

## **NEWS APRIL 2019**

### **Economic stimulus in China drives second year of emissions growth**

China's carbon dioxide emissions grew by roughly 3% last year, according to Greenpeace analysis of the country's annual 'statistical communiqué'. This marks the second year of emissions increase in China – which also recorded growth of 1.7% in 2017.

A rapid increase in energy consumption, including increased household electricity use and industrial power demand, drove the CO<sub>2</sub> rise. According to Greenpeace, expansion in China's construction industry and sectors linked to it – such as iron, steel and cement – accounted for two-thirds of growth in industrial power demand.

As economic growth continues to slow in the world's most populous nation, the government has enacted resource-intensive stimulus measures to try and mitigate the impacts. Increased infrastructure spending is part of these efforts – and industrial energy use has risen as a result.

Coal consumption in China also rose for the second year in a row in absolute terms in 2018, but coal's share of total energy consumption fell below 60% for the first time as cleaner power sources come to prominence.

Gas, nuclear power and renewable now account for a combined 22.1% of generation in China, up 1.3% year-on-year. The country is currently striving to reduce the proportion of coal in its energy mix to under 58% by the end of the decade.

In a note, Greenpeace analyst Lauri Myllyvirta said that there are several factors that will determine if China's CO<sub>2</sub> emissions rise again this year:

- Whether the government responds to slowing economic growth with another round of stimulus to 'highly polluting smokestack industries';
- Whether the government can moderate energy demand growth;
- Whether the speed of clean energy deployment can grow to meet overall demand growth; and
- Whether the war on smog gets back on track after setbacks this winter.

In March, the Chinese government announced it would extend winter anti-smog measures – which include production cuts and traffic restrictions – for a third successive winter.

Analysis by Reuters has shown that only six of 39 smog-plagued cities in northern China have managed to reduce concentrations of the toxic particle PM 2.5 during the latest anti-smog campaign, which was launched in October last year. On average, PM 2.5 concentrations rose 13% last winter.

Meanwhile, China's National Development and Reform Commission announced that it will launch the country's first subsidy-free wind and solar projects this year. In January, the planning agency reported that solar construction costs in China had fallen by 45% from 2012 to 2017, with wind installation costs dropping by 20% over the same period.

### **Norway's sovereign fund to divest from oil exploration firms**

Norway's \$1tn sovereign wealth fund – made up of the surplus revenues of the country's petroleum sector – has unveiled plans to phase out its investments in oil and gas companies that only conduct exploration and production.

The announcement marks the fund's latest foray into fossil fuel divestment. In 2015, it notably pledged to offload holdings in firms that derive 30% or more of their turnover from coal. However, the fund has noted that it will stay invested in oil majors such as Shell, Total and BP.

'The objective is to reduce the vulnerability of our common wealth to a permanent oil price decline,' explained to country's Minister of Finance, Siv Jensen, in a statement. 'Hence, it is more accurate to sell companies which explore and produce oil and gas, rather than selling a broadly diversified energy sector.'

In a white paper, the Norwegian Ministry of Finance said it anticipates that companies that do not have renewable energy as their main business will make up about 90% of growth in listed renewable energy infrastructure to 2030. Jensen said that the fund should be able to participate in this growth.

In its statement, the Ministry emphasised that a permanent reduction in the oil price would have long term implications for public finances. However, it said that excluding energy stocks altogether could further reduce the oil price risk – but the effect of doing so would be limited.

The fund has already reduced its oil price risk by extracting a large portion of the oil and gas resource on the Norwegian continental shelf and converting these into diversified financial holdings abroad.

Divestment campaigners have largely welcomed Norway's decision, while warning that further divestment will be necessary to meet global climate change targets.

'If it passes through parliament, this decision will deal a large blow to the illusion that the fossil fuel industry still has decades of business as usual ahead of it,' said Yossi Cadan, a Senior Divestment Campaigner with the environmental NGO 350 org. 'This should sound like a red alert for private banks and investors whose oil and gas assets are becoming increasingly risky.'

The Norwegian sovereign wealth fund holds almost €28bn in oil and gas stocks, and it will begin phasing out 6bn worth of exploration and production holdings once the decision is passed by lawmakers.

Norway's government still owns 67% of Equinor – formerly known as Statoil – which changed its name last year to signify a shift away from its primary oil and gas business.

### **Battery storage system for world's largest solar farm**

An energy storage system has been installed at the world's largest solar park – Dubai's Mohammed Bin Rashid Al Maktoum Solar Park.

According to storage system supplier Ingeteam, the installation marks the first time energy and energy storage system has been paired with a photovoltaic plant at a grid – scale level in the United Arab Emirates.

The 77 km<sup>2</sup> solar park – which was commissioned in 2013 – will eventually have a total generating capacity of 5,000 MW of solar photovoltaic (PV) and concentrating solar power (CSP). Development of the site is scheduled to finish in 2030. Dubai has said it wants 75% of its power output to come from clean sources by 2050.

Anticipating the large – scale introduction of renewable in the coming years, the Dubai Electricity & Water Authority (DEWA) installed a sodium sulphur (NaS) battery system in the park to demonstrate its effectiveness in stabilising grid fluctuations.

The 1.2 MW/7.2 MWh storage systems allows DEWA to evaluate the technical and economic capabilities of this technology, when integrated with PV arrays, in order to increase grid stability and reduce carbon dioxide emissions.

The storage system will be also used for energy time shifting, frequency control and voltage control using the large capacity of the batteries.

The Ingeteam supply comprises a 1.2 MVA power station equipped with two storage inverters and all the rest of the components for an LV – to – MV and DC – to – AC conversion (medium voltage transformer, medium voltage switchgear, etc).

While energy storage systems are still in the early phases of commercial deployment, analysts are increasingly optimistic about the impact they could have of the global energy system.

In a report issued in November last year, Bloomberg New Energy Finance (BNEF) predicted that the capital cost of a utility – scale lithium-ion battery storage system would fall another 52% between 2018 and 2030. This BNEF believes, will transform the economic case for batteries in the Vehicle and electricity markets.

‘We see energy storage growing to a point where it is equivalent to 7% of the total installed power capacity globally in 2040,’ said Logan Goldie – Scot. Head of Energy Storage at BNEF. ‘The majority of storage capacity will be utility – scale until the mid – 2030s, when behind – the – meter applications overtable.’

### **Murphy Oil sells Malaysian assets to PTTEP**

Murphy Oil has sold its Malaysian subsidiaries Murphy Sabah Oil Murphy Sarawak Oil to Thailand’s national oil company PTTEP for \$2.127bn. The all – cash deal is subject to an additional \$100mn contingent payment based on certain exploration drilling results up to October 2020.

Year – end 2018 proved reserves net to Murphy were 816mn boe, of which 16% were attributable to Malaysia. Of the 129mn boe of proved reserves, 70mn boe are characterised as proved undeveloped. The proved reserves comprise 468bn cf of natural gas and 51mn barrels of liquids. Total output net to Murphy in 2018 for the properties to be divested was over 48,000 boe/d, comprised of 62% liquids.

Commenting on the news, Wood Mackenzie Research Analyst Alex Siow says: ‘The deal underscores Murphy’s strategic pivot to the US Gulf of Mexico, US unconventional and Latin America exploration, and brings to an end Murphy’s 20 year involvement in Malaysia, during which time it discovered and developed the country’s first deepwater oil field, Kikeh.’

‘Like many Asian national companies, PTTEP suffers from a maturing domestic portfolio. To improve its production outlook the company has been on the hunt for licence extensions and counter – cyclical M&A opportunities, with a focus on Southeast Asia.’

‘The proceeds from the sale will go to Murphy’s unconventional assets in the Eagle Ford, Montney and Duvernay in North America. The company will also initiate a \$500mn share buyback programme.’

Focus will now turn to Murphy's new cash engine – the Gulf of Mexico, where the company established a joint venture with Petrobras in late – 2018.'

Siow concludes: 'Murphy's Malaysian assets strengthen PTTEP's near – term production profile, and reinforces its "Coming Home: strategy, following its winning bids on the Erawan and Bongkot contract extensions in late – 2018. The deal also provides exposure to important growth resource themes – deepwater and LNG – which the company has identified as core.'

'At \$2.127bn, this is the biggest oil and gas deal in Southeast Asia for over five year, and supports our view that 2019 is set to be a big year for M&A activity in the region. Murphy's Vietnam and Brunei positions will now become divestment candidates, but it is unclear whether PTTEP will continue its Southeast Asia spending spree.'

### **Record – breaking lift completes Johan Sverdrup field centre**

The two final platform topsides, a bridge and a flare stack have been installed at Johan Sverdrup, completing the first phase of construction at the Norwegian North Sea field centre.

Using the heavy lift vessel Pioneering Spirit's single lift technology, the processing platform life nearly 26,000 tonnes – set a new lifting record offshore. The vessel also carried out the lift for the 18,000 tonnes utility and living quarters, while the final flare stack and the bridge linking the processing platform to the drilling platform were lifted into place by the heavy lift vessel Thialf. The final bridge to connect the utility and living quarters topside to the rest of the field centre will be installed in the next possible weather window.

With the installation campaign completed, the project is on track to start production in November 2019.

Johan Sverdrup is one of the five largest oil fields on the Norwegian Continental Shelf. With estimated recoverable resources of 2.7bn boe, it is one of the most important industrial projects in Norway in the next 50 years. At plateau, the field will contribute up to 25% of Norway's total production of oil and gas, while power from shore gives the field carbon emission of just 0.67kg CO<sub>2</sub> per barrel, which is reported to be among the lowest in the world and 25 times lower than the average, according to Equinor, project operator.

The Johan Sverdrup field will be developed in several phases. Phase 1 will start in November 2019, with an estimated production capacity of 440,000 b/d of oil. After start – up of the second phase of the project in 4Q2022, the field is expected to produce 660,000 b/d of oil a peak.

Equinor holds a 0.0267% stake in the project, and is operator, partnered by Lundin Norway 22.6%, Petoro 17.36%, Aker BP 11.5733% and Total 8.44%.

BP Trinidad and Tobago (BPTT) has produced first gas from its Angelin development. Delivered on time and under budget, the new platform has a production capacity of 600mn cf/d. The Company recently announced the sanction of another two developments in Trinidad and Tobago – Cassia Compression and Matapal – which are expected to come onstream in 2021 and 2022 respectively.

ExxonMobil has revised its Permian Basin growth plans to produce more than 1mn boe/d by as early as 2024 – an increase of nearly 80% and a significant acceleration of value. The size of the company's resource base in the Permian is approximately 10bn boe barrels and is likely to grow further as analysis and development activities continue.

A natural gas discovery offshore Cyprus in the Eastern Mediterranean at the Glaucus – 1 well could be ‘one of the biggest finds of the year’ according to Wood Mackenzie. The discovery, located in block 10, could represent an in – place natural gas resource of approximately 5 – 8tn cf, says ExxonMobil which holds a 60% stake in the block and is operator. Qatar Petroleum holds the remaining 40% interest.

Equinor, together with partners Petoro, ConocoPhillips and Repsol, has made an oil discovery from the Visund A platform in the Telesto exploration well in the North Sea. Resources are estimated at 12 – 28mn barrels of recoverable oil.

The biomethane sector is booming worldwide, according to a new report and database from Cedigaz, with more than 1,000 biomethane production plants soon to be operating in 34 countries, up from 720 at year – end 2017. According to the report, since 2010, world biomethane production has increased exponentially, reaching 3bn cm in 2017. In Europe, biomethane use is spreading across the continent. There are now 19 European producing countries, whose output totalled nearly 2bn cm in 2017. The US is now the world leader for the use of biomethane as vehicle fuel, following a production surge in 2014 -2017 and driven by federal and state regulations.

India’s first east coast regas project, Ennore LNG Terminal, was commissioned in March by Indian Oil Corporation (IOCL). The country is looking to double its regas capacity to 56.5mn t/y by 2025.

The International Civil Aviation Organisation (ICAO) has approved detailed rules on the operation of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) system – the global aviation emission offset regime, reports Keith Nuthall. The scheme enables airlines to invest in carbon reduction initiatives, inside and outside the industry, which can remove as much carbon from the atmosphere as is released by an airline. Meanwhile, an agreement has been struck between the European Parliament, the European Union (EU) Council of Ministers and the European Commission on the first EU regulation limiting carbon dioxide (CO<sub>2</sub>) emissions from Lorries and trucks. Under the legislation, which still needs formal approval by the Parliament and Council, emissions from new trucks will have to be 30% lower in 2030 compared to 2019, and 15% lower by 2025.

Eni has signed an agreement with COREPLA, the National Consortium for the Collection, Recycling and Recovery of Plastic Packaging, to launch research projects to produce hydrogen from non – recyclable plastic packaging waste. The announcement sees Eni continuing to develop its strategy to apply the principles of the circular economy to its business, based on research and newly developed technologies.

#### **Total to take 10% stake in Arctic LNG2**

Total has signed definitive agreements with Novatek for the acquisition of a direct 10% interest in the Arctic LNG 2 project on the Gydan Peninsula, Russia. Taking into account Total’s 19.4% stake in Novatek and Novatek’s intention to retain 60% of the project, the Group’s overall economic interest in this new LNG project will be approximately 21.6%. Should Novatek decide to reduce its participation below 60%, Total will have the possibility to increase its direct share up to 15%.

Novatek and Total have also agreed that Total will have the opportunity to acquire a 10 – 15% direct interest in all Novatek’s future LNG projects located on the Yamal and Gydan peninsulas.

With production capacity of 19.8mn t/y, or 535,000 boe/d, Arctic LNG 2 will develop over 7bn boe of resources in the Utrenneye onshore gas and condensate field. The project will involve installation of three gravity – based structures in the Gulf of Ob, on which three liquefaction trains of 6.6mn t/y each will be installed.

### **Asia leads global liquids storage capacity growth by 2023**

Asia is forecast to be the major contributor to the growth of the global liquids storage industry by 2023, accounting for around 33% of the global liquids storage terminals' capacity from newbuild and expansion projects in 2023, according to GlobalData.

Research by the data and analytics company reveals that global liquids storage capacity is expected to grow 5.7% during 2019-2023, from 7,705mn barrels in 2019 to 8,145mn barrels by 2023, Asia, North America and the Middle East lead globally in terms of Liquids storage capacities of 272mn, 112mn and 106mn barrels respectively, in 2023. China, Indonesia and India have the highest newbuild capex spending in Asia during the outlook period.

Arpan Roychowdhury, Oil & Gas Analyst at GlobalData, says: 'Asia is witnessing the highest liquids storage capacity growth due to increasing demand for crude oil and petroleum products in the fastest growing economies such as China and India. Among the five leading countries in liquids storage capacity growth globally, three China, Indonesia and India – are from Asia.'

North America is identified as the second highest in terms of liquids storage capacity growth. It accounts for 31% of global liquids storage capacity in 2023. Among the countries in this region, the US will have the highest capex spending in planned and announced liquids storage projects during 2019-2023.

In terms of capacity, Zhanjiang IV in China, Fujairah XVIII in the United Arab Emirates (UAE) and Lawe – Lawe CCT in Indonesia will be the top three newbuild liquids storage terminals, with capacity of 44mn, 42mn and 25mn barrels in 2023, respectively.

### **Why high oil prices can be bad for energy companies**

Rising oil prices are a mixed blessing. Whilst they are good for profits and shareholders, they correlate with worsening outcomes for large capital expenditure (capex) projects, inevitably forcing companies to earmark more money for oil recovery, reports Boston Consulting Group (BCG).

According to its latest research, which examined the performance of a sample of upstream oil and gas capital projects during period of high and low oil prices, whilst cost and scheduling overruns were endemic at all times, project performance deteriorated significantly during higher oil prices. On average, during high price eras, capital projects exceeded original time estimates by more than double and costs were 46% above anticipated budget. By contrast, during low price periods, scheduling and costs overruns averaged out to 20% and 6% respectively.

'While cost overruns may not be a perfect measure of project performance (as they depend on how realistic the initial budget estimate was), these problematic trends also show up in less relative and more reliable gauges. For instance, capital intensity (the amount spent to ad a barrel of oil to a company's output) is 10% greater when oil prices are climbing or at historical highs,' notes BCG.

'Of course, a simple explanation for this is that the number, complexity, and average cost of projects undertaken during high and low price periods are different enough to make up for the distinctions in overall outcomes. For instance, when oil prices are lower, smaller and more predictable projects – which are easier to manage and maintain cost controls – are the norm. In addition, the organisation is operating at a relatively slower pace, making more talent available to monitor these projects. Equally important, competition for contractors and equipment is diminished, in turn reducing construction costs.'

However, BCG believes that these 'don't explain the differences completely, nor do they provide a sufficiently meaningful rationale for oil and gas companies to avoid the opposite: less attractive outcomes when prices rise'. In its view, 'the more trigger toxic, undisciplined behaviours that are toned down during tougher periods of low oil prices'.

The 'troublesome behaviours' that emerge during high oil prices include overly ambitious targets, fast – tracker front – end engineering, gold plating designs, owners acting as passive monitors, and misaligned contractor payment incentives.

BCG says energy executives should look to encourage virtuous should look to encourage virtuous behaviour, better collaborate with contractors, increase efficacy in project scheduling and maintain focus on value creation. It concludes: 'Companies that proceed with discipline will find they can enjoy their cake during the upturn and eat it, too – even when the inevitable downturn hits.'

### **Iran inaugurates onshore refining facilities for recent South Pars phases**

According to the Iranian Oil Ministry's news website SHANA, the President of Iran Hassan Rouhani has inaugurated the onshore refining of phases 13 and 22 – 24 of the supergiant South Pars gas field, located in the Persian Gulf. Iranian Minister of Petroleum Bijan Zangeneh accompanied the President at the ceremony, which was held in the southern city of Assaluyeh where the refinery is located.

Each of the phases will produce 56mn cm/d of gas, 75,000 b/d of gas condensate and 400 t/y of sulphur. They are also expected to yield 1.05mn t/y of LPG (propane and butane) and 1mn t/y of ethane to feed petrochemical plants.

Iran has invested \$10bn in the two megaprojects, which exceed 2% of the country's gross domestic product, according to the website.

Zangeneh reported that Iran's gas production capacity from South Pars will exceed 750mn cm/d by late 2019, exceeding that of Qatar, its partner in the joint development project. He also noted that Iran's current gas production capacity stands at 841mn cm/d and is expected to reach 950mn cm/d by 2020. The Minister of Petroleum also said Iran's petrochemical production capacity currently stands at 31mn t/y and is forecast to reach 92mn t/y by 2021.

### **Norway's sovereign fund to divest from oil E&P companies**

Norway's \$1tn sovereign wealth fund – known as the Government Pension Fund Global (GPF) – has unveiled plans to phase out its investments in upstream oil and gas companies. However, the fund will continue to invest in oil majors such as Shell, Total and BP, which have a renewable portfolio. The move follows the fund's 2015 pledge to divest holding in firms deriving 30% or more of their turnover from coal.

The decision appears motivated by a desire to protect the Norwegian economy by reducing exposure to oil price falls, rather than climate concerns. The Minister of Finance, Siv Jensen, stated: 'The objective is to reduce the vulnerability of our common wealth to a permanent oil price decline. Hence, it is more accurate to sell companies which explore and produce oil and gas, rather than selling a broadly diversified energy sector.'

The Ministry said in a white paper that it anticipates that companies that do not have renewable energy as their main business will make up about 90% of growth in listed renewable energy infrastructure to 2030. Jensen said that the fund should be able to participate in this growth.

Divestment campaigners largely welcomed the announcement, although warning that further divestment would be necessary to meet global climate change targets.