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THE ENERGY INDUSTRY TIMES

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China and US move closer on clean technology

Chinese President Hu Jintao: state visit to Washington

China and the US are continuing to create closer ties on clean energy technology, most notably in the field of clean coal, writes **Junior Isles.**

China and the US underlined their determination to cooperate on clean energy development last month during Chinese President Hu Jintao's state visit to Washington.

At a ceremony held in Washington, D.C., Secretary Steven Chu announced and witnessed the next milestones in the establishment of the US-China Clean Energy Research Centre (CERC) –nitably the signings of five-year work plans developed jointly by the US and Chinese research teams. The $150 million centre is a flagship initiative, funded equally by both countries over five-years with a combination of public and private sector sources.

Sarah Forbes, senior associate and lead for carbon capture and storage (CCS), the World Resources Institute commented: "This joint work between the United States and China demonstrates the great potential for cooperation on clean energy. As the world's largest energy consumers and producers, the United States and China recognise that advancing clean energy technology is essential to reduce greenhouse gases and other pollutants, and to enhance energy security. Notably, the occasion of the state visit was used to announce an agreement between GE and Shenhua to form an industrial coal gasification joint venture to advance the deployment of cleaner coal technology solutions in China. The new company combines GE's expertise in industrial gasification technologies with Shenhua's expertise in coal gasification and coal-fired power generation.

Under the joint venture, GE and Shenhua will sell industrial coal gasification technology licenses, jointly advocate for and develop integrated gasification combined cycle (IGCC) facilities and conduct research and development to improve cost and performance of commercial scale gasification and IGCC solutions. This includes industrial coal gasification applications in China as well as jointly pursuing the deployment of commercial scale IGCC plants.

Zhang Xiwu, chairman of Shenhua Group Corporation Ltd. said: "Shenhua has deep experience in developing and operating coal gasification and coal fired power generation facilities in China, including the Shenhua Baotou coal-to-olefins facility which uses GE's gasification technology." He added: "Collaboration between our two companies in this joint venture will create a gasification technology business in China with significant local presence, focus, resources and expertise."

Keith White, general manager, gasification, GE Power & Water commented: "Coal plays an important role in the economies of the US and China, and gasification technology allows us to use this abundant and low cost resource in a much cleaner way. Each business intends to contribute existing technology, operational and service expertise to create a comprehensive gasification and cleaner coal technology and service provider in China."

Once established the joint venture company will commence operation later this year, subject to regulatory approvals.

GE's gasification technology is one of the most widely applied technologies of its kind in China, with more than 40 licensed facilities.

Shenhua is one of the world's largest coal and energy companies, with coal

Continued on page 2

Cyber theft opens EU carbon trading to criticism

The shutdown of the EU emissions trading scheme (ETS) following a cyber attack that swiped allowances worth about €7 million from an account in the Czech Republic has once again opened the bloc's main tool in the drive to reduce CO_2 emissions to criticism.

The ETS suffered the longest disruption in its history after authorities suspended trading activities to combat the attack. In the days leading up to the closure, allowances had also been stolen from private accounts in Austria, Estonia, Greece and Poland.

Kjersti Ulset, the head of European analysis at Point Carbon told the *Financial Times*: "For those people who are against emissions trading as a tool to reduce greenhouse gas emissions, now they have another argument."

Launched in 2005, the ETS is supposed to encourage companies to invest in low-carbon technologies.

However, it has long been a source of criticism for European manufacturers who complain that it imposes an extra burden on them compared with competitors in countries like China and India.

Environmentalists also argue that the carbon price has been too low to be effective, partly due to the handing out of free allowances in the early years of the scheme's operation.

The security breach further adds to the ETS' woes. The Commission proposed measures last year to tighten security after discovering that hackers had broken into the registries where allowances are stored.

But many members, who are ultimately responsible for securing their registries, have not taken action saying that they cannot afford them.

According to commission officials as of January 25th, some five days after trading was halted, 14 EU states – including those, where the attacks took place – had failed to update obsolete and vulnerable security systems.

"Each member state has been asked to urgently provide the Commission with an independent report confirming that the minimum security requirements have been put in place. The Commission is now awaiting these reports from member states before national registries are fully reactivated," an executive said in a statement.

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(Continued from page 1)

reserves, coal fired power generation and a national role in the development of new coal-related technologies such as coal-to-liquids and carbon sequestration.

The announcement by GE and Shenhua was quickly followed by news of another clean coal technology venture between China Huaneng Group, Peabody Energy and Calera Corp.

The companies agreed to pursue development of a green coal energy campus in the Xilinguole Region of Inner Mongolia. The energy project would include a 1200 MW supercritical power plant that would capture a portion of carbon dioxide (CO_2) and convert it into green building materials, advancing carbon capture technology.

The plant would be fueled by a 12 million ton-per-year surface mine operated by Peabody. Huaneng, the largest generator in China and second largest in the world, will serve as the power plant operator. Calera brings its proprietary technology to convert CO_2 into solid carbonates that can be used as building materials.

Every ton of captured CO_2 is expected to produce two tons of cement construction material. The planned location has good access to serve electricity customers and industrial users in the Xilinguole Region.

In a separate announcement, AEP signed a cooperation agreement with China Huaneng, China's largest power generation company, through which AEP, Huaneng, the US Department of Energy and the National Energy Administration of China will perform the initial evaluation of a post-combustion, advanced amine carbon capture technology developed by China Huaneng for power plant applications. Additionally, the two companies will share data about power plant operation efficiencies pioneered at both companies.

AEP is already operating a 20 MW pilot that uses a different post-combustion CO_2 capture technology, Alstom's patented chilled ammonia process, at AEP's Mountaineer Plant in New Haven, West Virginia, and is permanently storing the captured CO_2 in underground rock formations.

AEP plans to scale-up the chilled ammonia technology to a 235 MW, large scale-demonstration project in the 2015 timeframe. The US DOE is funding 50 per cent of the demonstration project costs, up to $334 million.

"While we continue to advance Alstom's chilled ammonia technology at our Mountaineer Plant, it is important to continue to evaluate other technological options for addressing greenhouse gases as well," said Michael G. Morris, AEP chairman and chief executive officer.

n GE and China Huadian Corporation have signed a five-year, joint collaboration agreement for distributed energy combined heat and power (DECHP) projects in China that is expected to boost US exports and support thousands of US jobs.

Turkey attempts to accelerate new capacity

Turkey is taking steps to bring new clean generation on line quickly. In addition to introducing renewables feed-in tariffs, the government is now holding talks on nuclear with France and Japan after failing to reach an agreement with South Korea. **Junior Isles**

In an attempt to head-off looming power shortages and cut greenhouse gas emissions Turkey is introducing feed-in tariffs to boost its renewables generating capacity. It is also moving to get its plans for a nuclear plant back on track after negotiations with South Korea to build the project came to a halt.

Turkey could face an electricity shortage by as early as 2016 if countermeasures are not introduced in the shortest possible time, according to the *Anatolia* news agency.

Citing a report by Turkey's national electricity grid company, it said power demand would increase by 5-7.5 per cent every year until 2019. A high-demand scenario projects electricity demand to rise 5 per cent this year, 7.5 per cent in each year of the 2012-2015 period, and 7.4 per cent each year in 2016-2019, according to the report.

At the same time, the country has set itself an ambitious target of generating 30 per cent of its power supply from renewables by 2023.

Despite Turkey passing a renewable energy law in 2004 that supports PV installations, the uncompetitive feed-in tariffs of $0.072/kWh meant that very few investments were made.

In January the Turkish Ministry of Energy and Natural Resources introduced new support for clean energy technology that aims to not only strengthen its domestic renewables industry, but to simultaneously improve its energy security prospects while also helping to meet its climate change objectives.

Under the new program the subsidy for PV installations will be extended to $0.175/kWh in a base tariff, plus an additional bonus of up to $0.067/kWh for PV systems consisting of locally produced components and $0.092/kWh for all concentrated solar power systems built with local equipment. The program also guarantees a price of $0.13/kWh for wind and hydro, $0.14/kWh for geothermal, and $0.17/kWh for energy generated from waste.

The increased use of renewables is also an attempt to diversify a generating mix that largely relies on coal gas and hydro. The country is also hoping to introduce nuclear into the mix and signed a deal with Russia last May to build its first nuclear power plant on its southern shore with four reactors, at a cost of about $20 billion.

Ankara has also sought a deal with Seoul to build Turkey's second nuclear power plant in Turkey's Black Sea coastal town of Sinop, however the talks have been suspended since November due to disagreement on the terms.

The country is now holding talks with both France and Japan. "We have been considering all applications," said Turkish Energy Minister Taner Yildiz.

He told reporters, however, that priority was being given to talks with Japan.

Turkey and Japan agreed in December to seek a deal and signed a memorandum on civil nuclear cooperation.

Meanwhile in a drive to increase efficiency and competitiveness in its energy market, the country is continuing to privatise its electricity sector.

Last month it was scheduled to launch a tender for the Hamitabat power station (HEA•), Turkey's largest electricity generating plant.

Speaking to Anatolia, Ahmet Aksu Vice President of the Privatization Administration (Ö•B) noted that the country's focus on privatisation has been on selling power generation plants since all public electricity distribution grids – except one – were privatised last year for TL 12.3 billion ($7.8 billion). He said the four largest thermal power plants – HEA•, Soma A-B, Çan and Seyitömer – would be privatised individually, while the remaining stations will be privatised in nine groups.

Solar hit by more subsidy cuts

- Germany to cut subsidies by up to 15 per cent
- Spain retroactively removes support

European solar power generation will be hit by more subsidy cuts in two of its leading markets – Germany and Spain.

Last month German solar power producers agreed to subsidy cuts of up to 15 per cent, according to the German Press Agency *dpa*, to compensate for a solar energy boom that inadvertently drove up costs and threatened to overburden electricity networks.

The deal, reportedly struck between German Environment Minister Norbert Roettgen and solar industry representatives, aims to cut subsidies by 6-15 per cent in July depending on the number of solar panels installed in the previous four months. A further 9 per cent cut is to follow in January 2012, *dpa* sources said. The decision still requires parliamentary approval.

At present, photovoltaic energy panels are subsidised with 28.74 euro cents (0.38 dollars)/kWh.

Photovoltaic panels are so popular in Germany that consumer energy prices for those not using photovoltaics have risen noticeably to cover the subsidy costs for those using solar energy.

The boom in solar has also made it difficult for energy providers having to incorporate surplus solar power into their networks.

Dierk Paskert, a board member with energy provider E.On, described this as a "giant problem", as firms had to incorporate energy from 160 000 photovoltaic systems in the state of Bavaria alone. "The networks were not intended for this capacity," he said.

Spain, which has experienced similar problems, has been reducing its solar subsidies in recent years.

Faced with a large budget deficit, the Spanish government has issued the fourth regulatory change for photovoltaic plants in less than four years. Pre-agreed subsidies will be cut by 30 per cent, or €3.9 billion, over the next three years, and the cuts apply to both existing and future plants. The decision sets a global precedent, dealing a huge blow to investor confidence in the renewable energy market.

According to market analysts Datamonitor, a Spanish industrial organisation has already threatened legal action against the government, citing "unprecedented regulatory instability". The investment community is describing the retroactive cuts as a breach of investor confidence, one that will result in increased regulatory risks for Spanish utilities and associated industries.

Datamonitor believes that the government's move could severely threaten the future of both the solar PV industry and renewable energies in general. As long as renewable energies still rely on indirect subsidies in order to compete with cheaper fossil fuel generation assets, maintaining the underlying assumption that agreed tariffs remain stable – at least for assets that have already been installed – is absolutely vital for attracting the required levels of investment.

Datamonitor stated: "The last thing indebted governments need is investors withdrawing their capital from an industry already employing large numbers of their citizens. Setting and maintaining the right level of feed-in tariffs is not an easy task, but by retroactively removing its support for a key future growth industry the Spanish government is doing little to boost investors' confidence in its financial and economic competencies."

France invites wind projects worth €10 billion

French President Nicolas Sarkozy has invited interested investors to participate in an international bid to develop French offshore wind power in the northern Seine-Maritime department.

He said France would launch a tender in the second quarter to build wind turbines off the French coast with a total capacity of 3000 MW.

Potential bidders will be picked in 2012. They are expected to invest €10 billion euros ($13.61 billion) to construct 600 wind turbines at five sites in the northern regions of Saint-Nazaire and Le Treport.

"The deployment of wind energy off the French coast needs restructuring of the sector's players to ensure the readiness of the French industry to respond to the demands in the best conditions," Sarkozy said during a visit to STX shipyards in Saint-Nazaire.

He also stressed that the offshore development will contribute to creating jobs for the growing army of job seekers in the second largest Eurozone economy, where unemployment stands at 9.3 per cent.

"This industry represents a considerable source of job creation. We estimate that 10 000 jobs could be created," he noted.

France wants to boost wind power by building offshore turbines with a total capacity of 6000 MW by 2020.


Nicolas Sarkozy: calling investors

EPA rules on GHG take effect

New regulations aimed at coal-fired generation signal a step-change for America's power industry.

Siân Crampsie

Utilities across the USA are watching and waiting to find out what impact new federal rules governing greenhouse gas emissions (GHGs) from power plants will have on their business.

New rules from the US Environmental Protection Agency (EPA) came into force in early January that require utilities to measure and report emissions of carbon dioxide (CO_2) and other GHGs. If they want to expand existing plants or build new ones, they will have to adopt technology to curtail these emissions.

Facilities burning biomass will be excluded from the regulations for three years, the EPA announced.

The new regulations are being enforced under the existing Clean Air Act and have been criticised by some sectors of the country's coal lobby as a 'back door' way of regulating what the government has been unable to legislate.

President Barack Obama put federal greenhouse gas legislation at the top of his agenda when he took office, but the country's Congress has been unable to agree on how best to control carbon emissions.

Utilities are concerned about the cost impact that the new regulations will have and have argued that the rules will strangle the country's coal industry, which provides 45 per cent of the USA's electricity and employs some 84 600 people.

They come as the EPA prepares to implement other new regulations that will affect coal-fired power plants by restricting pollutants such as mercury, sulphur dioxide and nitrous oxides. Coupled with low natural gas prices, the future seems bleak for the coal fired generation sector.

A December report from investment bank FBR Capital Markets indicated that coal plant retirements could reach 45 000 MW over the next few years as utilities face the upgrade-or-retire decision because of new regulations. Utilities are likely to install emissions control technology on larger units, and replace smaller coal fired units with natural gas-fired plants, says FBR.

Another report from the Brattle Group says that "emerging EPA regulations on air quality and water for coal fired power plants could result in over 50 000 MW of coal plant retirements and require an investment of up to $180 billion for remaining plants to comply with the likely mandates."

The Brattle Group also indicates that coal plant closures will reduce coal demand by about 15 per cent and increase natural gas demand by about 10 per cent. Around one-third of plant closures will be plants under 40 years old and larger than 500 MW.

US President Barack Obama has a green agenda but Congress has been unable to agree on how best to control carbon emissions

The proposed air and water quality regulations from the EPA present "significant challenges" for the coal industry as a whole, said Brattle economist Metin Celebi.

The coal industry and lawmakers from coal-producing states are likely to continue making challenges to the new EPA rules, but the Obama Administration says that it is legally bound to regulate greenhouse gases under the Clean Air Act after a 2007 US Supreme Court decision ordered the EPA to determine whether GHGs endanger the public.

The rules have been widely welcomed by environmental groups, who say that they will help to enable a shift to cleaner energy in the USA and help to stimulate the economy.

Environmental group Sierra Club reported in December that utilities announced 12 000 MW of coal plant retirements in 2010 and that no new coal plant had started construction since October 2008. The Energy Information Administration (EIA) projects that no new coal plants will be built in 2011 without significant incentives.

Elektro cements Iberdrola's position in Brazil

Iberdrola says that its $2.4 billion acquisition of a Brazilian electricity distribution company will make it one of the largest electricity companies in Brazil.

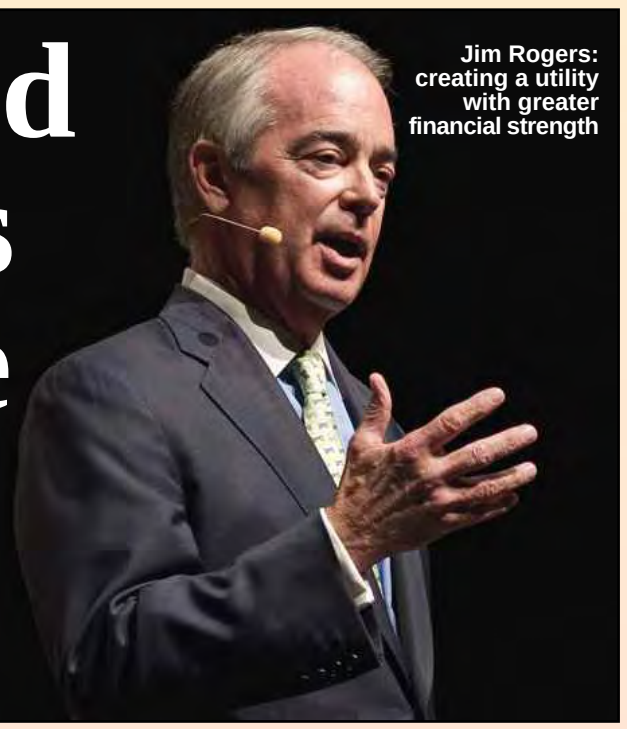
The Spanish utility has agreed to buy Elektro from Ashmore Energy International (AEI), the investment fund that controls assets formerly owned by Enron, in a cash transaction. The deal is in line with Iberdrola's strategy to expand in key international markets while reinforcing the regulated side of its business.

Elektro serves 2.17 million customers, most of which are in Sao Paulo state, supplying more than 11 000 GWh in 2009 via a 105 792 km distribution network. Iberdrola says that it will integrate Elektro into Neoenergia, a holding company that is 39 per cent owned by the Spanish group.

Other markets that offer growth potential and stability include the USA, Mexico and the UK, says Iberdrola.

Elektro has debt totalling €369 million and in 2009 recorded Ebitda (earnings before interest, tax, depreciation and amortisation) of €334 million in with net earnings of €216 million.

Duke and Progress continue M&A trend



Jim Rogers: creating a utility with greater financial strength

Duke Energy has announced plans to create the USA's largest utility through a merger deal with Progress Energy.

The two companies have unveiled a $26 billion all-stock merger agreement that will make them well-positioned to face upcoming regulatory and investment requirements.

"Our industry is entering a building phase where we must invest in an array of new technologies to reduce our environmental footprints and become more efficient," said Jim Rogers, chairman, president and chief executive officer of Duke Energy. "By merging our companies, we can do that more economically for our customers, improve shareholder value and continue to grow.

"Combining Duke Energy and Progress Energy creates a utility with greater financial strength and enhanced ability to meet our challenges head-on."

The newly-merged utility will be known as Duke Energy and will have the country's largest regulated customer base, providing service to approximately 7.1 million electric customers in six regulated service territories in the states of North Carolina, South Carolina, Florida, Indiana, Kentucky and Ohio.

It will own around 57 GW of generating capacity from a diversified mix of coal, nuclear, natural gas, oil and renewable resources, and will also operate the largest regulated nuclear fleet in the US.

The deal requires approval from state and federal regulators and is the latest in a string of transactions by utilities, which are under pressure from low energy prices, increasingly stringent emission requirements and the need to invest in new and upgraded infrastructure.

In November last year, PPL Corp. bought Louisville Gas and Electric and Kentucky Utilities from Germany's E.On. Also last year, First Energy Corp. agreed to buy Allegheny Energy and Northeast Utilities agreed to buy NStar, although those deals have yet to be completed.

Progress and Duke are aiming to close the deal by the end of 2011.

New alliance boosts clean energy development

- Members hope to coordinate resource development
- Abengoa closes Solana financing

Several companies have joined forces to show how the coordinated development of strategic transmission, energy storage and energy dispatch resources can make renewable energy more cost-effective than would be the case with "piecemeal development".

The Southwest Energy Alliance includes members such as Tri Global Energy, Alstom, American Superconductor, Burns & McDonnell, CH2M Hill and Tres Amigas, the firm that is developing a 'superstation' in New Mexico to interconnect the USA's three main power grids.

Their plan is to tie together wind and utility-scale solar power plants as well as clean, gas-fired generation, gas pipelines, and energy storage projects using advanced battery, superconductor power cable, HVDC converter and other technologies. Strategic development of such resources will help to ensure that the electricity system can cope with the intermittent nature of renewable energy plants.

Southwest US states such as Texas and California are key areas for renewable energy development but transmission line development, in particular, has become a barrier to further development.

In January, Abengoa Solar announced that it had finalised $1.45 billion of financing for the Solana project, the world's largest parabolic trough concentrating solar plant, to be built near Phoenix, Arizona.

Many of the Alliance members are already involved with the Tres Amigas superstation project, which is itself designed to enable the faster adoption of renewable energy.

"The Southwest Energy Alliance will be a catalyst for change in the way clean energy is developed and delivered to consumers," said Alliance President, Peter Esposito. "Tying renewable, clean fossil fuel, storage and delivery dispatch resources together and delivering them into all three of the US regional electrical grids will unleash the vast, untapped wind and solar energy resources available in the Southwest US and make these clean and renewable resources an engine for environmentally responsible economic growth for years to come."

Regional nuclear interest grows but India JV hits obstacle

While nuclear power continues to gain momentum in Asia, a joint venture to build projects in India – one of the region's largest markets – has hit a stumbling block. **Syed Ali**

Asia's thirst for nuclear power was again underlined by Pakistan's goal to build 10 projects by 2030, and Vietnam's progress with plans to build two nuclear power plants. However India, one of the region's most lucrative countries for nuclear investment, hit a stumbling block when the government objected to the presence of a state-run nuclear power producer as a partner in BHEL's planned three-way joint venture to build nuclear turbines with French energy major Alstom.

India's department of atomic energy contends that Nuclear Power Corp of India (NPCIL) cannot be both a buyer and supplier of nuclear turbines, as this could hurt price discovery, officials said. The move is a setback to the venture that has been in the works for close to a year. It has already secured commitments worth over Rs 7500 crore ($1.64 billion) to build turbines for 10 nuclear energy plants of 700 MW each.

"The department of atomic energy (DAE) has objected to NPCIL's participation in the venture on the grounds of conflict of interest," a senior government official said.

The joint venture is expected to participate in the nuclear power projects that will come under the Indo-US civil nuclear agreement – about 36 units of over 1000 MW each are planned.

NPCIL is one of the five public sector firms under the DAE's watch and would play a key role in achieving the country's nuclear power generation target of 63 GW by 2032. Alstom will be a technology partner to assist in making the large steam turbines for the conventional power island. Currently, BHEL can only manufacture turbines of 220 MW and 540 MW capacities.

Commenting on the JV and DAE's concerns, NPCIL chairman of the managing board, SK Jain said: "Negotiations for the venture are complete and it's in the final stages (of formation).

"We are working out a mechanism to suitably allay the concerns raised about our conflict of interest," he added. Each of the partners will have a one-third stake in the proposed JV," he said.

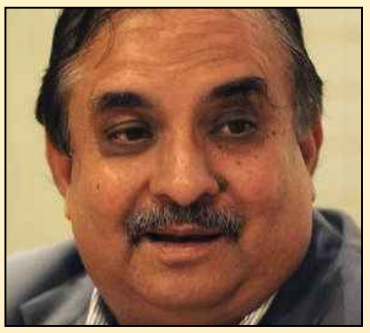
Meanwhile in neighbouring Pakistan, Dr. Ansar Parvez, Chairman of the Pakistan Atomic Energy Commission (PAEC) said 10 nuclear power plants would be set up in the country by the year 2030 to help cope with the growing electricity crisis.

He said that more than 10 nuclear power plants would be established in the country to generate about 1000 MW of power including the one for which groundbreaking would be done in the not-too-distant future in Karachi.

In other parts of Asia, Japan and Vietnam signed a bilateral nuclear cooperation pact, paving the way for Japanese firms to secure contracts to build two nuclear power plants in Vietnam.

Yasuaki Tanizaki, the Japanese ambassador to Vietnam, and Le Dinh Tien, deputy minister of Ministry of Science and Technology in Vietnam, signed the pact in Hanoi last month, according to Foreign Ministry officials.

The signing came after Japanese Prime Minister Naoto Kan and his Vietnamese counterpart Nguyen Tan Dung had reached a basic accord also in Hanoi in October on Japan's securing of contracts to build the plants.



NPCIL's SK Jain is allaying government concerns

Floods hit Australia coal industry and world coal prices

- Newcastle port coal hits $130 per tonne
- Profit falls forecast for power utilities

The floods that have hit central Queensland have cost the Australian state's coal industry an estimated A$1 billion ($1.02 billion) in production and have sent world coal prices soaring.

The floods covering an area the size of France and the UK, forced 75 per cent of coal mines to grind to a halt, dramatically reducing production from what is the world's biggest exporter of coking coal and second largest exporter of thermal coal

Queensland Resources Council (QRC) chief executive officer Michael Roche told reporters in Brisbane last month that disruptions could continue for months.

The floods are disrupting global coal shipments, rippling into the US and China markets where coal prices have surged.

Power station coal prices at Australia's Newcastle port, an Asian benchmark, rose 1.1 per cent in the week ended January 7. According to the globalCOAL NEWC Index, coal prices at the New South Wales port climbed to A$129.90 a tonne from A$128.50 the previous week. Last month the cost of thermal coal in Newcastle went above $130 a tonne, the highest in two years.

Senior mining executives and traders say that annual contracts, which run April-April, could rise to an all-time of $140 a tonne, above the record of $125 a tonne set in 2008.

The surging price is expected to hit power producers hard. AmResearch forecasts that net profits of Malaysian utility TNB for FY11 to FY13 could drop by 28-29 per cent.

"We estimate that a $10 per tonne increase in the cost of coal, which is above our average coal cost projection, could shave TNB's FY11 forecast net profit by 18 per cent," the research house said.

Michael Roche: expects disruptions to continue for months

Japan shies away from carbon trading

Japan is to press ahead with tax measures and other incentives aimed at reducing greenhouse gas emissions after deciding to delay the start of carbon trading.

The government decided to put off the creation of a greenhouse gas emissions trading system (ETS) until after fiscal 2013 in the face of strong resistance from the business sector.

The government has already submitted to parliament a basic anti-global warming bill that also includes an environment tax and fixed-price purchases of power generated by renewable energies, but is backing off on the ETS while the bill is pending at the Diet.

At a meeting of Cabinet ministers concerned, it decided to introduce an environmental tax during fiscal 2011 and a system for power utilities to buy electricity generated with renewable energy sources at relatively high fixed prices in fiscal 2012.

National Strategy Minister Koichiro Gemba said the country has not given up on plans to introduce emissions trading. According to *Reuters*, he said: "Our circumstances have changed. Our views on emissions trading schemes have also changed", referring to failed attempts to introduce trading systems in the US, Canada and Australia.

Australia's opposition party used Japan's decision to reinforce its argument against introducing an ETS, which the government has twice unsuccessfully tried to push through but still remains on the agenda.

Opposition climate spokesman Greg Hunt said: "Japan's decision is a stunning rebuke to Labour's plans to impose a massive hike in power prices on Australian families and businesses. Surely now Julia Gillard must admit that her plans are in tatters."

In late December, the federal government's multi-party climate change committee agreed on a set of principles to guide it in developing a price on carbon, although a specific model has not been decided on.

China and GE cooperate on smart grid standards

The State Grid Corp. of China, the country's state-owned power distributor is moving forward its plans for a smart grid after signing a strategic cooperation agreement with General Electric Co. (GE) and the Chinese Academy of Science to jointly develop smart grid standards.

China currently has no national standards or technical specifications for smart grid implementation.

The three organisations will therefore cooperate in the standardisation of technologies in areas including electric vehicle charging and integration of large power storage systems, the State-Owned Assets Supervision and Administration Commission said.

State Grid has said it wants to build a nationwide "strong smart grid" by 2020 to increase electricity transmission capacity from coal-rich inland provinces to the power-hungry coast, and to improve the grid's ability to absorb more of the variable amounts of power generated by wind, solar and other renewable energy sources.

Coal meets two-thirds of China's power needs, and the government wants most new thermal power plants to be built at mine mouths to ease bottlenecks in the country's transportation network and pollution near major cities, so it will need to develop ways to store that power and deliver it efficiently over long distances.

The smart grid will be based on the current national grid, including ultra-high voltage (UHV) power transmission lines, on which State Grid will invest CNY500 billion ($76 billion) over the next five years.

Gujarat focuses on renewables

The Indian state of Gujarat is contributing to the country's efforts to reduce carbon dioxide emissions through its increasing focus on renewable generation.

It hopes to become the first Asian country to begin operating a commercial-scale tidal power station. Construction of the 50 MW facility is scheduled to start in 2012 but to be the first, the project will have to come on line ahead of a tidal array under construction on South Korea's Sihwa Lake on the west coast.

The tidal farm will be constructed in the Gulf of Kutch on India's west coast. Its capacity could eventually be expanded to deliver more than 200 MW of electricity.

British company Atlantis Resources, which says Gujarat has good potential for tidal exploitation, will build the $150 million tidal plant.

At the start of the year, Gujarat also announced that it is setting up Asia's largest solar park on 2000 hectares of land at Charanka village in northern Patan district.

The park is expected to generate solar energy for 330 days a year, amounting to 5.5 to 6.0 kW per km^2 solar radiation daily. The state government has agreed to buy 933 MW of power from the project under its new solar power policy.

Last month Tulsi Tanti-promoted Suzlon Group said it would set up wind projects to generate 1000 MW in Gujarat by 2014. This move is likely to attract investments worth around Rs 6000 crore ($1.3 billion).

"Suzlon Group signed a Memorandum of Understanding (MoU) with Gujarat government to develop 1000 MW of wind power in Gujarat over the next three years," a company statement said.

S. Korea to spend $42.7 billion on new power plants

The South Korean government says it will spend Won 49 trillion ($42.7 billion) to build 48 new power plants by 2024 in order to meet growing domestic demand for electricity.

The plan calls for total electricity generation to reach 551.6 GWh in the target year, with annual average demand expected to go up 1.5 per cent in the coming years, the Ministry of Knowledge Economy said.

Based on an assessment of the country's long-term energy requirements, the plan also takes into account peak summer demand that may reach 950.4 GW.

The ministry said it would start injecting money this year so the power plants can be built according to schedule. The construction programme includes 14 nuclear reactors to augment the 20 units already on-line.

In addition, 15 coal fired plants and 19 gas fired units are to be built around the country.

By 2024, authorities said nuclear power generation should account for 32 per cent of the country's power production installation facility, followed by coal and gas fired power plants that are expected to account for 28 per cent and 21 per cent of the total, respectively.

Indonesia moves to guarantee investment


Sinthya Roesly: praised the decree

Indonesia is hoping that the issuance of a presidential decree will give investors the confidence to develop much needed new generating capacity.

Following the government's 2010 presidential decree, which was due last year, PT Penjaminan Infrastruktur Indonesia (PII), an Indonesian government-sponsored infrastructure financing guarantee agency, said it will soon provide a guarantee for the construction of a Rp 30 trillion ($3.3 billion) power plant in Central Java.

PII president director Sinthya Roesly praised the government for issuing the presidential decree, saying that it is a big step in accelerating vital infrastructure developments in the country. "The ground rule will enable us to start guaranteeing infrastructure projects, including the PLTU Jawa Tengah coal fired power plant with a total capacity of 2 x 1000 MW in Central Java," Sinthya said.

PII will cover financial loss risks that might appear from government or non-government actions like regulation changes, late permission issuance and the absence of tariff adjustment, Sinthya said.

The head of Fiscal Risk Management Centre at the Finance Ministry, Freddy Rikson Saragih, said that the coal fired power plant project would be the first project conducted under the public-private partnership scheme.

"Previously, private investors were reluctant to invest in public infrastructure developments in Indonesia due to the country's unstable political condition," he said.

Murtaqi Syamsudin, business and risk management director at state electricity company PT PLN, said that the issuance of the guarantee would pave the way for the company to continue the tender process to choose the contractor to build and operate the coal fired power plant in Central Java.

"Seven companies and consortiums of companies have passed our pre-qualification process," he said.

The seven bidders were Mitsubishi Corporation, China Yudean and CNTIC consortium, GDF Suez and J-Power consortium, Marubeni, Korea Electric Power Corporation (Kepco) and Guohua Electric Power Company (GEPC), Murtaqi explained.

Murtaqi said the operation of the new coal fired power plant would boost the electrification ratio in Java-Bali from the present 70 per cent to between 80 per cent and 85 per cent in 2016. PLN is to be the representative of the Indonesian government in supervising the power plant development project. He added that construction of the power plant was estimated to start in early 2012.

Murtaqi said that the firm had not determined the location of the planned power plant. Currently, it is still conducting studies to find a suitable location by considering energy balances in Java.

At the beginning of January PLN announced it would set aside Rp 66 trillion ($7.34 billion) of this year's budget to build new electricity infrastructure across the country

In 2011, seven new power plants will begin operating in Java and Bali. The power plants are part of the first phase of the 10 000 MW fast-track programme.

TGreen targets are a risk to security of supply

Europe is striving to meet targets for green energy, but as recent experience in the UK shows, more balance is needed to ensure that other policy targets are also met.

Sian Crampsie

The UK's drive to exploit its wind power resources could lead to increased price volatility and greater dependence on imported natural gas, according to analysts.

Energy procurement specialist Utilyx has warned that although the level of renewable energy is rising in the UK, these sources of energy cannot be relied upon to generate electricity when they are most needed.

The UK-based firm, which provides services to major energy users, says that during the cold snap experienced in December when temperatures plummeted, wind energy contributed very little to the generation mix even though electricity demand soared.

"The cold snap that the UK is experiencing at the moment is a stark reminder of how reliant we are on imported gas," said Andrew Horstead, Risk Analyst at Utilyx. "Record demand has been met with supply, but at a price climbing to levels not seen for over two years.

"With power demand also soaring to record levels in [December], the government must be mindful that output from the UK's existing wind generation has provided less than one per cent of our total requirements, when we need it most, which is clearly not enough to sustain a green Britain during a white winter."

It warns that the government, which is currently drafting a White Paper on electricity market reform, must recognise the need to draw from a diverse energy mix, including clean coal and nuclear builds. "The government's heavy support of offshore and onshore wind to get the UK to our green targets could potentially create security of supply risk and more than likely contribute to volatile prices," said a statement from Utilyx.

Statistics released by the government for the last quarter of 2010 indicate that renewable energy – including wind, hydropower, biomass and landfill gas – accounted for 8.6 per cent of electricity generation, up from 6.9 per cent for the same quarter of 2009.

The UK has set a target of sourcing 15 per cent of all its energy needs from renewable sources by 2020.

The warning from Utilyx highlights the 'trilemma' faced by the UK and other European countries as they strive to implement an energy system that is sustainable, secure and affordable. The UK is currently debating electricity market reforms proposed by the government in December.

The market overhaul includes proposals to introduce a carbon price support mechanism; feed-in tariffs to promote low-carbon power generation; 'capacity payments' – targeted payments aimed at securing electricity supply; and an emissions performance standard to limit the carbon intensity of coal fired power stations.

The government's proposals were broadly welcomed by industry groups as promoting investor certainty in the market, but there remain concerns over the impact that the reforms – and more general policy changes – will have on energy prices.

"We have to brace ourselves for the long term reality: heating and lighting our homes and powering the economy is going to cost much more in the years to come," said David Hunter of M&C Energy Group. "These ageing power stations must be more than replaced as we move towards electric vehicles and renewable energy that will require both 'back up' generation and a reinforced national grid.

"It will cost £200 billion to 'keep the lights on' and meet greenhouse gas targets by 2020, and guess who pays? The hard-pressed consumer."

The UK's energy retail market is also being investigated by regulator Ofgem, which is concerned about the market dominance of the UK's 'Big Six' energy suppliers.

Consumer groups in the country raised concerns in January after E.On said that electricity charges would rise by nine per cent in 2011 in spite of the fact that the company managed to more than double its earnings in 2010.

Azerbaijan deal boosts EU security

José Manuel Barroso: hailed the deal as a "major breakthrough"

European Commission President José Manuel Barroso has hailed a strategic gas deal with Azerbaijan as "a major breakthrough" for the diversification of Europe's energy supplies.

Barroso and Azerbaijan President Ilham Aliyev have signed a joint declaration on gas delivery under which Azerbaijan will supply "substantial volumes of gas over the long term" to the EU. In return, Azerbaijan will gain access to the EU's markets.

"This agreement confirms Europe's direct access to gas from the Caspian basin, thus enabling the realisation of the Southern Corridor," said Barroso. "This new supply route will enhance the energy security of European consumers and businesses."

The Southern gas corridor consists of several gas pipelines that together would bring natural gas from the Caspian Sea to Europe. Adding Azerbaijan to its list of natural gas suppliers will help Europe to become less dependent on Russia for natural gas.

One of the pipelines that could be developed in the Southern corridor is Nabucco, a 3300 km-long project stretching from Turkey to Austria backed by RWE, MOL, and OMV among others.

The declaration was welcomed by the Nabucco partners. "The Joint Declaration on strategic gas supplies to Europe is of particular importance as it seals the bond between the EU nations and a close neighbour and strategic partner," said Reinhard Mitschek, Managing Director, Nabucco Gas Pipeline International GmbH. "[It] serves to pave the way to the full implementation of Nabucco, by providing a firm political basis for gas supply from Azerbaijan."

The European Commission has pledged €200 million in start-up funding for the Nabucco project.

Other Southern Corridor gas pipeline projects include ITGI, White Stream and TAP. These require the strengthening of existing gas infrastructure in non-EU countries, rather than the construction of a new pipeline.

Competition "unsatisfactory" in Germany

- 'Big Four' dominate wholesale market
- Improved data access needed

Germany's federal cartel office believes that competition in the country's wholesale electricity market is "unsatisfactory" because the 'Big Four' utilities still dominate the market.

The Bundeskartellamt has released its final report on an inquiry into the country's electricity sector that began in 2009. The report says that RWE, E.On, Vattenfall and EnBW between them hold an 80 per cent share in the first-time sales market and suggests way of monitoring and improving the situation.

"Thanks to the sector inquiry we have been able to clarify key questions on market and competition processes on the electricity wholesale markets," said Andreas Mundt, President of Bundeskartellamt. "This gives us a sound basis for detecting and preventing the abuse of market power."

Although the report found no evidence that any of the main utilities had used their market power to manipulate electricity prices in 2007 and 2008, it does suggest that "the leading producers have the incentive and possibilities to considerably influence the electricity price by abusively holding back capacities".

The Bundeskartellamt believes that behaviour on the wholesale markets as well as power station operation and management should continue to be monitored, and it wants access to power station production data to be improved.

The Bundeskartellamt says that it supports the federal government's proposed market transparency scheme, which would improve data access as well as deter market abuse.

ITER dealt funding blow

A plan by the European Commission to plug a funding gap for the ITER nuclear fusion demonstration reactor by using unspent funds from the EU budget has been rejected by the European Parliament.

The funding package included a commitment to find an additional €1.4 billion in funding for the project, the cost of which is spiralling, using unspent funds from the EU's 2010 budget together with funds from the 2011 budget.

The proposal was rejected by the European Parliament in December, however.

Member states will now have to table a new proposal for early next year but access to the EU's 2010 budget is now closed.

"We had the green light of the Council of Ministers, but the Parliament did not follow," Michel Claessens, a spokesperson for the directorate-general of research at the European Commission told the *BBC*.

The EU is responsible for funding 45 per cent of the ITER project, which is already under construction in France. The project's other partners are China, India, Japan, Korea and the USA.

The original cost estimates for ITER were around €5 billion. Experts now believe the cost will be closer to €15 billion.

n French naval firm DCNS is planning to develop small-scale underwater civilian nuclear reactors designed to generate electricity for consumers on land. The capsule-shaped 'FlexBlue' reactors would produce 50-250 MWe and be installed on the sea bed several kilometres from land.


FIELD REPORT#2
Topic
Fuel Reliability
Location
Worldwide
Close collaboration secures fuel performance and reliability.
We share a common goal with our customers: to harness the highest level of expertise, innovation and in-reactor experience feedback for safe and successful fuel operation, no matter how tough the conditions may be. Utilities want to maximize power output and uranium utilization through optimized fuel design and operation. To get there requires high-quality fuel, on-time delivery, optimal core management, and close daily collaboration between utility engineers and AREVA experts. Constant dialogue is the key: More than 600 engineers work with our customers on more than 140 reloads every year for a broad range of operating environments making AREVA's worldwide fuel experience with light water reactors unparalleled. AREVA fuel products are continuously upgraded to preserve their reliability and increase performance under tougher operating conditions. Such evolutionary innovation is supported by constant efforts in Research & Development leveraging AREVA's panel of dedicated R&D test facilities worldwide. Thanks to decades of close collaboration with customers, AREVA continuously integrates acquired in-reactor experience feedback to achieve optimal fuel performance and reliability.
Return on experience
INCREASED RELIABILITY
Find out why: www.areva.com/fieldreport
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FIELD REPORT#3
Topic
Low-Carbon Power Generation
Location
Worldwide
Deploy nuclear and renewables to build a sustainable low-carbon generation portfolio now – and later.
New regulations require utilities to reduce emissions, while adapting to regional resources and producing profitable, competitive power in today's global economy. Utilities can build a sustainable energy mix that satisfies current requirements and future goals for low-carbon power generation by investing in an optimum combination of nuclear and renewable technologies from AREVA.
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Find out how AREVA can help build a low-carbon energy portfolio with the right mix of innovative nuclear and renewable technologies that makes economic sense for you now and later.
Return on Experience
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Some call it an achievement.
We call it another reason to keep doing better.
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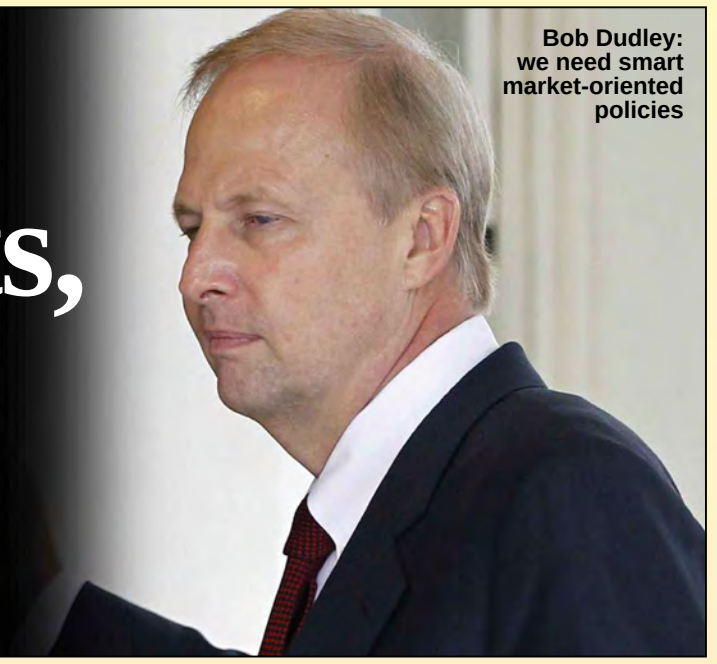
BRIC growth will drive energy markets, says BP analysis


Bob Dudley: we need smart market-oriented policies

The next 20 years will see continued diversification in the world's primary energy mix, with demand and trends driven mainly by rapidly industrialising countries.

Sian Crampsie

Energy from non-fossil fuel sources such as renewables, hydropower and nuclear will play an increasingly important role in meeting growing global energy demand over the next 20 years, according to analysis from BP.

The oil firm has for the first time published the results of its projection of energy trends – 'Energy Outlook 2030' – which indicates that global primary energy demand will grow by 40 per cent over the next two decades.

The study is an outline of how BP sees the world's energy markets developing between 2010 and 2030 and highlights key trends in energy use. The company has decided to publish it as a way of contributing to the energy debate.

"The issues covered in this document are huge ones – the effort to provide energy to fuel the global economy, sustainably, in an era of unprecedented growth," said BP CEO Bob Dudley. "What producers, governments and consumers all want is secure, affordable and sustainable energy. But on a global scale, this remains an aspiration.

"And to meet that aspiration over the next two decades, we need smart, market-oriented policies to deliver the energy we need in a manageable way – without inhibiting economic development or jeopardising the improvements in living standards now being experienced by billions of people worldwide."

The Energy Outlook highlights how major changes in the world's population and economies have driven change in energy use. Since 1970, while the world population has risen about two-fold, GDP has risen more than three-fold and consumption of commercial primary energy 2.5 fold, says BP.

However, in 1970, OECD countries used around 70 per cent of all the energy consumed worldwide. By 2009, this figure had fallen to 47 per cent.

Looking forward, the Energy Outlook indicates that the vast majority of energy demand growth – 93 per cent – will come from non-OECD countries, particularly those that are in the throes of rapid industrialisation such as Brazil, India and China.

Coal and oil will lose share in primary energy use as energy sources diversify, says BP. Notably, non-fossil fuels are together expected to be the biggest source of growth for the first time, and the contribution of renewables – including solar, wind, geothermal and biofuels – to energy growth will rise from five to 18 per cent between 2010 and 2030.

Over the same period, energy intensity, a key measure of energy use per unit of economic output, is set to improve globally led by rapid efficiency gains in non-OECD economies.

Fossil fuels' contribution to primary energy growth is projected to fall from 83 per cent to 64 per cent.

The diversifying fuel mix is being driven largely by developments in the power sector, says BP. Energy used to generate power remains the fastest growing sector, accounting for 53 per cent of the growth in primary energy consumption over 1990-2010 and projected to account for 57 per cent of the growth to 2030.

In terms of end-use, industry drives the growth of final energy consumption.

In the oil sector, Opec's share of global oil production is set to increase to 46 per cent, a position not seen since 1977. Global consumption growth is also impacted by higher oil prices in recent years and a gradual reduction of subsidies in oil-importing countries.

China is the largest source of oil consumption growth in the study, with consumption forecast to grow by 8 million barrels a day to reach 17.5 million b/d by 2030 – overtaking the US to become the world's largest oil consumer.

Biofuels production is expected to reach 6.7 million b/d by 2030 from 1.8 million b/d in 2010 and will contribute 125 per cent of net non-Opec supply growth over the next 20 years. Continued policy support, high oil prices, and continued technological innovations all contribute to the rapid expansion.

The US and Brazil will continue to dominate biofuel production with 76 per cent of total output in 2010 but falling to 68 per cent in 2030 as output from Asia-Pacific begins to rise.

"The global fuel mix continues to diversify – but for the first time, non-fossil fuels will be major sources of supply growth," said Christof Rühl, BP's Chief Economist.

Abu Dhabi delays hydrogen power plant

A $2 billion project to construct the world's first commercial-scale hydrogen fuelled power plant equipped with carbon capture and storage (CCS) in Abu Dhabi has been delayed, according to the project partners.

Hydrogen Power Abu Dhabi (HPAD) is a 60:40 joint venture between Masdar and BP tasked with the development of a facility that would convert natural gas into hydrogen and carbon dioxide (CO_2).

The hydrogen would be used to fuel a 400 MW power plant and the CO_2 transported and used for enhanced oil recovery (EOR).

According to reports, the project is waiting for approvals from the government, but could be delayed by as much as three years.

According to BP, the project partners were planning to make the decision to proceed with construction of the plant by the second quarter of 2011. Front End Engineering Design (FEED) activities for the project were completed in June 2009 and HPAD had aimed to issue a request for proposals for construction of the plant last year.

BP is planning the construction of a second hydrogen fuelled power plant in California, USA.

Saudi Arabia offered nuclear assistance

Saudi Arabia is hoping to sign nuclear cooperation agreements with overseas governments in order to help get its planned nuclear energy programme off the ground.

The Middle East nation – the world's largest exporter of oil – has been holding talks with both Japan and Russia that could boost bilateral ties and create joint ventures in preparation for a nuclear build programme.

Talks with Japan were held in January during a visit to Riyadh by Japanese trade minister Akihiro Ohata. In December Russian ambassador to Saudi Arabia Oleg Ozerov said both countries are holding talks to pave the way for the signing of a deal on nuclear cooperation.

Saudi Arabia is planning the construction of nuclear power plants in order to meet rising energy demand and conserve oil reserves. Other key projects aimed at increasing electricity generating capacity are underway, including the Shuqaiq power and desalination plant in Jazan, which will add 850 MW to the grid.

In January, ACWA Power International, the lead developer on the Shuqaiq water and power project, said that it had completed construction of the plant 70 days ahead of schedule.

Other nuclear power programmes in the Middle East are also progressing.


Offering a helping hand: Japanese Trade Minister, Akihiro Ohata

In January, Jordan inked a nuclear cooperation agreement with Romania, bringing the number of countries that have officially extended support for the kingdom's nuclear programme to ten.

According to the Jordan Atomic Energy Commission (JAEC), the deal will facilitate the transfer of know-how and training support as Jordan moves closer to its goal of constructing a 1000 MW reactor within the next decade. It also paves the way for the sale of nuclear technology between the two countries.

Jordan also recently announced that its Nuclear Regulatory Commission has drafted and approved the regulations that will govern the construction and operation of its first nuclear reactor.

The regulations, drafted with the assistance of the International Atomic Energy Agency and the EU, cover the handling of nuclear materials as well as the licensing, inspection, monitoring and control of radioactive sources in hospitals.

The bylaws will also govern the commission and operation of nuclear facilities, the review of site selection studies and impact assessments as well as the transportation of radioactive materials.

Kenya pushes for nuclear power

A newly-appointed Nuclear Electricity Project Committee has been granted funds of Sh300 million ($3.7 million) by the Kenyan government to start work.

The committee has been tasked with the identification of a suitable site and technology for a nuclear power plant in the country, and with conducting a public awareness campaign.

The Kenyan government wants to add nuclear energy to its generating mix in order to overcome dependence on hydropower and expensive oil-fired generation. Nuclear energy would provide the country with reliable and affordable energy and would help the country to meet its economic growth goals under its Vision 2030 plan, according to officials.

Kenya has experienced serious droughts in the last four years that have had a major impact on food and energy security. It is also developing geothermal and wind energy resources.

Kenya's current installed capacity stands at around 1200 MW. The government's least cost power development plan for 2010-2030 forecasts that demand will surpass 15 000 MW by 2030.

BP targets a new frontier

Scrutiny and criticism of BP's groundbreaking deal with Russia's Rosneft are unlikely to halt the international oil company's pursuit of growth.

A $16 billion handshake: but not all are happy with the BP-Rosneft tie-up

Sian Crampsie

BP's shareholders and partners around the world are examining the potential risks and rewards of the international oil firm's groundbreaking tie-up with Russian oil company Rosneft.

The $16 billion share-swap deal between the two companies will give BP access to potential oil and gas reserves in the Russian Arctic, but also makes the Russian state – Rosneft's owner – an indirect shareholder in BP.

The complex deal is in line with BP's strategy to access large and new reserves of hydrocarbons and also bring numerous advantages for Rosneft.

It has, however, drawn criticism from US politicians concerned about the Kremlin's influence over an oil firm that is a major supplier to the US military, as well as from the billionaire shareholders in TNK-BP, the British firm's main Russian oil venture.

BP Chief Executive Bob Dudley said that the deal defines a new template for doing business in the international oil industry. "We are very pleased to be joining Russia's leading oil company to jointly explore some of the most promising parts of the Russian Arctic, one of the world's last remaining unexplored basins," commented Dudley.

"Underpinning this alliance is a new type of relationship based on a significant cross-shareholding, and bringing together technology, exploration and safe and responsible field development skills."

Dudley's views were echoed by BP Chairman Carl-Henric Svanberg, who said: "The world's need for energy continues to increase. BP is working with national oil companies using its leading exploration skills and expertise to meet this demand. This is a trend which will increase as access to resource becomes scarcer."

Under the deal, Rosneft will take a stake of around five per cent in BP in exchange for around 9.5 per cent of the Russian group. The two companies will explore and develop three licence blocks in the Russian Arctic continental shelf that combined represent an area "roughly equivalent in size and prospectivity to the UK North Sea", according to BP.

The agreement is the first major equity-linked partnership between a national and international oil company. BP's willingness to surrender shares to the Kremlin is viewed as a risky move, but the rewards could be significant, according to analysts.

In a research note, analyst firm Renaissance Capital said that the deal would be an "important catalyst" for Russia's oil sector and demonstrated the "strategic attractiveness" and "vast resource potential" of Russian reserves. Further international investment in Russia is required in order to bring the required technological know-how to explore and develop its oil reserves.

The deal could also help transform Rosneft into a leading global oil firm, says Renaissance.

But the two companies' deal has drawn criticism from the USA, where President Barack Obama's National Commission into the Gulf of Mexico oil spill recently recommended a moratorium on Arctic drilling pending improved scientific data. BP and Rosneft's plans to explore the Russian Arctic could be seen as insensitive and become a major point of conflict between BP and the Whitehouse.

US lawmakers have also voiced concerns about the Kremlin becoming – indirectly – BP's largest single shareholder.

While the US is unlikely to be able to block the deal, there is potential for it to damage relations between the Whitehouse and BP, Russia and the UK.

The UK government has given its support for the deal, which in Europe could help to improve the somewhat fractious relationship that the European Union has with Russia over energy matters.

One potential major stumbling block for the BP-Rosneft agreement would be a legal challenge from Alfa-Access-Renova (AAR), BP's partner in the TNK-BP alliance. AAR has said that its lawyers are examining the deal to see if it contravenes its agreement with BP.

BP's shareholder agreement with ARR states that all new business opportunities in Russia should be pursued through TNK-BP, according to AAR Chief Executive Stan Polovets.

MOUs boost AP1000 supply chain

- Suppliers register for AP1000 projects
- Westinghouse signs China agreements

Memoranda of Understanding (MOUs) signed by three of the biggest names in the UK's nuclear energy industry have boosted the prospects for the development of AP1000-based nuclear power plants in the UK.

Nuclear Power Delivery UK – a consortium led by Toshiba-Westinghouse and including Shaw and UK engineering firm Laing O'Rourke – has signed agreements with BAE Systems, Doosan Power Systems and Rolls-Royce.

The agreements build on earlier MOUs signed by Westinghouse and the three suppliers and would "bring a clearer team focus to where these major organisations can support us, and allows us all to look at how we can best work together to bring the AP1000 nuclear plant for UK customers as reliably and cost-effectively as possible", said Nuclear Power Delivery UK Managing Director, Rita Bowser. Specific areas for development include engineering support, manufacturing and components and logistics.

Nuclear Power Delivery is attempting to strengthen its supply chain in advance of firm agreements to build new AP1000-based nuclear capacity in the UK, and recently announced that 500 companies had now registered their interest in being a supplier.

Westinghouse has also boosted prospects for the AP1000 reactor technology in China through the signing of a two-year extension of a nuclear cooperation agreement with State Nuclear Power Technology Corporation.

The extended deal will help Westinghouse to seek further opportunities for deploying the AP1000 in China, where it and its partner The Shaw Group are currently building four AP1000 units.

In January Westinghouse also signed an agreement with China Baotou Nuclear Fuel to design, manufacture and install fuel fabrication equipment for AP1000 fuel in China.

Tognum exits fuel cell market

A lack of medium-term commercial viability has forced engine specialist Tognum to withdraw from the fuel cell market.

The German firm, which supplies engines and propulsion systems for off-highway and stationary power applications, said that it has opted against further active engagement in the fuel cell business following an analysis of the risks and rewards, demand forecasts and current market conditions.

The decision would have no impact on the company's full-year guidance for 2010 nor on its prospects for 2011, it said in a statement.

Tognum had been developing high temperature ceramic fuel cell technology designed to produce energy for stationary power, heating and cooling applications and marketed as 'HotModules' under its MTU brand. It said that over the course of 2010 it had looked at additional market initiatives to support its fuel cell business, including possible partnerships for serial production in Asia.

"After negotiations with a potential Asian partner, which had appeared promising at first, ended without agreement on 28 December 2010, the Executive Board took the decision to discontinue its fuel cell activities," said the firm in a statement.

Tognum says that it still expects revenue growth of around ten per cent and an adjusted EBIT margin in the high single-digit percentages for 2011. The firm's medium-term growth targets are also unchanged.

GE offers commitment to Russia

GE is once again targeting high growth countries, signing a deal with two Russian firms aimed at modernising the country's power generation sectors.

The US conglomerate has signed a framework agreement with state corporation Russian Technologies (Rostekhnologii) and Inter RAO UES to form a joint venture to manufacture, assemble, sell and service heavy duty gas turbines in Russia.

The move follows announcements made by GE at the end of 2010 to invest more than $2 billion in a range of markets in China, as well as $500 million in Brazil.

The deal in Russia will allow GE to localise manufacturing bases as well as gain a significant foothold in the country's power generation market, which requires investments of $80 billion in the next ten years to address aging generation assets.

Official Russian government forecasts say Russia needs to build 80 GW of thermal power generation capacity in the next 20 years. According to the Ministry, the average efficiency of gas-fired power stations in Russia is 38 per cent, with a goal of 53 per cent efficiency by 2030.

Americas

Gamesa signs Western Wind Energy deal

Gamesa has secured a contract to supply 10 MW of wind turbines for a wind farm being developed by Western Wind Energy Corporation in Kingman, Arizona.

The contract is the second that the Spanish wind turbine manufacturer has signed with Western Wind in the last month and gives the firm a foothold in the Arizona wind turbine market.

The wind farm will comprise five G90-2.0 wind turbines. Turbine installation is scheduled for April 2011.

California utility signs 800 MW PV deal

Southern California Edison (SCE) has signed contracts with two renewable energy developers for the supply of more than 800 MW of solar photovoltaic (PV) power from seven new projects in California.

The utility has signed three contracts with SunPower totalling 711 MW, while contracts with Fotowatio Renewable Energy Ventures (FRV) total 120 MW from four separate projects.

One of the contracts with SunPower is for the largest single solar PV installation in the USA – the 325 MW Solar Star California XIX project that is scheduled to be operational by October 31, 2016.

Siemens wins largest onshore wind contract

Germany-based Siemens has secured its largest ever onshore wind energy contract after signing a deal with MidAmerican Energy to deliver 258 wind turbines for wind farms in Iowa, USA.

Under the contract, Siemens will supply its 2.3 MW wind turbine units for the projects, which will be commissioned in early 2012.

René Umlauft, CEO of the Siemens Renewable Energy Division said: "Our largest onshore order to date from the US demonstrates that we are well on track to becoming one of the three leading suppliers of wind turbines by 2012."

Element builds first North American wind plant

Element Power has announced plans to build its first wind farm in North America in Luna County, New Mexico, and has placed an order with Vestas for the supply of the project's wind turbines.

Vestas will supply 28 of its V100-1.8MW wind turbines for the first phase of the 99 MW Macho Springs wind energy project. The contract includes delivery and commissioning along with a 10-year turbine service and maintenance agreement.

Element Power has an option to purchase an additional 27 V100-1.8 MW wind turbines for the second phase of the project, which could proceed as early as next year.

Asia Pacific

Tognum provides nuclear back-up

A consortium led by Tognum subsidiary MTU Friedrichshafen GmbH has won an order to supply four emergency power generating sets to the nuclear power plants currently being built in Fuqing, southeast China.

Certified to class 1E safety, the gensets are scheduled for delivery to the customer in December 2012 and August 2013. The deal positions the consortium well to win further orders for emergency gensets in China's nuclear power market.

The consortium also includes Areva and Shanxi North MTU Diesel Co. Ltd. (SNMD) – a joint venture formed by MTU and the Chinese Norinco Group.

Vestas wins China orders

Denmark's Vestas has received an order from Hebei Construction Investment New Energy Company (HCINEC) for the supply of 25 wind turbines for a new wind farm in Laoting County in China's Hebei province.

The order is for Vestas' V90-2.0 MW wind turbine unit, and marks the third time that the two companies have collaborated. It includes delivery, installation and commissioning of the wind turbines, a Scada solution and a service and maintenance agreement.

Vedanta orders 150 MW of wind capacity

Hindustan Zinc Limited, part of the Vedanta Group, has signed a contract with Suzlon Group to build, operate and maintain 150 MW of wind power capacity in four Indian states.

Under the Rs 865 crore ($190 million) deal, Suzlon will supply a mixture of its S821.5 MW and S882.1 MW wind turbine models to sites in Karnataka, Maharashtra, Rajasthan and Tamil Nadu. The project will help Vedanta to meet its growing energy needs in a sustainable manner.

The first 50 MW phase of the project will be completed by March 2011, and the remaining 100 MW by September 2011.

South Korea places turnkey H-class order

South Korean utility GS Electric Power has placed an order with Siemens for the construction of a new combined cycle power plant based on H-class gas turbine technology.

The order is the third received by Siemens for its H-class gas turbine but the first turnkey order for a complete combined cycle plant based on the new technology.

Under the contract, Siemens will build the 400 MW Bugok 3 power plant, which will feature a SGT6-8000H gas turbine, SST6-5000HI-L steam turbine, a hydrogen-cooled generator SGEN6-2000H, a Benson-type heat recovery steam generator as well as electrical equipment and the instrumentation and controls system SPPA-T3000. The new plant will achieve an efficiency of over 60 per cent, says Siemens.

Kyocera to supply 204 MW pv project

Kyocera Corporation has won a contract to supply around one million solar photovoltaic (pv) modules to Thailand's largest solar power project.

Developed by Solar Power Co., the solar farm project involves the construction of thirty-four 6 MW solar plants across northeast Thailand.

The solar farms will provide electricity to local households and businesses and will help the country to meet growing energy demand in a sustainable manner.

Thailand's government introduced a feed-in tariff for solar power in 2007 and has targeted the installation of 500 MW of solar capacity by 2022.

Europe

Salzburg AG selects data hub

Austrian power company Salzburg AG has chosen Siemens to provide it with a meter data management system for its 'Smart Grid Model Region' pilot project.

The pilot project will test intelligent electricity meters under real-life conditions, and Siemens' Energy IP meter data management system will serve as a data hub for other IT systems. It also gives the utility a comprehensive smart metering solution, and will allow it to integrate further IT systems in the future.

Acting as a data hub, the data management system will link the Siemens automated metering and information system AMIS to Salzburg AG's accounting and billing system SAP IS-U. This will allow the meter data collected by Salzburg AG to be used efficiently by Salzburg AG for its business processes.

AMSC boosts UK D-VAR business

American Superconductor Corporation (AMSC) has received several new orders for its D-VAR reactive compensation solution for wind farms in the UK, including two from Nordex.

The new contracts will bring the number of D-VAR systems in service in the UK to 15, says the USA-based technology company.

Under its new contracts with Nordex, AMSC will provide D-VAR solutions that will enable extensions to Nordex's Kilbraur and Millennium wind farms in Scotland. AMSC's D-VAR solutions have been successfully providing system-wide voltage control at the initial phases of both of these wind farms.

In 2009, the UK installed over 1 GW of new wind capacity, bringing its total installed capacity to more than 4 GW, according to the Global Wind Energy Council.

Industry research firm IHS Emerging Energy Research expects the UK's total capacity of onshore and offshore wind power will exceed 40 GW by 2025.

Siemens building key European link

Siemens Energy says it is on track to commission the converter stations for a key electricity transmission link between France and Spain in 2013.

The German firm is currently building the converter stations for the 2000 MW HVDC link, which will provide a major boost to the interconnection capacity between the two countries and which also marks an important stage in the expansion of Europe's electricity network.

The 65 km-long link will run from Baixas, France to Santa Llogaia, Spain. The €700 million project is being developed by Inelfe (Interconnecteur Electrique France-Espagne), a joint venture between the grid operators Réseau de Transport d'Electricité (RTE) and Red Eléctrica de España (REE), and is partly-funded by the European Commission.

International

MHI wins Saudi Aramco order

Canada's SNC Lavalin has placed an order with Mitsubishi Heavy Industries (MHI) for the supply of four sets of natural gas fired M501F gas turbines and generators for installation at a gas processing plant owned by Saudi Aramco.

The units will be delivered in 2012 and installed at the Wasit gas plant in eastern Saudi Arabia. They will form the heart of a cogeneration plant at the new facility.

The Wasit facility will process the gas produced from the Hasbah and Arabiyah non-associated gas fields.

Egypt orders wet compression systems

Siemens has received an order from Egypt's Ministry of Electricity for the installation and commissioning of wet compression systems for eight SGT-4000F gas turbines installed at three separate power stations in the country.

The wet compression systems will be installed at the Nubaria, Talkha and Kureimat power plants and will enable each turbine to generate 25 per cent more power while reducing NOx emissions by more than 30 per cent.

The first two systems will be installed at the Nubaria power plant during scheduled outages in early 2011 in time for the summer peak.

Estonia secures energy independence

Eesti Energia says that it has secured its domestic energy supply for the next few decades through a $1.3 billion deal to build two new 300 MW oil shale-fired power plants.

The Estonian state-owned utility has signed a contract with Alstom for the construction of the new power plants near the town of Narva. The first phase of the project is expected to be completed by 2015.

Under its contract, Alstom will supply one 300 MW unit based on circulating fluidised bed (CFB) boiler technology, with an option for a second unit. Alstom will also supply the final fuel handling, CFB boiler, steam turbine, flue gas treatment, automation and control systems and electrical systems for each unit.

Alstom has previously supplied enhanced dust removal systems to Eesti Energia and performed three low-pressure turbine retrofits at the Narva power plants. Alstom is currently supplying new desulphurisation systems for four 200 MW Narva plants and has had a Long Term Service Agreement (LTSA) with Narva since the year 2000.

GE selected for Romania projects

GE is partnering with wind farm developer Monsson Alma for two projects that will add 35 MW of renewable energy capacity to Romania's power grid.

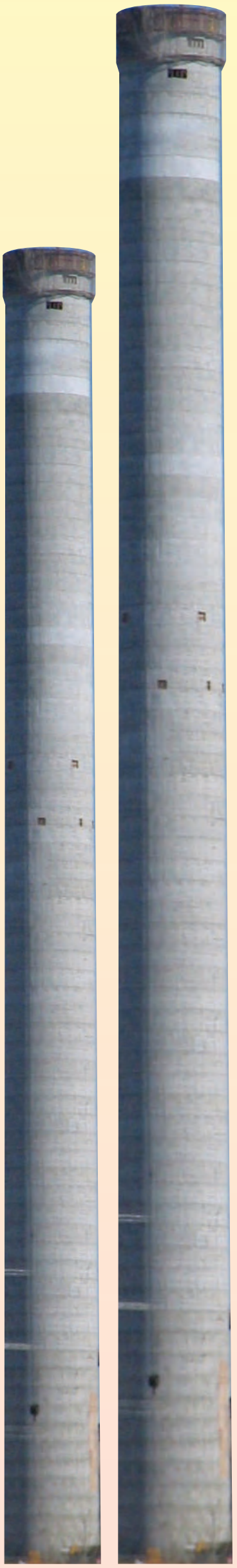
GE will provide ten 2.5 MW wind turbines and ten years of maintenance for the Silistea 1 project, which will be owned by SC Romconstruct Top SRL and four 2.5 MW machines and five years of maintenance for the Mireasa 2 project, owned by SC Eco Power Wind SRL.

Romania recently enhanced financial incentives for renewable energy project development, and is aiming to source 24 per cent of energy production from renewable energy by 2020.

Metso secures Estonia order

The Metso-Wärtsilä joint venture MW Power is to supply Ou Helme Energia with a biomass power plant for combined heat and power (CHP) production in the township of Helme in Estonia.

The biomass power plant will be based on bubbling fluidised bed (BFB) technology and will use a combination of spruce bark, chipped logging residues and wood chips or milled peat as the main fuels. The plant will produce 15 MW of heat and 6.4 MW of electricity, which will partly be used in the customer's own pellet factory and the rest will be distributed into national grid.



Not all plain sailing for new nuclear

Many countries are once again seeing nuclear power as an important part of the future energy mix. *TEI Times* speaks to global management consultancy Arthur D. Little about the challenges facing new nuclear build.

Nuclear power is on the cusp of what could be seen as a global renaissance. There are currently 63 projects under construction around the world and around a further 500 either already under contract or planned within the next two decades.

A recent study by global management consultancy Arthur D. Little, however, points out there are several threats to new nuclear build.

The challenges facing nuclear projects are in many instances regional or country specific. The supply chain – 'hardware' as well as engineering and financing – is one key area that has been identified in the past as a potential obstacle.

While it is an issue that has been largely resolved in countries with a history of operating nuclear plant, for many of the new entrants it is still a potential stumbling block.

Michael Kruse, Principal, Energy and Utilities Practice, Arthur D. Little said: "In emerging and developing countries like Turkey, Jordan and Mexico, that are looking for ways to get nuclear plants built, financing can be a show-stopper for several projects."

For some developing countries, especially those with little or no operating expertise, a build, own operate (BOO) or build, own, transfer (BOT) model could be adopted. However, with the tremendous costs involved, the builders of such projects would be limited to vendors that are closely tied to a utility operator such as Rosatom, EDF or Kepco.

"We are seeing this in places like Turkey with Rosatom and the UAE with KHNP. Toshiba is beginning to go in this direction with Tepco, as is Areva and EDF. It may give you a competitive advantage in certain countries if you are able to provide the build, technology transfer and training, and operation at the same time," said Kruse.

With regards to what he describes as the "hardware" part of the supply chain, Kruse says that long lead times for items such as reactor pressure vessels and other large forgings is no longer an issue on the global level. Companies in countries such as Japan and Germany have increased production capacities, although Arthur D. Little's study warned that these new expanded capacities carry the risk of lower quality in the period immediately after start-up. Also, many projects have a more realistic timeframe, which will flatten out the project cycle and ease any bottlenecks.

However, in countries like Vietnam and Turkey, Kruse said that there would still be local supply chain issues. "These countries often require a certain degree of local content so that building a nuclear plant has a positive impact on the overall economy. But building up a nuclear supply chain in these countries is a challenge. It requires supplier identification, qualification and grading etc. which, unlike in Europe, can be difficult. Therefore contracts are often constructed in a way that involves some kind of technology or skills transfer."

In Western Europe the problems are more related to labour. Based on current project schedules, the Arthur D. Little study estimates that more than 65 000 people will be needed to work on nuclear new build throughout Europe by the year 2018. A more realistic scenario, which takes into account the likelihood that not all planned new builds will be implemented, still estimates a labour demand peak of 35 000 people. This number does not take into account upstream supply chain labour involved in the manufacture of equipment and components.

More specifically, Kruse believes the more critical issue is the lack of skilled labour. "In most EU countries, there have been no nuclear plants built in the last 20-25 years. Many of the utilities do not have people with experience [of building nuclear plants] any more," he noted. The problem is further compounded by the fact that electrical and mechanical engineers are also needed to work on replacing conventional power plants.

Most nuclear new builds in Europe have a commissioning date of around 2020, which means that many plants will have to be built in parallel. With each construction site requiring around 4000 workers, it would put a strain on suppliers to provide significant numbers of people.

In an optimistic scenario, the study estimates that a peak of 6500 nuclear, conventional, and civil engineers will be needed by engineering consultancies, suppliers and owners in Europe within the next decade. Even in a more realistic scenario it forecasts that more than 3000 people will be required.

Kruse added: "You cannot send the best people to every project, so some projects will lose out in terms of having the best people. In our projects we see that several owner's engineering firms, which typically represent the owner's interest related to plant suppliers, have a hard time providing sufficient nuclear engineering capabilities."

Such a gap in skilled labour can have consequences such as project overruns in an industry that is already all too familiar with being over-time and over-budget.

Kruse, however, puts this in perspective, arguing that this is an affliction of many large infrastructure projects, not just nuclear. He said: "London's Heathrow airport Terminal 5 is an example. The issue is not nuclear-specific. But if you look deeper into it, the consequences may be different. Unlike, say an airport terminal operator, electricity is purchased by consumers so there is a different consequence for the economy, especially in countries already facing tight electricity supplies."

Dr Matthias von Bechtolsheim (left) and Michael Kruse (right) agreed there is always a willingness to accept cost overruns as long as safety is not compromised

He also pointed out the nuclear industry always has to consider safety over and above everything else. "Safety comes before profitability so there is always a willingness to accept cost overruns as long as safety is not compromised."

Dr Matthias von Bechtolsheim, Director, Energy and Utilities Practice, Arthur D. Little noted that some of the huge cost and time overruns seen in the 1980s were ultimately the result of Three Mile Island. "The incident led to an increase in safety requirements. So projects had to be stopped and re-designed."

As building new nuclear power plants is one of the most complex technical undertakings that currently exists, due to high quality requirements and standards, owners frequently face huge technical risks.

Typical investment of €5 billion per unit and project execution times of around 12-15 years from first feasibility studies to the start of commercial operations, impose a high degree of uncertainty. Strict regulation in many countries, including rigid safety requirements, challenging financing requirements and public reluctance, add further complexity that needs to be handled professionally.

Arthur D. Little's study notes that inaccurate understanding of project risks and inaccurate prioritisation of critical activities are what often lead to significant delays and project overruns.

The study states that there are several factors that lead to cost overruns, one of the main ones being start of construction before design completion (including changes imposed by the owner). This is a particularly difficult area to address. As Kruse explained: "Technology is always evolving, especially in terms of safety. Regulators in most countries want nuclear plants built according to the state of technology and science. This can cause reversals in certain design aspects, which affects the entire supply chain. But it can be managed through a good understanding of technology."

Managing and allocating such risks is important. Risk related to the safety of the plant resides with the owner. However, if there is a breach in safety that is the result of a design error, then the nuclear liability clause signed with the supplier means that the liability lies with the supplier.

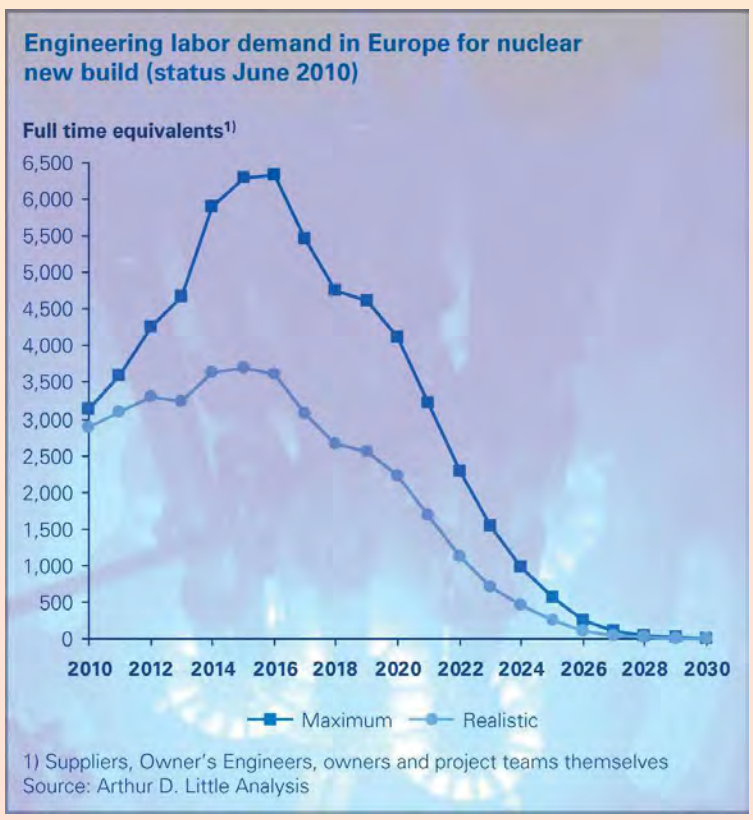
According to Arthur D. Little, the ultimate risk stays with the owner. For example, the risk of loss of revenue if the plant does not operate or is not connected to the grid is with the owner, even if there is a contract with the supplier for some form of compensation in case of delay.

The type of contract signed can mitigate such risks. The Olkiluoto 3 plant in Finland, which is currently behind schedule and over-budget, is a good case in point of how future contracts might change to mitigate the risk to the owner.

"In the future, EPC [engineering, procurement and construction] turnkey contracts like at Olkiluoto 3 will not be fixed price contracts. There will be some kind of hybrid pricing model. You could separate the 'E', 'P' and 'C' elements over the different islands i.e. the nuclear and turbine islands and balance-of-plant, and further break it down to the components. Then you could approach the suppliers. For example, in the nuclear island you could determine the amount of steel that is needed and fix the price. Then you would look at the construction. This takes five years and so cannot be fixed price. It would need some sort of price index. You could then negotiate on the price of certain components. No contracts have been signed like this yet but we see it coming and are advising clients to do it this way."

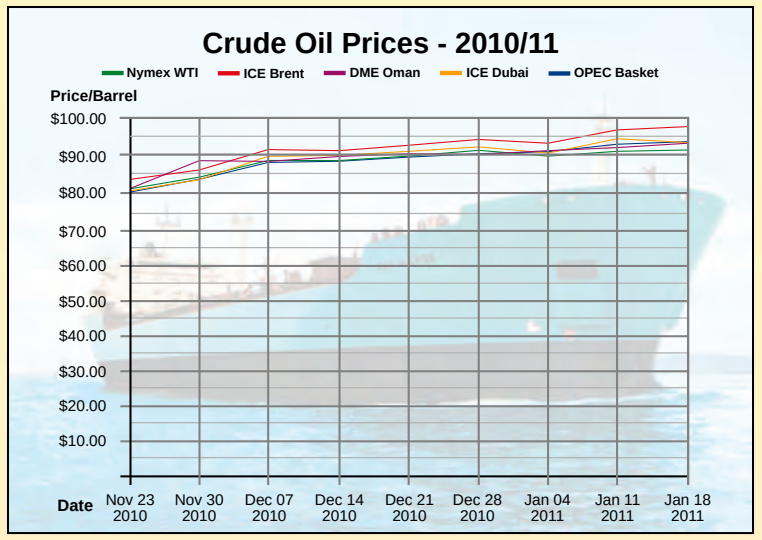
The nature of the industry is such that people are slow to implement counter-measures to identified risks and concerns. The study says there is a lack of understanding of other departments' requirements and the natural interdependencies between the different tasks of a project's subject areas. This, it says, often delays decision-making and is amplified by an unspoken reluctance among project members to deal with the high degree of uncertainty in nuclear new build. Arthur D. Little believes that professional management of nuclear new build ventures is important in order to overcome the management challenges.

While the challenges to nuclear new build should not be underestimated, Kruse is confident that projects in returning nuclear markets like the UK will go ahead. "The UK has developed an attractive environment for owners. If the commitment of the government remains as it is now, there is a very high likelihood that these projects will be implemented successfully. It is more a question of time. Every country has set a 2020 timeframe. It may be a little later, say 2023/24 but that's not really an issue from my perspective. It's better to progress steadily than to be set on a fixed date."



Oil

Rising prices causes concern for global recovery



Price levels "already pose a real economic risk"
Saudi Arabia begins to place more oil on market

David Gregory

With crude oil prices expected to soon touch the $100/b mark again, Western sources are expressing concern about the impact on the global economic recovery. However, the more hawkish members of Opec are confident that the global economy can cope with prices in that range.

This comes despite the fact that when crude oil prices were hovering at $40/b, several Opec moderates, particularly Saudi Arabia, said they considered a fair price for crude to be $75/b. In mid-January the price of West Texas Intermediate was moving in the low $90/b range and Brent crude was close to $100/b.

Commenting on forecasts that demand for crude oil will rise over the course of 2011 and that the fundamentals of supply and demand are beginning to once again influence the market, Opec said in its latest *Monthly Oil Market Report* that the early onset of winter weather and bullish market sentiment were key factors contributing to the recent price surge.

"The rise in crude [prices] is part of a general increase across commodities as a whole, as expectations about a continued improvement in the global economy have supported increasing commodity investment… The recent surge in prices cannot be fully explained by a change in oil market fundamentals, as global stocks point to a continued well-supplied market."

In its January report, Opec forecast world crude demand at 86.09 million b/d for 2010 and put 2011 demand at 87.32 million b/d. It said demand for Opec crude would likely average 29.4 million b/d. Opec said the oil market continues to face "significant uncertainties," and that "a clearer picture will emerge with the end of the winter season, as the market heads into the lower demand second quarter." In the meantime, it pointed out that it had some 6 million b/d of spare capacity that it could make available to the market in the event of market disruption.

According to a report in the *Financial Times* on January 19, Saudi Arabia has begun to quietly place more oil on the market and is now producing at around 8.6 million b/d in an effort to cool down the market.

In early January, the International Energy Agency's (IEA) chief economist Fatih Birol issued a statement saying that crude oil prices "are entering a dangerous zone for the global economy," adding that crude import bills are becoming a threat to the economic recovery.

"This is a wake-up call to the oil consuming countries and to the oil producers," Dr. Birol said. Urging producing countries to boost output and for importing countries to conserve energy, especially in the transportation sector, he said: "It is not in the interest of anyone to see such high prices. Oil exporters need clients with healthy economies but these prices will sooner or later make the economies sick, which would mean that the need for importing oil will be less."

In its monthly *Oil Market Report*, released on January 18, the IEA said many market watchers "already see a market prone to downward correction, suggesting the dalliance with three-figure oil should ultimately prove to be fleeting. But will that prove to be the case?"

The IEA forecast that global oil demand would average 87.7 million b/d in 2010, an increase of 3.2 per cent over 2009, up by 2.7 million b/d. It forecast demand in 2011 at 89.1 million b/d, up by 1.6 per cent over 2010, or by 1.4 million b/d. It attributed the growth in demand more to a buoyant economic recovery than the demands of winter weather.

Warning that there may be trouble ahead, the IEA said in its report: "Recent price levels already pose a real economic risk – something of deep concern to producers and consumers alike. Average prices $80/b in 2010 represented a nominal oil burden of 4.1 per cent. Were $100/b oil to become entrenched in 2011, that would risk pushing the figure through 5 per cent." It added that equivalent levels of oil burden in the past "have clearly been associated with economic problems."

Meanwhile, the US Energy Information Adminstration (EIA) said in its January report that demand for 2010 would average 86.57 million b/d and for 2011 reach 88.02 million b/d. It forecast demand in 2012 at 89.65 million b/d.

The EIA said it expects the price of WTI to average $93/b in 2011 and could hit $99/b by the fourth quarter of 2012. "Should Opec not increase production as global consumption recovers, oil prices could be significantly higher than the central forecast."

Gas

Delek proposal sets picture for East Mediterranean

A proposal made by Israel's Delek Group to the government of Cyprus to jointly establish a multi-purpose LNG facility on the island could add a new dynamic to the East Mediterranean and possibly make an impact on the international gas market before the end of the decade.

Mark Goetz

In a letter to the president of Cyprus in early January, Israel's Delek Group requested a meeting in Nicosia at which it would present a plan for an LNG facility that would process natural gas from its offshore Leviathan and Tamar gas fields. It suggested that any natural gas discovered offshore Cyprus could be processed at the plant as well, to be built at a site allocated by the Cypriot government. The Cypriot government has yet to reply to the letter or meet with Delek Group officials.

The Delek proposal has set off a debate among political parties in Cyprus, where the government recently announced that it had selected a bid by Shell to supply LNG over 20 years at a cost of around €4.5 billion. The LNG would be delivered to a regasification terminal that has yet to be constructed. Many in Cyprus argue that it would be unnecessary to enter the agreement with Shell and to build a regasification terminal (estimated to cost €600 million) to import LNG if Israel can supply natural gas by pipeline or even if Cyprus might have its own offshore natural gas deposits.

The discovery of Israel's offshore Leviathan field was announced in late December by Houston-based Noble Energy, Delek's partner in several blocks offshore Israel. Noble also holds 100 per cent in Cyprus' offshore Block 12, which is now estimated to hold up to 10 trillion cubic feet (tcf) of natural gas. Under the terms of its production sharing contract with Cyprus, Noble is obliged to drill in Block 12 between October 2011 and October 2013. Furthermore, Delek has an option to participate in Block 12.

The Leviathan field, which lies some 60 km from Block 12, holds 16 tfc (453 billion cubic metres) and the Tamar gas field, discovered by Noble (with Delek as partner) in 2009, has reserves of 8.4 tcf (238 bcm). Israel's current demand for natural gas is around 4.5 bcm annually.

These major discoveries – Leviathan is the largest gas find in the last 10 years – have created a stir within Israel, where the government is looking to increase taxes on hydrocarbon profits by up to 60 per cent. Noble, Delek and other energy companies in Israel have opposed this proposal.

With reserves that amount to 25 tcf (705 bcm), Noble, Delek and partners are keen to get the gas onto the market, but apart from the tax issue, the consortium also faces the challenge of dealing with Israeli environmentalists. The original plan to develop the Tamar field called for the construction of a gas processing plant near Haifa, but opposition from environmentalists forced the partners to change it and route the gas onshore to an existing processing facility at Ashdod.

Cyprus, a member of the European Union, would likely prove to be a safe location for an LNG plant processing Israeli and Cypriot natural gas combined, despite the island's long-standing political situation with Turkey.

While the current state of the LNG market is hardly robust as a consequence of the advent of shale gas in the US and the repercussions of the global economic downturn, the LNG market is tightening and prices are expected to pick up in 2012.

A LNG export facility in Cyprus would fit into an improved market and could serve as another source of natural gas to Europe, which is looking to diversify its supply, particularly with gas by pipeline from the Caspian Sea region and the Middle East through the Southern Gas Corridor that is designed to run through Turkey.

But whether Israel and Cyprus work together or not, drilling for hydrocarbons in the East Mediterranean will continue. Another discovery offshore Israel or one offshore Cyprus would add impetus to exploration activity in the region. A second licensing round long-scheduled for Cyprus is now expected not to take place until after Noble drills in Block 12, with the hope that a discovery there will spark wide interest.

The US Geological Survey said in a study of the Levant Basin in the East Mediterranean that there exists recoverable reserves in the region amounting to 122 tcf (3.2 tcm). Some geological experts have expressed their views that most of these reserves lie in either Israeli or Cypriot waters.

Extended aid for coal exposes deep EU fissures

The move to extend coal subsidies for uncompetitive coal mines has called into question the EU's ambitions of moving to a low-carbon economy.

Timothy Spence

On April 18, 1951 the Treaty of Paris established the ECSC (European Coal and Steel Community). Mark Johnston argues that subsidies are technically prohibited under its founding documents

A pending legal challenge over a Spanish subsidy scheme that would pay electricity producers to burn domestic coal highlights the deep fissures in Europe decades after one of the continent's seminal treaties of cooperation sought to end such protectionism.

The European Commission-backed plan to subsidise energy production to the tune of €800 million to reduce fuel stockpiles from Spain's hugely uncompetitive coal industry was temporarily blocked by the European Union's General Court. The injunction was sought by the Madrid-based Gas Natural Fenosa SDG and others last October, on the grounds that it defies competition rules. More hearings could be held later this year.

The case underscores divisions within the EU over state subsidies to coal producers, especially aid to finance the closure of unprofitable coal mines, which in many instances has only prolonged operations. Seven EU countries provide such aid, amounting to more than €9 billion from 2007 to 2009, and the EU recently extended subsidies through 2018.

"More than 50 years after Europe was founded on a legal principal of no subsidies, the European institutions have still not agreed nor implemented the phase-out of coal mining subsidies," said Mark Johnston, a Brussels-based policy adviser to the WWF, one of the environmental organisations that has called for the end to state support for coal.

Though approved by European authorities, the aid also flouts the EU's commitment to creating a low-carbon economy, and its backing of a G20 pact to end fossil fuel subsidies within a decade.

Stephen Tindale, an energy and climate analyst at the Centre for European Reform in London, calls the latest extension of state support "a clear sign that it's about politics and trying to retain the support of coal mining areas, and it's not about climate policy or economic policy."

Once Europe's energy monarch, coal has been in a slow decline for years. But it remains integral to power generation, accounting for nearly 30 per cent of the electricity produced in the EU, compared to 28 per cent for nuclear and 22 per cent for natural gas, according to the World Bank. The Czech Republic, Germany, Greece, Poland and Romania are among the biggest coal producers, and the industry employs more than 280 000 people across the EU.

Germany, which derives more than 40 per cent of its electricity from coal, and Spain, where the fuel accounts for one-quarter of power production, provide the most generous subsidies – €1.7 billion and €769 million, respectively in 2009.

Electricity generated from coal among leading producers

Electricity generated from coal among leading producers

	2000	2001	2001	2003	2004	2005	2006	2007	2008
EU-27	32	31	31	32	31	30	30	30	28
Poland	96	95	95	95	94	93	94	93	92
Czech Republic	73	72	66	62	61	61	60	63	59
Germany	53	52	53	53	50	50	48	49	47
Romania	37	37	38	43	39	37	40	41	40
Spain	36	31	34	29	29	28	23	25	17

Sources: International Energy Agency, World Bank

Germany, with 50 000 colliers working in hard and soft coal operations, pressed for continuation of the protection in the hope of gradually closing its unprofitable mining operations, which are concentrated in the Ruhr Valley. The Germans and a coalition of trade unions, mining groups and European lawmakers successfully altered an earlier European Commission plan to ban state aid after 2014, a deal approved just weeks before the earlier aid authorisation was due to expire.

Bernhard Rapkay, a European Parliament member from Germany, has called the extension a "transition regulation, allowing member states to be able to take measures to alleviate the social and regional consequences of the closure of those mines."

Spain and Romania, another country that provides hefty subsidies to coal operations, sought EU endorsement of state aid beyond 2018. Seven countries subsidise coal mining, though aid has fallen from €6.3 billion in 2004 to €2.7 billion in 2009, according to the European Commission.

Under rules that took effect on January 1, EU countries are allowed to provide assistance to decommission mines through 2018, and offer social support, job-training benefits and environmental cleanup through 2027. The new scheme was the seventh approved under European competition regulations.

WWF's Johnston called the extension "manifestly unfair and contrary to EU legal principals", noting that subsidies that are technically prohibited under the European Coal and Steel Community's founding documents. The 60-year-old treaty forms the foundation for today's common market.

Philippe Lamberts, a European Parliament member from Belgium, says coal has "very strong emotional content, and that makes the rational debate about where we spend our money almost impossible".

Yet arguments in favour of protecting Europe's indigenous coal industry run deep. As the continent's most abundant fossil fuel with reserves that could last well into the next century, coal provides energy security. For the foreseeable future, coal is an irreplaceable part of the energy mix.

Industry supporters also see coal mined at home as better for the environment than fuel shipped from overseas. They are banking on emerging technologies such as carbon capture and storage (CCS) as offering a promising future in sync with environmental stewardship. In December, the European Trade Union Confederation endorsed a shift to clean coal technology while calling for "sustainable and quality employment programmes".

And the coal industry is hardly alone when it comes to state largesse. Worldwide support for fossil fuels topped $300 billion in 2009, with coal subsidies accounting for only $6 billion, according to the International Energy Agency's *World Energy Outlook 2010*. Renewable energy enjoyed $57 billion in subsidies, despite accounting for only 19 per cent of electricity production worldwide, and 85 per cent of that from hydro. In the EU, coal subsidies in 2009 amounted to 0.6 per cent of the €427.3 billion in overall state aid, while 82.4 per cent went to rescue financial services, according to the European Commission.

Still, some European mines wouldn't survive if it weren't for the state. A 2008 study for the European Commission, conducted by the Dutch consulting group Ecorys BV, showed the unit cost of hard coal in Germany was double the world price, and nearly three times the production cost in Poland – one of the EU's most competitive coal producers. In Romania, one of the EU's poorest countries, the unit production cost of hard coal was higher than in Germany.

Spain's hard coal costs more than four times the global price of around €90 per tonne. In a country struggling to balance its books and avert a currency meltdown, state subsidies for unproductive mines amount to more than €128 000 for each of the country's 6000 miners, some four times that of Germany's.

> We are subsidising basically the entire German coal industry, the entire Spanish coal industry, a large part of the Romanian coal industry. I'm not sure we need the entire German coal industry to carry out experiments.

Only a few European countries, including Britain, Bulgaria and the Czech Republic, ban state coal subsidies. Besides Germany, Romania and Spain, Hungary, Poland, Slovakia and Slovenia all help underwrite costs of their coal sectors, according to the European Commission.

Critics say the money sheltering an industry that is uncompetitive undermines investments in cleaner energies. Indeed, cash-strapped governments are already axing programmes to help meet the EU's renewable energy target of 20 per cent by 2020. Environmentalists were aghast when Spain's green-friendly prime minister, José Luis Rodríguez Zapatero, moved to slash subsidies for the solar power industry while defending his country's handouts for unproductive coal mines, and the €800 million power generation subsidy that is now on hold.

"Do you spend it [public money] in order to prolong the ultimate death of an industry that should, by the way, leave the scene in favour of new industry? I would say no," said Lamberts, a member of the Greens alliance in the European Parliament who opposed the extension of coal subsidies to 2018. "What we are saying is that money should best be spent on supporting emerging industry."

Lamberts also dismisses arguments that Europe's coal industry should be kept on a lifeline to encourage CCS and other clean technologies.

"We are subsidising basically the entire German coal industry, the entire Spanish coal industry, a large part of the Romanian coal industry," he said. "I'm not sure we need the entire German coal industry to carry out experiments. I mean, come on, this really is bulls**t."

Even if unproductive mines are closed by 2018 and Spain must abandon its electricity subsidies scheme, the coal industry won't be left out in the cold. Günther Oettinger, the European Energy Commissioner, in November announced $1 billion in funding for large-scale CCS demonstration projects. At least double that amount may be needed to ensure success. Though based on market forces, the EU-backed emissions trading system, launched in 2005, allows coal-burning power stations to buy and sell pollution credits as needed across the EU, Iceland, Liechtenstein and Norway.

The most pressing challenge ahead will be weaning uncompetitive coal operations from state support by 2018. In 2002, EU countries were given until 2010 to do just that. Joaquin Almunia, Europe's Competition Commissioner, told the European Parliament in November that the past subsidies "didn't have the desired effect, and instead of making mines competitive what they actually did was create a moral hazard".

But the future may not be so grim. Closing uncompetitive mines in a handful of countries would be good news for others, like Poland or the Czech Republic, which have more robust coal industries and importing from them would be more true to the ideal of a common energy market. Advances in CCS and other innovations could boost demand in the years ahead, especially if Europe's renewable energy targets are not met and other fossil fuel supplies become less stable.

Coal might take comfort from another energy source that has faced criticism for its handsome subsidies and rogue environmental image. Obituaries were being written about nuclear energy, especially after accidents in Pennsylvania in 1979 and Chernobyl in 1986. Today, atomic power is on the rebound as a clean energy.

Pushing the solar barrier

The need to achieve grid parity for solar power continues to drive the development of photovoltaic panels with higher conversion efficiency. The recent launch of a new panel takes the efficiency of the technology a step closer to the theoretical limit, **writes Junior Isles.**

In December, Japanese technology company Sanyo Electric Company launched a new solar module, which it claims has the world's highest conversion efficiency. According to the company, the HIT-N240SE10 has a solar cell efficiency of 21.6 per cent and a module efficiency of 19 per cent – the highest achieved in the world to date for crystalline silicon solar modules.

Photovoltaic (PV) generation is a method of generating electrical power by converting solar radiation into direct current electricity using semiconductors that exhibit the photovoltaic effect. Photovoltaic power generation employs solar panels comprising a number of cells containing a photovoltaic material. Materials presently used for photovoltaics include monocrystalline silicon, polycrystalline silicon, amorphous silicon, cadmium telluride, and copper indium selenide/sulphide.

While sunlight conversion efficiency in these cells is quite low, typically 5-18 per cent, there has been significant improvement in efficiency in recent years.

Kamil Shah, Sanyo's Corporate Communications Manager noted: "From the 1990s through to about 2005, the levels of efficiency didn't progress as they should have. This was symptomatic of the industry at the time. The industry was quite small and solar was not really a competitive technology for power generation. But the start of feed-in-tariffs (FITs) in the early 2000's has caused the market to grow exponentially, allowing manufacturers to invest a lot more into research and development."

Conversion efficiency is influenced by a number of factors – one of which is the type of PV material used, e.g. monocrystalline or polycrystalline. Monocrystalline silicon generally has a higher efficiency than polycrystalline, which is the most abundant form of silicon. Thin film, meanwhile, has lower quantities of silicon but also has a lower efficiency than monocrystalline silicon.

Sanyo uses a technology known as (HIT) Heterojunction with Intrinsic Thin-layer. The HIT cell has a sandwich-type structure, where a monocrystalline wafer is surrounded by ultra-thin amorphous silicon layers. In a rigid thin film module, the cell is created on a glass substrate or superstrate, and the electrical connections are created *in situ*.

Shah explained: "We have forged a connection between the amorphous and monocrystalline. Unlike a standard cell, which has a different structure on the top side and bottom side, our cell has the same structure both top and bottom. Due to this sandwich structure, it has an electrode on both the bottom and top side. This means it starts to generate from the immediate contact point all the way through to the point when the radiation passes out of the cell on the backside. This results in a higher conversion efficiency."

The new module also features a new type of tab structure and anti-reflective glass to allow greater absorption of sunlight.

The vertical line passing through a typical cell is known as the electrode tab, which allows the cell to conduct electricity. Previous Sanyo cell designs have two tabs. Now a third tab has been introduced, which reduces the electrical losses in the cell fingers. In addition to this, through designing new thinner tabs, the effective area is enlarged to capture more sunlight and therefore improve the efficiency.

According to Shah, the theoretical maximum conversion efficiency for crystalline-based cells is 29 per cent and the goal is to produce a commercial product that can achieve the levels that have been achieved in the laboratory.

"We achieved a record breaking efficiency of 23 per cent in lab conditions in May 2009. But our strategy since then has been to pass on the technological innovations to the consumer by taking the experience from R&D conditions and introducing it to our commercialised cells," he said.

In addition to high efficiency, Sanyo says the panel also has a good temperature coefficiency, which allows it to operate well at high ambient temperatures.

These characteristics, says Shah, all add up to a space saving installation since it offers more output per square metre. This is particularly important in the residential market. "If you imagine a standard terraced house in the UK, the roof space is very limited. So if someone installs a panel, output has to be maximised as much as possible. So this is when characteristics such as high conversion efficiency and temperature coefficiency come into play. It will really help in the race towards grid parity."

Shah is convinced that, with the support of feed-in tariffs, more efficient panels will make solar power attractive even in a market like the UK, which is not renowned for high levels of sunshine. "The feed-in tariff in the UK is probably the best in Europe. Most FITs across the continent run for 20 years, whereas here in the UK it runs for 25 years."

Notably, in countries like Germany and Spain, which have seen a reduction in FITs, panel efficiency will be even more important as users try to maximise their return from the subsidy system.

The increasing price of fossil fuels will also be another driver says Shah. "The price of petrol and oil will continue to increase, so we will see more attention focused on micro-generation and technology like solar."

A third tab has been introduced, which reduces the electrical losses in the cell fingers

Sanyo calls its 'N' range panels. The N230 and N235, with outputs of 230 W and 235 W, respectively, have been available since last autumn. The N240 is currently in production and will be available from this month (February). "We are already seeing orders coming through," said Shah.

Rooftop installation: high efficiency is particularly important in the residential market

But Shah does admit, however, that its adoption is not a done deal. The biggest barrier to entry, he says, is educating people that the technology does work.

"People are interested but they are not convinced. Education is really important to promote the awareness. A lot of people in the UK particularly, comment that climate conditions are not suitable for solar. But flowers grow in the UK, which means there is enough daylight. It is this same daylight that is used to generate electricity from PV panels. The people that have researched the technology and are educated are the ones that will make the jump."

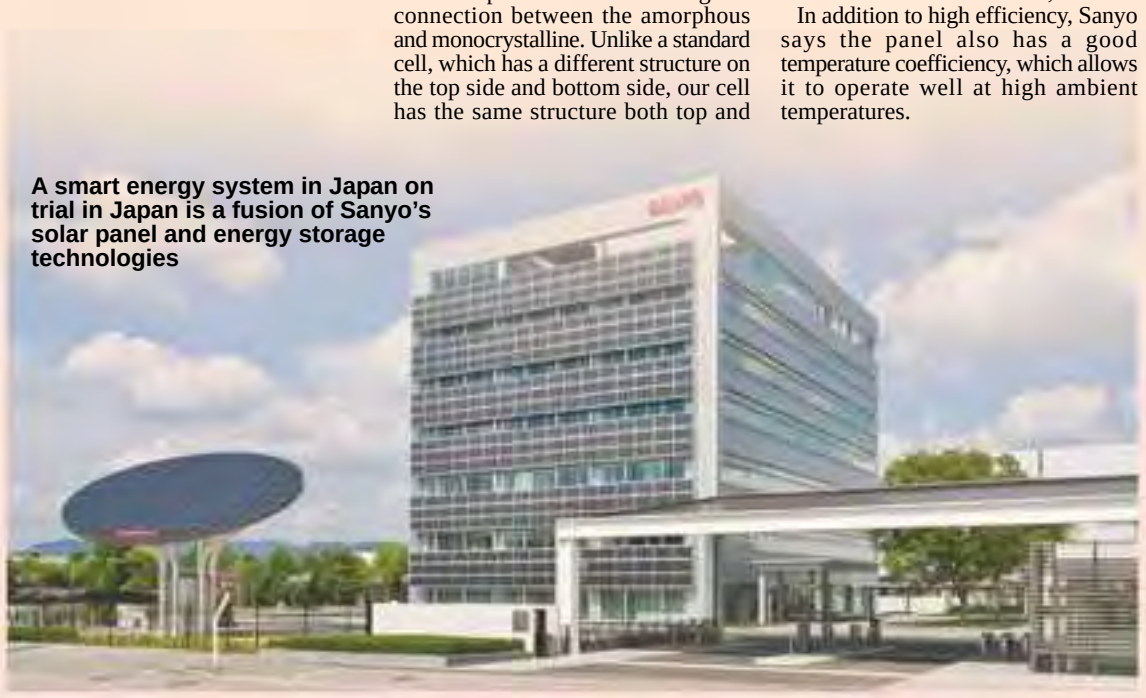
According to data from Ofgem, in 2009 the installed capacity of PV solar in the UK was just 4 MW. As a result of the FITs, this figure had increased ten-fold to 42 MW in 2010. This equates to about 16 000 homes. "This demonstrates the power of subsidies and as an industry we believe there is still space to grow," commented Shah.

The new N240 panel, with an output of 240 W, is the latest in a line of what

While Shah could not comment on utility interest in the new panels, it is likely that the technology will have a place in the smart energy systems being discussed and trialled in various parts of the world.

Sanyo is currently involved in one such trial in Japan. "Our smart energy system in Japan is a fusion of our solar panel technology and our energy storage technology. Here we are using our lithium-ion batteries in a battery farm application. This is currently being tested in one of our factories where we have installed a 1 MW PV plant together with a battery farm that can store 1.5 MWh of electricity. The idea is not to store the electricity from the PVs, but to store the electricity at night from the grid when it is cheaper and then use the electricity from the PVs the next day supplemented by the electricity stored in the Li-ion batteries the previous night."

With projects such as these being considered for the not too distant future, it will be important for the solar industry to continue its push towards higher levels of conversion efficiency if these installations are to be economically viable as well as clean.



A smart energy system in Japan on trial in Japan is a fusion of Sanyo's solar panel and energy storage technologies

Junior Isles

No more “silver bullets” please

He may have been cutting it close but a phone call, which the Secretary General of the European Power Plant Association (EPPSA) received while at the podium, demonstrates that Günther Oettinger, the European Commissioner for Energy, is serious about pushing carbon capture and storage (CCS). Securing the Commissioner for this type of function is no mean feat.

The Commissioner was giving the keynote address at EPPSA’s fifth annual Technology Evening and noted that “one technology stands out” in the effort to secure a low-carbon electricity supply. He said: “Investment in CCS can take control in reducing emissions from coal and gas power plants in decades to come, while giving us time to develop complementary low-carbon technologies such as wind, solar and smart grids. Once developed and supplied to coal plants, CCS should also be applied to gas plants and heavy industrial emitters.”

The EU is certainly putting its money where its mouth is, having so far awarded funding to the tune of some €1 billion for six large-scale demonstration projects.

Whether this will turn out to be money well spent or a waste of taxpayers’ hard-earned cash remains to be seen. However, what should perhaps be the current point of debate is whether Europe should be attempting to lead the development of CCS in times of austerity across much of the region.

Certainly CCS has great potential and could be the key technology when considering the fact that fossil fuels will continue to dominate the global power generation mix for the foreseeable future.

Many times we have heard the phrase “there is no silver bullet” in terms of technology to combat climate change. This is much like a safe harbour statement – one that is made all too often by politicians and CEOs when put on the spot. And while it may be true that the world will need a range of technologies to meet the twin challenge of meeting growing energy demand and tackling climate change, the phrase is not really helpful to European companies currently making investment decisions related to what is currently an expensive and complex technology, and one that may never see the commercial light of day in Europe.

Yes, there is no silver bullet and every technology has its pros and cons. However, in the end there will always be winners and losers. Oettinger said CCS represents a “business opportunity” and is keen for Europe to be a leader but perhaps it is a gamble that European companies should either not be taking right now, or at least spending so much money on.

> “there is no silver bullet”... while it may be true… the phrase is not really helpful to European companies currently making investment decisions related to what is currently an expensive and complex technology

Mark Johnston, a Brussels-based policy adviser to the environmental organisation, WWF, commented: “I’m not convinced Europe should lead.”

He inferred that the EU was perhaps not best positioned to lead, saying that while CCS is “an important issue in all those regions where coal and other fossil fuels remain prevalent today… [in Europe] there is a disconnect between energy policy and climate policy”.

Helen Donoghue, Principal Administrator in the Energy Strategy Unit in the EC’s Directorate-General for Energy disagreed and said that an integrated electricity market and the strengthening of the carbon price would allow the process for the implementation of these new technologies to be improved.

In response to this, and to one delegate who asked what could be done to get the investment in CCS to meet climate objectives, Johnston responded: “We are not doing enough. The ETS is a system based on rationing and only works when we ration in great quantity. We have to create scarcity in order to generate a strong price signal for mitigating CO_2. If we do less this year, we will have to do more next year to catch up on hitting our targets.”

Whether the EU should be putting its faith in the European ETS is point of debate – especially with the recent revelations of fraud in the market. And although the issue of whether Europe is best positioned to lead or not because of policy disconnects or otherwise is an important point, perhaps an even more fundamental question is: should Europe spend such large sums of money on pushing a technology, which may have only limited roll-out in the region?

It is a question that seems to be giving an increasing number of companies second thoughts, something that is evident in their actions if not in their words.

The UK “competition” for a CCS project now has just one competitor; last year the Mongstad project in Norway was delayed; in December the UK company Powerfuel went into administration and last month BP said a proposed $2 billion hydrogen power plant in Abu Dhabi is delayed at least three years.

There is universal agreement, however, that if CCS is to be used anywhere, it needs to be in the likes of China and India.

Last year at the launch of a report into clean energy technologies, Nobuo Tanaka, director of the International Energy Agency said China’s emissions of carbon dioxide need to peak by 2020 if the world is to meet its 2050 targets aimed at curbing climate change. The IEA report said that the installation of CCS technology could contribute as much as 18 per cent to China’s required emission cuts.

So, why not let China take the lead? It certainly has the resources and financial strength to develop a technology that it needs more than any other country.

Indeed it may be a moot point. In 2009 officials at the government-owned Huaneng Group opened a facility that ‘captures’ some of the carbon dioxide emitted by the existing 1320 MW coal-fired Shidongkou power station. The system in fact purifies roughly 120 000 tonnes of CO_2 a year from 3 per cent of the facility’s flue gases and re-uses it in the food and beverages industry.

But most notably Huaneng claimed the cost of ‘capture’ to be $30-35 per tonne of CO_2. This is far below the $100 typically estimated for first-generation projects to retrofit existing power plants for carbon capture and storage (CCS) in the US and Europe.

The race to take the lead in CCS development is probably more based on national or, in the case of Europe regional, pride than any business opportunity.

But pride can be an expensive business. If the hope is to sell CCS technology to China, Europe may end up betting on a horse that has already passed the post. If the goal is to develop it for use in its own power plants, current industry players may find that utilities may opt for other sources of generation or simply build coal fired plants (if there is no mandate to fit capture) and opt to pollute if the carbon price is low.

CCS may be gaining momentum as the race of national pride heats up but for Europe to gamble so much on the technology seems to be an increasingly risky bet.

The Wolfman that is climate change may be coming but Europe does not have to own the silver bullet, it might be sufficient to just borrow it on this occasion.