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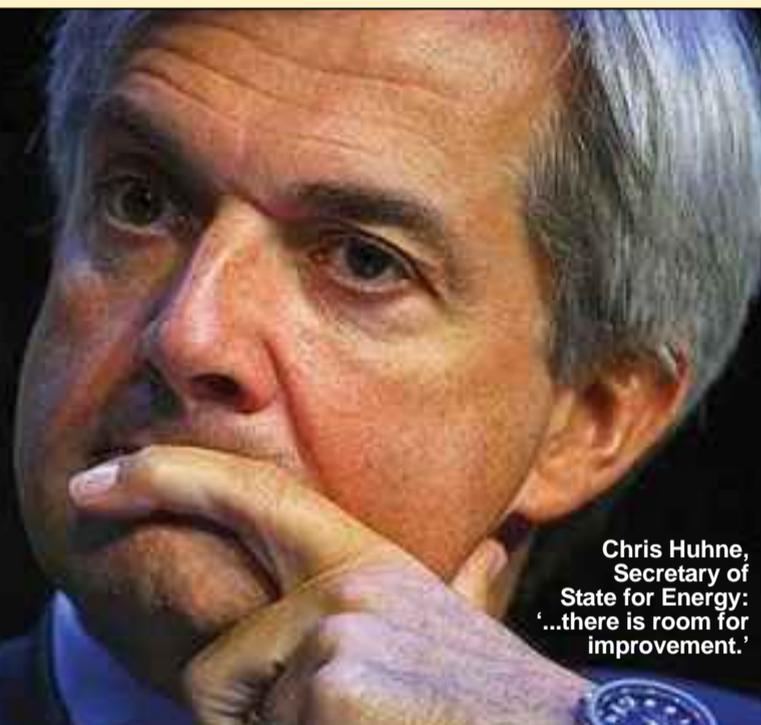
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Mixed reaction to UK FIT review



Chris Huhne, Secretary of State for Energy: "...there is room for improvement."

While some have welcomed the UK's decision to conduct an early review of its feed-in tariff scheme, large-scale solar investors have voiced concerns. **Junior Isles**

The UK government's decision to conduct an early review of its renewable feed-in-tariff (FIT) scheme may see a backlash from the solar industry and a shift of investment from solar to onshore wind.

Last month, amid concerns that the current scheme would see a disproportionate amount of large solar projects, the government said that it would conduct a review of the scheme less than a year after its introduction.

Announcing the start of the first review of the scheme for small-scale low carbon electricity generation, Chris Huhne,

Secretary of State for Energy and Climate Change said: "The FIT scheme has proved highly successful at stimulating growth, driving innovation, creating jobs and cutting carbon... However, there is room for improvement. I am concerned about the impact of super-size solar installations."

The coalition government is determined to take a more responsible and efficient approach to public subsidy, including where the subsidy is funded through energy bills. Specifically, the Spending Review committed to improving the efficiency of FITs and

finding £40 million of savings in 2014/15.

However, since the Spending Review, the government has become increasingly concerned about the prospect of large-scale solar PV projects under FITs, which was not fully anticipated in the original scheme. It said that if left unchecked, large-scale solar could take a disproportionate amount of available funding or even break the cap on total funding.

"In light of this uncertainty and the risk that such schemes could push FITs uptake off trajectory and may make the

Spending Review savings difficult, I have decided to end the potential for damaging speculation and bring forward the review of the scheme to look at ways of correcting these early teething problems," said Huhne.

The review will be completed by the end of the year, with tariffs remaining unchanged until April 2012 "unless the review reveals a need for greater urgency". All aspects of the scheme including tariff levels, administration and eligibility of technologies will be assessed.

Continued on page 2

EU moves to unite on energy policy

The European Commission looks set to take stronger action in creating a common EU energy market.

The first ever EU summit on energy saw European Union leaders agree to meet new deadlines to set up an energy market, share information on energy contracts and develop new energy infrastructure.

"We need a truly integrated EU energy market... The internal market should be completed by 2014 so as to allow gas and electricity to flow freely," said EC president José Manuel Barroso.

The EC's effort is finally gaining the support of large energy groups, which seem to have shifted in favour of giving Brussels more authority over energy policy. In the past, in an effort to protect their national interests, many

energy groups resisted the EC's moves to create greater competition. Now, they believe that a failure to make progress towards a single market will result in higher energy prices and hinder the bloc's ability to meet its targets for greenhouse gas reduction.

Eurelectric, the group that represents Europe's electricity companies, said that conflicted policymaking meant the internal energy market was "an empty shell" and that the emissions trading system, Europe's main tool for fighting global warming, was failing.

Two of the organisation's board members – Johannes Teysen, CEO of E.ON, and Fulvio Conti, CEO of Enel – recently urged the EU Energy Commissioner, Gunther Oettinger, to be more forceful in challenging wayward member states.

Two days before the summit, 20 European companies and associations called on EU Heads of State to show the courage and vision to create a single market for electricity by 2015. They signed a Declaration on the Single European Energy Market, which stated: "A Europe without its single market is unthinkable. It has boosted trade, competition and prosperity in Europe, created millions of new jobs, provided wider consumer choice, and a hugely expanded market for business. But 25 years after the signing of the Single European Act there is still no single market in electricity."

The EC also wants to see Central and Eastern Europe connected with the Adriatic and the Black Sea regions with new North-South energy links.

Barroso said: "The North-South initiative will connect and integrate the power sources of the Baltic, Adriatic and Black Sea, ensure the free and diversified flow of energy within Central and Eastern Europe and thus enhance the economic security of the region and of our Union as a whole," he said in a statement.

The new links would reduce CEE countries' dependence on energy imports from Russia – a key strategic objective for most governments in the region.

Barroso said the commission would set up an expert panel to draw up "deadlines for North-South interconnections for gas, oil and electricity", with an aim to have EU states endorse the plans in the second half of 2011.

(Continued from page 1)

Most controversially, however, there will be "fast-track consideration" of large scale solar projects (over 50 kW) with a view to making any resulting changes to tariffs as soon as practical.

Dave Sowden, chief executive of the UK-based Micropower Council, said the fast-track enquiry came as a "complete shock" noting that the enquiry could affect installations across retail outlets, schools and other public buildings.

"There is a now real concern of job losses in the sector from the uncertainty caused by inclusion of this market segment in an accelerated review," Sowden said.

A campaign has now been mounted by Low Carbon Solar, urging the public and landowners to register their support for solar energy. Mark Shorrocks, CEO of Low Carbon Solar called the proposals "ill-conceived and dangerously short-sighted".

He added: "Some will argue that this is a veiled attempt by the Treasury to save many tens of millions of pounds, on top of cuts that have already been announced. However, it will also likely trigger many unintended consequences, including government missing a European target of generating 30 per cent of electricity from renewables by 2020, and incurring significant fines."

Some renewable energy groups, however, expressed broad support for the review, especially those in the wind sector.

Kevin Parslow, CEO of Evance Wind welcomed the government's decision to look into the issue of solar farms rapidly consuming FITs. He said: "Small wind turbines give people throughout the UK... the ability to make the most out of feed-in tariffs, with the windiest regions able to generate a significant return on investment. However, that financial benefit will only be available if the feed-in tariff is not being siphoned off by ambitious businesses."

Andrew Newman, finance director of London-based management fund Low Carbon Investors, said the company would now focus its short-term UK investment efforts on the wind sector as it offers "nicer" returns and greater regulatory certainty than the solar industry.

"We won't not invest in solar," he said at a recent conference, but added that Low Carbon Investors is not prepared to take on the risk of changes to the FIT system, a possibility likely to impact the solar photovoltaic sector.

James Vaccaro, Bristol-based managing director of investment banking and renewables at Triodos Renewables, said his firm is also turning its focus away from solar and towards wind. The company has six UK onshore wind projects currently on its books, he said.

Triodos "is still looking at solar", he said, but added that diversification – across renewable technologies, power purchase agreements and currencies – will be a major platform of its investment strategy.

UK companies keep faith in CCS

The UK government has decided to postpone publishing its carbon capture and storage (CCS) roadmap until the autumn rather than the spring in order to incorporate lessons learned from the electricity market reform and completing the front end engineering and design studies for the first demonstration project.

The move, however, has not deterred UK companies looking to build demonstration projects. A total of 14 UK low-carbon technology projects – nine of which will demonstrate carbon capture and storage – recently applied for a share of EU funding set aside for CCS, the government said.

Last month, Scottish and Southern Energy (SSE) with Royal Dutch Shell and Petrofac, Alstom with Drax, and National Grid with Peel Energy all announced details of their applications for the funding.

UK Energy Minister Charles Hendry did not give details on the remaining applicants for the EU funding.

Three of the CCS applications are based in Scotland. The other six are in England – four in the Humber and two in the Teesside regions. Seven of the CCS projects are for coal-fired power stations while two are for gas fired plants.

Notably, the two gas project applications were submitted by Powerfuel Power Ltd, the first for the 900 MW Hatfield IGCC project and the second for the Hatfield Endex 450 MW combined cycle gas turbine project. The Hatfield IGCC project looks like continuing even though Powerfuel plc has gone into administration. The project has so far received 10 'expressions of interest'.

Speaking at a CCS conference in London, Hendry said: "The strong



Although the government has postponed its CCS roadmap until the autumn, UK companies still have ambitions to lead global efforts to commercialise the technology, says Junior Isles

level of interest received for CCS projects in particular is heartening – it shows that UK industry is keen to move forward in the development of CCS and confirms the lead that the UK is taking in this critical technology."

The government has until May 9th this year to assess the applications against the EU's New Entrant Reserve (NER) scheme and UK criteria and decide which projects to put forward to the European Investment Bank for further consideration.

The NER will sell 300 million allowances that have been set aside from the EU Emissions Trading System to provide the funding. At current carbon prices of around €15 per metric tonne, the allowances would raise around €4.5 billion. The EU is expected to use the money to support up to eight CCS and 34

renewable energy projects across Europe. The nine UK bids could make up half the total number of applications submitted for NER300 funding. A decision is expected in late 2012.

The UK is keen to take the lead in CCS technology with a view to exporting it to countries such as India and China that are rapidly expanding their fossil fuel-fired power generating capacity. However, the decision to delay the CCS roadmap could impact its ambitions.

Jeff Chapman, chief executive of the Carbon Capture and Storage Association said the delay was "very regrettable" given the strategic importance of the roadmap. He said the association was working with the Office of Carbon Capture and Storage to get the document completed and out to business as soon as possible.

Green credentials will affect credit ratings

■ Climate risk to be routinely included in credit ratings ■ Impact of climate risk will change post 2012

Exposure to carbon liabilities may affect companies' credit ratings in the not too distant future.

According to *Environmental Finance*, ratings agency Standard & Poor's (S&P) is to routinely include an assessment of climate risk into its corporate credit ratings across all industrial sectors, in anticipation of when climate policy begins to "bite hard" in the next few years.

Up until now, climate change policy has had little effect on the financial position of corporate borrowers but this is likely to change soon. In Asia there will be a negative impact on electricity companies if emission trading schemes are made mandatory. In Europe, exposure to carbon risk will increase as the European ETS moves into the next phase and the price of carbon begins to rise.

At a meeting in London earlier in

the year, Michael Wilkins, managing director and global head of carbon markets at S&P, revealed that there will be a change post-2012 when there is a replacement for the Kyoto Protocol or it moves into its next phase. "This will put pressure on companies to not only report their emissions but to manage them or face financial liabilities."

Last year a survey, which canvassed the views of 513 corporate issuers rated by S&P, revealed that while only around 40 per cent of respondents fully integrate carbon exposure risk and carbon reporting into their funding decisions and financial statements, a similar percentage does not factor carbon emissions into any form of corporate financial calculations.

S&P is now reportedly working out how to incorporate the potential liabilities into the credit rating process.

Although the details of the methodology are not yet finalised, by the middle of this year companies across all industrial sectors will undergo an initial automatic screening. If they are deemed to be exposed to climate risk, a more in-depth assessment will be carried out.

This will include an examination not only of their emissions profile but also: where those emissions are produced (with European assets facing greater risk of carbon constraints than those in developing countries); the company's ability to mitigate those emissions; and its ability to pass any carbon costs through to suppliers. Wilkins said the output will be "carbon exposure per euro or dollar of EBITDA [earnings] – a financial metric".

Meanwhile, a recently released Deutsche Bank Climate Change

Advisors (DBCCA) report argues that a major shift in investor attitudes is leading institutional investors around the world to examine risks associated with climate change because of a growing realisation of the potentially profound impact it may have on their existing portfolios.

"Institutional investors are giving greater consideration than ever before to climate change in their assessment of asset allocation," said Kevin Parker, Global Head of Deutsche Bank's Asset Management division (DeAM) and a member of Deutsche Bank's Group Executive Committee. "I believe that we have reached a critical point in our industry at which all the talk about climate change begins to translate into action. Asset owners everywhere are starting to move and their first impulse is to identify where in their portfolios the climate risk lies."

Shale gas bubble?

Alexander Medvedev, deputy chief executive of Russia's state-owned gas company, Gazprom, says that the surge in shale gas is a "bubble" which, like the internet, "first blew up enormously and then flattened itself out to a rational and logical size".

He also said that the low gas prices resulting from the surge would reach \$6-8 per million Btu within five years, up from about \$4/mBtu today.

He told the *Financial Times*: "The massive production of shale gas is impossible against a price which is

below \$6-8 per million Btu." Medvedev also predicted that, as with the internet bubble, many shale gas companies would be forced out of the industry.

Some analysts note his predictions may not be far off. Industry consultancy Wood Mackenzie said

the pressure on uneconomic gas producers to drop out of the market, and the rising price of coal could push gas prices to \$5.5-6.5/mBtu by the end of next year.

In the meantime, the rush on shale gas continues. Last month, BHP Billiton Petroleum paid \$4.75 billion for an Arkansas gas asset owned by Chesapeake Energy.

At the end of January, US oil company Halliburton capitalised on the shale gas rush to double its net profit in the fourth quarter.

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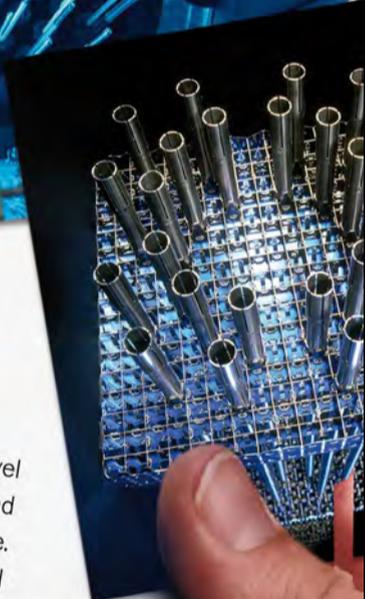
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Obama tables clean energy budget

■ “Hard choices” made to attain clean energy goals
 ■ Environmentalists concerned over CES

US President Barack Obama is likely to face a continued battle with Congressional Republicans as he attempts to continue his clean energy push via the fiscal year 2012 budget request.

The White House has given details of a \$29.5 billion budget request for the Department of Energy (DOE) that it hopes will spur the country to continued investment in clean energy sources.

The budget represents a 4.2 per cent increase in spending compared with the fiscal 2011 budget and aims to support renewable energy as well as nuclear power and energy efficiency while cutting support for the Fossil

Energy Office and several key technology programmes.

The budget announcement came just weeks after the President's State of the Nation speech, in which he called for America to become a world leader in clean energy technologies, and for 80 per cent of the country's electricity to be sourced from clean energy by 2035.

According to Energy Secretary Steven Chu, the budget requires “hard choices” to be made, a fact that is reflected in reaction to the budget proposal from the polarised ends of the energy debate.

Obama's budget proposal is unlikely to get much Republican support because of a proposal to eliminate

subsidies paid to the oil, natural gas and coal industries. Although such a move would save taxpayers around \$3.6 billion in fiscal 2012, Republicans are concerned about the impact that removing such payouts would have on industries that employ thousands of workers.

The budget request also contains a provision for \$36 billion in federal loan guarantees to help finance the building of nuclear power plants. This, and the possibility of developing a Clean Energy Standard (CES) that includes nuclear power and clean coal power plants, has angered environmentalists.

“President Obama's vision for clean

energy is commendable, but we need to commit to truly clean energy like solar, wind and energy efficiency, which don't threaten our public health or our environment,” said Nathan Wilcox of Environment America. “So-called ‘clean coal’ and nuclear power in fact, create more pollution and put our environment and our health at risk.”

The DOE's budget significantly increases funding for the clean energy sector, including \$1.8 billion for energy efficiency, up 56 per cent, and \$1.2 billion for renewable energy, a 35 per cent increase. The budget also asks for an additional \$200 million in credit subsidies to support \$1-\$2 billion in

loan guarantees for innovative energy efficiency and renewable energy projects.

The Advanced Research Projects Agency-Energy would receive more than \$550 million to fund “potentially game-changing clean energy projects”, said Chu.

But Republicans now have control of the US House of Representatives and the DOE budget is likely to clash with Republicans who are refusing to abandon a campaign pledge to reduce federal spending by \$100 billion. Republicans have also proposed to cut funding for the Environmental Protection Agency's programme to regulate greenhouse gases.

Seven states affected by Brazil blackout

A fault in a substation is thought to have caused a major blackout in Brazil last month that is thought to have affected ten million people.

The blackout hit seven states across northeastern Brazil, with some

consumers affected for several hours. It is the second major blackout to affect the country in the last 18 months and has raised questions about the robustness of the country's power grid.

According to local media reports, an

electronic component that was part of the protection system in a substation failed, triggering the security system of the Luiz Gonzaga substation in Pernambuco state to automatically shut down. This cut power to six high voltage transmission power lines running from the station, causing the blackouts to quickly spread.

In late 2009 a fault in the transmission system originating near the Itaipu hydropower plant cut power

supplies across nine Brazilian states for up to three hours.

Recent blackouts in both Brazil and Chile have led to calls for greater integration of electric transmission capacity in the southern cone region.

In January Chilean President Sebastian Pinera and his visiting Peruvian counterpart Alan Garcia agreed to reinforce electricity integration in the region, and also

urged Bolivia, Brazil and Ecuador to do the same.

According to Brazil's energy research company EPE, electricity consumption in Brazil increased by 7.8 per cent in 2010. The increased demand was driven mainly by industrial consumption.

In 2010, the country increased its installed generating capacity by 5.7 per cent over 2009 levels to 112 300 MW.

Ontario stalls offshore projects

■ CanWEA “disappointed” at moratorium
 ■ Health, environmental impacts to be studied

Siân Crampsie

The Ontario government's decision to impose a moratorium on offshore wind energy could harm the province's reputation as a leader in clean energy development.

Ontario has won praise from environmentalists for its green energy plan and commitment to phasing out coal-fired generation, but the Canadian Wind Energy Association (CanWEA) last month expressed its disappointment at the surprise moratorium.

The Ontario government says that it wants to conduct further scientific research into the impacts of freshwater offshore wind power development on health and the environment before it grants consents to projects. “Applications for offshore wind projects in the feed-in tariff programme will no longer be accepted

and current applications will be suspended,” said a statement.

Ontario is proving itself a leader in driving a new clean energy future that delivers emission-free power and new jobs for our skilled trade workers,” said CanWEA president Robert Hornung. “This is an unfortunate decision that surrenders the province's leadership role in exploring the potential for offshore wind energy in the Great lakes and creates significant uncertainty for investors.”

Of the 1500 green energy applications to the government's feed-in tariff scheme, only five are for offshore wind projects.

Ontario says it wants to observe other freshwater offshore developments – notably the Lake Vanern project in Sweden and a proposed 20 MW pilot project on Lake Erie, Ohio – to monitor impacts.



John Wilkinson: wants a “cautious approach”

“Offshore wind on freshwater lakes is a recent concept that requires a cautious approach until the science of environmental impact is clear,” said John Wilkinson, Ontario's Minister of the Environment.

Ontario's long term energy plan

targets the installation of 10 700 MW of renewable energy from wind, solar and biomass sources by 2018. The government says it has already attracted more than C\$16 billion in green investment from the private sector.

AEP project wins GCCSI support

The Global Carbon Capture and Storage Institute (GCCSI) is to support the USA's first commercial-scale carbon capture and storage (CCS) system, says US utility AEP.

Australia-based GCCSI is to provide AEP with A\$4 million to support the initial engineering and characterisation phase of AEP's CCS project at the utility's Mountaineer coal fired power plant in new Haven, WV.

The CCS system will use Alstom's chilled ammonia process to capture at least 90 per cent of the carbon dioxide from 235 MW of Mountaineer's 1300 MW of capacity. The captured carbon dioxide, approximately 1.5 million metric tons per year, will be treated and compressed, then injected into suitable geologic formations for permanent storage.

The system will begin commercial operation in 2015. The US Department of Energy is funding 50 per cent of the commercial scale project costs, up to \$334 million.

AEP is in discussions with other potential international partners for the project.



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Philippines seeks foreign investment but eyes gas in short term

The Philippines is turning to gas to meet its short-term power needs while attempting to attract foreign investment to meet a long-term energy demand that will require nearly \$42 billion over the next 20 years. **Syed Ali.**

The Philippines Energy Secretary Jose Rene D. Almendras says the country will need P1.827 trillion (\$41.78 billion) in new investments for energy projects from 2010 to 2030.

Over the next 20 years, the country will have to build new power plants that could add 11 900 MW to the Luzon grid, 2150 MW to the Visayas grid and 2500 MW to the Mindanao grid.

The government is keen to attract foreign investment to help build new capacity and Almendras stressed that investors would have a favourable market in the Philippines because of the growing demand for power.

Almendras told reporters on the sidelines of a hearing of the House of Representatives Committee on Energy that six foreign companies had already expressed an interest in entering the country's power generation market.

"We have two Japanese groups, one Korean group and three Chinese companies not yet in the country [that] are interested," said Mr. Almendras.

He cautioned, however, that the companies would not enter the country unless a number of issues are resolved. "Investment climate is favourable. However, there are nuances. There is still fear about inconsistency of policies."

At the beginning of last month, Almendras led a road show in Japan to encourage Japanese investors to pursue energy projects in the Philippines.

During the visit he urged investors to look into energy projects involving power generation, development of renewable energy and alternative fuels, as well as exploration of oil, natural gas and coal, as these would address the country's problems on energy security, self-sufficiency and climate change.

Almendras further said that Japanese investors have been encouraged to participate in the establishment of liquefied natural gas (LNG) terminals in Southern Mindanao and Sarangani as well as strategic infrastructure projects in Luzon to help the government push for natural gas as a transition fuel for power.

Gas is seen as a key fuel to meeting the country's immediate electricity needs as they are typically much quicker to build than conventional coal fired plants. There are also modular LNG power

plants available in the market that could be connected to the grid in a short time.

San Miguel Corp. recently announced plans to expand its Limay diesel power plant to 1200 MW from the current 600 MW this year and convert the plant to run on LNG.

The Department of Energy also said a group is considering putting up a 300 MW LNG-fired power plant in Mindanao and recently submitted proposals for the project to the World Bank and the International Finance Corporation.

Almendras said that LNG plants are suitable for Mindanao to compensate for lack of production from hydropower plants during the summer months.

Mindanao's efforts to reduce its dependence on hydropower received a further boost last month with the announcement by Aboitiz Power Corp., that it will invest \$1.5 billion to construct two coal-fired facilities in Subic and Davao to provide 900 MW of new capacity by 2014.

Vietnam hikes rates to improve power infrastructure

Vietnam is looking to attract foreign investment to fund improvements to its power grid infrastructure.

The government moved to improve the rate of return on projects by increasing electricity prices from March 1st. All electricity is sold by the state-owned monopoly Electricity of Vietnam, but foreign investors are allowed to build power plants and sell electricity to the company.

"Hiking [the] electricity price will allow investors to make more profit in electricity markets," said Pham Manh Thang, Head of the Electricity Regulatory Authority.

Observers said authorities were likely to raise the price to Dong1271 (\$0.06) per kWh. The current rate for industrial customers is Dong1058 /kWh.

Pham said that unless it increases electricity prices, Vietnam "cannot encourage foreign investors to invest" in the sector.

Regional competition for investment is also a factor. "The electricity price of Vietnam is much lower than the average amount paid in neighbouring countries like Thailand, Malaysia, or even China," said Tran Viet Ngai, chairman of Vietnam Energy Association.

"This price hike is part of the roadmap to reform Vietnam's electricity sector and help the country to attract more foreign investors," Ngai said.

China's nuclear power sector target too "aggressive"

An industry expert from the Energy Research Institute (ERI), the think tank of China's National Development and Reform Commission (NDRC), has cautioned that an "over-aggressive" target for the nuclear power industry by 2020 may harm the sector's healthy development.

Any target exceeding 80 GW by 2020 may put excessive pressure on the sector due to insufficient domestic equipment manufacturing capacity and safety risks, said Xiao Xinjian, a researcher from the ERI.

China has 13 reactors currently in operation, with a total generating capacity of 10.8 GW and an additional 28 units, with a total capacity of 30.97 GW, are under construction, according to the latest statistics from the National Energy Administration (NEA).

However, domestic nuclear power equipment manufacturing is already operating at full capacity and construction and management resources are already stretched to the limit said Xiao. Further, China will need time to digest the third-generation technology, Xiao said.

A shortage of uranium is considered another important factor hindering the industry's expansion.

Industry experts therefore warn that China should be cautious in accelerating the development of the nuclear power industry during the 12th Five-Year Plan (2011-2015).

China is expected to approve another 10 nuclear power projects over the next five years, Zhang said.

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Free electricity plan will be government burden

■ Waiver may sidetrack energy efficiency
■ ERI plans fuel tariff to promote renewables

Syed Ali

Thailand's promise to permanently waive electricity bills for low-income earners will result in huge costs for the government during a year that may see electricity price rises due to higher oil imports.

Under the scheme households consuming below 90 units per month would not be charged for electricity, costing the government an estimated Baht 1.2 billion (\$38.4 million) per month.

But the plan, which threatens to sidetrack the national campaign for energy efficiency, has raised concerns with the regulator. "We're concerned that this would encourage households which consume less than 90 units to push their consumption to the limit. This could jeopardise the campaign towards efficiency which urges all to cut their consumption," said Direk Lawansiri, president of the Energy Regulatory Commission (ERC).

Energy efficiency is a major objective of the Thai commission this year and, with electricity prices set to rise due to temporary gas stoppages, inadvertently encouraging wasteful practices will increase the government's financial burden.

State-owned utility Electricity Generating Authority of Thailand (Egat) has said that recent temporary stoppages in natural gas supply from the Gulf of Thailand and Burma will force it to resort to the more expensive alternative of bunker oil.

The supply feed of 700 million ft³/day from the Gulf sources will stop during April 11-17, while 1.2 billion ft³/day from Burma will halt from December 5-29.

"The cost of bunker oil is naturally higher than that of natural gas. The higher cost will be included in fuel tariffs," Egat governor Sutas Patamasiriwat said.

Thailand is a net oil and gas importer and given its reliance on imports, ERC is promoting

renewable energy. It plans to collect 0.5 satang (cents) from fuel tariffs, imposed on electricity costs, to promote renewable energy. This is subject to approval by the National Energy Policy Committee.

Last month GDF Suez, the world's largest independent power producer, said it is looking at expanding its investment in renewable energy in Asia, pointing to Thailand as a target market.

Denis Simonneau, one of the executives of 16 French companies who made a three-day trip to Thailand said: "Thailand is a market in addition to China, India, Indonesia, Pakistan where GDF foresees strong potential energy business growth in Asia, for both fossil and decarbonised sources of power."

For Thailand, he said, the company was just waiting for a clear direction of its renewable energy development framework.

The Energy Ministry late last year

set new conditions for renewable energy businesses by introducing a revised feed-in tariff scheme for all new renewable energy operators, except those in the solar power sector, which will continue to receive an adder tariff but at a lower rate of Baht 6.50/kWh, down from Baht 8.0/kWh previously.

The feed-in tariff will be calculated based on real investment costs and an appropriate rate of return on investment for the operator.

The adder tariff, a payment above normal power rates, was established to encourage renewable energy development. But for the feed-in tariff, every supplier to Egat will need to propose and negotiate the rates with the state utility.

The ministry has defended the shift from the adder tariff to a feed-in tariff as necessary. Without it, power users would have faced the financial burden of huge subsidies for renewable power, estimated at 400 billion baht from 2010-25, it said.

Carbon trading losing momentum

South Korea's plans to cut greenhouse gas emissions face a setback as the government looked set to delay the start of its emissions trading scheme.

The government said it would likely delay the start of its carbon emissions trading scheme (ETS) to between 2013 and 2015, after strong opposition from industry. Its initial plan was to start in 2013.

A revised carbon trading bill, which was due to be presented before parliament at the end of February, would also allow for a higher proportion of free emission allowances to be given to heavy emitters.

South Korean President Lee Myung-bak said the government plans to implement the scheme in a flexible manner, considering "international trends and industrial competitiveness."

The country's five major economic organisations issued a joint statement calling on the government to delay the launch of the ETS until 2015.

"The business circle raises an objection that it is too premature to implement an emission trading scheme, given that it can weaken companies' competitiveness... and a global trend where major economies such as Japan and the United States have suspended or withdrawn their own plans," the statement said.

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Carbon markets make muted restart

Siân Crampsie

The theft of emission allowances from the EU emissions trading scheme (ETS) earlier this year have knocked confidence in the region's carbon market.

ETS registries in five EU countries were given the go-ahead to restart in early February after a two-week shutdown but confusion over the legalities of how stolen allowances should be handled meant that trading volumes remained low after the trading restart, according to reports.

The European Union is also facing legal challenges from companies affected by the theft, which centred on Austria and involved 3.3 million allowances.

The theft is the latest problem to affect the credibility of the EU ETS, which the European Commission regards as a key tool in combating climate change.

Governments and major players in the market such as Barclays Capital have called for standards across the EU to be raised in order to prevent further thefts.

"While it is important to ensure a minimum level of security now to ensure the reopening of the registries, the UK will continue to press the European Commission to ensure that registry security across Europe is raised above this level," said UK Energy Minister Greg Barker in a written statement. "This is vital to ensure continued confidence in this growing market."

The European Commission ordered the shutdown of national carbon registries on January 19, putting a halt on spot trading of emission allowances. Futures trading was allowed to continue.

Registries were allowed to reopen once they had given "reasonable assurances that the minimum security

requirements are in place" to prevent further attacks, said the Commission.

In the UK, the Environment Agency, which operates the country's registry, has been served with an injunction to recover stolen emission allowances, according to Carbon Finance.

In addition, Italian firm TCEI has brought a case against the EU in an effort to recover some 267 991 allowances that were stolen, according to *The Guardian* newspaper. It wants the allowances to be tracked down and returned.

In a statement the European Commission said that it "has no authorisation under relevant legislation to disclose" details of unauthorised transfers of allowances, and "no investigative powers to follow up the thefts".

According to the Commission, the treatment of recovered stolen allowances is a matter for national law enforcement authorities.

Companies are calling for tighter security measures and better regulatory coordination to prevent further damage to the reputation of the EU's flagship carbon trading scheme.



The UK's Greg Barker is pushing for greater security

In the UK, stolen allowances must be returned to their rightful owner. In Germany and the Netherlands, those that have bought emission allowances in good faith are entitled to hold on to them.

Nuclear liabilities pose additional burdens

Torness Nuclear Power Station

Operators of nuclear power plants in the UK will be liable for up to €1.2 billion of clean-up costs in the event of an accident under new proposals tabled by the government.

UK Energy and Climate Change Secretary Chris Huhne says that the cap that nuclear power plant operators should face should increase seven-fold, from the current level of £140 million to £1 billion (€1.2 billion).

This is significantly higher than new requirements of €700 million proposed by the European Commission.

The proposal is another step forward in the UK government's policy to ensure that companies such as EDF and RWE that are planning to develop new nuclear power plants receive no public subsidy.

If the plans go ahead, the developers will have to factor this liability into

the running costs of their plant as they are unable to insure against nuclear accidents. It is a questionable proposal, given the need for investment in the UK's ageing energy infrastructure, says analyst firm Datamonitor, which has called the proposed increase in liability "excessive" and a "political exercise".

Green groups, however, fear that the operators of nuclear power plant will

be subsidised because of plans in the UK to set a carbon floor price.

WWF and Greenpeace have calculated that the benefit to the nuclear power industry of the carbon floor price could be as high as £3.4 billion between 2013 and 2026.

Huhne has argued that the floor price is designed to support all forms of low carbon energy by providing more certainty in carbon prices.

Netherlands cuts renewables support

- No support for offshore wind and large biomass
- Subsidy cuts considered in Italy

The Dutch government is following in the footsteps of other European countries by proposing financial cuts and major changes to its renewable energy subsidy scheme.

It has also made moves to clarify the conditions for the construction of a new nuclear power plant in the country.

The government wants to cut the level of subsidies payable to renewable energy operators from €4 billion per year to €1.5 billion, and says that it will only support the cheapest forms of clean energy generation.

The Dutch Minister of Economic

Affairs is proposing to cap subsidies at a maximum of €0.015 per kWh of electricity produced, and to remove subsidies altogether for offshore wind and large scale biomass facilities. The new support mechanism, called SDE+, would apply from 1 July 2011.

The government also says that it wants nuclear power to play a part in the energy mix and intends to issue a license by 2015 for the construction of a new unit. In a letter to parliament last month, it stated that the government would not invest in new nuclear power.

Two companies – Delta NV and

Energy Resources Holding BV – have expressed their interest in applying for the license.

Holland's move to cut renewable energy subsidies follows similar decisions taken in Spain and Germany, where generous payments have led to a boom in renewable power installations and resulted in a major burden on government budgets.

The government in Italy is also reported to be considering a cut in subsidies paid to operators of solar power installations in order to reduce the fiscal burden of renewable energy.

The country's generous scheme for

solar power has produced a boom in installations but is also thought to have spurred high levels of fraudulent applications.

Italy's state energy management agency, Gestore dei Servizi Energetici (GSE) recently reported that it had received 55 000 applications – amounting to 4 GW – in 2010 under the country's feed-in tariff system for solar photovoltaic installations. If all of these installations are genuine, the government's solar subsidy bill will amount to €40 billion over the next 20 years, according to Barclays Capital.

EU markets could be better by design

Current power market design in the European Union (EU) does not effectively support member states' plans to boost levels of renewable energy, according to a new study led by Climate Policy Initiative.

According to the research, power markets do not make effective use of network transmission capacity or use improvements in wind forecasts during the day to optimise European system dispatch.

The study came as the European Commission announced that only three EU states – Germany, Hungary and Sweden – have met their 2010 interim goals for renewable energy for both electricity and transport.

The Commission says that investment in renewable energy in the EU needs to double to reach the target of having 20 per cent of the region's energy come from renewable sources by 2020.

According to the CPI study, some of the problems in the EU's market design could be solved by implementing nodal pricing systems. It believes that the adoption of a nodal pricing system would increase EU power transfers by up to 34 per cent and provide operational savings from improved congestion management of €0.8-2.0 billion.

"Decarbonising the EU power system involves more than investment in generation and grid," said Karsten Neuhoff, director of CPI Berlin. "As our analysis indicates, a smart power market makes more effective use of existing grids, provides information to guide new investment, and creates flexibility for integration of more wind and solar energy."

WWF presents bold vision of renewable future

Environmental group WWF believes that it will take just 40 years to make the transition to an all-renewable energy system.

Siân Crampsie

WWF's vision of a world in which all energy needs are met from clean and sustainable supplies has been endorsed by a number of senior policy makers and business leaders, says the environmental organisation.

Last month WWF published its 2011 Energy Report, which shows that by 2050, the world's power, transport, industrial and domestic energy needs could be met by renewable sources.

It has called on governments and organisations around the world to implement the policy frameworks outlined in the report in order to reduce anxieties over energy security, pollution and climate change.

WWF's vision has been described as "bold and inspiring" by Bernard Deryckere, CEO of soya-based food and drinks firm Alpro, and as "ambitious but achievable" by Bruce Sohn, President of First Solar.

Both business leaders have signed

up as WWF 'Clean Energy Ambassadors', lending their support to the drive towards clean energy.

The Energy Report calls for a global effort to drastically improve energy efficiency while investing in renewable energy and smart grid technology. Authored by energy consultancy Ecofys and WWF, it contains a detailed analysis and scenario for 2050 where total global energy demand is 15 per cent lower than in 2005 in spite of increases in population, industrial output, freight and travel.

The proposed 100 per cent renewable energy future would result in an 80 per cent drop in global CO₂ emissions by 2050, says WWF. Global savings from lower energy costs would amount to around €4 trillion by 2050.

"The WWF Energy Report provides tangible guidelines on how to achieve a 100 per cent renewable energy future and a perspective for businesses to develop towards a sustainable economy," said Yvo de Boer, KPMG

Global's special advisor on climate change and sustainability and another of WWF's clean energy ambassadors. "It's another proof that action is needed and that current sustainability leaders are future winners."

The report highlights the role of both government and the private sector in providing the required policy environment as well as investment. The upfront costs required to reach WWF's goals amount to 1-2 per cent of global GDP, or €1 trillion per year.

This will be turned into positive cash flow after 2035, says Ecofys.

"Unfortunately, our current financial system is not suited to taking the long view," WWF says in the report. "We need new financing models, such as public-private partnerships with shared risks, to encourage long-term investment in renewables and energy efficiency. Legislation and stable political frameworks will also help to stimulate investment."

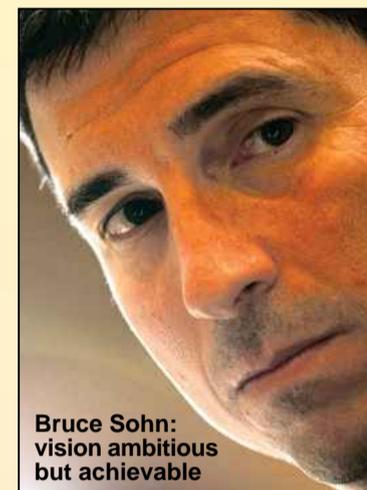
WWF advocates the use of feed-in

tariffs and energy taxes to provide the right investment environment, as well as cutting out subsidies provided to conventional energy sources. It argues that once the infrastructure for energy supply has been established, the costs for a renewable energy system are lower than for a conventional energy system.

The report has drawn some criticism for being naïve in its approach to complex, global issues, and for glossing over the huge potential challenges of phasing out coal-fired and nuclear power generation.

The IEA welcomed the report as a valuable contribution to the energy debate, but noted in a statement that "a broader mix of energy technologies – including nuclear energy and carbon capture and storage – will be required to meet future challenges".

"The transition will present significant challenges, but I hope this report will inspire governments and business to come to grips with those



Bruce Sohn:
vision ambitious
but achievable

challenges and, at the same time, to move boldly to bring the renewable economy into reality," said James P. Leape, Director-General of WWF International.

Jordan seeks nuclear partner

The Jordan Atomic Energy Commission (JAEC) is seeking a private sector partner to help develop the Kingdom's first nuclear power plant.

The JAEC has announced plans to launch a tender for a strategic partner to take a stake in the power project. It wants an established international nuclear power operator to share the costs of the project and provide experience in forming a utility to run and manage the plant.

The partner is likely to take a majority stake of between 50 and 75 per cent in the project, according to JAEC Chairman Khaled Toukan.

JAEC is currently receiving bids from technology providers for Jordan's first nuclear plant, which will have a capacity of around 1000 MW. Bids are expected from three shortlisted technology suppliers – Areva with Mitsubishi Heavy Industries, Canada's AECL, and Russian firm Atomstroyexport.

Technology bids are expected to be in by the end of March and JAEC is due to announce its preferred supplier in mid-2011.

Jordan is pursuing a nuclear power programme to help it reduce its dependence of energy imports. The country was recently selected as the headquarters for the recently-formed Arab Renewable Energy Commission (AREC).

It also signed in February a nuclear cooperation agreement with Turkey.

South Africa to start renewable energy drive

South Africa will this year begin to drive its renewable energy generation programme forward, says its President,

Jacob Zuma.

In his February State of the Nation Address, Zuma highlighted the need

for increased energy security in the country in order to help sustain the economy.

While much investment will continue to be focused on major coal fired power plant projects such as Medupi and Kusile, the procurement of power from renewable energy sources would demonstrate South Africa's "commitment to renewable energy", said Zuma.

National utility Eskom has so far invested over R75 billion (\$10.7 billion) in electricity infrastructure development. The government hopes that the Renewable Energy Feed-In Tariff (REFIT1) programme will attract investment for the development of around 1000 MW of renewable energy capacity.

South Africa's 2010 Integrated Resources Plan (IRP) has also proposed a wind power programme to develop 3.8 GW of wind power, starting in 2014, and a solar power programme for the development of 400 MW of solar capacity that would commence in 2016.

A further 7 GW of renewable energy capacity could be developed under a renewable energy programme starting in 2020, according to the IRP.

"Energy security is critical for economic development and job creation," said Zuma. "We must all save energy so that we do not have to resort to load shedding again as a saving measure."



Jacob Zuma:
driving
renewables

Russia tests CBM resources

Russia is celebrating the official opening of its first coal bed methane (CBM) to energy project.

The 1 MW project has been built at a mine in Russia's Kemerovo region and could serve as a model for the further development of this resource in Russia's coal mining regions.

The gas for the power plant comes from a test drill built by Russian energy giant Gazprom. Reserves of CBM in the Kemerovo mining region are "huge", according to GE, which supplied the Jenbacher engine for the project.

The Kemerovo administration believes that encouraging active coal mines to collect CBM during and after coal mining operations will help to improve mine safety as well as provide coal mining companies with additional revenues.

Cameroon to add 300 MW

The Cameroon government is hoping that two major new power plants will help boost electricity supplies in the country.

The government and its partner in the two projects – AES Sonel – are aiming to conclude financing for both projects by the end of May. The International Finance Corporation (IFC), European Investment Bank (EIB), African Development Bank (AfDB) and the Bank of Central African States will all help to fund the projects.

The Yassa-Dibama project will have a capacity of around 85 MW and will run on fuel oil, while the Kribi project will have a capacity of 216 MW and will use natural gas from the Sanaga Sud gas field.

The projects will cost a total of XAF250 billion (\$521 million) to develop.

GE marches on with new deals

- Closes Dresser deal
- Acquires Wood Group division, wind tower technology

GE is continuing to transform its energy portfolio with the announcement of further acquisitions and new ventures worldwide.

The US conglomerate last month said that it has reached an agreement to acquire the well-support division of John Wood Group, a move that would give GE entry into the fast growing market for enhanced oil recovery technology.

The \$2.8 billion deal would also expand GE's product and service offering in the market for unconventional oil and gas production. It was announced just days after GE said it had acquired Wind Tower Systems LLC (WTS), a firm specialising in the development of taller wind turbine towers.

Earlier in February, GE said that it had successfully closed its \$3 billion acquisition of Dresser Inc., which employs 6300 people and operates in more than 150 countries.

The move for Dresser significantly expands GE's offerings for energy and industrial customers requiring solutions for compression, flow technology and measurement and distribution infrastructure. The deal brought the value of GE's acquisition in the energy business in the last few months to \$5 billion.

The Dresser business will be integrated into GE's Energy Services and Power & Water business units.

GE is hoping to close the acquisition of Wood Group's well-support business in 2011. "The acquisition is another major step

forward for GE Oil & Gas in executing our strategy to equip and serve our global oil and gas customers with the mission-critical equipment and solutions required to address their toughest technical challenges and growth objectives," said Claudi Santiago, President and CEO, GE Oil & Gas.

The proposed transaction immediately positions GE as a key player in enhanced oil recovery by adding electrical submersible pumps (ESPs) to GE's growing portfolio of drilling and production solutions.

Demand for products and services that enhance oil recovery is expected to grow significantly driven by a decline in production from existing wells and the increasing complexity of developing new reserves. ESP deployment is one of the most effective methods of enhancing production and also one of the fastest

growing segments in the oil and gas industry, says GE.

GE's acquisition of WTS will provide it with access to space frame wind turbine tower technology that has been designed to help reduce the cost of wind energy. The space frame towers are designed for use at wind farms requiring hub heights of over 100 m and have been developed to eliminate the need for heavy lift cranes during installation.

"We see great potential in the addition of this technology to our portfolio not only for our customers but also for the wind industry as a whole," said Victor Abate, vice president renewable energy for GE Power & Water. "Taller towers are an essential complement to longer blades. Longer blades capture more energy and in turn improve return on investment for wind farm developers."

"The taller space frame towers and integrated lifting system concepts, developed with the support of the US DOE and California Energy Commission, have been designed to drive lower wind energy costs," said Thomas Conroy, CEO of Wind Tower Systems.

Plans are under way to install a prototype of the space frame tower system technology to validate and test its design later this year with commercial availability targeted for 2012.

Last month also saw GE sign a joint venture agreement with Fuji Electric Holdings Co. Ltd. to design and market a new generation of electric meters for the Japanese market.

The new joint venture – GE Fuji Meter Co. – will combine GE's smart meter technology with Fuji Electric's Japan-based manufacturing and sales network.



Record orders boost Vestas

Record-high orders, an investment programme, reduced debt and a reorganisation of manufacturing have put Vestas on track for the years ahead.

Siân Crampsie and Junior Isles

Vestas called 2010 "a tough year" but says that it remains on track for a solid performance in 2011 and to retain its position as the world's leading wind turbine manufacturer.

The Denmark-based firm reported a record-high order intake for 2010 together with an increase in revenues and reduced debt in its full-year results.

Ditlev Engel, Vestas CEO said: "In 2010 there was one priority above all others, and that was the order intake. In 2009 the order intake dropped by 50 per cent compared to the year before. The top priority was to therefore ensure a strong rebound on the order

intake. We had aspirations to reach between 8000 MW and 9000 MW. We actually achieved 8673 MW."

Vestas expects revenues to remain stable in 2011 and says that the expected 2011 order intake will put the company in a good position going into 2012.

"2010 was a tough year, because... we had to make a profit warning and lay off some three thousand colleagues; a change in our accounting policies caused uncertainty; the outlook for 2011 was a disappointment, and the share price was down by almost 50 per cent," said Vestas Chairman Bent Erik Carlsen in a statement on Vestas'

website.

Vestas is largely on track, added Carlsen, because of the large 2010 order intake, the regionalisation of its production and an ambitious investment programme.

"The transfer of the production from Europe to the USA and China has substantially lowered manufacturing costs and reduced transport needs," said Carlsen. "As a result, Vestas no longer has huge amounts of money tied up in large inventories during transport, and soon transportation by lorries will be replaced by rail transportation, which is a cheaper solution measured in euro, cents and CO₂."

Deliveries of the company's products also hit a record high in the fourth quarter of 2010, helping to boost Vestas' overall revenues to €6.9 billion, a 36 per cent rise over 2009 revenues.

Revenues in Vestas' service business also rose to €23 million, an increase of 24 per cent over 2009. The EBIT margin was 4.5 per cent after taking into account the one-off costs of €158 million for the closure of factories and lay-offs.

The company forecasts that 2011 revenues will be mostly unchanged on 2010 levels at around €7 billion, and forecasts a "minor loss" for the first quarter.



Ditlev Engel: order priority

TNK-BP eyes stake in Rosneft deal

- High Court grants injunction
- Russia concerned over Arctic environment

BP's proposed tie-up with Russian oil giant Rosneft has been stalled by the British firm's existing Russian joint venture partners, Alfa-Access-Renova (AAR), and an announcement by the Russian government that it wants to review the potential environmental impact of the deal.

AAR owns 50 per cent of TNK-BP, the vehicle through which BP currently pursues oil and gas opportunities in Russia, and says that it is interested in participating in the BP-Rosneft deal.

AAR, which is owned by a group of Russian billionaires, entered arbitration proceedings with BP after being granted an injunction against the BP-Rosneft tie-up by the High Court in London last month.

AAR argued that BP's proposed deal with Rosneft breaches the shareholder agreement that was established when the TNK-BP alliance was formed.

However, TNK-BP said recently in a statement that it was ready to revise its approach to the BP-Rosneft deal because of its "potential interest in participating in the alliance".

BP sees the proposed deal with Rosneft as a breakthrough because it would give it access to potential oil and gas reserves in the Russian Arctic.

However the Russian natural resources ministry now wants to carry out a review of the environmental impact that the deal might have on the Russian Arctic region, which is a protected nature site.

The ministry says that it would have to take into account the need to preserve the ecological balance and natural diversity of the region when considering oil exploration licenses.

The BP-Rosneft deal would see Rosneft 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 would 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.

Analysts believe the deal would provide the Russian oil industry with a much needed financial and technological boost, and that it demonstrates the vast resource potential and strategic attractiveness of Russia's reserves.

Tenders, Bids & Contracts

Americas

Suntech, Zachry selected for Mesquite Solar 1

Sempra Generation has chosen Suntech Power Holdings Co. and Zachry Holdings Inc. to design and construct the Mesquite Solar 1 project in Arizona.

The project will use around 800,000 Suntech multi-crystalline solar panels, the installation and integration of which will be supervised by Zachry. Construction is slated to begin in mid-2011.

Electricity from the plant will be sold to Pacific Gas & Electric under a 150 MW, 20-year power purchase agreement, approval of which is pending from the California Public Utilities Commission.

Martifer opts for Suzlon technology

Industrial group Martifer has awarded a contract for the construction of a 218 MW wind power project in Brazil to Suzlon.

Under the deal, Suzlon will install 104 of its S88-2.1 MW wind turbines across Brazil's Ceara and Rio Grande do Norte states for Martifer's renewable energy subsidiary. Suzlon will also operate and maintain the sites, which will be commissioned in phases by June 2012.

Siemens wins New England cable contracts

Siemens Energy has been awarded a contract by Northeast Utilities for the supply of gas insulated transmission lines (GITL) to a portion of a major project aimed at enhancing transmission reliability in the USA's New England area.

Siemens is to supply 115 kV and 345 kV GITL for substation projects being implemented under the Greater Springfield Reliability Project. Siemens will build five circuits at two air-insulated substations (AIS) located 17 miles apart in Massachusetts and Connecticut for Northeast Utilities for a total length of 1 mile.

The GITL will run underground and then connect to above-ground bushings on both AIS. The GITL technology carries high current ampacity on one single conductor, whereas the same current would need two or three cables in an AIS application.

Alstom signs small hydro deals

Brookfield Renewable Power (BRP) has signed two contracts with Alstom for the supply of key plant equipment for two small hydropower plants in Brazil.

Under the deal Alstom is to supply two Kaplan 'S' turbines as well as generators, speed controllers and voltage regulators for the Pezzi and Serra dos Cavalinhos II power projects in Brazil's Rio Grande do Sul state. Both projects are scheduled to start operating in late 2012.

The 20 MW Pezzi SHP will be built on the Antas River, between the municipalities of Bom Jesus and Jaquirana. The 29 MW Serra dos Cavalinhos II SHP will be located in the municipalities of São Francisco de Paula and Monte Alegre dos Campos.

Siemens to build Mexico CCGT

Minera Mexico has awarded Siemens a contract to build a combined cycle power plant in Sonora State, Mexico.

Minera Mexico is a subsidiary of Grupo Mexico, the country's largest mining company. The 250 MW La Caridad plant will enter operation in mid-2013 and supply electricity to the company's copper mines.

Siemens will be responsible for the

full turnkey supply of the plant, which will be equipped with an SGT6-5000F gas turbine, SST-900 steam turbine, electric generators, heat recovery steam generator, and an SPPA-T3000 instrumentation and control system.

Asia Pacific

Bangladesh invites bids

BPDB-RPCL Powergen, Bangladesh's first state-owned joint venture firm, has invited bids from international sponsors to build a 150 MW furnace oil-run power plant at Kodda near the capital, Dhaka. The deadline for bid submission is 14 March 2011.

The selected sponsor will be responsible for the turnkey engineering, design, manufacturing, inspection, supply, installation, erection, testing and commissioning of the power project, which will help the country to overcome power shortages.

Sravanthi Energy selects GE gas turbines

Indian private power developer Sravanthi Energy has selected GE gas turbine technology for a combined cycle power plant project in the northern Indian city of Kashipur.

The 450 MW plant will tap into India's growing supply of natural gas and will feature four GE 6FA gas turbines. It will enter service in two 225 MW phases.

Toshiba awards Thai HRSG contract

Toshiba Plant Systems & Services has selected Vogt Power International to supply the heat recovery steam generators (HRSGs) for the Amata Nakorn: ABP3 combined cycle cogeneration plant project in Chonburi district, Thailand.

Under the contract, Vogt Power will design, engineer and deliver two HRSGs with exhaust gas bypass systems to operate behind two Siemens SGT800 gas turbines.

Gamesa wins NZ contract

Spain's Gamesa has announced that it has won an order to supply nine wind turbines to Pioneer Generation Ltd. for the Mount Stuart wind farm in New Zealand.

Gamesa will supply its G52-850 kW wind turbines to the 7.65 MW project, which will be located 15 km east of Milton in the southeast of New Zealand's South Island. The contract includes manufacturing and shipping the generators and supervising installation and commissioning.

Caparo, Suzlon sign \$1.3 billion deal

Caparo Energy India Limited (CEIL) has placed an order with Suzlon for the supply of equipment for 1000 MW of wind power capacity to be developed in India.

The two companies have signed a \$1.28 billion business partnership agreement that outlines plans for the commissioning of 500 MW by March 2012 and a further 500 MW by March 2013. The agreement is the largest deal signed by an independent power producer (IPP) for wind power investment in India, says Suzlon.

The planned projects will use various Suzlon turbine models including the S88 and the new S9X series 2.1 MW turbines with doubly-fed induction generator technology.

Marubeni signs Bangladesh CCGT contract

Marubeni Corporation has signed a contract with Electricity Generation Company of Bangladesh (EGCB) for the turnkey construction of the 410 MW

New Haripur power plant.

The contract is worth around Y31 billion (\$370 million) and is supported by a development loan funded by the Japan International Cooperation Agency.

The combined cycle power plant will be equipped with an MHI gas turbine and steam turbine from Fuji Electric Systems. It is expected to start commercial operation in mid-2013.

Europe

Siemens to install offshore link

The Dutch-German transmission grid operator TenneT has awarded Siemens a contract to install the grid connection for the SylWin cluster of offshore wind farms in the North Sea.

In a consortium with the Italian cable manufacturer Prysmian Powerlink, Siemens will connect the wind farm cluster to the mainland using HVDC Plus technology. The first wind farm in the cluster to be connected will be DanTysk, a 288 MW facility located west of the island of Sylt.

TenneT estimates the total cost of the connection to be nearly €1 billion, around one quarter of which is accounted for by Prysmian's share of the contract. The Siemens share is "significantly higher", says the German firm.

In total, the SylWin cluster will supply 864 MW to the grid.

GE supports Cobra Energia wind farm sites

GE says it has cemented its position in Europe's wind turbine services sector by signing its largest wind energy services contract in the region.

The US firm has signed a 10-year contract with Spanish wind developer Cobra Energia to provide advanced services for 178 GE wind turbines installed at eight wind farms across Spain.

The service agreement covers Cobra Energia's entire fleet of GE 1.5 MW wind turbines coming off warranty between 2010 and 2012.

MW Power to supply Porvoon Energia

The Metso-Wärtsilä joint venture MW Power has won a contract to supply Porvoon Energia with a biomass boiler for a combined heat and power (CHP) plant in the Finnish township of Tolkkinen.

Under the €15 million order, MW Power will supply a bubbling fluidised bed (BFB) boiler for the CHP plant, which will use a combination of wood chips, bark and saw dust to produce 38 MW of district heat to the Porvoon area and 12 MW of electricity for the national grid.

Ofgem qualifies eight for offshore transmission

UK energy regulator Ofgem has announced that eight bidders have successfully qualified to compete for the contracts to build three high voltage transmission links for offshore wind farms.

The bidders will compete for the rights to build, own and operate the links for three of the UK's largest offshore wind farms: Gwynt y Mor, Lincs and London Array phase 1. A shortlist of bidders will be selected in the spring of 2011 and the winning tenders are expected to be announced in the summer 2011.

The qualifying bidders are: Balfour Beatty Capital Ltd; Blue Transmission; Cheung Kong Infrastructure Holdings Ltd/Hongkong Electric International Ltd; Green Energy Transmission; Mitsubishi Corporation; National Grid Offshore Ltd; Transmission Capital Partners; and the Ventran Consortium.

Centrax wins French orders

Centrax has won four new orders for gas turbine powered generating sets from customers in France, supporting the French government's drive for reinvestment and greater efficiency across the energy sector.

Three of the four Centrax CX501-KB7 packages ordered are direct replacements for earlier -KB7 units while the fourth is for a new customer. Two of the new Centrax packages are for the operator Semhach and will equip district heating schemes in southern Paris, while the third replacement Centrax package will equip a district heating scheme in the northern Paris suburb of Gennevilliers.

The new Centrax customer is the Vaulx-en-Velin power station in the northeast suburbs of Lyon, operated by Cofely.

Göteborg Energi orders gasifier

Metso is to supply the gasifier for Göteborg Energi AB's innovative GoBiGas project, the technology firm has announced.

Under the €30 million order, Metso will supply a gasification solution based on a new technology licensed by Austrian company Repotec. The gasifier will be used for the first phase of Göteborg Energi's gasification demonstration project, which aims to produce biogas by gasification of biofuels and waste from forestry.

The 20 MW facility will be built on the existing premises of Rya Värmecentral in Gothenburg, Sweden, during 2011-2013.

International

SEC awards substation contract

The Saudi Electricity Company (SEC) has awarded a SR350 million (\$93 million) contract for the construction of six new substations for the Kingdom's national power transmission and distribution operator to ABB.

Under the contract, ABB will design, supply, install and commission the 110/13.8 kV substations, which are scheduled for completion in 2012. The substations will be equipped with the latest IEC61850 compliant automation, control and protection systems.

GE boosts Romanian wind business

GE is teaming up with wind farm developer Monsson Alma to build two new wind farms in Romania.

The two companies are to construct the Silistea 1 project, featuring ten 2.5 MW GE wind turbines, and the Mireasa 2 project, which will consist of four 2.5 MW GE machines. GE will also provide ongoing maintenance services for the projects once they are operational.

GE and Monsson Alma say that Romania's progressive renewable energy legislation has created "one of Europe's friendliest environments for renewable energy developers".

ABB wins Ukrainian order

ABB has won an order worth \$20 million from Ukrainian power grid operator NPC Ukrenergopro to supply 44 sets of sulphur-hexafluoride (SF₆) circuit breakers to be installed in five transmission substations around the country.

These modern circuit breakers will replace outdated air blast-type circuit breakers that have been in operation for nearly four decades. ABB will supply the equipment and provide technical training.

The circuit breakers, rated at 800 kV, will be installed in four phases, starting



Three 'A's for gas

Some see gas as only a bridging fuel for the transition to an energy landscape dominated by renewables. Shell's **David Loughman** tells *TEI Times* why he views things differently.

With carbon capture and storage (CCS) for coal fired plants still a long way off and the inability to bring sufficient renewable generating capacity on line fast enough to avoid global temperature change rising above the 2°C limit – which scientists say is necessary to avoid irreversible climate change – gas has become the fuel of choice in recent times.

There are those who argue that this renewed dash for gas not only makes sense from an environmental standpoint but also in terms of economics. A recent study was conducted by the European Gas Advocacy Forum (EGAF), whose members include: Centrica, Eni, Gazprom, GDF Suez, Qatar Petroleum, Shell and Statoil. The study entitled: 'Optimised pathways to reach 2050 abatement targets at lower costs and improved feasibility', which was supported by analytical input from McKinsey & Company, claims that the use of gas will avoid up to €500 billion of investments between 2010 and 2030 compared with an even more renewables intensive pathway, with further savings potential in 2030-50.

Yet while gas is an obvious bridging fuel between now and 2030, some believe it has a much longer-term role to play.

David Loughman, Managing Director A/S Norske Shell and Vice President of Upstream Commercial Europe noted: "Gas is a triple-A fuel: abundant, acceptable and affordable. We believe it can be a 'destination' fuel well beyond 2050."

As a geo-scientist, Loughman is well placed to comment on the abundance and availability of gas. "My background is in looking for oil and gas. Gas is truly abundant. People get confused by unknown unknowns and don't factor in the fact that there are unknown reserves of oil and gas."

Loughman gave two well-known examples: the fairly recent discoveries of shale gas and the findings of huge oil deposits in Brazil.

"When I worked in the US in 2002/2003, I was responsible for Shell's development projects in the US, including our efforts to get into shale gas. But if you had told me then that the US would not really need any LNG in 2011 and was even thinking of exporting gas, I simply wouldn't have been able to believe that. And I'm a geologist! We have known about those shale gas deposits for 100 years and should have known what those shale gas basins might have done."

On Brazil, he noted: "The scope and number of basins that remain unexplored – even beyond the fact that the industry, led by Petrobras, has unearthed this deep salt play – shows yet again that there's more to be thought about and more to discover."

Loughman pointed out that Europe sits within commercial striking distance of 70 per cent of the world's proven reserves of gas. These reserves are sufficient to last 250 years at the current rate of consumption i.e. about 650 bcm/year in Europe.

There is also the potential for shale gas in Europe. This is in its very early stages and may have a different outcome to the US. There are also other large resources such as in the Arctic, which could hold as much as a third of the world's undiscovered natural gas.

This, said Loughman, all shows that the "abundance of gas is incontrovertible". He added: "I think people get confused with peak oil, and the fact that we have declining UK production, as a signal of what's

happening in the rest of the world. While it's true that UK production will continue to decline, a field such as the North field in Qatar – which is the biggest gas field in the world – is only just starting to be exploited."

Loughman also explained that the development of a typical oil and gas basin tends to be "asymmetric". He said: "Even though there is declining gas production in the UK, the tail is very long and very gradual. So it is possible that in total – depending on policy and technologies, etc – there may be scenarios where there is more gas looking forward than what is behind us. In other words, the future is still in front of us."

But one of the challenges we face, according to Loughman is that people still think of gas simply as a fossil fuel. He argues that the right way to look at the challenge in terms of where the industry needs to get to, particularly in the short term, is how to decarbonise the system as fast as possible.

"The mental model we should have is that gas is a low-CO₂ fuel. I compare it with a diet. We can have low-carb diets. Most would not advise nil carbohydrates but we can have lower, balanced carbohydrates. In a way, that's the role gas plays; it's a low-CO₂ fuel within the energy mix. It's a difficult message to get across but gas is a low-CO₂ fuel for the current world... we have to deal with the reality we are in."

The acceptability issue is particularly critical when considering the timescale. "I am concerned about the possibility of non-linear climate change. It seems that the targets in terms of controlling temperature rise are important but the key thing is that they are quite short-term. As the Inter-government Panel on Climate Change pointed out, to keep the temperature rise within the 2°C band we have got to start reducing global CO₂ emissions by 2020. That is tomorrow."

But despite the immediacy, the fastest growing source of fuel in absolute global terms is still coal. Loughman believes that the quickest way of cutting CO₂ emissions is to reverse this trend by taking coal plants off line and building gas fired plants instead. "Clearly the renewables sector will

The development of a typical oil and gas basin tends to be asymmetric "... so it is possible that in total – depending on policy and technologies, etc – there may be scenarios where there is more gas looking forward than what is behind us."

grow but not fast enough to meet the rising demand and deal with the issue of turning the CO₂ emissions around by 2020. Depending on the nature of the coal fired plant, gas will save between 50 and 70 per cent of the CO₂ emissions. This is huge when you look at it in the context of global power generation."

The challenge, however, is how to get countries like China and India, which are heavily dependent on coal, to make the shift to gas.

It is a point that Loughman acknowledges. "A robust agreement on carbon price would certainly be helpful but we have got to help them. As a global gas producer, we can do this by making the gas available and involving companies from China, for example, in our value chains."

This is a role that Shell has played in Australia, where it brought a Chinese partner into its Arrow venture in eastern



Loughman: the "abundance of gas is incontrovertible"

Australia with a view to importing LNG into China.

If the gas is available, it can make economic sense to switch to gas from the affordability standpoint. Combined cycle gas fired plants are far cheaper to build than coal plants and have a much higher efficiency.

But while capital costs are lower, the long term operating costs due to gas price volatility remains a burning issue. "This is a complex area," said Loughman. "[But] we have seen that volatility in the UK, for example, is beginning to level out. The very cold winter last year saw some shutdowns of gas producing facilities around Europe, but the system demonstrated that it was much more flexible and

signals due to shutdowns etc.

Loughman cautioned, however, that where absolute gas prices will end up in the future is "anybody's guess". He added: "In all likelihood, it will be linked to a wider range of indices and baskets of indices than it is today. What will be key is the ability for partners to sign up for long-term contracts."

Security of supply and a possible over-dependence on Russian gas is a subject of political debate. But Loughman believes the concerns are largely unfounded. He argued: "Over the years, Russia has been an extraordinarily reliable supplier of gas. Through pipelines like Nord Stream and South Stream, it is also looking to increase its opportunities for bringing more gas to the European market. It is essential for Russia to maintain those exports. [In any event], the reality is that with the continuing growth of LNG terminals, we are seeing a diversification of supply. Our very first cargo of from Sakhalin LNG in the Pacific basin on the east side of Russia actually ended up in the European market – that's global security of supply!"

Loughman concludes that the 'three As' are robust, and when plugged together not only represents the best way to meet emission targets quickly but also results in a positive economic impact.

"What is important," he says, "is that we should not be trying to pick winners. We should be investing and supporting all efforts to develop new technologies to solve the energy challenge. The IEA's view of the world is that energy demand will double by 2050. We will therefore need everything we can get our hands on – renewables, fossil and nuclear. So let us not back winners. Let's, preferably, set a robust carbon price that reflects the price of carbon in the system and then see how the systems react to that in order to create the best outcome. In our view, that is a wholesale shift to gas, especially in the short to medium term."

Oil

Middle East turmoil pushes up crude prices

■ Unrest pushes Brent crude over \$100/b
■ "We are seeing a little more oil from Opec"

David Gregory

Uprisings in Tunisia and Egypt and continuing unrest throughout North Africa and the Middle East, pushed the price of Brent crude over \$100/b in mid-February and at times put WTI crude in the \$90/b range. Meanwhile, Opec's crude basket price touched \$99/b.

This came despite the market being well supplied, according to Opec's estimates. Crude inventories in the US remain high, but speculation in the market took advantage of circumstances in the Middle East.

Concern about future energy security caused markets to react as each event, be it in Egypt, Bahrain, Yemen, Iran, Libya or Algeria, unfolded. In January and February the main fear was that shipments of crude and products through the Suez Canal or the Suez-Mediterranean (Sumed) pipeline would

be disrupted. As peaceful demonstrations turned to violent riots in other countries in mid-February, concern turned to possible disruptions in production.

Public resentment erupted as the price of foodstuffs and basic commodities put more financial stress on citizens. Some analysts argue that rising crude oil prices themselves contributed to the rising price of food and in that sense brought home the results of policies that have kept crude oil prices high.

Commenting on market conditions on February 19, Opec Governor Muhammad Ali Khatibi of Iran (where anti-government demonstrators had returned to the streets) said there was no shortage of crude oil and that "recent political developments" had affected prices.

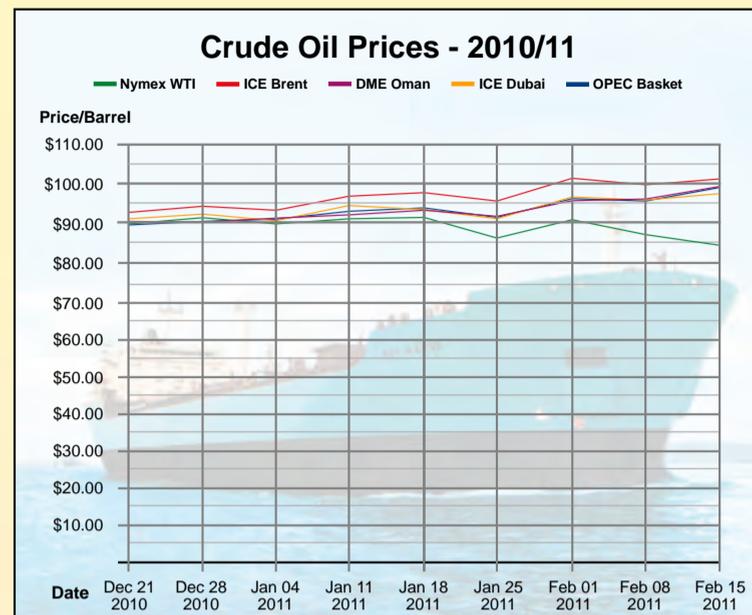
But as crude oil prices began last year to move up and away from the

\$75/b price range that Opec had once described as perfect, a number of analysts began to urge Opec to increase production or risk harming the global economic recovery.

In its latest *Oil Market Report (OMR)*, released on February 10, the Paris-based International Energy Agency (IEA) forecast that crude oil demand would rise to 89.3 million b/d in 2011, an increase of 1.5 million b/d over 2010's demand average of 87.8 million b/d, up by 2.8 million b/d over 2009.

It added that Opec crude supply had been at its highest in two years in January 2011, with output averaging 29.85 million b/d. Meanwhile, crude stocks with members of the Organisation for Economic Cooperation and Development (OECD) had fallen to 57.5 forward days cover.

"We are seeing a little more oil from



Opec as they're seeing the same indicators on the demand side, especially in Asia, that we are," David Fyfe, head of the IEA's oil industry and markets department said to *Reuters* on February 10. "A flexible attitude from Opec is a good thing," he said, adding: "The fact that prices have gone up from around \$75/b in September to \$95/b and above is because of sharp tightening in the physical market. It's not the only thing driving prices, but some of the impetus comes from that market tightening. We saw very strong 2010 oil demand growth and we're feeding that through into 2011."

The IEA said in the report that crude oil demand in China "reached yet another record high in December" of 10.4 million b/d. It said apparent demand rose by 12.2 per cent in full-year 2010 (up by 1 million b/d), the equivalent to over a third of global demand growth.

Meanwhile, the US Energy Information Administration (EIA) said

in its February *Short-Term Energy Outlook* that it expects the price of WTI crude to average around \$93/b in 2011, up by \$14/b over the 2010 price. It forecast that WTI would average \$98/b in 2012.

But the EIA quantified that by saying that there are a number of "significant uncertainties that could push oil prices higher or lower than current expectations". It said among those uncertainties was Opec's response to global recovery in oil demand, the rate of economic recovery, fiscal issues for national and sub-national governments, and China's efforts to address growth and inflation. "In addition," the EIA said, "even though Egypt is not a major supplier of crude oil or natural gas to world markets, the recent unrest in that country raises the concern that unrest could spread to other countries in the region with a larger role in supplying world energy markets or that key transit routes for energy and other goods could be disrupted."

Gas

Egypt's revolution raises gas supply concerns

The revolution has heightened international concern over the security of gas supply. A disruption or halt to Egypt's contribution to global energy movements could have serious consequences for world energy markets as well as Egypt's domestic welfare.

Mark Goetz

The people of Egypt have succeeded in ousting Hosni Mubarak as President of Egypt, but perhaps the hardest part of their popular revolution still stands before them. And while the Egyptian military is in control during the interim, the circumstances remain volatile. Although the country's energy industry appears to be functioning normally, gas exports through the Arab Gas Pipeline (AGP) and those to Israel have been disrupted.

Natural gas exports and the transportation of LNG, crude oil and petroleum products through the Suez Canal, plus shipments of crude oil through the Suez-Mediterranean (Sumed) pipeline bring considerable foreign revenues to Egypt.

A disruption or halt to Egypt's contribution to global energy movements could have serious consequences for world energy markets as well as Egypt's domestic welfare.

Two million barrels of crude oil and products pass through the canal every day on average, along with 30 million tons of LNG every year. Earnings for the Suez Canal bring Egypt some \$5 billion annually.

During the revolution, international concern was expressed over the possible disruption of tanker traffic through the 200 km Suez Canal or the shipment of crude oil through the 320 km Sumed pipeline. Some drilling operators halted their operations and evacuated their personnel from the country, but in most cases drilling continued while crude oil and natural gas continued to flow.

Events did not impact Egypt's two LNG production facilities at Idku and Damietta, which together hold a capacity of 12 million tons/year (approximately 16 bcm/year) and which also provide Egypt with an important export income, but in the northern Sinai Peninsula an explosion and fire brought a stop to gas exports to Jordan, Syria and Lebanon through the AGP and to

Israel through the Al Arish-Ashkelon pipeline.

Repairs on the metering station where the explosion occurred were still under way in mid-February and a target date of February 17 to resume gas shipments to Israel was missed.

In the meantime, the army has taken up positions to guard the pipeline, as well as the canal, and the military council announced that Egypt will continue to respect all international agreements – including its deal to supply Israel with natural gas.

Israel relies on Egyptian gas for 40 per cent of its power generation, but its supply contracts are controversial among many Egyptians. About 2 bcm/y is supplied to Israel by the East Mediterranean Gas Company (EMG), a joint venture between Egyptian and Israeli firms.

As events in Egypt unfolded, Israel took steps to ensure its energy supply should gas shipments from Egypt stop. Furthermore, the Israeli government

pressed the US and Israeli partners that have recently discovered huge deposits of natural gas in the offshore Tamar and Leviathan gas fields to speed up development – especially of the Tamar field. Discovered in 2009, the Tamar field holds 8.4 trillion ft³ (tcf) of natural gas, enough to meet Israel's entire gas demand for more than 20 years.

Jordan, too, relies heavily on Egyptian gas supplied through the AGP and had also made provisions in case of disruption. Eighty per cent of Jordan's power is generated with Egyptian gas, but it is now using diesel to generate electricity until shipments through the AGP resume. Syria and Lebanon have also been adversely affected by the pipeline's closure.

Egypt's natural gas reserves are estimated at 77 tcf (2.2 tcm). Total gas production during 2009 was put at 2.3 tcf (65 bcm) while local consumption amounted to 1.6 tcf (45 bcm).

Pipeline exports amount to around 5 bcm/year. An extension of the AGP

from Syria to Turkey could enable Egyptian gas to enter the proposed Southern Corridor and export gas to Europe through Turkey.

But growing domestic demand has forced the government in recent years to delay plans to boost exports, while at the same time it has taken steps to encourage foreign investment for the purpose of increasing exploration and boosting reserves.

A new government in Egypt can expect to hear demands from the people to provide more electricity, particularly in the Upper Nile. But the new rulers will be torn between maintaining important money-earning exports and providing more gas for domestic use. Renewed efforts to increase exploration can be expected.

The revolution has heightened international concern over the security of supply. Those concerns can be expected to continue until the political situation in Egypt is stable, a condition that may take years to achieve.

The Middle East starts on a renewable pathway

Renewable energy could play a significant role as it becomes increasingly imperative for net oil importing countries in the Middle East to diversify their energy mix and attain independence from the risks of high oil prices.

Abhay Bhargava

The Middle East region today is host to approximately 160 GW of installed power generation capacity, with the GCC amounting to approximately 54 per cent of the region's total capacity.

A recently launched Arab Petroleum Investments Corporation (APICORP) report forecasts that this installed capacity is set to grow at a rate of 7.7 per cent between 2011 and 2015, resulting in more than 80 GW being added over the next five years at an investment tag of \$90 billion. Frost & Sullivan's analysis predicts that the major investments in the next 10 years will be in Saudi Arabia, the United Arab Emirates, Iraq, and Egypt.

Frost & Sullivan estimates that the GCC alone will spend upwards of \$100 billion in the next 10 years in adding 80 GW+ of power generation capacity. Based on plans for economic diversification, the GCC countries have seen significant investments being made in industrialisation, infrastructure development, water treatment, and petrochemicals – all energy-intensive developments.

Hence, the demand-supply equation for power has shifted, leading to an energy deficit in a number of countries, and reduction in margins for others. This was clearly visible in Saudi Arabia, Sharjah (the UAE), and Bahrain in 2010.

With the current energy mix skewed vastly towards conventional sources, it is expected that the region will not be able to cope with the forecast increase in demand. Oil-exporting countries in the Middle East will find it increasingly difficult to attain

increasingly imperative for the net oil importing countries in the Middle East to diversify their energy mix and attain independence from the risks of high oil prices.

This is where we see renewable energy playing a significant role. In 2010, less than 4 per cent of the total electricity generated in the Middle East was from renewable sources. This is miniscule, compared to a significant 19.4 per cent contribution (including hydropower) in the European Union (EU) as a whole.

Low oil prices, recession, and absence of a framework conducive to investments, have primarily contributed to the delayed progress of the renewable energy sector. The situation, however, is set to undergo a rapid change over the next 10 years.

Egypt, Morocco, Algeria, Syria, and Lebanon have all been at the forefront of renewable energy. Each of these countries has announced targets/mandates for the next 10-12 years that would pave the way for new projects. The current political and social instability in these countries, however, raises doubt over the implementation plans for these targets – a clearer picture is expected to emerge by 2012.

The GCC countries are expected to be a balancing force in the region with an increasing level of interest in renewable sources of energy, specifically solar energy.

While nuclear energy has made inroads in the region, this option is still not available to all nations. As a result, renewable energy is being seen as a key solution to future power generation requirements. A number of recent developments illustrate the seriousness with which the GCC is approaching this issue.

The UAE is leading the way with more than 100 MW of solar power under way (Shams 1), and another 100 MW to be operational by 2012. It has setup the pioneering Masdar City, and the Masdar initiative and is host to the Irena (International Renewable Energy Agency). Abu Dhabi has set a target to achieve 7 per cent of electricity generation from renewable sources by 2020. This would amount to nearly 1500 MW of power from renewables to be achieved over the next nine years, with an expected investment of \$7-10 billion in these projects.

Qatar's recent success in winning the bid to host the 2022 Soccer World Cup is expected to boost the penetration of renewables in the country. The country has announced plans to cool stadiums using solar power and utilise other measures to manage carbon emissions.

Bahrain recently awarded a contract to Fichtner to setup a pilot project for renewable energy generation in the country.

Oman awarded a contract in 2011 for a power project with an expected capacity of up to 200 MW using solar photovoltaic (PV) systems.

Saudi Arabia, in spite of its massive proven oil reserves, was faced with power shortages last year, and is investing in alternative energy. This is demonstrated by: plans for a 3.5 MW power plant to be built by Aramco, tendered in 2011; using solar power to power cathodic protection (CP) devices to fend off pipeline corrosion; and trials to power a village and a school already under way using solar



Abhay Bhargava: investing in renewables presents a viable long-term solution towards continued prosperity and political stability

power. It is also planning to invest in a polysilicon production facility in the kingdom.

There are a number of challenges that MENA countries need to overcome in their attempts to embrace renewable energy.

The first and foremost problem is that of investments – and subsequent returns. The cost of solar power generation is still at least six times higher than the cost of generating power using subsidised gas, creating a significant obstacle that earlier curbed the flow of investments in this sector.

Government subsidies and measures, such as feed-in tariffs, long-term power purchase agreements, and guarantees are expected to gain ground. Private participation in power generation is making rapid inroads as well. These two factors are jointly expected to pave the way towards large-scale adoption.

The second challenge is solar PV and concentrated solar power (CSP) technologies have not yet been thoroughly researched and designed to meet desert conditions – lower efficiencies still plague the sector.

Meanwhile, there is a perennial threat that available capital will go to other sectors that offer higher return and/or lower risk on such investments, given that the investment climate in renewable energy is extremely nascent.

Lastly, the region still faces hurdles due to lack of sufficient technical expertise and resources to manage the envisaged roll-out of green projects. The advancement of training technology and availability will be a critical factor in determining the adoption of renewables in future in the region.

There are, however, a number of factors that build a compelling case for the Middle East to opt for renewable sources of energy.

Unemployment in the Middle East region has been a critical contributor towards the recent waves of revolution flowing across the region. While there is no single answer to unemployment, adoption of renewables has been seen

as a major employment generating opportunity in other parts of the world. The associated investments in renewable sources of energy can create much needed employment opportunities in the region, and contribute towards bringing political stability to economies plagued with rapidly increasing populations.

With renewables contributing to the energy mix, a substantial amount of hydrocarbons that would have been used for power generation would be freed from domestic usage, and present a potential for export earnings. This additional revenue could also be used by the governments to subsidise or build the case for renewables.

Increased adoption of renewables will contribute towards the regional governments' aim to reduce their GDP's dependence on oil and gas, and diversify their economies.

Opting for renewables will also aid industrial development. Localisation of technology is essential to sustain performance in the hot, humid, and dusty climate prevalent in most parts of the Middle East. This localisation and the associated investment in research and development can, in turn, contribute to the development of related industries and lead to the advancement of a knowledge economy.

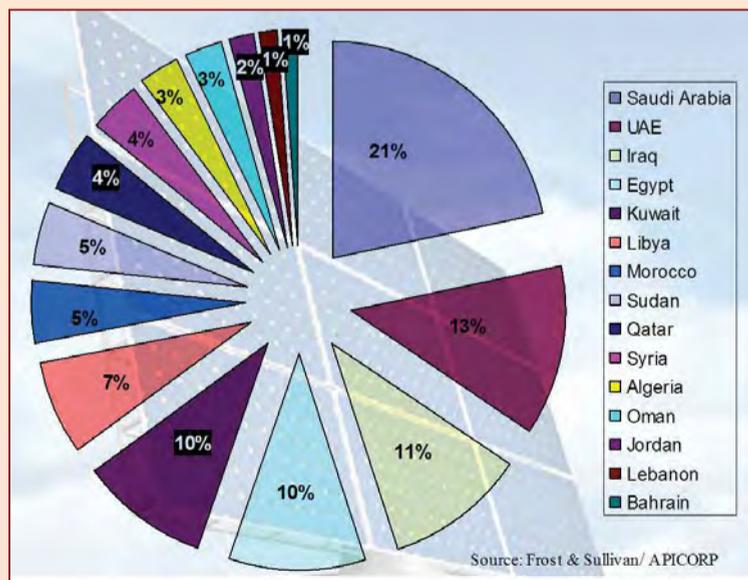
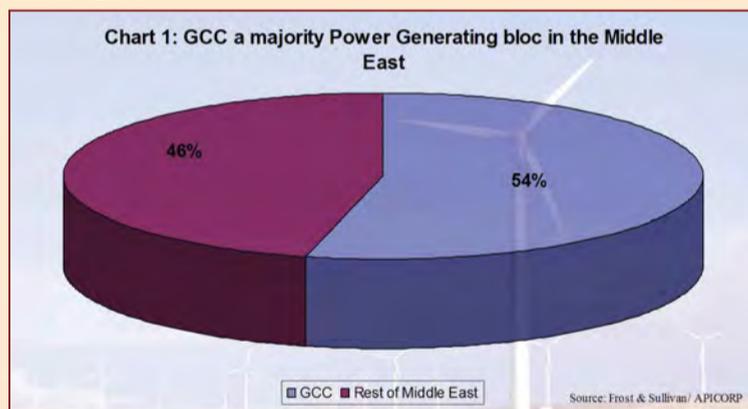
The MENA region is going through an extremely challenging time, coupled with the necessity to be economically stable and achieve sustainable growth.

With a forecast investment tag of \$110-120 billion over the next 10 years, renewable energy technologies are seemingly prohibitive on account of being capital-intensive.

However, this drawback is only applicable in the short term, since these investments present a viable long-term solution towards continued prosperity and political stability.

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GCC: a majority power generating bloc in the Middle East



Percentage share of planned investments in installed capacity

sufficient feedstock from their reserves to cater to the forecast rise in demand. On the other hand, it is becoming

Green shoots for CCS

A project under way in Australia, which will use captured carbon dioxide to produce algae-derived products, looks set to make CCS an economically attractive proposition to power generators. **Junior Isles.**

Many argue that carbon capture and storage (CCS) is an essential technology if the world is to have a chance of reducing carbon dioxide (CO₂) emissions in order to combat climate change.

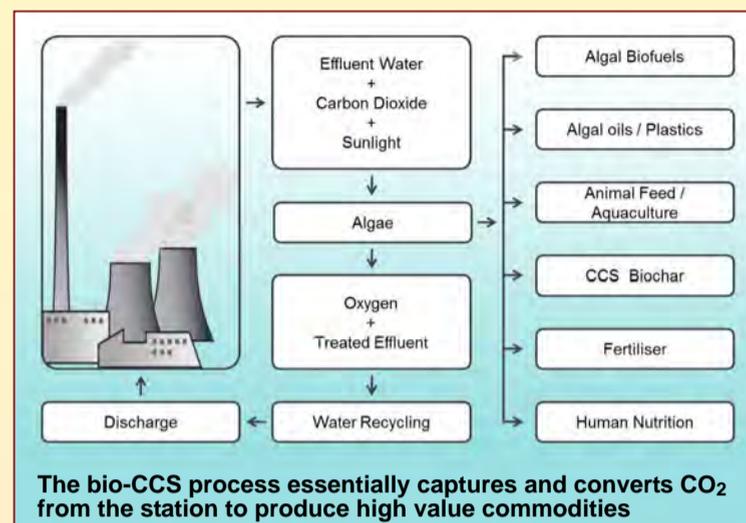
However, according to the IEA, coal-based CCS adds an additional \$750/kW for a plant using ultra-supercritical technology, while generating costs would be in the region of \$25-35 MWh higher than the cost of conventional coal-based generation, in the absence of a carbon price. Other industry estimates note that CCS would increase the cost of energy from a new power plant with CCS by 21-91 per cent. This, combined with the potential difficulties surrounding transport and underground storage of the captured CO₂, currently makes CCS an unattractive proposition to power plant owners.

However, a project now under way in Australia could be a game-changer. At the end of January, US-based OriginOil announced that MBD Energy of Australia had placed the first commercial order to deploy its algae oil extraction system at the 1400 MW Tarong coal fired station

after the company's formation in 2006. Andrew Lawson, MBD Energy's Managing Director explained: "MBD was formed to pursue bio-diesel projects but we quickly worked out that we needed to go to find a genuinely sustainable feedstock source especially with the price of farm oil increasing in value dramatically."

The company formed a relationship with James Cook University (JCU) in Australia in 2007 to set up a research and development facility and then conducted a global search for different algae growing systems. Unable to find a suitable system, MBD decided to develop its own system for growing micro and macro algae.

What they developed was a bio-CCS algal synthesiser consisting of a scalable array of large, fully enclosed elongated membranes containing wastewater and piped emissions waste. The current expanded test facility has a micro algae capacity of 450 000 litres and a macro algae capacity of 600 000 litres and is the base for all MBD's research and development, including algae strain



capture emissions from the smoke stack. These emissions will be cooled and piped into proprietary growth membranes that contain wastewater from the power station.

Construction of this 1 ha facility is nearing completion, and is expected to start growing algae next month (April). It is expected to reach full capacity in September this year, producing meal for cattle feed and fuel grade oil that will be refined by a third party into bio diesel.

The plant is ideally located for the algae products. "There is quite a strong market sitting around the plant. About eighty per cent of Queensland's beef feedlots are within 50 km of the plant," said Lawson.

The Tarong Stage 1 trial will run until March 2012, after which it will be expanded to 80 ha. This project will grow 100t/day of algae, which will in turn produce 30 t/day of oil (11.8 million litres/year) and 25 000 t/year of feedstock.

In addition to the contract for Tarong, MBD has also signed MOUs with Loy Yang and Eraring power stations, Australia's two other largest CO₂ emitters.

Between them, Tarong, Loy Yang and Eraring produce nearly 25 per cent of Australia's electricity. Tarong alone emits 10 million t of CO₂ per year. In the first 1 ha stage, MBD's facility will capture 800 t of CO₂ from the station, while the second stage will sequester 70 000 t of CO₂. This Stage 2 will be fully operational in 2013.

If the first two phases are successful, in 2014 the facility will be expanded to 1600 hectares in Stage 3. When fully operational in 2015, it will sequester

1.4 million t of CO₂ to produce around 300 million litres of transport (or plastics) oil per year, and 450 000 t/year of feedstock. MBD expects to capture and convert more than half of the power station's CO₂ into energy by 2020.

To date MBD has invested \$15 million of private funding into research and development. Last year the federal Government AMCR awarded a \$5 million grant in support of the R&D programme. The first proof of concept stage (the 1 ha facility) represents a \$5 million investment. The second phase will require an additional \$30 million. The fully commercial scale 1600 ha facility is expected to cost about \$300 million. But, unlike geo-sequestration CCS, the bio-CCS algal synthesiser technology at Tarong could ultimately be a significant revenue earner.

If all three projects reach full-scale production and capture half the emissions from the plants, according to Lawson it would allow the production of 25 per cent of Australia's diesel and more than all the meal that is currently imported into the country.

Producing such large quantities of valuable commodities is of huge significance to the uptake of CCS in the power industry. "The energy equation typically means two thirds of the energy is lost up the stack. We can change this so that two thirds of the energy is used and only one third is lost to the atmosphere. Compared to geological CCS, where each one million tonnes of CO₂ that is put underground costs \$2 billion, we can make \$250 million out that 1 million t of CO₂."

MBD is clearly confident in the value of the technology. It is providing 80 per cent of the \$5 million financing for the first stage of the Tarong project. The power station is providing all the services and civil works to the project and the state and federal governments are providing the remaining 20 per cent of the funds. The power stations will have an option to take a joint equity position in the subsequent phases, which will cost in the region of \$200 000 - \$400 000/ha to extend.

Although it is still early days, the technology is attracting significant interest from other parts of the world. "In the last two years I have visited England, Denmark, the Netherlands, India and China. We have had visits from all of these countries and significant interest from Brazil, Japan, Thailand and the US. But we want to prove it in Australia first before taking it to other places," said Lawson.

As Lawson pointed out, the market potential is huge, especially in countries like India and China where food processing is becoming a big problem. "There is already a \$7 billion macro algae industry in Asia, and we think our technology taps right into it."



Photo of the fully operational 10 m growth membranes producing oil-rich algae using the Tarong strain at MBD's R&D facility at JCU. The Tarong 1 ha plant will use up to thirty two 50 m membranes

in Queensland, Australia.

Such systems, known as bio-CCS essentially capture and convert CO₂ from the station to produce and sell high value commodities. The philosophy, as described by MBD, is simple: "Why should the world pay to bury captured smokestack carbon dioxide when it can be recycled to provide fossil-fuel offsets plus earnings and increased food, energy and water security?"

This line of thinking first hatched shortly

selection for growth in a commercial setting at Tarong Power Station.

Local strains of algae are introduced into this carefully controlled environment. Algae selection is based on a range of factors, including which commodities are to be produced for sale.

According to MBD, trials at JCU have shown a doubling of oil-rich algal biomass every 24-48 hours.

The next step is the proof-of-concept at Tarong where MBD's system will

Single step extraction

A key component of MBD Energy's system is US-based OriginOil's harvesting and extraction system.

Dr Brian Goodall, OriginOil's Technical Director commented: "Our job on this project is to supply unique dewatering and oil extraction equipment to MBD - which directly helps them monetise their CO₂-to-energy process by helping deliver the oil for transport fuel and remnant biomass to be used for animal feed."

There are two ways of growing algae. One is to feed it sugar; grow it in a fermenter to produce algae with high concentration, about 10 per cent, of algae solid in water. However, the algae facility has to be placed on the farming land that is being used to grow the sugar, which is the carbon source for the oil grown using this "heterotrophic" algae growth technology. The other way ("autotrophic" algae growth) is to use sunlight to transform flue gas CO₂ which forms the carbon source in this case. However, the concentration of algae solids in water is typically less than 0.1 per cent. This means the algae solids have to be dewatered or concentrated extensively and at low energy cost or the oil produced will be both too expensive and non-sustainable.

OriginOil has developed a 'single-step extraction' system that performs the dewatering so that the algae can be efficiently dried and converted for use in animal feed. At the same time it cracks or ruptures the algae cells causing the oil to be released, which can then be converted to diesel or jet fuel.

In the context of making renewable diesel and jet fuel from algae as "drop in" replacements for those made from fossil crude Dr Goodall noted: "All the individual pieces of the technology have been proven. Now it all just

has to be put together in an efficient way and at a huge scale to be competitive with crude oil."

Prior to its work with MBD, OriginOil had developed its own algae growing system - the Helix BioReactor - that can grow multiple layers of algae biomass around-the-clock with daily harvests.

With the company's new strategic focus on the harvesting phase, its growth stage technology will now be reserved exclusively to its extraction clients.

The company's extraction innovations also include 'live extraction', a way to 'milk' oil from the algae while it remains alive; and the 'hydrogen harvester', a continuous, passive extraction system for removing hydrogen gas from algae.

Hydrogen is essential to the refining process, thus enabling algae producers to refine algae right at the point of production, a major benefit. The company has announced that it has managed to produce hydrogen in the lab at a rate comparable to photovoltaics.

OriginOil recently announced that it will participate with a Mexican partner in a pilot scale algae project to be funded by the Mexican government. This 'Manhattan Project' will demonstrate industrial algae production, paving the way for substantial investment by the Mexican government in large-scale jet fuels production.

According to OriginOil, the Mexican government has set a target to produce one per cent of the nation's jet fuel from renewable fuels such as algae in less than five years.



Junior Isles

Throwing a FIT

The UK's solar players are no longer a happy bunch and perhaps understandably so. Less than a year after introducing a feed-in tariff (FIT) scheme for renewables, the government is already looking at making changes.

Early last month, UK Energy Secretary Chris Huhne said that while the FIT scheme introduced in April last year has been "a huge success, there is room for improvement". The government is particularly concerned "about the impact of super-size solar installations" and the possibility of such installations taking the lion's share of subsidies.

The government fears that the number of projects in the pipeline for installations over 50 kW risk it exceeding the amount it was anticipating to spend in subsidies for the scheme and therefore jeopardise its Spending Review targets.

The decision to carry out a review a year early has probably been prompted in part by experiences in countries like Spain where a budget deficit has forced the government to reduce the level of subsidies. Germany also recently reduced solar subsidies to compensate for a solar energy boom that inadvertently drove up energy costs and threatened to overburden electricity networks.

In an attempt to head-off what he sees as a looming problem, Huhne said: "I have decided to end the potential for damaging speculation and bring forward the review of the scheme to look at ways of correcting these early teething problems."

In terms of ending speculation, the decision, however, may achieve the exact opposite. Andrew Newman, finance director of London-based management fund Low Carbon Investors, said his company would now focus its short-term UK investment efforts on the wind sector as it offers "nicer" returns and greater regulatory certainty than the solar industry.

He was reported as saying that while the fund has typically split its investment equally across solar and wind, the possibility of changes to the subsidy scheme could, in the short term, push investment in wind projects to more than 90 per cent of its portfolio. He said: "We won't not invest in solar," but stressed that Low Carbon Investors is not prepared to

take on the risk of changes to the FIT system, a possibility that is likely to have an impact on solar.

Dave Sowden, chief executive of the UK-based Micropower Council, welcomed "many aspects" of the review but said the fast-track enquiry into solar came as a "complete shock". He warned that it could affect installations across retail outlets, schools and other public buildings.

In response to the news, Low Carbon Solar has launched a campaign called 'Power to Society' to give voice against what it calls "the coalition government's backtracking over funding for community scale solar energy schemes".

Mark Shorrock, CEO of Low Carbon Solar, said: "At its most basic, we want the campaign to create an understanding in the political realms that there is a popular and probably little considered renewable called solar that: has a place on school roofs,

stadium roofs, hospitals etc; is on its way to being a cost-effective renewable; and is supported by planners and a public that has been perhaps less keen on other forms of renewables."

Shorrock added that such schemes create distributed embedded generation, which will strengthen the country's underlying grid infrastructure and ultimately reduce the cost of power.

"The other part of the story," he said, is "investor confidence". For many investors such as pension funds solar represents the first toe in the water in investing in renewables. "I don't think the government has understood this at all. We can stand on the shoulders of the Germans and the Spanish, who have driven the costs out and create a renewable [market] here that county council pension funds and insurance groups would find attractive if they are making their first still nervous steps into renewable energy," he said.

Yet not all would agree with Shorrock, and arguably the government is being prudent in acting early.

Warning of the potentially massive

long-term cost consequences, M&C Energy Group's energy analyst David Hunter said: "Germany has had them for a decade and has successfully increased the share of power production coming from wind and solar power, however its energy prices are among the highest in the EU and Angela Merkel is now concerned about energy costs and business competitiveness.

"Spain made their 'feed-in' tariffs so generous for solar that the government have had to renege on the price guarantees. The implied subsidy – paid for indirectly by every customer – is many multiples of the wholesale market price. When 19 000 are taking advantage as in the UK, no problem, but as Germany shows, the costs can really add up. Germany expects to have spent €46 billion in solar subsidies alone by 2030 – and the cost of feed-in tariffs there are expected to rise by 72 per cent in 2011 alone."

"There is a limited pool of cash... As a result, feed-in tariffs must be protected from large-scale solar farms wrongly taking advantage of the generous scheme."

The company said the government has to be extremely careful when agreeing tariffs, especially since once agreed, they are guaranteed and index-linked for 25 years.

"The government will have to be careful to strike the right balance – be generous enough to encourage homes and small businesses to take part, but not too generous so that it results in even higher, uncompetitive energy prices," cautioned Hunter.

Indeed, if not handled carefully, it may have wider ramifications for the entire UK renewables industry.

If the consultation starts immediately and takes 12 weeks for due consideration, it is possible that a change in legislation could take place as early as July this year.

A point made by Shorrock that should be seriously considered is the impact such an early review might have on potential investment in other renewables.

He argued: "If you [the government] pay a bit more in the first window you take it off in the second window by reducing the tariff. But you don't create change halfway through. I had an unprompted response from an investor

who asked: 'when are they going to play with wind next?' Seeing what the government did with biomass – basically kill an industry overnight – my message back to government is don't mess."

But not all disagree with the early review of solar. Kevin Parslow, CEO of Evance Wind said: "There is a limited pool of cash with just £400 m being ring-fenced for the scheme. As a result, feed-in tariffs must be protected from large-scale solar farms wrongly taking advantage of the generous scheme. Otherwise those that should benefit from this scheme, for example individuals, land owners, small businesses and schools, will be left by the wayside as the finite incentive is utilised by investment funds and corporations. April 2012 will still allow a sizeable number of new solar farms to be commissioned."

If there is a finite pool of money, one way of making it stretch further while maintaining certainty is to reduce the level of tariffs, something which the government is considering. This, however, is something that does concern Parslow.

He said: "The scheme is such a great catalyst for renewable energy investment, that reducing the potential return could have a real detrimental effect on the UK meeting its renewable energy target as well as affecting UK jobs."

Commenting on the overall decision, however, he said: "We welcome the announcement that Chris Huhne is now going to look into the issue of solar farms rapidly consuming feed-in tariffs. As well as the issue surrounding industrial abuse of feed-in tariffs, there is a general misapprehension that solar panels are the only option for homeowners to benefit from feed-in tariffs. We're not the sunniest European country, but we're definitely one of the windiest. Small wind turbines give people throughout the UK, not just the sunny southwest, the ability to make the most out of feed-in tariffs."

So while the wind chasers maybe relatively sanguine – for now – I get the feeling that the solar community would like to tell the government to stick its review in a place 'where the sun don't shine'. Considering the UK weather, some would argue that is exactly what the government plans to do.

