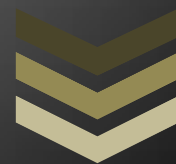
ENERGY PRICE BENCHMARKING 2016 Q3



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A briefing on energy markets both globally and in Europe together with price benchmarking.

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MARKET ISSUES

UK Energy Market

UK Energy Market

Siemens puts plans to export wind turbines from Hull to EU on hold following 'Brexit'. CMA releases revised energy market report, dropping claim that big-six overcharged customers by £1.7bn. Waste to energy project in Teesside dropped costing 700 jobs. BP shareholders launch revolt against 20% pay rise awarded to chief executive. New entrant to the UK energy supplier market, Extra Energy, receives record number of complaints. Centrica sells new stock raising £700m to reduce debt and protect credit rating.

World Energy Market

Royal Dutch Shell announces accelerated cuts to expenditure since the takeover of BG Group. Shell's plan to sell $30bn worth of assets following acquisition of BG Group delayed until at least 2018.
Earnings fall at the two largest US oil groups. Number of 'green' jobs in the renewable energy industry rises by 5%. Chief Executive of Total outlines plans to have 20% of assets invested in 'green' energy over the next 20 years. Germany's two largest energy companies suffer from a radical shift to renewable energy and increased liabilities for nuclear waste storage.
Dong plans IPO for summer 2016. Linn Energy, one of the 20 largest producers in the US, files for bankruptcy. Total agree a deal to buy battery manufacturer Saft. Iran moves closer to opening its oil and gas fields to foreign investment. Joint venture launched to pool African generation assets and create large pan-African power supplier. Talks between Areva and TVO regarding Olkiluoto 3 nuclear plant collapse. Trafigura overtakes Glencoreto become the second largest independent oil trader in the world. Irish oil and gas company Petroceltic, enters administration as the company struggles to cope with the collapse in oil prices, but finds a buyer in Worldview. $28bn proposed takeover of Baker Hughes by Halliburton collapses. Gulf Keystone share price falls by 35%.
In late June, Siemens, who are a major manufacturer of wind turbines, stated that although plans to produce turbine blades in Hull for the UK offshore wind industry, creating 1 000 jobs, would not be affected by Brexit, it would have to place plans to export turbines from the UK to other EU countries on hold due to uncertainty over the future relationship with the EU. Norwegian gas supplier, Statoil, also expressed concerns that geopolitical tensions, including Brexit, could threaten the drive to replace coal with renewable and low carbon energy sources, due to risks to international cooperation and a greater emphasis on energy security rather than mitigating climate change.
In late-June, the Competition and Markets Authority dropped its accusation that the big-six energy companies have overcharged customers by around £1.7bn a year made in last year's interim report on the energy market. The final report instead claims that customers could have saved this amount if they had switched, changing the onus to the consumer rather than the supplier. This accusation was the least well received when the interim report was published, with energy companies expressing their objections to the way the figure was calculated and a potential legal challenge to the report's findings appears to have pushed the CMA to water down its language to appease the industry. In late-April, Utilita, one of the fastest growing independent utilities suppliers in the UK, warned that the plans to cap prices for customers on prepayment meters, suggested by the CMA report, would all but wipe out its profits. The CMA found that customers on these meters are being charged around £300m more than others. The company's founder has stated that it has not ruled out challenging the CMA findings in the courts. In early April plans for a £300m plasma gasification waste to energy project in Teesside was dropped by its American builder, costing around 700 jobs. The two highly advanced plants would have provided renewable energy for around 100 000 homes and prevented waste from going to landfill. The cancellation is another blow for the region which has also suffered from the collapse of the British steel industry.
In April, shareholders of BP launched a revolt against a 20% pay rise awarded to chief executive Bob Dudley. 59% of investors voted against the move which would have put Dudley's pay package at

nearly $20m for 2015, including a $1.4m bonus, despite the company losing $5.2bn during the year and chief executives of other energy companies taking pay cuts. BP stated that these losses were out of the control of Dudley and related to the oil price crash, whilst targets relating to the bonus were all met. This was the first time a major British company has lost a vote on executive pay in four years, although it was advisory only and non-binding. The vote will be considered during next year's round of remuneration. Meanwhile, profits at the company increased in the first quarter of the year from $196m in the final quarter of 2015, to $532m – although this was significantly down from the $2.6bn made in the same quarter last year.

New entrant to the UK energy supplier market, Extra Energy, who has rapidly expanded to hold 500000 customers, received a record number of complaints in the first quarter of 2016 as the company's systems struggled to cope with the large number of customers. The company has amassed so many due to its low prices and a record number of people switching suppliers following a campaign of encouragement by the government. More than 4m customers switched supplier in 2015. Competition has got stronger between the smaller independent suppliers as they cut prices to gain more customers, leading to tighter margins.

In mid-May, Centrica sold new stock to rise around £700m. The company increased its share stock by 7%, causing share prices to fall by almost 10%. The move to reduce debt was in anticipation of credit agency Moody's re-evaluation of the company's credit rating, an attempt to preserve their Baa1 status. Centrica's debt stood at double its earnings at the end of last year, at around £4.7bn, as the company lost domestic customers to smaller independent rivals. Centrica owned British Gas lost 224 000 domestic customers during the first quarter of 2016 alone.

Rival company SSE meanwhile reported its highest profit margin for 4 years despite also losing around 370 000 customers last year, on top of the 500,000 it lost in 2014/15.

In early May, Royal Dutch Shell announced that it would be accelerating cuts to expenditure since the takeover of BG Group for $35bn was completed last quarter. Expenditure is expected to fall by 36% compared to what was spent by both companies' combined during 2014. Shell's shareholders were promised steep spending cuts as part of the takeover deal in order to secure their backing. Cuts are likely to be made by cancelling or delaying projects, such as the announcement during the quarter of the withdrawal from a $10bn gas field project in Abu Dhabi, and a further 5 000 job cuts that were announced in late-May, on top of the 10 000 already stated, with 475 of those in the UK.

In early-June, Shell's plan to sell $30bn worth of assets following its acquisition of BG Group was delayed until at least 2018 due to the expected lengthy period of low oil prices. Shell need to shed the assets in order to deal with the large debts the company has built up, which equate to around 26% of the company's total capital, more than double the proportion compared to last year. In order to raise enough cash however, the oil price must be at a high enough level and so any sales are likely to be delayed until the oil price recovers to a point where assets will be valued at a viable price.

In late April, Exxon and Chevron, the two largest US oil groups reported sharp declines in Q1 earnings, with a 63% fall at Exxon versus the same period last year, whist earnings at Chevron were down by $319m. Days before the announcement, ratings agency Standard and Poor's downgraded Exxon from its triple-A credit grade which it has held since 1930, due to large dividend payments.

Whilst jobs in the oil and gas sectors fell sharply over the quarter, data released in late May showed that over the last year, the number of jobs in the renewable energy industry rose by 5% to 8.1m in solar, wind and other renewable energies plus 1.3m in hydropower worldwide. These new jobs were concentrated in developing Asian markets, with a fourth consecutive year of falls in 'green' jobs across the EU due to slow economic growth and increasing mechanisation. The IEA predicts that there could be 24m green jobs by 2030 as countries engage with the Paris climate accord.

In late-May, Chief Executive of Total, Patrick Pouyanne, outlined plans for the company to have 20% of its assets invested in 'green' energy over the next 20 years. This would include investments in renewable energy, energy storage and energy efficiency. The move is seen as a response to the Paris climate agreement, as oil and gas companies seek to remodel their businesses to cope with a changing market and energy outlook. The IEA has predicted that demand for oil could fall by over 20% by 2040 as countries take steps to reduce emissions. Some energy companies have been criticised for not revealing plans on how they will move away from the reliance of fossil fuels.

In mid-May shares in Eon fell by 5% following an announcement that it had set aside a further €2bn on top of the €8bn it has already provisioned for storing nuclear waste from Germany. The German

government had published a proposal in April which increased the big four German energy companies' liabilities for nuclear waste, telling them they must now contribute a total of €23bn to cover the cost of storage. The company stated that it may have to sell assets and postpone investments in order to cover the costs and both Eon and RWE, the two largest utilities companies in the country have attacked the move. Both companies have already been hit by Germany's recent radical shift to renewable energies which now account for 32% of power generation. In May, RWE posted a 2% fall in Q1 profits versus the same period last year. However, Eon did post a €300m increase in profits from last year for the first quarter of 2016 following a renegotiation of gas contracts with Gazprom following arbitration. Danish utility company, Dong, in mid-May announced plans for an IPO in the summer of 2016 which could raise around $1.8bn from a 15% share offering from current stakeholders. The Danish government will still retain a 50.1% majority holding of the company.

Oil and gas producer, Linn Energy, one of the 20 largest producers in the US, filed for bankruptcy in mid-May as it became the biggest company to go under following the crash in oil prices. The group reported total debts of $9.3bn in February; around seven times the amount of cash it received from operations in 2015. Share values in the company closed on the day of the announcement at 33 cents, down from a 2014 peak of over $33.

In mid-May, Total agreed a deal to buy battery manufacturer Saft as the group moves into renewable energy and away from fossil fuels. The company has ambitions to become a market leader in renewables and energy storage over the next two decades and already owns SunPower, a major US solar company, after paying $1.4bn for the acquisition in 2011. It has also converted its La Mede oil refinery into a biofuel plant.

In late-June, Iran moved closer to opening its oil and gas fields to foreign investment by identifying Iranian partner companies for western groups such as BP, Total and Eni who wish to invest in the country's recovering oil industry. Iran is rapidly re-entering the oil market following the lifting of sanctions against the country. US oil groups are still prohibited from dealing with Iranian companies however. In early-June, Norwegian oil and gas company, Helma Vantage, agreed a deal with Iranian Kharg Petrochemical Company for 200m standard cubic feet of natural gas from offshore oilfields which will be produced as LNG and LPG. This is the first major natural gas deal to occur since the lifting of sanctions and will be the first ever LNG production from a floating production vessel.

Also in late-June, a $3.3bn joint venture was launched between a number of small electricity suppliers in Africa, led by the Africa Finance Corporation and Harith General Partners. It will pool generation assets to create a large pan-African power supplier. The aim of the move is to increase the resilience of African power supply which is currently uncoordinated and severely lacking in a number of sub-Saharan countries. The larger company intends to tap bond markets in order to gather funding quickly for large scale projects in the region in order to increase the power supply for the growing population of the developing continent. Funding for these projects has historically been a major problem, with funding sought on a project-by project basis, often taking years to acquire.

Talks between struggling French nuclear group Areva and Finnish company TVO regarding legal claims over the Olkiluoto 3 nuclear plant in Finland collapsed in June. The project has had major cost overruns of around €5bn and is 10 years behind schedule. TVO are seeking compensation from the French company, whilst Areva and partner Siemens are counter suing. The uncertainty of the future of the project is stopping the €2.5bn sale of Areva's NP reactor division to EDF which is part of a restructure that is intended to save the company from going under. Areva has been haemorrhaging money, posting losses of €4.8bn in 2014 and €2bn in 2015. The French state is planning a bailout of the company, with most of the company being sold off to raise cash to pay debts. This includes a potential £2bn sale of a majority stake to Schneider Electric.

In June, Trafigura overtook Glencore to become the second largest independent oil trader in the world. Traders have been enjoying highly favourable market conditions as the oil price fluctuates amid an era of low oil prices and competition between producers for market share, with profits for Trafigura topping $1bn in the first half of 2015. However, net profits at Trafigura have fallen around 10% during the last quarter which is seen by some commentators as a sign that the trading boom that has occurred over the last 2 years may be coming to an end. The company has expanded its portfolio aggressively, doubling the amount of oil it trades over the last 2 years after a number of deals with Russian state-controlled Rosneft, which reported a 75% fall in net profits in the first quarter of 2015 due to the 13-year low oil price seen in January (see Oil section).

In April, Irish oil and gas company Petroceltic, entered “examinership”, the Irish equivalent of administration, as the company struggles to cope with the collapse in oil prices. Dragon Oil had pulled out of buying the company in 2014 which has caused the company to struggle since and in December the company put itself up for sale in the wake of posting a $23m loss for the first half of 2015. In May, a bid by hedge fund Worldview, its largest shareholder, to take full control of the company was recommended by the administrators, following a failed bid by Sunny Hill in mid-April.

In early-May, a $28bn proposed takeover bid by Halliburton of rival Baker Hughes, which was agreed in November 2014, collapsed following opposition from the US Department of Justice. The deal between the second and third largest listed oil companies in the world would have helped the companies to cut costs by up to $2bn a year in the face of pressure from the low oil price outlook. The collapse, following the legal challenge by the US Department of Justice due to concerns over the impact on competition with the combined company having a near monopoly in some areas of oilfield services, leaves Halliburton having to pay Baker Hughes a $3.5bn break fee.

Gulf Keystone, the company developing one of the largest producing fields in the Kurdish region of Northern Iraq, saw its share price drop by 35% to hit record lows in mid-April following fears of its ability to restructure its debts. The company currently has debts of around $575m and is owed around $150m from the Kurdish Regional Government.

ELECTRICITY

UK News

Hinkley Point new nuclear project hit by a legal challenge from workers committee. Analysis warns of tight electricity supply margins this winter with National Grid forced to use emergency powers. Contract with China Harbour Engineering Company to build Swansea Bay tidal lagoon sea walls cancelled. Equitix invest £100m in Atlantis who are currently building Scottish tidal stream project.

World News

Argentina plan to invest $20bn in renewable energy. Sweden commit to building 10 nuclear reactors to replace aging plant. Europe’s largest energy companies pledge to reduce the cost of offshore windfarms to around €80/MWh by 2025. New energy bill in Poland will effectively kill off the wind power industry.

The Hinkley Point new nuclear project was hit by a legal challenge towards the end of June as an EDF workers’ committee tried to delay the £18bn project. The committee, which intervened in the project in April due to concerns over the unproven EPR technology and financial risk, particularly in light of the £5.7bn and 6 year overrun of the still incomplete Flamanville nuclear project in France, was given until the 4th of July to decide whether it would support the project. However, after the committee claimed that they had not been given important documents relating to the project and therefore could not form an opinion, they decided to challenge the company in the courts, with the hearing set for September this year. EDF had been due to give final approval for the project in May; however the intervention by the workers group has added further delays to the already beleaguered project. Legally, the company must seek an opinion from the workers group, although their decision is only advisory and EDF could decide to proceed regardless. Not all workers are opposed to the project, with around 100 engineers at the company coming out in favour of it in early April. EDF regards the projects as essential for maintaining competencies as well as supporting nuclear suppliers, and for the credibility of France’s nuclear industry, whilst the new reactor is seen as essential for energy security by the UK government, although there have been calls from the

Conservative benches for the government to rethink its energy policy and have a ‘plan B’ should the project end up not going ahead. It is seen as unlikely that the project will be abandoned, despite the French energy minister in May calling the cost of the project “colossal” and stating that EDF may have gotten “carried away” with the project. Following the decision by the UK to leave the EU, the French government, which owns 85% of EDF, stated that the decision had “no consequences” for Hinkley Point C as the agreements were bilateral between France and the UK, regardless of membership of the EU. However, there were numerous calls for the project to be further delayed or cancelled due to the changing outlook and uncertainty regarding the future, not least from EDF trade unions. At the end of May the French government outlined plans to sell a stake in Peugeot owner PSA to raise a €3bn aid package for EDF to help fund its capital expenditure projects.

Earlier in the month EDF revealed it had put aside a further £2.7bn of contingency funds for the Hinkley Point project which could push the cost to over £20bn. There are doubts that the French state would be allowed to give state aid to the project however due to EU competition rules and 'green' energy company Ecotricity is planning a legal challenge should they attempt to do so.

In mid-June, an analysis of the UK wholesale energy market suggested that the country could be hit by tight electricity supply margins this winter and that National Grid could be forced to use last report powers to push up wholesale electricity prices in order to tackle the problem. The emergency measures were used for the first time last year and could be used again in the winter as margins tighten further, especially if there is a cold snap of weather, as the 11 coal and gas fired power stations that have closed since winter 2015/16 have to a large extent not been replaced, with only 2 new gas plants coming on line. Wholesalers may be able to charge many multiples of the usual prices for significant periods, which could not only encourage the building of new power supply plant, but also force smaller electricity suppliers out of business as they struggle to afford them, which would be bad for competition in the market as well as passing high prices through to end users. Smaller scale diesel and gas engine back up generation plant is likely to be used much more this winter to plug the supply gap. These power sources are more expensive than the large scale gas and coal fired power stations and their greater use could also push up prices for consumers, particularly as the government has made moves to reduce subsidies being paid to small scale diesel generation. Other measures that could be used to tackle this tight supply margin could also involve paying large energy users to use less power at peak times, especially if, as is growing increasingly likely, the demand for electricity surpasses available supply.

In late May, the contract with China Harbour Engineering Company, who was the preferred bidder to build the sea walls needed for the Swansea Bay tidal lagoon project, was cancelled after the project developer, Tidal Lagoon Power, decided it could find a cheaper supplier. The tidal power sector is currently under a 6 month review due to report in the autumn. Assuming a financial package can be agreed, the project is not expected to begin until late 2017. This package could include government subsidies which could add around 20p to the average annual household electricity bill. This compares with around £10 on the average bill that would be needed to fund Hinkley Point.

In early April, infrastructure investor Equitix announced that it would be investing over £100m in tidal power company Atlantis who are currently building the largest tidal stream project in the world, MayGen, in the Pentland Firth in Scotland. The move is seen as a turning point for tidal stream technology in the UK and could lead to further projects being developed. The UK has a large tidal stream resource, particularly in Scotland, and coupled with other tidal technologies, could theoretically supply around 12% of the UKs electricity demand. The MayGen scheme will provide around 398MW of electricity when it comes on line. The downturn of the oil industry in Scotland has lowered the cost of tidal power in the country as vessels and skilled labour have become cheaper and more available.

Argentina is planning to invest around $20bn in renewable energy to take advantage of the country's vast wind and solar resources. The country is one of the windiest places on earth whilst also having expanses of desert with large exploitable solar resources and is seen as one of the most promising places for investment in renewable energy in the world. The country has set a target of generating 20% of its electricity from renewable sources by 2035 compared with just 1% at the moment.

In mid-June, Sweden committed to building 10 nuclear reactors to replace their aging plant that are being phased out, in a boost to the European nuclear sector which has been suffering since the Fukushima disaster of 2011. The country has a target of 100% renewable energy by 2040.

In early-June, some of Europe's largest energy companies pledged to reduce the cost of offshore windfarms to around €80/MWh by 2025, around half of today's cost, which would make the resource directly competitive with gas and oil fired power, even without government subsidy support which it currently receives. This would only be possible however with clear and ongoing support for the industry by governments through energy policy initiatives according to the group of companies.

'Green' subsidies have come under pressure from some quarters in a number of countries as they have been seen by some to have increased electricity prices for consumers affecting the competitiveness of some industries. The cost of offshore wind has reduced by around 20% since 2011.

In April, a proposed new energy bill in Poland to prevent wind turbines being built within 2km of other buildings and forests will effectively kill off the industry as the vast majority of land in the

country will be off limits. Changes to taxes on existing turbines is set to quadruple, making them unprofitable and powers to shut down turbines for inspections, with the threats of prison sentences for non-compliance is threatening investment in the country. The move by the right-wing government is intended to aid the country's coal industry. Polish coal mines, which employ significant numbers of Polish citizens, are currently losing money.

GAS

UK Market

Fracking for natural gas has been approved in North Yorkshire. Government supports further fracking but critics point to collapse of US ventures.

International Market

US regulate to control shale industry methane emissions. Political differences on climate change regulation surface in US presidential contest. Texan Eastern gas pipeline explodes in Pennsylvania, USA, causing an increase in gas prices. Engie ordered to raise gas prices in France. Construction begins on Trans Adriatic Pipeline (TAP).

In mid-May, permission was granted for fracking to take place in North Yorkshire as councils in the region backed plans from gas company Third Energy to use the technique at a well just outside Kirby Misperton. The company has been extracting gas in the area conventionally for around 20 years. The announcement from the Conservative-dominated council was met with anger from protesters gathered outside of Northallerton town hall as many local residents, including local businesses, farmers and a number of town and parish councils, are opposed to the move and there has been widespread opposition to the technique across the country. Just 36 of the 4 800 application consultation responses were supportive of the plans. The decision sees the return of fracking to the UK after a hiatus since drilling near Blackpool caused two minor tremors in 2011 and is the first time an application has been approved since then. Attempts to drill elsewhere have been blocked by planners on noise and increased traffic grounds. Third Energy has promised that gas will be transported away from, and water transported to, the area via pipelines rather than by road and there will be no drilling at night or on Sundays.

The move could see hundreds of wells being drilled across the North Yorkshire region and could eventually lead to the expansion of the UK shale industry, if the eight week test period is successful.

Proponents of shale gas - including the government, which sees it as a central plank of its energy policy - believe it will create thousands of jobs and increase the UKs energy independence. However, critics have noted the impact of the collapse in global gas and oil prices on the industry in the US, seen as the model for the future UK industry. Many US producers are now struggling to survive as the unconventional drilling technique is relatively expensive compared to traditional gas and oil extraction. The US produced a record 74bn cubic feet of gas a day last year, mostly due to the increase in shale production. The widespread rollout of shale gas drilling in the UK is still many years away however, with large scale extraction unlikely until at least post 2020.

Meanwhile, the US government imposed new regulations on the shale industry in an effort to curb methane emissions. Methane is a potent greenhouse gas and has a significant impact on climate change. The shale industry has had a poor record of methane leaks and the new rules require operators to identify and repair these by conducting rolling leak checks. Introduced by the Obama administration and developed by the Environmental Protection Agency (EPA), the regulations are an attempt to reduce greenhouse gas emissions and preserve the depleting resource.

They will first target new oil and gas installations but further regulations are being developed to incorporate existing plant. The new rules are expected to cost the industry around $530m. However the EPA insists this will be outweighed by a saving of $690m in 2025 due to mitigated climate impacts. This additional expenditure could have a significant impact on the industry, which is already struggling due to the sharp fall in gas and oil prices over the last 18 months, with operators calling the rules overly burdensome.

Hilary Clinton, the Democratic presidential candidate, has promised to increase regulations on the shale industry, whilst the position of the Republican nominee, Donald Trump, has been unclear.

However, towards the close of May, Trump revealed his energy policy ambitions, with cuts to environmental legislation, strong support for increased oil and gas drilling and a promise to cancel the Paris climate change agreement. Trump is seen as a climate change sceptic and has questioned the scientific consensus on anthropogenic climate change.
At the beginning of May, the Texas Eastern gas pipeline exploded near Pittsburgh, Pennsylvania causing a large fire and resulting in increased gas prices. The pipeline is used to carry shale gas from the Marcellus and Utica shales.
In early-May, Engie (previously GDF Suez) was ordered by the French competition authority to raise its gas prices after rival company Direct Energie complained that Engie were artificially fixing low prices to exclude competitors. The company could yet be fined up to €7bn if it is found to have abused its dominant market position.
Engie, which in the past was the sole gas supplier in France, currently supplies around 80% of residential and 60% of non-residential customers.
In mid-May, construction began on the 870km Trans Adriatic Pipeline (TAP) which will transport gas from Turkey to Italy, east to west through Greece and Albania and across the Adriatic Sea. The pipeline is part of the $45bn Southern Gas Corridor project, designed to supply southeast Europe with gas from the Caspian Sea and reduce the EU's reliance on Russia for its natural gas supply. TAP will connect to the Trans Anatolian Pipeline (TANAP) which will carry gas from the Shah Deniz II gas field in Azerbaijan. The project is intended to be an alternative to the Russian backed Southern European Pipeline which will supply Russian gas to the region through Greece, after an agreement was reached between the countries last year, and the Nord Stream 2 project which has been controversial amongst EU members wanting to diversify the continents energy supply, with a leading German politician criticising the project in early-May. The project has also be criticised as it will divert around €2bn of funding away from Ukraine as Russia intends to stop the transit of its gas through the country which will be facilitated by the new Baltic Sea pipeline.
Russia has been trying to build a pipeline to supply the region over the last few years, one such project, South Stream, was cancelled in 2014. Future investments in such projects are likely to have to be scaled back as the state-owned gas group, Gazprom, the largest gas supplier in the world, takes a hit to its finances due to the low prices which are expected to continue over the next few years. The company's profits fell by 6% last year. $1.5bn of funding for TAP will come from The European Bank for Reconstruction and Development, with $500m coming directly in the largest single loan in the bank's history, with the rest of funding coming from the European Investment Bank and the pipeline's commercial partners such as BP.
Gas is expected to start being delivered to Europe through the pipeline in 2020.

OIL

Market News

Saudi Arabia scuppers potential oil production freeze deal at meeting between OPEC and non-member countries. Saudi Arabia reshuffles government with long-standing oil minister replaced and a change in energy policy tactics with a potential IPO of state-owned oil group Saudi Aramco.
Numerous supply disruptions during the quarter affect oil prices. Iranian output helps increase OPEC production, restricting price increases resulting from non-Opec supply disruptions. Prices rise in early quarter by the largest monthly amount in 7 years. Recovered oil prices open possibility of US shale oil producers restarting mothballed projects, increasing output from the country over the next 18 months. The UK votes to leave the EU, causing a fall in prices, a fall of the pound against the dollar, and increased market volatility. Nigerian output forecast cut by over 20%. US congressman advising republican presidential candidate Donald Trump pushes for an official inquiry into alleged unfair market practices of OPEC. Cuts to investment in exploration lead to the fewest discoveries of new oil reserves since 1954. Oil majors urge US agency to continue with plans to sell drilling rights in Arctic waters off Alaska in the early 2020s.
In mid-April, a proposal at a meeting between Opec and non-member countries, such as Russia, to freeze oil production at January levels, which would have been the first such global supply deal for 15

years, collapsed as Saudi Arabia, the largest member by output, insisted that Iran be included in the deal. Oil prices had been volatile over the preceding weeks with the prospect of the deal being signed. The agreement would have restricted oil output and put the brakes on the current supply glut and caused prices to increase in early April in anticipation. However, since sanctions imposed on Iran were lifted, the country has been attempting to increase its oil output back to pre-sanction levels and beyond - which it has now achieved - and any suggestion of restricting this growth has been rejected outright with Iran declining to send a representative to the OPEC meeting. The Saudis had earlier in the quarter insisted they would sign the deal whether Iran was included or not. The country began to backtrack however, raising fears that an agreement would not be reached and causing prices to fall by around $5/bbl. Other members were expecting a deal until just hours before it was due to be signed, however it collapsed after the Saudis demanded new additions to the draft with no prospect of them being agreed to due to the absence of Iranian delegates. Tempers were left frayed and non-Opec members that had attended the meeting had reportedly left feeling alienated from the cartel.

In early-May, Saudi Arabia announced a reshuffle of its government bringing in a new oil minister to replace Ali al-Naimi who had held the position for over 20 years.

His replacement, Khalid al-Falih, who like his predecessor, is a long serving employee of state oil group Saudi Aramco, is working closely with Prince Mohammed bin Salman who has taken control of Saudi energy policy and is charged with moving the country to a 'post-oil economy'. The Prince is perceived as being unpredictable and is expected to politicise the countries oil policy in a way seen to have been generally avoided by al-Naimi, in order to challenge increased market activity by rival Iran. For example, it was reported in early April that the Saudis had banned vessels carrying Iranian oil from entering their waters in an attempt to stem Iran's market growth. It emerged that Salman was the main culprit in the collapse of the potential freeze deal in April by insisting that rival Iran sign up.

81-year old Al-Naimi, who was well respected in the global oil industry and was seen as the most influential non-royal in the country, had been increasingly side-lined by the Prince before the official announcement that he had been replaced. State oil group Saudi Aramco reacted to the reshuffle news by announcing that it would be increasing production in 2016, a move to compete with Iran's increasing output. In early-June however, the new minister moved to allay fears that Saudi Arabia would flood the market, stating that a market rebalancing should be "encouraged", although he also said it would be "premature" for OPEC to restrict output at this point, arguing that global demand is increasing to meet supply.

Currently state-owned Saudi Aramco, which produces around 13% of global oil output, is planning an IPO, with around 5% of the company being offered to the public initially. This is expected to be the largest IPO ever seen and could value the company at around $2tn. Saudi Arabia plans to completely reform their economy, aiming to end their reliance on oil over the next 15 years. In mid-May, credit agency Moody's downgraded Saudi Arabia's rating for the first time in 20 years. Rival credit agencies Fitch and Standard & Poor's have already downgraded the country due to fears over its ability to move the economy away from oil dependence. The country's GDP is expected to fall 5% this year whilst it has borrowed $10bn from foreign banks for the first time. Other Gulf States have also had to borrow record amounts as state budgets are squeezed due to the fall in oil revenues.

A number of supply disruptions during the quarter affected oil prices. In mid-May supply was disrupted in Nigeria following a militant attack and an oil pipeline leak, cutting the country's output by around a quarter to the lowest level in over 2 decades. Around the same time, wildfires in Canada, expected to be one of the most costly natural disasters in the country's history, forced output at oil sands in the Alberta region to be cut by around 1m bbl/day, up to a third of the countries production. Ongoing power supply issues in Venezuela, including a water shortage leading to a shutdown of a large hydro plant which provides a third of the country's electricity and rolling blackouts announced in late April to try to reduce power demand, caused its oil production to be limited and the country's president to declare a state of emergency, with production expected to fall by 100 000 – 200 000 bbl/day in 2016. There was also unrest in Libya earlier in the month, affecting oil supplies whilst output from China is also reducing. In April, a strike in Kuwait caused the country's output to temporarily halve which for a short period caused a balanced oil market. Furthermore, scheduled summer maintenance in the North Sea is expected to add further supply pressure. These disruptions, which in total averaged around 3.6m bbl/day during May, the highest level since the US

started tracking outages in 2011, led to sustained price rises, jumping by around 4% in mid-May to above $45/bbl, again towards the end of the month to nearly $50/bbl for the first time since November, and then breached $50/bbl in early June for the first time since July 2015, causing Goldman Sachs to raise its forecast of average oil prices for the second quarter of 2016/17 to $45/bbl from its previous estimate of $35/bbl.

As reported last quarter (see April 16 edition), oil prices had dropped to a 13-year low of under $30/bbl at the beginning of 2016 but the above supply disruptions coupled with rising transport fuel demand in India, China, Russia and the US all contributed to a strong price recovery. Demand for transport fuels has now reached pre-2007 levels and US demand is expected to reach record levels during 2016, against expectations. Oil demand growth in India is now running at 300 000 bbl/day. Meanwhile, Opec reported that the cartel's overall output had risen to 32.6m bbl/day in April, primarily due to the return of Iran to the market, with the country's output increasing by around 200 000 bbl/day over the month, faster than most analysts had predicted. Iran's output is now at the level it was before sanctions were imposed on the country during 2011 and this quick recovery is having a restrictive effect on price increases. It is likely that without this production growth, prices would have increased significantly more due to the supply disruptions. As May progressed, supply disruptions abated and along with a strengthening US dollar, caused prices to fall around 2%.

April saw prices rise by the largest monthly amount in 7 years, increasing by over 22% to a level more than 70% higher than the trough in January as non-Opec oil supply fell by the largest amount in 25-years. At the close of April, prices hit their highest level in six months as the global oil surplus began to shrink, with expectations that it would continue to reduce over the latter half of 2016, despite data showing that US stocks had risen against expectations. Brent rose above $47/bbl and WTI rose above $45/bbl for the first time since November although this rise was moderated by the US stocks data, which showed continued rises in early May. Signs indicated that supply and demand were beginning to come into balance whist a weak US dollar in the first two months of the quarter also helped to boost prices. Last year, prices rose sharply in May but dwindled during the latter stages of the year and some traders expressed concerns that prices could follow the same trajectory, being compounded by the collapse of the OPEC production freeze deal, throwing supply and demand out of balance again.

The price rises during April and May, including a 5-week long consecutive price rise, the longest since 2012, in May and early June which had increased the cost of oil to nearly 80% above the January low, also opened the possibility of US shale oil production starting again, just as the supply disruptions earlier in the quarter eased.

This caused Goldman Sachs to describe this year's rally in prices as "fragile" with between 500 000 and one million barrels a day of production capacity potentially coming back on to the market over the next 18 months as US producers reactivate thousands of projects known as Drilled but Uncompleted wells (DUCs) that were mothballed as the price fell, vastly increasing the number of active onshore rigs. This has been called a "fracklog" by commentators, and some shale producers, such as EOG resources, have already begun to complete these DUCs. As prices breach $50/bbl, more producers are likely to complete their DUCs, with around 90% thought to become profitable at price point, increasing the oil supply in the market and putting a ceiling on prices whilst delaying the rebalancing of the oil market that is expected as demand grows to meet supply, well into 2017 according to the IEA.

In mid-June oil prices fell sharply over a 7-day period as unease spread through the markets over the spectre of the UK voting to leave the EU. The possibility of 'Brexit' had considerably increased market volatility over the month leading up to the vote. On 23rd June, the UK voted to leave the EU. Although too early to be certain, in the run up to the referendum, commentators predicted significant impacts on oil prices, with a rebalancing of currency exchange rates, the possible effects of the UK, then the world's 5th largest economy, no longer being part of EU free trade agreements with other countries around the world, and the prospect of an economic slowdown in the EU as a result of the UK withdrawing, all having an effect on commodity prices. Although Brexit is unlikely to significantly affect global oil demand (the UK accounts for just 2% of demand, whilst the EU accounts for 15%), with around 100 000 bbl/day reduction in global demand expected over the next two years, market turbulence makes predictions very difficult and the effect on oil prices cannot be foreseen with any certainty. Following the vote result, the pound immediately fell against the dollar to

the lowest level in over 30 years, making oil, a dollar denominated commodity, relatively more expensive for consumers trading in pound sterling. Between the 23rd and the end of June, the oil price fell by 7% as risk aversion hit the markets.
In late-April global energy consultants Wood Mackenzie cut its output forecast for Nigeria by over 20% as concerns that an overhaul of the state-owned oil company NNPC are not being implemented at a rate fast enough for oil production not to decline over the next decade. NNPC has large debts and poor cash flow which is highly likely to affect output in the medium term, particularly as investment in the country's oil industry has been poor since the crash in oil prices in 2014. Earlier in the month, Nigeria embarked on a drive to gather foreign investment to boost its oil industry. The country, which is the largest African oil exporter, is dependent on oil revenues, earning 90% of export revenues from the commodity, and the fall in prices has caused the rate of economic growth to slow to the lowest level for 15 years. The country has stated ambitions to double production; however this is looking increasingly unlikely.
In the US, a congressman advising republican presidential candidate Donald Trump on energy policy pushed for an official inquiry into alleged unfair market practices of OPEC. The cartels tactic of maintaining oil output despite a supply glut, which has largely caused the oil price crash, has led to around 130 US companies declaring bankruptcy with the loss of around 131 000 jobs as US Shale production became uneconomic. US output has reduced by around 500 000 bbl/day from its peak in early 2015. Trump has previously suggested imposing oil trade restrictions on Saudi Arabia.
In early-May it was reported that the cuts to investment in exploration seen across the oil industry since the crash in oil prices (see previous editions of EB) have led to the fewest discoveries of new oil reserves since 1954. Investment in the exploration and development of new reserves has fallen from a pre-price crash level of $95bn/yr to around $41bn expected in 2016 and funding will be around $1tn less between 2015 and 2020 due to the low prices. Oil companies, which have seen debts increase by around a third to $383bn over the past year, have focused budget cuts on exploration as new discoveries have a long payback period taking around seven years to reach full production on average. The impact of the fall in new discoveries is therefore likely to be seen during the next decade, with reduced supplies expected during the mid-2020s. By 2035 global supplies could be reduced by as much as 4.5m bbl/day if reduced investment continues. This could lead to a significant increase in prices in the future and a greater reliance on unconventional proven reserves such as shale oil. Despite these cuts, in mid-May, Statoil, Chevron, Centrica and ConocoPhillips purchased licences to drill for oil off the Norwegian coast, in the closest areas to the Arctic so far.
In mid-June, oil majors including Shell, Exxon-Mobil, ConocoPhillips and Chevron, wrote to the US Bureau of Ocean Energy Management, the body that controls drilling rights off the country's coast, to urge them to continue with plans to sell drilling rights in Arctic waters off Alaska in the early 2020's. US Arctic drilling has ceased since Shell withdrew from the region after disappointed results from their test wells; the weak sub-$50/bbl price makes exploring the region currently nonviable.
The companies argue that the exploitation of resources in the region is vital to long term energy security, whilst environmental groups argue that the risks of damage by drilling in the region are too great, and that fossil fuel reserves should be left in the ground to mitigate climate change.

COAL

UK Market

UK generates all its electricity without burning coal for the first time.

World Market

Study criticises Japanese plan to expand coal use for electricity generation. Largest private sector coal producer in the world Peabody Energy, files for bankruptcy protection in the US. World's largest sovereign wealth fund divests from coal.
In early-May, for the first time the UK produced all its electricity without burning any coal. This happened on seven separate occasions. Low wholesale electricity prices have made electricity generation from coal uneconomical compared to wind and solar when these resources are at high levels. Coal typically requires a wholesale electricity price of around £40/MWh to be economic;

however prices at this time were hovering around £30/MWh. This is a significant milestone as the UK moves to a 'zero coal' scenario. The government has announced its intention for coal to be totally phased out by 2025 and the move towards this target is rapid, with around 40% of electricity being generated by coal fired power stations just 4 years ago.

In mid-May, a study by Oxford University warned that Japan's plan to expand its use of coal for electricity generation could leave the country with around $60bn of stranded assets and could not be economically justified. The country is planning to replace its nuclear power fleet with 49 coal fired stations in the wake of the 2011 Fukushima nuclear disaster, which has drastically changed attitudes towards nuclear power in the country. Only one nuclear reactor is still operational in Japan, which previously relied on nuclear for around 29% of its electricity demand. The new coal fleet will produce around 28GW of electricity which is nearly twice as much as the nuclear plants they are replacing and the plan will commit Japan to producing electricity from coal up to 2070s. This is seen by the report as a vast oversupply and a flawed strategy, particularly with growing renewable generation in the country and around the world, with most of the world's leading economies moving away from coal-fired generation completely.

In mid-April US mining company, Peabody Energy, filed for bankruptcy protection following a sustained period of low coal prices and falling demand, which has led to low revenues and escalating debts. Peabody is the largest private sector coal producer in the world and joins 50 other US coal producers that have also filed for Chapter 11 bankruptcy protection since 2012, including another two of the four largest coal producers in the country. It reported a net loss of around $2bn for the last year and has ran up debts of $6bn as a slowing Chinese economy which has resulted in a steep fall in metallurgical coal prices, coupled with the sharp falls in gas and oil prices, drastically affected the coal industry. US coal exports have fallen by over 40% in the two years to the end of 2015. Global coal demand fell last year by the largest amount since 1980, with prices falling around 20%. US energy secretary, Ernest Moniz, stated in late April that controversial 'clean coal' technology could help save the industry in the country. Elsewhere, the largest private coal miner in Eastern Europe, New World Resources, faced potential bankruptcy or nationalisation in mid-April. The company's share price has fallen by 99% since it listed in 2008.

In mid-April, Norway's oil fund, the world's largest sovereign wealth fund, worth $870bn, announced it would no longer be investing in 52 companies that it sees as too reliant on coal. This is one of the largest ever divestments from fossil fuels by a single investor and includes divestment from Drax power station in the UK. The campaign of coal divestment began last year, and sees sales of shares in any company that derived more than 30% of revenues from activities related to coal.

The fund is seen as a pioneer in ethical investments having already divested from tobacco companies and nuclear weapons. In late June the fund also withdrew from companies exploring for oil off the western Saharan coast, which are disputed waters. Investment decisions are made by the Norwegian parliament and are therefore under democratic control.

WATER

News

UK water companies fined record amounts over pollution. World Bank publishes report warning of hits to GDP from water shortages by 2050.

In mid-May it was revealed that water companies had received record fines over major sewerage leaks and pollution incidents, including a £1.1m fine in April imposed on Yorkshire Water for polluting the rover Ouse with sewerage and a £1m fine for Thames Water for leaking sewerage into the Grand Union canal. In total, the eight largest fines since July 2014 when new sentencing guidelines were published equate to more than £5m.

A report by the World Bank published in early-May warned that water shortages in the Middle East, central Asia and Africa will deliver a severe hit to economies in those regions by 2050. The report suggests that shortages could take around 14% off the GDP of the Middle East, around 12% from GDP in the Sahel region of Africa, 11% off the GDP of central Asia and 7% off East Asian GDP. Climate change is expected to have a severe impact on water in these regions, with less predictable

monsoons and storm surges that could contaminate freshwater reservoirs. Population increases are also expected to add pressure to freshwater supplies. The report encourages more efficient use of water and policies to help mitigate these threats.

ENVIRONMENT & CLIMATE CHANGE

UK News

UK cross party environmental audit committee criticise government over flood defences. UK government ministers approve ambitious fifth carbon budget under the Climate Change Act. UK government axes support for two agencies promoting action on climate change, diverting funding to promoting alternative 'clean' energy sources.

World News

Australian bureau calls an end to one of the strongest El Nino events in history. Fossil fuel groups warned over the impacts of climate change on their businesses. Banks criticised by environmental groups over fossil fuel financing. Push by shareholders and academics for greater disclosure by ExxonMobil over potential impacts of climate change.

ExxonMobil launch research into new CCS technology. BP reaches settlement with investors over Deepwater Horizon claims. Donald Trump pledges to "cancel" the Paris climate agreement should he come into office in November.

In early-June, a UK cross-party environmental audit committee found that storms during December and January caused losses of around £1.3bn and that better long term planning is required to cope with increased threats from similar or worse events in the future as projections show flooding is set to become more frequent and severe in the UK. Policy was found to be failing and funding for flood defences open to political manipulation rather than being allocated to where it is most needed.

In late-June, UK government ministers approved the fifth carbon budget under the Climate Change Act. The fifth budget, proposed last November by the Committee on Climate Change, needed to be agreed by the end of June under legally binding rules set out in the Climate Change Act. It commits the country to reducing emissions by 57% on 1990 levels by 2032, well in access of the EU target of a 40% cut by 2030, and is seen as world leading. The approval follows calls from the UN for the UK not to abandon the leadership that the country has historically shown on climate change following 'Brexit'.

Early in the quarter, however, the government axed support for the Central Point of Expertise on Timber (CPET) which promoted sustainable wood, and the IEA Clean Coal Centre which was based in London and provided information on 'clean coal' technologies, both seen as ground-breaking agencies for action on climate change.

DECC stated that it had decided to redirect funding to "promoting the use of alternative and cleaner forms of energy".

In late-May, the Australian Bureau of Meteorology called an end to the El Nino event which has been described as one of the strongest in history with tropical Pacific Ocean temperatures returning to neutral levels. The weather event has brought unusually high temperatures across the Asia-Pacific region and Africa, leading to droughts and associated impacts on agriculture as well as increased frequency of forest fires. The Great Barrier Reef has also experienced severe stress with over half of the coral dying in the worst affected areas, and bleaching effects on over 90% of the coral due to the high ocean temperatures off the North-Eastern Australian coast. 2015 was the hottest year on record and in Sothern Africa, the driest year in 35 years, leading to livestock deaths and threatened food security. There is a high chance that a La Nina event could now occur, with droughts expected across the southern US and greater rainfall in the Western Pacific-rim elevating risks of flooding. Climate change is highly likely to increase the frequency and severity of El Nino and La Nina events in the future.

In late-June, former chief executive of BP, John Browne warned that large oil and gas groups risk collapse if they do not remodel their businesses to cope with climate change risks and a move away from fossil fuels expected over the next decades in light of the Paris climate agreement. Browne drew on the example of US major, Peabody Energy, the largest private sector coal producer in the world,

which filed for bankruptcy protection in April as many western countries move away from using coal to less carbon intensive fuels, such as natural gas, and renewable energies. Under Lord Browne's tenure of BP, the company invested heavily in renewable energy although the company largely reversed this following his departure in 2007. Earlier in the month, British economist Nicholas Stern, who has produced highly influential work on the economics of climate change, also warned fossil fuel groups that they risk significant threats to their businesses if they chose to ignore the Paris accord by assuming that governments are not serious about reducing emissions. This could come from both physical climate changes and stronger legislation from governments, which could lead to assets becoming stranded or scrapped.

In mid-June, environmental campaign groups, US Sierra Club, BankTrack, Oil Change International and the Rainforest Action Group, produced a report stating that billions of dollars of financing for fossil fuel companies was "deeply at odds" with the Paris climate agreement and called for top banks such as Citigroup, Deutsche Bank and JP Morgan Chase to reign in lending for coal, oil and natural gas projects. Particularly of concern was funding for ultra-deep offshore oil exploration and exploration of the Arctic. This financing has continued despite many major banks stating publically their commitment to reduced support for such projects following the signing of the accord. As reported in the previous edition of EB, a study by Oxford University found that to have a 50% change of meeting the targets set by the Paris agreement, no new coal or gas fired power stations could be built after 2017 without carbon capture and storage (CCS) technology. The banks responded to the report by highlighting their increasing support of low carbon energy.

The report followed a push by US state pension fund, Calpers, for greater access to the board of ExxonMobil in order to scrutinise and air concerns over the company's climate change policies. ExxonMobil have been heavily criticised in the past over its stance on climate change and is currently under investigation by the attorneys general of some US states over potentially misleading statements the company has made on the issue in the past. The fund is a significant stakeholder in ExxonMobil, which is the largest listed oil company in the world, and is one of a number of stakeholders calling on the group to do more to address the risks associated with climate change. In mid-June, more than 1 000 academics signed a letter to the 20 largest ExxonMobil and Chevron shareholders to seek backing for demands for more openness from the groups over climate change. This would include resolutions to force the companies to disclose the impacts of government climate change policies and to set targets for emissions reductions. This would bring the companies into line with other fossil fuel groups such as Shell and BP that have already agreed resolutions to disclose similar information after pressure from shareholders.

In early-May, ExxonMobil launched a new research programme into carbon capture technology which could significantly improve the efficiency of the technology by developing an innovative way of stripping CO2 from power plant flue gasses.

Current CCS technology can use up to 30% of the power produced by coal fired power stations to which it is fitted, severely affecting the plant's efficiency. This new technology works by producing power in a fuel cell from reactions of chemicals in the flue gasses and producing a concentrated stream of CO2 in the process that can then be capture and sequestered. This could potentially add around 120MW to a 500MW gas fired power station according to researchers. The technology has only been proven at laboratory level however, but there are hopes that it could be scaled up and made affordable. Although the technology is still in the early stages.

CCS technology is seen by many as vital if climate change mitigation is to be successful.

In early June, BP reached a $2.5bn settlement with investors over the Deepwater Horizon disaster. Last quarter, BP had set aside $56.4bn for costs relating to the spill, including damages and clean up costs. Most of the largest claims have now been settled, however there are outstanding claims against the company still to be resolved. Shares in the company rose by 1.5% on the back of the settlement news as a costly trial was avoided.

In late-May, Republican US presidential candidate Donald Trump, pledged to "cancel" the Paris climate agreement should he come into office in November.

Experts called the claim unrealistic, with a four year withdrawal period written into the agreement. However the promise highlights the candidate's sceptical views on climate change and the direction he could take the US should he be elected later this year. It is thought that Trump would attack much of current President Obama's environmental legislation, such as the Clean Power Act which is

controversial in the US and is currently under review by the courts, with companies and the public polarised and lining up on either side of the debate.

APPENDICES

Notes

- Price forecasts reflect known and anticipated trends and changes in each element of the delivered price for each of the products covered.
- Price forecasts are prepared on the first day of the month of issue of this forecast. Any Changes occurring after this are not included.
- Electricity prices forecasts for England & Wales are representative and based on charges in Eastern England.
- Electricity prices forecasts for Scotland are representative and based on charges in the Edinburgh area.
- Gas prices forecasts are representative and based on charges in the Midlands.

Appendix I - Electricity Price Forecasts 2016

England & Wales

PRODUCT		July 2016	Aug 2016	Sept 2016	Oct 2016	Nov 2016	Dec 2016
<100kW Unrestricted	LV	8.79	9.93	10.28	11.17	11.78	11.74
<20%	LV	8.49	9.56	10.09	11.14	11.99	11.94
<30%	LV	8.13	9.27	9.62	10.48	11.04	11.01
<40%	LV	7.58	8.62	8.87	9.50	10.04	10.04
>40%	LV	6.97	7.91	8.19	8.67	9.12	9.15
<1MW 30%	LV	7.85	8.98	9.12	9.95	10.60	10.55
	HV	7.35	8.43	8.52	9.33	9.85	9.84
50%	LV	7.28	8.30	8.53	9.03	9.60	9.48
	HV	6.63	7.59	7.78	8.29	8.76	8.70
70%	LV	6.67	7.61	7.93	8.30	8.85	8.74
	HV	6.11	6.68	7.28	7.66	8.13	8.08
90%	LV	6.42	7.27	7.61	7.94	8.44	8.35
	HV	5.88	6.68	6.99	7.33	7.77	7.73
>1MW 30%	HV	7.19	8.25	8.33	9.11	9.62	9.61
50%	HV	6.54	7.47	7.68	8.17	8.64	8.58
70%	HV	6.05	6.91	7.20	7.58	8.05	8.00

90%	HV	5.79	6.57	6.88	7.22	7.66	7.63

PRODUCT			Jan 2017 p/kwh	Feb 2017 p/kwh	March 2017 p/kwh	April 2017 p/kwh	May 2017 p/kwh	June 2017 p/kwh	Average 2017 P/kwh
<100kW	Unrestricted	LV	11.96	11.97	11.74	10.38	10.32	10.46	10.88
	<20%	LV	12.19	12.19	11.93	10.28	10.15	10.27	10.85
	<30	LV	11.21	11.22	11.03	9.89	9.66	9.71	10.19
	<40%	LV	10.19	10.19	10.05	9.28	9.04	9.02	9.37
	>40%	LV	9.26	9.26	9.14	8.52	8.29	8.25	8.56
<1MW	30%	LV	10.77	10.77	10.57	9.27	9.20	9.31	9.75
		HV	10.04	10.02	9.84	8.69	8.65	8.72	9.11
	50%	LV	9.67	9.72	9.63	8.88	8.60	8.68	8.95
		HV	8.86	8.88	8.79	8.14	7.90	7.94	8.19
	70%	LV	8.90	8.95	8.87	8.18	7.90	7.98	8.24
		HV	8.21	8.24	8.15	7.54	7.31	7.35	7.59
	90%	LV	8.49	8.54	8.47	7.84	7.62	7.72	7.89
		HV	7.84	7.87	7.79	7.23	7.06	7.11	7.27
>1MW	30%	HV	9.80	9.79	9.61	8.50	8.46	8.53	8.90
	50%	HV	8.74	8.76	8.67	8.02	7.80	7.84	8.08
	70%	HV	8.13	8.16	8.07	7.46	7.24	7.28	7.51
	90%	HV	7.74	7.77	7.68	7.12	6.95	7.01	7.17

1. All prices are fully delivered and include: energy, transmission charges & losses, distribution charges & losses, renewables obligation & climate change levy.
2. All prices exclude VAT.

Appendix II - Electricity Price Forecasts 2016

Scotland

PRODUCT			July 2016 p/kWh	Aug 2016 p/kWh	Sept 2016 p/kWh	Oct 2016 p/kWh	Nov 2016 p/kWh	Dec 2016 p/kWh
<100kW	Unrestricted	LV	9.00	10.13	10.47	11.37	12.03	12.00
	<20%	LV	8.53	9.58	10.12	11.17	12.01	11.96
	<30%	LV	8.13	9.25	9.59	10.45	11.00	10.98
	<40%	LV	7.58	8.62	8.86	9.49	10.01	10.02
	>40%	LV	6.99	7.93	8.20	8.68	9.11	9.14
<1 MW	30%	LV	7.88	8.97	9.18	10.00	10.66	10.59
		HV	7.57	8.66	8.71	9.50	9.97	9.95
	50%	LV	7.38	8.41	8.64	9.12	9.70	9.56
		HV	6.79	7.76	7.96	8.43	8.88	8.79
	70%	LV	6.83	7.78	8.11	8.46	9.03	8.89
		HV	6.24	7.12	7.42	7.78	8.24	8.16
	90%	LV	6.59	7.45	7.80	8.10	8.62	8.50
		HV	6.00	6.80	7.12	7.43	7.87	7.80
>1 MW	30%	HV	7.41	8.47	8.52	9.28	9.73	9.72
	50%	HV	6.70	7.65	7.85	8.31	8.76	8.67
	70%	HV	6.18	7.04	7.34	7.69	8.16	8.08
	90%	HV	5.91	6.69	7.00	7.32	7.76	7.07

PRODUCT			Jan 2017 p/kWh	Feb 2017 p/kWh	March 2017 p/kWh	April 2017 p/kWh	May 2017 p/kWh	June 2017 p/kWh	Average 2016/17 p/kWh
<100kW	Unrestricted	LV	12.21	12.22	11.95	10.60	10.51	10.65	11.10
	<20%	LV	12.21	12.21	11.89	10.29	10.16	10.30	10.87
	<30%	LV	11.17	11.18	10.95	9.84	9.62	9.69	10.16
	<40%	LV	10.16	10.17	10.00	9.24	9.01	8.99	9.35
	>40%	LV	9.25	9.25	9.11	8.50	8.28	8.25	8.56
<1MW	30%	LV	10.82	10.83	10.58	9.29	9.21	9.35	9.78
		HV	10.15	10.13	9.95	8.86	8.82	8.90	9.26
	50%	LV	9.75	9.82	9.71	8.93	8.64	8.77	9.04
		HV	8.96	9.00	8.91	8.27	8.01	8.07	8.32
	70%	LV	9.06	9.12	9.03	8.31	8.02	8.14	8.40
		HV	8.30	8.34	8.26	7.64	7.40	7.46	7.70
	90%	LV	8.65	8.71	8.62	7.98	7.75	7.89	8.05
		HV	7.92	7.96	7.89	7.32	7.13	7.21	7.37
>1MW	30%	HV	9.91	9.89	9.71	8.66	8.63	8.70	9.05
	50%	HV	8.84	8.87	8.79	8.14	7.90	7.96	8.20
	70%	HV	8.22	8.26	8.18	7.56	7.32	7.39	7.62
	90%	HV	7.82	7.86	7.78	7.21	7.02	7.10	7.27

1. All prices are fully delivered and include: energy, transmission charges & losses, distribution charges & losses, renewables obligation & climate change levy.
2. All prices exclude VAT.

Appendix III - Gas Price Forecasts 2016

Supply Type	Usage therms/yr	Load Factor	July 2016 p/Therm	Aug 2016 p/Therm	Sept 2016 p/Therm	Oct 2016 p/Therm	Nov 2016 p/Therm	Dec 2016 p/Therm
Firm Gas	1,000	35%	91.90	92.10	92.20	9230.	92.60	93.00
Firm Gas	5,000	30%	84.30	84.50	84.60	84.70	85.00	85.40
Firm Gas	20,000	35%	84.60	84.80	84.90	85.00	85.30	85.70
Firm Gas	50,000	35%	79.00	79.30	79.40	79.50	79.70	80.20
Firm Gas	100,000	35%	74.30	74.60	74.60	74.80	75.00	75.40.
Firm Gas	200,000	45%	70.40	70.60	70.70	70.90	71.10	71.40
Firm Gas	500,000	80%	67.20	68.30	68.70	69.00	69.30	69.60
Firm Gas	1,000,000	60%	65.70	66.90	67.30	67.60	67.80	68.10
Firm Gas	2,000,000	80%	60.60	62.20	62.80	63.20	63.50	63.70
Firm Gas	10,000,000	80%	59.30	60.80	61.40	61.80	62.10	62.40

Supply Type	Usage therms/ yr		Jan 2017 p/Therm	Feb 2017 p/Therm	March 2017 p/Therm	April 2017 p/Therm	May 2017 p/Therm	June 2017 p/Therm	Average 2016/17 p/Therm
Firm Gas	1,000	35%	93.30	94.20	94.30	95.10	95.20	95.20	93.50
Firm Gas	5,000	30%	85.70	86.60	86.70	87.30	87.40	87.50	85.80
Firm Gas	20,000	35%	86.10	86.80	87.00	87.60	87.70	87.80	86.10
Firm Gas	50,000	35%	80.50	81.20	81.40	82.00	82.10	82.10	80.50
Firm Gas	100,000	35%	75.80	76.50	76.70	77.20	77.30	77.30	75.80
Firm Gas	200,000	45%	71.80.	72.30	72.50	73.00	73.10	73.20	71.70
Firm Gas	500,000	80%	69.90	70.30	70.40	70.90	71.00	71.10	69.60
Firm Gas	1,000,000	60%	68.40	68.90	69.00	69.40	69.50	69.60	68.20
Firm Gas	2,000,000	80%	64.00	64.30	64.40	64.70	64.90	65.00	63.60
Firm Gas	10,000,000	80%	62.60	62.90	63.00	63.30	63.50	63.60	62.20

1. All prices are renewal prices for 1 year's gas starting in the month shown in p/therm.
2. Please note that all supplies are deemed firm
3. Each price includes the annualised energy price together with the transportation and metering charges and climate change levy for the current month
4. To convert prices to p/kWh divide price in p/therm by 29.3071

Appendix IV - Oil Products Price Forecasts 2016

PRODUCT		July 2016	Aug 2016	Sept 2016	Oct 2016	Nov 2016	Dec 2016
HEATING FUELS							
Heavy	p/Litre	28.21	30.65	34.81	4935.	36.11	36.80
Medium	p/Litre	29.21	31.75	36.06	36.76	37.41	38.13
Light	p/Litre	34.11	37.25	42.36	43.22	44.02	44.89
Gas Oil	p/Litre	35.30	38.44	43.56	44.42	45.21	46.09
LPG	£/tonne	398	449	528	542	554	568
MOTOR FUELS							
Derv ULS	p/Litre	78.60	81.20	85.30	86.10	86.70	87.50
Petrol ULS	p/Litre	82.60	85.70	90.70	91.50	92.30	93.20
Petrol UL	p/Litre	82.60	85.70	90.70	91.50	92.30	93.20
Petrol – (Lead)	p/Litre	91.80	94.90	100.80	101.60	102.40	103.30
LPG	p/Litre	49.10	53.40	60.50	61.60	62.70	63.90

		Jan 2017	Feb 2017	March 2017	April 2017	May 2017	June 2017	Average 2016/17
HEATING FUELS								
HEAVY	p/litre	37.08	37.31	37.58	37.78	37.98	38.31	35.68
MEDIUM	p/litre	38.42	38.66	38.93	39.35	39.35	39.70	36.96
LIGHT	p/litre	45.25	45.54	45.87	46.12	46.38	46.79	43.48
GAS OIL	p/litre	46.44	46.74	47.07	47.32	47.57	47.99	44.68
LPG	£/tonne	574	579	584	588	592	599	546

MOTOR FUELS								
DERV-ULS	p/litre	87.70	88.00	88.30	88.50	88.70	89.00	86.30
PETROL - ULS	p/litre	93.60	93.90	94.20	94.40	94.70	95.10	91.80
PETROL U/L	p/litre	93.60	93.90	94.20	94.40	94.70	95.10	91.80
PETROL (lead)	p/litre	103.60	103.90	104.30	104.50	104.80	105.20	101.80
L.P.G.	p/litre	64.40	64.80	65.30	65.60	66.00	66.50	62.00

1. All prices include duty and climate change levy where appropriate.
2. LPG for use as a heating fuel includes climate change levy but excludes excise duty.
3. LPG for use as a motor fuel includes excise duty but excludes climate change levy.
4. Prices are for oil products supplied in the industrial & commercial consumers (ICC) markets. Prices in the retail market (i.e. forecourt prices) are normally higher.
5. All prices exclude VAT.

Appendix V - Emissions Allowances Price Forecasts

EU ALLOWANCES							
		July 2016	Aug 2016	Sept 2016	Oct 2016	Nov 2016	Dec 2016
EUA	€/tCO2	4.53	4.54	4.55	4.55	4.55	4.55
Exchange Rate	€/£	0.80	0.80	0.80	0.80	0.80	0.81
EUA	£/tCO2	3.62	3.62	3.64	3.64	3.64	3.67
CERTIFIED EMISSION REDUCTION (Units)							
CER	€/tCO2	0.39	0.39	0.39	0.39	0.39	0.39
Exchange Rate	€/£	0.80	0.80	0.80	0.80	0.80	0.81
CER	£/tCO2	0.31	0.31	0.31	0.31	0.31	0.31

		Jan 2017	Feb 2017	March 2017	April 2017	May 2017	June 2017	Average 2016/17
EU ALLOWANCES								
EUA	€/tCO2	4.55	4.55	4.56	4.56	4.56	4.57	4.55
Exchange Rate	€/£	0.81	0.81	0.81	0.81	0.81	0.81	0.80
EUA	£/tCO2	3.67	3.67	3.69	3.69	3.69	3.71	3.66
CERTIFIED EMISSION REDUCTION (Units)7.18								
7.CER	€/tCO2	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Exchange Rate	€/£	0.81	0.81	0.81	0.81	0.81	0.81	0.80
CER	£/tCO2	0.31	0.31	0.32	0.32	0.32	0.32	0.31

Appendix VI - Quarterly Energy Prices Forecast

PRODUCT		Units	Qtr3 2016	Qtr4 2016	Qtr1 2017	Qtr2 2017	Qtr3 2017	Qtr4 2017	Qtr1 2018	Qtr2 2018
ELECTRICITY										
<100kW	Poor LF	p/kWh	9.38	11.69	12.10	10.23	10.35	11.44	11.78	10.20
	Good LF	p/kWh	7.69	8.98	9.22	8.36	8.48	8.88	9.07	8.40
<1MW	30%LF - LV	p/kWh	8.65	10.37	10.70	9.26	9.50	10.20	10.47	9.27
	30%LF - HV	p/kWh	8.10	9.67	9.96	8.69	8.91	9.51	9.74	8.70
	70%LF - LV	p/kWh	7.40	8.63	8.91	8.02	8.14	8.55	8.78	8.07
	70%LF - HV	p/kWh	6.79	7.95	8.20	7.40	7.50	7.87	8.07	7.46
>1MW	30%LF - HV	p/kWh	7.92	9.45	9.73	8.50	8.71	9.30	9.52	8.51
	70%LF - HV	p/kWh	6.72	7.88	8.12	7.33	7.42	7.80	7.99	7.38

PRODUCT		Units		Qtr3 2016	Qtr4 2016	Qtr1 2017	Qtr2 2017	Qtr3 2017	Qtr4 2017	Qtr1 2018	Qtr2 2018
NATURAL GAS											
FIRM GAS	<2,500 therms/yr	from	p/therm	91.90	92.30	93.30	95.10	95.20	95.20	94.90	95.40
		to	p/therm	9220.	93.00	94.30	95.20	95.40	95.40	95.30	95.50
FIRM GAS	<25,000 therms/yr	from	p/therm	84.60	85.00	86.10	87.60	87.80	87.80	87.50	87.90
		to	p/therm	84.60	85.40	86.70	87.50	87.50	87.70	87.50	87.60
FIRM GAS	>25,000 therms/yr	from	p/therm	67.20	69.00	69.90	70.90	71.10	71.30	71.10	71.20
		to	p/therm	79.40	80.20	81.40	82.10	82.10	82.30	82.20	82.20
	>1,000,00 0 therms/yr	from	p/therm	59.30	61.80	62.60	63.30	63.70	63.90	63.80	63.80
		to	p/therm	67.30	68.10	69.00	69.60	69.80	70.00	69.80	69.80

PRODUCT	Units	Qtr1 2016	Qtr2 2016	Qtr3 2016	Qtr4 2016	Qtr1 2017	Qtr2 2017	Qtr3 2017	Qtr4 2017
OIL PRODUCTS									
2017HEAVY FUEL OIL	p/litre	31.22	36.13	37.32	28.63	38.72	39.25	39.59	39.96
MEDIUM FUEL OIL	p/litre	32.34	37.43	38.67	29.64	40.12	40.66	41.01	41.41
LIGHT FUEL OIL	p/litre	37.91	44.04	45.55	34.63	47.29	47.92	48.35	48.84
GAS OIL	p/litre	39.10	45.24	33.76	47.63	48.49	49.13	49.56	50.04
LPG	£/Tonne	458	555	629	593	606	614	620	628
DERV - ULS	p/litre	81.70	86.70	77.20	88.70	89.40	89.80	90.20	90.60
PETROL – USL	p/litre	86.30	92.40	80.90	94.70	95.50	96.00	96.40	96.90
PETROL - UL	p/litre	86.30	92.40	80.90	94.70	95.50	96.00	96.40	96.90
PETROL – LRP	p/litre	95.80	102.40	90.80	104.80	106.10	107.50	107.90	108.40
LPG	p/litre	54.30	62.80	69.10	66.00	67.20	68.10	68.70	69.40

EMISSIONS ALLOWANCES									
EU ALLOWANCES		Qtr3 2016	Qtr4 2016	Qtr1 2017	Qrt2 2017	Qtr3 2017	Qtr4 2017	Qtr1 2018	Qtr2 2018
EUA	Euro/tCO2	4.54	4.55	4.55	4.56	4.57	4.58	4.60	4.61
Exchange Rate	Euro/£	0.80	0.80	0.81	0.81	0.81	0.81	0.82	0.82
EUA	£/tCO2	3.63	3.65	3.68	3.69	3.71	3.73	3.76	3.78
CERTIFIED EMISSION REDUCTION		Qtr1 2016	Qtr2 2016	Qtr3 2016	Qtr4 2016	Qtr1 2017	Qtr2 2017	Qtr3 2017	Qtr4 2017
CER	Euro/tCO2	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.40
Exchange Rate	Euro/£	0.80	0.80	0.81	0.81	0.81	0.81	0.82	0.82
CER	£/tCO2	0.31	0.31	0.31	0.32	0.32	0.32	0.32	0.33

1. All electricity prices are fully delivered and include:
2. Energy, transmission charges & losses, distribution charges & losses, renewables obligation & climate change levy.
3. All gas prices are fully delivered and include: energy, transportation, metering & climate change levy.
4. All oil prices include duty and climate change levy where appropriate.
5. All prices exclude VAT.

Appendix VII - 5 Year Energy Prices Forecast

PRODUCT	Units	2017	2018	2019	2020	2021
ELECTRICITY						
<100kW Poor LF	p/kWh	11.30	10.94	11.24	11.51	10.88
Good LF	p/kWh	8.73	8.74	9.10	9.42	9.06
<1MW 30%LF - LV	p/kWh	9.91	9.23	9.56	9.83	9.39
30%LF - HV	p/kWh	9.27	9.23	9.56	9.83	9.39
70%LF - LV	p/kWh	8.40	8.43	8.79	9.11	8.80
70%LF - HV	p/kWh	7.74	7.77	8.12	8.44	8.15
>1MW 30%LF - HV	p/kWh	9.06	9.03	9.36	9.64	9.21
70%LF - HV	p/kWh	7.66	7.69	8.05	8.36	8.08

PRODUCT	Units	2017	2018	2019	2020	2021
NATURAL GAS						
FIRM GAS <2,500 therms/yr	p/therm	94.90	95.40	98.90	101.00	100.90
FIRM GAS <25,000 therms/yr from	p/therm	87.50	87.80	91.20	93.10	92.80
FIRM GAS <25,000 therms/yr to	p/therm	87.20	87.50	90.90	92.80	92.50
FIRM GAS >25,000 therms/yr from	p/therm	70.90	71.20	74.30	75.80	75.30
FIRM GAS >25,000 therms/yr to	p/therm	81.90	82.10	85.30	87.10	86.70
FIRM GAS >1,000,000 therms/yr from	p/therm	63.50	63.80	66.80	68.20	67.60
FIRM GAS >1,000,000 therms/yr to	p/therm	69.50	69.80	72.80	74.30	73.70

PRODUCT	Units	2017	2018	2019	2020	2021
OIL PRODUCTS						
Heavy Fuel Oil	p/litre	38.33	40.16	41.40	42.43	43.38
Medium Fuel Oil	p/litre	39.71	41.61	42.89	43.95	44.92
35Light Fuel Oil	p/litre	46.80	49.07	50.57	51.80	52.92
Gas Oil	p/litre	48.00	50.27	51.79	53.04	54.17
LPG	£/tonne	598	630	656	674	687
Derv - ULS	p/litre	88.98	90.67	91.68	92.44	93.11
Petrol - ULS	p/litre	95.04	97.06	98.26	99.18	99.98
Petrol - UL	p/litre	95.04	97.06	98.26	99.18	99.98
Petrol - LRP	p/litre	105.58	109.13	112.21	115.11	117.96
LPG	p/litre	66.56	69.70	71.80	73.53	75.11

PRODUCT	Units	2017	2018	2019	2020	2021
EU ALLOWANCES						
EUA	Euro/tCO2	4.57	4.62	4.67	4.75	4.79
Exchange Rate	Euro/£	0.81	0.82	0.83	0.85	0.85
EUA	£/tCO2	3.70	3.79	3.89	4.01	4.09
CERTIFIED EMISSION REDUCTION						
CER	Euro/tCO2	0.39	0.40	0.41	0.41	0.41
Exchange Rate	Euro/£	0.81	0.82	0.83	0.85	0.85
CER	£/tCO2	0.32	0.33	0.34	0.35	0.35

1. All electricity prices are fully delivered and include:-
2. Energy, transmission charges & losses, distribution charges & losses, renewables obligation, climate change levy.
3. All gas prices are fully delivered and include: energy, transportation, metering, climate change levy,
4. All oil prices include duty and climate change levy where appropriate.
5. All prices exclude VAT.

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