

# THE ENERGY INDUSTRY TIMES

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# EU ETS back-loading proposal likely to face long negotiations



Lidegaard: expecting price to drop once allowances re-introduced

The European Commission's proposal to alter the timing for auctions of emissions allowances is facing tough negotiations. **Junior Isles**

The European Commission's proposal that the timing for the auctions of emissions allowances in the Emissions Trading Scheme (EU ETS) should change – with some auctions being moved to a later date, or 'back-loaded' – is likely to face long negotiations ahead of any approval.

It is hoped that a decision on the proposal, which requires approval by the European Parliament and European Council, will be reached before the end of the year, in time for the next auctioning phase starting at the beginning of 2013.

The changes were proposed by the Commission in response to widespread criticism that the price in the EU ETS is too low to promote the necessary investments in clean energy.

Denmark, which handed over the EU presidency to Cyprus in July, is hopeful that the proposal will gain the majority support it needs from EU

member states in order to be passed.

Denmark's climate and energy minister Martin Lidegaard said: "In the last informal meeting we had during our presidency, there was a very expressed will from many countries to ensure that we have more stable carbon prices."

Lidegaard said it is imperative that Cyprus looks at the long-term future of the EU ETS, but acknowledges it faces a tough challenge. "I really hope that Cyprus will look into the future of the ETS system, but they are on a difficult pathway. During the Danish presidency, we tried to adopt unified conclusions on some of these issues, but encountered opposition on issues such as long-term targets."

Poland has already said it plans to oppose the proposal and its environment minister, Marcin Korolec believes other countries will back its position in the negotiations.

It is not known whether Poland could gain enough support from other member states to block a law change but Korolec said he is "confident there are other countries sharing our point of view".

Speaking to *Environmental Finance* he said: "It's quite strange to have some initiative coming from the Commission now changing this existing piece of legislation. I think it is unacceptable because it's changing the rules during the game by a referee."

"I remember negotiations in 2008 [on the EU's Energy and Climate Package] when we were told we're coming from a post-communist country and don't understand markets and that a market mechanism is the best we can have. And today [the Commission] is proposing something which is completely questioning the market mechanism."

But even if the back-loading proposal

goes ahead, it may not be sufficient to deliver more stable carbon prices.

"Changing the auction profile will have an impact but it is difficult to determine how much. Once the allowances are reintroduced to the market at the end of Phase 3, the price will drop again," said Lidegaard.

The international trade association Climate Markets and Investment Association (CMIA) said it supports the back-load proposal but does not believe it will be sufficient to support the market. Under the proposal, allowances will be re-introduced to the scheme in the final years of Phase 3.

CMIA director Miles Austin said: "We would support a move to cancel the back-loaded allowances because otherwise you are only deferring the oversupply."

"The best approach is to take a three-

Continued on Page 2

## Green Climate Fund under pressure ahead of Doha

US think-tank, the Heinrich Böll Foundation says the UN's Green Climate Fund (GCF) is under "extreme time pressure" to reach key decisions ahead of the UN climate conference in Doha at the end of this year.

According to the timetable set out at last year's Conference of the Parties (COP17) in Durban, countries are to endorse several GCF board decisions at this year's COP18 conference. These decisions include who will be the host nation of the GCF and working arrangements with the COP. The COP is the governing body of the UN Framework Convention on Climate

Change (UNFCCC).

Six countries are bidding to host the GCF administration: Germany, Mexico, Namibia, Poland, South Korea and Switzerland.

The GCF is supposed to start disbursing funds by 2014, but the Durban decision lists more than 50 distinct tasks that the board will have to tackle to get to that point said Liane Schalatek, associate director at the Heinrich Böll Foundation in Washington, DC.

"Nevertheless, the board could opt for disbursing limited funds quickly on a pilot basis, for example by focus-

ing initially on readiness activities," Schalatek noted.

The GCF was scheduled to hold its first Board meeting on August 23-25. According to Schalatek, discussion of the vision and business model of the GCF will have to come in its first couple of meetings, particularly since developed countries see this as a prerequisite for making funding commitments.

But issues relating to financial instruments, how the funds are accessed and the creation of a private-sector facility will have to come after COP18, she added.

Meanwhile at the end of July, a high-level panel established to conduct a policy dialogue on the Kyoto Protocol's Clean Development Mechanism (CDM) concluded its final meeting by developing a set of recommendations for reforming the CDM, after three days of deliberations. The eagerly awaited recommendations cover issues such as the role and value of the carbon markets, sustainable development, regional distribution, governance structure, additionality, appeals and grievance mechanisms as well as the development of new carbon market mechanisms.

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year window and calculate how many allowances there should be in the system at that point. If there are more EU allowances than you would anticipate, then you hold them back from the next auction." This automatic process would be entirely predictable, he said.

David Hone, senior climate change adviser to oil giant Shell commented that although the plan could support carbon prices "at best, the move buys time" for the Commission to gain agreement on changes to Phase IV (2021-28). Auctioning fewer allowances in 2013-15 and potentially re-introducing them in 2016-19 does not address the huge overhang of allowances in the system's third phase, which runs from 2013-20.

He also noted that the plan "doesn't inflame the whole ETS target debate by proposing a full set-aside and cancellation of allowances". This latter step, he said, is what is really needed but "may be politically too big a bite to chew on given the recent animosity over the Low Carbon Roadmap to 2030 and beyond".

"As such, the Commission has opted for something that it thinks can be done today, rather than fighting the bigger fight over targets which it will have to do anyway in the context of Phase IV,"



**The CBI's Dr Matthew Brown says back-loading emissions allowances can only be useful as part of a long-term plan**

said Hone.

The International Emissions Trading Association stated at the end of July that a change to the auction profile seems the only measure to reduce over-supply in the short-term. However, it noted that it is only meaningful if it is done in the context of long term structural reforms, which will take longer to negotiate and implement.

It is a view that is shared by many in the industry. Dr Matthew Brown, the UK's CBI Head of Energy and Climate Change policy, said: "Back-loading emissions allowances can only be useful as part of a long-term plan. Businesses agree that emissions trading is the best way to encourage the investment needed to meet carbon targets. However, the EU ETS is currently out of step with Europe's long-term climate goals, and investors urgently need to see emissions targets for 2030 and beyond."

"The Commission's EU ETS report due in the autumn must provide a blueprint for the future of the scheme, which should include ways to protect energy-intensive industries at risk of international competition."



## Companies make nuclear manoeuvres

Plans for new nuclear power plants in emerging countries to meet growing energy demand, combined with the need for decommissioning in Europe, saw some significant announcements by equipment manufacturers last month.

Toshiba Corp. announced that it plans to sell a significant portion of its stock in its affiliate Westinghouse Electric Co., a major US nuclear electric power firm. The move is aimed at winning orders for the construction of nuclear power plants in emerging countries.

Toshiba plans to reduce its 67 per cent stake in Westinghouse to 51 per cent. The top candidate to buy the off-loaded shares is a US firm, but other nuclear-related firms could step forward.

Since the crisis at the Fukushima nuclear power plant it has become

difficult to build new nuclear reactors in Japan, and overseas markets are now considered a lifeline for Japanese nuclear-related companies.

The nuclear crisis has also made it more difficult for them to win overseas orders. This prompted Toshiba to seek a business and capital alliance with a new investor to stabilise the production process and cut costs.

Toshiba's Japanese rivals have already allied with partners. For example, Hitachi Ltd. has joined with General Electric Co. of the United States, while Mitsubishi Heavy Industries Ltd. is a partner of French nuclear giant Areva SA, which receives full support from the French government.

Emerging countries still plan to construct nuclear power plants as their

energy demands are expanding along with economic growth. According to the intelligence firm GlobalData's latest findings, emerging nuclear countries are expected to add more than 95 000 MW in global nuclear installed capacity by 2030.

In China, 57 nuclear reactors are either being constructed or in the planning stage, while India is to construct 63 reactors.

Meanwhile, Westinghouse Electric Company announced that it has signed an agreement with Studsvik AB to offer jointly a full range of decommissioning services for nuclear power plants in Europe under the separate brand name of ndcon, Nuclear Decommissioning Consortium by Studsvik and Westinghouse.

Services will include dismantling, decontamination and waste handling, initially in Germany and Sweden.

In terms of new build the nuclear power industry in developed countries looks somewhat bleak.

Jeff Immelt, CEO of General Electric Co., one of the world's largest suppliers of nuclear equipment recently told the *Financial Times* that nuclear power is so expensive that it is "really hard" to justify.

"It's really a gas and wind world today," Immelt told the newspaper.

"When I talk to the guys that run the oil companies they say look, they're finding more gas all the time. It's just hard to justify nuclear, really hard. Gas is so cheap and at some point, really, economics rule."

## Indian executives face personal penalties over blackout

■ Regulator to make CEO's liable ■ Failure underscores the shortage of investment

The Central Electricity Regulatory Commission (CERC) of India is planning to change the rules on who is liable for utilities withdrawing more than their allotted share of electricity from the grid. The move follows the country's largest ever blackouts at the end of July.

Two blackouts in two days, which affected nearly 700 million people, was blamed on distributors drawing more than their allotted share of power from the grid.

While there is a penalty for overdrawing power from the transmission grid,

known as an unscheduled interchange (UI), states prefer to pay this because it is cheaper to do so than to buy power in the spot market. These penalties are currently imposed on utilities and not on officials, but the CERC now plans to impose the penalties on chief executive officers of power distributors.

In August the CERC summoned the CEOs of the power distribution companies of Delhi, Uttar Pradesh, Punjab, Haryana, Rajasthan, Himachal Pradesh and Jammu and Kashmir.

The power overdrawn by these states is in the range of 3-51 per cent of the

scheduled quota. Overdrawing by Uttar Pradesh has been as high as 43.32 million units (MU) per day. For Haryana and Punjab, this touched 27.83 MU and 18.33 MU per day, respectively, in the month of June 2012.

"We have called a meeting of the CEOs. Imposing a penalty of '1 lakh or '1 crore means nothing for the utilities. We now plan to impose personal penalties on officials who head these overdrawing utilities. It will be a personal fine on them," said Pramod Deo, CERC chairman.

Ratings agency Standard and Poor's

(S&P) said in an August report: "Standard and Poor's Ratings Services believes that a power failure of such magnitude underscores the shortage of investment in India's power sector..."

The blackout was, in our view, a consequence of capacity and infrastructure that severely lag the country's mushrooming demand. While India's installed electricity capacity is growing and its generation, transmission, and distribution infrastructure has improved, particularly at the state level, they have yet to catch up with the country's need for electricity."

## Gasification interest

Air Products is to build and operate what it says will be the world's largest advanced gasification energy-from-waste (EfW) plant. The 50 MW Tees Valley project will be located at the New Energy and Technology Business Park in Teesside in the UK.

The plant is expected to produce enough electricity to power up to 50 000 homes. Located close to landfill disposal facilities, it will divert up to 350 000 metric tons of non-recyclable waste from landfill per year - helping to meet the UK's waste diversion targets.

Air Products has secured the necessary environmental and planning

approvals and the renewable energy facility is scheduled to enter commercial operation in 2014. Work has already begun to prepare the site. Full-scale construction activities will begin ramping up shortly.

The plant will use Westinghouse's advanced gasification technology provided by AlterNRG.

The technology is said to offer a more efficient, cleaner conversion of waste-to-power than traditional EfW technologies and has the potential to generate a wider range of useful products, including heat, hydrogen, chemicals and fuels.

"Advanced gasification has a key role

to play in delivering renewable energy and I warmly welcome the decision by Air Products to proceed with its Tees Valley Renewable Energy Facility. Air Products' announcement reflects the UK's commitment and support for clean energy, combined with our stable and transparent environment for investors," said UK Deputy Prime Minister Nick Clegg.

The announcement marks what seems to be a growing interest in gasification technology.

Last month Ukraine Prime Minister Mykola Azarov said the country is interested in Chinese technology that can generate power via coal gasification.

"The substitution of expensive imported gas with coal is a strategic issue for us. We are interested in the Chinese technology of coal gasification and coal-water fuel production," Azarov said during a meeting with Li Jiping, vice president of the China Development Bank.

In July Ukraine and China signed a protocol on cooperation, which envisages the possibility of opening a special credit line in the China Development Bank for Ukraine's coal industry.

The deal includes building three coal gasification plants in Ukraine and switching utilities from gas to coal slurry and a coal-water mix.

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# Committee gives hope for PTC extension

- CO<sub>2</sub> emissions at 20-year low
- Committee approves "No More Solyndras" Act

Romney: accused of lack of ambition on clean energy



Sián Crampsie

The USA's wind energy industry has welcomed the approval by a US Senate panel of legislation to extend the federal wind power Production Tax Credit (PTC) beyond 2012.

The Senate Finance Committee gave strong bipartisan support to a package of legislation that includes the PTC as well as an investment tax credit (ITC) for offshore and community wind projects. The vote gives hope to the wind industry that Congress will approve the legislation this autumn.

The US wind power sector employs 75 000 people and the industry believes that investment would drop dramatically if the PTC is allowed to expire at the end of 2012.

There is also concern that clean

energy – once a central part of President Barack Obama's policies – has slipped down the agenda in the run up to the presidential election.

Obama supports the extension of the PTC and has campaigned at wind power facilities across the US. His Republican challenger, Mitt Romney, opposes an extension to the PTC.

"We applaud the committee for this act of leadership to move critical policies forward in a difficult environment," said Denise Bode, CEO of the American Wind Energy Association (AWEA).

"This was an extremely important step to provide critical certainty to keep people at work in wind energy manufacturing and construction."

According to the US Department of Energy (DOE), wind turbines powered

nearly one-third of new electricity generating capacity in the USA last year and accounted for \$14 billion in investment. In its *2011 Wind Technologies Market Report*, it warns that the industry would see a "dramatic slowing" in investment if the PTC expires.

The DOE report also says that two-thirds of the equipment installed on new US wind farms in 2011 came from domestic manufacturers, compared with 35 per cent in 2006.

In August, wind turbine manufacturing firms in North Dakota, Arkansas, Colorado and Iowa announced layoffs.

Environmentalists in the USA have criticised presidential candidate Romney for his lack of ambition on tackling climate change. As governor of the liberal-leaning state of Massa-

chusetts, Romney imposed restrictions on carbon dioxide emissions on power plants in the state. But as a presidential candidate, he has said the "idea of spending trillions and trillions of dollars to try to reduce CO<sub>2</sub> emissions is not the right course for us".

In the USA the recent surge in the use of natural gas is thought to have contributed to a drop in carbon dioxide emissions, which are at their lowest level in 20 years, according to the US Energy Information Administration.

Romney's stance on clean energy and the PTC has the support of many Republicans, who have accused Obama of reckless spending in the green energy sector. The arguments have been fuelled by the failure of several solar energy firms that were awarded loan guarantees to help them finance major projects.

Earlier in August the US House Energy and Commerce Committee approved the "No More Solyndras Act", a bill that would ban the DOE from issuing loan guarantees for clean energy projects.

The DOE loan guarantee programme is supporting the construction of some 2700 MW of renewable energy capacity in the US but has been tainted by the bankruptcy of three firms that had received support: Solyndra, Beacon Power and Abound Solar.

The failure of these firms will cost the US taxpayer millions of dollars and has triggered an investigation by the Energy and Commerce Committee. The proposed legislation will not only prevent new loan guarantees from being issued, but will also increase taxpayer protection for loans already issued.

## Westinghouse seeks part in Darlington new build

Westinghouse Electric says that it has been asked by Ontario Power Generation (OPG) to prepare detailed construction plans, schedules and cost estimates for two potential nuclear power reactors at the Canadian utility's Darlington site.

The plans form part of OPG's information gathering process and will help the utility to determine the base load generating option that best fits its needs.

OPG has also asked SNC Lavalin/Candu Energy to prepare similar plans based on its Enhanced Candu 6 reactor design.

Westinghouse will prepare its studies based on two AP1000 reactors. The company recently opened new offices in Toronto, Canada, to help it meet the growing business opportunities in the countries and strengthen its ties with suppliers and customers.

Both Westinghouse and SNC Lavalin/Candu Energy will be given

12 months to produce their reports. The government of Ontario will analyse the reports before making a decision on whether to move forward with the Darlington project.

Ontario's long term energy plan calls for the construction of about 2000 MW of new nuclear capacity to help it meet energy demand.

In the USA, Westinghouse is also moving forward with plans to develop its small modular reactor (SMR) technology, bidding in conjunction with utility Ameren Missouri for up to \$452 million of US Department of Energy (DOE) funds to support its project.

The two companies want to build an SMR-based power plant at the Callaway Energy Centre in Missouri.

■ The US Nuclear Regulatory Commission (NRC) is putting on hold requests for new reactor construction and license renewals after a recent federal court ruling that questioned the

agency's plans for storing radioactive waste. A coalition of two dozen environmental groups sought the delay after a federal appeals court in Washington ruled that the NRC's plans for long-term storage of waste at individual reactors were insufficient. The decision will delay around 19 license requests by utilities.



The Darlington nuclear facility will be the site of two new reactors

## World Bank urges renewables, energy efficiency use

Greater use of renewable energy and energy efficiency would help countries in Central America and the Caribbean to reduce their dependency on oil, according to the World Bank.

All countries in Central America and the Caribbean are net importers of oil, and oil accounts for more than 90 per cent of primary needs, says the World Bank in a new report. This is more than one-third higher than the average for the Latin America and Caribbean region overall and more than twice the global average.

"We estimate that the implementation of a strategy that combines a more diversified power system, better energy efficiency in electricity production and use, and regional integration can significantly reduce Central America and the Caribbean's vulnerability to high and volatile oil prices," said Ede Ijjasz-Vasquez, World Bank Director for Sustainable Development in the Latin America and Caribbean region. "Because of their exposure to oil price fluctuations, less oil dependency can have a positive effect on these countries' fiscal balance and ultimately benefit the poorest sectors of the population."

In August two major renewable energy investments in the region made progress. Green Energy Renewable Solutions signed a letter of intent with Landfill Solutions of Puerto Rico to remediate and manage the Yabucoa municipal landfill.

Meanwhile Centrales Hidroeléctricas de Nicaragua, or CHN, a company formed by Brazilian state-controlled utility Eletrobras and the

Queiroz Galvao conglomerate, announced plans to build a 253 MW hydropower plant in La Cruz de Rio Grande, a city in Nicaragua's Atlántico Sur Autonomous Region.

According to the World Bank, a ten per cent increase in renewable potential capacity in Central America and the Caribbean could lead to savings of 14.2 million and 5.6 million barrels of diesel and heavy fuel oil, respectively, representing an average reduction of almost one per cent of GDP.

The bank also says that Nicaragua and Jamaica would achieve the largest fuel savings by taking advantage of energy efficiency strategies. For Honduras, supply and demand-side efficiency gains would lead to savings of up to one per cent of GDP, and nearly 1.5 per cent of GDP for Nicaragua and Jamaica.

**Renewables could help Central America and the Caribbean countries reduce their dependency on oil**



## California dedicates new gas plant

A new power plant dedicated in California in August will help to pump water across the state as well as run commuter trains.

The 300 MW natural gas fired Lodi Energy Center will be among the most efficient in the state, according to the Northern California Power Agency (NCPA).

NCPA's member utilities and other partners have invested \$400 million in the new facility, which will supply one-third of its energy to the California Department of Water Resources to pump water from the Sacramento-San Joaquin Delta.

An additional 6.6 per cent of energy from the Lodi plant will go to the Bay Area Rapid Transit District. The rest will be split among ten publicly owned utilities across the state.

The new plant was supplied by Siemens, which installed its SCC6-5000F 1x1 Flex-Plant power island at the site. The plant is designed to deliver approximately 200 MW of power to the grid within 30 minutes, enabling NCPA to respond rapidly to changing market conditions.

"The plant's cutting edge technology will help strengthen electrical system reliability as variable renewable

resources continue to be deployed to achieve California's important energy goals," stated James H. Pope, General Manager, Northern California Power Agency during the dedication ceremony.

"Lodi Energy Center will be the first operating Siemens Flex-Plant combined cycle plant in the USA and will contribute to meeting California's ambitious renewable energy and green house gas reduction goals," said Mario Azar, Head of Gas Turbine Power Plant Solutions Americas in the Fossil Power Generation Division at Siemens Energy.

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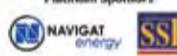
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# Japan still ponders nuclear future

Japan will enlist expert help in assessing public opinion as it attempts to devise a new energy policy. **Syed Ali**

Japan's government says it will seek advice from experts on how to assess numerous opinions received from the public in the process of devising the country's new energy policy following the Fukushima Daiichi nuclear power plant disaster.

National policy minister Motohisa Furukawa said the government has received more than 80 000 public comments since July 2. He said he plans to set up a group of experts later to discuss how the government can appropriately put these opinions "into shape" to ensure fairness and transparency.

The experts are expected to hold several meetings and the government

plans to formulate the country's new energy strategy shortly.

The government has solicited comments and held public hearings nationwide since July on three future scenarios for Japan's reliance on nuclear energy.

The three options for nuclear energy's share of total power generation the government has proposed are zero per cent, 15 per cent and 20-25 per cent by 2030, compared with 26 per cent in 2010.

According to recent reports, the government appears to favour the intermediate 15 per cent option. Given that the 15 per cent is achievable by simply decommissioning reactors after 40 years of operation – something the

government has already committed to do – Environment Minister Goshi Hosono has indicated support for this option, calling it a base scenario.

Hosono is also wary about immediately ending Japan's reliance on nuclear power, saying that expertise in the area should be maintained to deal with the decades-long work to scrap the crippled reactors at the Fukushima Daiichi nuclear power plant.

"Unless we have the knowledge of how to maintain such technology (for decommissioning), we can't simply say that we will be able to abandon nuclear power generation," said Hosono, who is also nuclear disaster minister. He also

stressed the need to consider the risks of relying too much on fossil fuels amid the unstable Middle East situation.

Kenji Yamaji, professor emeritus of the University of Tokyo, said he supports the 20-25 per cent scenario because nuclear power can contribute to Japan's energy security and economy, as well as its efforts to combat global warming, in a well-balanced manner.

Meanwhile, Hiroshi Takahashi, research fellow of the Fujitsu Research Institute, said: "Although nuclear power had a certain role to play during the transition period from fossil fuel to renewable energy, it has already fulfilled that role."

Japan's trade and industry minister also believes that phasing out nuclear power completely by 2030 is possible and would not be a drag on the domestic economy.

Earlier this year, a government panel forecast that GDP growth could fall by up to 5 per cent by 2030 if the country

phases out nuclear power.

"We can do it," said Japan's Minister of Economy, Trade and Industry Yukio Edano. "I don't think the zero scenario is negative for Japan's economy. On the contrary, it can create growth by driving technological innovation in renewable energy and energy efficiency," he said.

Many Japanese municipalities are already turning their backs on nuclear power and Japan could soon become one of the world's biggest solar power nations, experts say.

An increasing number of Japanese cities have started solar projects in recent months, and there are plans for large-scale solar parks in Hokkaido and Kyushu, energy officials said.

Minamisoma City in Fukushima prefecture – site of the March 2011 Fukushima Daiichi nuclear power plant disaster – recently signed an agreement with Toshiba to build the country's biggest solar park.

## Ratchaburi eyes further regional opportunities

Thai power company Ratchaburi Electricity Generating Holding may increase its investment budget beyond the Baht 7 billion (\$222.6 million) earmarked for this year if opportunities arise as it looks to expand its regional footprint.

The company said its foreign investment plans for this year will focus on Cambodia, Myanmar and Australia.

It is currently studying the feasibility of a 1800 MW power project in Cambodia, Chief Executive Noppol Milinthangoon said.

Besides power plants, Ratchaburi Electricity plans to acquire coal mines in Australia and Indonesia, Mr. Noppol said.

The company has set a target to raise

its power capacity to 7800 MW by 2016 from 5220 MW at present.

Ratchaburi currently has an 80 per cent stake in Ratch-Australia Corporation Limited, which invests in Australia's power industry and holds stakes in several projects in Laos.

■ Ratch-Australia last month accepted Stanwell Corp.'s proposal to terminate a power purchase agreement (PPA) with the company's Collinsville power plant in return for A\$99.57 million in compensation. Collinsville, a wholly-owned plant of Ratch-Australia located in Queensland, is a 40-year old coal-fired plant with a generating capacity of 180 MW, it said in a filing to the Stock Exchange of Thailand. The PPA was set to expire in 2016.

## China demonstrates entire CCS chain

China is the first country able to demonstrate the entire process of capturing carbon dioxide and sealing it in saline aquifers. It has announced that its first carbon capture and storage (CCS) demonstration project, located in north China's Inner Mongolia autonomous region, has sealed off more than 40 000 tonnes of carbon dioxide in the past 15 months.

As an environmental protection project of China's megaton direct liquefaction coal project, the CCS project was listed as a national key technology project and was implemented by China's leading coal company Shenhua Group Corporation Ltd, located in Wulanmulun, Erjinhor Banner, Inner Mongolia.

Shu Geping, general engineer of China Shenhua Coal to Liquid and Chemical Co., Ltd. said experiments and research are still under way and the goal of sealing 300 000 tonnes of carbon dioxide is expected to be realised in June 2014.

The underground saline aquifers in Ordos Basin in Inner Mongolia can store tens of billions of tonnes of CO<sub>2</sub>, and this kind of basin is quite common in China, which means the demonstration project will greatly contribute to reducing China's carbon emissions, said Zhang Dongxiao, dean of the Clean Energy Research Institute of Peking University.

About 80 per cent of China's carbon dioxide emissions come from coal burning. China made a promise to the United Nations that by 2020 the country would reduce carbon dioxide emissions per gross domestic product by 40 to 45 per cent, based on levels observed in 2005.

Researchers with Shenhua said the current CCS technology only stores carbon dioxide but can not generate profits. To popularise the technology, carbon dioxide needs to become a resource that can be utilised and Shenhua has started relevant research, Shu said.

# Australia looks beyond domestic carbon market

- Talks to link cap-and-trade system with EU ETS
- Spot prices "higher than anticipated" since carbon tax introduced

Following the introduction of the carbon tax, the Australian government is already looking ahead to the future evolution of its carbon market. Last month it confirmed it is in talks with the EU to link its cap-and-trade programme – which starts in 2015 – to the EU Emissions Trading Scheme (EU ETS).

An adviser to climate minister Greg Combet confirmed to Environmental Finance that talks were under way to negotiate a link to the EU ETS. He said the issue of how to handle Australia's floor price – which starts at A\$15

(\$15.73) in 2015, and rises 4 per cent a year until 2018, while Europe's carbon price is determined by the market – "is where discussions are going".

"They are very complex negotiations," he said. "We would like to get it done soon," but added that there is no deadline for the talks to conclude.

Having announced its intention last year to link with the EU ETS, Australia is also in talks with New Zealand and South Korea about linking to their respective emissions trading programmes.

The government's decision to put a price on carbon is already having an impact on the power sector.

Australia's largest electricity generator Macquarie Generation was recently accused of forcing up power prices in a move to offset the effect of the carbon tax.

The Australian Energy Regulator said it is monitoring the market after unusually large price rises since the introduction of the carbon tax on July 1.

"Since the commencement of the carbon price, spot prices in the (wholesale) market have been higher than anticipated," it said in a report.

Unusual pricing activity has been noticed in the Victorian and South Australian markets, in addition to Macquarie Generation's activities in the New South Wales market.

Macquarie Generation was not alone, with AGL boosting prices in South Australia with "extreme pricing" also evident in the Victorian and Tasmanian markets, according to the regulator.

In August Australian Prime Minister Julia Gillard called on all the states to reform energy markets, saying electricity prices cannot continue to rise at the levels they have over the past four years.

But Queensland's Energy Minister Mark McArdle said the prime minister was trying to blame "everybody else for her mistakes".

"The carbon tax is biting," he said.





## India looks overseas to meet coal demand

Coal India Ltd., the country's largest coal supplier is looking to invest in assets overseas in an attempt to help solve what is becoming a crisis in its domestic coal supplies.

With coal demand in India growing faster than output, the state-run company is seeking to secure new supply sources and has set aside Rupees350 billion (\$6.4 billion) to acquire assets abroad and to develop its blocks in Mozambique.

It also plans to spend Rupees254 billion during the five-year period through March 2017 to mainly expand production from its mines in India and to create infrastructure for transporting the fuel.

Slow procedures for environment and forest clearances for new mines have hurt Coal India's plans to expand production to meet demand from India's power sector. The company has been actively looking for coal mines in South Africa, Australia and Indonesia since 2010, but has been unable to seal any big deals due to delays in getting government approvals.

Because of its inability to expand production, the firm had earlier said it would be able to fulfil only 65 per cent of the fuel needs of Indian power producers from its current year's production of 464 million t of coal, up from 436 million t last year.

Coal India Ltd has therefore agreed to import 18-20 million t of coal this year and supply 80 per cent of fuel committed to power producers under long-term supply pacts, provided they agree to share among themselves the cost of buying coal overseas and shipping it to India.

Coal India chairman, S. Narsing Rao, said that most power producers had agreed to its proposal for sharing the cost of imported coal.

According to industry group, Association of Power Producers (APP), this will result in an 8-10 paise/kWh increase in generation cost, but will enable power utilities to generate an

additional 32 billion kWh in the current year and an additional 44 billion kWh next year.

India's power utilities are operating at 40-50 per cent of their installed capacity because of coal shortages, according to APP. The increase in supply could push up capacity utilisation to around 75 per cent.

Coal India last month agreed to pay a range of penalties under fuel supply agreements for the coal shortages.

Rao explained: "We agreed to revise the penalty levels and fix them in ranges."

For supplying coal between 80 per cent and 65 per cent of the required amount, Coal India will have to pay a penalty of 1.5 per cent of the coal price to the purchaser with which it has a pact, Rao said.

If the company supplies below 50 per cent of the required amount, it would have to pay a penalty of 40 per cent, he said. There are three more levels at which penalties will be triggered at varying rates.

In a separate development the Australian government last month granted final environmental clearance to a large-scale coal project owned by GVK Power & Infrastructure. GVK plans to invest about \$10 billion to develop the Alpha coal scheme. GVK

aims to export coal from the mine to Asian markets including India.

The Indian government has been criticised for the country's ongoing coal shortage, which is ultimately stunting economic growth.

India's national auditor recently said the government lost huge sums of money by selling coalfields to private companies without competitive bidding. It revealed that 142 coalfields were sold since July 2004 to private and state-run companies. Some of the coal fields bought by private companies in 2004 did not begin production until 2011, while some companies later made large profits by selling the coal mines.

Opposition lawmakers last month slammed the government for not pushing ahead with legislation on auctioning procedures for coal fields that has been pending in Parliament since 2006.

■ Last month Tata Power Co., India's largest private power producer by capacity, reported a sharper-than-expected 66 per cent fall in its quarterly consolidated net profit. Performance was hurt by lower margins on coal sales and higher interest and depreciation costs.

Net profit for the quarter ended June 30 declined to 1.46 billion rupees (\$26.5 million) from 4.30 billion rupees in the year-earlier period, the Mumbai-based company said in a statement.

## Bangladesh finalises nuclear deal

Finalisation of a financing agreement with Russia is a significant step in Bangladesh's plans to build a nuclear power plant in Rooppur.

Under a deal signed in August, Russia is to provide the necessary funding for constructing the plant and Bangladesh

will borrow \$500 million for a technical study with an interest rate of not less than four per cent from Russia.

The \$500 million would be spent in the next two years for the technical study, which would determine how much money would be needed to

develop the plant.

The government plans to build two 1000 MW nuclear plants that will use Russia's latest 'third generation' technology featuring five-layer security measures, according to officials. Each unit is expected to cost about \$1.5-\$2

billion, depending on security features and technology standards.

A delegation led by the Economic Adviser went to Moscow and negotiated with acting Russian Finance Minister to finalise the deal.

The team included State Minister

for Science and Technology Yeafesh Osman, Board of Investment Executive Chairman SA Samad and representatives from ministries of finance, foreign and law, ERD, Planning Commission and Bangladesh Atomic Energy Commission.



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# Germany prepares for nuclear decommissioning

■ EnBW will not challenge government ■ Regulator warns on investment speed

Siân Crampsie

Germany's nuclear power plant operators are finalising their strategies to exit nuclear power plant operation.

EnBW has completed its plans for the dismantling of nuclear power plants in Neckarwestheim and Philippsburg, while RWE has officially submitted an application to decommission and dismantle reactor units A and B of the Biblis nuclear power plant in Hesse.

The nuclear power plants were shut down following the nuclear disaster at Fukushima, Japan, in March 2011. RWE and two other operators of German nuclear power plants – E.ON and Vattenfall – have filed constitutional complaints seeking compensation from the German government over its decision to close the nuclear power plants early.

EnBW has confirmed that it will not file a complaint against the government

over the nuclear phase-out. However, it says that it supports the other utilities' actions against the government.

Both EnBW and RWE have opted for direct dismantling of the nuclear power plants rather than secure entombment. EnBW says that it will carry out the work as soon as possible and has applied to the Ministry for Environment, Climate Protection and the Energy Sector in its home state of Baden-Württemberg for approval to carry out the decommissioning.

It expects to receive this in two years, during which time it will complete some required environmental reviews and prepare facilities to handle the various types of wastes.

EnBW says that it has sufficient funds to carry out the dismantling work at Neckarwestheim 1 and Philippsburg 1. The two plants' second blocks will continue to operate until 2022 and 2019, respectively.

"We are taking note of our responsibility and not putting off the issue of decommissioning work any longer," said Jorg Michels of EnKK, the company that operates the plants for EnBW. "With direct decommissioning we are achieving clarity for the public, employees and our business partners."

EnBW's decision to not file a constitutional complaint against the government's policy to close nuclear plants early is based on the fact that the utility is over 98 per cent publicly owned and "according to case law of the Federal Constitutional Court [EnBW] lacks legal grounds", the company said in a statement.

German Chancellor Angela Merkel's decision to immediately close eight of the country's 17 reactors triggered billions of euros in extra charges for the four nuclear operators in Germany, and will also result in massive investment in new generating capacity and

networks.

In August the German networks regulator warned that the country needs to speed up investments in the country's power transmission networks in order to ensure that it has sufficient capacity to absorb the increase in power from renewable energy.

Germany's inadequate power transmission capacity is generally considered one of the major obstacles to the government's ambitious energy strategy and investments in priority high voltage projects have already been delayed.

The Bundesnetzagentur said that only 214 km of power lines, out of a total of over 1800 km of identified priority projects, have so far been realised. Only two of 24 planned power lines have become operational, with 15 of the projects expected to be delayed by up to five years, the regulator said.

Meanwhile, renewable energy capacity continues to increase.

The German Wind Energy Association said last month that wind power installations in the first half of 2012 were up by one-quarter over the same period last year, and that 2012 as a whole would see a sharp increase compared with 2011.

The wind turbines installed in the first six months of 2012 brought the total capacity to over 30 000 MW, producing 9.2 per cent of the country's electricity, up from 7.7 per cent in 2011.

By 2020, Germany wants to cover at least 35 per cent of its electricity consumption with renewable energy and plans to raise this share to over 80 per cent by 2050.

German Environment Minister Peter Altmaier said in August that more coal and natural gas fired plants would also be needed to meet demand.

## Anomalies force Doel 3 off-line



The Doel 3 nuclear power plant in Belgium will not be restarted if there is a risk that hairline cracks discovered in the vessel housing the reactor core could grow, according to the country's nuclear regulatory agency.

The head of Belgium's Agence Fédérale de Contrôle Nucléaire (AFCN) has met with technical experts from several European countries and has asked Electrabel, the operator of Doel 3, for further analysis of the plant.

Doel 3 was shut down in early August after routine inspections discovered several anomalies, including

possible cracks, in the reactor vessel. The plant is one of seven nuclear plants operating in Belgium and is located 25 km from Antwerp.

It is due to operate until 2022 but would be decommissioned earlier unless Electrabel can prove that the reactor could function safely.

Belgian grid operator Elia said that the prolonged closure of the Doel 3 plant would affect energy security during peak hours of cold winter months.

Belgium plans to close all of its nuclear power plants by 2025.

## Poland redresses biomass balance

Poland wants to reduce the level of co-firing in its coal fired power plants and direct the subsidies paid for using biomass to other renewable energies.

The government has drafted legislation that would reduce the level of subsidy paid for using biomass in coal fired power plants, a policy that has proved lucrative for power plant operators and led to massive imports of biomass.

It wants fiscal support to be directed towards other renewable energy technologies, such as solar photovoltaics (PV), that have been slow to take-off in the country.

Polish power utilities such as PGE Polska Grupa Energetyczna, Tauron Polska Energia and Enea received in total some PLN500 million (\$153 million) in 2011 in subsidies for using biomass such as wood pellets alongside coal in their power plants. Poland imports around PLN1 billion worth of biomass a year and reducing these imports will help to improve the country's trade balance.

Poland is also attempting to reduce

its dependence on coal for power generation by exploiting its shale gas reserves. It is believed to have recoverable shale gas reserves of 12.4-27.4 trillion cubic feet (tcf), and Polish firm PGNiG has already achieved technical shale gas production and aims to start commercial-scale shale gas production in the next two to three years.

Other countries in Eastern Europe, including Lithuania, Bulgaria, Slovakia, Hungary and Romania, are also diversifying their generation mix through renewable and nuclear energy in order to improve energy security.

According to GBI Research, the cumulative installed capacity of these countries will climb from 50 GW in 2011 to 66 GW in 2020, with much of the capacity additions accounted for by nuclear and renewables. Bulgaria is expected to dominate renewable energy growth in the region. From a 2012 installed capacity of 435 MW, Bulgaria will expand its renewable capacity to 2672 MW by 2020

■ Ukraine's government has selected

a consortium of ExxonMobil Corp., Royal Dutch Shell, Romania's OMV Petrom and Ukrainian state firm Nadra Ukrayna to develop an oil and gas field on its Black Sea shelf. The contract is a major step forward in the country's bid to reduce its dependence on Russia for energy and follows the selection of Chevron and Royal Dutch Shell to explore for shale gas reserves onshore.



Poland is attempting to exploit shale gas reserves

## UK creates second marine energy park

The Pentland Firth and Orkney Waters in the north of Scotland have become the UK's second marine energy park (MEP) as the country attempts to boost investment in offshore energy technologies.

The new MEP will provide a dedicated space for companies to test

equipment and develop projects and follows the creation of another MEP in southwest England earlier this year.

It will incorporate the European Marine Energy Centre, which already hosts developers from across the world.

"We're delighted to see the government building on the enormous prestige of EMEC and creating another dedicated zone around it for wave and tidal developers to take forward their projects," said Renewable UK's David Krohn. "Work needs to continue to build up the industry so that it can

achieve sufficient volume to reduce costs over the longer term, but this is another important step along the path."

In July new figures from the UK government showed that electricity production from renewable energy sources in 2011 was up by 33 per cent

on the previous year and accounted for 9.4 per cent of all electricity generated in the year. Much of the increase in renewable generation was accounted for by wind energy, statistics show.

Data from the government also shows that the UK's reliance on imported fossil fuels hit a 36-year high.

# Nigeria leads growing genset market

- Egypt hit by blackouts
- Aggreko inaugurates cross-border plant

Diesel generating sets are stepping into the void to help countries in Africa meet growing energy demand, according to a new market report.

Market analysis from GlobalData shows that the growth in African economies coupled with a lack of investment in electricity infrastructure is leading to increased power shortages in parts of the continent.

Nigeria is leading the growth in Africa's genset market, while South Africa, Egypt, Angola and Algeria are also expected to show strong growth in the future.

In August a massive blackout hit Egypt's capital city, Cairo, halting traffic on the roads and stopping train services on the city's metro. The power cut was the latest in a series of power shortages affecting the city over the summer that has led to criticism of the country's new President, Mohammed Morsi.

Various reasons for the power shortages have been given, according to local reports, including theft of high voltage lines, soaring temperatures and corruption by the previous government of deposed leader Hosni Mubarak.

According to GlobalData, the worldwide genset market will almost double in value by 2020 to reach \$22.3 billion, from a 2011 valuation of \$12 billion. The Nigerian market was worth \$450 million in 2011 and is expected to grow to a market value of \$950.7 million by 2020, a compound annual growth rate of 8.7 per cent.

Like many nations in Africa, Nigeria suffers from inadequate generating capacity as well as poorly maintained transmission networks.

In Lebanon, electricity services have been affected by several months of industrial action by contract workers who took over the headquarters of

national utility Electricité du Liban (EDL).

The industrial action resulted in blackouts but was resolved in early August after workers agreed a deal with the government over pay and conditions.

■ Aggreko and its joint venture partner Shanduka Group have officially inaugurated a 107.5 MW gas-fired power plant at Gigawatt Park in Ressano Garcia, Mozambique. Power generated by the facility will supply both Electricidade de Moçambique and South Africa's Eskom. "While this is a temporary power solution to meet the immediate needs of South Africa and Mozambique, it is likely to have a lasting impact. It provides an excellent model for public-private partnership and cross-border collaboration that can be used as a benchmark for future ventures," said Cyril Ramaphosa, Executive Chairman, Shanduka Group.

## Algeria approves electricity plan

Algeria's government is hoping to bring power cuts in the country to an end with a four-year, \$27 billion investment programme.

Minister of Energy Youcef Yousfi said last month that the plan envisaged the addition of 12 000 MW of new generating capacity to the grid by 2016 in order to meet soaring electricity demand.

Installed generating capacity in Algeria stands at around 10 GW, with average peak consumption reaching 7-8 GW. However economic growth combined with a heat wave this summer has pushed peak demand to 9 GW, resulting in power cuts in some regions in the last few weeks.

Electricity demand growth stands at

around 14 per cent, according to the energy ministry, compared with an expected growth rate of just six per cent.

National electricity and gas utility Sonelgaz had planned to add 4 GW to the grid between 2012 and 2016, but Yousfi said that this would be increased by 8 GW.

The power plan also calls for new power plants to be built in three years and for new capacity to be built in the southeast of the country, which has been particularly hard hit by blackouts. The completion of two new power lines as well as two new solar power plants would also help to alleviate power shortages in the short-term, said Yousfi.



Meeting demand: economic growth combined with a heat wave has pushed peak demand to 9 GW, resulting in power cuts

## Uganda hails start-up of Bujagali

The 250 MW Bujagali hydropower project in Uganda has been credited with bringing an end to power shortages in the country.

The new plant achieved commercial operation on August 1, 2012 and will enable Uganda to become almost completely sufficient in electricity supplies. It represents the largest ever private sector investment in Uganda and will also bring economic, social and environmental benefits, according to the government and Bujagali Energy, the partnership that developed the plant.

Named after the Bujagali waterfall on the Nile River, the project has suffered several setbacks over the last 15 years, as well as strong opposition from environmentalists. Uganda is planning to build two more hydropower plants along the Nile.

"The bidding process for the next

project, to be located at the Karuma Falls in northern Uganda, is ongoing," said an energy ministry spokesman. "We are compensating the people who have to make way for this 600 MW dam."

Environmental groups are concerned about the impact on water resources and the environment of building multiple dams along the Nile River. The Bujagali project has been criticised because of its potential effect on Lake Victoria and the fact that it will have little impact on the lives of Ugandans, 95 per cent of whom are not connected to the grid.

Bujagali Energy is a partnership between Sithe Global power and the Aga Khan Fund for Economic Development. It will operate the power plant for 30 years.

The Bujagali project also received assistance from the World Bank.



## US Exim Bank offers South Africa loans

South Africa's Integrated Resource Plan is to benefit from up to \$2 billion of investment from US firms after the US Export-Import Bank and the Industrial Development Corp. (IDC) of South Africa signed an agreement.

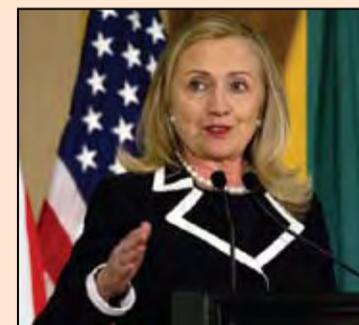
The US Exim Bank has pledged the financing to assist US companies setting up renewable energy projects in South Africa. The agreement was signed during a visit to the country by US Secretary of State Hillary Clinton.

"South Africa is a dynamic market that offers enormous opportunities for American companies," said Fred P.

Hochberg, Chairman of the Exim Bank, which has identified South Africa as one of nine key markets offering great potential for US exports because of its size and economic growth.

Companies that could benefit from the funding, which will consist of 18-year, low-interest loans, include GE, Solar Reserve and Siemens AG.

South Africa's Integrated Resource Plan calls for the construction of 17 800 MW of renewable energy capacity by 2030. The country is the largest economy in Africa and its GDP is expected to grow by 2.2 per cent in 2012 and 2.7 per cent in 2013.



Hillary Clinton signed the deal during a recent visit

## Iran launches solar plant

Iran is reported to be building its first power plant based on solar chimney technology, according to reports by the country's official news agency.

The new plant will be built in the northwest Iranian province of Zanzan and has been three years in the planning, according to the IRNA news

agency.

The location for the facility was selected after a feasibility study examined the potential for locating such plants in cities such as Zanzan and Abadan.

■ Recent research from GBI Research indicates that China, India

and the UAE are driving growth in the market for concentrating solar power (CSP) plants. The global CSP market is expected to grow from a 2011 installed capacity total of some 1546 MW to 47 463 MW in 2020, a compound annual growth rate (CAGR) of 44 per cent.

# Vestas increases job cuts

- Return to profit in Q2
- Order intake affects outlook

Siân Crampsie

Vestas said that 2013 would be even tougher than 2012 as it announced a new round of job cuts to boost cost savings.

The Danish wind turbine manufacturer is struggling with the effects of increased competition, reduced renewable energy subsidies and uncertainty in the US market on its business. It says that it will cut 1400 jobs on top of the 2335 job cuts it announced earlier this year.

Vestas' results for the first half of 2012 showed a return to profit in the second quarter but it has downgraded its guidance for shipments for the full year from 7 GW to 6.3 GW. It has increased its cost savings target by €100 million to more than €250 million.

"The further reduction in the workforce is part of the continued cost saving plans which Vestas has been working on since November 2011," said Vestas CEO Ditlev Engel. "We have said before that 2012 will be tough and 2013 will be even tougher for Vestas, and in order to reach our target of making 2013 profitable, it is unfortunately a necessity."

Vestas posted earnings before interest and tax (EBIT) of €40 million for the second quarter of 2012, an increase on the losses made in the first quarter of the year but down by 48 per cent over the second quarter of 2011. It has retained its full-year guidance of an EBIT margin of 0-4 per cent before special items and revenues of €6.5-8 billion.

Vestas is blaming the projection of reduced shipments on a lower order intake in the first half and delays in grid

connections in China. Its financial position has led to speculation that the company could become the subject of takeover bids and analysts believe that customers may opt for Siemens or GE products until Vestas is on firmer footing.

In the USA, Vestas last month began workforce reductions at a tower manufacturing facility in Pueblo, Colorado.

It said in a statement that the move was directly tied to uncertainty over whether the US Congress would extend the wind energy Production Tax Credit (PTC) beyond 2012.

Vestas said in August that it expects 55 per cent of its planned workforce reductions to occur in Europe, the Middle East and Africa, 20 per cent in Asia Pacific and 20 per cent in the

Americas. It is planning to maintain job functions that are directly business and revenue generating.

It also said that it is three months ahead of schedule in its employee reduction programme, and is identifying outsourcing opportunities in order to further improve cost savings. Job cuts will save the firm an estimated €75-125 million in 2012, says Vestas.



## RWE, E.On lament European trading conditions



Terium: conditions "anything but favourable"

German utilities are looking to restructure and mothball unprofitable plants in an attempt to counteract falling sales partly caused by poor trading conditions in Europe.

Siân Crampsie

RWE is intensifying its efforts to improve cost savings in order to maintain its market competitiveness.

The German energy firm has launched an initiative called "RWE 2015" that will see up to 2400 job losses across its business in an effort to improve earnings by €1 billion per year by the end of 2014.

It will also restructure its European electricity generation businesses into a single group headquartered in Germany.

RWE is one of three German energy companies battling the effects of the country's nuclear phase-out as well as a drop in electricity demand. The challenging market conditions led two ratings agencies to cut RWE's long-term ratings in July.

"The present framework conditions are anything but favourable," said Peter Terium, CEO of RWE. "Mounting state intervention in the energy sector, shrinking power plant margins and fierce competition in electricity and gas supply are all challenges we are facing."

RWE managed to improve its earning performance in the first half of 2012 compared with the same period in 2011, which was affected by the German government's decision to permanently close eight of the country's nuclear reactors. In the first six months it maintained revenues at €27.1 billion while EBITDA rose nine per cent to €5 billion.

Electricity sales fell by eight per cent in the first half of 2012 and gas sales fell by 11 per cent. The company has already announced a divestment programme as well as plans for 8000 job losses.

RWE says that it will consolidate its conventional power plants operated by RWE Power, RWE npower and Esent into a single pan-European generating company. This would allow it to "respond more quickly to the rapid pace of change within the electricity market".

In contrast, E.On last month reported a tripling of net profit in the first half of the year, although its results were boosted by a deal with Russia's Gazprom on long-term gas supply contracts and the fact that it took a

larger hit compared with RWE related to nuclear closures in the first half of 2011.

Nevertheless E.On said that falling sales have affected its business and like RWE, E.On is considering mothballing unprofitable power plants. It has pledged to reduce operating costs by €1.5 billion by 2015 and earlier this year announced 11 000 job losses.

E.On is also attempting to expand into emerging markets to counteract poor trading conditions in Europe.

Turnover at E.On's power generation business, which includes fossil fuel and nuclear plants across Europe but not renewable energy, fell 18 per cent to €6.2 billion in the first half of 2012. Its renewables business was healthier, however, driven by "a considerable increase" in installations of wind farms and solar plants, especially in the US.

Sales from E.On's renewables division rose six per cent to €1.2 billion. First-half earnings before interest, tax, depreciation and amortisation (EBITDA) rose 55 per cent to €6.7 billion. It expects underlying net income to reach €4.1-4.5 billion in 2012 and EBITDA to be €10.4-11 billion.

## EDF controls Edison after tender offer

EDF says that it now owns just over 98 per cent of Italian utility Edison following the launch of a mandatory tender offer earlier this year.

The tender offer is the final step in EDF's two-year battle to take control of the group. It says that Edison's minority shareholders have until September 4, to sell their shares to EDF.

EDF has been trying to conclude a deal for Edison for two years but had met with opposition from the utility's Italian shareholders. In June this year the Italian regulator approved an improved offer made by EDF to Edison's Italian shareholders, triggering a mandatory tender offer for the outstanding shares.

EDF will use Edison as a springboard for developing its gas business in Italy.

According to Ernst & Young, the \$7.6 billion EDF-Edison deal has helped to boost the value of global power and utility mergers and acquisition (M&A) activity by 84 per cent to \$47.9 billion in the second quarter of 2012.

In comparison with M&A activity in the first quarter of the year, deal volume also increased—by 20 per cent—and was also boosted by the Tepco transaction in Japan, Ernst & Young

said in its Transactions and Trends report.

"The Tepco transaction is an example of the significant increase in Asia-Pacific deal activity compared to the previous quarter," said Joseph Fontana, Ernst & Young Global Transaction Advisory Power and Utilities Leader.

"Deal volume increased by 140 per cent and deal value escalated from \$3.5 billion in Q1 2012 to \$20.2 billion in Q2 2012, contributing to three of the top ten deals in the quarter."



EDF had been trying to conclude a deal for Edison for two years

## CB&I buys Shaw

CB&I is to move into the nuclear power plant construction market with a \$3 billion deal to buy Shaw Group.

Texas-based CB&I is to buy Shaw for \$46 per share in cash and stock, creating one of the world's largest engineering and construction companies focused on the global energy industry.

CB&I says it will operate Shaw as a business sector under the brand name CB&I Shaw and that the transaction

is "highly compelling". The deal has been approved by the boards of both companies but is still subject to regulatory approval.

Philip K Asherman, president and CEO of CB&I said that the addition of Shaw would make CB&I "fully diversified across the entire energy sector". Shaw is currently building two new nuclear power plants in the USA in conjunction with Westinghouse.

## Tenders, Bids & Contracts

### Americas

#### Toshiba supplies Iowa turbine

Burns & McDonnell Engineering Co has awarded Toshiba Corp a contract to supply a steam turbine for a power plant upgrade project in Iowa state, USA.

The new steam turbine will be installed at the Ottumwa power plant, where it will provide a 14 per cent output improvement compared with the existing steam turbine. Installation will begin in September 2014 and will be completed by the end of that year.

#### Brazil orders ABB substations

ABB has won an order worth around \$55 million to supply three new substations and transmission infrastructure for the Brazilian utility Eólicas do Sul.

The Swiss engineering group will design, supply, install and commission the substations in the southern state of Rio Grande do Sul, bordering Uruguay. The project is part of the government's efforts to increase the share of non-hydro renewable energy in Brazil.

The project scope includes two turn-key 34.5/138 kV substations, one 138/500 kV substation, step-up power transformers and air- and gas-insulated switchgear. ABB will also supply supervisory control and data acquisition (SCADA) and telecommunication systems as well as IEC 61850 compliant substation automation, control and protection equipment.

Step-up transformers will increase the voltage of wind-generated power for integration into the transmission grid. ABB will also supply and install two 138 kV overhead transmission lines to connect a new 400 MW wind power plant, one of the largest in the country, to the national electricity grid.

#### CFPL selects Silver Spring

Brazilian utility CFPL Energia has selected Silver Spring Networks to help implement a smart grid networking project in its distribution area in Brazil.

Silver Spring will deploy its Smart Energy Platform in parts of São Paulo, Rio Grande do Sul, Paraná and Minas Gerais states, enabling CFPL to deploy a robust smart grid infrastructure for a diverse range of commercial and industrial customers.

The project will later be expanded to include residential customers, says Silver Spring.

"CPFL is adopting a Telecom infrastructure technology which will allow introduction of smart grids in Brazil and, for that, we are counting on Silver Spring to set a global benchmark in how we provide our clients with power and information," said Mauro Carmello, Manager of Operations and Automation at CPFL Energia. "We believe that the smart grid system will significantly improve the company's operating efficiency, particularly in terms of energy metering, automation and network operation processes."

### Asia-Pacific

#### Voith supplies Hongping

Voith is to supply a pumped storage hydropower plant in Jiangxi province, China with four 300 MW units, the Germany-based firm has announced.

The €70 million order was awarded by State Grid Corporation of China, the country's largest energy provider. The new plant will enable China's electricity system to cope with the increasing amount of renewable energy

installed on the grid.

The Hongping power plant will generate 1200 MW of energy when its first phase is completed in 2015. A second phase of the project will double the plant's output to 2400 MW, making it one of the largest pumped storage power plants in the world.

There are currently 24 pumped storage hydropower plants in China with a total installed capacity of 18 700 MW, says Voith.

#### MHI wins Chinese order

Mitsubishi Heavy Industries Ltd. (MHI) says that it and its Chinese partner Sinosteel Equipment & Engineering Co. have been commissioned to provide two new power plants to Baotou Iron & Steel (Group) Co., a Chinese state-run producer of steel and rare earths in Inner Mongolia.

The two 150 MW blast furnace gas-fired combined cycle power plants are expected to commence operations in August and September 2014.

In 2005 MHI delivered to Baotou two similar facilities that use exhaust gas from blast furnaces and coke ovens to produce electricity.

#### NBT Pakistan appoints engineer

Scottish renewable energy consultancy, SgurrEnergy, has been appointed as owner's engineer on the proposed NBT Pak 1 wind farm project in Pakistan.

Developer of the project, NBT Pakistan Holdings Ltd. selected SgurrEnergy to provide engineering services including engineer, procurement and construction (EPC) tender document creation, and indicative substation location assessments.

The 250 MW wind farm, located in the Hyderabad area just off the Karachi Hyderabad highway, is targeting to reach financial close by the end of the year in order to begin construction in early 2013.

NBT Pakistan Holdings is a subsidiary of Norwegian wind developer NBT AS.

#### B&W awarded contract in Vietnam

Babcock & Wilcox Beijing Co. Ltd. (BWBC) has been awarded a contract worth more than \$300 million to design and manufacture two coal-fired boilers, boiler auxiliaries and two wet flue gas desulphurisation (FGD) units for PetroVietnam's Thai Binh II power plant in Vietnam.

South Korean engineering and construction firm Daelim Industrial Co. Ltd., the project's lead contractor, selected BWBC to engineer and manufacture the two 600 MW, sub-critical down-shot boilers according to a B&W design. B&W's licensee, Zhejiang Tiandi Environmental Protection Engineering Co., Ltd., will supply both wet FGD units.

Engineering is currently underway at BWBC's facility in Beijing. Both units are scheduled to be completed and operational in 2016.

#### Siemens secures Australian wind farm order

Siemens said that it has secured its first order to build a wind farm in Australia.

The German engineering firm is to deliver, install and commission 90 wind turbines at the Snowtown II wind farm, which is owned by TrustPower, one of New Zealand's largest energy retailers. Siemens will also maintain the wind turbines under a long term service agreement.

Siemens will supply its gearless SWT-3.0 wind turbines for the project. Installation is scheduled to begin in

2013, with commissioning planned for 2014.

The Snowtown II wind farm is located 140 km north of Adelaide in South Australia and will be one of the largest wind farms in the country.

### Europe

#### Voith extends Kops 1

Voith has received an order from Vorarlberger Illwerke AG to modernise and extend the Kops 1 pumped storage hydropower plant in Austria.

Under the contract Voith will supply three new double Pelton turbines and controller components. The project will increase the capacity of Kops 1 by 12 per cent to 276 MW.

The contract is worth around €16 million, says Voith, which equipped Kops 1 50 years ago.

#### Iberdrola awards geological study contract

British company Gardline and GEO of Denmark are to carry out geological seabed surveys for the 400 MW Wiking offshore wind farm after being awarded contracts by Iberdrola.

The two contracts – worth a combined €18 million – are the first step in the construction of the wind farm, to be located in the German Baltic Sea. The findings of the surveys will be used in foundation design for the wind turbines at the facility, which will be one of the world's largest deep-water wind farms.

The Wiking wind farm will cover an area of 34 km<sup>2</sup> and will consist of 80 turbines. Gardline and GEO will employ specially designed vessels to take stratigraphic samples of sedimentary and metamorphic rocks, requiring 63 m boreholes to be drilled. They will also conduct seismic surveys using sound waves to determine the structure of the terrain.

#### Metso renews Rauhalhti automation

Jyväskylän Energiantuotanto Oy (JEO) has signed an agreement with Metso for an extensive automation renewal project at its Rauhalhti power plant in Jyväskylä, Finland.

Metso is to modernise the complete plant automation system with its Metso DNA technology, including the burners ash handling, water treatment and sootblowing processes. The renewal project also includes a plant-wide energy management system, including multipurpose reporting applications as well as a fuel management system. Condition monitoring will be integrated with Metso DNA; it will also monitor the rotating equipment and predict its need for service.

The modernised automation system will have a connection to the Keljonlahti power plant that was started up in 2010. It is JEO's main production facility and also runs with Metso's automation. As both of the plants will be connected to the Metso DNA user interface, the flow of information from one plant to another will be improved and joint control will be possible.

### International

#### Areva wins UAE fuel contract

Areva is to supply the United Arab Emirates with enriched uranium after signing a contract with the Emirates Nuclear Energy Corporation (ENEC).

Under the €400 million contract, Areva will supply enriched uranium to the nuclear power plants under

construction at Barakah, UAE, for eight years. The first of four reactors at the site is due to start operating in 2017.

"Areva is delighted that ENEC has entrusted us with this key part of the commissioning of its first nuclear power plants," said Areva's Luc Oursel. "The deliveries of advanced-stage uranium will contribute to ensuring the long-term supply of fuel to the United Arab Emirates."

#### Estonia to install smart meters

Landis+Gyr and Ericsson Eesti are to install 630 000 smart meters in Estonia after signing a contract with electricity distribution company Elektrilevi.

Ericsson Eesti will be responsible for the implementation of the project, which will extend smart metering to all of Elektrilevi's residential customers by 2017. Landis+Gyr will provide the smart metering infrastructure and will also help Elektrilevi to enhance the efficiency of its electrical network operations.

"The provision of hourly consumption data helps our customers to manage their energy consumption. We can also improve the quality of our customer service and increase customer satisfaction as our service is now based on customers' real-time consumption data," said Mait Rahi, Head of Smart Metering Programme at Elektrilevi.

#### Al Toukhi places ABB GIS order

ABB has won an order worth over \$40 million for high-voltage gas-insulated switchgear (GIS) from the Al Toukhi Group, a leading engineering, procurement and construction (EPC) company.

ABB will supply 420 kV GIS equipment that will form an integral part of the New Muhayil West and Al Omran substations being built in Saudi Arabia for the Saudi Electricity Company (SEC). The substations are scheduled to be energised in June 2014.

Al Omran, located in the eastern part of Saudi Arabia, is part of the Qurayyah independent power producer (IPP) project. New Muhayil, connected to the Shuqaiq and Namera North transmission network, is being constructed to meet the rapidly growing demand for electricity in the southwestern part of the country.

#### Siemens signs up Penspen for EPC services

Oil and gas engineering group Penspen has signed an agreement with Siemens to provide engineering and procurement services for a new simple cycle power plant in Southern Iraq.

Under the terms of the agreement, Siemens will provide the engineering and supply of the power island, and Penspen will provide the remaining engineering and supply of the balance-of-plant (BOP) equipment and materials.

#### Alstom secures Egypt order

The East Delta Electricity Production Co (EDEPC Inc.) has placed an order worth €90 million with Alstom for the supply of equipment for a 650 MW steam cycle thermal power plant near the city of Suez, Egypt.

The scope of the contract includes engineering, manufacturing, erection and commissioning of the steam turbine and generator including auxiliaries like the condenser and the delivery of spare parts. The new plant will be commissioned in 2015.



## Oil

# Tighter third quarter market reflects reduced crude supply

- Talk of measures to stimulate sluggish economies
- Opec members boost production

David Gregory

The price of West Texas Intermediate (WTI) rose during the first three weeks of August to more than \$97/b and Brent rose to nearly \$115/b. The continuing geopolitical debacle with Iran can be held responsible for some of the rise in the price of crude oil as markets worry over supply disruptions should a military move be made by any of the key players in the argument about Iran's nuclear intentions. Furthermore, the escalating war in Syria and its potential to expand throughout the region gives reason to worry.

With the presidential election drawing near in the US, Washington has expressed its concern over rising gasoline prices by stating it is giving consideration to another release of crude from its Strategic Petroleum Reserve (SPR), a move that the Paris-based International Energy Agency (IEA) said would be unnecessary. But in late August the Americans, Europeans and Chinese were talking of implementing some measures to stimulate their respectively sluggish economies. Crude

prices would likely move higher in that case.

The upswing in prices during the third quarter of this year has been attributed to a tightening of the crude market brought about by a rise in demand and shrinking supply.

The sanctions against Iran have been a key factor in this, even though Saudi Arabia and other key Opec members have boosted production in order to keep prices under control.

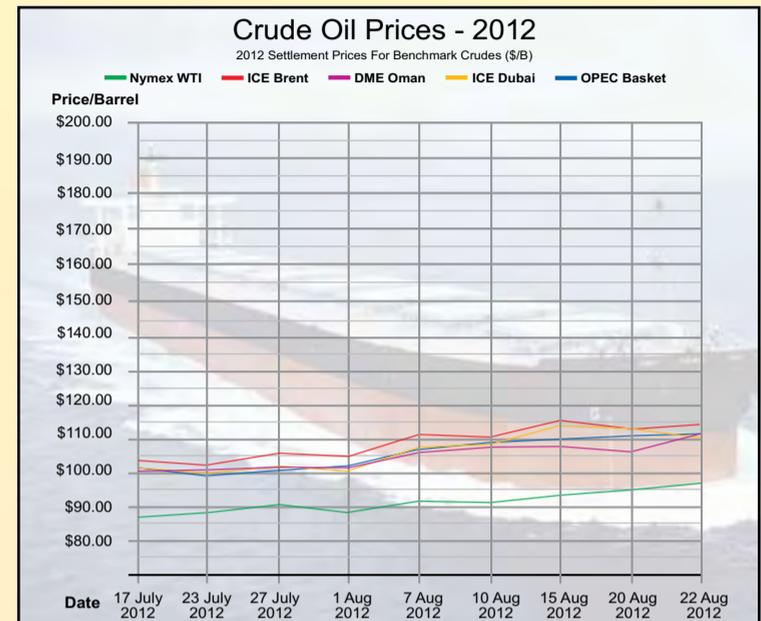
Iranian crude production is reported to be down by about 1 million barrels per day (b/d) to 2.65 million b/d. European countries have stopped their purchases of Iranian crude, but much of the alternative Gulf supply is moving to the Far East and the US, leaving Europe facing a crude shortage similar to the one it faced during the civil war in Libya.

In an analysis of the current oil market, Barclays Research described the third quarter as a "monster," due in part to the fact that demand is seen as reaching 90.7 million b/d, 2 million b/d more than the second quarter. "Demand is being helped by a stronger

performance in the OECD and a seasonal swing in non-OECD demand, including a sharp ramping of Saudi demand in the face of seasonally increased crude, diesel and fuel oil burn use for power generation." Also, non-Opec supply is "set to fall by 300 000 b/d" from its second quarter average, and Opec production looks likely to decline as well, the Barclays report said.

"Putting all that together, [Barclays] estimates that the overall global oil market tightening relative to the second quarter amounts to about 2.4 million b/d, transforming what was a normal rate of seasonal global stock-build as experienced in the second quarter into a draw of about 1.3 million b/d in the third quarter."

Aggregate Opec crude production (including Iraq) declined during July to 28.22 million b/d from 31.43 million b/d in June, according to London-based Centre for Global Energy Studies (CGES). During that same period, Iraqi production rose from 2.93 million b/d to 3.12 million b/d. Non-Opec production is down as well, with



as much as 1 million b/d off the market due to political disruption in Sudan/South Sudan, Syria and Yemen. Production has also fallen in China, Brazil, Columbia and the North Sea.

In its latest *Oil Market Report*, the IEA forecasts that global crude oil demand would rise by 900 000 b/d during 2012 to 89.6 million b/d and by 800 000 b/d in 2013 to 90.5 million b/d. Crude supply rose to 90.7 million b/d during July. Global production during July was 2.6 million b/d above what it was a year ago, with 80 per cent of that coming from Saudi crude and NGLs.

Opec's *Monthly Oil Market Report* forecasts the same growth demand figures for 2012 and 2013 - 900 000 b/d and 800 000 b/d respectively. "World oil demand has overcome earlier

expectations of declining momentum and moved to a more stabilised trend, supported by the summer driving season, the summer heat, and the continued shutdown of most of Japan's nuclear capacity," the report said. Because of this, it said, the 2012 forecast was unchanged as 900 000 b/d, but it added: "There is considerable uncertainty surrounding the forecast for world oil demand in 2013."

It revised slightly downward its forecast for demand for Opec crude for 2012 to 29.9 million b/d, down by about 100 000 b/d from the 2011 level. Demand for Opec crude in 2013 is forecast to average 29.5 million b/d, a drop of 400 000 b/d from the current year and representing a downward adjustment of 100 000 b/d from the previous report.

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# Solar under siege

The global solar industry continues to experience phenomenal growth but trade disputes with China, the eurozone crisis and consolidation will all impact the future outlook.

**James Woollard**

**S**olar panels are supposed to be a product of the future but they are caught up in an old battle between China and the US. Some analysts are warning of a trade war after the US slapped tariffs on Chinese-made solar panels, but are they already in one?

For a number of years US energy companies have complained they cannot compete with the vast amount of 'cheap' solar energy products that are coming from China and flooding the US and other world markets. Companies facing financial troubles or even bankruptcy are looking for a scapegoat, and many of them are pointing at China.

In response to these complaints, the US Department of Commerce recently announced its preliminary decision to impose 'anti-dumping' duties of 31.22 per cent on crystalline silicon photovoltaic cells imported from China. This anti-dumping investigation has led Commerce to explore the option of levying duty fees, or tariffs, against Chinese-made solar goods.

The solar industry, however, is an odd one for the US administration to target. Chinese subsidies have made solar roughly price-competitive as an energy source for the first time, something the supposedly environmentally minded administration would approve of. It now appears the administration wants to make it more expensive.

With China selling more than \$3.1 billion worth of solar cells and panels in the US last year, it is easy to see why it is referred to as a 'dump.'

Obviously the Chinese government is protesting the US anti-dumping tariffs, calling them unfair and damaging to producers and consumers. A statement from the Chinese Ministry of Commerce said Washington's decision sent a 'negative signal' about trade protectionism.

The rest of the solar industry is keen to see the dispute settled. The Solar Energy Industries Association (SEIA), the national trade association representing companies across the solar value chain, recently released a statement saying that the two parties must immediately work together towards a 'mutually satisfactory resolution.'

China-based solar firms, however, have been finding ways to avoid paying the tariff such as transferring solar orders to Taiwan.

Taiwan based solar cell makers have been experiencing rising capacity utilisation rates but indicated that

orders from China-based firms often have unprofitably low quotes. China does not want to give up on the US market because it is one of the fastest growing solar markets in the world but the US Department of Commerce is not making it easy.

This is not the first time Commerce has threatened to impose such tariffs, or indeed carried them out. Protectionism is always controversial, and in today's global economy it is not always easy to know if one country's tariffs might not also harm companies within that same country's borders. For example, some American energy companies that use Chinese-made solar parts might stand to lose profits if they have to buy them at higher margins.

Following the announcement of the tariffs, Beijing mounted a spirited response, with officials accusing Washington of illegally helping its domestic industry and Chinese solar companies teaming up to fight the levies.

At the end of May China's Commerce Ministry said in a brief statement that its investigations of six clean-energy projects in five US states had uncovered violations of international trade law, although it did not go into further details.

The chief executives of four major Chinese solar power equipment companies then announced that they had formed an alliance to fight Washington's allegations, saying the Chinese industry is beneficial to the US. The alliance said US consumers benefit from the lower prices that result from the industry's concentration and competitiveness.

Chinese manufacturers shipped nearly half the world's solar panel's last year, representing more than 10 900 MW, while US supplied just 3 per cent, or about 780 MW.

US policy is not the only challenge for China's solar industry. A study published last year by three scholars at George Washington University estimated that Chinese companies will be able to make 38 per cent more product than they can sell this year and predicted that the question of whether Chinese supply and demand can come into balance will depend on the impact of US import policy and installation of the equipment in China.

The US market even with added costs will survive, as it is currently in a state of boom. A report prepared by GTM Research and the Solar Energy Industries Association showed that in the first quarter of 2012 the US installed 506 MW of photovoltaic panels – the second highest number of quarterly installations ever and an 85 per cent increase from the first quarter of 2011. But more importantly the developers of projects have good margins and can afford to cut back on margins if necessary. The same cannot be said, however, for Chinese developers who have already deeply cut margins.

Furthermore, and adding to China's growing headache, Solarworld AG (SWV), Germany's biggest solar-panel maker, recently said it would file an 'anti-dumping' case against Chinese competitors as part of a group of European manufacturers.

It is an unfortunate situation. China has made a tremendous contribution to making solar a viable energy source for the future, and it produces some very high quality products.

If the tariffs go through, Chinese



**Woollard: China has made a tremendous contribution to making solar a viable energy source for the future**

companies will be left to either raise their prices in the hope of turning a (now lowered) profit, or move their manufacturing centres outside of China to dodge the tariffs.

Whether an energy company in America is smiling or frowning about these potential tariffs largely depends on where they sit in the solar supply

reduction should be possible – assuming a 2.5 per cent average yearly inflation, a modest 1.5 euro cent profit per kWh in the 2020-2045 period and a conservatively estimated yield of 70 GWh/km<sup>2</sup> per year.

So, for Portugal, with €78 billion debt, this would be 1000 km<sup>2</sup> or one per cent of its total territory. And Greece with a

**“One plan to solve the eurozone debt crisis would be to enact concession ‘programmes’ to stimulate investment in renewable energy projects”**

chain. The people who shape steel and silicon into panels might be happy, but those who actually install the finished panels onto rooftops, for example, might be less so.

Meanwhile, the eurozone crisis has had, and will continue to have, a huge impact on manufacturing and trading. Following in the footsteps of Greece, Ireland and Portugal, Spain has become the latest eurozone 'periphery' member to seek EU aid as it seeks to shore up banks ailing from a hangover of bad loans made during the country's housing and property boom.

Eurozone leaders, led by Germany, have taken on a strictly hardline austerity-driven approach to solving the debt crisis. Calls for EU leaders to augment emergency measures taken to date with pro-growth actions have become increasingly strident as it is becoming increasingly clear that strong, strict austerity measures are threatening weaker eurozone members with economic depression.

However, renewable energy offers an avenue for EU leaders to implement the sort of pro-growth measures that can stand the eurozone and broader global economy and environment in good stead, both short and long term.

One plan to solve the eurozone debt crisis would be to enact concession 'programmes' to stimulate investment in renewable energy projects, including solar. This will then offer weaker eurozone periphery countries the opportunity for economic expansion, which will help them reduce bad debt, while benefitting both society and the environment.

The linchpin of the renewable energy stimulus-debt reduction programme would be to convert existing debts into renewable energy concessions.

For example, a 30 per cent debt

€210 billion debt would amount up to 2800 km<sup>2</sup>, which is two per cent of its territory.

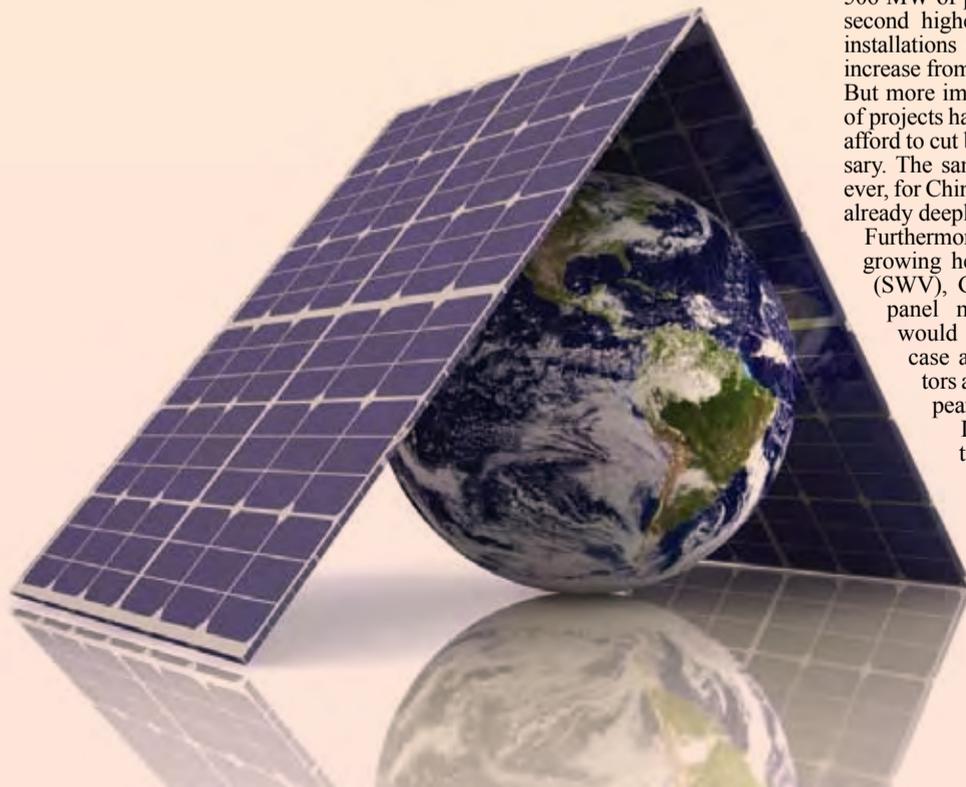
The energy projects do not have to be exclusively large scale and on a few large pieces of land. They could capitalise on vast opportunities for decentralised energy locally as well.

Creditors should be able to exert their concession rights by financing renewable energy projects at a low interest rate with the European Investment Bank (EIB). This would dovetail nicely with the EU's drive to reduce carbon dioxide and greenhouse gas emissions, improve environmental sustainability and reduce fossil fuel consumption.

It is also eminently practical from an operational perspective, as renewable energy projects, like all energy infrastructure, require a significant amount of up-front capital and have very low operating costs over their life cycles. This is particularly the case for renewables, where the cost of fuel for resources like solar is free. A plan like this will only work if creditors are willing to take a long-term perspective, one of at least several decades. The pieces are there, they just need to be put in place.

As for China, there has to be optimism for the country; it is capable of preventing the tariff from hurting it too much. Hopefully the international community – China, the US, Europe and the rest of the world can work together to prevent this from becoming any more of a trade war and debt problem, and instead make it a war against reliance on carbon based fuels and a solution to bad debt.

*James Woollard is Managing Director at Evergreen PV, one of the UK's largest importers and distributors of solar PV kits.*

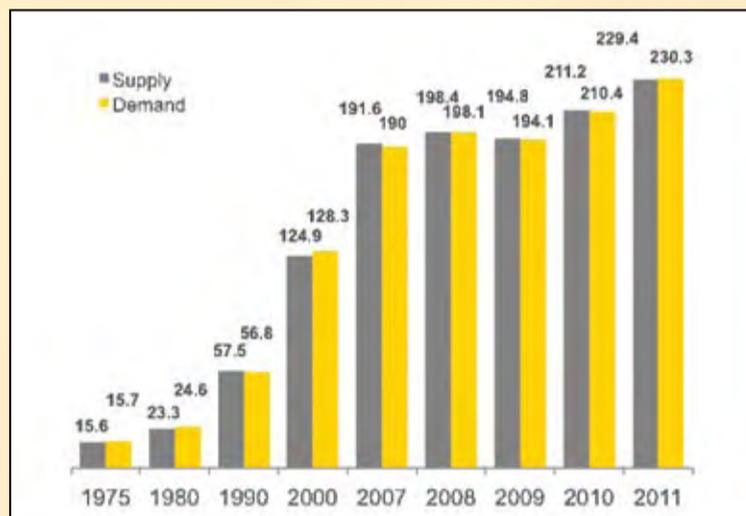


# Turkish temptation

Pushing for EU accession as soon as possible and showing solid prospects for economic growth, Turkey is arguably an even more attractive power market than ever before. **Bülent Ozan**

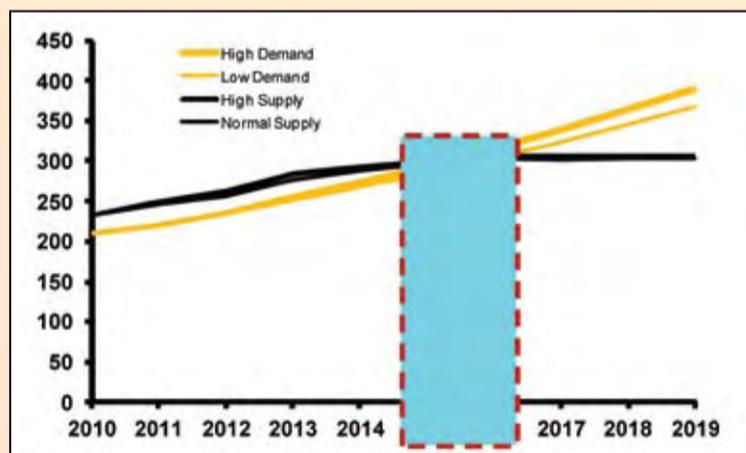
Turkey, with its significant growth potential and increasing population, is one of the fastest growing energy markets in the world. Despite a drop in demand in the early 2000's, associated with domestic economic downturn, demand has grown steadily to date.

Historical supply-demand development (GWh)



Through a competitive marketplace, and with the involvement of private sector participants, the Turkish electricity sector as a whole is progressively reforming, to provide a reliable and cost-effective electricity supply. The expanding working-age population and growing economy indicates

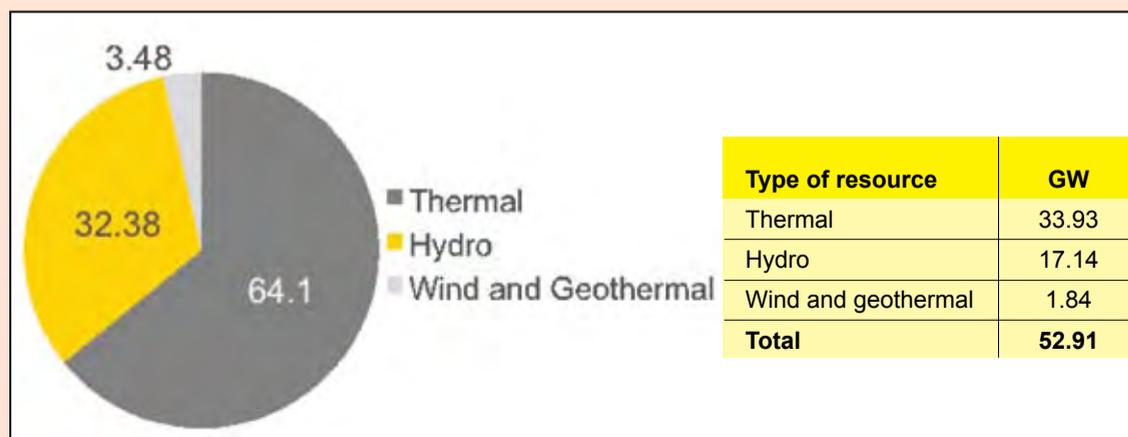
Capacity projection: supply-demand balance (GWh)



strong potential for increased power demand in the medium-to-long term.

This will raise the need for utilities operating in Turkey and the government as a whole to increase the country's generating capacity. While more

Installed capacity (2011, %)



mature power markets in the Central Eastern Europe region have largely refurbished their electricity generator systems, in Turkey significant investments are still required to build new capacity.

So far a capacity problem has not materialised, thanks to the introduction of a balancing and settlement market and decrease in demand as the result of the recent economic crisis. However, even the capacity forecasts, which take into account the projects that are already under construction, show that the Turkish electricity market is set to face a capacity problem by 2016. It should be noted that the 4800 MW nuclear energy plant that has already been ordered will not be in operation till early 2020s.

To tackle this issue, the Turkish government is channelling all efforts towards security of supply via its strategies around renewable energy, privatisation and faster deregulation. It is hoped that this approach will entice new investors into the market, but the big question is whether these efforts will kick-in in time.

One approach being considered by the government to fast-track efforts to plug the gap in capacity is privatising the sector by giving domestic and foreign investors the opportunity to buy into a vibrant market potentially worth billions of US dollars. But previous privatisation efforts in Turkey have seen mixed results. So will it work this time, and what opportunities and pitfalls should investors look out for?

The restructuring measures necessary to attract private capital into the Turkish power sector began with a failed attempt in 2006. The first distribution monopolies were finally privatised two years later when Czech utility, CEZ, and Austria's Verbund each joined forces with a local Turkish partner to buy the attractive distribution businesses.

Other overseas bidders were apparently put off by uncertainty over future tariff changes, but domestic investors were more confident and the prices paid on a per customer basis have rapidly escalated since 2010. Some of the heady prices we have seen may lead to a wave of secondary sales, which could be attractive to overseas investors.

The Turkish government now envisages a new wave of privatisation, involving sales of state-owned generation assets and further distribution businesses. These opportunities are

again drawing serious interest from the leading European utilities. Pushing for EU accession as soon as possible, Turkey is arguably an even more attractive market now, with solid prospects for economic growth, a stable political framework and well developed financial markets.

Most of the country's generation is still under state ownership and this side of the business could be more attractive to overseas investors as the government proposes to privatise close to one-third of total existing generating capacity.

Assets for sale include portfolios of thermal and hydroelectric capacity, and the prospects for 'greenfield' renewable projects have been enhanced recently with the enactment of a separate law framing the incentive regime.

Strong interest is already rumoured from many leading European utilities, but buyers may need to be particularly wary of:

- Actual capacities falling short of nameplate: many generation assets need significant refurbishment to reach nameplate capacity. The watchwords for investors are "Caveat emptor" (buyer beware)

- Off-take: there is no off-take arrangement in the current privatisation plan. The government is reviewing the issue, since investors will need clarity on off-take to secure the best financing terms

- Access to fuel sources: rights to fuel sources for privatised assets are not currently guaranteed. It is expected that key laws clarifying rights to fuel sources will be ratified soon but until these laws are enacted, investors need to be fully aware of the risks.

Foreign investors wanting a long term presence in the Turkish market will undoubtedly look closely at the distribution monopolies, with some prized distribution regions still up for grabs during the privatisation process.

Secondary purchases of distribution regions that have already been privatised may also offer a compelling alternative. These businesses will have already addressed some of the legal issues outstanding at privatisation, and are also likely to have begun the necessary restructuring and change management measures. In either case, a range of issues are likely to warrant significant attention, including:

- The potential for further legislative change, including changes to PPA conditions, remains a significant risk

- Tariff issues: prices are still regulated and Turkey's spot market is not yet wholly dependable for investment signals and use in contracts

- Legal unbundling of distribution and retailing is scheduled to begin by 2013 and may compound uncertainty for the distribution businesses.

Turkey aims to reduce its dependence on fuel imports and at the same time improve its clean energy balance. Nuclear fits well into the equation, as it is seen as cleaner and more reliable when compared to alternative technologies. The plan is that nuclear energy will have a 10 per cent share of the energy mix by 2020.

To date, Turkey has owned and operated a small reactor for research

purposes but it has neither experience with technology nor the trained staff, and is looking for suppliers with good experience that are capable of helping set up its civil nuclear programme.

Construction of the first unit at Akkuyu by the Russian consortium led by Atomstroyexport, a subsidiary of Rosatom is under way. In the engagement for the Akkuyu plant, the Russian Federation will be charged with both construction and operation. It will also train Turkish engineers and provide technological transfer, so that Turkish suppliers can be more active in future projects.

Financing is also a noteworthy aspect: the Russian Federation will incur the entire cost of construction and operation of the nuclear plant. The investment will be recovered through selling a predefined portion of the electricity produced for Turkey at a predefined price.

The events at Fukushima have been closely analysed by Turkish authorities and communication efforts were launched to assure enduring public support for nuclear energy.

The Turkish government is in negotiations with a number of countries for the second planned nuclear power plant for the north of Turkey and there will be a greater emphasis on risk management in future power plant projects.

Training for emergency situations will be improved, passive safety boosted, and back-up systems such as emergency electricity supply and cooling reservoirs also enhanced.

The Fukushima accident is likely to have an impact on the choice of technology for future plants. Turkish authorities may lean towards technologies such as Advanced Boiling Water Reactors, which have more passive safety features that enable faster response time and simple operation.

Despite setbacks, Turkey is showing resilience and a determination to achieve a fully liberalised energy market within the next 10 years.

It still has work to do to attract foreign investors but firm foundations are in place: legislation is catching up. Power purchase agreement (PPA) arrangements, tariff regulation and renewable incentives are becoming clearer and closer to international norms; the energy trading market is maturing; and the regulator EMRA (Energy Market Regulatory Authority) has learned from past mistakes.

The attractions of a fast growing economy and high expected power demand make investment in Turkey's energy sector look tempting, despite some negatives on the regulatory side. But foreign buyers would need to make a large capital investment, which, in the current high-risk market with uncertain returns, they may decide is not yet justified.

The market is complex and foreign investors currently lack the necessary local knowledge to go it alone.

For now, they are more likely to consider gaining exposure to the Turkish market by investing in independent power plants (IPPs) or taking stakes in Turkish utility companies.

Bülent Ozan is Advisory Director, Ernst & Young Turkey

## Technology

# Making the most of waste

There can be tremendous environmental and commercial benefits from treating waste as a feedstock resource, rather than as a problem to be buried in landfill or burned in incinerators. **TEI Times** looks at an innovative technology approach to energy from waste.

As part of a strategy to produce green energy from municipal waste, in April this year UK-based Waste2Tricity (W2T) acquired exclusive rights for deployment of AFC Energy's fuel cells in the UK energy-from-waste sector. Its objective, says the company, is to "apply the most efficient and economical technologies to achieving effective conversion of scrap carbon to electricity".

W2T says that compared to any alternate technology, the significantly higher efficiency of using AFC Energy's technology with high temperature gasification, means it can produce more electricity from the same amount of feedstock.

Peter Jones OBE, chairman of Waste2Tricity (W2T), a Fellow of the Chartered Institute of Wastes Management (CIWM) and until recently the mayor of London's special advisor on waste, explained: "By integrating these alkaline fuel cells with proven conversion technologies we can increase electricity output by up to 130 per cent – from the same amount of feedstock."

only commercially proven technology was the Westinghouse plasma [process] being developed by AlterNRG, which reduces parasitic losses by using the plasma to assist gasification rather than drive it. In our view that remains the same today, a view endorsed by Air Products' selection of Westinghouse for the Tees Valley project."

There are a number of strands to this combination of technologies. Obviously from an environmental standpoint in using scrap [i.e. post recycled] carbon, the more net kilowatt-hours that can be produced from a given input the better – and with developing carbon taxes, lowest cost will follow efficiency. Commercially, as the market for feedstock becomes more competitive, the plant that produces the most value of output will be in the best position to secure its supplies.

Jones therefore describes the process as potentially playing an important role in the reduction of rubbish going to landfill, whilst making a significant contribution to the UK electricity supply.

He added, however, that there is another major benefit. "At the same time as creating clean hydrogen for the fuel cells, plants will generate a stream of capture-ready pure CO<sub>2</sub>." Jones sees alkaline fuel cells as the ideal technology to efficiently produce low, or even negative, carbon electricity once storage technologies are established.

However, Jones believes low appetite for risk among funders means the first W2T-led project will combine plasma-assisted gasification with internal combustion engines (ICEs) to demonstrate the commercial viability of the model with proven technology. The project, known as the Midlands project, will be based on an 80k tonne model and will pave the way for projects using alkaline fuel cells.

Hydrogen fuel cells may be demonstrated on this project to prove the concept for funding purposes, opening the door to future sites delivering around 50 per cent more electricity to the grid. "As a business dedicated to achieving the most efficient conversion of the calorific value (CV) or energy of the feedstock delivered to the plant to busbar electricity supplied to the grid/private customer, the fuel cell offers around 60 per cent electrical conversion efficiency," said Jones.

Jones goes on to explain that projects and technologies must be seen in a strategic context. W2T has identified the 80 000-100 000 tonnes of feedstock waste-to-energy plant as commercially attractive, effective in terms of the proximity principle and also in the number of sites suitable for development.

"The issues," says Jones, "are that large sites, such as Air Products' Tees Valley project, can use combined cycle gas turbines to convert syngas to electricity; [but] with lower volumes of gas, efficiency drops away. Alternative smaller scale technologies, such as ICEs, equally offer efficiency [percentage levels] in the mid-30s on syngas."

"The alkaline fuel cell on the other hand offers hydrogen to electricity efficiency of around 60 per cent and, as it is a modular technology, the scale of project is more determined by the economic scale of the balance-of-plant than by the generating equipment. Alkaline fuel cells will also maintain efficiency through fluctuation in the volume of feed gas, an important property when waste-to-energy plants are dealing with variable CV feedstock."

Following gasification the syngas will be cleaned – removal of particulates, acid gases, volatile metals etc. – with the cleaned gas passing to water gas shift and then separated in a pressure swing adsorption (PSA) unit. The hydrogen fraction feeds the cells, and the CO<sub>2</sub> can potentially be stored subject to national infrastructure developments.

The production of low carbon hydrogen at dispersed sites also offers the opportunity for diversion of gas to vehicle fuelling and other hydrogen economy destinations. W2T sees this type of plant as future proofed. "It is not simply tied to one output, i.e. electricity, but is producing a chemical building block so can adapt as economic circumstances change," noted Jones.

Jones therefore sees geography as an important component in site positioning. "As government grapples with the shift from a centralised to a decentralised power grid we believe waste has an important part to play. Waste-to-energy plants can be sited close to the multiplicity of 1-5 MW demand nodes across the UK, but especially near those in areas demanding high investment in marginal supply line capacity or at distribution grid pinch points, which threaten online supply integrity going forward."

In waste terms this means plant sizes of 50 000-80 000 tonnes, which means less concentrated traffic and fewer logistical impacts than for mega plants. Co-location around data processing centres, docks, airports, transport nodes, food processing centres, exhibition parks and industrial estates resonates with both the job and energy security debate.

All this is taking place at a time of change. In the last five years the market in waste has been transformed. On the supply side the landfill tax, though introduced in 1997, has at last raised landfill gate fees from £12 per tonne to £80 per tonne, with £100 in prospect by 2013.

This rising gate fee has diverted almost 45 million tonnes of material from landfill to other exit routes – currently recycling and anaerobic biochemical transformation in addition to the more traditional incineration. On the demand side, developing markets for recovered materials and uncertainties over the medium term supply capability of the current UK

electricity infrastructure has encouraged risk investment in resource recovery. This change underpins W2T's plans – as gate fees have risen, interest in thermo-chemical conversion routes has expanded.

But other changes are also driving the market. Major waste generators are identifying the opportunity of taking control of this resource and its income opportunity, rather than simply viewing disposal as a cost to the business. And whilst the big six waste companies are reviewing this fundamental shift in handling routes, others are also moving into the space.

"Because no one company has exclusivity of the technological, logistical and end market opportunities, we are seeing the emergence of strategic partnering of the wastecos; partnerships involving, amongst others, civil engineering and finance specialists in changing combinations according to the needs of specific opportunities," commented Jones.

He also notes that those finance specialists have four simple needs to satisfy before money can flow: a feedstock supply agreement; an output off take agreement; appropriate site/planning and the right technology appropriate to the output profile.

"Only then does a project have legs as far as investors are concerned," Jones stated bluntly. Nevertheless, he also believes that W2T's close association with the commercial property sector places it in a position to evaluate the appropriateness of available tenants, feedstock and sites for the chosen technologies.

Jones is equally blunt about the involvement of the big utilities: "Not as interested as we believe they should be. It is easy to grasp their position though. Defensively they wish to protect economies of scale available from 2 GW platforms and the development issues for a 5 MW plant can be as complex as for a 2 GW one. Distributed systems are also more difficult to manage, although waste does have particular advantages in terms of on line 24/7 capability."

For these reasons Jones feels there may be more scope in the immediate future for energy supply companies and single wire deals i.e. direct supply to an end user. "The latter also have attractions in terms of reduced grid losses and therefore higher efficiencies, particularly when the alkaline fuel cell is taken into consideration."

Assessing the changing picture for the UK waste to energy market, Jones said: "No one really understands where the dynamic of the overall energy debate could take us. The impact of shifting transport to an electricity platform; gas grid capacity issues in shifting production from nuclear and coal to gas; population growth pressuring supplies to the southeast and then, climate change impacts, for example. What the need for air conditioning might produce in demand?"

Waste organics currently contribute around 2 GW of capacity from landfill gas and mass burn incineration without heat recovery. According to W2T in the future this energy recovery might expand to 4 GW electrical and 3 GW as heat. But to achieve this it believes plants will need to be high efficiency combined heat and power plants at a scale matching or contributing to local demand.

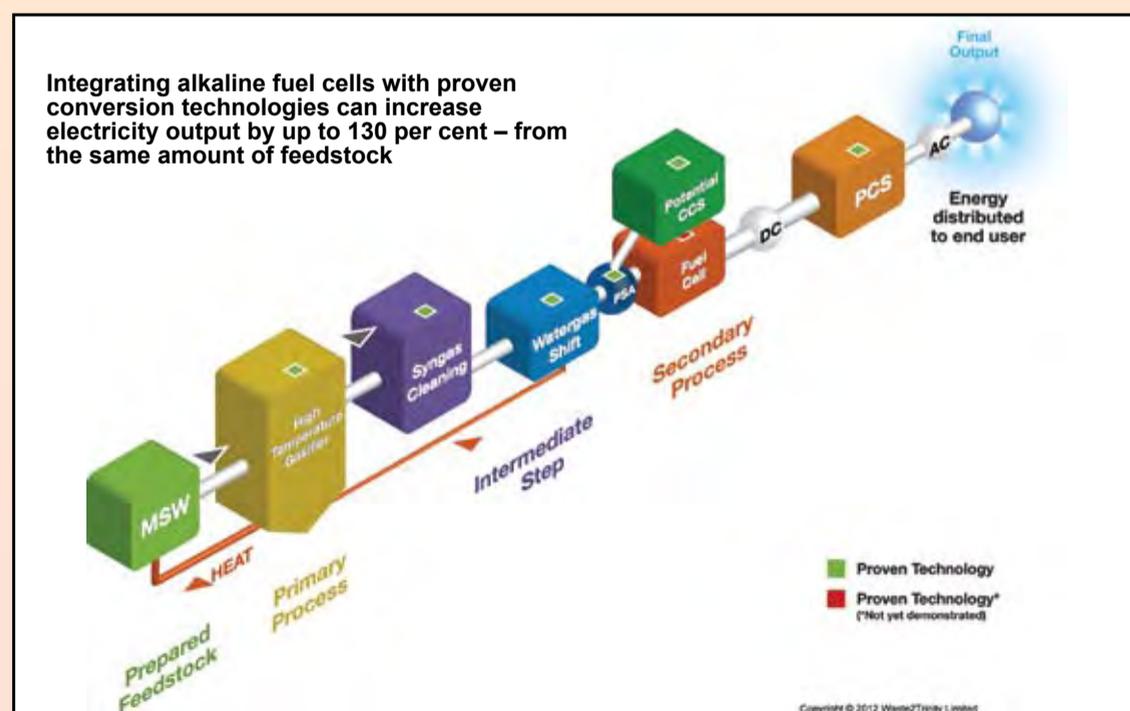
Jones summed up: "As a high efficiency system, plasma gasification combined with alkaline fuel cells offers a strong advantage and we look forward to driving that advantage home in the uncertainties of the coming years."



Jones: waste has an important part to play in decentralised generation

Three years ago W2T identified the need for high temperature gasification, high temperature meaning more than 1100-1200°C, to ensure clean syngas to remove the impact of tars etc. on the clean-up stage but also to maximise the conversion of carbon in the feedstock to useful energy gas.

Jones recalled: "At that time the





Junior Isles

# Silence is not always golden

It is said that ‘Speech is silver; silence is golden’. But there is another quote that is perhaps more apt for the state of the climate change debate and progress with international efforts aimed at tackling the problem in a unified global manner: ‘The most profound statements are often said in silence’.

Despite there being just a few months left until the 18th session of the Conference of Parties (COP18) in Doha, Qatar, there has been relatively little to report on the climate change discussion. Since the climate debate reached fever pitch ahead of Copenhagen in 2009, public and political interest seems to have steadily waned. Compared to the run-up to the last three COP meetings, the pre-Doha public debate has been almost non-existent.

With the Eurozone in crisis and the US focused on the upcoming presidential election, climate change has been pushed down the agenda. Notably there has been little talk on the subject from either US President Barack Obama or Republican presidential candidate Mitt Romney as both campaigns focus on the economy.

Even behind the scenes, the international effort to tackle climate change seems to be an uphill battle. As *TEI Times* prepared to go to press the Global Climate Fund (GCF) Board was set to have its first meeting in Geneva. The GCF was one of the few concrete outcomes of the Copenhagen Accord but the first meeting of the Board has been delayed by several months.

Commenting on prospects for the meeting, Liane Schalatek, associate director at US think-tank, the Heinrich Böll Foundation in Washington, DC said: “Their most important first task will be to regain momentum lost since December.”

Although the fate of billions of dollars promised to developing countries was expected to be discussed in Geneva, key decisions – such as where the fund should be headquartered, who should run it, how it will operate and how it can raise funds – will be delayed for months.

The GCF has been set up as the main channel for industrialised countries to deliver public finance to developing countries. The fund is meant to be the biggest single funding route for the

\$100 billion that developed countries have pledged should flow to developing nations each year from 2020 to help them cut greenhouse gas emissions and adapt to the effects of climate change.

The GCF is supposed to start disbursing funds by 2014, but the Durban decision lists more than 50 distinct tasks that the board will have to tackle to get to that point, Schalatek noted.

Organisational issues will dominate

The panel’s report, which will be submitted to the Parties to the Kyoto Protocol, is expected to urge the adoption of new, far-reaching ground rules to help the CDM meet the challenges of the future.

“Our recommendations convey a sense of urgency that measures need to be taken not only to meet the target of limiting global warming to a maximum of two degrees Celsius above

“... investments in clean energy need to double by 2020 and achieving the 2°C scenario would require \$36 trillion (35 per cent) more in investments from today to 2050”

the agenda initially, Schalatek said, and procedures will have to be established, for example, to deal with decisions where no consensus can be reached despite exhaustive efforts.

A discussion of the vision and business model of the GCF will have to come in its first couple of meetings, particularly since developed countries see this as a prerequisite for making funding commitments, she said.

But issues relating to financial instruments, how the funds are accessed and the creation of a private-sector facility will have to come after COP18, she added.

At the end of COP17 in Durban the EU said it would sign up to an extension of the Kyoto protocol before it lapses at the end of this year in return for an agreement from all nations that a new binding treaty will be finalised by 2015 and enacted by 2020. The EU’s commitment would at least ensure the protocol would not be a toothless treaty following Russia, Canada and Japan’s refusal to adopt new targets. The US has never ratified the protocol.

The extension of the Kyoto targets by developed countries was a key demand from poorer nations, including India, China and Brazil, which have voluntary goals under the protocol and argued they need more time for a shift to mandatory commitments that would impact their economic growth.

Yet in May at a meeting in Bonn, climate change negotiators remained divided over how long the extended Kyoto protocol should operate, with developing countries insisting the treaty should continue to be enforced over five-year commitment periods, and the EU expressing its preference for an eight-year commitment period that would allow it to be replaced by the new international treaty in 2020.

Negotiators for the group of Least Developed Countries (LDCs) and the Alliance for Small Island States believe that an eight-year commitment would allow industrialised nations to delay action to curb emissions.

It is a fair point and one that must be given serious consideration when reflecting on progress thus far.

As Doha and the expiration of the Kyoto Protocol come closer there is still plenty to do. In July a high-level panel established to conduct a policy dialogue on the Kyoto Protocol’s Clean Development Mechanism (CDM) concluded its final meeting by developing a set of recommendations for reforming the CDM. The panel will officially announce its recommendations in mid September.

pre-industrial levels but also to ensure the international carbon markets can support that effort,” said Joan MacNaughton, vice-chair of the panel.

Indeed urgency is the key word. The current lack of political will is having a negative impact on the deployment of clean energy technology.

The International Energy Agency’s *Energy Technology Perspective (ETP) 2012* said that nine out of ten technologies that hold potential for energy and CO<sub>2</sub> emissions savings are failing to meet the deployment objectives needed to achieve the necessary transition to a low-carbon future.

Most worrying is that some of the technologies with the largest potential are showing the least progress. Implementation of energy efficiency measures has been notably slow and there is a distinct lack of progress with carbon capture and storage.

The US and Europe may have made “the economy” the priority, leaving climate change discussions to take a back seat, but the irony is that investing in clean energy makes economic sense. According to *ETP 2012*, every additional dollar invested can generate three dollars in future fuel savings by 2050.

The report said that investments in clean energy need to double by 2020 and achieving the 2°C scenario would require \$36 trillion (35 per cent) more in investments from today to 2050 than under a scenario in which controlling carbon emissions is not a priority. That is the equivalent of an extra \$130 per person every year.

The IEA also pointed out that investing is not the same as spending, noting that by 2025 the fuel savings realised would outweigh the investment. By 2050, the fuel savings amount to more than \$100 trillion. Even if these potential future savings are discounted at 10 per cent, there would be a \$5 trillion net saving between now and 2050, it said. And if cautious assumptions of how lower demand for fossil fuels can impact prices are applied, the projected fuel savings jump to \$150 trillion.

Environmental organisations and other clean energy proponents, along with those tasked with grinding out a global agreement, must at times feel like they have been charged with a Sisyphean task. Yet no matter how many times the boulder rolls back down the hill, the toil must continue and the message must remain loud.

The current silence surrounding the issue is far from golden. Instead it speaks volumes about some governments’ lack of resolve and dedication to the task.

