact (- - - -)

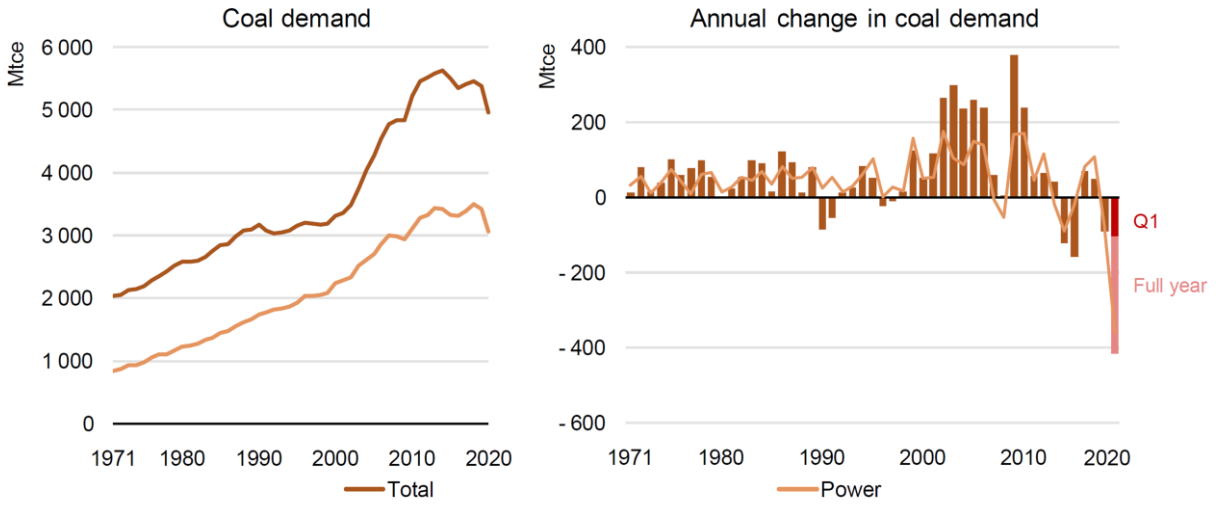
The IEA estimates global coal demand to fall by 8% I 1Q20 vs 1Q19. This significant drop was driven by lower demand in the electricity sector, where two-thirds of coal is consumed: coal power generation fell by around 10%. Industrial use of coal also declined during the period, although reported increases in coal use for steel production in China mitigated the decline.

In China, where more than half of the world's coal is consumed, the Covid-19 outbreak triggered a marked decline in coal demand because coal supplies 60% of primary energy and an even higher share of electricity. Coal consumption fell by 8% in 1Q20 compared with 1Q19 as the economy contracted by 6.8% and coal power generation fell by close to 9%. Industrial production fell sharply; in January and February 2020, automobile production declined by almost 50% and cement production by 30% with a slight recovery afterwards.

In the EU coal demand fell by more than 20% in 1Q20. The COvid-19 outbreak and shrinking electricity demand during lockdowns added pressure on coal use, which was already falling because of low gas prices, a mild winter and increasing renewable output, which was also supported by favourable weather conditions. The fall in CO2 allowances did not improve coal's competitiveness with gas in the power sector and therefore was not much relief for coal, which declined 20% in 1Q20.

In the US, a mild winter and the abundance of natural gas pushed gas prices down. Along with expanding renewables, this further squeezed coal out of the market. The decline in electricity use after the first states started lockdowns pushed coal use down even further, by around 30% in 1Q20, with coal's share in the power mix falling below 20% for the first time since the widespread development of coal-fired electricity generation in the 21st century.

Global total coal demand, and coal demand for power generation



Source: IEA

FOCUS ON RENEWABLES AND CLEANTECH

Coronavirus:
Double direction impact (- / +)

The impact of Covid-19 on renewables has a double direction in the sense that on one side it pushed the use of renewables and on the other it could slowdown and delay investments.

According to the IEA renewable energy has so far been the energy source most resilient to the slash of demand induced by Covidid-19.

In fact lockdown measures have been driving a major shift towards low-carbon sources of electricity including wind, solar PV, hydropower and nuclear.

After overtaking coal for the first time ever in 2019, low-carbon sources are set to extend their lead this year to reach 40% of global electricity generation – 6 percentage points ahead of coal. In 1Q20 global use of renewable energy in all sectors increased by about 1.5% relative to 1Q19. Renewable electricity generation increased by almost 3% mainly because of new wind and solar PV projects completed over the past year and because renewables are generally dispatched before other sources of electricity.

This is a key element that we would like to stress: renewables are resilient to lower electricity demand because they are generally dispatched before other electricity sources due to regulations or their low operating costs that give them priority.

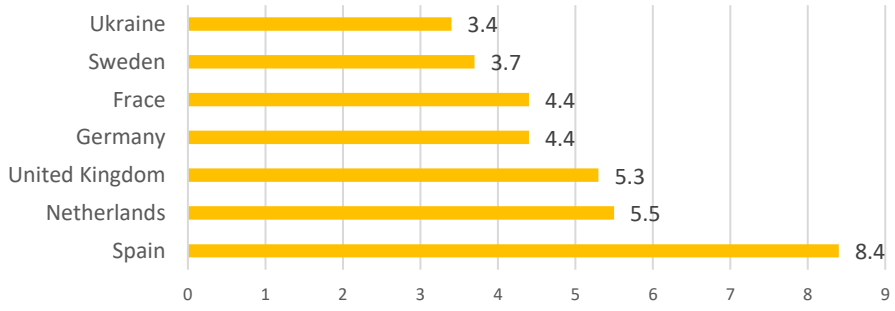
The IEA estimates that despite supply chain disruptions that have paused or delayed activity in several key regions, renewable electricity generation will rise by nearly 5% in 2020.

BloombergNEF predicts slow-down in clean energy economy due to Covid-19. Central Bank rate cuts and the lack of other investment options is good for clean energy, since the cost of debt is a significant factor in project levelized costs. However, it will be challenging for some investors to raise equity due to the collapse in stock markets. BloombergNEF says Covid-19 will affect renewables by slowing down legislative processes as parliaments work on emergency disease control measures.

Investments in 2019

Renewables represent solely 4.4% of the energy mix in the world as they are not yet fitting certain sectors as transports. Even though investments in the sector seem to sore, they are still insufficient to meet the objectives set in the Paris Agreement of 2015. According to BloombergNEF, in 2019, global investment in renewable energy capacity came in at $282.2Bn, up 1% from 2018. This modest rise is owed to a late surge in offshore wind deals and the slowing activity in Chinese solar market. Wind led the way with $138.2Bn, up 6%, then solar with $131.1Bn, down 3%, biomass and waste-to-energy with $9.7Bn, up 9%.

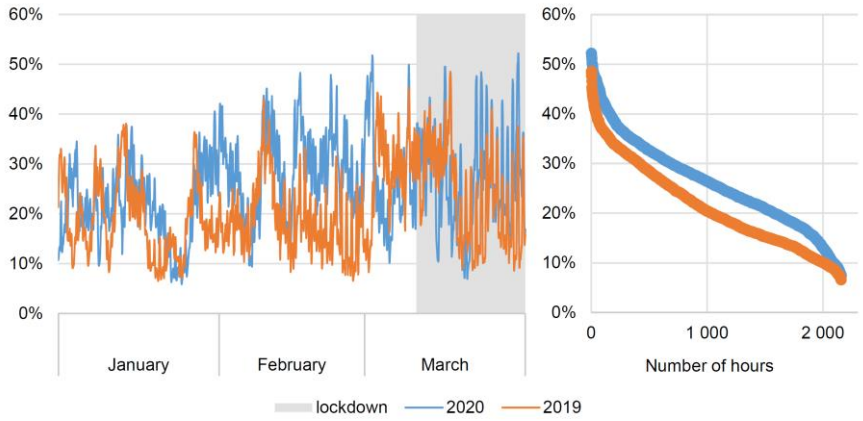
Europe renewable energy capacity investments in 2019, $Bn



Source: BloombergNEF

FOCUS ON RENEWABLES AND CLEANTECH

Wind and solar share of electricity demand in selected countries in France, Italy, UK and Spain in 1Q20



Source: IEA

Corporations contracted a record amount of wind and solar energy through power purchase agreements in 2019, up more than 40% vs 2018. Some 19.5 GW of clean energy contracts were signed by more than 100 corporations in 23 countries in 2019. This is more than three times the 2017 amount.

Europe

There has been a reduction in investments in renewables capacity in Europe of 7% in 2019 compared to the 2018 level, down to $54.3Bn, according to Bloomberg NEF.

Spain led European countries at $8.4Bn, up 25%, mainly in solar. This is in line with the trajectory targeted during the COP21 for 2020, which is to have 20% of the energy consumption coming from renewables. The reduction could be attributed to the UK, Germany and Sweden.

According to Refinitiv, the total of acquisitions in alternative energy sources reached $10.8Bn in 2019. But new wind projects are expected to get traction reaching €7.4Bn (or about $8.4Bn) by 2021. This momentum in the secondary market creates a harsh competition between investors, drives prices of acquisition up and rates of returns on projects down. The investors for these kinds of assets are strategic and financial investors of utilities, as well as a small number of pension funds. The renewable energies accounted for more than 34% of the EU new electricity-generating capacities in 2019. In Europe the share of low carbon energy never ceased to increase and now represents 60% of the energy investments.

Americas

While President Donald Trump takes very little action to protect the environment, US states and cities continued to try to encourage investment in renewable energies. Indeed, the states of California, New Jersey, and New York have already passed on laws requiring them to produce 100% of their energy from renewable sources by 2030. The M&A market in the sector continued to be driven by solar and onshore wind segments. The Americas represent 80% of global corporate PPA volume, with 15.7 GW.

According to FTI Intelligence Spark, the most risk-averse investors continued to invest in mature projects, whereas those with higher return requirements invested more in early-stage projects. Overall, the US benefited from the advancing technologies with declining costs, making renewables more attractive. The big players in oil & gas will still have a continued interest in renewables faced with the gain of maturity of the sector and the push towards a more diversified energy mix.

FOCUS ON RENEWABLES AND CLEANTECH

Overall, the US invested $55.5Bn in renewables in 2019, up 28$ from 2018. It was the second-largest investing country behind China.

Concerning South America, the region is currently facing the need for more investment in electricity generation as the demand is increasing by more than 3% per year, pushed by population growth and a rising GDP per capita. This need for infrastructure has made South America a good investment.

Even though the hydropower sector is very important in the renewable energy mix, there is a growing demand for sources of power such as solar, wind, and biomass. In 2019, new investments in renewable energy were worth $18.1Bn, up 54% vs 2018. This increase was attributable to Brazil and Chile, according to BloombergNEF, respectively up 74% and fourfold. They both need to finance power capacity additions in the coming years. The wind sector made a great comeback and was the first component of renewables investments, with $8.9Bn invested, up 87% compared to 2018. The second component was the solar sector with $8.1Bn worth of investments, up 31%.

In terms of countries, Brazil paved the way, representing $6.5Bn worth of investment, up 74% from 2018. The country can power 10 million homes using renewables. Brazil has a problem of overdependence on hydroelectricity which causes issues during periods of drought, as it did in 2014. Brazil is therefore trying to increase its presence in the fields of the other renewable sources. The country has committed to expanding by 20% of its non-hydropower renewables to at least 20% of the renewable mix by 2030, which is likely to create the need for investment in the sector in the coming years.

Chile came second with $4.9Bn worth of investment, up fourfold.

Mexico saw its investments in renewables increase by 17% within the year, up to $4.3Bn.

Asia-Pacific

Asian countries are very active investors in the sector with China playing the biggest role. The country represents 30% of the RES (Renewable Energy Sources) installed capacities in the world and invested $83.4Bn in 2019.

The investments of China in renewables are increasingly made abroad as its government decided to limit domestic solar and wind capacity additions. China accounted for 30% of the global investments in the sector in 2019, a decrease of 8% from 2018. It was the lowest amount since 2013. Wind investment rose 10% to $55Bn, but solar fell 33% to $25.7Bn. Two places below followed Japan for 2019 with $16.5Bn worth of investments and $373Bn in the last 11 years. In fifth place came India ($9.3Bn).

We can especially expect to see investment rise in South Korea in the coming years as there is a growing concern for air quality and a government commitment to achieving 20% of power generation from renewables by 2030.

Fund managers are coming in the region and expanding their teams to have a stronger presence. Indeed, Blackrock opened an office in Asia-Pacific and Macquarie Green Investment acquired a solar development team composed of 88 Asia-based professionals. Fund managers and developers also went to Taiwan to participate in the implementation of many offshore wind projects. According to Rystad Energy, the renewable investments in the Asia-Pacific region are seen to overtake the ones of oil and gas by 2020.

FOCUS ON SOLAR AND WIND ENERGY

Solar Energy

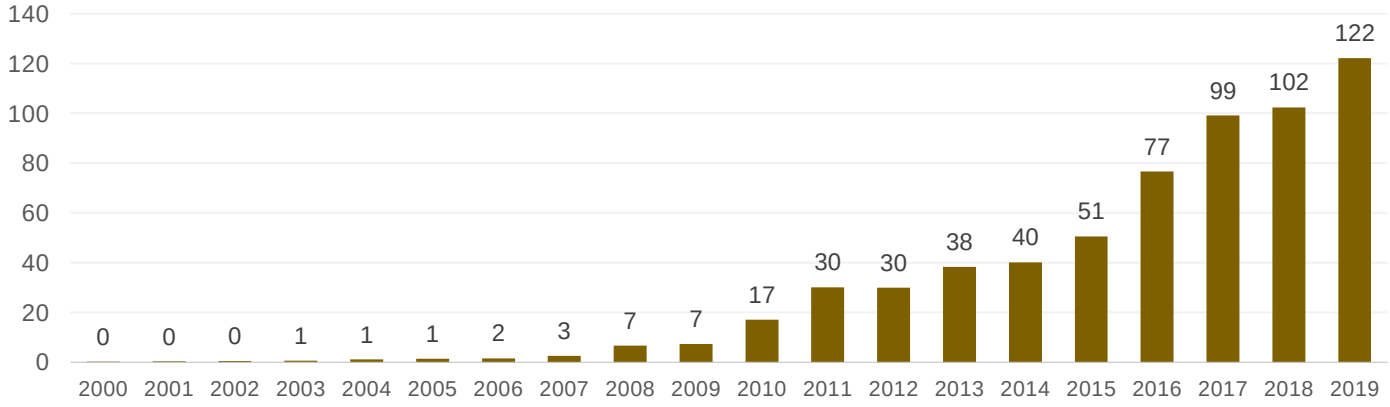
Coronavirus:
Double direction impact (- / +)

The decline of the world equity markets does not have a strong impact because financing of long-term solar projects are not dependent on the current level of the market. According to BloombergNEF, the demand for solar has never been stronger. But Covid-19 impacts supply. Factory shutdowns in China have disrupted global supply chains for wind turbines and solar panels, with consequences for clean energy progress this year around the world. Moreover, labour shortages due to containment have reduced global supply. According to Bloomberg NEF, the solar energy's rate of growth is expected to slow for the first time since the 1980s, with an increase by 121 to maximum 143 Gigawatts.

The industry accounts for $131.1Bn worth of investment, down 3% from its 2018 level, according to BloombergNEF. It is the second biggest sector within the renewables behind wind energy. The global solar energy market is expected to reach $422Bn in 2022 according Statista. The success related to the solar energy segment can be attributed to the declining cost of installing solar photovoltaic systems. According to projections from the Institute for Energy Economic and Financial Analysis, in 2021 the US is expected to generate more power from renewable energy than from coal.

The sector went through continuous growth from 2012 to 2019. In 2019, 122,120 MW were built, and it is expected that in 2025, 194,740 MW will be installed within the year. It saw corporate funding and M&A activities generate $11.7Bn during the year with 117 deals. This represents a 20% rise compared to the level of 2018, a year in which $9.7Bn were raised. The increase was mainly due to large debt financing activity in the first (Q1) and last (Q4) quarters of 2019 compared to 2018 and six solar IPOs around the world, according to the Mercom Capital Group's *2019 Q4 and annual solar Funding and M&A report.* There were 65 M&A deals in the solar sector compared to 82 transactions in 2018. The top deal in 2019 was $6.1Bn acquisition of Pattern Energy by Canada Pension Plan Investment Board (CPPIB).

Global new installed solar PV capacity from 2000 to 2019 in MW



Source : Statista, IHS Markit

FOCUS ON SOLAR AND WIND ENERGY

Debt financing activity surged in 2019 with $7.8Bn in 46 deals, a 29% increase year-on-year spurred by eight securitization deals in 2019, totalling $1.6Bn. The top debt deal in 2019 was Yieldco company TerraForm Power, which raised $700 M through senior notes. The report said that Global Venture Capital/Private Equity (VC/PE) funding in the solar sector in 2019 came to $1.4Bn in 53 deals, compared to $1.3Bn in 65 deals in 2018. Solar downstream companies accounted for 75% of VC/PE funding that went into solar companies in 2019.

The largest country for solar is China with 204.8 GW installed, in front of the US (78 GW). China is first because of capacity targets for the country rapidly developing and rising concerns for air pollution in the country. The largest IPO in 2019 was Xinyi Energy Holdings, a Chinese solar farm operator, which raised $465 M.

The US is second, but this situation is likely not to continue as there are more and more uncertainties concerning the future of solar panels as their main components come from China. In the future, we can expect India's investments to overthrow those of the EU.

Overall, solar energy is made at 70.7% of thermal energy, 28.6% f photovoltaic and at 0.7% of concentration thermal. China accounts for 62.5% of the thermal capacities, then comes the European Union with 11.75% of the capacities, followed by the United States. Germany accounts for nearly half of the energy production in the EU. Germany is the leader in the sector of photovoltaic production, followed by Italy, the US and then China. The local photovoltaic capacity has been multiplied by 10 in 5 years as prices of production decreased sharply. Investment firms acquired over 30GW of large-scale solar projects in the past five years which shows solar's attractiveness in the long-term.

Wind Energy

Coronavirus:
Double direction impact (- / +)

Although it is impacted by Covid-19, BloombergNEF still expects 2020 to be a record year for new wind installations. Markets most at risk of missing 2020 expectations are China and the US where end-of-year subsidy deadlines have driven a rush to build. Indeed, tight construction schedules leave little flexibility to accommodate later deliveries of components. A prolonged outbreak could put the maintenance of wind farms at risk by lowering availability and reducing output.

According to the 2019 Global Wind Report, 60.4 GW of wind energy capacity was installed globally in 2019, up 19% from 2018 and the second-best year wind historically. China and US remain the world's largest onshore wind markets, together accounting for more than 60 per cent of new capacity in 2019. The wind energy industry has grown thanks to new technologies such as hybridisation and green hydrogen.

The late surge in offshore wind financings took capacity investment in that sector to $29.9Bn, up 19% on 2018, and $2Bn more than the previous record year of 2016, according to BloombergNEF. Among the offshore projects reaching financial close in the fourth quarter were the 432MW Neart na Gaoithe array off the Scottish coast at $3.4Bn, the 376MW Formosa II Miaoli project off Taiwan at $2Bn and the 500MW Fuzhou Changle C installation in the East China Sea, at $1.5Bn.

FOCUS ON SOLAR AND WIND ENERGY

The first of France's offshore wind projects to be financed, the 480MW, $2.5Bn Saint Nazaire, got its go-ahead in the third quarter. Wind (onshore and offshore) received the biggest capacity investment in 2019 with $138.2Bn, up 6%. Global Wind Energy Council expects over 50 GW of new offshore wind capacity to be installed from 2020-2024.

Europe

According to Wind Europe, Europe installed 15.4 GW of new wind power capacity in 2019. This is 27% higher than 2018 but 10% less than the record in 2017. Europe now has 205 GW of wind energy capacity and wind accounted for 15% of the electricity the EU-28 consumed in 2019. Onshore wind was 76% of the new installations with 11.7 GW. The UK installed the most wind power capacity in 2019 (2.4 GW), 74% of offshore wind. Spain (2.3 GW), Sweden (1.6 GW) and France (1.3 GW) led the installation of onshore wind farms. Investments in Germany reached a historic low of €300m.

Americas

North, Central, South America and Caribbean installed 13.4 GW of wind energy capacity in 2019, up 13% from 2018, according to GWEC. Total installed wind capacity is over 148 GW, which is three times more than 10 years ago. Markets to watch in the region are Chile and Columbia.

About 18% of electricity of the United-States is generated by renewable resources such as wind, solar and hydroelectric power from dams.

For the first time in history, wind turbines created more electricity than the long-time renewable champ, hydroelectric dams. 7.2% of the country's electricity came from wind power in 2019, according to the American Wind Energy Association (AWEA). Wind power activity was fuelled by the Production Tax Credit (PTC), scheduled to expire by 2022.

Asia Pacific

GWEC reports that the Asia Pacific region installed 30.6 GW of new wind energy capacity in 2019, which brought the total wind capacity to 290.6 GW, representing 44% of total global installations.

Leading countries in the region for wind installations in 2019 were China (26.2 GW) and India (2.4 GW). South East Asia is forecast to play an increasingly important role in driving wind power growth in the region. Markets to watch in the region include Vietnam and Thailand.

FOCUS ON NUCLEAR POWER

Coronavirus:
Low impact (-)

Nuclear generation has two characteristics that will assist in maintaining supplies. Firstly, in most reactors, fuel assemblies are used for around three years. Reloads of fuel take place every 12-18 months. There is therefore greater security of supply than for fossil fuel plants, which require a constant feed of coal or gas. Secondly, nuclear reactors operate with high capacity factors, providing a more reliable, constant supply than some intermittent renewables, such as wind and solar.

Kazatomprom, Kazakhstan's state-owned uranium production company - which produced 40% of the world's primary uranium in 2018 – has announced that to date the pandemic has no impact on its operations. However, containment measures still have consequences in some countries.

At the Cigar Lake uranium mine in northern Saskatchewan, Canada, production has been temporarily suspended, reducing the workforce on site from around 300 to 35.

Industry overview in 2019

Based on data reported to the IAEA, 450 nuclear power reactors were in operation worldwide since 2018, totalling 398.9 GW, up 2.5 GW. Nuclear power generated around 10% of the world's electricity in 2019 and remained the second largest source of low carbon electricity after hydro power.

Americas

Americas have a total of 123 reactors in operation, largely led by North America, and especially the United States and Canada. The US have 97 nuclear power plants (NPPs) and produced 809TWh in 2019, representing 20% of their total electricity output. The country accounts for over 30% of the world's nuclear generation and its nuclear fleet comprises also 2 reactors under construction which will be operative by 2021. Indeed, the US nuclear fleet is aging, as can be illustrated by the 7 reactors shutdowns over the last five years. This phenomenon can also be attributed to the less expensive shale gas.

The Nuclear Energy Institute emphasizes the risk of closing 15 to 20 power plants within 5 to 10 years. The fleet is getting older with an average age of 39 years, according to EIA. In response to this, the US passed a bill on nuclear innovation to promote research on the subject. Canada is also a major supplier of nuclear power with a nuclear production capacity of 13.5GW from 19 operating NPPs.

South and Central America have only a slight share of nuclear power, as they generate much of their energy from renewables. The sub-continent has only 7 reactors in operation, 3 of which are in Argentina. The other big player in South America is Brazil with 3 active reactors and one under construction.

FOCUS ON NUCLEAR POWER

The country only generates 3% of its energy from this source of power. The two other reactors belong to Mexico and provide the country with 5% of its energy needs.

Europe

While globally, demand for new nuclear capacity is still growing, in Europe demand is under pressure as a result of major social acceptance issues following the Fukushima accident in Japan. This pushed European governments to lessen their share of nuclear power generation in favour of renewables.

There are two trends in Europe. First, the European Union, led by France and its 58 reactors, which is the second-largest nuclear country after the US, has not planned to launch nuclear construction projects. The current policies promote the dismantling of sites or the refurbishment of NPPs to extend their lifetime above 40 years. The only construction projects in the EU are the EPR in Flamanville in France and the "Olkiluoto-3" reactor in Finland.

On the other hand, Eastern Europe is expanding its nuclear fleet and Russia is leading the exports. Russia's Rostov 4 and Leningrad II-1 NPPs were connected to the grid during the year. Moreover, the country completed the construction of its first floating NPP and began the construction of Kursk II in April 2019. Russia is also one of the first exporters of new reactors, notably in Asia, the Middle East, and South America. According to the World Nuclear industry, other East European countries are going to expand their nuclear capabilities, such as Belarus, to whom Russia lent $10Bn for the construction of 2 reactors and Poland, which has for objective to build 4 reactors by 2040.

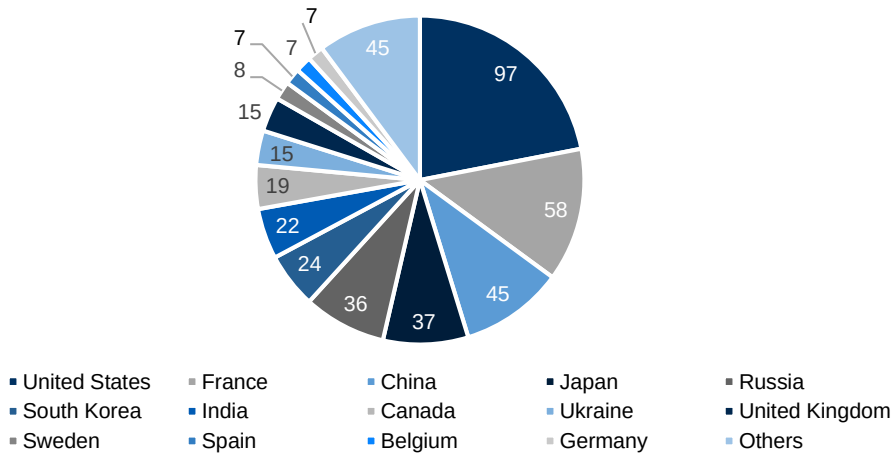
Asia-Pacific

There is a growing demand for nuclear energy in Asia and notably in China. This is due to increasing electricity needs and carbon emission constraints. Nuclear generation capacity is expected to double worldwide by 2040. China will then be one of the main drivers of this increase.

Indeed, at the end of 2019, the country had 45 reactors in operation, among which 7 were started in the year. Although the country is the world's main driver in the sector, it is the World Nuclear Industry opinion that the country missed its Five-Year-Plan 2020 targets of 58GW installed.

Japan has implemented a five-year nuclear stimulus plan in 2018 to propose an electricity supply that will be generated at 20% from nuclear power by 2030, up from 2% in 2018. This pushed the country to restart 9 reactors mid-2018.

Number of operable nuclear reactor plants by country 2019



Source: World Nuclear Association

CLIMATE CHANGE AND ENVIRONMENT PERSPECTIVE

Climate change / environment

Coronavirus:
Strong impact (+ + +)

The pandemic has a positive impact on environment because it leads to a reduction in gas emissions. According to China's Ministry of Ecology and Environment, the average number of "good quality air days" increased 21.5% in February, compared to the same period last year. Moreover, according to the Centre for Research on Energy and Clean Air (CREA), in China CO2 emissions were down by around 25% over a four-week period because of the measures to contain the coronavirus.

Scientist Marshall Burke from Stanford University calculated the reduction air pollution may have helped to save the lives of 77 000 people in China under the age of five and over 70. However, experts warn that when China starts to reboot its economy the toxic chemicals could up to higher levels than before the epidemic hit.

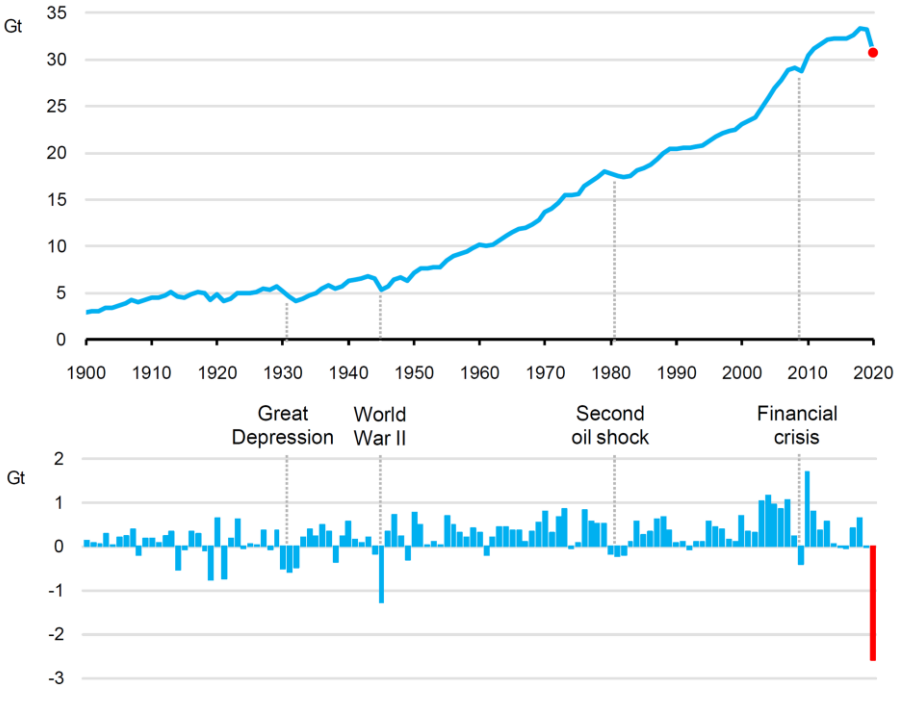
Globally CO2 emissions were over 5% lower in 1Q20 vs 1Q19 and are expected to decline almost 8% for the full year 2020 vs 2019 according to the IEA.

Trends before and beyond Covid-19

It has been 5 years since the Paris agreement were signed by 196 countries. This agreement targets to limit the temperature increase to 2 degrees for the century. Global carbon emissions flattened in 2019 after two years of increases. This resulted mainly from a sharp decline in CO2 emissions from the power sector in advanced economies (3.2%), thanks to the expanding role of renewables, fuel switching from coal to natural gas, and higher nuclear power output.

The EU adopted measures earlier on to limit gas emission by 20% by 2020 and to create 32% of its electricity from renewables by 2030. In that objective, EU countries adopted different goals. In France, the environment sector must follow recommendations according to the Multi-Year Energy Program (MYEP). The purpose of this document is to achieve carbon neutrality by 2050 and to comply with the Law on Energy Transition for Green Growth (LTECV). China is in a good way to meet the objectives it committed to achieving during the Paris agreement.

Global energy-related CO2 emissions and annual change, 1900-2020



Source: IEA

CLIMATE CHANGE AND ENVIRONMENT PERSPECTIVE

The problem is that those objectives were not ambitious enough. China's emissions are the largest in the world. Even though it heavily subsidized the electric car industry, which made the Chinese buy 1.1 million electric cars in 2019, it is still financing the construction of coal power stations.

Other countries, like Saudi Arabia and Russia, are not doing any particular effort to reduce their carbon emissions. Data on greenhouse emissions in those countries are scarce and cannot be relied upon. Russia committed to keep the increasing of its gas emissions below 6% by 2020 compared to 2016 and 15% by 2030. As for Saudi Arabia, its emissions are estimated to increase by 80% from 2015 to 2030.

The US, which was a signatory of the Paris agreements has for objective to exit the agreements in 2020. Moreover, the US is coming back on the other plans President Obama put in place when he was still in office such as the regulation of toxic air pollution, or the clean power plan which had as objective to reduce the carbon emissions by 32% by 2030.

Even if states and cities are putting measures in action to counter the lack of regulation from the country, it will not be enough to stay beneath the 2°C threshold at the end of the century.

M&A dimension

Overall, we can still witness a global shift toward cleaner energies. This trend is inevitably reflected in M&A transactions. It has already been reflected in the number of sustainable funds in the world. In 2019, the number of sustainable equity and bond funds climbed from 351 to 479, which is an increase of nearly 25%.

There were a record number of issuances for green bonds in 2019 as firms, financial institutions and governments raised $185Bn in total to fund environmentally sustainable projects, according to data from law firm Linklaters.

The environmental issue in M&A transactions is often referred to as "ESG", i.e. Environmental, Social and Governance issues. M&A transactions can directly affect companies operating in the environmental field, but in most cases, environmental issues are addressed in a growing number of transactions as a secondary subject that adds value to a company's own business.

Recycling

Coronavirus:
Strong impact (- - -)

In the most COVID-19 affected countries, production facilities are closing, resulting in a sharp decline of storage demand. According to EURIC, competent authorities shall be able to grant derogations allowing to increase storage capacity beyond what is normally allowed by European or national rules in order to restrict negative effects on the collection and treatment of waste.

Furthermore, EURIC explains that when domestic European and global demand is decreasing, recycling companies are currently facing considerable economic and licensing problems, in particular for small & medium sized companies.

In the United States, coronavirus disrupts recycling sector in many municipalities.

Some communities have made the decision to adjust or suspend recycling collection.

CLIMATE CHANGE AND ENVIRONMENT PERSPECTIVE

Market overview in 2019

Recycling and waste treatment are major and global challenges in the energy and environment sectors. Indeed, this market was estimated to be worth $102.2Bn in 2019 just in the United States, according to Statista.

The material raising the most issues is plastic. Indeed, according to the World Bank the world produced 242 million tons of plastic, out of which only 9% is recycled.

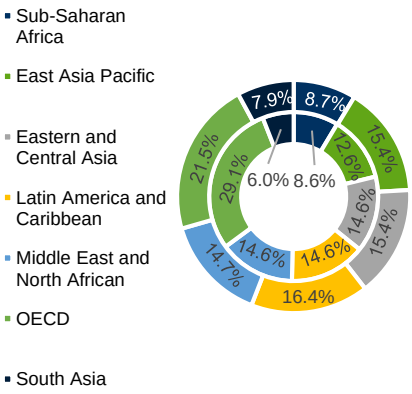
Out of this total waste produced in 2019, it is estimated by the World Bank that 19% went through a recycling or composting process. The rest was either put in landfills or incinerated and often exported in Asian countries.

We have recently witnessed strong reactions towards the exports of this waste, notably from China, which started refusing all imports of plastic waste from any other countries.

Americas

According to Capstone Headwaters, with 122 announced or closed M&A YTD in the "Waste & Recycling" industry, the sector has already outpaced all of 2018 volume.

Urban waste production current and 2025 estims.



Source: Urban development series: a global review of solid waste management

Private equity firms have contributed to increase their appetite in the Waste & Recycling industry, representing 45% of total deal volume in 2019, up 7% from 2018. Despite a softening global economic outlook, Waste & Recycling companies held a defensible market position due to stability in waste volumes, increasing municipality and local government privatization of public services, and recurring revenues. Therefore the market is largely inelastic to economic downturns and presents a highly attractive stable investment. The North American Liquid Waste services market is expected to reach a market value of $42Bn by 2023.

Liquid waste service providers have significantly benefited from a rise in consumer spending, steady levels of industrial production, and stringent waste disposal regulatory standards.

Europe

We have witnessed the arrival of many developing SMEs in the sector, in addition to large groups that are strongly developing their recycling and waste treatment activities. This can be illustrated by the activities of Suez NWS who won three water management and waste recovery contracts in the Grand Bay region for a global amount of nearly $280m in January 2019.

Asia-Pacific

East Asia Pacific produces 21.5% of global waste. China used to be the world's largest importer but now places barriers to the import of waste. This benefited other Asian countries developing in the sector such as Malaysia and Indonesia. China stays one of the major M&A players in the sector. Its main deal was the acquisition of a 10.18% stake in Beijing Origin Water Technology by China Urban & Rural for $415.6m.

COUNTRIES ON THE RADAR

Coronavirus: Horrendous impact

The Covid-19 affected all countries analysed or mentioned in this report as well as basically all countries in the world. We consider the impact of the Covid-19 in each country as horrendous, particularly in terms of victims and social costs.

We are not in the position and it would go beyond the scope of this report to make a more in-depth analysis of the impact of the Covid-19 on each country.

Countries' overview in 2019

Germany

Germany remains the leading European economy but experienced a slowdown in 2019 with an economic growth of 0.6%, compared to 1.5% in 2018. The forecasts made by Xerfi for the country for 2020 are pessimistic, with an estimated growth rate of 0.5%. This can be attributed to protectionist tensions that have reduced its exports, as well as the impact of anti-pollution standards on its automotive industry.

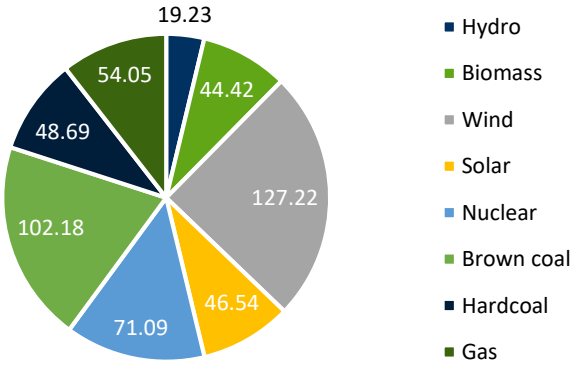
Germany is a model for energy transition.

In 2019, Germany's renewables were the first energy source of the country before coal, accounting for 46% of the electricity production. Indeed, the green generation units in the country rose by 7% in 2019 to produce 237.4 TWh of electricity. The country targets to get out of nuclear power by 2022 and to produce 65% of its electricity from renewables by 2030. Indeed, according to many economists, it is very unlikely that Germany will respect the measures it signed during the Paris Agreement for its 2020 objectives. One of the problems Germany will have to deal with is its transport industry. The automotive industry is one of the German flagships. Measures on vehicles are thus particularly hard to implement. Other sectors are still to develop such as building insulation.

Germany still uses a great amount of coal for its electricity production and has for objective to shut them all down by 2038. This would require a $45Bn investment to the country's most affected regions.

The German energy sector was mainly characterized by the trade in activities and capital of E.ON and RWE. E. ON acquired 76.8% of the shares of Innogy previously owned by its competitor RWE for $38Bn. The two competitors were impacted by the government's decision to shut down nuclear power generation activities in 2015 and decided to cease their vertically integrated electricity production in order to focus on smaller and separate services. In Q4 2019, mergers and acquisitions in Germany rose by 49% compared to last year, to a level of $35.2Bn.

Energy mix in Germany in 2019 (in TWh)



Source: Fraunhofer ISE

COUNTRIES ON THE RADAR

USA

The US achieved a growth rate of 2.1% in 2019, 0.8% less than the past year. This phenomenon of economic slowdown had been forecast to continue in 2020 by the Bureau of Economic Analysis before the Covid-19 crisis. The lockdowns resulting from the Covid-19 containment measures are likely to dramatically boost the expected slowdown.

The energy demand in the US is largely covered by fossil fuels. In 2019, the US generated approximately 4,100 TWh of electricity. About 82% of the electricity generated was from fossil fuels and nuclear resources. Petroleum is one of the county's main energy sources with an estimated petroleum consumption being around 20.46 million barrels daily in 2019. The liquid is predominantly used in the transportation sector.

Moreover, from 2025, American oil production will overthrow that of Russia and Saudi Arabia. This pushes massive investment in pipes towards Mexico and Canada and in liquefaction plants in Texas and Louisiana to transport the LNG to Europe or Asia.

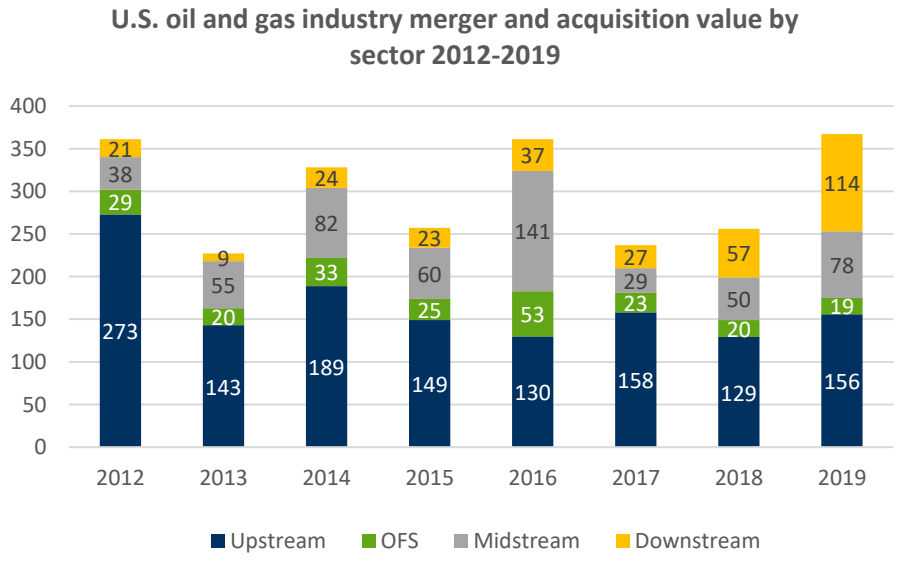
Despite Donald Trump's denial of global warming and his willingness to exit from the Paris Agreement, the use of renewables (non-hydro) expanded by 6.2% from 2018 due to the addition of new wind and solar power plants. Indeed, wind electricity consumption increased by 4.4% while solar rose by 13.7%. These figures were offset by a decline of 5.2% in hydroelectricity consumption.

Today, renewable energies account for 18.5% of the US electricity produced, twice as much as 10 years ago. This change in the energy mix is made at the expense of the use of coal-fired power plants.

Indeed, the US encountered in 2019 their 5th consecutive year of decline in the coal sector. In a decade, the part of electricity from coal decreased from 30% to 23.5% and this phenomenon is nowhere to stop as renewable components are the least expensive power generating components in many US states, despite the end of tax credits on renewables.

Dealmaking in oil & gas in 2019

The oil & gas sector reached $11Bn in Q4 2019, achieving a 2019 deal value of $96Bn. It was the 3rd biggest sector concerning the M&A activity, after technology and healthcare in 2019. The biggest deals of this sector in Q4 were the acquisition by Hess Midstream Partners' $6.2Bn of Hess Infrastructure Partners and the $5Bn asset transaction with Apache by Total.



Source: 2020 Oil & Gas Mergers and Acquisitions Outlook, Deloitte US Statista

COUNTRIES ON THE RADAR

China

China is the world's second-largest economic power behind the US and the world's largest exporter. While in 2019 its economic growth was one of the fastest with a 6.1% increase in GDP, it was also the country's slowest rate since 1990 because of the trade tensions with the US. These tensions have led to increased tariffs and will have an unknown impact on the country's companies. Faced with these uncertainties, China subsidized its companies 15% more than in 2018 for a total amount of 25.7Bn.

In terms of resources, China is the leading producer and exporter of rare earth, an essential component in the construction of renewable energy equipment (solar panels, batteries, etc.), according to ClearWorld.

China is largely contributing to raising Asia's coal-based power generation capacities. This trend can be seen with the creation of the largest energy /coal company through the merger of Shenhua Group with China's Guodian Group for a total amount of around $271Bn.

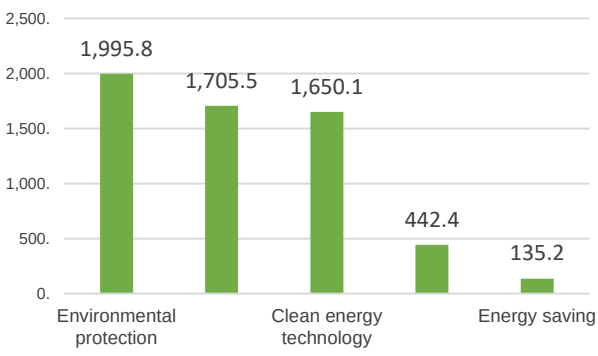
China is also developing its nuclear industry. According to the World Nuclear Industry Status Report, the country has currently 47 nuclear power plants operating generating a capacity of more than 253.5TWh of power in the first three quarters of 2019, up 22.75% compared to a year earlier, making it the third-largest nuclear power generating capacity.

The country accounted for about 10% of nuclear global production and its nuclear fleet is among the youngest with an average age of 7.2 years. China is also continuing its development with the construction of 10 nuclear power plants.

China has introduced numerous restrictions to be able to refuse to be "the world's trash can" by imposing restrictions on the import of plastic waste. The country has therefore redistributed the roles of the recycling market since it was the first plastic waste collector.

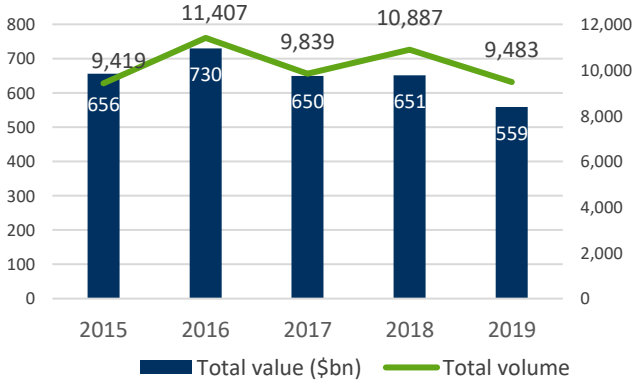
In the oil & gas sector, outgoing M&A transactions declined in 2019 due to a volatile market. The country has a keen interest in Europe in terms of power & utilities according to Herbert Smith Freehills. Moreover, its outgoing investments in renewables are increasing. This follows the state's decision to limit local capacity for state's decision to limit local capacity for additional wind and solar energy.

Value (M$) of M&A cases in cleantech sector in China 2018, by industry category



Source: PwC - China cleantech annual report 2018

China M&A deal value and volume since 2015



Source: PwC - M&A 2019 Review and 2020 outlook

COUNTRIES ON THE RADAR

Japan

Japan is the world's third-largest economy, but it is still highly dependent on its exporters, and the many natural disasters it has experienced accelerated its economic recession (1.7%, 1.2% in 2017 and 0.9% in 2018). However, 2019 GDP returns to growth with a 0.75% increase.

Renewables investments fell by 10% in 2019 to $16.5Bn. This is particularly due to the fall in solar power investment, which encountered its lowest level since 2011. Solar, wind, biomass and geothermal energy still account for just 1% of Japan’s power capacity. According to the REN21 study, this was caused by falling costs as well as the fact that developers struggled to secure land and grid connections.

Japan is at a turning point concerning its nuclear sector. Since the Fukushima disaster in 2011, the Japanese government's objective was to completely cease the country's nuclear activity by 2030.

However, a nuclear recovery plan has been put in place, and 9 of the 54 available reactors have already been relaunched in 2018.

The objective of this plan is to revive the Japanese economy and production by generating 20% of the country's electricity from nuclear power by 2030.

In addition, 2019 has been a record year for Japan, which completed numerous transactions totalling $ 200Bn, a significant 13% increase from 2018.

This increase is driven by its internal deals ($55Bn) and external deals and by the consumer, financial services and technology sectors.

The largest transaction was Shire's acquisition by Takeda Pharmaceutical for $62Bn. Significant transactions were also carried out in the energy sector, such as the acquisition of 24.95% of Gunfleet Sands Offshore Wind Farm Project by JERA Co, and the Mitsui & Co Ltd acquisition of the Australian company Oil & Gas AWE Limited for $602m.

Most transactions carried out in 2019 are less significant than in 2018, as the major transaction in the Japanese energy and environment sector in 2019 until now was the acquisition in February of 20% of the British company OVO Energy by the Japanese entity Mitsubishi Corp for $277.43m.

Vietnam

While China's slowing growth is being felt throughout Asia, Vietnam is stabilizing its GDP growth at 7.02% in 2019 and, before the Covid-19 breakout, was expected to have a growth of about 6.8% in 2020. This stable growth has been mainly due to the migration of a labour force from rural areas to the manufacturing industries, services. This growth is also due to developments in investment, urbanization, etc.

Indeed, with stable policy, low labour costs, a young population, and middle-class gentrification, Vietnam holds all the cards to attract investors and to boost M&A activity.

The total deal value the country achieved in 2019 is about $4.5Bn (mainly inbound and domestic deals), an increase in deal activity of $1Bn compared to 2018. The major transactions in the country were carried out within the financial industry, in addition to an M&A operation between two of the leaders of real estate development: the purchase of Vingroup, subsidiary Vinhomes by the Singapore sovereign wealth fund GIC group for a total amount of $1.3Bn.

COUNTRIES ON THE RADAR

However, the renewable energy industry, and particularly the solar sector is growing. Indeed, according to Herbert Smith Freehills, this attraction to solar energy is due to the new regulations in solar and wind energy, which should continue in this direction.

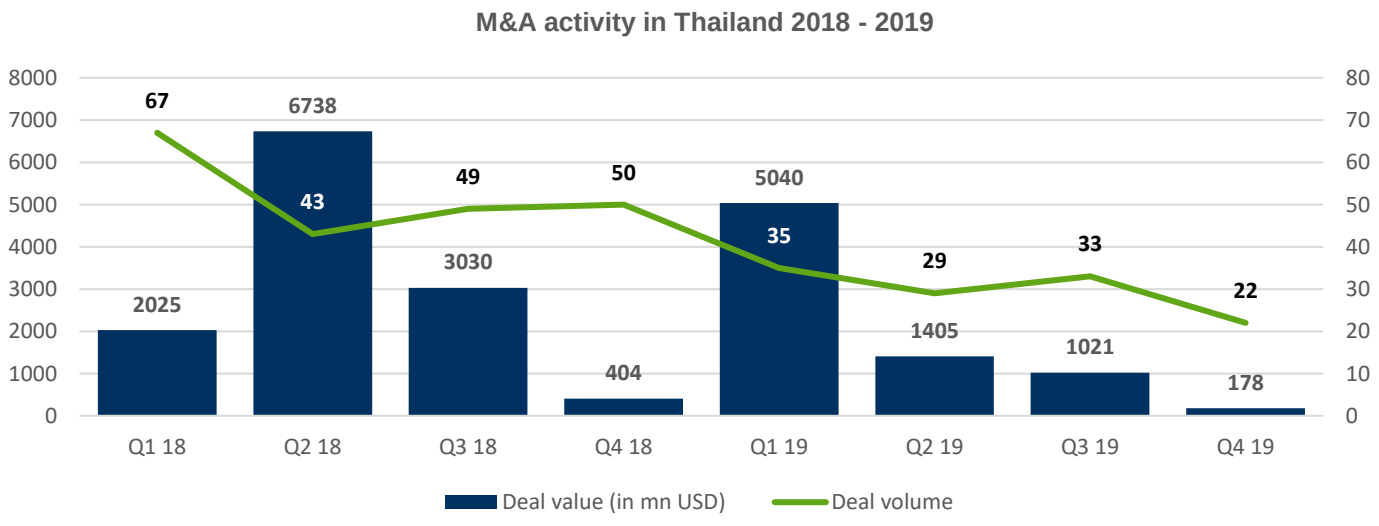
Thailand

As it was the case for China Thailand GDP slowed down in 2019 growing 2.4%, compared to an upwardly revised 4.2% growth in 2018, the weakest since 2014, and missing the government's 2.7 – 3.2 % target range. This GDP dynamics is the result of the country's internal development strategy, according to the *Asia Pacific M&A Review 2019 and 2020* (Herbert Smith Freehills) based on investing in its own country rather than abroad. This strategy faced a significant downturn in the overall value of deals across all industries, which amounted to $7.5Bn in comparison with the $12.2Bn in 2018. In addition, the value of incoming deals was worth $3.6Bn in 2019, compared to $1.7Bn in 2018.

The Thai Government's Eastern Economic Corridor continued to attract interest from domestic and foreign investors to participate in mega-infrastructure projects that aim to connect major airports and ports in Thailand Easter Seaboard. We have witnessed many big-ticket investments exceeding $30Bn notably made in the infrastructure projects which were put out for tender.

According to Herbert Smith Freehills, it is expected that Thailand will continue its development and that it will be able to see many more investments in its energy sector.

The merger in Thailand of TMB Bank PCL and Thanachart Bank PCL for a value of over $5Bn deserves to me mentioned as it was the major deal of 2019. However, unlike in 2018, there were no influential transactions during the first half of 2019. Thai Solar's subsidiary Solar Visible Co acquired Bang Chak Green Energy Co Ltd, a Bangkok-based power generation company and Grimm Power is in the process of acquiring alternative energy company Glow Energy Plc.



Source: KPMG M&A trends in Thailand / Q4 2019

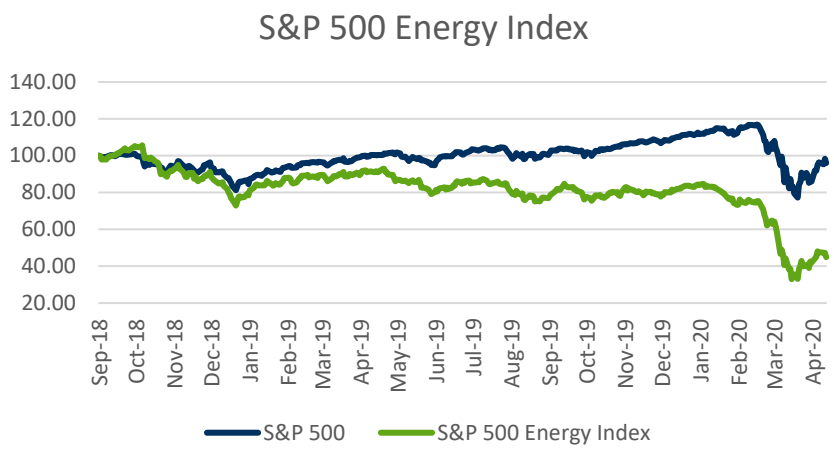
SELECTED 10 RECENT MAJOR M&A TRANSACTIONS IN THE EEC SPACE

Date announced	Acquirer	Target name	Target country	Synopsis
27/02/2020	Equitrans Midstream Corp	EQM Midstream Partners LP	United States	US - Equitrans Midstream Corp (ETRN) agreed to merge with EQM Midstream Partners LP (EQM), a Pittsburgh-based owner and operator of midstream assets, for a total $4.246Bn, in a stock swap transaction. ETRN offered 2.44 common shares per EQM share.
26/11/2019	Alimentation Couche-Tard Inc	Caltex Australia Ltd	Australia	AUSTRALIA - Alimentation Couche-Tard (ACT) of Canada planned to acquire the entire share capital of Caltex Australia (Caltex AU), a Sydney-based petroleum refinery operator, for a sweetened estimated $23.748 in cash per share, or a total estimated value of $5.93Bn, via an unsolicited offer.
06/11/2019	Investor Group	Republic Of Brazil-Buzios Field	Brazil	BRAZIL - an investor group comprised of Petrobras, CNODC Brasil Petroleo e Gas and CNOOC Petroleum Brasil, agreed to raise its ownership interest from 30% to 90%, in Buzios Field, via auction. Concurrently, Petrobras agreed to acquire the remaining 70% interest, which it did not already own, in Itapu Field. The two transactions were to have a combine cash value of $8.981Bn.
04/10/2019	Hess Midstream Partners LP	Hess Infrastructure Partners LP	United States	US - Hess Midstream Partners (HESM) acquired the entire share capital of Hess Infrastructure Partners, a Houston-based energy exploration and production JV, for an estimated $6.194Bn, in a stock swap transaction. The consideration consisted of an estimated $550M in cash, 230 M HESM new units valued at $4.494Bn and the assumption of $1.15Bn in liabilities.
27/08/2019	Investor Group	Tallgrass Energy LP	United States	US - An investor group, comprised of Blackstone Infrastructure Partners LP, Enagas, GIC, NPS and USS, definitively agreed to merge with Tallgrass Energy, a Leawood-based provider of pipeline transportation services of natural gas, for a sweetened $22.45 in cash per share, or a total $3.538Bn.

SELECTED 10 RECENT MAJOR M&A TRANSACTIONS IN THE EEC SPACE

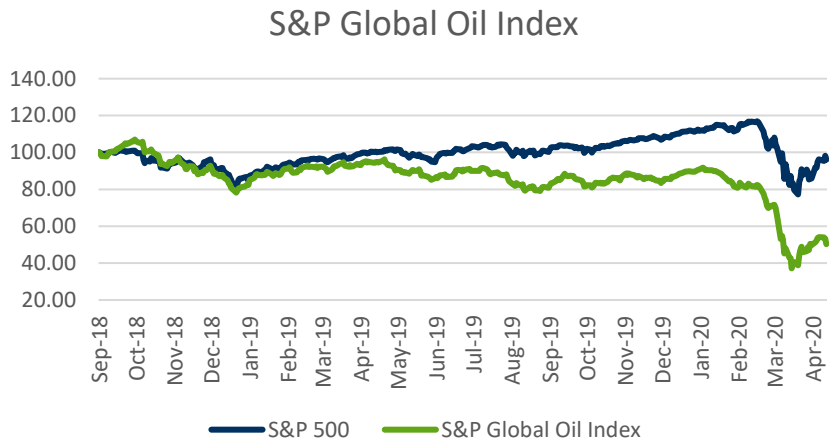
Date announced	Acquirer	Target name	Target country	Synopsis
27/08/2019	Hilcorp Alaska LLC	BP PLC-Alaska Business	United States	US - Hilcorp Alaska LLC (Hilcorp Alaska), a unit of Hilcorp Energy Co (Hilcorp), agreed to acquire the Alaska business of BP PLC (BP), a London-based oil and gas company, for a total value of $5.6Bn. The consideration was to consist of $4Bn and up to $1.6Bn in profit-related payments.
05/05/2019	Total SA	Anadarko Petroleum Corp-African Oil & Gas Assets	South Africa	SOUTH AFRICA - Total agreed to acquire African oil & gas assets of Anadarko Petroleum (Anadarko), The Woodlands-based producer of crude petroleum and natural gas, for $8.8Bn. The transaction was conditioned upon the completion of Occidental Petroleum Corp's acquisition of entire share capital of Anadarko.
24/04/2019	Occidental Petroleum Corp	Anadarko Petroleum Corp	United States	US - Occidental Petroleum Corp merged with Anadarko Petroleum, a Woodlands-based oil and gas exploration and production company, for a sweetened $38.379Bn. Occidental offered $59 in cash and 0.2934 common shares per Anadarko common shares. Based on Occidental's closing stock price of $57.95 on 3 May 2019, the last full trading prior to the amendment of the terms, each share was valued at $76.003.
03/06/2019	Infrastructure Investments Fund	El Paso Electric Co	United States	US - Infrastructure Investments Fund, a unit of JP Morgan Investment Management Inc, definitively agreed to acquire the entire share capital of El Paso Electric Co, an El Paso-based electric power distributor, for $68.25 in cash per share, or a total $4.387Bn.
27/03/2019	Saudi Arabian Oil Co	Saudi Basic Industries Corp SJSC	Saudi Arabia	SAUDI ARABIA - The Saudi Arabian state-owned Saudi Arabian Oil Co (Aramco) agreed to acquire a 70% interest in Saudi Basic Industries Corp SJSC, a Riyadh-based manufacturer of petrochemicals, for $32.907 per share, or a total value of $69.104Bn, from the Saudi Arabian state-owned Public Investment Fund, ultimately owned by the Saudi Arabian government.

S&P ENERGY INDEXES



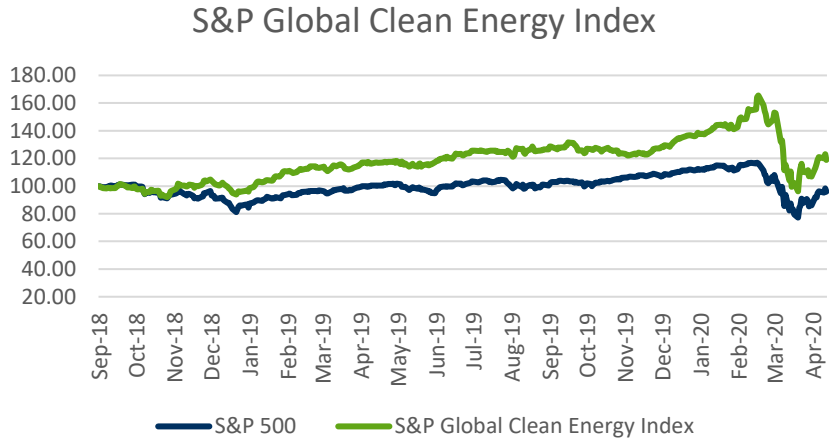
S&P 500 Energy Index

This index comprises the companies included in the S&P 500 that are classified as members of the GICS (Global industry classification Standard) energy sector.



S&P Global Oil Index

This index measures the performance of 120 of the world's largest publicly traded companies engaged in oil & gas exploration, extraction and production from around the world.



S&P Global Clean Energy Index

This index provides liquid and marketable exposure to 30 companies around the world that are engaged in clean energy activities. It includes a diverse mix of clean energy production companies and clean energy equipment and technology companies.

SELECT M&A WORLDWIDE-ADVISED TRANSACTIONS IN THE EEC SPACE

VS Rubber
Rubber recycling
Netherlands
Has acquired
EBO
Recycling
Netherlands
BUY SIDE

NIBE
Energy efficiency
Netherlands
Has been acquired by
NATHAN
driven by knowledge
Metal Supply & Recycling
Netherlands
SELL SIDE

TRADENER
Electricity production and trading
Brazil
Has acquired
PCH
Rondinha
Hydroelectric power plant
Brazil
BUY SIDE

raízen
Fuel procurement and distribution
Argentina
Has been acquired by
Italgas
Gas distribution
Italy
SELL SIDE

OKEA
Oil & Gas exploration/development
Norway
Has acquired
Interests in Draugen and Gjøa fields
Norway
BUY SIDE

San Antonio
Oil & Gas services
Argentina
Has been acquired by
LONE STAR FUNDS
Investment fund
International
SELL SIDE

PIMET
Cleantech hinges for the industry
France
Has been sold in a
MBI TRANSACTION
(G. Bataille, Picardie Investissement)
Industrial components
France
SELL SIDE

MPH Energie
Energy distribution services
France
Has acquired
MESTROLE
Legal and industrial metrology
France
BUY SIDE

Groupe Adonis Environnement SA
Oil and gas recycling
France
Has been acquired by
VEOLIA
Environmental services company
France
SELL SIDE

GUNKUL
not only the energy, we care
IPP /EPC solar and wind
Thailand
Has acquired
Solar8K
60 MWp solar farm
Vietnam
BUY SIDE

SECOS
Waste management
Luxembourg
Has acquired
BRG umwelt park
Recycling
Germany
BUY SIDE

FRÖHLICH + WALTER
COMPUTERCOMPONENTS
Computer components
Germany
Has been acquired by
CUC Groupe
CUC - Cablage Universel Connexion SAS
Wiring, Networking, and IT Products
France
SELL SIDE

BEECHBROOKcapital
Investment fund
Ireland
Has provided debt facility to
BHSL Hydro
Creating Value from Waste
CHP from biomass producer
Ireland
DEBT ADVISORY

Doppstadt
Environmental technology
Germany
Has acquired
ZEMMLER
Trommel screening machines
Germany
BUY SIDE

BGE
Solution
Conglomerate, IPP renewables
Thailand
Has acquired
PKS
PHUKHANHSOLAR
100 MWp solar farm
Vietnam
BUY SIDE

AC Energy
An Ayala Company
IPP renewables
Philippines
Has acquired (50%)
ami
80 MWp solar farm
Vietnam
BUY SIDE

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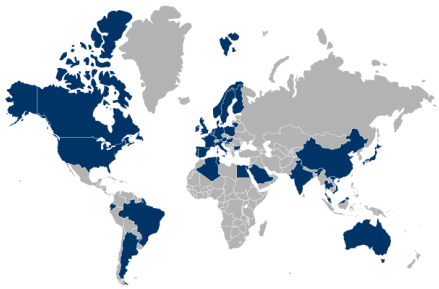

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- ✓ Locations on every continent
- ✓ Over 400 dedicated professionals
- ✓ 10 board members in the EEC Industry Group

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