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Edward Davey: the support will "unlock investment decisions

UK moves to provide certainty to wind investors

The UK's long awaited Banding Review for the Renewables Obligation will help deliver some certainty to the wind industry. **Junior Isles**

The UK government is hoping that the recent release of the Banding Review for the Renewables Obligation will deliver the investment it needs to help it hit its 2020 renewable targets.

New bandings were set last month for renewable technologies under the Renewables Obligation – the government's main mechanism for supporting large-scale renewables – for the period 2013-17 (2014-17 for offshore wind).

According to the Department of Energy and Climate Change (DECC), by 2017 the package could deliver as much as 79 TWh of renewable electricity per annum in the UK – nearly three-quarters (74 per cent) of the way towards the 108 TWh needed to meet the 2020 renewable energy target.

The proposals are expected to bring forward 11 TWh more renewable energy in 2016/17 than current bandings, and stimulate between £20 billion and £25 billion of new investment.

Edward Davey, Secretary of State for Energy and Climate Change, said: "The support we're setting out today will unlock investment decisions, help ensure that rapid growth in renewable energy continues and shows the key role of renewables for our energy security."

Prior to the announcement there was a heated debate between Davey and Chancellor George Osborne over the level of reduction of support for the wind industry. A compromise was eventually reached between the Treasury and DECC, with DECC agreeing to the key proviso of not setting low carbon targets for 2030.

The agreed 10 per cent reduction for onshore wind, based on evidence of cost reductions within the industry, sees the level of support cut in April 2013 from one Renewables Obligation Certificate (ROC)/MWh to 0.9 of a ROC/MWh. The level of financial support from April 2014 onwards will be subject to a review of costs to commence this September, concluding early next year.

The government's decision was broadly welcomed by the wind industry. Maria McCaffery, Chief Executive of RenewableUK, the trade and professional body for the wind and marine energy industries, said: "We welcome the government's decision to set its financial support for onshore wind energy at a level that will enable the industry to continue to grow. Although it has been a long time in coming, the final decision was based on hard economic evidence, and was not derailed

Continued on Page 2

Dong Energy shows faith in UK offshore wind

The placement of a massive order by Dong Energy for turbines for offshore wind farms in the UK demonstrates growing confidence in the future of the country's offshore wind sector.

Last month, the Danish energy group ordered 300 of Siemens' new 6 MW turbines worth around €2 billion. Dong said some of the new turbines would be destined for the 240 MW Westermost Rough project, off the Yorkshire coast near the Humber Estuary.

Other projects that could be included but are still under consultation are the extensions of the Burbo Bank offshore wind farm and the Walney wind farm.

The order came just ahead of the UK banding review for the Renewables Obligation. Environmental group, WWF-UK said the deal reaffirmed the huge potential for the UK to become a leader in offshore renewables.

Jenny Banks, energy policy officer at WWF-UK described it as "fantastic news" for the UK and said that it comes in spite of the political rows over support for renewables between the Department of Climate Change (DECC) and the Treasury, which risk serious damage to the sector.

She noted: "The government also needs to be aware that the industry's looking for certainty beyond 2020 too – otherwise there's a danger that serious investment like this in the UK economy will simply drop off a cliff-edge."

In June, Danish wind turbine manufacturer, Vestas, abandoned plans to build a turbine factory in Sheerness.

The UK remains a key market for Siemens and the Dong Energy order indicates that the two companies are set to collaborate on a new wave of offshore wind projects.

The two companies are already working together on several UK wind farms including the 1 GW London Array project.

Michael Suess, member of the Managing Board at Siemens AG and CEO of the Energy Sector said: "Offshore wind energy has huge potential.

Offshore wind conditions are strong and stable enabling an energy yield, which can be about 40 per cent higher than onshore. The United Kingdom, Denmark and Germany in particular are counting on the future of offshore wind energy.

"We are pleased that our long-term customer Dong Energy has chosen the latest generation of our wind turbines. Together we are working to further reduce the levelised costs for this environmentally-friendly form of power generation."

Dong Energy already announced that it will install two of the new 6 MW wind turbines later this year for testing at the Gunfleet Sands offshore wind farm. The new SWT-6.0-154 direct drive wind turbines are designed for large-scale projects including the UK Round 3 projects that will be installed between 2014 and 2017.

According to Siemens the turbines use the world's largest rotor blade measuring 75 m in length, equalling a total rotor diameter of 154 m.

"The agreement will enable Dong Energy to install a significantly larger and more efficient wind turbine from 2014 compared to what we know today," said Carsten Krogsgaard Thomsen, acting CEO of Dong Energy.

"The agreement is a key element of Dong Energy's objective to significantly expand offshore wind and strengthen our position as market leader within offshore wind."

The UK has set a target of installing 18 GW of offshore wind capacity by 2020, which equates to around 18 per cent of the UK's electricity demand.

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by short term political considerations. We recognise that these are difficult economic times and we have been trying to drive costs down."

RenewableUK said the reductions would have an impact, reducing the growth of the sector by an estimated £2 billion of investment out of a potential £20 billion, with 1300 fewer jobs created.

It noted, however, that the additional certainty the announcement provides could help the onshore wind sector grow to employ over 12 000 people by 2020 and add over £1 billion to the UK's economy every year.

The cut in financial support for offshore wind does not come into effect until April 2015, when it will be reduced from 2 ROCs to 1.9 ROCs. A further cut to 1.8 ROCs will take place in April 2016.

"The carefully-phased reduction in financial support for offshore wind over a long timeframe shows that the government is committed to the development of the UK's world-leading offshore sector as a key part of our energy mix," noted McCaffery.

Project developers also welcomed the news. Gordon MacDougall, Chief Operating Officer, RES UK & Ireland said: "By maintaining its commitment to an evidence-based approach, based on broad range of industry experts and stakeholders, the government has sent a clear signal that Britain is open to investment.

"The timescales associated with planning and developing much needed infrastructure projects such as wind farms require stable, long-term policies to ensure investor confidence and engagement. As a leading UK renewable energy company, which has developed over 100 wind farms worldwide and provides around 10 per cent of the UK's onshore wind energy, RES is now more confident that we will be able to progress with our plans to bring forward £1.7 billion of projects vital to UK energy security in the next five years, and deliver significant

MacDougall: now "more confident"

benefits to communities across the UK."

In other renewable sectors, support levels for certain marine energy technologies will more than double from 2ROCs to 5ROCs per MWh, subject to a 30 MW limit per generating station.

There will be no immediate reduction in support for large-scale solar, but there will be a further consultation this year on reduced support levels given recent dramatic falls in costs.

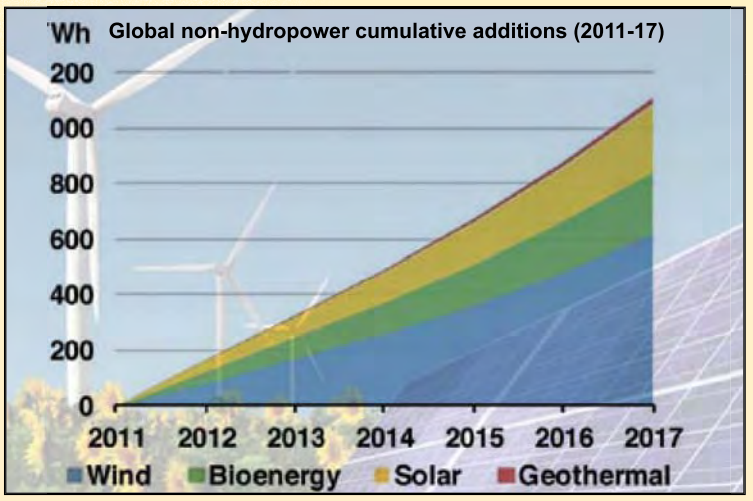
There will also be a new band to support existing coal plant converting to sustainable biomass fuels.

Alongside its plans for renewables the government is also committed to ensuring that the UK is an attractive location for gas investors.

Renewables grow despite economic climate

The International Energy Agency's first medium-term report on renewables shows that growth will continue to accelerate. But with difficult economic conditions, it warns that the industry cannot get comfortable.

Junior Isles



Renewable power generation is expected to continue its rapid growth over the next five years despite global economic uncertainties, according to a new report from the International Energy Agency.

The report, *Medium-Term Renewable Energy Market Report 2012*, says that global power generation from hydropower, solar, wind and other renewable sources is projected to increase by more than 40 per cent over the next five years to almost 6400 terawatt hours (TWh) – up from the current 4500 TWh.

It says renewable electricity generation should expand by 1840 TWh between 2011 and 2017, almost 60 per cent above the 1160 TWh growth recorded between 2005 and 2011.

The study released last month marks the first time the IEA has devoted a medium-term report to renewable power sources. It examines 15 key markets for renewable energy, which currently represent about 80 per cent of renewable generation, while identifying and characterising developments that may emerge in other important markets.

Speaking at a webinar to launch the report, Executive Director Maria van der Hoeven said that renewable energy has "come of age" but warned that many challenges remain for the sector. "There are uncertainties associated with the cautious macroeconomic outlook and the fact that several key markets are going through deep electricity market reforms," she said.

She also noted that the cost and availability of renewable financing "remains a persistent question mark".

In terms of investment in renewables, there has been a slowdown in the first part of this year, according to Didier Houssin, the IEA's Director of energy markets and security. He added, however, that he expects new sources of financing to emerge as banks and utilities become more constrained in terms of financing projects.

According to Bloomberg New Energy Finance's second quarter report on clean energy, investment rebounded 24 per cent in the second quarter from the first quarter, hitting almost $60 billion. However, it was still 18 per cent below the near-record quarterly figure of $72.5 billion in Q2 last year.

Solar accounted for $33.6 billion of investment in Q2, up 19 per cent on Q1, and wind accounted for $21.6 billion, up 47 per cent.

China was the top performer, with investment almost doubling from the first quarter to $18 billion.

Michael Liebreich, chief executive of Bloomberg New Energy Finance, said: "China has recently quadrupled its domestic goals for solar installations. And it has been by far the biggest market for wind turbines for several years. These figures underline the pivotal role China is playing in the clean energy sector."

Investment in the US rose 18 per cent, followed by Europe with an 11 per cent rise.

Commenting on how the IEA's mid-term forecasts reconciled with the EU's 2020 targets van der Hoeven noted: "The forecasts are broadly in line with the 2020 goals but the details for technologies differ a lot. Solar PV is ahead in many countries but offshore wind is starting to lag behind.

"We also have to remember that the 2020 goals are set as percentages of total energy consumption. We know that the economic crisis in Europe can impact energy consumption, and we also know that the trajectories were set up under strong energy efficiency scenarios that may not materialise. So renewable electricity may have to substitute a portion of 2020 trajectories to cover more difficult sectors like heating and transport. So while the current progress for renewable electricity is encouraging, I don't think we can get comfortable."

India mulls new import tax

- Tax on equipment for mega projects
- Move could hurt expansion plans

In its latest step to protect and promote the local power equipment manufacturing industry, the power ministry is proposing to extend its tax on imported foreign power equipment.

India already levies a 21 per cent import tax on imports of generating equipment for power projects with a capacity of less than 1 GW but equipment imported for larger projects are currently exempted as part of a drive to boost the country's generating capacity. The new proposal seeks to extend the 21 per cent tax on foreign equipment to large projects as well.

Indian power equipment makers such as state-run Bharat Heavy Electricals Ltd. as well as Larsen & Toubro Ltd, India's biggest engineering company by sales, have been demanding higher tax on imports for several years.

The move is seen as the latest sign of New Delhi's sensitivity to Chinese imports that are flooding in to boost the nation's power sector.

Explaining the government's thinking, two senior officials from the Ministry of Power told *Dow Jones* that it is crucial in the long-term for India to be self-reliant in a sector as sensitive as electricity.

They added that Indian companies have been narrowing the generally 30 per cent difference in prices between their equipment and Chinese imports.

The officials said that the proposal – if cleared by the cabinet – would be effective only for new projects.

Power generators in India have so far placed nearly half of the total 146.48 GW equipment orders with overseas companies for delivery until about 2020.

About 42 per cent per of the orders have been placed with Chinese manufacturers, including a $10 billion contract that Reliance Power placed with Shanghai Electric Group Co. in October 2010.

The Association of Power Producers (APP), which represents several Indian private sector utility companies, noted however that a tax on imported equipment would increase costs and hurt consumers.

"One should have a long-term view of the sector," said Ashok Khurana, APP's director general. "How can the government even think of such a move when it has planned a massive expansion of power generation in the long-run."

India is struggling with power outages as coal shortages cripple many of its power plants and threaten its power expansion plans. Energy shortages are being blamed for slowing economic growth in the country.

■ Reliance Power Ltd. has filed a case with the Indian Council of Arbitration against 11 companies that had agreed to buy electricity from its proposed 4000 MW Krishnapatnam thermal project in south India, which has been delayed due to a problem securing coal for the plant.

Flaring rises as shale gas production increases

New data from the World Bank-led Global Gas Flaring Reduction partnership (GGFR) shows a 2 billion cubic metre (bcm) increase in flared gas in 2011 over the previous year.

The slight increase in flaring from 138 bcm in 2010 to 140 bcm in 2011, revealed in latest satellite data, is due largely to increased hydrocarbon production in Russia and shale oil and gas operations in the US.

While not significant when viewed against the longer-term 20 per cent drop in flaring since 2005 – from 172 to 140 bcm – the new increase is a warning sign that efforts to reduce flaring need to be sustained and even scaled up, World Bank officials said.

Gas flaring reductions since 2005 have cut greenhouse gas emissions by a volume equivalent to that emitted by some 16 million cars.

"The small increase underlines the importance for countries and companies to sustain and even accelerate efforts to reduce flaring of gas associated with oil production," said Bent Svensson, manager of the GGFR partnership. "It is a warning sign that major gains over the past few years could be lost if oil-producing countries and companies don't step up their efforts."

The USA, Russia, Kazakhstan, and Venezuela are the main contributors to this increase and these countries, along with Iraq, need to step up their efforts in associated gas utilisation, said the World Bank.

Russia still tops the world's flaring countries, followed by Nigeria, Iran and Iraq. The USA is now the fifth flaring country in the world, with some 7.1 bcm of gas flared in 2011. Most of the increased flaring in the USA comes from North Dakota, where there has been a big increase in activity related to shale oil and gas production.

Global gas flaring in 2011 accounted for some 360 million tons of greenhouse gas emissions. Eliminating these annual emissions is equivalent to taking some 70 million cars off the road.

The GGFR is a public-private initiative of some 30 major oil-producing countries and companies, whose main objective is to reduce the environmental impact of gas flaring, as well as the waste of a valuable energy source.

Sky reaches for Chilean solar

Chile continues to attract investment to its energy sector in spite of setbacks to key power projects.

Siân Crampsie

Chile's electricity sector is set for a 300 MW boost to its renewable energy sector after solar power developer Sky Solar pledged $900 million of investment in the country.

The China-based company has signed a cooperation agreement with the China Development Bank and Chilean mining firm Sigdo Koppers to build 300 MW of solar photovoltaic (PV) capacity in Chile in several phases.

The deal marks the start of grid-parity solar PV projects in South America, say the partners. It is also an important step forward for Chile's energy strategy, which is focused on improving energy security and growing the renewables sector. A number of key power projects have faced setbacks in recent months.

Sky Solar says that it expects to break ground this year on a 2 MW pilot project in Chile, followed by an 18 MW ground-mounted project. A further 150 MW will be carried out over the next 18 months.

In a statement, the Shanghai-based company said that Chile is one of "the most attractive PV markets in the world" because of its politically stable government and policies, strong investment environment and growing electricity demand. The country currently derives around three per cent of its electricity from renewable energy, and wants to boost that to 20 per cent by 2020.

To attract more renewable energy investment, the Chilean government is considering the use of subsidies. Deputy Energy Minister Sergio Del Campo told *Dow Jones* newswires that the government was planning to offer $20 million to the winner of an upcoming 50 MW concentrated solar power tender to be launched in September.

Chile's Centre for Renewable Energy (CORFO) said recently that 694 MW of new solar projects have gained environmental approval and that there are a further 37 projects totalling 2.47 GW in the approval process. Some 2.8 GW of wind projects have also been approved.

The projected growth in the renewables sector is good news for Chile's government, which is facing severe opposition to the 2750 MW HidroAysen hydropower project in Patagonia. In late June the environmental impact study for a 740 MW coal-fired project owned by Empresa Nacional de Electricidad SA (Endesa) was rejected by a regional environmental authority.

Endesa is planning to appeal the ruling on its $3 billion Punta Alcalde project.

Chile needs to nearly double its installed capacity of 15 GW over the next ten years in order to keep pace with rising demand. The projected growth in its energy sector and stable political environment is attracting major energy sector players from around the Americas, Asia and Europe.

In July, Duke Energy announced it had entered the Chilean power market through the acquisition of bankrupt generator Campanario, which owns a 240 MW power plant in central Chile.

NRG deal creates new utility giant

NRG is set to become the largest unregulated generator of electricity in the USA after announcing a deal to acquire GenOn Energy in a stock transaction valued at $1.7 billion.

The deal will expand NRG's footprint in the USA, giving it 47 000 MW of installed capacity and the ability to generate around five per cent of electricity in the country. It is the latest in a string of mergers and acquisition in the US utility industry, which has suffered from falling energy prices and demand.

Based in New Jersey with a market capitalisation of $4.1 billion, NRG operates nuclear, wind, solar and traditional power plants that serve about 2 million customers, mainly in Texas. GenOn, based in Houston but serving customers in the northeast US and California, operates more conventional coal and natural gas power plants, and is valued at around $1.4bn.

Edward Muller, GenOn chief executive, will become vice-chairman of NRG.

■ UK firm Centrica has strengthened its position in North America with a deal to buy two US gas and electricity suppliers from Spain's Iberdrola for $110 million. Centrica will buy Energetix and NYSEG Solutions, adding 245 000 customers to its North America brand, Direct Energy.

Abound triggers new debate on clean energy support

■ Solar firm declares bankruptcy
■ Pressure mounts on wind firms

Workers at Abound Solar face an uncertain future

A third solar energy firm to have received a loan guarantee from the US Department of Energy (DOE) has filed for bankruptcy.

Abound Solar, a Colorado-based manufacturer of thin-film cadmium telluride solar modules, has filed a petition for bankruptcy protection and suspended operations after attempts to find a buyer failed.

The company received a loan guarantee in 2010 and it follows in the footsteps of Solyndra and Beacon Power, two other firms that declared bankruptcy after receiving DOE support.

Abound's failure has once again triggered questions about the effectiveness and cost to the US taxpayer of the loan guarantee programme, which is designed to accelerate the commercialisation and deployment of advanced clean energy technologies.

In testimony before the US House of Representatives' committee on oversight and government reform, Veronique de Rugy, a senior research fellow at the Mercatus Centre at George Mason University, said that there are fundamental problems with the loan guarantee programme because it transfers risks from lenders to taxpayers, increases the cost of borrowing and inhibits innovation.

"The taxpayers bear the risk, but the profit, if there are profits, are borne by the private company and the banks that loaned it money," de Rugy said. "Yet these loan programmes remain popular with Congress and the executive branch. That's because in general most of the financial cost of these guaranteed loans will not surface for many years."

Abound received less than $70 million against a $400 million DOE loan guarantee because funds were frozen in 2011 when Abound failed to meet financial goals stipulated in the loan guarantee agreement.

After Abound's assets are sold, the cost to US taxpayers is likely to be $40-60 million, said de Rugy, who has also criticised the fact that recipients of loan guarantees are also eligible for other types of clean energy support mechanisms.

The debate on government support for renewables in the USA is also heightened by the impending expiry of the federal Production Tax Credit (PTC) for the wind sector.

The US wind power industry says that it will experience a huge drop in business of the PTC is not renewed. The PTC gives wind power generators 2.2 cents for every kilowatt-hour they produce and is due to expire at the end of the year.

The American Wind Energy Association (AWEA) says that over the last five years, the PTC has helped to attract $15.5 billion per year of private investment in the US and helped to increase the domestic content from 25 per cent to over 60 per cent.

"Wind projects typically have an 18- to 24-month development cycle. So effectively the PTC is already expiring," said AWEA CEO Denise Bode, referring to the fact that wind manufacturers are already making layoffs and cancelling expansion plans. "That is why an extension is urgently needed now. We can't afford to wait until the PTC runs out. Extending the PTC already has broad bipartisan support, but Congress and the President need to act."

Argentina give Atmea-1 the go-ahead

Argentina is progressing with plans for the construction of a fourth nuclear reactor as part of its strategy to increase generating capacity.

The country's nuclear power utility, Nucleoeléctrica Argentina (NASA) has prequalified the Areva-Mitsubishi Atmea-1 nuclear reactor design as a possible technology for a new nuclear power plant.

Atmea-1, a mid-sized Generation III+ pressurised water reactor (PWR), can now be submitted for the next request for proposals that will be issued by NASA for a new plant.

Argentina operates two nuclear power plants and is getting ready to commission a third. In 2006 it embarked on a strategic plan to build new nuclear capacity to help meet rising electricity demand.

Argentina is also looking to expand its renewable energy capacity.

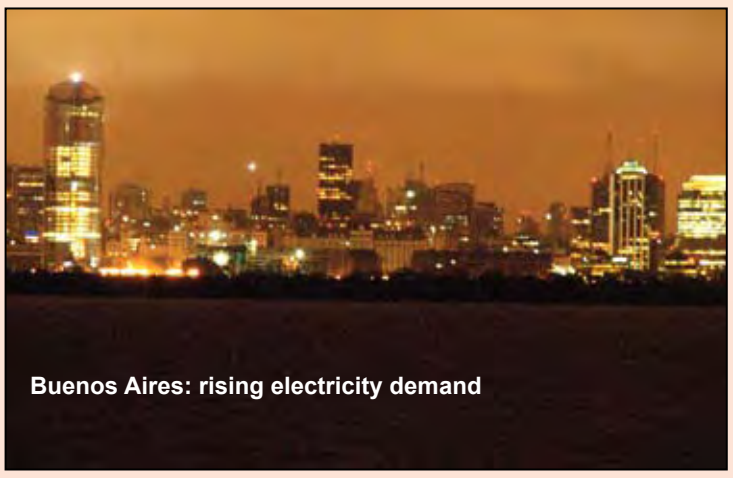
In July Argentinean renewable energy developer Generadora Eolica Argentina del Sur (Geassa) said that it was planning to install 1350 MW of wind power capacity in the south of the country with the help of $3 billion in financing from the China Development Bank.

The project would feature Chinese wind turbines and be constructed by Beijing Construction Engineering group.

Geassa says that it is tapping financing and technology from China because local banks are not familiar with the economics of wind farms and because Argentina is blocked from international bond markets since defaulting on $95 billion of debt a decade ago.

Geassa says it is expecting to sign a 15-year contract with wholesale energy administrator Cia. Administradora del Mercado Mayorista Electric SA to sell energy from the project.

■ AES Corp has submitted plans to build a 30 MW wind farm in the Argentine province of Buenos Aires, according to the Industry Ministry.



Buenos Aires: rising electricity demand

Studies say carbon tax could have limited impact

- Carbon tax will drive efficiency and renewables
- Lower carbon price will lead to reduced carbon costs

Australia's recent introduction of a carbon tax poses tough challenges for industrial companies but will drive demand for energy efficiency solutions and renewable energy power generation, despite the unchanged renewable target in 2020.

A new study by Frost & Sullivan – *Impact of Australia Carbon Tax on the Energy Markets: a Strategic Perspective* – provides an overview of the carbon tax, available government grants and programmes, carbon tax in the international scenario, industries' readiness for the tax, and the opportunities created in the wake of the carbon tax.

From July 2012, 500 large emitters in Australia are required to pay carbon tax at a fixed price of A$23 per tonne of CO_2. To mitigate the effects and create a smooth transition to a low-carbon economy, the Australian government has also announced a series of grants and programmes valued at over A$20 billion.

According to Frost & Sullivan the tax and associated grants and programmes have opened up opportunities for accelerated energy efficiency solutions upgrades as well as a higher proportion of alternative energy generation in the power portfolio in Australia.

Frost & Sullivan senior consultant Sarah Wang said: "Industrial companies that consume a lot of energy are likely to face a cost increase of between 5-15 per cent and, as such, will seek solutions and power sources that reduce energy consumption or lower carbon emission."

However, the study also noted that "most companies have shown a myopia" when it comes to technology upgrades or adoption, and are unwilling to invest the initial capital to acquire the systems and solutions to lower energy usage.

"Active promotional activities are required from energy-efficiency solution suppliers to increase the industrial energy consumers' understanding of the benefits of carbon tax as well as the challenges it will pose," said Wang.

Meanwhile a separate study released by RepuTex indicates that companies liable under the Australian carbon price mechanism will pay up to 45 per cent less than initially expected, with cost savings totalling over $10 billion translating into significantly reduced carbon price impacts for Australian consumers and regional commodities buyers.

Treasury has historically modelled a carbon price of upwards of $40, but RepuTex considers this scenario unrealistic in the face of low carbon offset prices in Asian markets. "We anticipate the Australian market will hit a more moderate $8-15 level as we move towards 2020, well below Treasury estimates," it stated.

According to RepuTex, this lower carbon price will lead to significantly reduced carbon costs for Australian businesses, and significant savings for Australian consumers. "Applying a more realistic carbon price we begin to see considerable savings for Australian businesses, with carbon costs to be on average 41 per cent lower across the board," it said.

■ AGL Energy Ltd. has completed the purchase of the approximately two thirds portion of Loy Yang A power station owner Great Energy Alliance Corp. that it did not already own for A$448 million ($457 million). The transaction makes AGL the owner of the 2210 MW Loy Yang A power station – one of the biggest in Australia.

Japan forced to rethink targets

Japan is now assessing its options as it accepts that it will not be able to fulfil its pledge on reducing greenhouse gases in the aftermath of Fukushima. **Junior Isles**

Other Japanese reactors may be in areas at high risk of earthquake damage

Japan may be forced to revise its Copenhagen pledge to reduce greenhouse gas (GHG) emissions by 25 per cent from 1990 levels by 2020, following the release of new energy proposals for the country, which all project emissions well above the target.

Following the nuclear disaster at Fukushima, last year Japan ordered a revision of its 2010 Basic Energy Plan.

Prior to Fukushima the plan had called for the proportion of nuclear power in the energy mix to rise from around 26 per cent to more than 50 per cent by 2030. Nuclear was therefore a critical component in Japan's strategy to fulfil its Copenhagen Accord pledge, made at UN climate talks in the city in 2009.

The government has now put forward three options for a revised energy mix, each specifying a reduced role for nuclear. The three scenarios are currently up for public comment and a government committee is expected to choose one this month (August). All three would see a larger proportion of renewable energy in the mix but fossil fuel consumption would also increase in each scenario.

This would see GHG emissions fall by only 23-25 per cent from 1990 levels by 2030, compared to 30 per cent in the previous plan.

Calculations unveiled earlier by a government panel on energy and the environment put Japan's reduction of its GHG emissions at between 0 per cent and 11 per cent in 2020 from the 1990 levels depending on the size of nuclear power generation.

Japanese Environment Minister Goshi Hosono told reporters in Tokyo: "The [25 per cent] figure has turned out to be a very difficult one to achieve under the current energy situation."

Takashi Hongo, a senior fellow at the Mitsui Global Strategic Studies Institute in Tokyo said one politically viable revision may be to change the target year "from 2020 to 2025, for example", but not the target itself. He added: "So we could keep the 25 per cent figure but delay the achievement."

Meanwhile, the government has ordered Tokyo Electric Power Co. (Tepco) to trim its electricity rate hike for households to 8.47 per cent from the earlier planned 10.28 per cent, after panels of experts proposed the utility reduce the additional cost burden on customers.

The electricity rate hike, along with the planned injection of Yen1 trillion ($12.75 billion) in public funds, is seen as essential for Tepco to overcome its financial plight stemming from last year's Fukushima Daiichi nuclear power plant disaster.

Crowds continued to rally in Tokyo last month in a bid to force the government to abandon nuclear power following the disaster at Fukushima which was caused by a tsunami triggered by a massive earthquake in March last year.

Last month it was revealed that another of Japan's nuclear reactors may be sitting on an active geological fault at high risk of earthquake damage.

The *Yomiuri Shimbun* reported that the Nuclear and Industrial Safety Agency plans a survey at the Shika complex in Ishikawa prefecture. Its operator, Hokuriku Electric, could be forced to find alternative sources of electricity for several months.

In April, the government made a similar finding at the Tsuruga complex in Fukui prefecture operated by Japan Atomic Power Co.

Tariff incentives to lure geothermal investment

Indonesia is hoping the recent increase in the feed-in-tariff for geothermal power will attract investment into the sector.

Last month the government raised the feed-in-tariff for geothermal power plants to 10-17 cents/kWh from 9.7 cents/kWh, the *Jakarta Post* reported.

"If we set the [geothermal] price at only 9 cents it means the price is only one-fifth of the price of electricity from [fossil] fuel fired energy," said Indonesian Energy and Mineral Resources Minister Jero Wacik.

The minister said the government would also offer investors other incentives such as tax holidays during exploration activities.

Geothermal is a key part of the government's strategy to meet rapidly growing demand that has seen power shortages in the country. According to PricewaterhouseCoopers, electricity demand in Indonesia – whose economy is forecast to grow 6.5 per cent this year – should expand 7-9 per cent a year for the next few years.

Coal fired generation will also be central to meeting this demand. Last month Malaysia's Genting said that one of its business units will build a 660 MW coal fired power plant in Indonesia at a cost of about $1 billion.

The Genting unit known as PT Lestari Banten Energi, has signed a 25-year Power Purchase Agreement with Indonesia's state-owned utility PT PLN (Persero) for power from the plant planned for Banten, West Java.

Pakistan seeks overseas help for power sector

Pakistan is seeking help from overseas as it attempts to tackle crippling power shortages.

France, through Agence Francaise de Development (AFD) is providing funds to support the development of small hydropower projects.

The government of France will provide €68.3 million for the construction of the 48 MW Jaggran-II hydropower project, which will be built in the upper extent of Neelum River, downstream of the existing 30.4 MW Jaggran-I project.

Pakistan will also increase power imports from Iran. According to *IRNA News Agency*, power imports from Iran have doubled from 35 MW per day to 70 MW in the previous Iranian calendar year (ended March 19, 2012) and are expected to reach more than 200 MW by next year.

According to reports, Iran also plans to build a new transmission line from its southeastern city of Zahedan to Pakistan's Quetta to increase power exports to the country to 1000 MW.

Last month during a visit to Pakistan, a delegation from Iranian power company MAPNA announced its readiness to launch a 1000 MW power plant in Pakistan.

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Spain prepares for new taxes

Closing the tariff deficit: Mariano Rajoy

Austerity measures and the tariff deficit spell bad news for Spain's utilities and energy sector investors.

Siân Crampsie

Spain's utility companies say that their future earnings could be severely impacted by the introduction of tax increases in the country's energy sector.

The heads of companies such as Gas Natural, Iberdrola and Endesa have appealed to the government to re-think the taxes, which are designed to reduce the €24 billion deficit that has been caused by a shortfall in consumer energy prices compared with generation costs.

The exact nature and level of the taxes were expected to be unveiled towards the end of July. They are likely to include a tax on all forms of electricity generation, including renewable energy, and it is believed that the government is considering a four per cent levy.

Spain has increased electricity prices twice this year already, and in early 2012 suspended feed-in tariffs (FITs) for new renewable energy projects.

The country's generous FIT scheme has encouraged rapid growth in renewable energy and has been largely blamed for the so-called tariff deficit, but the renewables lobby argues that the control of tariffs by the government is to blame.

Energy companies with large renewable energy portfolios are likely to be worst hit by the reforms, which could also include plans to eradicate FITs, according to analysts. The *Financial Times* recently reported that a group of 13 renewable energy investors, including KKR and HgCapital, sent a letter to Spanish Prime Minister Mariano Rajoy and the European Commission warning that the reforms would wipe out the value of their investments.

The Spanish government is under pressure to reduce the tariff deficit as part of austerity measures and has set a target of reducing the deficit to €1.5 billion this year. Utilities want consumers to bear more of the burden but further electricity price rises would be politically difficult for the government.

Investors are also concerned about the impact that taxes and reforms could have on investor confidence and long-term growth prospects for renewables.

Commission proposes ETS intervention

The European Commission is formulating a plan for short and long term intervention in the region's carbon market.

Siân Crampsie

The European Commission is demonstrating its willingness to reform the region's emissions trading scheme (ETS) in order to reduce an excess of emissions allowances and boost the price of carbon.

The EU's executive body has announced plans to delay, or 'back-load' some of the emissions allowances that are scheduled to be auctioned for the ETS's third trading period, running from 2013-2020.

If approved by the European Parliament and European Council, the measure would improve the functioning of the ETS in the short-term, said the Commission.

Carbon prices fell briefly in mid-July over speculation about whether the Commission would release the proposals before the summer break. EU emission allowances – the units that permit companies to emit greenhouse gases – traded at around €7-8 throughout July and fell to just below €7 as *TEI Times* went to press.

Connie Hedegaard, Climate Action Commissioner, said that the proposals could be implemented by the end of the year. "If the political will is there, all the necessary decisions can be taken before the next auctioning phase starts at the beginning of 2013," said Hedegaard. "Now it is up to the European Parliament and Member States to deliver."

Hedegaard added that the Commission would start examining longer-term measures to fix the ETS after the summer recess.

According to the Commission's proposals, some auction volumes from 2013-2015 would be back-loaded to be auctioned at the end of phase 3. It has not indicated how many allowances should be back-loaded, but 800 million is the upper limit of what would be politically acceptable, according to carbon market analysts Thompson Reuters Point Carbon, which believes that the oversupply in the ETS amounts to 1.8 billion allowances.

Projects like Don Valley could benefit from ETS reform

Carbon prices have been in decline since 2010 due to an excess of allowances and a drop in energy demand caused by the recession. The drop in prices has undermined confidence in the ability of the ETS – the cornerstone of Europe's climate change strategy – to encourage investment in clean technologies.

Analysts believe that carbon prices of at least €30 per tonne are required to encourage investment in advanced technologies such as carbon capture and storage (CCS). Such prices are only likely to be achieved if permanent, long-term changes were made to the ETS, including cancelling of some of the back-loaded allowances.

"If there ends up being an agreement on back-loading and cancelling in the order of 800 million allowances, we assume that carbon prices could increase by as much as €6/t on average over the 2013-20 period compared to current price levels," said Marcus Ferdinand, senior market analyst at Thomson Reuters Point Carbon.

The Commission's proposal has been largely welcomed by energy sector companies such as Dong Energy, Shell and GE, who say that they need greater certainty over carbon prices in order to make clean energy investments.

Earlier in July the Commission unveiled its list of preferred bidders in a competition to win EU funds for the construction of carbon capture and storage (CCS) demonstration and renewable energy projects.

The so-called NER300 funds are being raised through the auction of 300 million EU emission allowances. CCS projects from the UK, Poland and the Netherlands, have been ranked highest by the Commission alongside 22 renewable energy projects from around the 27-nation bloc.

The Don Valley project in the UK and Belchatow in Poland are most likely to win funding, provided that the auction of allowances raises the €1.3-1.5 billion predicted by the Commission. The Green Hydrogen project in the Netherlands is next in line for funding.

The NER300 funds will provide up to 50 per cent of the cost of the CCS element of the project, and will be disbursed based on the performance of the project, i.e. the amount of CO_2 that is stored.

The 650 MW Don Valley project in the UK is being developed by 2Co Energy, which is planning to build an integrated gasification combined cycle plant. The project has already been awarded funding under the European Energy Programme for Recovery.

Germany draws up offshore grid plan

- Liabilities for operators, TSOs resolved
- Grid development plan proposed

Germany's utilities have welcomed proposals addressing liability issues relating to the connection of offshore wind farms to the country's power grid.

The German Environment and Economics Ministries have drawn up legislation that will improve coordination in onshore and offshore grid development as well as create legal certainty and remove investment barriers.

The legislation is seen by the German energy industry as vital to the country's plans to develop 10 GW of offshore wind energy by 2020. Delays in the connection of existing and new offshore wind projects to the grid is threatening investment.

The proposed plan consists of a framework for the creation of an offshore grid development plan that would detail the schedule, location and capacity of future grid connection points. The proposals also seek to address liability issues related to delays in grid connections and network disruptions.

"The planned legislation will allow us to push ahead with the expansion of offshore wind energy," said Federal Minister of Economics and Technology Philipp Rösler. "We want to improve coordination between the construction of wind farms and the necessary grid connections by means of a binding offshore grid development plan. We will thus enhance planning security for all those involved and ensure that the expansion of the offshore grid is efficient.

"The envisaged liability regime will create legal certainty, remove investment barriers and render investments in offshore wind farms and grid connections economically attractive."

The proposed liability regime entitles wind farm operators to fixed compensation payments if grid connections are delayed or interrupted. They also include a ceiling for grid operators' financial liabilities.

Delays to the connection of offshore wind farms to the German grid have largely been caused by technical difficulties, according to Tennet, one of Germany's four main TSOs. The company is also attempting to attract equity investors in order to help finance the expansion of the offshore network.

- German lawmakers have reached a compromise on legislation allowing the underground storage of carbon dioxide. The agreement keeps in place veto rights for Germany's 16 federal states and reduced the maximum volumes of carbon dioxide to be stored by each facility by half to 1.3 million tons per year.

Bids submitted in Nigeria sell-offs

Nigeria's plans to reform its power industry have taken a step forward with a tender for the privatisation of six power plants.

The country's Bureau of Public Enterprises (BPE) says that it received technical and financial proposals from 25 investors who are interested in four thermal and two hydropower plants.

A second round of tenders for the sale of 11 distribution companies was due to close at the end of July.

The assets have been created by the unbundling of the Power Holding Company of Nigeria (PHCN) and their sale is part of a wider reform process designed to attract investment to the country's ailing power sector.

Blackouts occur daily in Nigeria and little investment has been made in the power infrastructure there since the 1970s in spite of its oil wealth.

The country's President Goodluck Jonathan has set a target of building 10 GW of new generating capacity over the next decade, and estimates that $10 billion of investment is needed in the power sector.

Earlier this year GE, Siemens and Eletrobras signed agreements with the Nigerian government aimed at boosting investment in Nigeria's power sector.

Nigeria is also considering the use of nuclear power to meet its electricity needs.

The thermal power generating companies listed for privatisation are Ughelli Power Plc with an installed generating capacity of 972 MW, Geregu Power Plc with 414 MW, Afam Power Plc with 776 MW and Sapele Power Plc with 1020 MW. The hydropower plants are Kainji Power and Shiroro Power.

The 11 distribution companies are located in Abuja, Benin, Lagos, Port Harcourt, Jos, Kaduna, Kano and Yola.

The technical bids are due to be reviewed in mid-August and the National Council on Privatization (NCP) will approve the results in September. Preferred bidders will be announced in October.

According to local reports, companies interested in placing bids were asked to pay $20 000 for data room access in order for them to carry out due diligence. The BPE believes that in total, the sales of generating and distribution companies will raise some N200 billion.

Efficiency scorecard ranks 12 economies

A new energy efficiency ranking of 12 of the world's largest economies has ranked the UK in first place but says that there is vast potential for efficiency improvements in every country.

The UK is followed in the rankings by Germany, Japan and then Italy. The study was carried out by the American Council for an Energy Efficient Economy (ACEEE), which routinely tracks the energy efficiency performance of the US states.

"The UK and the leading economies of Europe are now well ahead of the United States when it comes to energy efficiency," said ACEEE Executive Director Steven Nadel. "This is significant because countries that use energy more efficiently require fewer resources to achieve the same goals, thus reducing costs, preserving valuable natural resources, and creating jobs."

The study puts France in fifth place, followed by the EU, Australia and China all tied in joint sixth. The USA, Brazil, Canada and Russia bring up the rear. Together the 12 countries studied make up over 78 per cent of global gross domestic product and account for 63 per cent of global energy consumption as well as 62 per cent of global carbon dioxide-equivalent emissions.

All of the countries studied could make major improvements, added Nadel. "Unfortunately, our results show that nowhere is the vast potential for improvements in energy efficiency being completely realised.

"While many countries achieved notable success, none received a perfect score in any category – proving that there is much that all countries can still learn from each other. For example, the United States scored relatively high in buildings, but was at the bottom of the list in transportation."

The ACEEE ranking system looks at both "policy metrics" and "performance metrics" to measure a country's overall energy efficiency. Examples of policy metrics include the presence of a national energy savings target, fuel economy standards for vehicles, and energy efficiency standards for appliances. The "performance metrics" measure energy use and provide quantifiable results.

Report author and ACEEE Senior Researcher Sara Hayes said: "While energy efficiency has played a major role in the economies of developed nations for decades, cost-effective energy efficiency remains a massively underutilised energy resource. Fortunately, there is a lot countries can do to strengthen their economic competitiveness through improvements in energy efficiency."

Nadel: vast potential for improvement not fully realised

Power line project paves the way for E. Africa integration

A project to construct a new power line that will pave the way for more cooperation between East Africa's power markets has been approved by the World Bank.

The Eastern Electricity Highway project will connect Ethiopia's electricity grid with Kenya's and the two countries to share electricity resources. It marks the first phase of a $1.3 billion East Africa power integration programme that will enable dynamic regional cooperation, says the World Bank.

"This landmark transformational project will change the fundamentals of the power sector in East Africa. It will expand access and lower the cost of electricity supply to homes and businesses across Kenya and help to reduce thermal power emissions in Kenya, a clear benefit to the region's environment," said Makhtar Diop, World Bank Vice President for the Africa Region.

"Currently, only one in three Africans has access to electricity in their communities so boosting power sharing between countries is an essential step toward addressing Africa's needs."

The cross-border power line will be financed by the World Bank, the governments of Ethiopia and Kenya, the African Development Bank and France's Agence Française de Développement.

It will enable Ethiopia to sell surplus power to Kenya, where the need for polluting thermal power generating capacity will be reduced.

The World Bank financing to both governments – $243 million for Ethiopia and $441 million to Kenya – will come from the International Development Association, the Bank's fund for the world's poorest countries.

"The Eastern Electricity Highway Project will make a significant contribution to help meet the development needs of the people of Ethiopia, Kenya and the sub-region" said Jamal Saghir, World Bank Director for Sustainable Development, Africa Region.

"Once built, this power line will be a symbol of Africa's determination to solve its energy crisis through cooperation in energy trade. It will be a landmark in achieving more growth and less poverty in the region."

UAE gets n-plant green light

- Concrete poured at Barakah site
- 5.6 GW scheduled by 2020

Siân Crampsie

The head of the Emirates Nuclear Energy Corporation (ENEC) says that the start of construction of the first nuclear power plant in the United Arab Emirates (UAE) is an "important milestone".

The company in mid-July received its construction license from the Federal Authority of Nuclear Regulation (FANR) as well as a No Objection Certificate from the Environment Agency Abu Dhabi (EAD), allowing it to pour the first safety concrete at the Barakah site.

"We are very pleased to receive the Construction License for Barakah Units 1 and 2 from the Federal Authority for Nuclear Regulation (FANR). This marks an important milestone in the UAE's peaceful, civil nuclear energy programme," said Mohamed Al Hammadi, Chief Executive Officer of ENEC.

"This approval confirms that we are building a world-class nuclear energy programme for the UAE and remain committed to the highest standards of safety and quality," added Al Hammadi. "We are now mobilising our team to move ahead with the next phase of activity under our new license, which starts with pouring the safety concrete for Barakah Unit 1."

The UAE announced its intention to build nuclear power capacity in 2008 as a means of meeting growing electricity demand and preserving its own fossil fuel resources for export. It is planning to build four 1400 MW reactors, coming on-line between 2017 and 2020.

ENEC selected Kepco's APR1400 technology for the four reactors. It will apply for an operating license for Barakah Unit 1 in 2015 and will pour concrete for unit 2 in 2013.

Barakah is located in the western part of Abu Dhabi. The project represents the first time that South Korea's Kepco has built a nuclear power plant overseas.

Kepco will lead a consortium that also includes Hyundai Engineering & Construction, Samsung, Westinghouse and Doosan to build the four plants.

Blame game continues as OL3 delayed once more

- Court orders TVO to pay contractors
- Parties disagree on I&C tasks

The dispute between Finnish utility TVO and an Areva-Siemens consortium over the construction schedule for a new nuclear power plant appears to have deepened after TVO announced further delays in the project.

TVO said during last month that the Olkiluoto 3 (OL3) nuclear power plant in Finland would not be ready for regular electricity production in 2014. It blames Areva-Siemens for the delays, an accusation that the French-German consortium refutes.

The announcement came just days after arbitrators ordered TVO to pay €125 million to the Areva-Siemens consortium. It is a further blow to the flagship project as well as to Areva's hope for marketing its European Pressurised Water Reactor (EPR) technology worldwide.

TVO maintains that the Areva-Siemens consortium is fully responsible for the construction schedule as it is contracted to build OL3 on a fixed-price, turnkey basis.

Areva-Siemens said in a statement that the schedule had slipped because TVO had not responded to its requests for close cooperation in the final phases of the project, and in particular, for TVO and its contractors to perform certain control and instrumentation tasks jointly.

"The plant unit's installation works and plant automation system engineering under the responsibility of the supplier have not progressed according to the supplier's schedules," said Anna Lehtiranta, senior vice president of corporate relations at TVO. "Even though we are not pleased with the situation and the fact that there have been repeated challenges with the time scheduling, works are progressing and solutions for remaining I&C items are fixed step by step."

Areva-Siemens says that it informed TVO in early July that the schedule planning had to be reassessed and that TVO would have to bear responsibility for delays.

Construction on the 1600 MW project started in 2009 but it has been repeatedly delayed, leading to cost overruns to the tune of €2 billion. On July 5, 2012 the Court of Arbitration of the International Chamber of Commerce (ICC) ruled that TVO had broken its contract with Aerva-Siemens by withholding €100 million of funds.

It ordered TVO to pay the funds, plus €25 million in interest and expenses.

In late 2011 TVO said that the plant would be fully operational in 2014. It said in a July statement that the mechanical installation of all major components of the reactor plant had been completed as well as the major part of the piping installations. It added that preparations for the commissioning of the plant unit were proceeding.

Dynegy parent files for bankruptcy

Dynegy Inc. has filed in the US courts for bankruptcy protection as part of a plan to restructure its business and its debts and overcome the complex corporate wranglings of the past two years.

The US utility has filed a voluntary petition to merge with its wholly-owned subsidiary Dynegy Holdings, which entered Chapter 11 bankruptcy proceedings in 2011.

The Houston-based power company operates in the Midwest, northeast and western USA and has been struggling for years because of falling power prices. Last year its debts reached $5 billion and the company transferred some of its power plant assets from Dynegy Holdings to Dynegy Inc. and put the former into bankruptcy proceedings.

That move threatened the position of Dynegy's creditors and favoured that of its shareholders, according to a court-appointed examiner.

Houston-based Dynegy is hoping to reach an agreement on its restructuring and emerge from bankruptcy this autumn

The latest plan will re-merge Dynegy Inc with its subsidiary and give unsecured creditors a 99 per cent stake. Dynegy Inc. shareholders will get just one per cent, but will receive warrants to buy up to 13.5 per cent if the company's value rises.

Dynegy tried to find a buyer in 2010 and 2011 but bids failed because of disagreements between the company's main shareholders.

Dynegy is aiming to reach a full agreement on its restructuring and emerge from bankruptcy this autumn.

E.On seeks damages Ming Yang plans expansion

China Ming Yang Wind Power Group has drawn up plans to expand its growing business overseas.

The Chinese wind turbine manufacturer has signed agreements with Huaneng Renewables Corporation and with India's Reliance Group to develop renewable energy projects in China and other parts of Asia.

Under a cooperation agreement with Huaneng Renewables, the two companies will investigate the creation of a joint venture specialising in the development of wind and solar power projects in China and overseas.

Meanwhile it has signed an agreement with Reliance under which its subsidiary, Ming Yang Singapore, will buy a stake in Reliance subsidiary Global Wind Power Limited (GWPL).

The companies will cooperate in the development of new wind and solar power projects in India.

Chuanwei Zhang, Chairman and Chief Executive Officer of Ming Yang, said that the deal with Huaneng "represents an important strategic development for Ming Yang", which is one of the world's top ten wind turbine producers. He called the deal with Reliance a "milestone" in the development of Ming Yang in the Asian region.

Under its memorandum with Reliance, Ming Yang will provide engineering, procurement and construction solutions, including micro-siting, wind resource assessment studies, project financing and other services for Reliance and third parties. Reliance is expected to play a supporting role in facilitating these projects in addition to providing local market support.

"Reliance is the leading player in India's utility sector, committed to clean energy development, and our strategic partnership is another strong endorsement of our capabilities in overseas markets, where we offer total solutions by combining equipment, technology innovation and financing support," said Zhang. "This platform between Reliance and Ming Yang is expected to enable us to quickly capture and grow India and South Asia markets.

"We are confident that our international market development will gather great momentum and further drive the Company's growth."

Alstom supports China hydro growth

Alstom looks to boost its hydropower capabilities in China and maintain its market share.

Siân Crampsie

Alstom says that the creation of a global hydropower technology centre in Tianjin, China, will accelerate research and development competencies in the country as well as support clean energy growth there.

The technology centre is part of a €100 million investment announced in November 2010 to upgrade Alstom's hydropower facilities in Tianjin. It will make Alstom Hydro China a full value chain entity and help the firm to fight off competition in China's vast hydropower sector.

The new global technology centre will be capable of research and development activities as well as sales, marketing, engineering design, manufacturing, project management, installation, maintenance and service. With the support of other local service centres, Tianjin will be well placed to meet the needs of Chinese and other hydropower markets as well as help to develop local expertise.

"The initiative to establish a Global Technology Centre in Tianjin illustrates Alstom's commitment to accelerate competence and R&D capabilities in China, bring our tecnology to local customers and support the clean energy growth in China and the global market as well," said Jérôme Pécresse, President of Alstom's Renewable Power Sector and Executive Vice President of Alstom.

China is the largest hydro market in the world. According to Chinese government estimates, the Chinese hydro market is expected to grow by over 65 per cent from 2011 to 2020 to reach an installed capacity of 380 GW – the equivalent of about 17 Three Gorges hydroelectric plants. By the end of 2015, China's production of hydroelectricity is expected to reach 910 TWh.

As well as European firms such as Voith, Kvaerner and Andritz vying for market share, Alstom Hydro faces competition from major Chinese firms such as Dongfang Electric and Harbin.

Alstom has a 20 per cent share in China's hydropower equipment supply market.

MW Power deal approved

Metso is to acquire full ownership of MW Power after European regulatory authorities gave approval to its deal with partner Wärtsilä.

The two Finnish firms agreed in late May for Metso to buy Wärtsilä's share in their joint venture, which combined Metso's heat and power business with Wärtsilä's biopower business to build small and medium-sized biomass heat and power plants in Europe. It was 60 per cent owned by Metso and 40 per cent by Wärtsilä.

The deal will allow Wärtsilä to follow its strategy of focusing on engine-based power plant solutions. Metso has pledged to continue developing the MW Power business, whose customers are mainly municipalities and process industries in Northern Europe and the Baltics. The two companies created MW Power in 2008.

Tenders, Bids & Contracts

Americas

Bechtel, Siemens win Panda plant

Bechtel and Siemens are to design and build a natural gas fired combined cycle power plant in Texas, USA, after winning a contract awarded by Panda Temple Power LLC.

The 758 MW Panda plant will be built by the two firms in Temple, Texas and will be one of the most efficient natural gas fired power plants in the USA. Bechtel will be responsible for the engineering, procurement, construction, and commissioning of the facility, while Siemens will provide the power island package including the natural gas and steam turbines and waste heat recovery boilers.

Commercial operations of the plant are expected to begin in 2014.

Siemens has also signed a long term service agreement for the main generating components.

Ormat signs Cove Fort EPC

Ormat Technologies has signed a $61.4 million engineering, procurement and construction (EPC) contract with Enel Green Power North America for the supply of equipment for the Cove Fort geothermal power plant project in Utah, USA.

Ormat is to provide two air-cooled Ormat Energy Converters to the project, which is part of plans by Enel Green Power North America to double its installed capacity in the next five years.

Gamesa completes Mexico wind farm

Gamesa has handed over a 74 MW wind farm in Mexico to owner Enel Green Power.

The Spanish technology firm has completed construction of the Bii Nee Stipa II wind farm in Oaxaca state and says that the facility will operate at a capacity factor of around 40 per cent.

The facility is equipped with 37 Gamesa G80-2.0 MW wind turbines.

Gamesa has a development pipeline in Mexico of 144 MW.

BC Hydro strengthens grid

ABB has won orders worth around $55 million from the leading Canadian utility BC Hydro to deliver FACTS (flexible alternating current transmission systems) solutions that will help increase transmission capacity through new and existing power lines.

ABB will design, supply, install and commission three series capacitors – two at Seymour Arm and one at Ruby Creek, British Columbia. The installation at Seymour Arm will be in service by the end of 2013 and Ruby Creek the following year.

The Ruby Creek installation is part of the Interior to Lower Mainland Transmission Project, a new 500 kV line being constructed to help ensure that homes and businesses in the Lower Mainland and Vancouver Island continue to receive clean and reliable energy.

The Seymour Arm series capacitor will enable more power flow without having to construct an additional transmission line.

Asia-Pacific

GE powers Cambodia rice husk plant

Cambodian industrial conglomerate Soma Group has selected GE's Waukesha gas engine technology to power a new rural, rice husk biomass-energy project in the rice-milling region of Kamphong Cham.

The new plant will consist of an integrated biomass gasification gas engine plant located at Soma Group's Hak Se mill. It will supply energy to the mill as well as the local grid and will support Cambodia's rural electrification goals.

Indian firm Ankur Scientific Energy Technologies is designing the power plant, which will convert rice husks into biogas. The gas will then be used to power two GE VHP5904 Waukesha engines and generate 1.5 MW of electricity.

The new power plant is expected to begin commercial service in March 2013.

Wärtsilä wins Timor-Leste O&M

Wärtsilä Corporation has been awarded a full scope, long term operation and maintenance (O&M) contract for the Hera power plant in Dili, East Timor.

In a consortium with Puri Akraya Engineering, a company contracted by the Timor-Leste government for the project, Wärtsilä will be responsible for operating the power plant, and for all service and maintenance activities deemed necessary to ensure its efficient and reliable availability.

The Hera plant supplies baseload electricity to the national grid and has an output capacity of 120 MW.

It is powered by seven Wärtsilä 46 engines currently running on light fuel oil, but which may later be converted to natural gas operation.

The Hera power plant is part of the Timor-Leste government's modernisation programme aimed at further increasing national electrification.

Europe

ElectraLink wins data services contract

One of the UK's "big six" energy retailers has awarded ElectraLink its first data services contract.

Under the deal ElectraLink will provide the utility with detailed sales performance reports that will benchmark it against the rest of the market.

The insight that the report provides will allow the utility to better monitor and manage its sales and marketing strategies.

ElectraLink's reports will be based on the data flowing across ElectraLink's data transfer network, which links market participants in the UK electricity industry.

Enercon supplies Irish wind farm

Gaelectric has announced that German wind turbine maker Enercon is to provide the turbines for the 13.8 MW Carn Hill wind farm in County Antrim, Northern Ireland.

The Irish renewable energy firm says it has finished the first stage of construction at the wind farm, which forms the first phase of its onshore wind portfolio in Ireland.

Enercon has also signed a contract to maintain the turbines and to provide civil and electrical engineering infrastructure for the project.

Proventus signs Greece MOU

Proventus Renewables has announced the signing of a memorandum of understanding (MOU) with Omega MG, a company involved in the development of renewable energy projects in Greece.

The two companies' initial plan focuses on the development of 17 renewable energy projects totalling over 400 MW of installed capacity. The MOU will expand Proventus' portfolio into Greece with favourable locations for the optimal production of wind energy and grid connectivity.

Seven of the projects are in northern Greece, four in western Greece and six in central Greece, says Proventus.

Areva signs fuel contracts

Areva has signed three contracts with RWE and EnBW for the supply of fuel assemblies for nuclear power plants in Germany.

The French nuclear engineering firm has signed two contracts with RWE covering the supply and manufacture of Atrium and HTP fuel assemblies for the Gundremmingen and Emsland nuclear power plants, respectively.

The third contract is with EnBW for the manufacture and supply of HTP fuel assemblies for reactor 2 of Philippsburg nuclear power plant.

French town orders storage system

Areva has won a tender launched by the French city of La Croix Valmer to supply and install an energy storage system.

The French technology firm will install a Greenergy Box industrial energy storage system in the city. The system will be connected to a 35 kWp photovoltaic panel facility installed on the roof of a public building.

The Greenergy Box consists of an electrolyser and a fuel cell. Excess energy generated by the PV system is used to electrolyse water into hydrogen and oxygen. The hydrogen is then used by the fuel cell to generate electricity at times of peak energy demand.

Metso automates pellet heat plant

Metso is to install an automation system at Finland's largest pellet-fired heat plant, the Finnish company has announced.

The plant is being built by MW Power, a Metso-Wärtsilä joint venture, in the Sarankulma industrial area of Tampere. It will be used as a peak load and reserve plant to replace the use of existing oil- and gas-fired boiler plants.

Metso will supply the plant with a Metso DNA automation system similar to the ones that owner Tampereen Energiantuotanto already uses at all its other power plants. Equipment delivery is scheduled for the autumn of 2012.

The new plant will be unmanned and controlled via a remote connection from the main control room of the Lielahti power plant. Its heat capacity will be 33 MW with pellets and 47 MW with light fuel oil.

International

Astana awards $12 million GIS order

Astana Regionalnaya Elektro Setevaya Companiya (AREK), the utility provider in the city of Astana, Kazakhstan, has placed an order worth around $12 million with ABB for the supply of gas insulated switchgear for new substations.

ABB will supply 18 bays of 110 kV and 16 bays of 220 kV GIS that will form an integral part of the Shygys and Dostyk substations, which are scheduled to be energised in June 2013. The substations are part of a new 220 kV overhead transmission system being constructed to help support economic growth in the city.

GPL awards O&M contract

Wärtsilä has signed a ten-year operations and maintenance agreement with Gulf Power Limited (GPL) for a new power plant in Kenya.

The agreement covers the full operation, maintenance and servicing of the new plant, which is being built by Wärtsilä in Athi River, southeast of Nairobi. The 80 MW heavy fuel oil plant will help Kenya to diversify its generation mix.

The GPL plant is scheduled to be completed by September 2013.

Nexans wins Libya order

Libya's Public Electrical Works Company (PEWCO) has placed orders with Nexans for the supply of cables for projects to upgrade the country's power transmission and distribution infrastructure.

Under the orders, worth around €110 million, Nexans will supply over 1000 km of high, low and medium voltage cables as well as accessories and optical fibre cables for automation and control. The cables will be installed by PEWCO, a subsidiary of GECOL, Libya's state-owned electricity utility.

Cable delivery and installation is due to take place in 2012 and 2013.

Kurdistan reinforces network

Alstom Grid has won contracts worth €34 million from KAR Construction & Engineering Company to engineer and supply five substations in Kurdistan.

Alstom will supply four 132/33/11 kV air-insulated switchgear (AIS) substations and one 132/33/11 kV gas-insulated switchgear (GIS) substation for the Kurdistan Regional Government Ministry of Electricity. The package award also includes extensions and modifications of three existing area substations.

Construction of the new substations are part of the country's ongoing efforts to keep pace with rapid economic development, by increasing both the availability and the reliability of the electrical network. It will enable the expansion of the transmission and distribution networks in the main city of Dohuk and surrounding suburbs.

Wärtsilä wins largest power plant order

Wärtsilä has received its largest single power plant order ever after being awarded a contract to supply a 384 MW facility in Azerbaijan.

The Finnish engine company is to supply the natural gas engines, auxiliaries and process equipment for the Boyuk Shor power plant near Baku that will be operated by Azerenerji JSC. The order is in line with Wärtsilä's strategy to grow its natural gas plant business.

The plant will consist of 21 Wärtsilä 50 SG engines and will start operating in autumn 2013.

GE technology supports Iraq growth

Independent power producer Mass Global Investment Company has selected GE's steam turbine technology to increase the output and efficiency of the Erbil power plant in Kurdistan, northern Iraq.

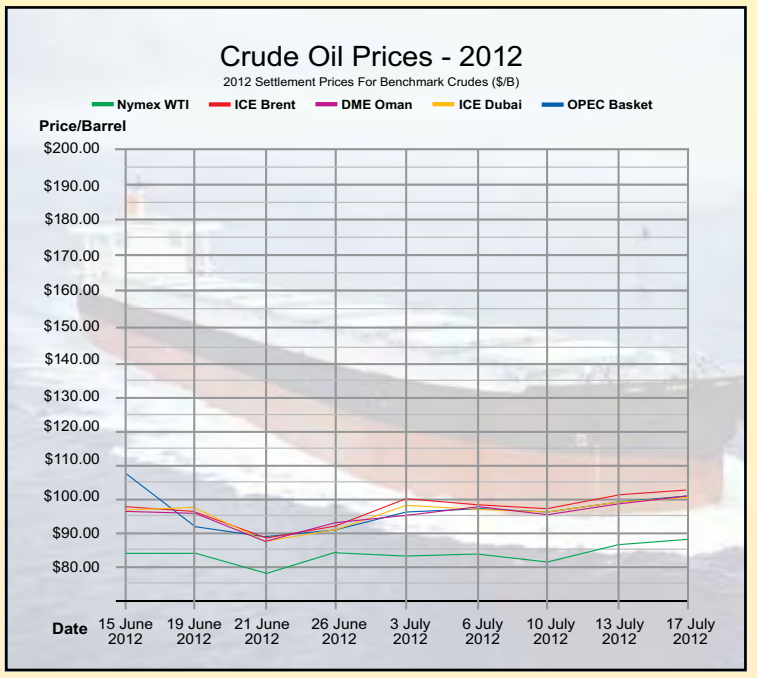
GE will supply two steam turbines that will be used to convert the Erbil plant from simple to combined cycle operation, boosting plant output by 500 MW, enough additional electricity to serve 100 000 Iraqi households. GE's contract also includes installation services.

The Erbil plant has been in operation since late 2008, and plays a vital role in meeting the electricity needs of Kurdistan.

Oil

Dire global economics push demand, prices down

- Sluggish OECD economy suppressing demand
- Demand growth to slow in 2013



David Gregory

The price of West Texas Intermediate (WTI) crude remained below $90/b in mid-July, held aloft by the chance of a new economic stimulus package by the US government and concerns over Iran's threats that it may attempt to halt oil tanker traffic through the Strait of Hormuz. Brent remained in the low $100/b range.

The poor performance of the world's economy and the consequential forecasts of lower demand may provide some solace to consumers who have been suffering from high retail prices, but that in itself reflects the dire economic circumstances in which those consumers function.

In its latest *Monthly Oil Market Report*, Opec commented on the decline of crude oil prices during the second quarter of 2012. The Opec basket declined for its third consecutive month in June to $93.98/b, its first time under $100/b in 18 months, the *MOMR* reported. WTI and Brent declined by 13 per cent during June. WTI fell by $23.80 during the second quarter, while Brent lost $28.62 during the April-June timeframe.

"In addition to economic concerns, especially regarding the eurozone," the Opec report said, "the main factors driving down prices were the decline in speculative long positions and abundant crude oil supplies."

Opec projected that world oil demand would rise by only 900 000 b/d during 2012, due to "various offsetting economic developments." It said the sluggish OECD economy "is suppressing the region's oil demand, except for Japan where the shutdown of most of the country's nuclear power plants has led to increased crude and fuel oil burning." It put demand growth in 2013 at 800 000 b/d, representing slower growth than in 2012.

"The unsteady pace of the global economic recovery is causing a considerable uncertainty for world oil demand," Opec said. "The non-OECD is expected to continue to contribute all of the world's oil demand growth for the next year. The industrial and transport sectors are expected to contribute the most to total oil demand."

The report said demand for Opec crude during 2012 is estimated at 29.9 million b/d, down 100 000 b/d from 2011. Demand for Opec crude in 2013 is forecast at 29.6 million b/d.

For months economic forecasters have been saying that the high price of crude oil was having a negative impact on global economic recovery. It appears that those predictions are beginning to ring true. Reduced demand and lower prices cannot be taken as positive news for countries that rely on crude exports for most of their revenue.

The latest projections from the US Energy Information Administration (EIA) also show a decline in global demand. The EIA said global liquid fuel consumption growth was forecast at 700 000 b/d for 2012 and 700 000 b/d in 2013 to 88.64 million b/d and 89.37 million b/d, respectively. World crude demand for 2011 was put at 87.97 million b/d.

"The weaker growth outlook is prompted by increased economic concerns about the debt crisis in Europe and indications of slowing growth in China, both of which could have spillover effects on other economies," the EIA said in its monthly *Short-Term Energy Outlook* for July.

The EIA said its research has shown that oil markets have loosened over the past several months, reflected in the decline in crude prices. It said that supply outpaced consumption by an average of 1.1 million b/d for the first half of 2012 and that stocks built counterseasonally during the first quarter. This was a marked contrast to significant stock draws during 2011, it said.

The US report said that both upside and downside risks dominate market sentiments. The possibility that the economic situation in the European Union countries could deteriorate further poses a downside risk to global oil demand and prices, it said. Also, the slowing growth in China, "which has been a key driver of increased oil demand in recent years," could also curb demand, the report added.

The Paris-based International Energy Agency (IEA) put the world's economic situation in succinct terms: "The exceptionally testing global economic backdrop, of the early summer months, had led to a reduction in underlying economic assumptions. GDP growth of 3.3 per cent is now assumed for 2012 (down from the IMF's previous 3.5 per cent projection), accelerating to 3.8 per cent in 2013 (previously 4.1 per cent).

The IEA forecast that global crude oil demand will average 89.9 million b/d during 2012 and 90.9 million b/d in 2013.

"After two years of relatively flat growth – up by 700 000 b/d in 2011 and an anticipated 800 000 b/d in 2012 – the predicted 1.0 million b/d growth rate for 2013 is unmistakably an acceleration, albeit a modest one," the agency said. "Underpinning the predicted uptick in growth in 2013 is a combination of the strengthening economic backdrop and mildly lower oil prices."

Gas

Black Sea gas holds promise for southeast EU countries

New and anticipated discoveries of natural gas in the offshore Black Sea territories of Bulgaria and Romania could lead to reduced dependence on Russian gas imports for these southeast European countries.

Mark Goetz

On the whole, the European Union, of which Bulgaria and Romania are members, is looking to diversify EU sources of natural gas for the sake of cutting its near 40 per cent reliance on Russian shipments. This reliance on gas has at times proved disastrous, particularly in the winter of 2009 when Gazprom stopped its shipments to Ukraine, consequently cutting supplies to much of Eastern and Central Europe.

For EU energy security it is vital to find additional sources of natural gas for its Balkan and southeast European states, and it had hoped to accomplish this through the construction of the proposed Nabucco gas pipeline. But a deal between Turkey and Azerbaijan to build the Trans Anatolian Pipeline (TANAP) for the purpose of carrying Azerbaijan's Shah Deniz gas across Turkey to Europe has pulled the rug out from under Nabucco, which has scaled itself back into the 'Nabucco West' project, a third the size of the original plan.

The Shah Deniz partners, led by BP, have shortlisted the Nabucco West – which would run from the Bulgarian-Turkish border into Central Europe – and the Trans Adriatic Pipeline (TAP) – across Greece to Italy – as the two options to pipe Azeri gas into Europe. Should Nabucco West not get the contract, southeast Europe would need to continue its reliance on gas from Russia, which is keen to start work on its €25 billion South Stream gas pipeline project across the Black Sea to Bulgaria later this year.

Earlier this year, ExxonMobil and Austria's OMV announced a natural gas discovery in the 9900 km^2 Neptun Block in the Black Sea. ExxonMobil is operator in the block where a discovery was made at the Domino-1 well, 170 km offshore. The well is located in 930 m of water and drilled to depth of 3000 m.

ExxonMobil said the estimated size of the resource at 42-84 billion m^3 of gas. Further 3D seismic tests are being carried out. This was Romania's first deepwater exploration well.

The discovery prompted Romanian President Traian Basecu to say it provides Romania with the "potential for total energy independence… Romania could become a source of gas not only for itself but for other European countries." Development of the field is estimated at around $10 billion and production could begin by the end of the decade if all goes smoothly.

Last month, Bulgaria awarded a large offshore concession to France's Total for exploration and development of the Khan Asparuh Block, which lies adjacent to Romania's Neptun Block.

The license won by Total is for five years and OMV and Spain's Repsol will be partners in the consortium.

Bulgaria is hopeful that a natural gas discovery in Khan Asparuh like that in Romania will eventually allow it to reduce its dependence on Russia, which supplies the country with about 85 per cent of its gas demand.

Bulgarian Minister for Economy and Energy, Delyan Dobrev, said a discovery similar to the one in the Neptun Block would cover the country's domestic demand for up to 20 years.

The Khan Asparuh 1-21 Block covers an area of 15 000 km^2 and lies along the maritime border with Romania. The target resources in Khan Aspurah are reported to lie some 5000 m beneath the seabed.

Commenting on Total's selection for the license, Bulgarian President Boiko Borisov told *Reuters*: "This is a real diversification… It will help us decrease gas prices and will help us during negotiations for the purchase of gas [with Gazprom]."

The Neptun discovery generated some excitement about the Bulgarian offshore and prompted bids from ExxonMobil and Edinburgh-based Melrose Resources. Melrose Resources is already working in Bulgaria: it holds an exploration concession in the offshore Galata Block where it is producing 1.077 million m^3/day, including the Kavarna and Kaliakra fields.

Bulgaria consumed about 2.6 billion m^3 of natural gas in 2010. It is paying Russia about $600 per million m^3, or $16.67 per million BTU. Other European gas importers are paying around $450 per million m^3 for Russian gas.

Russia is pushing Bulgaria to sign up for the South Stream project, giving it until November of this year to qualify for a gas price discount. Bulgarian-Russian energy relations are not the closest. Bulgaria's pulled out of a Russian nuclear power plant project for Bulgaria earlier this year, and last year it withdrew from the Moscow-based Burgas-Alexandroupolis crude oil pipeline project.

Bulgaria has signed a preliminary agreement with Azerbaijan to receive Shah Deniz gas when it comes on-stream, and it has signed gas pipeline interconnector agreements with Turkey, Greece and Romania.

At a crossroads of power

India's hunger for power and energy is likely to continue unabated even though many mature economies will be impacted by the current global economic uncertainty. But the road forward is fraught with tough policy decisions and the challenges of integrated infrastructure planning.

Vishvjeet Kanwarpal

The installed power capacity of India as of May 31, 2012 was almost 203 000 MW. An impressive 20 500 MW of capacity was added in 2011-12 and the government aims to add another 18 000 MW of capacity in 2012-13. In the 12th five-year plan (2012-2017), India is targeting an addition of 94 065 MW to its generation capacity with a total estimated fund requirement of Rs. 13, 72, 580 Crores ($247.3 billion).

But while the government has set ambitious capacity addition targets to meet the growing economy, the sector is encountering severe challenges including fuel shortages, slippages in capacity addition, policy and regulatory issues, foreign investment slowdown, environment clearances, transmission/open access constraints, and unmitigated high AT&C (Aggregate Technical and Commercial) losses.

The Planning Commission held a meeting with state power ministers to review the strategies for the 12th five-year plan. Taking cognizance of the unbearable distribution losses amounting to almost Rs. 70 000 Crores ($12.6 billion) annually, it was concluded that loss reduction and increase in consumer tariffs were critical to avoiding a catastrophic crisis in the power sector. Several options to restructure the accumulated debt and losses of the distribution companies (discoms) and State Electricity Boards (SEBs) are being developed and considered.

Having reached a dead-end due to the crippling non-availability of fuel, especially coal and gas, and the mounting losses of discoms and SEBs, many states have initiated hikes in power tariffs. The government has also allowed industrial consumers to buy electricity directly from generators and traders. This may potentially impact almost a third of the revenue of the distribution companies and further limit the option of subsidised supplies to farmers and special interest consumers.

Tamil Nadu Electricity Board has hiked power tariffs by an unprecedented 37 per cent. Other states such as Andhra Pradesh and Odisha have raised tariffs by up to 25 per cent. Haryana Energy Regulatory Commission (HERC) has hiked power tariffs by around 10 to 15 per cent and Bihar by over 12 per cent. Even smaller states such as Tripura have hiked tariffs by 17 per cent.

The major challenge in 12th five-year plan is to supply sufficient coal to achieve a targeted capacity addition of 63 781 MW of new coal plant.

India is the third largest producer and consumer of coal in the world, with 533 Mt of production and total reserves of 285 862 Mt. About 57 per cent of power generated in India is based on coal.

The aggregate demand for coal at the end of the 12th Plan in 2017 is estimated to be between 900 and 1000 Mt depending on the pace of commissioning of power capacity. The domestic production of coal is estimated to exceed 750 Mt indicating a more than 200-250 Mt shortfall to be met from imports.

Effective January 1, 2012, Coal India Ltd. (CIL) adopted a new coal pricing methodology from Useful Heat Value (UHV) based on the internationally accepted Gross Calorific Value (GCV). In this new pricing model coal is categorized into 17 grades. This has increased prices of specific grades significantly.

India imports about 12 per cent of its coal requirements and sources 70 per cent of that from Indonesia. Indonesia plans to impose a 25 per cent export tax on coal, which in turn will impact the net cost of power generation in India. The challenge facing the Indian power sector is therefore not just the supply of coal but maintaining a competitive cost of generation.

The Ministry of Environment and Forests has adopted a policy of 'Go-No-Go' in which coal mining was completely banned in 'No Go' areas. As large coal bearing areas were suddenly declared 'No Go' areas, this would have severely limited the ability to expand domestic production of coal. A final policy framework acceptable to all stakeholders is yet to be formalised.

With the continued challenges in fuel supply to the power sector, India has little choice but to continue its exploration of the nuclear power option.

As of July 2012, India had a total installed capacity of 4780 MW of nuclear power. Its largely indigenous nuclear power programme aims to achieve 14 600 MW installed capacity by 2020 and 27 500 MW by 2050.

The much debated Civil Liability for Nuclear Damage Rules, 2010, are now in place to implement the provisions of the Civil Liability for Nuclear Damage Act, 2010. The Act and the Rules were notified on the same day i.e., November 11, 2011.

Kanwarpal: tough measures are needed

On March 27, 2012, India made a strong appeal for membership in four exclusive nuclear clubs – the Nuclear Suppliers Group (NSG), the Missile Technology Control Regime (MTCR), the Wassenaar Arrangement and the Australia Group – to strengthen its export control systems and maintain the high international standards of its nuclear programme.

The protests against Jaitapur nuclear power project in Maharashtra and Kudankulam nuclear power project at Tamil Nadu have delayed their commissioning due to safety concerns of the public. However, India continues its nuclear power plant development programme.

Large hydropower projects will also continue to be important. The Central Electricity Regulatory Commission (CERC) plans to amend the hydro tariff structure and has proposed a 16.5 per cent RoE (Return on Equity) for reservoir based hydro power stations. Also some major changes in other types of hydro stations are being proposed. These steps have been taken to increase the participation of private sector in the hydro sector, to increase the peak load capacity and also to improve the thermal hydro mix.

Hydropower tariffs typically range from Rs1.50-3/kWh. Key hydropower challenges include geological and hydrological problems, evacuation of power due to difficult terrain of hydro projects, environmental clearances, poor infrastructure, recent financial norms for project delays, land acquisition as well as resettlement and rehabilitation issues, resulting in hydro projects getting delayed with an associated cost and tariff increase.

Hydro tariffs as high as Rs3.64/kWh in the public sector and Rs6.23/ kWh in the private sector have been petitioned. The delayed and erratic monsoon has further increased the power generation challenge. Weak monsoons have caused a rise in power rates and tariffs have crossed Rs7/kWh on most power exchanges.

Small hydro (up to 25 MW) also offers potential. According to the MNRE assessment there are 5415 potential sites for small hydro with an aggregate potential capacity of 14 305 MW. The Ministry aims to achieve 7000 MW SHP based installed capacity by the end of 12th Plan.

Looking at other renewables, with the exception of wind power, the utilisation of renewable energy sources is still relatively low in India, which presents a significant business potential. The total renewable installed capacity in India as of March 2012 was 24 914 MW.

Notably, India has emerged as one of the largest potential sources of Certified Emission Reduction (CER) and Renewable Energy Certificates (REC). Though potential upside of CER benefits exist for small hydro plants, uncertainty continues over Kyoto Protocol Mechanism post December 2012.

In the solar sector the main objective of the National Solar Mission is to reduce the cost of solar power generation in the country through long-term policy, large-scale development, aggressive R&D and the promotion of the solar sector. The installed capacity of solar power increased from 17.8 MW to 500 MW in phase I of the National Solar Mission. The target of the mission is to achieve 20 000 MW installed solar capacity by 2022.

India is facing problems in project financing and fund availability because there is a lack of robust policy to support capacity development and utilisation as well as clarity on subsidy support.

Meanwhile for wind power, as of December 2011 the installed capacity of wind power plants was 16 179 MW. India is estimated to have a potential of about 48 560 MW of wind capacity. Wind power accounts for 6 per cent of India's total installed power capacity. However, it generates only about 1.6 per cent of the country's power.

The Ministry of New and Renewable Energy (MNRE) has announced a revised estimation of the potential wind resource in India from 49 130 MW assessed at 50 m hub heights to 102 788 MW assessed at 80 m hub heights.

Biomass also offers significant potential. As of March 2012, India had a total installed capacity of 2675 MW (direct biomass 901 MW, cogeneration 1649 MW and gasification 125 MW) connected to the grid. The total potential in biomass is estimated at more than 19 000 MW.

Realising all of this potential, however, requires the right policies. The government has initiated significant initiatives and regulations to strengthen the Indian power sector such as competitive bidding, new transmission pricing norms using point-of-connection (POC), development of a National Electricity Fund, greater coordination with coal supply and a second amendment in Sharing of Inter State Transmission charges and losses Regulations 2012. However a lot more needs to be done.

Decades of populist policies by all political parties have taken a heavy toll on the power sector and state governments are left with little or no option but to institute tough measures. India's tomorrow depends on the policy actions of today.

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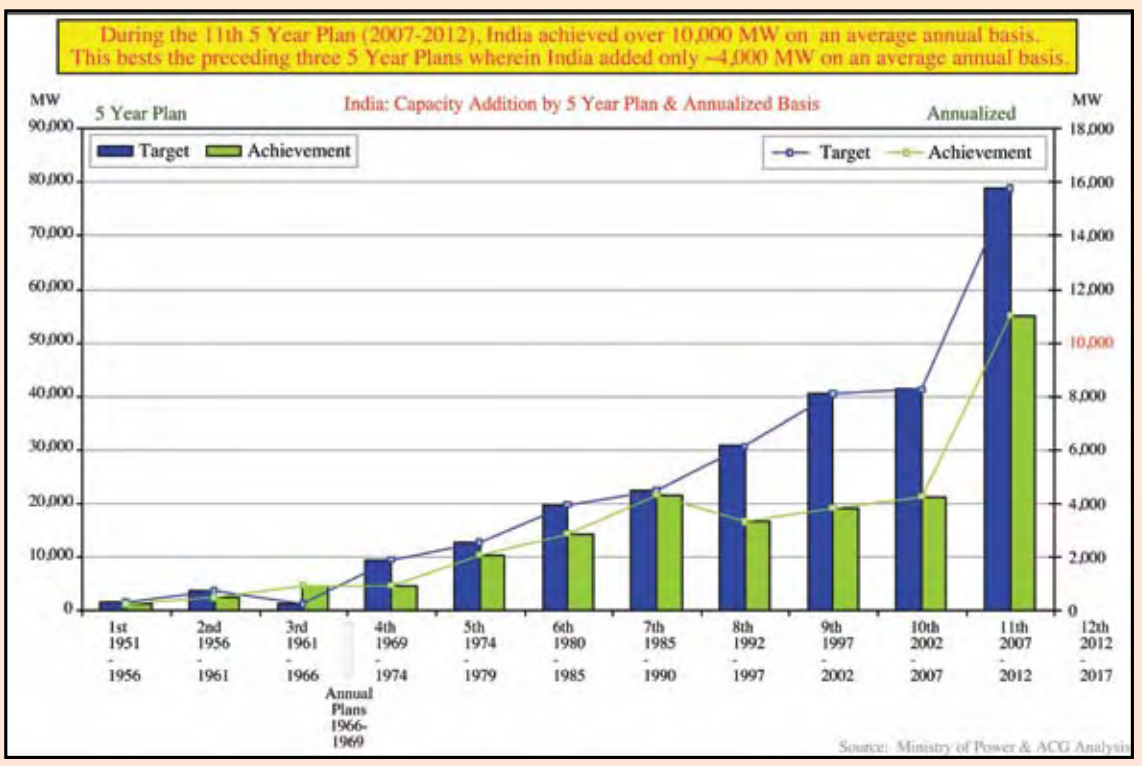
Power capacity addition by Five Year Plan

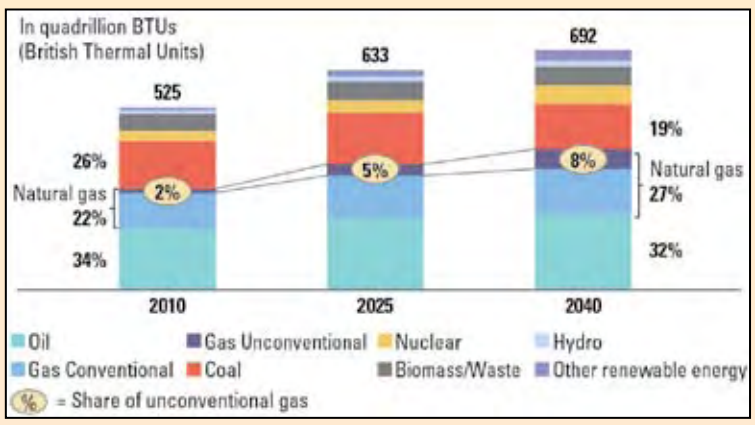


Plotting a shale gas revolution

The so-called shale revolution is gaining momentum. But the road towards globalisation presents significant strategic, commercial, technical and environmental challenges for energy players.

Rodolfo Guzmán, Daniel Monzón and Agustín Gogorza

World primary energy supply matrix (in Quadrillion BTUs)



Predictors of peak oil have for many decades underestimated the energy industry's capacity to innovate and develop new and improved technologies to extract increasing amounts of hydrocarbons from hard to reach, or highly complex reservoirs.

The most recent and perhaps most important breakthrough in the industry has been the emergence of two new key technologies: horizontal drilling and hydraulic fracturing, commonly known as fracking.

These technologies have enabled the large-scale exploitation of vast amounts of unconventional types of hydrocarbons known as shale gas and shale oil, with dramatic consequences for the global energy markets and huge potential repercussions in many other sectors of the global economy.

While the so-called shale revolution has so far been limited to North America, the potential shale resources in many regions of the world are enormous, and many countries and industry players expect to benefit from a growing global trend in fracking activity. However, the road towards shale globalisation presents significant strategic, commercial, technical and environmental challenges for energy players.

Shale fracking is having a significant beneficial impact on the global energy industry, and consequently the global economy, by providing enduring opportunities for an abundant, cheaper and relatively cleaner new source of energy supply. This trend has become a real game-changer in the global energy industry. The shale gas bonanza has already transformed the energy equation in North America, and the fracking revolution is rapidly expanding into new geographies and will impact global energy balances.

The development of shale gas in North America over the last decade has been so dramatic that it has quickly helped to transform the energy markets in the region. The proliferation of drilling in established and new shale plays helped the US to increase its dry shale gas output from only 0.39 trillion cubic feet (TCF) in 2000 to 7.2 TCF in 2011, an average increase of over 30 per cent per annum.

Shale gas production already accounts for more than one third of total natural gas domestic output and is expected to reach 60 per cent by 2035. Moreover, shale drilling in the US is rapidly expanding into liquid-rich basins, and the country's domestic output of crude oil has also started to increase after decades of declining production.

The shale gas boom could turn the region into one of the world's largest LNG exporters within a decade. The first LNG export project in more than 40 years is already being developed by Cheniere Energy to target, among others, the gas markets of Spain, Korea and India. Several other LNG export projects are on the drawing board in the US and Canada.

Access to cheap natural gas from shale developments is also encouraging fuel substitution in the domestic transportation sector and helping the US reduce its dependence on expensive imported crude oil.

Geological estimates of the global potential for technically recoverable shale resources are enormous in comparison to conventional reserves of oil and gas, and many basins around the world have significant shale gas resources. The shale gas revolution is only now beginning to expand into Eastern Europe, Asia and Latin America, where current production is still non-existent or very modest relative to the potential shale gas reserves.

Many players with the appetite, capital and technical know-how are already securing acreage with known shale prospects in these regions, and significant investments are expected in the next few years.

The sudden potential availability of over 6600 TCF of global recoverable shale gas has had a radical impact on the world's energy balance. At a current global gas consumption rate of 112 TCF per year, shale gas reserves represent nearly 60 years of natural gas demand.

The share of unconventional gas (shale gas, tight gas and coalbed methane) in the global energy supply matrix is expected to grow by a factor of four in the next three decades, mostly due to the rapid expansion of shale gas supplies. Shale gas availability will also help substitute coal in many markets, with positive effects on the reduction of greenhouse gases and other undesirable pollutants.

One key factor in the future of the global energy markets will be the pace of development of shale resources in China. The country's shale gas potential is the largest in the world with technically recoverable resources of 1275 TCF, representing over 330 years of current natural gas consumption. The government is aggressively promoting opportunities and targeting 3.5 TCF of shale gas output by 2020.

However, China's shale gas geology remains largely untested, and there are significant challenges such as geological risks, infrastructure limitations and water availability. China will require accelerated investment in basin-specific technologies to address its unique geological conditions and develop a better understanding of these opportunities.

The global shale revolution is also leading to dramatic changes in electricity markets around the world and will shape the power industry for decades to come. Mirroring the gas market, wholesale electricity prices in the US have dropped more than 50 per cent on average since 2008.

As profit margins are squeezed, more generators are shelving plans for new coal, nuclear and wind projects. The rate of retirements of coal-based power plants is also accelerating as it becomes unprofitable for utilities to install new pollution control systems on older coal-fired units. These trends are resulting in rapid displacement of coal by natural gas in the overall US power mix, and the US power industry is expected to almost double its consumption of natural gas by 2035.

In Europe the prospects for power generation from shale gas look brightest in some Eastern European countries with large estimates of potential resources such as Poland and Ukraine. But even some West European nations such as Austria and the UK are seeing shale gas as a resource that will help meet EU's emissions targets in a more rapid and affordable manner.

Significant technical challenges are still ahead for the development of unconventional hydrocarbons. Although innovation in the oil industry continues to make strides, and new technologies are transforming what yesterday was clearly unconventional into todays' conventional, major technical challenges still need to be overcome.

In addition to the higher technological hurdles, shale developments are also subject to complications such as needing to find large sources of water supply and sand for shale fracking activities.

In practice many of the typical risks faced by the industry are magnified in emerging markets due to the presence of additional challenges such as less developed gas markets, absence of pipeline infrastructure, incoherent or conflicting regulations, an undeveloped local services industry and greater environmental and community concerns.

In view of these challenges, many countries are already taking a more cautious approach to shale developments. Also, regions with higher population density, such as Europe, will face more public opposition to drilling for shale gas.

This may slow down or completely stop developments, as already seen in the cases of France, the Czech Republic, Bulgaria and Hungary, where complete bans on hydraulic fracturing have been implemented.

In order to capitalise on the potential economic boom associated with shale gas riches around the world and ensure sustainable development, energy players need to pay special attention to a series of strategic, commercial, operational and sustainability-related factors. Early access to acreage in promising shale basins will provide strategic advantages.

A properly balanced portfolio of unconventional assets will also help international companies sustain long-term growth. Key skills and technical know-how can be incorporated through acquisitions or alliances. There are many critical technical decisions that can significantly impact the economic returns of a shale development such as choice of drilling equipment, stimulation technologies and well spacing.

Shale developers also need to proactively manage all of the environmental risks linked to these projects, including the consumption of large amounts of water and the potential for contamination of fresh water aquifers. Community concerns must be addressed with a transparent and fact-based approach.

There is no unique recipe for succeeding in the global shale game. Energy players need to carefully select opportunities and build international portfolios that align well with their overall strategic interests and specific capabilities.

While the shale gas space is starting to get crowded in North America, there are still plenty of exciting although perhaps riskier opportunities to choose from around the world.

The reality is that for most global energy companies, unconventional hydrocarbons will represent a significant growth avenue for many years to come.

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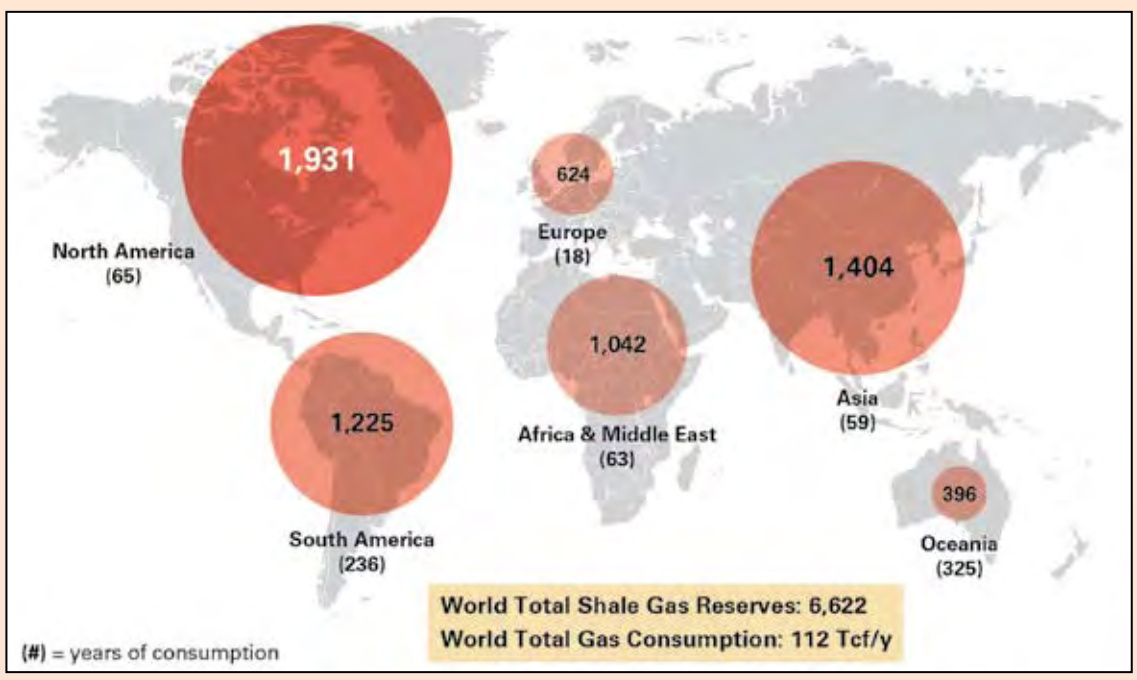
Shale gas technically recoverable reserves (Tcf)



Fossil fuelled power generation without CO_2 air emissions

Work on a new power cycle that could eliminate the need for carbon capture systems on fossil fuelled plants is now under way. Current plans could see the first commercial plant running within five years. **Junior Isles**

The commercialisation of carbon capture and storage (CCS), seen by many as an essential technology in the battle against climate change, is facing an uphill struggle, largely due to costs.

Although it has been proven at pilot scale, the cost of the technology combined with the penalty in efficiency that the capture process inflicts on the power plant has so far proved inhibitive to the widespread development of power plants equipped with CCS.

The economic case for building new coal fired plants or back-fitting existing coal plants with capture technology is daunting enough. The case for equipping gas fired plants with CCS is even harder to justify.

In many developed countries it is already a requirement that new coal fired plants are equipped with CCS, and it is likely that the same will ultimately be applied to gas. And with gas fired plants expected to play a key role in supporting the integration of renewables into the energy mix, finding a solution for tackling CO_2 emissions from gas fired plants becomes even more urgent.

One company that may have found an answer is US-based NET Power LLC. The company is teaming up with Toshiba Corporation, The Shaw Group and Exelon Corporation to develop a new, clean, gas fired power generation technology that uses a new a high-pressure, supercritical, carbon dioxide oxyfuel power cycle that produces pipeline-ready CO_2 and no air emissions without reducing plant efficiency or increasing costs. The cycle is expected to have an efficiency that is competitive with traditional combined cycle gas plants and produce pipeline-ready CO_2, which will improve overall plant economics.

NET Power LLC was formed about three years ago by 8 Rivers Capital, a technology commercialisation firm based in North Carolina. The founders of 8 Rivers are also behind the technology – Bill Brown, a Professor at Duke University School of Law and Dr Miles Palmer, an entrepreneur, engineer and scientist in a range of fields including power, energy, fuels and environmental chemistry.

Having met as students at MIT University, the two got together in 2007 to commercialise new technologies that addressed big markets and problems. Energy was the first sector they decided to tackle.

Walker Dimmig, a spokesperson for NET Power said: "A lot of people are working hard to make clean energy with renewables, but the reality is that fossil fuels will continue to play a large role in the energy mix, particularly in the developing world, due to their low cost and abundance. It's absolutely essential that we find a way to burn these more cleanly."

> "A lot of people are working hard to make clean energy with renewables, but the reality is that fossil fuels will continue to play a large role in the energy mix… It's absolutely essential that we find a way to burn these more cleanly."

With NET Power, 8 Rivers decided to start from scratch. Instead of trying to "fix" supercritical coal, IGGC or natural gas combined cycle power plants, it looked at designing a fossil based system from the ground up that achieves the desired end result.

Dimmig explained: "Everyone has been taking an additive approach whereby systems are integrated with power plants in order to capture or remove pollutants or CO_2. But there are a lot of problems associated with this approach, especially on the cost side."

In 2009, the company teamed up with Rodney Allam, a former head of technology development at Air Products, to work on a new thermodynamic cycle so all the emissions are controlled from the outset.

NET Power stresses that it is not a combined cycle. According to the company, its Allam cycle, named after its lead inventor, removes the steam Rankine Cycle from the process, and improves upon the simpler, more efficient Brayton Cycle. Following a Brayton Cycle-like expansion across its turbine, NET Power recirculates its CO_2 back to the beginning of the cycle in a highly recuperative process. The system eliminates the expensive steam cycle components and avoids the inefficiencies of traditional Rankine cycles.

The Allam Cycle combusts natural gas or synthetic gas (derived from a coal gasification system) with pure oxygen (oxyfiring), as opposed to combusting gas with air. This process generates a relatively pure stream of high pressure carbon dioxide and some water while significantly reducing or eliminating other pollutants such as NOx. At very high pressures, CO_2 exhibits a greater energy density and work output, enabling the cycle to reach extremely high efficiencies.

Following its expansion through a turbine, the working fluid is then cooled through a heat exchanger, and H_2O is separated from it to create a CO_2 stream. The CO_2 stream is pressurised and a major part of this flow is fed back to the combustor to begin the cycle anew. The remaining part of the CO_2 flow can be collected and sent into a pipeline. The need for a separate CO_2-capture system is thus eliminated.

There is therefore no efficiency penalty of adding a capture process, which can typically result in a loss of around 10 per cent in overall electrical efficiency. NET Power believes that the cycle will be highly competitive with today's most advanced natural gas combined cycle plants.

J .M. Bernhard Jr., Shaw's chairman, president and chief executive officer said: "This next-generation technology… will be of great interest to both electricity generating utilities, as well as oil recovery and exploration companies."

The team is currently working to design, develop and manufacture an innovative turbine for this new technology. Commercialisation of the plant is planned under a four-phase programme that will see NET Power, Shaw, Exelon and Toshiba first develop a 25 MW plant.

Phases 1 and 2 involving front-end engineering and design (FEED) and combustor rig testing are expected to be completed in 2012. Phase 3, expected to be completed in mid-2014, involves the construction and commissioning of a 25 MW small-scale natural gas plant that will capture all emissions and will generate revenue from the sale of electricity and carbon dioxide for enhanced oil recovery (EOR). Development of the first 250 MW commercial scale natural gas plant is expected to begin in late 2014 or early 2015.

NET Power will be responsible for overall project development and systems engineering; Toshiba will design, test and manufacture a combustor and turbine; Shaw will provide engineering, procurement, and construction services; and Exelon will support the development and operations of the 25 MW plant.

Commenting on the programme Dimmig said: "A lot of the work we are doing right now is aimed at ensuring the 25 MW plant answers all of our questions for a commercial 250 MW plant."

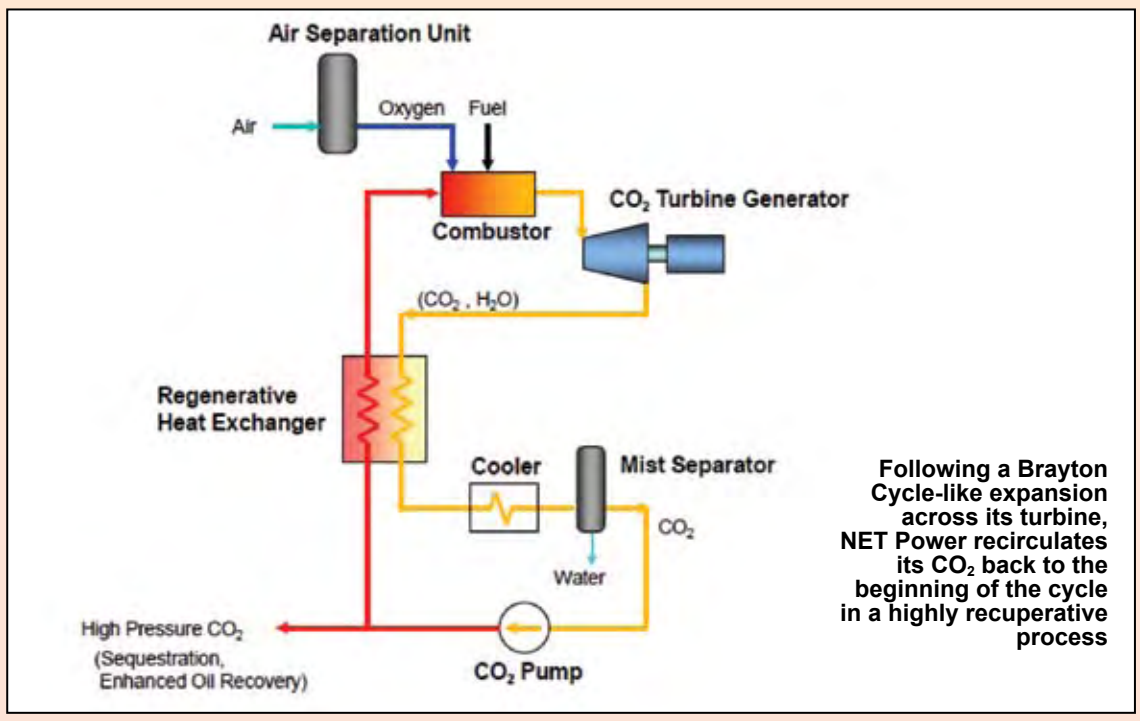
According to NET Power, the 25 MW plant will validate all the major components and demonstrate the entire process, including everything from electricity generation and sales, to sale of CO_2 for EOR. "It will prove-out the entire system," noted Dimmig.

As milestones are completed for the four phases, Shaw will invest up to $50.4 million in cash and in-kind services and will acquire up to 50 per cent of NET Power LLC, to obtain exclusive worldwide rights to engineer, procure and construct NET Power plants. Exelon, the largest competitive power generator in the US, will provide and obtain permitting for the test site, test and commission the facility, market its output, supply fuel and provide other operations and maintenance support.

Exelon will have options for the first full-scale commercial plants when development is complete. Although this is expected to be about 250 MW, the final size could change depending on feedback from potential customers.

NET Power believes it can move the technology to commercialisation quite quickly. It says that apart from the turbine and combustor, the plants will utilise off-the-shelf equipment. "It is a unique configuration of existing technologies and turbine knowledge," said Dimmig.

Although these are early days, NET Power is already evaluating the future technology path. The initial application of the technology will use natural gas. Future variants of NET Power are expected to be capable of using coal as the fuel source with existing, commercially available gasifiers. This, said Allam, will allow the world to employ a process that produces even cheaper electricity than existing coal technologies while eliminating emissions.



Following a Brayton Cycle-like expansion across its turbine, NET Power recirculates its CO_2 back to the beginning of the cycle in a highly recuperative process

Junior Isles

Life is full of compromises

Speaking on compromise, Sir Winston Churchill once said: "The English never draw a line without blurring it." Churchill may have died nearly 50 years ago but his words still ring true.

The recent compromise reached between the UK Treasury, headed by George Osborne, and the Department of Energy and Climate Change (DECC) led by Ed Davey, may leave both factions in the coalition government claiming some sort of victory but perhaps blurs the UK's future energy landscape.

Osborne had been demanding cuts of up to 25 per cent on the onshore Renewables Obligation Certificates (ROCs) used to subsidise renewable power. DECC argued that such a deep cut would harm the sector and insisted on a lower reduction of 10 per cent.

In the end an agreement was struck whereby Osborne agreed to a 10 per cent reduction – in the short term. In return, the coalition would not legislate on decarbonisation targets for 2030. Osborne also secured a "review point" in 2013 where the cost of onshore wind ROCs will be reviewed – and if necessary – the scope for further reductions could be assessed.

DECC also agreed to commit to the long term use of gas for power generation – a concession that has not gone down well with environmentalists.

Responding to the news that DECC had confirmed the level of support the government plans to offer the onshore wind sector, WWF-UK said that the 10 per cent reduction was the "common sense decision" but questioned why the government had taken so long to reach it.

Keith Allott, head of climate change at WWF-UK, said: "This is a common sense decision by DECC and Ed Davey, but as far as victories go, it's a skirmish in the ongoing battle with the Treasury that is turning energy policy into a political football."

WWF also highlighted concerns that the government was continuing to back gas. Davey said there would be a £500 million tax break for offshore gas fields – in addition to the £3 billion announced in the March budget. WWF said that the support for the gas industry dwarfs the sums involved in the row over support for renewables.

Allott said: "The Committee on Climate Change has made it clear that the power sector needs to be nearly carbon-free by 2030, and that a new "dash-for-gas" is neither economically sensible nor compatible with our legal carbon budgets. The Treasury is forcing DECC to take a massive gamble that gas prices will come down, on the basis of no credible evidence, while subjecting renewable energy technologies to continual review and uncertainty."

> "Committee on Climate Change says the targets are needed for the government to hit its carbon targets"

It is a fair argument that banking on gas is a gamble in terms of future energy prices. Logic dictates that gas prices will naturally continue to rise. On the other hand, they could come down significantly as they have in the US if the UK is able to exploit its reserves of shale gas. But as Davey says, the extent to which unconventional gas production will develop is by "no means certain".

Fracking has met with controversy, and in Lancashire there have been local protests following earthquakes that resulted from exploratory drilling at four sites by Cuadrilla Resources. DECC is expected to allow drilling to restart in October.

Like WWF, Greenpeace is also unhappy with DECC's decision to support gas as part of its concession to the Treasury. Doug Parr, head of policy at Greenpeace, said: "Osborne's going to hand over hundreds of millions of taxpayers' money to the polluting and pricey gas industry. This is clearly bonkers, for economic and environmental reasons."

Greenpeace and WWF have a point on the environmental issue. The economic argument is not so clear-cut; only time will reveal the direction of future gas prices. However, the issue of a diverse energy mix also needs to be addressed.

The Confederation of British Industry (CBI) gave a more measured response. John Cridland, the CBI's Director-General, said: "The government is right that gas should play a crucial role in any future energy mix. We have argued that there is no need for a false choice between renewables, nuclear, gas, and carbon capture and storage. It's clear from the evidence that we need a diverse supply."

Although DECC's RO banding announcement is good news for the renewables sector and will bring some short-term relief for the industry as a whole, significant challenges still remain with the forthcoming electricity market reform (EMR). Further, the debate on long term carbon targets still has to be resolved.

A draft bill on EMR published in June was recently described by the cross-party Energy and Climate Change Committee as "unworkable" and "vacuous". According to the Committee report the bill, designed to attract £110 billion in investment to build new low-carbon capacity, is likely to scare off investors.

While it blamed DECC for producing a plan that has a dismaying lack of detail and being complex "to the extent of being unworkable", the Treasury came under most fire.

The Committee report says the Treasury has undermined the new 'contracts for difference' (CfD) system intended to give generators a guaranteed minimum price for the low-carbon electricity they produce.

Instead of the state guaranteeing these contracts, the Treasury has proposed spreading the liability across various energy companies and creating a 'synthetic counterparty' – a move that would not only raise the cost of capital for renewables developers, but would add complexity and may not be legally enforceable.

Arnaud Bouillé, Ernst & Young Energy and Environmental Infrastructure Director, commented: "For independent power producers, the availability of long-term off-take contracts remains an issue, affecting the availability and cost of financing. DECC's ongoing consultation on this matter should not only confirm that this is a significant challenge but also identify the need for a continued obligation on UK suppliers to purchase 'green' under the proposed CfD/EMR environment."

The finance ministry has also been accused of obstructing plans to encourage investment in low-carbon energy.

Osborne is urging Davey to legislate to take powers to shut down the renewables "feed-in tariff" subsidy scheme "should that prove necessary". Such talk is unlikely to instil confidence in a solar sector that has seen the government go back on previously promised tariffs for solar installations.

But what looks like it might be a bigger and ongoing point of conflict is the Treasury's current outright resistance to 2030 decarbonisation targets, which it believes would deter investment in gas fired plants.

Although the Committee on Climate Change says the targets are needed for the government to hit its carbon targets, Osborne is against setting "inflexible targets" on the energy sector, describing such targets as "inefficient".

And so the battle on 2030 targets is set to continue in the autumn when Davey finalises the energy bill. Davey said the target "hasn't been ruled out" and would be debated as the energy bill was finalised later in the year.

One government official told the *Financial Times*: "The official line is that there is no agreement… but the status quo is that there are no targets for 2030 and that will remain the case."

As is often the case in politics, a compromise sometimes means to continue the status quo and do nothing at all.

Churchill had another comment on compromise: "They are decided only to be undecided, resolved to be irresolute, adamant for drift, solid for fluidity, all-powerful to be impotent." Never a truer word spoken.