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Offshore oil and gas operators are being encouraged to implement a new solution using floating wind turbines to power water injection for oil recovery, reducing costs, increasing flexibility and avoiding carbon dioxide (CO₂) emissions. The 'WIN WIN' (WIND powered Water Injection) concept was conceived by DNV GL in 2013 and is now reportedly ready for prototype development after two joint industry projects have shown the concept to be both cost efficient and technically feasible.

Equinor has exercised its preferential rights over Delek Group to acquire an additional 22.45% interest in the Caesar – Tonga oil field from Shell, for \$965mn in cash. This will increase Equinor's interest from 23.55% to 46%. Anadarko remains the operator, holding a 33.75% stake, with Chevron retaining its 20.25% interest. Shell had previously agreed to sell the Caesar – Tonga assets to Delek Group, also for \$965mn. That deal was conditional upon other interest – holders agreeing not to buy the stake.

ExxonMobil's Liza Phase 2 project offshore Guyana has received government and regulatory approvals and is on track to be commissioned in mid – 2022, producing up to 220,000 b/d of oil. Liza Phase 1 remains on track to achieve first oil by 1Q2020, producing up to 120,000 b/d of oil at peak. Pending government and regulatory approvals, a final investment decision is expected later this year for a third phase of development, Payara, which is expected to produce between 180,000 and 220,000 b/d, with start – up as early as 2023.

Shell is estimated to have over \$3bn in total abandonment and decommissioning liability (ABEX) in producing UK oil and gas developments, stacking above fellow UK operators Apache, Total, ExxonMobil and BP, according to GlobalData. The company's latest research reveals that Shell is set to spend as much as half of the \$3bn by 2025. This is driven mainly by the Brent oil field but also relates to expenditure in aging developments such as Pierce and Curlew.

Wood Mackenzie's 11th annual exploration survey indicates that the oil and gas industry is optimistic for 2019, it has returned to profit and the prospects look good. According to the survey, the global exploration budget will total about \$40bn in 2019. Drilling will account for about half of that, while 25% is earmarked for geological and geophysical surveys. High – quality prospects in deepwater sweet spots, such as Brazil, Guyana, the Gulf of Mexico and the East Mediterranean, are attracting the most attention.

The European Commission has hailed a 272% increase in LNG exports from the US to the European Union (EU) since a landmark meeting between President Donald Trump and Commission President Jean – Claude Juncker in July 2018, writes Keith Nuthall. Releasing trade data at a high – level business – to – business energy forum staged in Brussels, where LNG executives from Europe and the US discussed increasing this trade, the Commission said EU imports of US LNG in March hit a record 1.4bn cm.

Electric vehicles (EVs) are on track to dominate global sales, of passenger cars and buses by 2040, and to encroach significantly on the market for vans and short – distance trucking, according to the latest forecast from research firm BloombergNEF (BNEF). Based on analysis of the evolving economics in different vehicle segments and geographical markets, BNEF's Electric Vehicle Outlook 2019 shows EVs taking up 57% of the global passenger car sales by 2040, slightly higher than it forecast a year ago. Electric buses are set to hold 81% of municipal bus sales by the same date.

The government of Mozambique had approved the development plan for the Rovuma. LNG project, which will produce, liquefy and market natural gas from three reservoirs located in the Area 4 block offshore Mozambique, two of which straddle the boundary with neighbouring Area1. The marketing

effort for the LNG produced from the Rovuma LNG project is jointly led by ExxonMobil and Eni. Sales and purchase agreements for 100% of the LNG capacity for trains 1 and 2 have been submitted to the government of Mozambique for approval, which together will produce more than 15mn t/y of LNG.

Alberta's temporary oil production cuts

Alberta Premier Rachel Notley announced in late 2018 that an 8.7% cut in oil production in 2019, some 325,000 b/d, would be needed to bolster sagging Canadian crude prices caused by rising oil sands production that had outstripped pipeline capacity and led to a storage glut. Cuts were to be reduced to 95,000 b/d once storage volumes returned to more 'normal' levels.

According to a new IHS Markit report, since the curtailment was announced in December, western Canadian crude price differentials have narrowed to a level much tighter than averaged in 2018. The heavy oil differential between Western Canadian Select (WCS) in Hardisty, Alberta, and West Texas Intermediate (WTI) at Cushing has averaged about \$12/b. Mixed Sweet Blend has averaged less than \$5/b beneath WTI, while Synthetic Crude Oil has averaged just over \$1/b beneath WTI. This compares with \$27/b, \$12/b and \$7/b beneath WTI in 2018, respectively.

IHS Markit expects 2019 Alberta production to average 3.4mn b/d, about 300,000 b/d less than its pre – curtailment outlook. 'With a few exceptions, western Canadian supply available for export is generally exceeding pipeline takeaway capacity even with the completion of Enbridge Line 3 until additional pipeline can be brought online – the latter likely sometime in 2022,' it reports. 'The delay of the Enbridge Line 3 pipeline increases the importance and the call on rail. The estimated call on rail is highly sensitive to the productivity of oil production facilities and the state of provincial curtailment policy. Due to the delay of Line 3 – from late 2019 to late 2020 – the call on rail could crest over the winter of 2019/2020 between 400,000 b/d and 500,000 b/d, which is typically the high point of western Canadian output.'

The market analyst also notes that crude – by – rail remains critical for ensuring western Canadian crude market access and avoiding the extreme upstream price discounts experienced in late 2018. It estimates that crude – by – rail capacity should exceed 500,000 b/d late in 2019 – roughly capable of meeting anticipated demand. However, this estimate includes some rail capacity that was idled early in 2019 because of narrower price differentials. 'There is risk that should some of this capacity face delays in ramp – up, there may be little room in the market to absorb any takeaway upsets,' the report concludes.

New light oil discovery offshore Angola

Eni has made a new light oil discovery in Block 15/06, deep offshore Angola. The well was drilled on the Ndungu exploration prospect, and is estimated to contain up to 250mn barrels of light oil in place, with further upside.

Ndungu is the first significant oil discovery in Angola inside an existing development area. It could be fast – tracked to production due to its proximity to the Mpungi field's subsea production system, just 2 km distant; Production will be routed to the N'goma FPSO, extending the West Hub's production plateau.

Ndungu is the fourth discovery of commercial nature since the block 15/06 joint venture re – launched its exploration campaign in mid – 2018. It follows the discoveries of Almba, Afoxe and Agogo. Together, the four discoveries are estimated to contain up to 1.4bn barrels of light oil in place.

The block 15/06 joint venture comprises Eni (operator, 36.8421%), Sonagol P&P (36.8421%) and SSI Fifteen (26.3158%).

Trade war leaves LNG projects vulnerable

The escalation of the trade war between the US and China could jeopardise several LNG mega – projects that are awaiting final approval, according to Rystad Energy. China announced on 13 May 2019 that it will raise the duty on import of US LNG to 25% from the previous level of 10% in retaliation to the US increasing its tariffs on \$200bn worth of Chinese goods.

Rystad Energy forecasts that Chinese LNG demand will reach 95mn t/y in 2025, up from 53mn t/y in 2018. This would make China the world's largest LNG importer thanks to strong Asian and Chinese demand. The consultancy expects the US export volumes will nearly quadruple over the coming years, reaching over the coming years, reaching 84mn t/y by 2025 based on currently sanctioned projects.

However, the increased tariffs will create additional headwinds for US LNG projects that are currently awaiting final investment decisions (FIDs). Rystad Energy has noted previously that if LNG prices continue to linger around their current low level for an extended period of time, some of the more expensive LNG projects could struggle to offer competitive terms to buyers – and this could result in FID deferrals.

'Most of these projects need to secure long – term contracts in order to get financing for their development. Rystad Energy expects China to be one of the biggest contributors in sponsoring new LNG projects over the coming years, and there will be a reluctance to signing new deals with US projects as long as this trade war persists,' comments Sindre Knutsson, Senior Analyst at Rystad Energy's Gas Markets team. 'For example, Cheniere and Sinopec agreed late last year on a 20 year deal that would supply 2mn t/y LNG to China starting in 2023. This deal could have been signed once the trade tensions were resolved, but due to the heightened tensions this has not happened.'

China's decision to impose tariffs on US LNG will make LNG projects outside the US more attractive. This means that non – US projects are more competitive in terms of breakeven price (delivered), and the China therefore could have greater bargaining power when negotiating new contracts,' Knutsson notes.

Commenting on the short – term outlook for the global gas market, Per Magnus Nysveen, Rystad Energy Head of Analysis says: 'US LNG export to China is already seriously affected by the 10% tariffs in effect from last year, and we expect it to continue to be so as long as the tariff is imposed.'

US low – emissions tech research collaboration

ExxonMobil has unveiled plans to invest up to \$100mn over 10 years to research and develop advanced lower – emissions technologies with the US Department of Energy's National Renewable Energy Laboratory and National Energy Technology Laboratory. The agreement – among the largest between the department's laboratories and the private sector – will support research and collaboration into ways to bring biofuels and carbon capture and storage (CCS) to commercial scale across the transport, power generation and industrial sectors.

'We're focusing on advancing fundamental science to develop breakthrough solutions that can make a difference on a global basis in emissions reduction,' said Darren W Woods, Chairman and CEO of ExxonMobil.

The partnership will work to develop technologies related to energy efficiency and greenhouse gas mitigation. The joint research will also focus on reducing emissions from fuels and petrochemicals production. The agreement will stimulate collaborative projects between ExxonMobil and the two laboratories, and facilities work with other national laboratories, such as the Idaho National Lab.

Chevron pulls out of Anadarko merger, while Occidental agrees to contingent sale of Anadarko African assets to Total

Chevron has said it will not increase its offer for Anadarko Petroleum, leaving the way open for the 'superior' \$555bn cash and stock bid put forward by Occidental Petroleum.

'Winning in any environment doesn't mean winning at any cost. Cost and capital discipline always matter, and we will not dilute our returns or erode value for our shareholders for the sake of doing a deal,' said Chevron's Chairman and CEO Michael Wirth.

Upon termination of the merger agreement, Anadarko will be required to pay Chevron a termination fee of \$1bn.

Meanwhile, Occidental announced that, in connection with its proposal to acquire Anadarko Petroleum, it has entered into a binding agreement to sell Anadarko's Algeria, Ghana, Mozambique and South Africa assets to Total for \$8.8bn. The sale is contingent upon Occidental entering into and completing its proposal to acquire Anadarko.

The assets to be acquired are:

- Algeria: 24.5% participating interest and operatorship of blocks 404a and 208 in the Berkine Basin, in which Total already owns 12.25%. These fields represented a gross production of 320,000 boe/d in 2018.
- Ghana: 27% participating interest in Jubilee field and 19% participating interest in the TEN fields. These fields represented a gross production of 143,000 b/d in 2018.
- Mozambique: 26.5% participating interest and operatorship in Area 1 where a 12.8mn t/y LNG project is largely derisked and close to sanction. Area 1 contains more than 60 tncf gas resources, of which 18tncf will be developed with the first two – train project which is expected to come into production by 2024.
- South Africa: exploration licences close to Total's recent Brulpadda discovery.

Overall, these assets represent around 1.2bn boe of 2P reserves, of which 70% is gas, plus 2bn boe of long – terms natural gas resources in Mozambique. Equity production in 2018 was 96,000 boe/d and is expected to grow to around 160,000 boe/d by 2028.

Commenting on what the announcement means for Total, Wood Mackenzie Research Director Nicholas Browne, says: 'Total will now comfortably be the second largest international oil company (IOC) LNG seller after Shell, and the fourth largest LNG seller after Qatargas, Shell and Petronas.'

He continues: 'The potential acquisition of Anadarko's stake in Mozambique LNG is representative of Total's ambitious and aggressive expansion of its LNG position. Its acquired Engie's LNG business in 2018 and has a plethora of pre – FID opportunities which it is aiming to sanction within the next two years. Total also has stakes in Russia's Arctic LNG- 2 Papua LNG, Nigeria's NLNG 7, the Cameron LNG expansion by Tellurian, which is developing the Driftwood project in the US it is seeking to participate in the Qatari megatrain expansion. Finally, Total recently signed a preliminary contract for LNG from Costa Azul in Mexico, in addition to a further offtake contract from Tellurian.'

'The company is entering a phase of strong cash flow growth. As such, we still expect Total to keep strict investment criteria in terms of deciding which LNG project goes ahead. Its focus on LNG investment is part of a wider company shift to "cleaner fuels". The group views its LNG portfolio as long term in nature, as a facilitator for monetising its own molecules, but has also become more active as an LNG trader in recent years.'

IEA shows the way forward for Iraq's electricity sector

In a new report: Iraq's Energy Sector: A Roadmap to a Brighter Future, the IEA has identified immediate practical action and medium – term measures to tackle the most pressing problems in Iraq's electricity sector.

According to the IEA, Iraq's electricity demand is likely to double between now and 2030, and its projected shortfall in electricity supply will widen as the country's population grows by more than one million people annually. However, the report found that Iraq has huge potential to cut its electricity network losses, which are among the highest in the world.

Reducing these losses by half would dramatically improve the efficiency of grid supply, effectively increasing available capacity by one – third. Without changes to the current structure of electricity supply and grid improvements, Iraq's domestic generation, imports and neighbourhood generation would need to double by 2030, the IEA said.

The report also looks at Iraq's oil and gas sector, projecting that the country will become the world's fourth largest oil producer by 2030 behind the US, Saudi Arabia and Russia. Iraq could also make better use of its gas – diverting currently flared gas to power generation.

'Operating under extremely challenging circumstances, Iraq has done a remarkable job expanding its oil industry,' said Dr. Fatih Birol, the IEA's Executive Director. 'Today's urgent issue is to address the national power sector as the summer heat wave approaches, by improving grid maintenance, boosting electricity production with larger mobile generators, and incentivising upgrades of power plants.'

Promoting energy efficiency, including through the use of progressive tariffs, could ensure that the growth in demand during the summer's peak does not continue to outpace supply. The report also urged Iraq to take advantage of its renewable energy potential. The analysis shows that expending the share of solar PV and wind to 30% to electricity supply by 2030 would bring benefit both to the Iraqi consumer, in the form of reduced electricity bills, and to the environment.

Meanwhile, German engineering giant Siemens has signed an agreement with the government of Iraq to help rebuild the country's electricity grid after years of war and unrest.

The partnership was announced following bilateral talks between Iraqi Prime Minister Adil Abdul – Mahdi and German Chancellor Angela Merkel in Berlin. Abdul – Mahdi later told journalists that Siemens would likely be awarded a majority of contracts in Iraq's \$14bn electricity grid modernisation project.

Within the implementation agreement, the parties also agreed on the award of contracts valued at approximately €700mn for Phase 1 of Siemens 'roadmap' plan for the electrification of Iraq. Confirmed projects include the construction of a 500 MW gas – fired power plant, the upgrade of 40 gas turbines with upstream cooling systems, and the installation of 13 substations, along with 34 transformers, across the country.

‘Collapse’ in new German onshore wind threatens renewable targets

The growth of onshore wind energy is collapsing in Germany, according to trade association WindEurope, jeopardising both German and EU renewable targets in the process.

Just 134 MW of new onshore wind was installed in Germany in the first quarter of this year – making it the country’s worst quarter for new onshore wind in 19 years. Germany is likely to install 1 – 2 GW of onshore wind in 2019, marking a significant reduction from the past five years, during which it installed an average of 4.2 GW annually.

According to WindEurope, these figures are well below what the country needs to meet its 65% renewable electricity target by 2030 and to deliver its share of the EU’s 32% renewable energy target. Offshore wind will not fill the gap, the association said: Germany is due to build just 730 MW per year up to 2030.

This is in contrast with Spain, for example, which will build 4 GW of new wind capacity in 2019.

The slowdown can be attributed, in part, to failed auction systems in 2017. However, the permitting process for new wind farms remains the most significant underlying problem. The process used to take 10 months, but WindEurope found that it’s now taking more than two years.

Public authorities are not applying deadlines and many wind farm projects are trapped in legal disputes. In addition, there is a lack of staff to process the applications.

‘The German government now needs to make clear how they’re going to reach its 65% renewable target for 2030,’ said WindEurope CEO Giles Dickson. ‘It needs an annual build – out of 5 GW of onshore wind – and urgent action to speed up the permitting process.’

The onshore wind slowdown also appears to be impacting Germany’s energy workforce. Half of the EU’s 300,000 wind energy jobs are in Germany, but 10,000 have been lost in the last years, WindEurope predicts that the situation could get worse, as there wasn’t a single turbine order recorded in the country in Q12019.

‘There’s plenty of space available for new wind farms in Germany,’ Dickson said. ‘And they can build them in industrial sites like the Dutch do, or alongside motorways like in France and Belgium. Repowering the early wind farms that are coming to the end of their life will also help.’

EVs to dominate car sales by 2040 – but more vehicles means emissions still rising

Electric Vehicles (EVs) are likely to make up to majority of global sales of passenger cars and buses by 2040, according to Bloomberg New Energy Finance (BNEF)’s Electric Vehicle Outlook 2019.

Based on analysis of the evolving economies in different vehicle segments and geographical market, the report shows EVs taking up 57% of global shows EVs taking up 57% of global passenger car sales by 2040 – slightly higher than it forecast a year ago. Electric buses are set to hold 81% of municipal bus sales by the same date.

The main driver for vehicle electrification in the coming decades will be the continued reduction in EV battery costs. BNEF said. By the mid – to – late 2020s, EVs will be cheaper than their internal combustion engine counterparts in almost every market on the basis of both lifetime and upfront costs.

Since 2010, the average cost of lithium – ion batteries per kWh has fallen by 85% on a mixture of manufacturing economies of scale and technology improvements. The report also showed EVs taking 56% of light commercial vehicle sales in Europe, the US and China within the next two decades, plus 31% of the medium commercial market.

“Electrification will still take time because the global fleet changes over slowly but, once it gets rolling in the 2020s, it starts to spread to many other areas of road transport,” said Colin Mckerracher, Head of Advanced Transport for BNEF. ‘We see a real possibility that global sales of conventional passenger cars have already passed their peak.’

Heavy trucks will likely prove to be the most difficult road transport vehicles to electrify, with their use limited to short - - distance applications. However, BNEF predicated that heavy trucks on long – haul routes will also face other, non – electric competition – from alternatives using natural gas and hydrogen fuel cells.

The analysis also found that, by 2040, EV Charging requirements will drive 7% increase in global electricity consumption. The expansion of electrification will also drive a surge in EV lithium – ion battery demand from 151 GWh in 2019 to 1.750 GWh in 2030. New mining capacity for all battery materials will need to come online to avoid this causing a supply bottleneck.

Despite positive developments in the field of low – emission road transport, BNEF warned that the global on – the – road conventional passenger car fleet will grow in number until 2030. This means that road vehicle emissions will continue to rise for the next decade, followed then by a sharp fall in the years before 2040, which will return levels to those similar to today.

Poland commissions new coal – fired power unit

Coal is not finished yet, even in Europe – GE Steam Power, Polska Grupa Energetyczna (PGE) and a GE – led consortium of partners have synchronised a new coal – fired generator, Opole Unit 6, to the Polish grid.

The new construction is part a €2.7bn expansion project at the Opole power plant in western Poland. Once the two new units – Units 5 and 6 – are operational, Opole will be Poland’s third largest power plant.

The plant includes ultra – supercritical technology to maximise operational efficiency, and will burn locally – mined hard coal.

Unit 6 will have a generating capacity of 900 MW. Opole will play an important role in the country, said Henryk Baranowski, PGE’s Chief Executive Officer, where electricity demand is expected to grow 40% by 2040 according to Poland’s Ministry of Energy.

Coal is set to continue as a central component of Poland’s energy mix: it is the tenth largest coal consumer in the world and the second largest in the EU, consuming 77mn tonnes of coal per year. According to the Polish government, 92% of electricity and 89% of heat in the country is generated from coal.

European airline emissions continue to grow

Eight airlines grew their carbon emissions at a faster rate than Ryanair on flights within Europe last year, according to the European Federation for Transport and Environment (T&E).

Low – cost airlines Jet2, Wizz Air, EasyJet, Vueling and Norwegian and national carriers TAP, Finnair and Lufthansa all out – paced the Dublin – based carrier, which had the highest overall emissions on European routes in 2018, according to EU Emissions Trading scheme data analysed by T&E. Jet2’s emissions grew by 20%, some 7% higher than the next fastest airline.

T&E says the top 10 growing polluters show that aviation’s runaway emissions are a problem for the whole airline sector, which governments have left untaxed and under – regulated compared to other transport sectors. Emissions from flights within Europe account for only 40% of the problem – the remaining 60% comes from flights to destinations outside Europe and these are entirely unregulated.

Andrew Murphy, Aviation Manager at T&E, said: ‘Airlines’ emissions are booming and not just on cheap flights. National carriers and low – cost airlines all benefit from paying no fuel tax and VAT while the rest of us must pay our way. Governments and the EU need to wake up, starting with a tax on kerosene and clean fuel mandates that force airlines to switch to zero – emission jet fuel.’

Rather than taxing and regulating aviation emissions, governments are pursuing a UN offsetting scheme that will allow aviation emissions to continue growing, despite the EU deciding to discontinue offsetting in its climate policy from 2021.

The Carbon offsetting and reduction Scheme for International Aviation (CORSIA) will allow airlines to continue to grow their emissions each year up to 2020 and account for any surplus growth by buying offsets.

One criticism is that offset allow airlines to avoid immediate changes in behaviour which would actively reduce their carbon footprints, by investing in hard – to – verify environmental projects instead.

Murphy added: ‘It’s no surprise that aviation emissions continue to soar as governments have wasted two decades trying to make offsetting work. It’s now time to call it quits on this failed climate policy, and instead focus on proven measures – taxing kerosene, and ultimately replacing it with Zero – emission fuels.’

Currently, the aviation industry produces around 2% of global CO₂ emissions, and rapid growth would put it on track to consume a quarter of the world’s carbon budget by 2050.

World Bank to support ‘Climate – smart’ mining for energy transition

The World Bank Recently launched the Climate – Smart Mining Facility, the first – ever fund dedicated to the sustainable mining of minerals used in energy technologies. The fund will support the sustainable extraction and processing of minerals and metals used in clean energy technologies, such as wind turbines, solar panels, and batteries for energy storage and electric vehicles.

The fund will focus on helping resource – rich developing countries benefit from increasing demand for minerals and metals, while ensuring the mining sector implements sustainable practices that minimise its environmental footprint.

The facility evolved from The Growing Role of Minerals and Metals for a Low – Carbon Future, a World Bank report which found that a low carbon future will be significantly more mineral intensive than a business – as – usual scenario. Global demand for ‘strategic minerals’ such as lithium, graphite and nickel will skyrocket by 965%, 383% and 108% respectively by 2050.

This growing demand offers an opportunity for mineral – rich developing countries, such as Bolivia (which has 70% of the planet’s known lithium) and the Democratic Republic of Congo (which supplies 60% of the world’s cobalt). However, it also represents a challenge: without climate – smart mining practices, the negative impacts from mining activities will increase, affecting vulnerable communities and the environment.

The facility will aim to make these processes more sustainable and less damaging.

The World Bank is targeting total investment of \$50mn for the fund, to be deployed over a five – year timeframe. Partners include the German government and private sector companies Rio Tinto and Anglo American. Projects may include supporting the integration of renewable energy into mining operations, preventing deforestation and supporting sustainable land – use practices.

Global carbon emissions still rising despite renewable growth – IEA

Energy related carbon dioxide (CO₂) emissions rose by the IEA’s Global Energy & CO₂ Status Report. The agency also found in 2018, with fossil fuels meeting nearly 70% of the growth for the second year in a row.

Energy demand grew by 2.3% last year – the fastest rate in the past 10 years – thanks to a strong global economy and greater need for heating and cooling in some regions. According to the IEA, unpredictable cold snaps drove demand for heating and, more significantly, higher summer temperatures pushed up demand for cooling.

Natural gas posted the biggest gains, accounting for 45% of the rise in energy consumption, with demand growth particularly high in the US and China.

Meanwhile, coal use in power generation accounted for around one third of the CO₂ emissions increase, says the report. Coal consumption rose 0.7%, with increases seen exclusively in developing countries in Asia. The majority of coal – fired generation capacity that exists today is found in Asia, where plants are an average of 12 years old. The expected lifetime of these coal – fired power stations is around 50 years.

‘Despite major growth in renewable, global emissions are still rising, demonstrating once again that more urgent action is needed on all fronts – developing all clean energy solutions, curbing emissions, improving efficiency, and spurring investments and innovation, including in carbon capture, utilisation and storage,’ says Dr. Fatih Birol the IEA’s Executive Director.

Electricity continued to position itself as the ‘fuel of the future’, with global demand growing by 4% in 2018. While solar and wind generation expanded at a double – digit rate, this growth was not fast enough to meet that increased electricity demand which ultimately drove up coal use.

The US, China and India accounted for nearly 70% of the rise in energy demand worldwide, with the US recording the largest global rise in oil and gas demand, says the report. Its gas consumption jumped 10% from the previous year, the fastest increase since IEA records began 48 years ago.

Oil demand also grew 1.3% worldwide last year, with the US again leading the global increase for the first time in 20 years thanks to a strong expansion in petrochemicals, rising industrial production and trucking services.

However, the outlook doesn’t wholly favour fossil fuels: a separate report issued in late March by the environmental groups Global Energy Monitor, Greenpeace and the Sierra Club revealed that the

number of coal plants under construction has fallen by 84% since 2015 and 39% in the last year alone.

Meanwhile the number of completed coal plants has dropped by more than half since 2015, although China remains an exception to the downward trend. According to the report, satellite images reveal that the country has quietly resumed construction on dozens of coal – fired power projects that had previously been shelved.

US nuclear generation reaches a temporary high

Electricity generated by nuclear power plants in the US hit an all – time high last year – though he country’s nuclear power output is likely to decline in the near future, according to new data from the EIA.

While a number of nuclear power stations in the US have shut down in the last decade, the combined impact of added capacity through power updates, as well as shorter refuelling and maintenance cycles, have allowed the remaining plants to produce more electricity. In 2018, US nuclear power output totalled 807.1 TWh – a fraction higher than the previous peak of 807.1 TWh reached back in 2010.

At the start of this year, there were 98 operational nuclear reactors at some 60 plants across the US. Two of these units – Pennsylvania’s Three Mile Island and the Pilgrim nuclear power station in Massachusetts- are expected to close later this year. The last nuclear power station to come online in the US was the Tennessee Valley Authority’s Watts Bar Unit 2 nuclear power reactor, which has a capacity of 1.2GW.

According to project information reported to the EIA, only two new nuclear reactors are scheduled to come online the coming years. Georgia’s Vogtle Units 3 and 4 will begin generating power in 2021 and 2022, respectively, and will provide 2.2 GW of generating capacity. But this new capacity will not offset the plant closures planned for the next seven years. By 2025, US nuclear capacity will fall by 10.5 GW following the closure of 12 reactors, says the EIA.

By 2025, it expects electricity generation from nuclear plants to fall by 17%.

The US nuclear fleet has only been able to maintain electricity generation near 800 TWh for the past ten years because several plants commissioned updates, or modifications to increase their generating capacity. The EIA measured 2.0 GW of thermal power updates between 2010 and 2018.

In addition, nuclear plants have reduced the time that they are out of service for refuelling or maintenance. Last year, the average nuclear reactor outage in the US was 25 days. The plants typically refuel every 18 to 24 months and annual fluctuations in power output are often attributed to maintenance cycle alignments across the fleet.

Venezuelan crude production hits new lows

In March 2019, Venezuela’s crude oil production averaged 840,000 b/d, down from 1.1mn b/d in February, according to estimates in the US Energy Information Administration’s (EIA) April 2019 Short Term Energy Outlook. This Average is the lowest level since January 2003, when a nationwide strike and civil unrest largely brought Venezuela’s state oil company, PdVSA, operations to a halt.

Widespread power outages, mismanagement of the country’s oil industry, and US sanctions directed at Venezuela’s energy sector and PdVSA have all contributed to the recent declines. Venezuela’s production decreased by an average of 33,000 b/d each month in 2018 according to the EIA, and the

rate of decline accelerated to an average of over 135,000 b/d per month in 1Q2019. The number of active oil rigs – an indicator of future oil production – also fell from nearly 70 rigs in 1Q2016 to 24 rigs 1Q2019.

The declines in Venezuela, production will have limited effects on the US, reports the EIA, as US imports of Venezuelan crude oil have decreased over the last few years, with average 2018 imports the lowest since 1987. However, there may be upward pressure on the prices of other crude oils imported into the US.

Subsea market surging forward

Oslo – based consultancy Rystad Energy is very positive about prospects for the subsea services market going forward. According to analyst Henning Bjoirvik, the subsea services market is one of the top performers in terms of oil and gas operations. Demand for maintenance and operations of offshore vessels globally from 2019 – 2024 is forecast to have a compound annual growth rate (CAGR) of 13% in Europe, reports Rystad Energy. Offshore drilling contractors are also expected to find a favourable business climate with CAGR of could climb 11% and subsea services 8%, Seismic and geophysical services are anticipated to increase by 10% CAGR.

‘We expect the subsea market to outpace other market segments, and see annual growth of up to 13% CAGR, which is pretty remarkable growth actually,’ Bjoirvik told group of industry journalists, including Petroleum Review.

In 2018, global demand for oilfield services was \$610bn, of which subsea equipment and installations accounted for 4% at \$23bn. Back in 2014, before the oil price slump, the subsea equipment market had about \$46bn of revenues. ‘Even though we predict a pretty steep growth in terms of CAGR of about 13% between 2018 and 2023, we think that the rate of recovery will be a bit long. 100% recovery to 2014 levels is unlikely before 2026, with 80% recovery in four years’ time,’ Bjoirvik said.

Rystad Energy breaks down the subsea sector into three main markets:

- Subsea equipment – subsea wellheads, subsea trees, manifolds, control modules, etc.
- Subsea services – inspection, maintenance and repair, ROV (remotely operated vehicle) drill support, flow assurance services, etc.
- SURF – subsea umbilicals and flow lines, and installation.

‘Typically, SURF are Greenfield – driven markets, while subsea services are more Brownfield and have longer time – frame agreements, and tend to be a more sluggish market,’ Bjoirvik explained. However, the subsea services market was the first to return to growth around 2016 – 2018. While the subsea equipment and SURF markets began rising from 2018. ‘Some of the growth is driven by inflation. Demand for subsea trees is also a prime driver for subsea development’ he said.

The subsea market started booming in the mid – 1990s. By 2000 there were about 350 subsea trees, then the market went flat to 2011, and started increasing with about 400 installed in 2013. Then the downturn came. About 250 subsea trees were installed in 2017 and the market has been recovering since. ‘Now we expect a lot of new trees to be installed going forward, with 4% CAGR between 2017 and 2023. The same is happening with manifold installations, which are expected to double from 2017 to 2021,’ he continued.

Demand for SURF lines are also expected to show the same pattern, apart from the peak due to development of Egypt's massive Zohr field in the Eastern Mediterranean, which accounted for 30% of SURF plant in 2017.

'Lots of subsea installation FIDs (finance investment decisions) are coming. We expect a lot of subsea tie – backs to come into play and have already seen a shift in 2017/2018 on both the UK Continental Shelf,' Bjorvik said, 'Moreover, FID in 2019/2020 will largely be driven by offshore Brazil developments. Norway and the UK and driving up subsea installation growth to 2021. Then it will be driven by countries such as Brazil and major developments like ExxonMobil offshore Guyana.'

Train 1 at Cameron LNG reaches final commissioning stage

McDermott International and its joint venture partner Chiyoda International Corporation, a US – based wholly – owned subsidiary of Japan's Chiyoda Corporation, report the Train 1 of the Cameron LNG project in the US has reached the final commissioning stage following the introduction of pipeline feed gas into Train 1 of the liquefaction exports facility, the precursor for the production of LNG.

Once Train 1 is fully operational, it will have the capacity to produce 4mn t/y of LNG.

The Cameron LNG project includes three liquefaction trains with a projected exports of 12mn t/y of LNG. The development is jointly owned by affiliates of Sempra LNG, Total, Mitsui & Co and Japan LNG Investment (a company jointly owned by Mitsubishi and Nippon Yusen Kabushiki Kaisha).