

# THE ENERGY INDUSTRY TIMES

December 2012 • Volume 5 • No 10 • Published monthly • ISSN 1757-7365

www.teitimes.com

## Highway planning

Building an electricity highway on the three pillars of European energy policy.  
Page 13



## Fuelling the future

Some argue that coal still has a place at the climate change table.  
Page 14



## Final Word

It's time to go from Nero to hero says Junior Isles.  
Page 16



## News In Brief

### Agreement on UK energy policy brings mixed response

After months of infighting the UK coalition government has agreed on key elements of an energy policy aimed at decarbonising its energy sector.

Page 2

### Rousseff faces opposition to reforms

Brazil's plans to reduce consumers' electricity bills could face legal challenges from companies that have invested in the sector.

Page 4

### Funding flows for Vietnam clean energy

The signing of several recent agreements will help provide a much needed boost to Vietnam's ongoing clean energy development effort.

Page 6

### UK government to underwrite subsidies for low-carbon generation

Electricity market reform (EMR) in the UK appears to be on track as its government said it would underwrite a new system of subsidies for low-carbon power generation.

Page 8

### SA renewable energy projects break ground

South Africa is set for investments of R47 billion (\$5.4 billion) in its energy sector after the government signed contracts with renewable energy developers.

Page 9

### Fuel Watch: US shale gas changes global energy scene

The abundance of shale gas in North America has led a number of US and Canadian producers to seek LNG export licenses that will let them sell in better markets, particularly Asia.

Page 12

### Technology: Power without the sag

A new overhead line conductor with a composite carbon core is able to carry about twice the power of a conventional steel-reinforced conductor with almost no sag.

Page 15

## Advertise

advertising@teitimes.com

## Subscribe

subscriptions@teitimes.com  
or call +44 208 523 2573

# Oil and gas boom at odds with environmental goals

Birol: appetite for reforming fossil fuel subsidies has declined in some countries

Massive growth in oil and gas output from North America will help to fuel Asia's appetite for energy but could leave the climate change agenda out in the cold. **Siân Crampsie**

World leaders are failing to implement energy policies that would put the world on to a sustainable energy path that would limit climate change, the International Energy Agency (IEA) has warned.

The Paris-based organisation says that in spite of progress in technology innovation and clean energy policies, fundamental trends of rising global energy demand and the dominance of fossil fuels in the energy mix are likely to persist over the next 20 years.

The IEA's assessment, published in the latest version of its annual *World Energy Outlook* (WEO), was released

just weeks before governments met in Doha, Qatar for the UN Climate Change Conference (COP18).

It indicates that carbon dioxide (CO<sub>2</sub>) emissions will continue to rise in spite of a rapid expansion in renewable energy. Emerging economies such as China and India will drive global energy demand and their appetite for energy will be met by a surge in supplies of oil and gas from North America and Iraq, says the IEA.

"The IEA has delivered yet another sober assessment of our failure to put the world's energy systems onto a sustainable path," said Keith Allott, head

of climate change at environmental group WWF, which also said that the report showed that governments and businesses are "in denial" over the threat posed by climate change and that it was "crazy" that governments still back fossil fuels over renewables.

The IEA's WEO indicates that subsidies for fossil fuels rose by 30 per cent in 2011 to \$523 billion. The trend reflected higher international energy prices and rising consumption of subsidised fuels. Fatih Birol, the IEA's chief economist, said that the appetite for reforming fossil fuel subsidies had also declined in some countries.

By comparison, financial support for renewables in 2011 amounted to \$88 billion, according to the WEO, an increase of 24 per cent over 2010. This is likely to reach \$240 billion in 2035 as renewable energy capacity expands three-fold its 2010 levels by 2035 in the IEA's central New Policies scenario.

Overall, the IEA has forecast that global energy demand will rise by over one-third in the period to 2035, with energy-related CO<sub>2</sub> emissions rising

Continued on Page 2

## Utility earnings will be hit by tighter ETS

Stricter limits on carbon emissions to be introduced in Europe next year will increase carbon liabilities and drag on the earnings of western European power generators.

Under the third phase of the EU Emissions Trading System (EU ETS), which takes effect on January 1, 2013, western European utilities will no longer receive EU carbon emission allowances (EUAs) for free, but will instead have to bid for them at auction.

According to a report titled *'Europe's Tightening CO<sub>2</sub> Emission Rules Add Costs And Uncertainties For Utilities'* by Standard & Poor's Ratings Services, carbon emission liabilities could cost companies between €92 million

(for UK-based Centrica) and €2.5 billion (for Germany-based RWE AG) in 2016.

S&P's credit analyst Michael Wilkins noted: "We believe the utility sector will be the hardest hit among carbon-intensive industries that are subject to Phase III of the EU ETS system. But we think the impact on credit quality associated with carbon exposure under Phase III will vary markedly between high and low emitters of CO<sub>2</sub>. Where utilities fall along this continuum will depend on, among other things, the auction price of EUAs, world events affecting energy supply and policy, individual countries policies on emissions, and companies'

own current energy mix and dependence on different fuels."

S&P's says that utilities' financial exposure could increase even further depending on the outcome of policy changes currently being considered by the European Commission (EC) aimed at driving up the price of allowances.

In mid-November the EC Commission tabled a draft amendment to postpone the auctioning of 900 million allowances from 2013-2015 to later in Phase III of the EU ETS, which ends in 2020. The proposal to 'backload' auction volumes in Phase III takes the form of a draft amendment to the EU ETS Auctioning Regulation, which was submitted today to the EU Climate

Change Committee.

Eurelectric, the organisation representing Europe's electricity utilities, has repeatedly called on the EC to rapidly publish proposals for long-term measures to strengthen the EU ETS. It says that these proposals should be adopted along with an ambitious, firm, long-term, economy-wide, greenhouse gas reduction target for 2030 up to 2050.

The Confederation of British Industry (CBI), the UK's leading business organisation, also recently called for political agreement on a new European energy and climate change package by 2014 to guarantee the future of the EU ETS.

2 | **Headline News**

Continued from Page 1

from an estimated 31.2 Gt in 2011 to 37.0 Gt in 2035. Non-OECD countries will account for 65 per cent of global energy demand by 2035, up from 55 per cent in 2010. China's energy demand will rise by 60 per cent by 2035 and India's demand will double over the same period.

The rapid rise in energy demand will be met by a "sweeping transformation in oil and gas production", said IEA executive director Maria van der Hoeven, that will see a surge in supplies from unconventional and deepwater sources and a "sea-change in global energy flows".

"The USA will overtake Saudi Arabia as the world's largest oil producer by 2020... and will also be a clear leader in gas production by 2015," said Birol. This trend, coupled with Canada's oil sands production will lead to a switch in international oil trade towards Asia. "The centre of gravity [in global energy trade] is moving east," commented Birol.

Oil production in Iraq is forecast to double by 2020 and the country could overtake Russia as the second largest global oil exporter by the 2030s. Some 90 per cent of the Middle East's oil exports will go to Asia by 2035, says the IEA.

According to the IEA, rising supplies of unconventional gas from China, the USA and Australia and a growth in liquefied natural gas



"Sweeping transformation": IEA's Maria van der Hoeven

(LNG) trade will diversify trade flows in natural gas markets. This could put pressure on conventional natural gas supplies, supply routes as well as oil-linked pricing mechanisms. "Trade will grow globally to become more diverse and complex," said Birol.

The IEA's forecasts indicate that CO<sub>2</sub> emissions are on a trajectory that would be consistent with a long-term average global temperature increase of 3.6°C, above the "safe" target of 2°C. While energy efficiency gains in North America and Europe will curb emissions in these regions, emissions in non-OECD regions rise by over half by 2035.

WWF and other environmental groups are urging governments to leave fossil fuel resources in the ground and direct subsidies to renewable energy in order to curb climate change. However, the energy industry maintains that investment in all forms of energy is needed, including the unconventional oil and gas reserves about which environmentalists remain so concerned.

"There is great pressure on oil resources because existing fields are depleting," said Simon Henry, CFO of Royal Dutch Shell speaking at a recent Canada-UK Energy Roundtable in London. "You can't ignore the Canadian oil sands. Production is set to grow because of investment from Europe and China."

Speaking at the same event, Steve Williams, CEO of SunCor Energy, said that Canada's oil sand were "essential to the world's future energy mix".

# Agreement on UK energy policy brings mixed response

The UK coalition government has managed a compromise on energy policy. Although it has been widely welcomed by many, the government has been criticised for not putting long-term decarbonisation at the heart of the policy. **Junior Isles**

After months of infighting, as *TEI Times* went to press, the UK coalition government agreed on key elements of an energy policy aimed at decarbonising its energy sector. The agreement came just a week before details of the long awaited Electricity Market Reform (EMR) were due to be released.

Announcing the agreement, Energy and Climate Change Secretary Edward Davey said: "The decisions we've reached are true to the Coalition Agreement, they mean we can introduce the Energy Bill next week and have essential electricity market reforms up and running by 2014 as planned."

With a fifth of the UK's electricity generating capacity due to close this decade, reforms are needed to provide certainty to investors to raise the £110 billion investment in new infrastructure needed to keep the lights on and continue the shift to a diverse, low carbon economy as cheaply as possible.

Among the key decisions taken are the creation of a government-owned company to act as a single counterparty to give investors confidence to enter into new long term Contracts for Difference (CfD) for low carbon electricity projects.

The government will also have powers

to introduce a capacity market, allowing for capacity auctions from 2014 for delivery of capacity in the winter of 2018/19, if needed, to help ensure the lights stay on even at times of peak demand. The government is also seeking to provide certainty to gas investors and a Gas Generation Strategy will be published alongside the Chancellor's Autumn Statement.

A major criticism of the agreement is that it does not put carbon emissions reduction at the heart of the UK's energy policy. The government has agreed not to set decarbonisation targets for 2030. Instead it will be allowed to take powers to set a decarbonisation target for 2030 in secondary legislation. A decision to exercise this power will be taken once the Climate Change Committee has provided advice in 2016 on the 5th Carbon Budget, which covers the corresponding period (2028-2033), and once the government has set that budget.

Responding to the announcement, John Sauven, Executive Director of Greenpeace, said: "By failing to agree to any carbon target for the power sector until after the next election [UK Prime Minister] David Cameron has allowed a militant tendency within his

own ranks to derail the Energy Bill. It's a blatant assault on the greening of the UK economy that leaves consumers vulnerable to rising gas prices, and sends billions of pounds of clean-tech investment to our economic rivals."

The agreement was, however, widely welcomed by renewable energy groups.

The government announced that the amount of market support available for low carbon electricity investment under the Levy Control Framework (LCF) budget will grow from £2 billion in 2012 to £7.6 billion in 2020 in real terms, or £9.8 billion accounting for inflation. It will now include support for nuclear and carbon capture and storage.

RenewableUK expects this will stimulate at least £40 billion of investment from the private sector.

Maria McCaffery, RenewableUK Chief Executive said: "The news that there is rock solid support across government for renewable energy, and clear evidence that Treasury and the Department of Energy and Climate Change are in step, provide the industry with exactly the kind of assurances we've been calling for."

Renewable Energy Association Chief Executive Gaynor Hartnell, noted: "This should help to draw a line under

the recent politicking, which has been so damaging to investor confidence."

She added, however: "While the commitment of the necessary budget is welcome, the sector urgently requires policy clarity in order to be able to invest."

The REA is particularly concerned about generators' ability to sell their electricity under the new EMR regime. In order to be financially viable under the new feed-in-tariff (FiT) with 'Contracts for Difference' (CfD) mechanism, generators must achieve the 'reference price' for their power sales. It says that evidence suggests this is unlikely to be achieved in the UK's illiquid power market.

Under the new mechanism, the government-owned counterparty will buy electricity at an agreed 'strike price' from low carbon generators. It will top-up revenues for low carbon generators if the wholesale electricity price is below the strike price and claw back revenues if wholesale prices rise above the strike price. The CfD FiT scheme will replace the Renewables Obligation although the two will run in parallel from 2014 until 2017.

The government aims to agree strike prices by the middle of 2013, and have contracts signed from 2014.



Cameron has allowed his "ranks to derail the Energy Bill"

## UK works to drive down CCS costs

The UK is continuing its efforts to drive down the cost of carbon capture and storage (CCS).

Universities and world leading energy and technology companies at the cutting edge of CCS research are among the 13 projects that have been awarded £20 million for innovative projects to reduce the cost of CCS development. The money will come from the UK's £125 million CCS research and development fund.

The innovation awards follow the shortlisting of bidders for the next phase of the UK's £1bn competition to build a commercial scale CCS demonstration plant.

At the end of October, four projects were shortlisted from eight bids received after an evaluation process that considered project deliverability, value for money, and the government's timetable to deliver a cost competitive CCS industry in the 2020s.

The four bids, all full-chain capture, transport and storage projects are:

■ **Captain Clean Energy Project:** A proposal for a new 570 MW, fully abated coal Integrated Gasification Combined Cycle (pre-combustion) project

■ **Peterhead:** A 340 MW post-combustion capture project retrofitted to part of an existing 1180 MW combined



Disappointed: Gillies cannot move forward with Don Valley

cycle gas turbine power station

■ **Teesside Low Carbon Project:** A pre-combustion coal gasification project linked to an approx. 330 MWe (net) power generating facility fuelled by syngas with 90 per cent of CO<sub>2</sub> abated)

■ **White Rose Project:** An oxyfuel capture project at a proposed new 304 MW fully abated supercritical coal-fired power station on the Drax site in North Yorkshire.

The successful projects are now being invited to take part in intensive commercial negotiations with government before decisions are taken in the New Year on which projects to support further.

Three of the UK's shortlisted bids also applied for European Commission funding from New Entrant Reserve

(NER) allowances.

The UK government has written to the Commission to inform them that it is willing to support these projects in the Commission's competition, subject to their ultimate success in the UK competition. The Commission will make a final decision on whether to support a UK CCS project at the end of the year.

Surprisingly 2Co Energy's 650 MW (net) Don Valley project, regarded as the EU's leading CCS project, failed to make the UK competition shortlist.

Lewis Gillies, 2Co Energy Limited's CEO said: "...we are trying to come to terms with how the UK's most advanced project, which has been selected by the EU for funding and is currently sitting as Europe's top ranked project, has not even made it to the UK's shortlist."

In July, Don Valley topped a list of European CCS projects competing for an estimated €337 million share of the €1.3 billion funding available in the EU's NER300 programme.

"We will complete the current phase of the project and meet the knowledge-share obligations of our existing EPR funding from the EU but we cannot take this project further without funding from the UK government," said Gillies.

## Italy energy strategy under discussion

Italy is now debating its recently published energy strategy (SEN) document – the first comprehensive energy plan presented since 1988.

This 116-page document is currently being discussed "so that contributions can come from parliament, research institutions, and social parties (employers, labour unions)".

Economic Development Minister Corrado Passera, who coordinated its drafting along with [Economic Development] Undersecretary Claudio De Vincenti, said that the government has "been engaged in tidying up everything that relates to energy, with the aim of reducing the energy bill and ensuring Italian prices match European prices, particularly at the wholesale level."

One area that is already causing concern, however, is the target for renewables. The report says that in 2020 the largest share of electricity consumption – between 36 and 38 per cent – will come from renewable energy sources.

Environmentalists are questioning this, noting that it is not understood how the increase in renewables will take place, given that one of the main points of the SEN is the cut in incentives to renewables. Prime Minister Mario Monti spoke at length on this issue during a news conference, pointing out the "distortions" caused by incentives.

**platts** | www.platts.com/ceepower | Register by 14 December 2012 and **SAVE UP TO \$500**

31 January - 01 February 2013 | Marriott Prague, Czech Republic

## 7TH ANNUAL Central & Eastern European Power Conference

Financing sustainable development for the CEE power community

**Sponsors:**

**Keynote speakers include:**

<b>Alan Svoboda</b> Executive Director - Sales & Trading <b>CEZ Group</b>	<b>Taavi Veskimägi</b> CEO <b>Elering</b>
<b>Nicola Cotug</b> Director of Power Division <b>Slovenské elektrárne</b>	<b>Bernhard Raberger</b> CFO <b>ENERJISA</b>
<b>Dr Susanne Nies</b> Head of Energy Policy & Generation Unit <b>EURELECTRIC</b>	<b>Inge Bernaerts</b> Head of Unit for Internal Market II: Wholesale Markets, Electricity & Gas. <b>EU Commission</b>

**The 2013 conference will offer and explore:**

- ▶ **Keynote presentations** - Hear C-Level speakers from CEE's leading utility companies including **CEZ, MVM, Elering** and **Slovenské elektrárne** present their visions of national and regional power markets
- ▶ **New players and high growth markets** - Learn about market developments and opportunities in the high growth territories of Turkey - **ENERJISA** - and Russia - **Roland Berger**
- ▶ **Financing power generation in CEE** - Discover more about the financing of projects in the current financial and economic climate from the **EBRD, EFT** and **Kinstellar**, with a special focus on the increased number of Chinese-financed projects most notably in the Balkans
- ▶ **The impact of renewable generation** - Expert analysis from the **EU Commission, EURELECTRIC, Candole Partners** and **Continental Wind Partners** on the current role of renewable incentives and support schemes and how wholesale prices and new build projects are being affected

Platts 7th Annual CEE Power conference is the region's longest running forum attended by C-level representatives of CEE power providers, power plant developers, regulators, traders, financiers and market analysts.

**REGISTER NOW!** [conf\\_registrations@platts.com](mailto:conf_registrations@platts.com) +44 (0)20 7176 6300  
[www.platts.com/ceepower](http://www.platts.com/ceepower) +44 (0)20 7176 8512

Principal media partners:

The McGraw-Hill Companies

**platts** | Register by 14 December 2012 and **SAVE up to \$300**

## 7th Annual European Carbon Capture & Storage

Accelerating the successful deployment of CCS in Europe

31 January - 01 February 2013 • The Tower Hotel by Guoman • London, UK

A snapshot of industry leaders participating in 2013:

<b>The Rt Hon the Lord Oxburgh</b> , KBE, Honorary President, <b>Carbon Capture and Storage Association (CCSA)</b>	<b>Brad Page</b> Chief Executive Officer, <b>Global CCS Institute</b>	<b>Tore Amundsen</b> Managing Director, <b>CO2 Technology Centre Mongstad</b>
<b>Philip Lowe</b> Director General, <b>DG Energy, European Commission</b>	<b>Lewis Gillies</b> Chief Executive Officer, <b>2Co Energy</b>	<b>Charles McConnell</b> Assistant Secretary for Fossil Energy, <b>US Dept. of Energy</b> ; Chair, <b>Policy Group, Carbon Sequestration Leadership Forum (CSLF)</b>

**Attend this industry-leading conference to:**

- Hear the industry's expert leaders discuss what needs to be done to accelerate the successful deployment of CCS in Europe
- Receive critical updates on the current state of CCS policy frameworks in practice from the EU and the UK
- Learn how Europe's leading CCS projects are progressing and the challenges still faced - project updates from **Don Valley, Captain Clean Energy Project, Teesside, Peterhead and White Rose** in the UK, **Belchatow, Poland, Mongstad, Norway, ROAD and Green Hydrogen** in The Netherlands
- Plus: discover how the rest of the world is advancing from the US to China

**SPONSORED BY:**

**Exclusive Networking Reception**  
 SUPPORTED BY: Join us on the evening of Day 1 for our networking reception exclusively hosted by the Global CCS Institute

**SUPPORTING ORGANISATIONS:**

Register Now: WEB: [platts.com/ccs](http://platts.com/ccs)  
 PHONE: +44 (0) 20-7176-6300 EMAIL: [conf\\_registrations@platts.com](mailto:conf_registrations@platts.com)

The McGraw-Hill Companies

**SMART Grids Summit**

28<sup>th</sup>-30<sup>th</sup> January 2013 | Maritim ProArte Hotel, Berlin, Germany

www.thesmartgridssummit.com

DELIVERING SMARTER ELECTRICITY

Join over 150 smart grid experts today for only £1,345  
[www.thesmartgridssummit.com/member](http://www.thesmartgridssummit.com/member)

**Highlighted sessions include:**

- Smart grid and smart solutions in city networks  
*Eric Landeck, Managing Director for Strategy & Regulatory Management, Vattenfall*
- Energy storage applications: gaining momentum  
*Urban Keussen, Senior Vice President Technology & Innovation, E.ON AG*
- Expected benefits of power systems and new opportunity for business models with smart grid roll-out  
*Bernard Delpech, Deputy Director R&D, EDF*
- Virtual power plant as a market platform  
*Ivan Kristian Pedersen, Programme Manager, Innovation-Strategy, DONG Energy*

View the programme [www.thesmartgridssummit.com/programme/](http://www.thesmartgridssummit.com/programme/)

**For more information**  
[sema.tezel@wtgevents.com](mailto:sema.tezel@wtgevents.com) or call us on +44(0)20 7202 7690

\*This offer is only valid until 14th December 2012 and does not apply to confirmed delegates, vendor companies, solution providers or consultants.

## 3rd Annual Electric Energy Storage

Advancing the Technological and Economic Potential of Electric Storage Operations for Real-Time Applications

January 8-10, 2013 | Phoenix, AZ

**“DEVELOP a Market Structure Supportive of Innovation and Economic Viability.”**

Leveraging Energy Storage for Reliable Power System Planning, Operations and Demand Side Management.

**Speakers Include:**

- PJM Interconnection
- NERC
- San Diego Gas & Electric
- Luminant
- MISO
- Pacific Gas & Electric
- Puget Sound Energy
- California ISO

**For More Information, Please Contact:**  
**Michele Westergaard**  
 T: 312-540-3000 ext 6625  
 E: [MicheleW@marcusevanssch.com](mailto:MicheleW@marcusevanssch.com)

conferences



# Oil sands set for new journey

Canada is preparing to ramp up energy production and prove its environmental credentials.

Siân Crampsie

Canada is set to become a major global energy supplier as it continues to develop its vast natural resources, according to industry experts.

The country has the third largest oil reserves in the world, held largely in its vast oil sands deposits, and is also the third largest producer of natural gas in the world.

Investment in oil sands production is set to rise and the country is starting to invest in unconventional gas reserves. Canada could also exploit oil reserves in the Arctic, according to Simon Henry, CFO of Royal Dutch Shell.

“Energy demand is expected to double globally propelled by growth in population and wealth... especially in developing countries,” said Henry at a conference on Canadian energy in London last month. “Canada can become a major global energy supplier.”

Henry noted, however, that “huge investment in infrastructure will be required” in North America to help distribute Canada’s resources not only to the USA but also to other countries around the world. A bottleneck in North American distribution infrastructure has already depressed Canadian oil prices, and the country will need to build pipelines from Alberta to the Pacific coast in order to broaden its export markets, said Henry.

Canada is currently very reliant on the USA for energy exports, with virtually all of its oil and gas exports going south. However, the USA’s import needs are likely to decline as it

ramps up production of its own oil and gas resources and improves energy efficiency.

If Canada builds on its nascent shale gas industry, “it could become a major exporter of LNG to Asia”, said Henry, noting that Royal Dutch Shell has already proposed the construction of a gas liquefaction plant in British Columbia to send LNG to China’s market.

“Canada is in a good position to export gas as LNG. However there is a narrow window of opportunity to exploit,” said Al Monaco, President and CEO of Enbridge Corporation, also speaking at the Canadian Energy Roundtable. “There will be competition from other regions, such as Australia. LNG projects are also very challenging and complex.”

But Canada’s energy investors could face another hurdle in their efforts to produce and export more energy around the world as environmentalists put up fierce opposition against the extraction of both oil sands and shale gas. The EU is also considering a proposal to ban imports of Canadian oil sands products because of greenhouse gas emissions associated with its extraction.

A recent report from analysts IHS indicates that emissions associated with refined products derived from Canadian oil sands are 4-18 per cent higher than those derived from conventional oil sources.

Canada’s oil and gas sector maintains, however, that its environmental stewardship is among the best in the world and is improving. It argues that

the EU’s proposed ban discriminates unfairly against Canadian oil sands. “The public expects much more from oil and gas companies in terms of environment and operational standards,” said Monaco.

Suncor Energy CEO Steve Williams argues that companies operating in Alberta’s oil sands industry have made massive steps forward in environmental performance in recent years. Major achievements include a 30 per cent reduction in water use compared with six years ago, the completion of Suncor’s first land reclamation project, improved energy efficiency and investment in alternative energy.

“We remain committed to that journey but it never ends,” said Williams.

One huge environmental issue for the oil sands extraction industry is tailings – the creation of very fine material that requires large ponds for it to settle. “We have now solved this issue with the development of a benign polymer that allows tailing to settle much faster,” said Williams. “We have now been able to cancel five tailings ponds projects... there is therefore much less land disturbance. Because of the impact of the technology we have given it away free to the industry.”

This type of cooperation in the oil sands region is set to continue through the Canadian Oil Sands Innovation Alliance (COSIA), established by the 12 main producers operating in Canada. “This is the largest collaborative effort of any industry around the world,” said Williams. “It is enabling the industry to move forward.”

## Rousseff faces opposition to reforms

Brazil’s plans to reduce consumers’ electricity bills could face legal challenges from companies that have invested in the sector.

Skagen, a Norwegian minority shareholder in Brazilian energy utility Eletrobras, has said it is considering legal avenues to address new government regulations that it believes will affect the value of its investment.

The move follows a decision by the government of Brazil to force utilities to charge lower rates for electricity in return for having their licenses renewed.

Eletrobras has recommended that its shareholders approve the renewal of

expiring electricity generation and transmission licenses under the new rules. However the company’s share value has fallen in recent weeks and it says that it would lose around BR9.6 billion (\$4.6 billion) in annual revenues under the new licenses.

The Brazilian government argues that utilities will be able to charge lower rates for electricity because investments in power transmission and generation assets have been amortized. It has also agreed to compensate utilities in cases where assets are not fully amortized.

The country’s power prices are among the highest in the world and

President Dilma Rousseff wants a cut in bills as part of wider plans to stimulate the economy.

Eletrobras is government controlled and is thus likely to accept the new regulations. It says it will have to cut costs and improve operating efficiency in order to cope with the new regime.

Other Brazilian companies, including CTEEP, Cemig and Cesp have indicated that they might not apply for their licenses to be renewed by a December 4 deadline. They will be able to continue charging their existing rates for energy but will have to re-bid for licenses when they come up for renewal.

## Polaris membrane offers CCS promise

A company developing a promising post-combustion carbon capture membrane technology is moving forward with a pilot programme to validate the technology.

Membrane Technology and Research Inc. (MTR) has won approval from the US Department of Energy (DOE) to progress to a 1 MW-scale field test after successful completion of preliminary tests.

MTR’s announcement came as another key CCS demonstration programme in the USA said that a carbon dioxide (CO<sub>2</sub>) injection and storage demonstration project in Illinois had completed its first year of operations.

MTR’s technology uses a membrane that can separate and capture 90 per cent of the CO<sub>2</sub> from the flue stream of coal-fired power plants. The company, which was awarded \$18.75 million from the US

economic stimulus package to develop its technology, says that its Polaris membranes have the potential for reduced energy requirements and reasonable costs.

The 1 MW system will be tested at the DOE’s National Carbon Capture Center in Alabama, starting in 2013. Data generated in a 6-month field test of the 1 MW system will be used by MTR to develop a preliminary 20 MW full-scale commercial design in cooperation with their partners, Vec-tren and WorleyParsons.

The Illinois State Geological Survey said last month that 317 000 tonnes of CO<sub>2</sub> had been injected into a saline reservoir in the Mount Simon sandstone over the course of one year.

The project is the first demonstration scale project of its kind in the US and is important to the commercial development of CCS technology in the country.



Carbon capture membrane technology is moving forward

## DOE selects SMR winner

The US Department of Energy (DOE) is embarking on the commercial development of small modular reactors (SMRs) after selecting a consortium to design and license the technology.

An inaugural funding award chose a partnership led by Babcock & Wilcox for a five-year cost-share programme to develop and commercialise SMR technology.

The DOE will invest up to half of the project cost with B&W and its partners at least matching that investment. The DOE will help the B&W venture – known as mPower

– to obtain Nuclear Regulatory Commission licensing with a view to achieving commercial operations of a reactor by 2022.

B&W set up mPower with partners Bechtel and the Tennessee Valley Authority earlier this year to pursue the funding opportunity. The mPower SMR has a capacity of 180 MW and is based on advanced integral pressurised water reactor technology.

TVA is preparing an application to the Nuclear Regulatory Commission to license up to four B&W mPower SMRs at its Clinch River Site in Oak Ridge, Tennessee.



# Australia energy white paper sets out low-carbon path

Australia has set out its pathway to a low-carbon future with the publication of its 2012 Energy White Paper.

The central objective of the white paper is to provide the setting to deliver secure, reliable, clean, competitively priced energy to consumers, while building national wealth through the safe and sustainable development of its energy resources.

The white paper was welcomed by the International Energy Association (IEA), which last month released an in-depth review of Australia's energy policies.

IEA Executive Director Ms. Van der Hoeven, commended its broad sweep of measures in relation to clean energy.

She said Australia has made a strong financial commitment to carbon capture and storage, the expansion of renewable energy and the establishment of the commercially oriented Clean Energy Finance Corporation, which will invest in renewable energy, low-emission energy and energy efficient technologies.

She also backed Australia's recent introduction of a price for the emission of carbon and proposals to reform its electricity market in an effort to tackle rising prices.

"The IEA views carbon pricing as a critical component of climate policy, and we hope its introduction in Australia will put an end to much uncertainty

in the energy sector," she said.

"But even with a carbon price, Australia will need supplementary policies, like energy-efficiency policies to unlock low cost abatement and technology policies to help lower the long-term cost of new technologies, including renewable energy and carbon capture and storage. Commendably, Australia has developed a relatively balanced package with strong elements of each policy."

According to a recent news report released by the Clean Energy Council, Australia's renewable energy target (RET) has delivered a reduction in fossil fuelled power generation since its introduction in 2001.

It said that Australia's 20 per cent RET has delivered A\$18.5 billion in investment, with the potential for A\$18.7 billion more if the policy is retained in its current form.

"The report shows that, if left unchanged, the Renewable Energy Target will result in 12 per cent less coal fired generation and 13 per cent less gas fired generation between now and 2030, with no reliability or security of supply issues identified," Clean Energy Council Chief Executive David Green indicated.

Meanwhile, the white paper also noted that Australian electricity pricing needs to be overhauled to stop inefficient investment in infrastructure,

which is only used during rare peak demand times. It also advocates charging more for power at peak times and using new technologies, like smart meters to help households manage their bills.

Energy Minister Martin Ferguson said there is no quick fix to counter energy price rises of recent years, but he is challenging the states to introduce reforms that might ease some of the pain.

■ New South Wales is to sell its state-owned electricity generators. However, it is expected that sale of the generator – worth up to A\$3 billion Australian (\$3.1 billion) – could drag on until 2014 as falling energy demand makes the assets less attractive.

## Climate change law could aid China's environmental ambitions

China should establish a climate change law as soon as possible, according to The Climate Group.

The group has also suggested that the country set up a ministerial government body to improve climate finance governance.

A report issued by the independent non-profit organisation, advised setting up a state climate fund and a special fund for South-South cooperation

in dealing with the environmental challenge.

Wu Changhua, the Greater China Director of The Climate Group praised the government's ecological progress.

In its 12th Five-Year Plan China has pledged to cut energy consumption per unit of GDP by 16 per cent while slashing carbon emissions by 17 per cent in the five years to 2015.

This will help China meet its pledge

of reducing carbon intensity by 40 to 45 per cent by 2020 from the 2005 levels.

According to a white paper recently released by the Information Office of the State Council, China will continue to develop new and renewable energy to protect its ecological environment and achieve sustainable development.

China plans to increase the share of non-fossil fuels in primary energy consumption to 11.4 per cent and increase

its installed non-fossil fuel-based generating capacity to 30 per cent by the end of 2015, the white paper says.

Notably, photovoltaic (PV) power generation installation capacity connected to the China State Grid by the end of September was up 415 per cent from the same period last year, the State Electricity Regulatory Commission (SERC) said.

China recently said, however, that it is creating supportive measures to shore its solar industry, which has been rocked by recent US duties on Chinese exports over alleged dumping.

At the end of October, State Grid Corporation of China (SGCC), said it will allow small-scale distributed solar power generators with less than 6 MW of installed capacity to be connected to the grid.

CONFERENCE & EXHIBITION

4th ANNUAL  
**NUCLEARPOWER**  
ASIA 2013

15 - 16 January 2013  
Shangri-La Hotel, Kuala Lumpur, Malaysia



STATISTICS FROM 2012:

<b>231</b> Nuclear industry stakeholders	<b>155</b> International companies	<b>49</b> Distinguished speakers	<b>22</b> Countries represented
---------------------------------------------	---------------------------------------	-------------------------------------	------------------------------------

Bringing together the global nuclear power industry to foster nuclear new builds in Asia

Official partner: World Nuclear Association

Platinum sponsor: ROSATOM

Gold sponsors: HITACHI, NORTON ROSE, EXCEL SERVICES CORPORATION

Silver sponsor: pillsbury

Bronze sponsors: KAERI, GSE SYSTEMS

Tel: +65 6590 3970 ■ Fax: +65 6223 9196  
Email: info@clarionevents.asia ■ www.nuclearpowerasia.com



**THE ENERGY INDUSTRY TIMES**  
www.teitimes.com

**subscribe today**

The Energy Industry Times is the only publication that covers global news related to the power and energy sector in a newspaper style and format whose uniqueness is recognised by our readers.

As a paid subscriber you will gain full access to our online news desk.

You will also no longer have to wait for the printed edition; receive it by PDF "hot off the press" or download it online.

To subscribe, email [subscriptions@teitimes.com](mailto:subscriptions@teitimes.com) or visit [www.teitimes.com](http://www.teitimes.com)

To guarantee receiving your monthly copy of the award-winning newspaper, you need to subscribe today



# Funding flows for Vietnam clean energy

■ Trung Son hydro deal signed  
■ EU to help fund climate change mitigation

| Syed Ali

The signing of several recent agreements will help provide a much needed boost to Vietnam's ongoing clean energy development effort.

Construction of the Trung Son hydropower plant in the north-central province of Thanh Hoa was set to begin in earnest on November 24, 2012, following the signing of a deal between Trung Son Hydropower Co Ltd, a subsidiary of Electricity of Viet Nam (EVN), and a joint venture company to build and equip the plant. The joint venture is formed between Samsung C&T Corporation and Construction Company 47.

The total cost of the project is

VND7.7 trillion (\$410 million), with VND6.2 trillion (\$295.2 million) being provided by the World Bank, accounting for about 70 per cent of the value. The remaining money has been invested by the Trung Son Hydropower Company Limited.

The 260 MW plant is expected to provide 1.55 billion kWh annually to help meet the nation's rising energy demand. According to the schedule, the first turbine will be running by the fourth quarter of 2016 and the entire construction will be complete by 2017.

This is the first hydropower plant to be funded in Vietnam by a loan from the World Bank.

The World Bank also recently signed an agreement with EVN to provide \$449 million of credit to the country's \$800 million Electricity Distribution Efficiency Project.

Under the project, smart grid technologies will be introduced to the Electricity Regulatory Authority of Viet Nam and five electricity corporations in the northern, central and southern regions, including Hanoi and Ho Chi Minh City.

Separately, at the end of October the European Union (EU) and Vietnam signed agreements on financial support for the mitigation of climate change, and sustainable international trade and investment in Vietnam.

The Vietnam Climate Change Global Loan, worth €150 million (\$195 million), signed between the European Investment Bank and Vietnam's Ministry of Finance, will contribute to environmental sustainability. It will make long-term financing available for investments that contribute to climate change mitigation through the avoidance or reduction of emissions of greenhouse gases by the use of renewable energy sources and energy efficiency enhancements, said Herman Van Rompuy, president of the European Council.

EVN recently said it is short of VND20 trillion in funds targeted for work on electricity projects during the remainder of the year.

According to EVN's report, the group has mobilised only VND54 trillion, which accounts for 73 per cent of its capital needs for 2012. Total targeted investment for the five-year plan from 2012 to 2017 is more than VND500 trillion (\$24 billion). For this 2012, the amount is around VND74 trillion.

The shortfall in funds has led to calls for a delay in scheduled coal price hikes, over concerns that these price increases will lead to skyrocketing production costs for the electricity sector.

Philippines state-owned power company Manila Electric Company (Meralco) recently expressed an interest in investing in power generation projects in the country.

## Thailand seeks to diversify energy sources

In an attempt to reduce its dependence on gas, Thailand is looking to import more power from its neighbours and is also proposing more coal fired generation.

| Syed Ali

Thailand expects to import 20 000 MW from Laos and Myanmar as part of the country's bid to diversify energy sources by reducing dependence on natural gas for power generation.

A decade ago, Thailand signed a memorandum of understanding (MoU) to purchase 1500 MW of electricity from Myanmar and 7000 MW from Laos. Under its revised Power Development Plan, covering 2010 to 2030, supply from neighbouring countries is limited to 20 per cent of Thailand's total power generation.

Energy Minister Pongsak Raktapongpaisal said the Electricity Generating Authority of Thailand (Egat) has been assigned to accelerate talks with Laos and Myanmar and renew the MoU, adding 10 000 MW from each

country. Supply in these two countries far exceeds demand, he said, though their economies are growing.

Minister Pongsak said electricity supplies from Laos and Myanmar would mostly come from hydroelectric and coal fired power plants.

On November 12, 2012 the Cabinet approved a Baht12 billion (\$391 million) budget to build facilities to receive electricity from the Xayaburi Dam, currently undergoing construction in Laos.

The minister said Thailand depends on gas "too much", as it constitutes 70 per cent of power generation. Coal accounts for 20 per cent and hydropower 5 per cent.

Over the next several years, the share of higher-cost liquefied natural gas (LNG) for electricity generation will gradually increase, causing electricity

prices to rise.

Sutat Patmasiriwat, Egat's governor said electricity bills could nearly double by 2017 to Baht6/MWh from Baht3.2 if LNG dominates the supply, hurting Thailand's competitiveness in manufacturing costs.

To rectify this, Egat is revising its power development plan and will propose it to the government soon.

The revised plan will increase the number of coal fired power plants by five with a combined capacity of 4000 MW.

■ In late October Gulf JP UT Co, a subsidiary of Gulf JP Co, secured a Baht39 billion financing facility from eight banks for a gas fired power plant project in Ayutthaya's Uthai district. Commercial operations are set to commence in 2015.

## China resumes "steady" nuclear approvals

The Cabinet's recent approval of plans on nuclear power safety and development will allow the construction of China's nuclear power plants to resume "steadily". The government said it would allow a small number of new nuclear reactors to be built before 2015, and only in coastal regions.

The approval of new nuclear safety and development plans comes after a near 20-month ban by Beijing on approvals of new plants following the Fukushima disaster in Japan.

China's leaders ordered safety checks for existing nuclear facilities, a review of projects under construction and improved safety standards.

"The inspection results show that nuclear security is guaranteed in China," stated a government report on its energy policy. "China implements the principle of 'safety first' in the whole process of nuclear power station planning," it said.

China currently has 15 nuclear reactors that provide about 12.5 GW of generating capacity. The current fleet of nuclear reactors is mostly second-

generation and is based on a variety of designs from Canada, France and Russia. Another 26 reactors are under construction that will add 30 GW, the report said.

In a decision that could be good news for foreign reactor builders including France's Areva and US-based Westinghouse, which is owned by Japan's Toshiba, China stipulated that new reactors would need to adhere to "third-generation" technology that meets the highest international safety standards.

According to *Dow Jones* French utility Electricité de France (EDF) and French nuclear engineering firm Areva recently signed an initial agreement with the China Guangdong Nuclear Power Group, or CGNPC, to design a mid-sized nuclear reactor.

"We have signed a cooperation agreement, it's really the very first step in the development and remains at a conceptual stage," the spokeswoman said. The three parties signed an agreement to build a 1000 MW nuclear reactor in October but no location has been chosen for the project, she added.

## Karachi commits \$400 million to boost electricity supply

The Karachi Electric Supply Company (KESC) says it plans to invest Rs40 billion (\$400 million) during the next two to three years to boost its generating capacity and improve the efficiency of its fleet to meet growing power demand across its service territory.

A spokesman from the power utility said that KESC would arrange these funds from local and foreign institutions in the form of debt and equity.

KESC has already invested around \$1 billion over the last four years in various large-scale generation, transmission and distribution projects. The new investment plan, he said, is aimed at increasing KESC's power generation capacity.

Under the investment plan, KESC is undertaking combined cycle conversion projects at its three power plants in Korangi and SITE area where it will improve the efficiency of the plants and add 47 MW of generating capacity.

A specially-designed 'transmission package' will see the installation of new transformer bays, in addition to three new substations at strategic locations and the extension of six existing substations.

The spokesman also said that in line with a strategy to bring down the cost of generation, the investment plan would allow KESC to convert two of its 210 MW oil-fired units at its Bin Qasim-1 to coal.

In addition, KESC pledges to develop a bio-waste energy project, which would convert cattle manure from Landhi Cattle Colony and organic food waste to produce 22 MW of electricity.

■ The Punjab government has signed a memorandum of understanding with German company AEG for cooperation in the solar energy sector. The MoU will see projects of at least 50 MW to 100 MW set up in Punjab in 2013 and projects of at least 300 MW in 2014.

Accelerating talks: Energy Minister Pongsak Raktapongpaisal





**POWER INDUSTRY**  
AN ITE CONFEX EVENT

## Network with influential leaders from the world's fastest growing power markets at ITE Group Plc's Power Industry Conferences and Exhibitions



**Power industry North Africa**  
27-28 February 2013  
Casablanca, Morocco



**Power Industry SOUTH KOREA**  
26-27 June 2013  
Seoul, South Korea



**Power Industry VIETNAM**  
November 2013  
Vietnam



**POWER INDUSTRY MIDDLE EAST**  
22-23 April 2013  
Abu Dhabi, UAE



**Power Industry INDIA**  
11-12 September 2013  
New Delhi, India



**Power Industry INDONESIA**  
21-22 May 2013  
Jakarta, Indonesia



**Power Industry TURKEY**  
September 2013  
Istanbul, Turkey

Hosted by



### How to participate

To become a delegate, speaker, exhibitor or sponsor, please contact us:  
Call **+44 0207 596 5181** Email **powerindustry@ite-events.com** (quote 'Energy Industry Times')  
**www.powerindustry-events.com**

Under the patronage of HH General Sheikh Mohammed Bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces

**WORLD FUTURE ENERGY SUMMIT**

15-17 JANUARY 2013  
ABU DHABI NATIONAL EXHIBITION CENTRE



## INNOVATION THAT MEANS BUSINESS

Learn to drive new revenue from the energy of tomorrow at the World Future Energy Summit (WFES), where the world's sustainable energy pioneers come together to access unrivalled insight, debate and opportunity. With innovative new features for 2013, including our Sustainable Living Area, Green Jobs Fair and interactive online matchmaking business tool for buyers and sellers, WFES is the place to meet, discover and trade.

**Join over 600 exhibitors from 35 countries, source more than 2,000 products, grow your business - and make a difference.**

**PRE-REGISTER ONLINE NOW TO GET YOUR FREE BADGE AND GET YOUR EVENT PLANNER FOR FREE (WORTH US\$ 50/AED 200)**

*For non pre-registered visitors, the event planner is available for US\$ 50/AED 200*

Register @ [WorldFutureEnergySummit.com](http://WorldFutureEnergySummit.com)



Launched by the UN Secretary General at WFES 2012



WFES 2012 Opening Ceremony

Platinum sponsors



Gold sponsors



Official airline

Digital media partner

Regional broadcast partner



[www.abudhabisustainabilityweek.com](http://www.abudhabisustainabilityweek.com)

Host of

Co-organized by

Supported by

Co-located event

Organized by



# UK regulators to investigate alleged gas market manipulation

Allegations of gas market manipulation will see the UK speed up the adoption of EU regulations. **Junior Isles**

The UK government says it will now speed up the implementation of the EU's new "Regulation on Wholesale Energy Markets Integrity and Transparency" – known as Remit – and transpose it to British law before the June deadline. Remit introduced explicit prohibitions on market manipulation and insider trading in wholesale energy markets.

The decision is the consequence of an investigation by the UK's Financial

Services Authority (FSA) and the Office of the Gas and Electricity Markets (Ofgem) into unusual activity in late September in the National Balancing Point (NBP). The NBP is a virtual hub that serves as the main pricing point for UK natural gas.

The investigation follows allegations made by Seth Freedman that the wholesale gas markets in the UK have been "regularly" manipulated by energy companies. Freedman worked at ICIS

Heren, an organisation that provides data on energy prices for the industry and sets benchmarks for prices.

ICIS Heren said that "unusual trading activity" may have affected gas prices. It said it had identified a series of deals done below the market trend on September 28, and had not yet determined a cause.

Energy Secretary Ed Davey voiced his concern about the allegations, saying: "We will be keeping in close touch

with the regulators while they get to the bottom of this."

NBP is the most active gas market in Europe, attracting billions of dollars of physical and financial transactions from utilities, hedge funds and banks.

Ofgem, which oversees the physical market, confirmed it had received information relating to trading in the gas market and said it was "looking" into the issue. The FSA, which regulates

the financial gas market, also confirmed it was investigating.

Shares in the UK's biggest energy suppliers dipped after the announcement of the probe sparked calls for tough action by regulators.

Davey said those involved in alleged rigging would face the "full force of the law" and promised "firm action" if the claims turned out to be true. "If we find we need more powers for the regulator, we will act," he said in parliament.

## CEZ stays local on power plant bidders

- Three bidders vie for Detmarovice
- Areva to appeal Temelin decision

CEZ, the 70 per cent state-owned Czech power utility, is likely to select a buyer for the 800 MW Detmarovice coal fired power plant by the end of the year.

The company said it received four bids for the power plant, but one offer failed to meet all legal requirements and so the sale process will continue with the three other parties.

The three bidders for the power station – the largest such plant in the eastern region of Moravia – all have ties to the country. Private investment group BXR is the main shareholder in the Czech Republic's black coal-mining operation New World Resources; Energeticky a Prumyslovny Holding AS is a closely held Czech company with

assets in energy and heavy industry; and Gascontrol sro is a Czech company supplying technology to the energy, engineering and construction sectors.

As part of an agreement with the European Commission to resolve competition issues, CEZ must sell at least 800 MW of its coal fired electricity generation capacity.

Meanwhile, French engineering giant Areva said it will appeal CEZ's decision to exclude its bid to build Temelin 3&4 and will call for a suspension of the bid procedure.

Areva believes that its detailed offer presented to CEZ last July is compliant with statutory requirements and has been misunderstood in many respects.

"I deeply regret that Areva is penalised based on matters that have never been discussed between the parties before, without any dialogue or clarification process, both of which are a standard in a nuclear industry where transparency and dialogue are key," said Luc Oursel, Areva CEO.

Areva said it is now forced to take all legal actions available under Czech and EU laws with the objective of returning to the Temelin 3 & 4 tender process. The first of these actions will be an appeal against CEZ's decision on Areva's objections to its exclusion, which Areva will file with the Czech Office for the Protection of Economic Competition, a body responsible for supervision of public procurement processes.

## Scotland leads UK renewables effort

Scotland is setting the pace in the UK's efforts to boost the share of renewables in the electricity generating mix.

The country recently introduced a new interim target of generating 50 per cent of the nation's electricity from renewables by 2015.

The move, brokered by First Minister Alex Salmond, is intended to help Scotland meet its previous target of generating the equivalent of 100 per cent of electricity demand from renewable sources by 2020.

Salmond's unwavering support for

renewables runs in stark contrast to the recent friction within Britain's coalition government on renewables and onshore wind in particular.

RenewableUK, the trade and professional body representing the wind, wave and tidal energy industries last month urged Prime Minister David Cameron to get a firmer grip on energy policy, after two Conservative MPs, including the Energy Minister John Hayes, sought to undermine the renewables sector.

In mid-November Hayes repeated his

view that no more applications for onshore wind farms should enter the planning system – despite being told by his boss, the Energy Secretary Edward Davey, that his views do not represent government policy, when he first made them in the national press two weeks earlier.

Meanwhile, the UK continues to invest in future renewable technology. Last month the Crown Estate announced three new leasing agreements for tidal energy projects at sites in Northern Ireland, Scotland and England.

## Uncertainty slows Germany's energy transition

German leaders are attempting to improve coordination of the country's transition from nuclear to renewable energy after a sluggish and much-criticised start to the switchover.

Chancellor Angela Merkel, who met with the nation's 16 state governors last month, said they would enhance coordination to ensure a steady power supply, a continuing renewable energy expansion and affordable electricity prices.

Germany decided last year to phase out nuclear power by 2022 and replace it with wind, solar and other renewable energies. Critics say the ambitious plan has fallen behind schedule because of a lack of coordination and oversight.

Missing grid connections for giant wind farms that utilities are planning to build off Germany's coasts have been a major stumbling block to the government's renewables strategy, prompting several utilities to postpone investment decisions until legislation for a quicker expansion of power grids has been passed.

Energy utility EnBW (Energie Baden-Wuerttemberg AG) recently postponed a decision on whether to go ahead with plans to build a €1.5 billion (\$1.9 billion) wind farm off the German North Sea coast, citing lack of adequate legislation and resultant uncertainties over grid connections.

"We need legal clarity and reliable framework conditions to make an investment decision for [a project worth] well over €1.5 billion," executive board member Hans-Josef Zimmer said in a written statement.

EnBW said that it is still committed to building the Hohe See offshore wind park with a planned generation capacity of 500 MW, but it will await the conclusion of the legislative process before evaluating the project economics.

At the end of October a government official said the production of renewable energy in Germany is expected to grow faster than the government's forecast and account for almost half of the country's electricity within a decade.

Stephan Kohler, who heads the government-affiliated agency overseeing Germany's electricity grid said new installations of wind, solar and other renewable power sources will easily top the official target of 35 per cent by 2022, reaching about 48 per cent by then.

German utilities say solar power production rose by more than 50 per cent on the year over the first nine months of 2012 amid a boom in installations of photovoltaic panels.



Merkel: enhancing coordination

## European Parliament supports shale gas development

The European Parliament has voiced its support for exploring Europe's domestic natural gas resources.

In late November ministers voted on the industrial aspects and environmental impacts of shale gas development in Europe and endorsed safe and responsible shale gas development.

Industry group Shale Gas Europe welcomed the outcome of the vote saying

that safe and responsible shale gas development will attract investment, create jobs, increase EU competitiveness and generate substantial tax revenues.

It said: "Europe is at a real energy, economic and environmental crossroads. Today's votes demonstrate that there is a growing understanding amongst European decision-makers that shale gas development can take

place within an adequate and responsible regulatory regime."

Shale gas exploration is viewed by many countries as a way of reducing independence on imported gas, especially from Russia.

Polish Prime Minister Donald Tusk said at the end of October that the development of both shale gas and nuclear energy are priorities for the

country.

"For the Polish government, nuclear energy and, of course, investments in shale gas are priorities," he said. "Nothing has changed in this regard."

Tusk said Poland aimed to make itself independent from external energy suppliers, but did not elaborate.

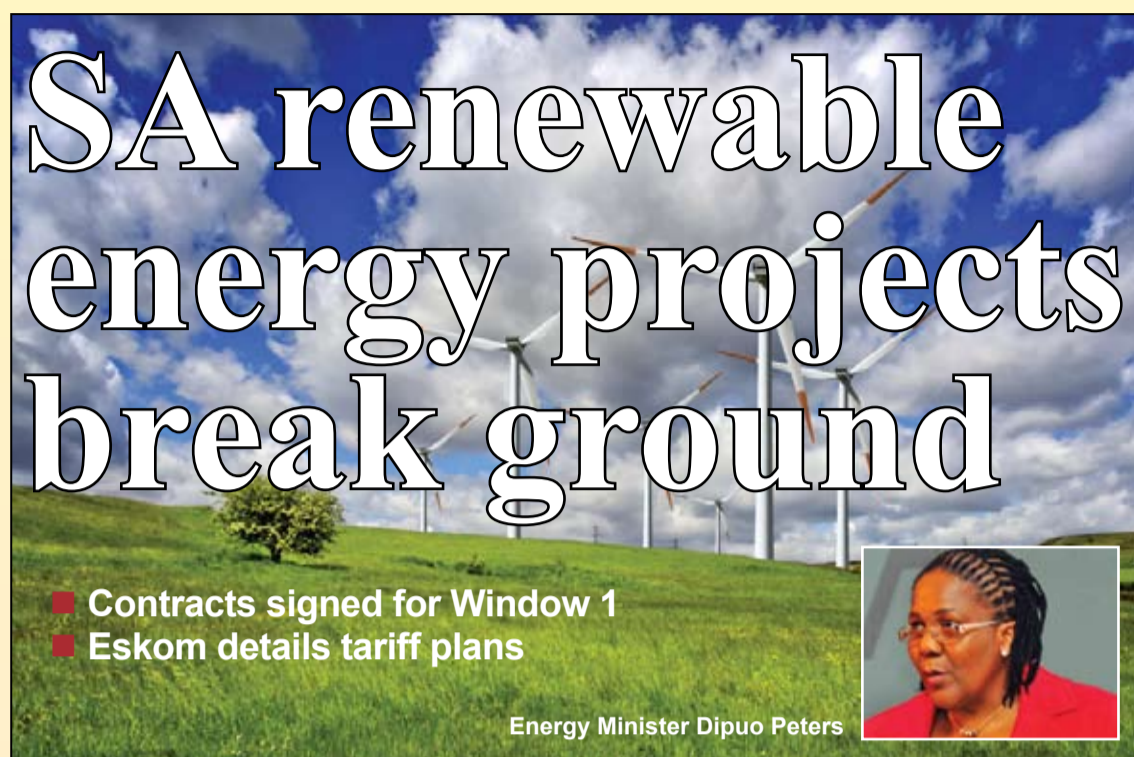
Russia, which has long downplayed the importance of shale gas, is now

watching its development. President Vladimir Putin last month called on state gas company, Gazprom, to pay more attention to the shale gas boom in the US.

"Politicians, experts and businesses are talking about a real shale gas revolution," Putin said. "We are simply obligated to take these trends into consideration."



## International News



South Africa is set for investments of R47 billion (\$5.4 billion) in its energy sector after the government signed contracts with renewable energy developers last month.

Energy Minister Dipuo Peters and national utility Eskom signed contracts with 28 approved bidders who will build 1400 MW of new capacity in South Africa as part of the country's 20-year Integrated Resource Plan (IRP).

Successful bidders in the first round of South Africa's renewable energy independent power producer (REIPP) programme include Mainstream Renewable Power, Abengoa and BioTherm Energy.

Abengoa announced on 6 November – one day after contract signing – that it had started construction on two concentrating solar power (CSP) plants it had been awarded. BioTherm – the only South African company to have been awarded three projects in the tender – said it would start construction of its projects immediately.

South Africa's IRP calls for the development of 18 GW of renewable energy by 2030. The first tender round – known as Window 1 – awarded 632 MW of solar PV, 150 MW of CSP and 634 MW of wind energy projects.

The bidders signed implementation agreements with the South African Department of Energy and power purchase agreements with Eskom, which in October requested an increase in tariffs to help it cope with the additional costs of buying more renewable energy.

According to BioTherm, which is developing two solar PV projects and one wind energy plant, the price of wind power today is more competitive than Eskom's recent tariff request.

Eskom has applied for an average increase of 13 per cent over five years to meet its own investment needs, plus an additional three per cent to support the entry of the new IPPs. It said in a statement that its request balances South Africa's need for a secure power supply with sustainable energy goals.

In its application Eskom said that coal is its single largest cost and that it has forecast coal costs to increase by ten per cent per year over the five-year tariff plan. The tariff application would see Eskom's return on assets improve from 0.9 per cent to 7.8 per cent over the five years.

Eskom plans to spend R337 billion over the five years on new infrastructure build and the refurbishment of existing assets.

South Africa's energy regulator Nersa will make a ruling on the tariff application in 2013 after public consultations.

■ The International Renewable Energy Agency (IRENA) is requesting applications for the first tranche of \$350 million of funding for renewable energy projects in developing countries. Financed by the Abu Dhabi Fund for Development, the fund aims to help developing countries mobilise financing for renewable energy projects and improve energy access in these regions.

## AfDB highlights wind energy benefits

African nations should do more to encourage wind energy developments as a means of stimulating sustainable economic growth and improving energy access in remote rural areas, says the African Development Bank (AfDB).

Experts from the AfDB believe that several African countries – including Kenya, Somalia, Sudan, Libya and Chad – have considerable wind energy potential but note that wind energy is lagging behind other types of development project.

GE reported last month that it was in the advanced stages of negotiation over plans to build two wind power projects in Kenya.

The two projects would generate 150 MW and would be built in the Kenya Rift Valley town of Kinangop.

In a study released by the AfDB, the bank calls on public authorities to take a leading role in encouraging private sector investment in wind energy. Successful renewable energy programmes have been implemented in northern Africa, and other regions are now following suit, says the AfDB.

According to the Global Wind Energy Council's (GWEC) latest assessment of wind energy capacity, Africa currently has an installed wind energy capacity

of 1024 MW, nearly all of it concentrated in the north of the continent.

Here, says GWEC, national policies for renewable energy development will help the sector to continue growing. Africa has considerable wind resources around its coast and in the eastern highlands.

According to GWEC's moderate scenario, wind energy capacity in Africa could reach 19 GW by 2020 and 68 GW by 2030. For this level of capacity to be achieved, investments would have to reach €3.58 billion per year by 2020 and €6.24 billion per year by 2030.

Under a more optimistic scenario, wind energy capacity in Africa would reach 28 GW by 2020 and 83 GW by 2030, according to GWEC. The organisation argues that wind energy could become a major industry in Africa, with local manufacturing facilities providing thousands of high quality jobs.

■ Wind energy competitiveness is improving thanks to decreasing operation and maintenance costs, according to a new industry index created by Bloomberg New Energy Finance. The index shows that the average price for full-service O&M fell by 38 per cent from 2008 to 2012.



The town of Kinangop in Kenya where plans are being put in place to build wind power projects

## Armenia, Iran build hydropower plant

Armenia and Iran say that a project to build a hydropower plant on their border will help to boost economic cooperation.

The two countries have held a groundbreaking ceremony for the Meghri hydropower plant on the Aras River and say that the output from the 130 MW plant will be used by Iran.

Ownership of the \$320 million plant will be handed over to Armenia after 15 years of operation, according to reports. Construction of the plant will take five years and will be financed by Iran.

Armenia is keen to improve ties with Iran because of disputes with Turkey and Azerbaijan. The project will boost Iran's electricity capacity and help its ambitions to export electricity to its other neighbours, including Pakistan.

### Meghri hydropower plant

# Solar trade war escalates

- China lodges WTO case
- ITC votes in favour of trade complaint

Siân Crampsie

The on-going dispute between Chinese and European solar photovoltaic (PV) technology suppliers has intensified with a filing by Chinese authorities of a World Trade Organisation (WTO) case challenging subsidies in the European Union.

In the filing China accuses some EU countries of providing subsidies for power generated by solar facilities in which the main components have been provided by European companies.

The complaint is thought to be aimed at Greece and Italy.

The move follows the instigation of an investigation by the European Commission into the commercial practices of Chinese PV manufacturers operating in Europe.

That investigation was triggered by a complaint lodged with the Commission by EU Pro Sun, which represents 20 European companies and which believes that Chinese solar companies have been illegally dumping solar products on Europe's market at below the cost of production in order to gain market share.

A similar investigation was carried out by US authorities earlier this year and resulted in duties being imposed on Chinese firms exporting goods to the USA.

Beijing has also launched an anti-dumping probe into European exports of polysilicon – a material used in PV panels – to China. China has requested a consultation with the WTO on the latest case.

Earlier in November the US Inter-

national Trade Commission voted unanimously that Chinese companies have materially injured US manufacturers, clearing the way for tariffs of up to 250 per cent to be imposed. Some US-based solar panel manufacturers have argued that the tariffs will do more harm than good by hurting trade relations with China.

In a separate move, US solar firm Solyndra in October filed a lawsuit against several Chinese solar panel manufacturing firms alleging that a wide-ranging conspiracy drove it out of business.

The bankrupt USA-based solar panel maker believes that Suntech, Trina Solar and Yingli sought to destroy Solyndra's commercial position by flooding the US market for solar panels with cheap products and fixing

prices.

It is seeking \$1.5 billion in compensation, according to a Reuters report.

Solyndra's lawsuit, filed in the US District Court in San Francisco, says that the three defendants "could not keep pace with the innovation presented by Solyndra's technology" and therefore "entered into a conspiracy with each other and... with key suppliers and lenders to dump product at predatory levels".

The three Chinese firms named in the lawsuit are all listed in the USA. Yingli said in a statement that the complaint was "unwarranted and misguided" and that it would vigorously defend itself.

Trina Solar says that the lawsuit by Solyndra is "without merit" and "baseless".

## Siemens targets €6 billion cuts



Siemens President and CEO Peter Löscher

Siemens has unveiled further details of a new programme aimed at improving its financial performance and competitiveness.

The German engineering giant is planning to save €6 billion by 2014 as well as achieve a profit margin of 12 per cent under its 'Siemens 2014' programme.

The move is in response to a decline in both profitability and orders and aims to strengthen the company's core activities in all business units. "We know what we have to do, and

we're doing it," said Peter Löscher, President and CEO of Siemens AG.

Last month Siemens announced better than expected fourth quarter results, with a seven per cent rise in year-on-year revenues and two per cent rise in orders. For fiscal 2012, revenue rose seven per cent over 2011 to €78.3 billion, while orders came in ten per cent lower at €76.9 billion.

"A strong fourth quarter enabled us to fulfil our expectations for fiscal 2012 and achieve one of our best years ever," said Löscher. "Even so we didn't fully succeed in significantly boosting our performance vis-à-vis competitors, as we did in recent years."

Siemens says that cost reductions in the business will account for half of the €6 billion target and will be achieved through improvements in procurement and the supply chain.

A further €2 billion will be saved by optimising capacity utilisation, processes and project management.

The company has already announced its intention to exit the solar power business as part of plans to focus on core activities.

## E.On reviews targets

German utility E.On is blaming the rise of renewables and the euro-zone crisis for its faltering performance.

Siân Crampsie

E.On says that a fall in energy demand and low wholesale power prices are continuing to affect its business.

The German energy giant has abandoned its profit target for 2013 and is reviewing its targets for 2015 after reporting a net loss for the third quarter. Its generation business in Germany and other parts of Europe have been particularly hard-hit by poor trading conditions, it says.

E.On reported nine-month sales of €93.6 billion, 21 per cent higher than the prior-year figure, led by strong performances in its trading and network businesses. However it reported that its generation fleet reported low utilisation figures over the period and CEO Johannes Teysen said that some of its gas-fired power stations are barely profitable.

Europe's economic crisis has

weakened energy demand in the industrial sector and the depressed power prices have been exacerbated by the rapid expansion of renewable energy, which is subsidised in many European countries.

E.On says it will close two gas fired power plants in Europe, and possibly others elsewhere.

The company reported that its E.On 2.0 efficiency programme is starting to show results and that the renegotiation of gas procurement contracts with suppliers had already led to improvements in its wholesale gas business.

"Our nine-month results reflect the first successes of the transformation of our company and our ongoing efficiency enhancement programmes. But they also clearly indicate that we face huge challenges, particularly in our generation business," Teysen said. "That's why we're further optimising our conventional genera-

tion portfolio and also exploring whether to close some assets.

"Where assets are important for ensuring the stability of the power supply, we're working with system operators and government agencies to find interim solutions."

Other European utilities, including EDF, have also reported that reduced energy demand in Europe was affecting business.

RWE, however, last month posted a brighter outlook as it net profits for the first three quarters rose by 33 per cent over the same period last year.

RWE is expecting its operating profit and earnings for 2012 to match those of 2011, largely due to a recent asset disposal and a solid performance by its coal- and lignite-fired power generation fleet.

RWE has warned, however, that it continue to cut costs in its business to help reduce debt.

## Vestas plans further cuts



Ditlev Engel: Vestas is progressing "faster than expected"

■ €400 million savings target  
■ Areva plans UK factory

Vestas is planning to make further cost savings to improve its financial position amid a difficult trading environment.

The wind turbine manufacturer has announced plans to shed an additional 2000 jobs by the end of 2013 as well as continue its hiring freeze and make divestments.

The measures are in addition to plans already announced to cut costs and will help the company to make a total saving of €400 million in 2013 compared to 2011.

"Vestas is progressing faster than expected in executing the plan we have earlier announced to lower the operating costs of the company," said CEO Ditlev Engel.

"We expect 2013 to be a tough year for the wind industry and to adapt to

future uncertain market development we have decided to further intensify our cost saving plan to make sure we are scalable and able to react fast to the challenges we expect in the market in the coming years."

Vestas' initiatives will see its workforce reduced to 18 000 by the end of 2012 and 16 000 by the end of 2013, down from 22 700 employees at the start of 2012.

Its troubles seem at odds with the projected expansion of wind power capacity around the world but the company is particularly exposed to the US and European markets where the financial crisis and uncertainty over government renewable energy policy has reduced investment in the wind power sector.

Vestas faces competition from Chinese wind turbine manufacturers. In addition the wind turbine market in

Europe has shifted from onshore to offshore, where Vestas is weaker.

Last month Areva announced plans to build a wind turbine factory in Scotland to serve increased demand for offshore wind turbines for the UK market.

Areva says it will find a site in the east of Scotland for the manufacture of its 5 MW offshore wind turbine blades. It already operates a facility in Le Havre, France, that serves the French and Belgian markets.

Luc Oursel, CEO of AREVA, said: "This demonstrates the group's commitment to contribute to the development of an ambitious offshore wind industry in the UK."

"The Scottish site will complete our industrial plan to supply European offshore wind projects and will strongly position us to grasp opportunities in the extensive UK market."

## Hitachi embarks on UK nuclear journey

Hitachi Corporation says that the acquisition of Horizon Nuclear Power is the first step in its plans to build "a strong UK power production company".

The Japanese firm has completed the purchase of Horizon from German firms E.On and RWE and is now planning to move forward with the construction of between four and six nuclear reactors at two nuclear sites in the UK.

The £696 million (\$1.12 billion) deal will help Hitachi to bolster its nuclear energy business, which currently accounts for less than two per cent of its overall revenues, as well as globalise its operations. The deal is also a relief for the UK government whose plans for the construction of a new generation of nuclear facilities

were thrown into disarray when E.On and RWE announced plans to pull out of the new build programme.

"Hitachi is committed to helping the UK achieve its vision of a secure, low-carbon and affordable energy supply," said Masaharu Hanyu, VP and CEO of Hitachi's nuclear systems division. "The acquisition of Horizon is the first step in this journey, which will see us strive to build a strong UK power production company and support the creation of thousands of highly skilled jobs in the UK's energy sector."

Hitachi says it will now begin discussions with UK regulators to obtain license approvals for its advanced boiling water reactor (ABWR) technology. It will also prioritise supply chain engagement, said Hitachi.



## Alstom reinforces solar business

Alstom has invested an additional \$40 million in BrightSource Energy to reinforce its partnership with the pioneering solar power firm.

The two companies have been in collaboration since 2010 when

Alstom made its first investment. Alstom now holds 20 per cent of the capital of BrightSource, a leader in concentrated solar thermal tower technology.

BrightSource recently announced

that it is currently at the halfway point in the construction of the world's largest solar thermal project in California, USA.

The two companies are also collaborating in research and development of

solar thermal technologies, including storage and hybridization with fossil fuels.

"Alstom's additional investment in BrightSource reflects the important role of our solar thermal power tower

technology in meeting the world's growing demand for cost-effective power that is not only clean, but reliable as well," said John Woolard, Chief Executive Officer of BrightSource.

## Tenders, Bids & Contracts

### Americas

#### Voith secures Alto Maipo deal

Voith has won a contract to build Chile's largest hydropower project, Alto Maipo.

The Alto Maipo project, with its two run-of-river plants – Alfalfal II and Las Lajas – will have a total capacity of 532 MW after completion. Under the contract, Voith Hydro will build the powerhouses, realise the complete electromechanical scope, including turbine and generator, the engineering, manufacturing, erection and commissioning as well as the entire project management.

The contract, which was awarded by AES Gener, will strengthen Voith's market position in Chile and South America.

#### Westinghouse signs agreement with SNT

Westinghouse Electric Company announced that it has signed an agreement with two Siempelkamp Nuklear-technik GmbH (SNT) subsidiaries to jointly market and provide Passive Autocatalytic Recombiner (NIS-PAR) technology and analysis to the global nuclear power plant industry.

The NIS-PAR technology uses hydrogen recombination to prevent the buildup of hydrogen gas, or other flammable gases like carbon monoxide that can collect and create an explosive atmosphere. The function is completely passive and self-starting at low temperatures and in steam environments.

Westinghouse will perform the design and analysis of the hydrogen control system while SNT will provide joint marketing support, the NIS-PAR devices, test and cleaning devices, as well as supports for mounting the devices.

"This partnership between Siempelkamp and Westinghouse will provide additional solutions to enhance safety across the global fleet," said Doug Holderbaum, Westinghouse director for Post-Fukushima Safety Products and Services.

#### Alstom supplies HRSGs

Fluor Corporation has awarded Alstom a contract to provide three heat recovery steam generators (HRSGs) for Dominion Virginia Power's new Brunswick County power station in the state of Virginia, USA.

These units will be the largest HRSGs supplied by Alstom for the North America market. They incorporate Alstom's OCC (Optimised for Cycle and Constructability) design, which offers better performance during gas plant cycling and a lower overall cost of construction. Selective Catalytic Reduction (SCR) and carbon monoxide catalyst technology embedded in the HRSGs significantly reduce overall emissions from the plant.

The 1300 MW power plant is scheduled for commissioning in 2016.

#### Alstom wins Colombia hydro contract

Alstom has been awarded a contract worth around €170 million by Colombia's Empresas Públicas de Medellín (EPM) to supply eight turbines and generators units for the Ituango hydropower plant.

The 2400 MW plant will be the largest in Colombia. Alstom will be the sole turbines and generators supplier for the project.

The contract involves the supply of eight 300 MW Francis turbines, with their respective speed regulators and cylindrical gates, and eight generators with their respective excitation

systems and busbar. The first four generating units will be ready by 2018 and the other four by 2021.

### Asia-Pacific

#### Metso wins Indonesia order

Indonesia's PT Cikarang Listrindo has placed an order with Metso for the supply of two power boilers with a total capacity of 270 MW.

The equipment will form the heart of a new power plant that will help PT Cikarang Listrindo, which generates and distributes electricity in Babelan, near Jakarta, to increase its generating capacity by around 30 per cent. The €100 million order is a major breakthrough for Metso in the Indonesian power sector, says the company.

The new plant will be commissioned in 2016.

#### SJVN appoints EPC contractor

Indian public sector joint venture firm SJVN Limited has appointed Gamesa as the engineering, procurement and construction (EPC) contractor for a 47.6 MW wind farm project in Maharashtra.

The contract includes the installation of 56 Gamesa 850 kW turbines and a 10-year operation and maintenance (O&M) services contract. The deal consolidates Gamesa's public sector undertaking portfolio in India, says the Spanish firm.

SJVN is a Mini Ratna CPSU (Central Public Sector Undertaking) firm and a joint venture between the government of India and the government of Himachal Pradesh. Its operations are focused mainly on the hydropower sector and it is diversifying its portfolio by investing in wind energy.

#### GE signs Zhejiang CSA

GE has signed a contractual service agreement (CSA) with Amber Energy Limited, a major energy provider in China's Zhejiang Province. The agreement will enable reliable, efficient operation of three GE Frame 6FA gas turbines at two sites over a period of 20 years or more.

Amber Energy's plants are located at Anji and Quzhou and will add a total of 354 MW to help meet China's soaring power demand. The three units are among eight GE 6FA gas turbines installed in the country.

Amber Energy expects the Anji and Quzhou combined cycle power plants to enter commercial operation in December 2012, using natural gas supplied by China's West-to-East Pipeline. The company says that the CSA will help it to reduce labour costs and minimise operational risks.

#### German firm wins Thai solar bid

Germany's Conergy AG has won a contract to supply parts and build two solar farms in Thailand with a combined capacity of 21 MW.

Thai Solar Energy Co Ltd (TSE) chose Conergy for engineering, procurement and construction services at its solar parks in Suphan Buri and Kanchanaburi provinces.

The photovoltaic solar parks, covering nearly 500 000 m<sup>2</sup> combined, will provide enough energy for 14 000 households.

Construction and commissioning of the parks will be finished next February, strengthening Thailand's leading position in Southeast Asian solar energy. TSE now runs one solar thermal site in Kanchanaburi.

The Thai government wants a quarter of the country's energy requirement

to use renewable energy sources by 2022, according to Conergy.

### Europe

#### Metso supplies biomass plant

Metso will supply Värnamo Energi AB with a biomass power plant for combined heat and power production in Värnamo in Sweden.

Under the €17 million order, Metso will deliver a complete power plant as well as carry out installation, training and commissioning. The plant will have a thermal output of 13.4 MWth for district heating and an electrical output of 3.6 MWe. The plant will use local forest residues such as bark and wood chips as fuel.

The start-up of the plant is scheduled for autumn 2014.

#### Alstom services Afşin-Elbistan

Alstom Power in Turkey has been awarded a contract by Elektrik Üretim A.Ş. (EÜAŞ) for the repair, overhaul and rewind of the steam turbine generator of the Afşin-Elbistan A thermal power plant unit 3.

The scope of the €13 million contract includes the rewinding of the rotor and stator of the unit 3 steam turbine generator as well as providing repair and major overhaul services for the steam turbines along with their spare parts. Alstom is the manufacturer of the original turbine generator groups installed at the Afşin-Elbistan A thermal power plant, which consists of four 344 MW units.

Service and maintenance works are expected to be completed by the end of 2013.

#### Sellafield selects partners

Sellafield Ltd has selected Amec, Hertel (UK) Ltd and Shepley Engineers Ltd as its preferred partners to deliver work packages worth a potential £280 million at the nuclear complex in West Cumbria.

The Multi Discipline Site Works (MDSW) framework updates an existing arrangement governing how a range of maintenance jobs and tasks, asset care projects and asset restoration projects are delivered across the Sellafield site.

The framework could run for a maximum four-year timeline with a total estimated range of £200 million to £280 million.

#### Alert system for RWE wind farms

The UK's RWE npower renewables is to use a web-based monitoring and alert system to ensure the safe and efficient operation of its 27 wind farms.

The Met Office's VisualEyes will provide each RWE npower renewables' wind farm site with detailed, up-to-date, site-specific weather information from one central system, and can also anticipate weather conditions. The system will enable RWE to improve its maintenance planning, improve safety and reduce costs.

RWE npower says it will extend the use of VisualEyes into projects across Europe over the next few months.

### International

#### LS Cable & System wins Qatar order

LS Cable & System, a leading South Korean wire and cable maker, says that it has signed a \$435 million deal to build a submarine power cable in Qatar. Under the deal with Qatar Petroleum, LS Cable & System will install 200 km of 132 kV high-voltage

power cable to connect Ras Laffan Industrial City, about 80 km north of Qatar's capital of Doha, to Halul Island.

#### Siemens celebrates SA win

Siemens has marked its entry to the South African wind energy sector with a contract to supply turbines for the 138 MW Jeffrey's Bay project.

Siemens will deliver 60 of its 2.3 MW wind turbines to the project and will also carry out servicing for 10 years. The order was placed by a consortium led by Mainstream Renewable Power.

The Jeffrey's Bay wind plant is part of plans by the South African government to build 20 000 MW of renewable energy capacity by 2030.

#### UniCem extends Wärtsilä contract

Nigeria's United Cement Company (UniCem) has signed a deal with Wärtsilä to extend an operations and maintenance contract covering a power plant in Mfamosing, Cross River State.

The original three-year contract expires in 2012 and has been extended by a further three years. The power plant provides electricity to UniCem's Mfamosing cement plant, which has an annual cement production of 2.5 million tonnes.

The 47 MW power plant is capable of operating on either natural gas or heavy fuel oil and is powered by three Wärtsilä 50DF dual-fuel engines. Wärtsilä will provide operational and maintenance support as well as parts and technology and engineering expertise through a customised programme.

#### CESI wins SEC mandate

CESI Middle East has signed an agreement with the Saudi Electricity Company (SEC) to assist with the implementation of a high voltage direct current (HVDC) power interconnector between Riyadh and Mecca.

The new 800 km HVDC link will run between the Dharma and Bahra stations. It will not only increase the power generation capacity of local distribution networks, which frequently experience power disturbances, power failures and outages, but also provide a reliable back-up energy supply in such emergency situations.

The link will have a power carrying capacity of 3000 MW or more, which will result in increased energy reserve margins for SEC. Energy demand has increased in various regions of the Kingdom due to the establishment of large-scale industrial manufacturing plants.

CESI, which specialises in power systems technical consulting and testing, will work in conjunction with Tractebel Engineering on the project.

#### SEC orders ABB substations

ABB has won orders worth around \$170 million to build a new substation in Saudi Arabia for the Saudi Electricity Company (SEC).

ABB will design, supply, install and commission a substation to help meet the increased demand for electricity in and around the central pilgrimage area of Mecca. It will help to strengthen the grid infrastructure and enhance power capacity to help address the issue of growing electricity demand in Saudi Arabia.

Saudi Arabia has one of the highest levels of per-capita residential electricity consumption in the world with growing demand driven by economic development. The country is executing an ambitious Ninth Development Plan (2010-2014) aimed at raising its installed power generation capacity by more than 20 GW by 2014.



## Oil

# Crude prices remain at Mid East mercy, as US energy future brightens

- Middle East instability will continue to impact prices
- US will overtake Saudi Arabia as largest oil producer

David Gregory

The fluctuation in crude oil prices when fighting erupted in the Gaza Strip reinforces the fact that instability in the Middle East will continue to impact prices – even though markets are currently well supplied and major producers have not been threatened.

The Arab Spring is far from over. Despite the fact that Libya's oil industry managed to escape a nasty civil war virtually unscathed and bring its oil production back on-stream relatively quickly, there looms numerous other scenarios that could literally blow up and send the markets into a frenzy. The civil war in Syria is the most immediate concern, and Iran – wrestling with its many foreign and domestic problems – never ceases to be a source of alarm.

Crude prices fluctuated throughout the first three weeks of November, but

generally reflected the stability in the market. West Texas Intermediate (WTI) ranged between \$84.44/b and \$89.28/b during the period, touching its highest mark just as it looked that a ceasefire in Gaza would be reached. Brent crude ranged from \$105.68/b to \$111.70/b, also hitting that range limit during the last hours of negotiation on November 19.

While crude prices have moved lower in recent months, largely due to the extra crude that Persian Gulf producers are making available to the market, it is still not enough to give the global economy the kick that it needs. Part of the decline in price can also be attributed to a decline in demand in the Western markets, brought on by prices that continue to stifle a rebound. High prices have also encouraged conservation.

The chief economist at the Paris-based International Energy Agency (IEA), Fatih Birol, said in London on

November 12 during the launch of the agency's *World Energy Outlook 2012*, the high prices were acting as a brake on global economic recovery.

"There is definitely enough oil in the world, but the problem is that oil is expensive," Birol said. "The current price levels today... are the highest in history in terms of the average of the year and [act as] a brake on the global economic recovery efforts." He added that the current high prices are also not necessarily good for producing countries. He said one reason was that sick economies would need less Opec oil. Another was that high prices encourage investment in unconventional oil, which could also reduce demand for Opec oil.

In its most recent Oil Market Report, the IEA cut its forecast for fourth quarter 2012 demand by 290 000 b/d to 90.1 million b/d. Global supply for the period is seen at 90.9 million b/d. "Mounting pessimism over the global

economic outlook," was cited as the reason, to which the US government's year-end 'fiscal cliff' was added.

The IEA's cut in forecast demand reflected Europe's "persistent weakness," and the impact of Hurricane Sandy, which devastated much of the US east coast. The agency reduced its forecast for growth in demand during 2012 by 60 000 b/d to 670 000 b/d.

The IEA reported that Opec production declined in October by 30 000 b/d to 31.5 million b/d, its lowest point in nine months, and that the call on Opec crude for the fourth quarter of 2012 had been reduced by 500 000 b/d to 30 million b/d. It was due to weaker demand outlook and stronger than expected supply from non-Opec producers.

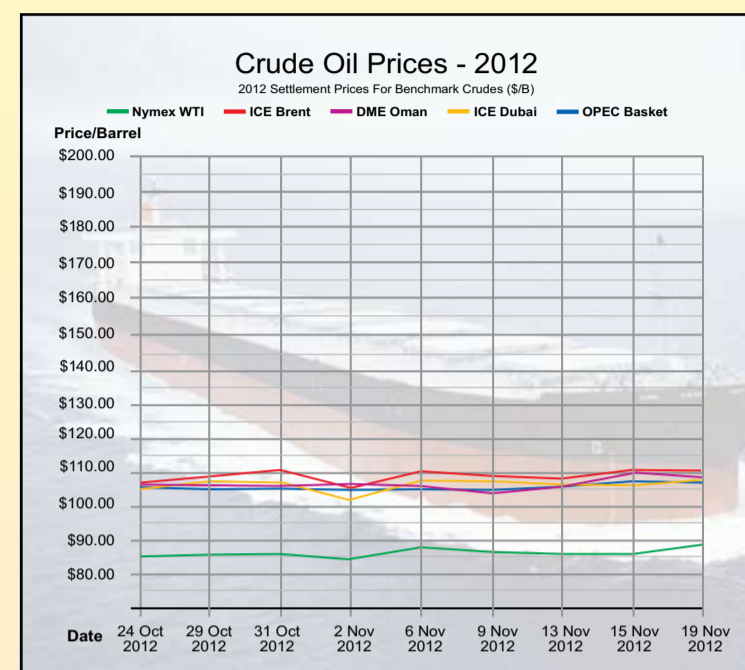
In the *World Energy Outlook 2012*, the IEA said there is a dramatic change in the global energy map that would "recast expectations" about the different countries, regions and fuels in the

global energy system over the coming decades.

It cited North America as the place where the most significant shift in the global energy industry would take place.

IEA Executive Director Maria van der Hoeven said in a statement: "North America is at the forefront of a sweeping transformation in oil and gas production that will affect all regions of the world, yet the potential also exists for a similarly transformative shift in global energy efficiency."

The IEA said that by 2020 the US would overtake Saudi Arabia as the world's largest oil producer for a few years until the mid-2020s. It said the US would begin to see the impact of new fuel-efficiency measures in transport. "The result is a continued fall in US oil imports, to the extent that North America becomes a net oil exporter around 2030," it said. This will quicken the shift in international oil trade to Asia, it added.



## Gas

# US shale gas changes global energy scene

The abundance of shale gas in North America has led a number of US and Canadian producers to seek LNG export licenses that will let them sell in better markets, particularly Asia.

Mark Goetz

US shale gas appears to have set the conventional gas market spinning. According to gas market experts and analysts, the impact of US shale – or shale from anywhere – on the global market will be significant.

The US shale gas 'boom' has driven prices down to around \$3.80 per million BTU and the advent of shale will eventually enable the US to attain its long-held desire to become energy independent, and an energy exporter.

The abundance of shale gas in North America has led a number of US and Canadian producers to seek LNG export licenses that will let them sell in better markets, particularly Asia.

Cheniere Energy, Sempra Energy, Shell, BP, ExxonMobil, Apache Corporation and ConocoPhillips are among those that are keen to open the North American LNG industry. So far, only Cheniere has received a license from Washington where there is a

growing sense among politicians that limits should be placed on gas exports in order to keep domestic energy prices low to benefit manufacturers and consumers.

During the next decade, LNG exports from North America will likely amount to 60-70 million tons/year, according to the CFO of Shell, Simon Henry. Shell estimates that there are projects under consideration in the US and Canada to export up to 130 million tons/year of LNG, Henry said during a conference in London last month. He estimated the combined cost of the projects at \$300 million, plus the cost of gas field development.

US companies are waiting for the Department of Energy to finalise an analysis of natural gas exports. Publication of the report has been delayed twice but the DoE has promised that it will be published by year-end. Decisions to grant licenses to export LNG will be based on its findings. Important considerations of the report include

job creation and whether it would offset US trade imbalances.

According to the US Energy Information Administration (EIA), US natural gas production will increase by 29 per cent from 21.6 trillion cubic feet (tcf) in 2010 to 27.9 tcf in 2035. "Almost all of this increase in domestic natural gas production is due to projected growth in shale gas production, which grows from 5.0 tcf in 2010 to 13.6 tcf in 2035," the EIA's *Annual Energy Outlook 2012* says.

The report goes on to say that the uncertainty in the size and economics of domestic shale gas resources could have a considerable impact on future domestic natural gas production and that by 2035 shale gas production could be between 9.7 tcf and 20.5 tcf. In that case, total US production could range between 26.1 tcf and 34.1 tcf.

The recently-released International Energy Agency's *World Energy Outlook 2012* said the regional picture for natural gas varies, but the overall

outlook over the coming decades "looks to be bright, as demand increases by 50 per cent to 5 trillion cubic metres in 2035."

Meanwhile, the gas market in Europe is glum due to economic troubles and declining demand, leading to oversupply. Experts say that gas demand in Europe will not return to its 2010 level until 2020.

This could affect the LNG industry, which has seen the market stagnate in Europe and all but disappear in the US. LNG deliveries to France, Spain, the UK and Italy declined during the first seven months of 2012, but the market for LNG has remained strong in the Asian nations of Japan, China and Taiwan.

An EIA report estimates that large shale gas deposits also exist in South America, North Africa, China, India, Australia and Europe. Not all countries were included in the report.

While the report shows a strong possibility of shale gas reserves in Europe,

the subject has not drawn widespread support. France has banned shale gas drilling out of environmental concerns. Large deposits exist in Poland, Romania and Ukraine. Poland has pursued its unconventional gas potential – which is estimated as high as 1.9 trillion m<sup>3</sup> – in order to reduce its dependence on Russian imports. Ukraine, too, is hoping to discover shale gas resources for the same reason.

It was recently reported that Sweden's Gripen Gas has made a discovery and production could begin within two years.

Throughout much of Europe there is widespread concern about the risk of environmental damage caused by the hydraulic drilling process, known as fracking. But should there be success in a European country that suggests success on the scale that has been seen in the US, Europe may embrace unconventional gas production and move itself towards greater energy self-sufficiency.

# Planning the EU's future electricity highways

A new research and development project known as e-HIGHWAY2050 has been recently launched. Its focus is designed in line with the three European Energy Policy Pillars that will be driving policy across Europe until 2020 – security of supply, competitive market conditions and sustainability.

**Dr Gary Taylor**

**T**his September saw the start of a major new European project that aims to address some of the major challenges facing the electricity distribution and transmission networks across the continent.

Co-financed by the EC and European electricity industry the e-HIGHWAY2050 research and development project is being delivered by a consortium of partners including European transmission system operators, research institutes, universities, industry associations and a non-governmental organisation. Fifteen ENTSO-E transmission system operators are also involved.

The project aims to develop a top-down planning methodology to provide a first version of a modular and robust expansion of the pan-European transmission network from 2020 to 2050. This will support the planning of the pan-European transmission system, including potential electricity highways, capable of supporting the energy need of future generations. This will address the main drivers and potential barriers for a range of proposed grid architecture options.

The focus of this project has been designed in line with the three European Energy Policy Pillars that will be driving policy across Europe until 2020. These are security of supply, competitive market conditions and sustainability.

Ensuring security of supply is arguably the most important aspect when considering future electricity distribution and transmission systems. With continually growing demand for energy it is vital that we minimise vulnerability to potential issues such as a shortfall in supply or possible energy crises across the EU. Developing and expanding the pan-European transmission network is an essential part of creating a more diverse and integrated network to allow for a coordinated, European response to any future issues around energy supply.

Plans for increased interconnection and the associated greater levels of transmission system interoperability are already starting to have an impact across Europe with ENTSO-E leading developments in this area. Four major EU priority corridors – or electricity highways – have been identified by ENTSO-E, including one directly relevant to the UK, which is an offshore grid in the North Sea.

Taking the UK as an example we can see how interconnectivity is already being explored on a wider scale. In April 2011 a 1 GW interconnector (BritNed) between the UK and Netherlands became fully operational. This is a joint venture between the National Grid and TenneT and is operated as a commercial interconnector meaning that funding and operation is based on commercial management and is separated from National Grid and TenneT's regulated activities.

Therefore, when building future pan-European transmission system interconnection investment decisions are more likely to be based on the present commercial viability of specific interconnectors as opposed to coordinated pan-European transmission system development plans to deliver future electricity highways.

A future 1 GW or greater interconnection is also being considered be-



The UK has the best offshore wind energy resource in the world

tween transmission systems, distribution networks and offshore grids could be achieved by linking electricity businesses, or more exactly Enterprise Service Buses, with secure high-speed information highways across trusted cloud computing platforms.

New pan-European service providers would also then be able to provide scalable and secure information management and exchange in order to enable much greater interoperability between European transmission system operators as well as much greater situational awareness at a pan-European transmission level. This will further enable and support more extensive pan-European electricity markets.

This project will also consider issues of sustainability of future electricity markets contributing to the EU commitment to reducing carbon emissions levels. The development of pan-Euro-

key challenges from 2020.

Firstly, significantly higher power flows across key boundaries. For example, the boundary transfer from Scotland to England will increase from being around 5 per cent of peak demand to around 15 per cent. Therefore, National Grid will be deploying a large number of novel smarter transmission system assets. Such assets will include embedded DC links and series compensation devices in order to deliver the higher transfers and manage the system.

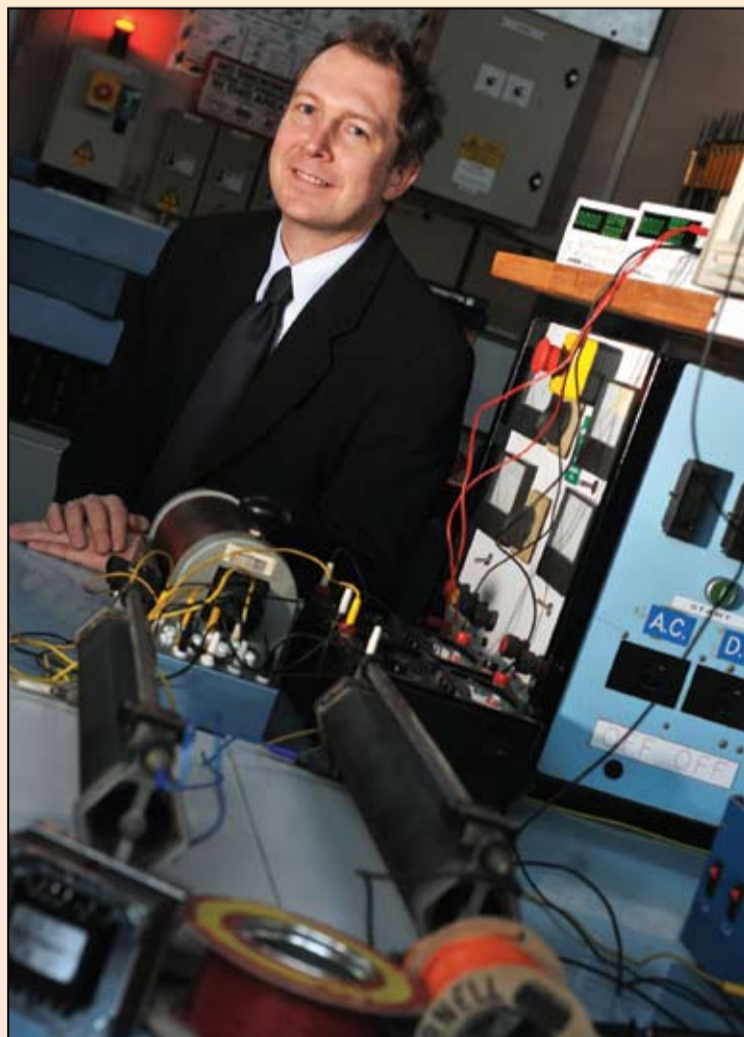
Secondly, more variable power flows across the transmission system as wind speeds change. This is because the output from conventional fossil fuel generation such as coal and gas will rise and fall to compensate for changes in wind farm output, but their location on the transmission system will be significantly different.

It will be a combination of variable power flows and the need to optimise the settings on sophisticated transmission system assets that will create a major challenge for future operation. National Grid is working both internally and externally with stakeholders, including generators and suppliers, to ensure that the appropriate solutions are put in place from 2020 and up to 2050.

This will include the development and adoption of more sophisticated tools for the control engineer, improved market arrangements, new services for system balancing including reserve or response and ensuring new wind farms are capable of meeting the appropriate national or international grid code requirements.

The results of e-HIGHWAY2050 will be presented and debated throughout the duration of the project with the whole electricity value chain as well as representatives from the impacted stakeholders in Europe. It is hoped that through this programme of work we can develop a robust and evidence-based framework that will support the expansion and performance of a more integrated pan-European electricity network to meet demand from 2020 to 2050.

*Dr Gary Taylor is Director of Brunel Institute of Power Systems at Brunel University, United Kingdom.*



**Dr Taylor: it is vital that we minimise vulnerability to potential issues such as a shortfall in supply or possible energy crises across the EU**

**“Four major EU priority corridors – or electricity highways – have been identified by ENTSO-E, including one directly relevant to the UK, which is an offshore grid in the North Sea”**

tween UK and Norway as well as an additional interconnection with France. It is expected that up to 8 GW of interconnection between the UK and mainland Europe may be commissioned and available by 2022. To support this, suitable onshore high-voltage direct current (HVDC) interconnector substation sites will be required alongside coordinated planning and interoperability between potential offshore grids in the North Sea.

With increased interconnection and interoperability developing in this way across Europe the scalable and secure management and exchange of power systems information, both at the transmission and distribution level, will be a crucial factor.

Furthermore, the need for the adoption, deployment and demonstration of the compliance of emerging electricity industry ICT (information and communication technology) standards to enable greater interoperability is also essential.

Improved levels of interoperability

pean transmission and distribution networks can help to improve energy efficiency and make better use of energy generated from renewable sources.

For example, in line with European directives the UK is now committed to 15 per cent of all energy coming from renewable sources by 2020 – this is going to have a significant impact on the transmission and distribution of energy from 2020 and beyond. It is thought that by 2020 around 30 per cent or more of electrical power in the UK will come from renewable energy sources compared to just 7 per cent at present.

The UK has the best offshore wind energy resource in the world, which can potentially provide a large-scale, secure and sustainable energy source to help contribute to these targets. However, as a consequence of such a significant change in electrical power generation the British electricity transmission system operator National Grid will be faced with two

# Fuelling the future

While many say that coal has no place in the power industry's fight against climate change, others argue that stopping investment in advanced coal technologies and underfunding carbon capture usage and storage is bad climate policy.

**Milton Catelin**

At a recent speech the International Energy Agency's Chief Economist, Dr Fatih Birol, described coal as "the forgotten fuel". In the context of 20 years of debates about addressing climate change and calls to reduce the use of the world's fossil fuels, 2010 saw coal's share in global energy consumption at its highest level since 1970. According to the IEA's *2011 World Energy Outlook* (WEO) "coal unquestionably won the energy race in the first decade of the 21st century" matching all other energy sources combined in providing incremental electricity supply.

In the last 30 years, worldwide coal consumption has increased from 3.7 billion tons per year to an amount approaching 8 billion tons per year today. The fact is that coal is the world's second largest source of primary energy and largest supplier of electricity – 41 per cent of global electricity generation comes from coal. Even in the face of action on climate change, coal's role is forecast to overtake oil as the world's most important energy source.

As the backbone of the world's electricity supply, coal must not be excluded from the world's energy mix based on concern over climate change, as we collectively cannot afford to step back from an affordable, secure, safe and reliable energy resource. Coal also has a significant role to play in CO<sub>2</sub> mitigation. Improving the efficiency of coal fired power generation and the deployment of carbon capture use and storage (CCUS) are key measures that can be taken to reduce emissions from coal combustion.

Improving the efficiency of coal fired power generation is among the cheapest and easiest ways to reduce CO<sub>2</sub> emissions. Many of the world's existing coal fired power plants are more than 30 years old, small, and use inefficient subcritical technology. Replacing those plants with modern, highly efficient plants can lead to a dramatic reduction in emissions, and China is a world leader in this, mastering the technology and driving down the costs.

A one percentage point improvement in the efficiency of a conventional pulverised coal combustion plant results in a 2-3 per cent reduction in CO<sub>2</sub> emissions. Highly efficient modern coal plants emit almost 40 per cent less CO<sub>2</sub> than the average coal plant currently installed.

Today, state-of-the-art coal combustion technologies, which have an efficiency rate of around 45 per cent, result in the emissions of 743g of CO<sub>2</sub> per kWh and research is on-going to reach

efficiency levels of 50 per cent and above.

Improving the efficiency of the oldest and most inefficient coal fired plants would reduce global CO<sub>2</sub> emissions from coal use by almost 25 per cent representing a 6 per cent reduction in CO<sub>2</sub> emissions, more than the total intended effect of the Kyoto Protocol. A substantial effort should be made by governments and international institutions to support the deployment of advanced coal fired power generation.

Given the obvious climate benefits of improving coal plant efficiencies, it would seem patently obvious that investment in clean coal technologies would be a global priority. But it seems it is mainly China and Japan, and until recently the USA, that are making any substantive investments in this area.

China's investment represents 36 per cent of global investment in advanced coal technologies. This is not surprising, given that Clean Coal Technologies are listed as the top climate change initiative by Chinese authorities. In its last Five Year Plan, China retired 76 GW of small coal power plants and replaced them with larger, more efficient plants. As a result, from 2005 to 2010, coal consumption per unit of electricity generated in China dropped by over 10 per cent. In the current Five Year Plan China has a target of reducing energy intensity of its GDP by 16 per cent. Here again, advanced coal technologies are identified as key players to deliver this goal.

While China is modernising its coal power plants and pushing the technology forward, countries such as the USA, UK and Canada are introducing emission performance standards, which are effectively banning the construction of new coal fired power plants. The Chinese approach is clearly the sensible option: invest in both advanced coal technologies and in CCUS. In September China launched its first CCUS demonstration project and it has another nine CCUS projects in the pipeline. This very first operating CCUS demonstration project in China captures CO<sub>2</sub> from a coal-to-liquids plant and is run by Shenhua Group, China's largest coal producer.

CCUS is a critical technology for dealing with climate change. It captures CO<sub>2</sub> from power plants and industrial installations, uses it productively and stores it safely underground. According to the *WEO 2011*, CCUS will contribute around 22 per cent of CO<sub>2</sub> abatement by 2035, more than the deployment of renewable energy and far more than by switching to nuclear.

Without CCUS the IEA says that the climate change mitigation effort will be as much as 70 per cent more expensive, or as much as an additional \$4.7 trillion in mitigation costs. Governments in the US, Europe, China and Australia have all announced significant support for demonstrating CCUS technology, but more action is needed to reach the IEA's target of 100 projects active by 2020.

The IEA's flagship publication *Energy Technology Perspectives* highlights the contribution of different technologies to reduce CO<sub>2</sub> emissions of the power sector at a level which would allow us to limit global temperature increase to 2°C. All low-



**Catelin: coal will be front and centre in global efforts to mitigate climate change**

carbon technologies will be needed for an effective response to climate change; however, clean coal technologies are expected to provide roughly a quarter of all the necessary CO<sub>2</sub> cuts in the power sector through to 2050.

In this analysis around 7 per cent of greenhouse gas (GHG) emissions cuts come from integrated gasification combined cycle (IGCC), supercritical and ultra-supercritical plants and another 16-20 per cent from coal power plants fitted with CCUS. This is more than solar or wind technologies which are expected to deliver 16 per cent and 11 per cent of the necessary cuts, respectively.

On the basis of its analysis, the IEA has said that it is not possible to halve CO<sub>2</sub> emissions by 2050 without CCUS and that mitigation costs by 2050 would be more than 70 per cent per year without coal and CCUS in the mix.

It is fair to say that CCUS is taking too long. However, the facts demonstrate that all climate solutions are well behind schedule. The IEA calculated in 2008 that 35 CCUS coal plants per year would need to be built in order to keep global warming below 2°C this century. This is fine in theory but the reality is, in comparison to other low-carbon technologies, CCUS is considerably underfunded.

The Global Subsidies Initiative calculated that nuclear and renewable energy projects (excluding hydroelectricity) receive \$45 billion and \$27 billion, respectively every year. In comparison to this, only \$12.2 billion has been made available to fund CCS demonstration since 2005. The funding gap is simply staggering.

Stopping investment in advanced coal technologies and underfunding CCUS is bad climate policy. The statistics are there in black and white: global coal demand will continue to grow. Based on the policies currently in place, coal consumption is set to double by 2035. Even if all governments fulfil their emission reduction commitments contained in the Copenhagen Accord, coal demand would still increase substantially by 2035.

Coal also provides an enormous benefit in terms of energy security and is actively mined in 70 countries.

Coal has been the cornerstone of China's unprecedented economic growth. Virtually all of the world's poverty reduction between 1981 and

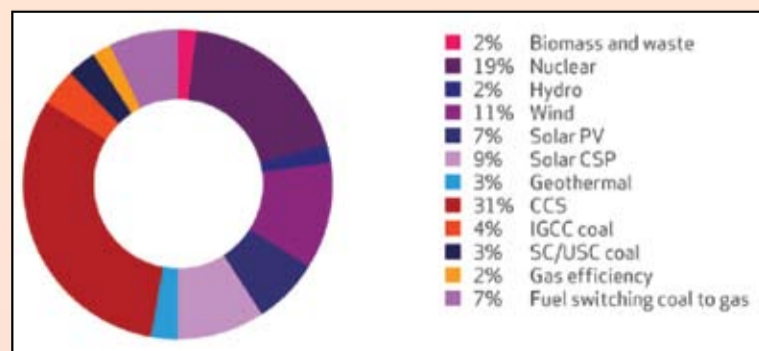
2008 took place in China and during this time China lifted 662 million people out of poverty. No other poverty alleviation strategy has been more effective than the one implemented by China and driven by an economy fuelled at over 70 per cent by coal. Coal has afforded 99 per cent of the Chinese population access to the national electricity grid. It was the key energy fuel behind this revolution and it is now playing a fundamental role in fuelling the industrialisation of India, where millions of people still have no access to electricity. They are some of the 1.3 billion people worldwide who live in energy poverty.

The issues of poverty alleviation and climate change are inextricably linked. Significantly reducing poverty in developing economies is a necessary first step to reducing greenhouse gases. Ignore this first step and developing economies will not have the capacity to focus their attention on reducing their GHG emissions. IEA analysis shows that coal will play an important role in addressing the challenge of energy poverty. Its statistics show that coal will be providing half of the new on-grid electricity connections and a quarter of all new energy needed to deliver universal electricity access between now and 2030.

So, significant investment in clean coal technology is paramount to provide the electricity needed to fuel economic development in developing countries. With international support this increase in coal-fired power supply can be done consistent with climate objectives.

International institutions such as the World Bank and other development banks, the Clean Development Mechanisms and the Green Climate Fund must all provide support for the deployment of advanced coal fired power generation and CCUS technology. The world faces significant climate and energy challenges and all technologies have a role to play in addressing these challenges. It is clear that coal will be front and centre in global efforts to mitigate climate change and to provide real energy access to those who currently struggle without it, allowing more people to live longer and better.

*Milton Catelin is Chief Executive at the World Coal Association*



**The IEA's *Energy Technology Perspectives 2012* shows the contribution of different technologies to reductions in CO<sub>2</sub> emissions of the power sector**

# Power without the sag

A new overhead line conductor with a composite carbon core is able to carry about twice the power of a conventional steel-reinforced conductor with almost no sag.

**Junior Isles** explains the significance of this new development.

The ability to put more power through an overhead AC line is often limited by the resulting expansion of the cable and subsequent sagging of the line. This can be a challenge for utilities saddled with the task of supplying more power to a city. Global cable manufacturer Nexans believes it has solved the problem by developing an overhead line conductor with a composite carbon core that can carry about twice the power of a conventional steel-reinforced conductor with almost no sag.

Known as Lo-Sag, the conductor has three main characteristics: high ampacity i.e. the maximum current throughput at normal operating temperature; it can achieve nearly twice its normal capacity by allowing its temperature to rise to 150°C, which is beneficial if more power has to be transmitted through a line in an emergency; and it has low sag, which allows shorter towers to be built or a

proved reliability. The third driver is the need for more interconnections between countries for energy trading and to accommodate the growing amount of wind and solar.

Nexans also notes that the ability to drive more power through a cable could help avoid blackouts.

Francis Debladis, Nexans Overhead Lines Corporate Technical Manager said: "The risk of blackout is the nightmare of any transmission system operator. If lines had enough capacity to temporarily accept more power, you can limit the effects of a blackout."

There are several ways to transmit more power through a line. One option is to increase the cross-section of the conductor. However, the increased weight of the conductor would mean towers would have to be reinforced, which is very expensive. Another possibility is to increase the voltage but this would require more

may be such that it is not possible to increase the current without exceeding the rated temperature.

Another interesting method is to raise the operating temperature of the line, and this is the area that has been the focus of a five-year development programme by Nexans.

In many of today's overhead cables, the temperature rating is around 80/90°C. To inject more power, the temperature rating has to be higher. This solution is no more expensive. Line losses would increase but the main constraint is the sag caused by thermal expansion of the line. Limiting sag is important to maintain vital safety clearances between the ground and the conductor.

"If you raise the temperature of the line, the sag will increase. So the coefficient of thermal expansion is absolutely key. If you want to increase the capacity of the line, the sag aspect is very critical," said Debladis.

The coefficient of thermal expansion of a conductor is a measure of the expansion per degree rise in temperature. This means that a cable with a coefficient of thermal expansion of 10 expands in length by 10 µm per metre for every 1°C rise in temperature.

The coefficient of thermal expansion and cable rating is determined by the material used to make the conduc-

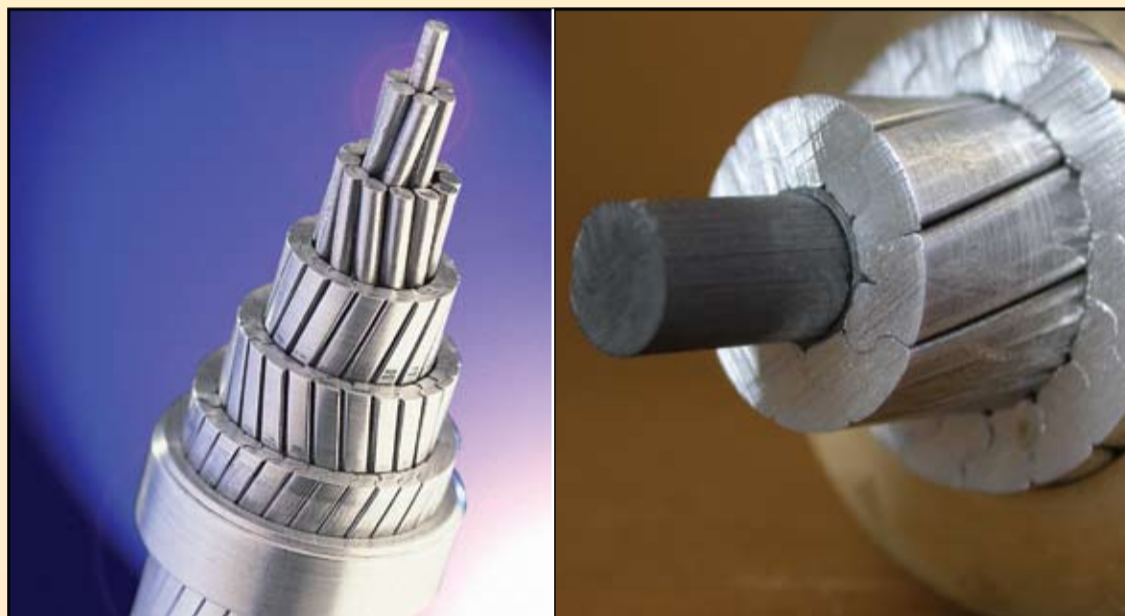
Nexans has worked with Light, Rio de Janeiro's electric utility to develop the conductor. The new cable will help Brazil supply more electricity to its large urban centres, where the construction of new overhead transmission lines is severely restricted and needs controlled clearance to buildings or natural obstacles.

The first conductor was installed late last year for demonstration on Light's 138 kV line that connects SE Cascadura to SE São Jose in Pavuna district. Pavuna is an area that needs more electricity. The new Lo-Sag cable replaces a traditional steel core conductor in a 2-3 km section where there is a tower at approximately every 300 m span. In this installation, Lo-Sag has been proved to increase power transmission capacity by 72.5 per cent, says Nexans.

The existing ACSR conductor has an ampacity of 690 A at about 70°C and a power throughput of 165 MW. The sag on the line under these operating conditions is 9.3 m between each span. With the Lo-Sag replacement, Nexans says ampacity would increase to 1380 A at about 150°C. Power delivered will be increased to 330 MW and the sag would be just 8.1 m.

Following several months of successful operation on the demonstration installation, Nexans recently won

**"If you raise the temperature of the line, the sag will increase. So the coefficient of thermal expansion is absolutely key..."**



Comparing cables: unlike traditional aluminium steel supported conductors (left) the new conductor (right) features a high strength composite carbon fibre core surrounded by a thin layer of aluminium

reduction in the number of towers in a network.

There are several drivers behind the development. Firstly, growing urban population means that electricity consumption in cities is increasing. Secondly, in many developed countries grids can be 80 years old and are in need of replacement, not only for increased capacity but also for im-

space between each phase and call for the arms on the towers to be changed. This is also generally not economically feasible. Monitoring the line in real-time, to take the possible cooling effect of weather conditions into account, in order to raise the current in the line without exceeding the rated temperature of the line is also possible. However, weather conditions

tors. The oldest product used for high temperature transmission is Aluminium Conductor Steel Supported (ACSS) cable. This can reach 200°C but with a coefficient of thermal expansion of 11.5, experiences significant sag.

Invar core, another type of conductor, can reach 200°C and has a coefficient of thermal expansion of 2. However, it has low strength and cannot handle icing conditions.

In order to overcome the limitations of existing conductors Nexans technology centres in France and Belgium initiated a five-year development to develop a new cable. The new composite conductor can reach 150°C. It has both a low coefficient of thermal expansion (between 2 and 4) and a high strength-to-weight ratio, according to the company.

The conductor features a high strength composite carbon fibre core surrounded by a thin layer of aluminium. This aluminium tube provides a good barrier between the core and the outside. This avoids any possibility of oxidation of the core, which can be damaging. The aluminium tube is then surrounded by two layers of a high-temperature aluminium alloy.

According to Nexans, the construction has performed as expected under a number of tests for things such as abrasion, corrosion and ageing.

Compared to a traditional aluminium conductor steel-reinforced (ACSR) cable, the superior performance in terms of sag is stark. According to Nexans, a 400 m-long ACSR cable operating at 90°C would sag 14.9 m. This compares to just 10.8 m for a Lo-Sag cable operating at 150°C.

This essentially means that a Lo-Sag conductor can carry almost twice as much power as a conventional cable if necessary while maintaining the specified ground clearance limits.

an order for a commercial project. This will be a 25 km cable in the São Paulo area.

Although the price of the cable is around three six times that of a traditional conductor, Nexans believes that it still makes a strong economic case for utilities.

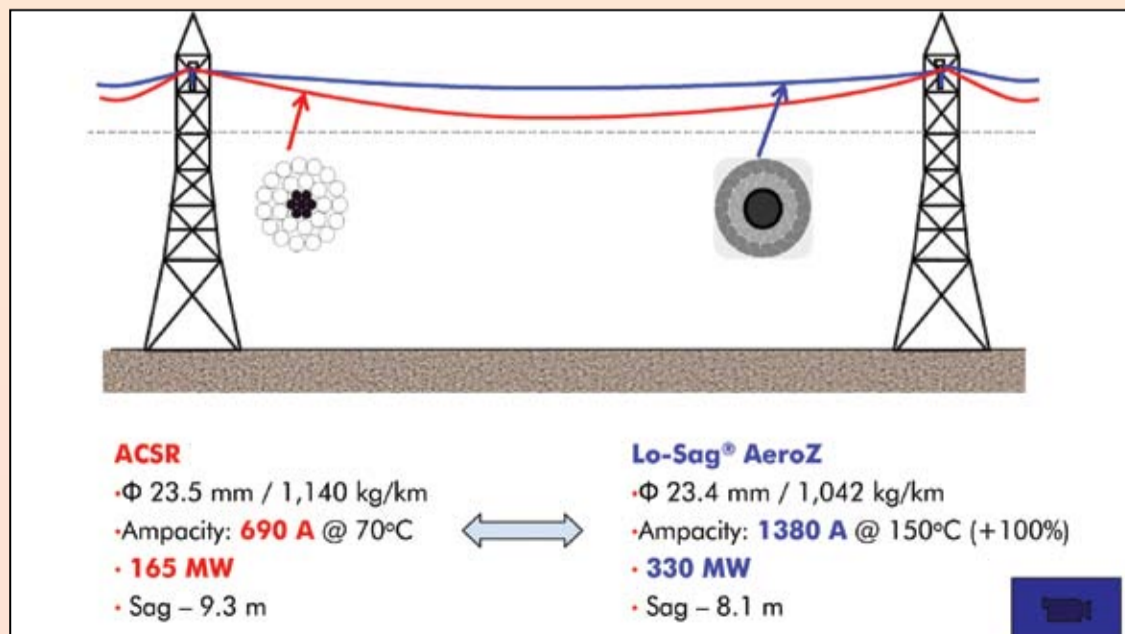
Debladis noted: "If you really want to increase the power and have to build a new line, it can cost about €700 000/km. A conductor costs about €30 000/km i.e. €90 000/km for three phases. So you can see that re-conductoring with a new conductor is much less capital intensive than building a new line. Also, this can be done immediately as here is no need to obtain a new right-of-way, which can be difficult in many countries."

While Lo-Sag has been developed to meet the particular needs of Brazil's transmission network, especially in upgrading projects, the concept is suited to many other markets around the world. It can offer advantages in the construction of new transmission lines, especially for the long spans, over 1 km, needed for river crossings. It enables the tower height can be up to 30 per cent lower.

Commenting on the opportunities for the conductor Debladis said: "We can split it into two markets. The first is refurbishment, which is mainly for developed countries. This market is about €3 billion/year. The second is for new cables, mainly in emerging countries. Asia is the biggest market for new cables. It is roughly the same size as the refurbishment market," he said.

As the need for more interconnections grows – whether due to greater use of renewables or increasing urban population – Lo-Sag looks set to play an important role in both new and refurbishment transmission development projects.

**The new Lo-Sag cable replaces a traditional steel core conductor to provide more power and less sag for Brazilian utility, Light**





Junior Isles

# Fiddling while Rome burns

Legend has it that Roman Emperor Nero played his lyre or – as the saying now goes fiddled – while the city of Rome burned. Many of today's government leaders could be accused of doing much the same in tackling global warming.

At the end of November as the 18th Conference of Parties (COP18) climate change talks were set to begin in Doha, Qatar, the spotlight once again returned to how the world would move forward on preventing disastrous climate change caused by the ever-increasing levels of carbon dioxide (CO<sub>2</sub>) in the atmosphere. Yet it is fair to say that the build-up going into the latest round of climate change negotiations has been a low-key affair compared to recent meetings, as heads of government averted their attention to the ongoing economic crisis.

But if we are to believe the science, which seems irrefutable, fighting short-term fires while the volcano simmers may not be the best policy.

Last month the World Meteorological Organization (WMO) said the amount of greenhouse gases in the atmosphere reached a new record high in 2011.

Total radioactive forcing, or the

warming effect on the climate, of all long-lived greenhouse gases was the CO<sub>2</sub> equivalent of 473 parts per million last year, a 30 per cent increase over that in 1990, said the WMO 2011 *Greenhouse Gas Bulletin*.

It said CO<sub>2</sub> accounted for about 80 per cent of the increase; and the amount

that if swift action is not taken by nations, emissions are likely to be at 58 Gt in 2020.

It says that even if the most ambitious level of pledges and commitments were implemented by all countries, under the strictest set of rules, there will now be a significant gap between

“...several countries no longer want to be part of a second Kyoto commitment period”

of CO<sub>2</sub> in the atmosphere reached 390 parts per million in 2011, or 140 per cent of the pre-industrial level.

Meanwhile the *Emissions Gap Report 2012*, coordinated by the UN Environment Programme (UNEP) and the European Climate Foundation, released days before COP18, said that greenhouse gas emissions levels are now around 10 per cent above where they need to be in 2020.

Instead of declining, it claims that the concentration of greenhouse gases in the atmosphere is actually increasing – up by around 20 per cent since 2000.

The report, which involved 55 scientists from more than 20 countries, says

current pledges to cut greenhouse gases for 2020 and the benchmark of 44 Gt, claimed to offer a credible pathway to keeping global temperature increase to below 2°C. Last year, the UNEP put the gap between pledges and what is needed at 6-11 Gt but has now increased this to 8-13 Gt.

Christiana Figueres, Executive Secretary of the UN Framework Convention on Climate Change (UNFCCC), said: “This report is a reminder that time is running out, but that the technical means and the policy tools to allow the world to stay below a maximum 2°C are still available to governments and societies.”

She added: “Governments meeting in Doha for COP18 now need to urgently implement existing decisions which will allow for a swifter transition towards a low-carbon and resilient world. This notably means amending the Kyoto Protocol, developing a clear vision of how greenhouse gases can be curbed globally before and after 2020, and completing the institutions required to help developing countries green their economies and adapt, along with defining how the long-term climate finance that developing countries need can be mobilised. In addition, governments need to urgently identify how ambition can be raised.”

Just ahead of Doha the World Bank also published its *Turn Down the Heat* report – a snapshot of the latest climate science prepared for the World Bank by the Potsdam Institute for Climate Impact Research (PIK) and Climate Analytics.

It said the world is heading down a path towards a 4°C temperature rise by the end of the century if the global community fails to act on climate change.

Going into COP18, one of the main areas up for discussion was extending the Kyoto Protocol. It was hoped that definite arrangements would be made for the implementation and enforcement of a second commitment period that would start in January 2013. Extending the Kyoto Protocol would act as a stopgap measure while negotiators work on a wider legally binding deal, which would take effect in 2020.

The 27-nation EU bloc, Switzerland, Norway and Australia are on board but several countries no longer want to be part of a second Kyoto commitment period. New Zealand is the most recent to say it will not be signing up to a second commitment period. Instead, the government said, it would opt for a non-binding pledge under the United Nations Framework Agreement on Climate Change.

The action puts New Zealand with a group of developed and developing

countries responsible for 85 per cent of global emissions, including the United States, Japan, China, India, Canada, Brazil and Russia.

“I want to emphasise that New Zealand stands 100 per cent behind its existing Kyoto Protocol commitment,” Climate Change Minister Tim Groser said in a statement.

“There is no question of withdrawing. The issue was always different: where would we take our next commitment – under the Kyoto Protocol or under the Convention with the large majority of economies?”

A key part of the new Kyoto Protocol commitment is some kind of revision of the Clean Development Mechanism (CDM). The CDM, credited with creating the first global environmental currency, is now under threat due to the current low prices paid for credits, the result of low demand and uncertainty over the timing and level of future demand, which is tied to countries' emission reduction commitments.

The CDM allows emission reduction projects in developing countries to earn certified emission reductions (CERs), each equivalent to one tonne of CO<sub>2</sub>. CERs can be traded and sold, and used by industrialised countries to meet a part of their emission reduction targets under the Kyoto Protocol.

In less than 10 years, the CDM has resulted in 5000 projects in more than 80 countries. A recently released UNFCCC secretariat report, titled *Benefits of the Clean Development Mechanism 2012*, examined roughly 4000 CDM project activities with respect to their contributions to sustainable development. It says the CDM has delivered 110 000 MW of new renewable energy capacity and spurred \$215.4 billion of investment in projects by the end of 2012 in developing countries.

A high-level independent panel recently concluded that if nations permit the CDM mechanism to disintegrate, the political consensus for truly global carbon markets might evaporate. Therefore, the panel is calling on nations to increase their mitigation ambition by strengthening the pledges made under the UNFCCC and by adopting corresponding domestic policies and measures.

While prices for CERs have dropped over the past year, Figueres points out that this is a matter of under-demand and stresses the need for countries to increase their level of ambition to reduce greenhouse gas emissions. “I say that the problem is one of ‘under-demand’ and not ‘over-supply’ because even if every last unit available in markets today were used or cancelled to meet mitigation targets, we would still be far from reaching the Parties' goal to limit global warming to 2 degrees or better,” she said.

The high-level panel, which officially presented its report at the 69th meeting of the CDM Executive Board in Bangkok in September, urged nations to intervene forcefully to address the crisis in the carbon market and substantially increase their level of ambition when it comes to reducing greenhouse gas emissions.

Such ambition is sorely needed; after all, today much more than Rome is at stake. It is time for certain world leaders to transform from Nero to hero.

