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EU has clear energy vision but international leaders dither


Denmark's Prime Minister Helle Thorning-Schmidt, announced a new energy agreement

The EU is making positive steps towards adopting a strategy and setting binding targets for achieving its decarbonisation goals. But the slow pace of progress at the international level is undermining its efforts. **Junior Isles**

The EU moved closer to setting its energy path towards 2050 last month as the Council "accepted" that renewables, efficiency and infrastructure – the three elements put forward in the Energy Roadmap 2050 – are the "platform for discussion".

In the Roadmap, renewables, efficiency and infrastructure are identified as the three common elements across different "decarbonisation scenarios", that need to be promoted in all cases.

Josche Muth, Secretary General of the European Renewable Energy Council (EREC) commented: "It is now high time to endorse a post-2020 renewable energy target. Binding targets have proven to provide the necessary long-term predictability needed to attract large amounts of private capital investments into a sustainable energy future."

The EU's efforts, however, will continue to be undermined by the lack of progress on the international stage.

Speaking at a recent WWF press conference, Denmark Energy and Climate Minister Martin Lidegaard said: "If you look at the international climate negotiations, it can get extremely frustrating. We have to achieve the 2º target and things are moving quite slowly."

Denmark recently announced a new energy agreement, which outlines the framework for the Danish climate and energy policy until 2020 and the direction until 2050. It says CO_2 emissions in 2020 will be 34 per cent less than they were in 1990. Energy consumption will decrease by 12 per cent in 2020 compared to 2006. Around 35 per cent of the country's energy will come from renewable sources and almost 50 per cent of electricity will come from wind.

Oettinger said that next month (June) the European Commission would start an open debate about binding targets for 2030. "Should we develop a new binding target for renewables in general and/or for the power sector? We have a target for CO_2 emission reduction, a target for efficiency and targets for renewables – which of these targets should be developed on an ambitious higher level for the next decade?"

Meanwhile, environmental representatives from the world's largest economies gathered in Rome, Italy last month for talks on clean energy and climate change.

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Emerging markets drive global wind power growth

The global wind industry will install more than 46 GW of new wind energy capacity in 2012, according to a five-year industry forecast published by the Global Wind Energy Council (GWEC). By the end of 2016, total global wind power capacity will be just under 500 GW, with an annual market in that year of about 60 GW.

Overall, GWEC projects average annual market growth rates of about 8 per cent for the next five years, but with a strong 2012 and a substantial dip in 2013. Total installations for the 2012-2016 period are expected to reach 255 GW, with cumulative market growth averaging just under 16 per cent.

Steve Sawyer, GWEC Secretary General said: "For the next five years, annual market growth will be driven primarily by India and Brazil, with significant contributions from new markets in Latin America, Africa and Asia."

For the second year running, the majority of new installations were outside the OECD, a trend that GWEC says will no doubt continue.

Asia will continue to be the world's largest market with far more new installations than any other region, installing 118 GW between now and 2016, and surpassing Europe as the world leader in cumulative installed capacity sometime during 2013, ending the period with about 200 GW in total.

After nearly a decade of double and triple digit growth, the Chinese market has finally stabilised, and will remain roughly at current levels for the next few years. In 2011 it connected some 17.6 GW of wind capacity to the grid representing 43 per cent of the global market.

Having achieved a 3 GW market for the first time in 2011, under its new Five Year Plan (2012-2017) India aims to add 3 GW each year. It is expected that this annual target will likely be surpassed in 2015, when wind installations are expected to reach 5 GW per year.

The GWEC forecast says Europe remains stable and there are unlikely to be many major surprises. Germany had strong growth last year, and the decision to phase nuclear power gives the industry a new boost. Spain had a disappointing 2011, and 2012 is likely to be worse, but Romania, Poland, Turkey and Sweden have taken up the slack, the report notes.

GWEC expects the North America market to have a strong 2012, as both Canada and Mexico will install well over 1000 MW to complement what is expected to be a strong year in the US, which began the year with more than 8 GW under construction.

However, a substantial drop is expected in 2013 in the US with the failure to extend the federal Production Tax Credit.

Overall, just over 50 GW is expected to be installed in North America from 2012-2016, bringing total installed capacity to just over 100 GW at the end of the period.

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The 14th meeting of the Major Economies Forum on Clean Energy and Climate, co-hosted by the United States and Italy, was the first full-scale international gathering since the conclusion of the talks in Durban, South Africa in December last year.

Delegates said they are at a starting point in the work to be done before the year-end Conference of the Parties meeting in Doha.

While there were no dramatic conclusions to emerge from the discussions, delegates said the talks were essential as a way for leading players in the international climate change process to stake out priorities and positions.

"There is nothing dramatic about these meetings, but they are absolutely essential because they lay the groundwork for what will happen in the coming months," said Alf Wills, a negotiator for South Africa, which still holds the presidency of the United Nations-led process.

Oettinger: European Commission to start open debate on 2030 targets

"Often times, this is where key progress is made."

The Forum will meet twice more this year ahead of the summit in Doha. Yet with ministers scheduled for yet another round of talks at the Rio +20 Summit next month, some are becoming cynical of endless ministerial talks with little outcome.

Steven Sawyer, Secretary General of the Global Wind Energy Council told reporters in Copenhagen: "They passed a resolution saying universal energy access by 2030. How is that different from what they have said at all these other UN meetings? I cannot see anything concrete coming out of this current process for Rio +20 – except for grim reminders of what we haven't done for the last 20 years. I hope I'm wrong. [But] climate is pretty much off the agenda."

With regards to the prospect of a legally binding target, he noted: "The US will agree to anything as long as there are no numbers i.e. nothing that actually means anything, or nothing that actually binds them to do anything. As long as it remains at a level of generality, they are happy to agree; and I think a number of other governments are in a similar position."

At the Clean Energy Ministerial (CEM) meeting in London late last month, the International Energy Agency warned that failure to curb the world's addiction to fossil fuels would result in energy use and greenhouse gas emissions rising by one third by 2020 and almost doubling by 2050.

The IEA said in a report prepared for the CEM meeting that progress was being made on renewable energy but that most clean energy technologies were not being deployed quickly enough.

US fracking rules may guide rest of world

The issuing of standards in the US to reduce harmful air pollution could provide guidance on regulating the production of shale gas globally before the industry really takes off. **Junior Isles**

In response to a court deadline, the US Environmental Protection Agency (EPA) has finalised standards to reduce harmful air pollution associated with oil and natural gas production. With many countries around the world hoping to emulate the US success in shale gas production, the standards may provide guidance on the contentious process known as hydraulic fracturing, or 'fracking', before the potential environmental problems associated with the process become too widespread.

When natural gas is produced, some of the gas escapes the well and may not be captured by the producing company. These gases can pollute the air and as a result threaten public health. Consistent with states that have already put in place similar requirements, the updated EPA standards released last month include the first federal air rules for natural gas wells that are hydraulically fractured.

Going into effect in mid-June, the rules cover the period when a well is first drilled when natural gas is still venting but before it begins actual production. In a compromise with the industry, regulators said drillers could flare the gas for now but from 2015 they would have to collect it – so-called green completion of new fracking wells.

Peter Kiernan, energy analyst at the Economist Intelligence Unit commented: "The announcement by the EPA reflects that regulations at a federal level in the US are catching up to the development of shale gas; not far enough for environmental groups and perhaps too intrusively for the oil and gas sector."

He added: "The implications for the UK and other countries in Europe considering shale gas development is that greater environmental scrutiny in the US can provide a way forward for regulatory oversight elsewhere: before the industry takes off."

Experts argue that in Europe any development of shale gas is not likely to progress at the same rate as the US, and national regulations are more likely to set the pace of extraction of shale gas using the fracking method.

It is currently banned in France and Bulgaria, and where drilling has occurred, such as in Poland, the results have been disappointing.

Furthermore, in Poland, recent resource estimates of shale gas have been downgraded.

Fracking came under the spotlight in the UK last month after the Department of Energy and Climate Change (DECC) published its report into the earthquakes that occurred across Lancashire in April and May 2011.

It concluded that they were caused by fracking. The report, however, concluded that the "probability of damage is extremely small" in future.

DECC gave the go ahead for fracking to continue, after a public consultation, and recommended steps to mitigate the impact of shale gas drilling.

Elizabeth Shepherd, partner and shale gas expert at international law firm Eversheds, commented: "The report published by DECC certainly seems to give the green light to shale gas exploration in the UK going forward. In many respects it is a victory for common sense, as without further exploration, carried out on a carefully managed and monitored basis, it is impossible to properly assess the scale of opportunity offered by shale gas in the UK."

However, Joss Garman, Greenpeace's senior energy campaigner, said the decision would be very damaging for UK efforts to tackle climate change. "Scientific studies suggest that this kind of gas could be as polluting as coal," he said.

The US shale gas boom pushed gas prices in April below $2 per million Btu for the first time in a decade as new supplies overwhelm consumption.

Energy chiefs may face UK nuclear committee

Nuclear concerns: Hendry is part of government and industry discussions

- Centrica threatens withdrawal
- No purchaser for Horizon

Executives from several major energy companies may be called before a UK parliamentary committee amid concerns that the UK's planned nuclear programme is under threat.

The committee was scheduled to meet at the end of April and the executives, along with Charles Hendry, the UK energy minister, were expected to be called to give evidence following the meeting.

The alarm bells are ringing within the UK government following last month's announcement that Centrica, the only British company in the running to build a new generation of nuclear power plants, is threatening to pull out.

Executives at Centrica, which is planning to build a new nuclear power plant at Hinkley Point in Somerset in a joint venture with EDF Energy, warned the government that the plan hangs by a thread and could be scrapped if the company does not receive assurances about the future price of nuclear-generated electricity.

Tim Yeo, chairman of the select committee, said Centrica's withdrawal would be a "hammer blow to the future of nuclear", given that it is one of the few companies with a big enough balance sheet to sustain an investment with little short-term reward.

"If they are considering pulling out I would regard it as very alarming indeed," he said.

In March German utilities RWE and E.On AG announced they were selling their Horizon joint venture set up to build new nuclear reactors.

They cited project finance worries during the economic downturn and the loss of revenues following Germany's accelerated shutdown of its nuclear plants.

Yeo said it was ominous that no purchaser had come forward to purchase Horizon.

EU to bring forward proposal for ETS fix

In response to weak carbon prices, the European Commission aims to bring forward a proposal for agreement by member states by the end of the year to tackle the oversupply of carbon allowances in the EU Emissions Trading System (ETS),

At an informal debate by EU environment ministers on the future of the EU ETS in Horsens, Denmark, there was reportedly a consensus that policymakers must take action to shore up carbon prices.

Following the debate EU climate commissioner Connie Hedegaard told reporters she has asked her climate department to bring forward the first annual report of the EU ETS, originally envisaged for 2013 by the law, to this year.

She wants it to include a "review of the auction time profile", which could in practice equate to a set-aside, or the temporary removal, of a number of allowances from the auctioning pool.

A statement from Rémi Gruet, Senior Regulatory Affairs Advisor for the European Wind Energy Association (EWEA) said: "The EU ministers need to ensure no more emissions allowances are put on the market. This must be included in the Energy Efficiency Directive, currently being negotiated between the Council of Ministers and the European Parliament, where decisions can be taken by a majority of member states. This directive is the only upcoming legislative opportunity to push such a measure."

Many in the market, including the International Emission Trading Association (IETA), believe more than a one-off set-aside is necessary to fix the EU ETS.

Nevertheless, carbon prices rebounded following Hedegaard's announcement, climbing from less than €7.10/tonne of CO_2 to above €7.40. At the beginning of April, the price hit a record low of €6.14/tonne.

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King coal edged out

US President Barack Obama's Administration is accused of "preventing the US from taking advantage of its vast domestic resources"

New EPA proposals will edge coal out of the generating mix.

Siân Crampsie

The US coal industry says that the Obama Administration's first proposal to control greenhouse gas emissions from power plants will push coal out of the generating mix.

The country's Environmental Protection Agency (EPA) has proposed new standards for all new power plants that would limit their emissions of greenhouse gases (GHGs) to 1000 lbs (454 kg) per MWh of electricity produced.

Efficient combined cycle gas fired power plants can already achieve these limits, but new coal plant cannot unless they were equipped with carbon capture technology.

Pro-coal groups said the proposed rule would have a negative impact on the country's economy. "This is another, in a series of new regulations, written by EPA to prevent the US from taking advantage of our vast coal resources that are responsible for providing affordable electricity for America's families and businesses," said Steve Miller, President and CEO of the American Coalition for Clean Coal Electricity.

He added: "This latest rule will make it impossible to build any new coal fuelled power plants, and could cause the premature closure of many more coal fuelled power plants operating today.

"So far, other EPA regulations are responsible for the announced closure of more than 140 electricity generating units in 19 states. The regulation EPA proposed today could raise the number of closures even higher."

The EPA argues that the new rules include flexibility for new coal plants by giving them the option of meeting the new standard based on an average of emissions over a 30-year period, rather than requiring that they meet the standard immediately. They would also exempt new plants that are permitted and under construction within the next 12 months.

The agency has been working on developing the rules since it determined in 2009 that carbon dioxide was a pollutant and should be regulated under the Clean Air Act.

According to the EPA, coal fired power plants account for around one-third of the country's greenhouse gas emissions. The new rules will have little impact on emission levels from the power sector but are likely to prevent an increase in emissions from coal fired generation plant.

Environmental groups are broadly supportive of the policy but have called for more action on emissions from existing coal fired power plants.

"This Environmental Protection Agency action means any new coal plants built in America must use modern, state-of-the-art carbon pollution controls," said Frances Beinecke, president of the Natural Resources Defense Council. "The logical next step is to improve the aging fleet of existing coal fired power plants, which remain the major source of industrial carbon pollution in our country."

They are also likely to lead to a greater dependence on natural gas. Alstom Power said in March that low natural gas prices in the US, coupled with slow progress on new nuclear build, would lead to a rush for new gas fired power plant installations.

Natural gas prices in the USA have continued to decline amid a boom in shale gas exploration. An April report from Moody's said that the historic lows could create a permanent change across the energy sector with generators reluctant to build anything other than gas fired power plants for the next decade.

"Even if utilities and unregulated power companies built 80 000 MW of new natural gas combined cycle generation to replace coal and nuclear retirements and support renewable energy, the natural gas surplus would only drop by half," said the Moody's report.

Canadian wind sector hot right now

Canada has emerged as a very competitive destination for wind energy investment and is set for a record year in 2012, according to forecasts from the Canadian Wind Energy Association (CanWEA).

The association has forecast that around 1500 MW of new wind capacity will be added in 2012, following on from a record year in 2011, which saw installations of 1267 MW and investments of C$3.1 billion.

Ontario is a particular hotspot for wind investment, largely because of the Green Energy Act, says GE. "For GE it's a remarkable story. In seven years we have grown from our first 100 MW Erie Shores Wind farm project to supplying over a thousand megawatts of clean energy to residents and businesses across Ontario by 2015," said Simon Olivier, general manager of renewable energy sales for GE Canada. "Ontario is a very hot wind market for GE right now."

GE recently announced that it has been selected to provide the wind turbines for nine new projects in Ontario with a total capacity of 650 MW. These include the Longyuan Canada Renewables 100 MW Dufferin wind farm, and six wind projects with a total power generating capacity of 460 MW being developed by NextEra Energy Resources.

Rurelec expands in Peru

Independent power producer Rurelec has made further progress towards replacing the 538 MW of generating capacity that was expropriated by the Bolivian government in 2010.

The UK-based firm, which specialises in developing and operating power projects in Latin America, has agreed to purchase a 255 MW hydropower development project in Peru through its 50 per cent-owned subsidiary, Cascade.

The $600 million run-of-river project is expected to enter operations in 2017. "Santa Rita is a large and long term development project for Cascade and we look forward to playing an active role in its development," said Peter Earl, CEO of Rurelec, who also said that Peru has "a well-developed and investor-friendly electricity sector".

Rurelec has also made investments in Chile, where rising economic output is driving electricity demand growth and attracting major energy sector investors.

In April, Chilean power generator Empresa Nacional de Electricidad SA announced plans to invest $11 billion in 17 energy projects by 2020.

The plans would see the company doubling its installed generating capacity to nearly 12 GW and include construction of the 2750 HidroAysen hydropower project.

Spanish firm Ingenostrum is also planning to build six solar power plants in Chile with a total generating capacity of 688 MW.

Rurelec also owns generating capacity in Argentina. In 2010 it started arbitration proceedings against the government of Bolivia in order to receive compensation for the loss of its 50 per cent stake in Empresa Guaracachi SA.

Blythe project in doubt

- Q-Cells, Solar Trust of America file for bankruptcy
- BrightSource withdraws IPO

The developer of a major US solar power project has filed for bankruptcy as pressures within the solar energy market continue to impact players.

Solar Trust of America is the latest solar energy firm to go-under in the face of intense market competition and falling solar panel prices.

German photovoltaic (PV) cell manufacturer Q-Cells also instigated insolvency proceedings in April, while First Solar announced plans to reduce its workforce by 30 per cent and cut production at its Frankfurt manufacturing facility.

Solar Trust of America is developing the 1000 MW Blythe solar power project in California. It had been awarded a $2.1 million loan guarantee by the US Department of Energy (DOE) but did not receive any of the funds.

The project, which started life as a solar thermal project but was then converted to include PV technology to help reduce costs, could be revived if another company acquires Solar Trust's assets in the US bankruptcy courts.

The difficulties faced by solar energy companies are a reflection of subsidy cuts in Europe, falling natural gas prices in the USA and an oversupply of PV components in the market.

The shake-out is likely to continue into 2014, according to a report in *Environmental Finance* that quoted Photon Consulting.

Other indications of the difficult trading environment include the decision by BrightSource Energy to withdraw its initial public offering that had been scheduled for mid-April.

BrightSource was hoping to raise up to $182.5 million through the IPO but said in a statement that the "continued market and economic volatility" were not the right conditions. Although the firm specialises in solar thermal, rather than PV technology, reduced prices in the PV market have put it under pressure.

In documents filed with the US Securities and Exchange Commission (SEC), BrightSource said that it had "generated substantial net losses and negative operating cash flows" since its inception and expects to continue to do so for the foreseeable future as part of the development and construction of solar thermal energy projects using its systems.

"We depend heavily on federal, state and local government support for renewable energy sources, which is subject to change."

Other solar energy companies to have gone bankrupt include Solar Hybrid, Solar Trust's parent company Solar Millennium and Solon.

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Coal shortages threaten India economic growth

- Coal India commits to supply obligations
- Economic growth forecast at 6.9 per cent

A shortage of coal, the fuel used to generate more than half the electricity in India, is hampering the country's power expansion plans. The shortfall this fiscal year to March 31 is estimated at 114 million metric tonnes.

Under the current Five Year Plan (2012-2017) India is targeted to add 75.78 GW of generation capacity to its existing capacity of 193 GW. However, state-run NTPC Ltd., the largest utility, has cut its aim to add thermal generating capacity (coal and gas plant) for the next five years by 34 per cent to just 66 GW.

In a move to tackle the problem, the government asked state-run Coal India Ltd. to sign long-term supply contracts with operational and upcoming power projects. According to reports, Coal India Ltd approved the proposal in April but fixed itself a lower penalty if it fails to meet supply obligations.

Major Indian power producers have said they may seek the federal government's intervention to levy higher penalties on Coal India Ltd. if it fails to meet its supply obligations.

If the company fails to supply at least 80 per cent of the contracted coal to new power stations, it will pay 0.01 per cent of the value of the shortfall as a penalty, an executive told *Dow Jones Newswires*.

The government is concerned that any shortfall in supplies from Coal India will have wider ramifications for the economy as the company supplies more than 80 per cent of the nation's coal. Last month the government also moved to secure additional gas supplies from Qatar.

India's economic growth in the current fiscal year to March 31 is estimated at 6.9 per cent. New Delhi expects the expansion to pick up pace next year with the economy growing at 7.6 per cent, and accelerating to about 9.0 per cent in a few years.

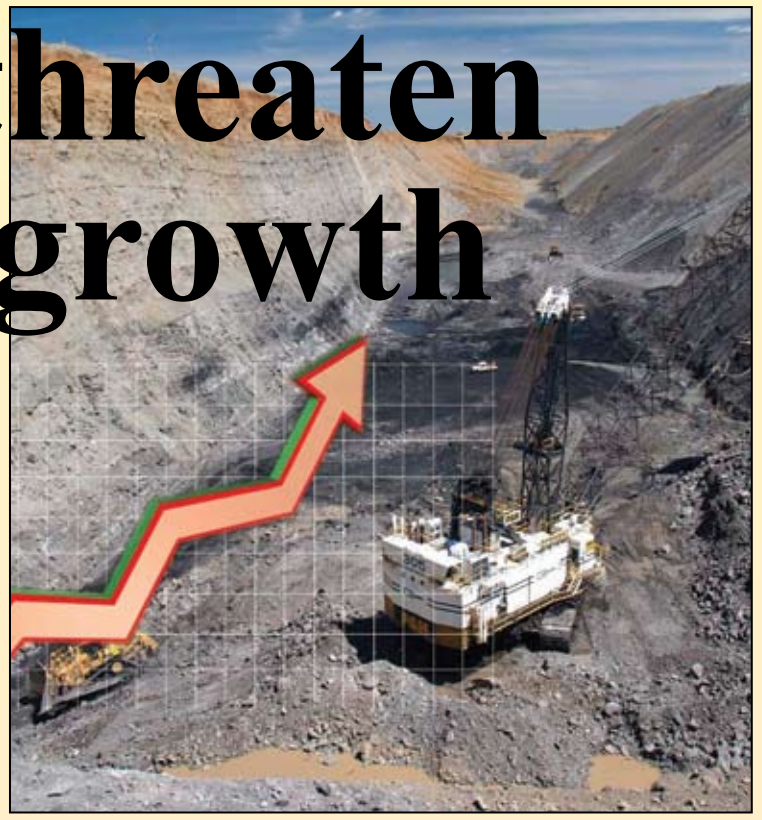
"The Indian economy will grow at a fast pace and so will the power sector," said Arvinder Singh Bakshi, chairman of the Central Electricity Authority, a power sector monitoring body.

India expects its power sector to attract INR13 trillion (about $255 billion) of investments in the next five years, nearly a third more than in the past five years, driven by demand for electricity from its expanding economy.

However, uncertainty over fuel supplies is discouraging lenders to put their money on new coal-based projects.

The investment outlook is more positive for the renewable sector. The country plans to add 20 GW of solar by 2022 and recently began operating Asia's largest solar power field in Gujarat. The Gujarat Solar Park, spread across a 1200-hectare desert, can supply 214 MW of electricity.

The country has also targeted for 3 GW of wind capacity to come on stream annually under the current Five Year Plan.



With a decline in European markets, many renewable energy producers are looking to India as an investment hub. CLP Power India, a wholly-owned subsidiary of Hong Kong-based CLP Holdings Ltd, plans to invest around Rs1800 crore ($343 million) in India to add over 200 MW capacity in wind energy in the fiscal year 2012-13.

Solar and wind projects do not face the same obstacles as the country's hydro projects. The government was recently forced to slash its target for increased hydropower generating capacity over the next five years due to delays in environmental approvals and difficulties over land acquisitions and water rights.

Vietnam part of Korea expansion

- SK Holdings tie-up with PetroVietnam
- Kepco to discuss more UAE reactors

South Korean firm SK Holdings has signed a memorandum of understanding allowing it to take part in Petro Vietnam's energy projects.

SK Holdings is to participate in projects to develop coal fired power plants as well as oil exploration and production, and oil processing, PetroVietnam said in a statement.

PetroVietnam Construction Corp., a unit of PetroVietnam, also signed an agreement with a consortium of South Korea's Daelim Industrial and Japan's Sojitz Corp. to arrange funds and supply equipment for the construction of the coal fired Thai Binh 2 power plant in Vietnam, PetroVietnam said.

South Korea has stepped up its efforts in promoting its power generation technology and expertise to the international market.

At the beginning of April, Korea Electric Power Corp. (Kepco) said it would invest Won2 trillion ($1.8 billion) this year in overseas businesses and resources, and hold detailed discussions next year with the United Arab Emirates about building four more nuclear reactors there.

Kepco is keen to build on its success after it headed a consortium that won a $20.4 billion contract in 2009 to build four reactors in the UAE.

Kim: Kepco is keen to build on success

Kepco's President and Chief Executive Kim Joong-kyum said the company aims to have overseas sales account for 50 per cent of total sales by 2025, compared with around 3.9 per cent last year and an expected 7 per cent this year.

Given the timeline of its current nuclear project, Kepco would have to sign the deal for the next four reactors by the end of next year to complete the fifth reactor by 2021, Kim told reporters.

The company expects its first nuclear power plant in the UAE to be built by 2017, and the remaining three to be completed by 2020.

Kim also cited Turkey, Vietnam, South Africa, Kazakhstan and India as possible locations for nuclear power projects, though he said it would be "difficult" for the company to meet its target of signing contracts to develop two reactors this year.

ASEAN to share nuclear safety knowledge

Leaders of the Association of Southeast Asian Nations (ASEAN) plan to set up an information-sharing network among nuclear agencies in the region to boost cooperation in nuclear safety and security.

With many ASEAN countries planning to develop nuclear energy, the Fukushima nuclear crisis raised awareness about the need to harmonise nuclear safety standards so as to minimise and avert the risk of trans-boundary effects of nuclear accidents.

A statement drafted by leaders of the 10 ASEAN countries said they have agreed to "develop a network amongst nuclear regulatory bodies in Southeast Asia which would enable regulators to exchange nuclear-related information and experiences on best practices, enhance cooperation and develop capacities on nuclear safety, security and safeguards".

Nuclear safety is a term generally used to refer to the safe operation of nuclear power plants, nuclear security is aimed at preventing the proliferation of weapons of mass destruction, while nuclear safeguards are meant to ensure the accountancy of nuclear materials.

Thailand had proposed the idea of establishing a network amongst nuclear regulatory bodies last year so that they can boost regulatory capacity through training and sharing of best practices, exchange information on nuclear activities to promote transparency, and to forge cooperation in nuclear emergency preparedness, and radiation monitoring in the region.

ASEAN's members are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam.

Thailand makes renewable investments

Wind Energy Holding Co (WEH), Thailand's first private wind turbine operator, is proceeding with plans to invest Baht40 billion ($1.3 billion) in seven wind turbine farms over the next four years.

Board chairman Noppon Suppipat said the company is now developing the first three projects – Huay Bong 2 and 3 in Nakhon Ratchasima and Watabak in Chaiyaphum. The three projects, worth Baht13 billion, have a combined capacity of 276 MW.

Construction of Huay Bong 2 and 3 started this year and the two wind farms are scheduled to begin operating in February and October next year, respectively. The company is looking for strategic partners for Watabak, which it expects to develop next year.

Mr Noppon said that the remaining four licences will be developed from 2014 to 2016, with a total capacity at 340 MW. They comprise Korat 2/1, 2/2, 2/3 and North Krissana with total investment of Baht26 billion.

Thailand's increasing focus on renewables saw South Korean firm Daelim ENT Co. announce plans last month to invest at least $1.8 billion in waste-to-energy projects in Phetchaburi and Chanthaburi. It has already received approval for a 10 MW in Phetchaburi.

TeaM Energy, Aboitiz tie-up

TeaM Energy Philippines, a joint venture between Japanese firms Tokyo Electric Power Co. and Marubeni Corp., has partnered with the Aboitiz Group to expand a coal fired power plant in Quezon province at a cost of $600-$700 million.

The third Pagbilao power plant will increase the available electricity in the Luzon grid by 400 MW in 2015, a top executive said.

"We are now preparing for the project. We agreed to have a 50-50 joint venture with Aboitiz," said TeaM Energy president and chief executive Federico E. Puno.

"Our target is to finish everything (documents) this year, [start] groundbreaking in the first quarter next year, and have the plant completed by December 2015," he said.

The project cost will be funded with cash generated from TeaM Energy's 735 MW Pagbilao coal plant and its 1200 MW Sual coal plant in Pangasinan, Puno said.

Puno said the new power plant is designed to burn low-quality coal from Indonesia.

Japan outlines 2050 emission targets

Mega-solar plans: the city of Kagoshima in the south of Japan

Japan is adopting a new basic environment plan specifying a target cut in Japan's greenhouse gas emissions of 80 per cent from 1990 by 2050. The plan was recommended by an Environment Ministry advisory panel.

Discussions on the plan at the Central Environment Council (CEC) have focused on whether to specify the target amid concern that emissions will increase with the expansion of thermal power generation following the shut down of nuclear plants in the wake of the Fukushima accident.

To reduce greenhouse gas emissions, the fourth basic environment plan says Japan should develop air-conditioning systems using geothermal energy and environment-friendly vehicles while promoting appropriate forest and farming land management and urban greening projects to secure sinks for absorbing emissions.

Notably, the new plan says Northeastern Japan should take advantage of its rich natural energy resources to expand geothermal, wind, solar and other renewable energy-based power generation.

A panel under the Environment Ministry stated in a draft report, it is possible for Japan to reduce its greenhouse gas emissions by 25 per cent by 2030 from 1990 levels without relying on nuclear power. The panel also said this could go up to 33 per cent if nuclear power accounts for 20 per cent of domestic power supply in 2030.

The projections made by the panel under the ministry's CEC contrast with those approved earlier by the industry ministry's Advisory Committee for Natural Resources and Energy, which calculates carbon dioxide emission reductions of just 16 per cent in 2030 if idled nuclear reactors remain offline.

Japan has pledged internationally to reduce greenhouse gas emissions by 25 per cent in 2020 from 1990 levels, a target some critics say is now difficult to attain in light of the disaster at Fukushima. The CEC's draft does not include calculations for 2020.

The government's Energy and Environment Council is expected to draw up a final strategy by this summer based on these calculations.

The draft was based on calculations conducted by the National Institute for Environmental Studies under four scenarios with nuclear power accounting for between zero and 35 per cent of power supply.

Before the Fukushima nuclear disaster, Japan was planning to increase its reliance on nuclear power to meet its international pledge.

■ In mid-April, Japanese electronics giant Kyocera said it would build a 70 MW solar power plant in the southern city of Kagoshima. The project, to be undertaken with partners IHI Corp. and Mizuho Corporate Bank Ltd., will create a "mega-solar plant" to help solve Japan's power supply issues, Kyocera said.

Pakistan steps up efforts to boost supply

Prime Minister Yousuf Raza Gilani has directed the ministry of finance to immediately release Rs6 billion ($66 million) to the ministry of water and power for payment to electricity generation companies to boost power production in the country.

He also asked the ministry of petroleum and natural resources to take steps to provide more natural gas to power plants so that more electricity could be produced and load-shedding controlled.

Emphasising the need for coordination for early resolution of issues, the prime minister asked the energy committee of the cabinet to hold its meetings on a daily basis to solve the problems hindering the imple mentation of various government decisions.

He said that increased water flow in April would increase hydropower production and made different suggestions on how to improve the supply of gas to the power plants for increased power production.

Any suggestions on gas supply will be a boost to plans for new gas fired plants. Early last month the government said it planned to install a new 747 MW combined cycle power plant at Guddu in Sindh to help meet future power requirements.

According to a statement, the Ministry of Water and Power has asked the relevant departments to speed up efforts and complete the required formalities.

The plant will comprise two 243 MW gas turbines and two heat recovery steam generators driving a single 261 MW steam turbine, and associated equipment.

The new plant will be installed on the premises of the existing Guddu power plant complex in Kashmore district of Sindh.

The existing 1655 MW plant at the facility includes a 640 MW steam plant consisting of two 110 MW units and two 210 MW units, a 600 MW combined cycle plant and another 415 MW combined cycle plant.

The existing steam and combined cycle units can run both on gas and fuel oil. However, fuel oil is used only during interruptions in gas supply. There will be no additional gas required for the new 747 MW combined cycle plant and existing supply will be used for power production.

According to the statement, the environmental impact assessment of the new plant has been conducted in accordance with the stipulations of Pakistan's environmental laws and the environmental guidelines of the International Finance Corporation (IFC).

"The power plant will help the government in coping with increasing demand of electricity. It will enhance power supply to this area, make the supply more reliable and improve the quality of service. The project will also create employment opportunities," the statement said.

Governments plan to boost offshore wind sector

Several European governments are still pinning their hopes on offshore wind energy to help them meet green goals, but can the private sector stomach the investment?

Siân Crampsie

Governments are continuing to push the development of offshore wind technology in spite of continued economic uncertainty in Europe.

The UK and USA have signed an agreement to collaborate in the development of floating offshore wind turbines, while France last month announced the winning bids in a tender to build the country's first offshore wind farms.

Denmark also recently announced a new package of clean energy measures that will result in the development of 1500 MW of offshore wind capacity by 2020.

In the first of several bilateral agreements in the clean energy sector, the UK and USA have agreed to collaborate on floating offshore wind power technology because of the potential it has to open up new offshore areas to development.

Offshore waters with depths of 60-100 m are currently off limits to fixed wind turbine structures but have the benefit of consistently higher wind speeds. Floating turbine structures have the potential to be cheaper than current offshore wind technologies because they do not require foundations on the seabed and can be towed to shore for maintenance, said UK energy secretary Edward Davey.

The UK has the largest offshore wind energy capacity in the world, while the USA has yet to get its offshore sector up and running. However, the US Department of Energy's recent announcement of a $180 million offshore wind funding opportunity indicates its enthusiasm for developing the sector.

The news is a positive development for the UK's offshore sector, which has been rocked in recent weeks by the news that two major investors had either cancelled or put on hold plans for the construction of offshore wind turbine manufacturing facilities in the UK.

Doosan Power Systems, the UK-based subsidiary of Doosan Heavy Industries & Construction, has withdrawn plans for a manufacturing facility in Scotland because of Europe's liquidity issues.

GE in February also said that it was putting plans for a wind turbine factory in the UK on hold.

Investors remain concerned about Europe's current economic conditions – which make borrowing more difficult – as well as government policy towards renewables, and there is a perception that renewable energy investment is becoming more risky.

The UK is also in the process of finalising electricity market reforms and altering the level of support given to renewable energy under the renewable obligation (RO) scheme. These changes are giving rise to uncertainty as specific details on levels of support and market mechanisms have yet to be revealed.

GE says it will only make a final decision on the development of its wind energy manufacturing facility in the UK once details of the market reforms are finalised.

The company said in April that the development of its first direct-drive offshore wind turbine was on track after a successful trial run in Gothenburg harbour, Sweden.

The development of France's first four offshore wind farms will require investments of €7 billion. In April, the country's energy regulator awarded concessions for offshore development to two consortia led by EDF and Iberdrola.

A third consortium led by GDF Suez that placed bids for four of the five developments being tendered failed to win any.

The EDF consortium, known as Eolien Maritime France (EMF), has been awarded the rights to develop almost 1.5 GW of wind power capacity on the Fecamp and Courseulles-sur-Mer sites in the English Channel and the Saint-Nazaire site on the Atlantic coast. Iberdrola's consortium, known as Alas Marinas, will install 500 MW of capacity off the Brittany coast.

One further concession that was due to be awarded was deemed unsuccessful and will be included in a second tender round later this year.

The French government has set a target of developing 6000 MW of offshore wind capacity by 2020.

CCS contest attracts interest

The UK's re-start of its competition to fund the development of a commercial-scale carbon capture and storage (CCS) facility is already generating interest.

The £1 billion competition, launched alongside the publication of the UK's first CCS 'roadmap', has already attracted at least four consortia.

The CCS contest hopes to succeed where the last one failed – it is open to a broader range of technologies than the first competition and companies investing in CCS in the UK will also enjoy other support measures provided by a CCS 'package'.

"The potential rewards from Carbon Capture and Storage are immense: a technology that can decarbonise coal and gas-fired power stations and large industrial emitters, allowing them to play a crucial part in the UK's low carbon future," said Energy Secretary Edward Davey. "What we are looking to achieve, in partnership with industry, is a new world-leading CCS industry, rather than just simply projects in isolation."

2Co Energy says that it will participate in the scheme with its Don Valley project, while a consortium of Petrofac, Summit Power Group and National Grid will seek funding for a CCS project in Grangemouth, Scotland. Successful applicants will start operating their facilities between 2016 and 2020.

Alstom, Drax and BOC also say that they will bid for funds, as will Teesside Low Carbon, a consortium that includes BOC, International Power, National Grid, Fairfield Energy and Progressive Energy.

The competition is open to coal and gas-fired power plants using pre- or post-combustion capture technologies. The government's first competition – launched in 2007 – restricted entries to post-combustion carbon capture on coal fired power plants.

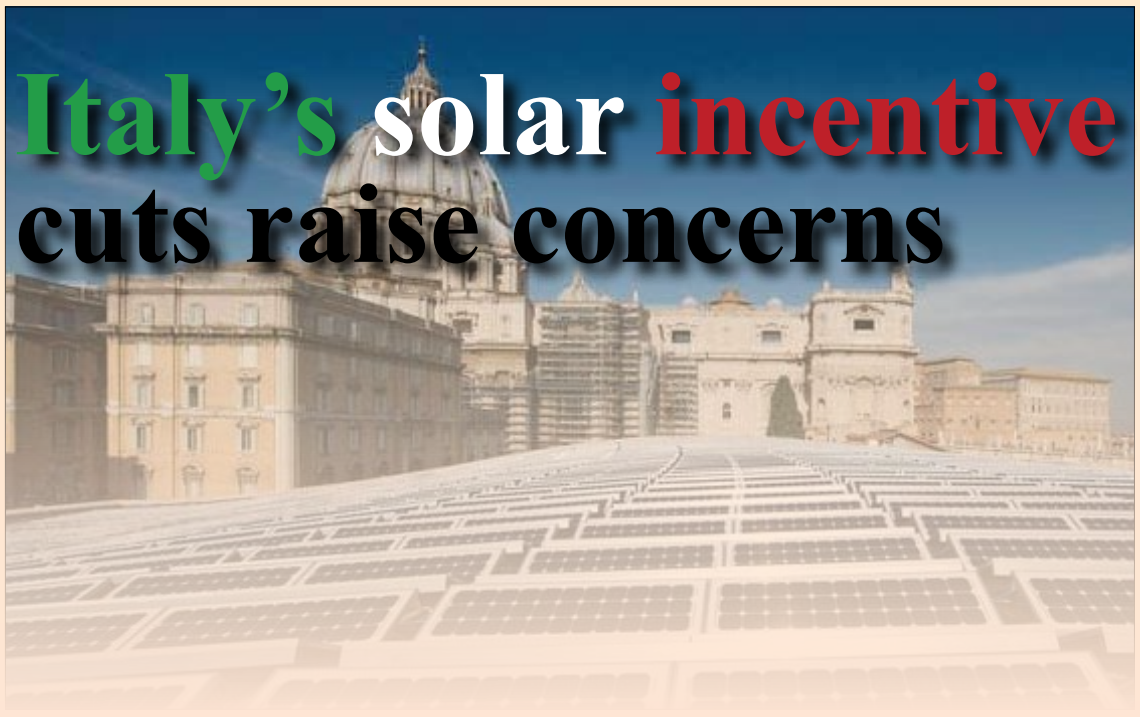
Although it initially attracted major energy companies, participants gradually withdrew leaving just Scottish Power. The utility failed to agree financial terms with the government and the competition collapsed.

"CCS has the potential to contribute significantly to our energy security, reduce carbon emissions, create jobs and become a major UK export for the future," said Rhian Kelly of business group the Confederation of British Industry. "If we are to gain any advantage from developing this important technology in the UK, the government cannot afford to waste this opportunity."

The government hopes that this time a raft of other measures – including £125 million of funding for research and development, including a new £13 million CCS research centre, a focus on international cooperation and support through the proposed electricity market reforms – will provide ongoing support for the industry as a whole.

Jeff Chapman, CEO of the Carbon Capture and Storage Association welcomed the new-look competition: "It creates an opportunity for the UK to take a leading role in world markets whilst cost-effectively reducing emissions, creating employment and generating prosperity."

Italy's solar incentive cuts raise concerns



Italy's decision to cut subsidies for renewable energy prompted protests in Rome last month from renewable industry and green groups concerned about the impacts of the move.

The protests came after the Italian Ministry of Industry said that it would reduce payments made under the Conto Energia incentive system in order to adjust levels of investment in the country's renewable energy industry.

The decision makes Italy the latest in a line of European countries to cut renewable energy subsidies, which have produced a boom in investment but also placed a burden on government finances.

Spain said in March that it would increase power prices for domestic consumers and small businesses to help reduce the tariff deficit – the shortfall between regulated power tariffs and generation costs. In January it halted all subsidies for new renewable energy projects.

Italy's generous renewables incentive scheme is designed to help the country reduce dependence on energy imports as well as reduce emissions but has resulted in a boom in both the wind and solar sectors. Changes to be made to the scheme include placing priority on residential and other small-scale schemes and an annual cap on solar sector incentives of €500 million/year.

Renewable energy plants below 5 MW in capacity will access incentives through an auction procedure, while larger schemes will have to enter a registry.

Some 9 GW of solar capacity was connected to the grid in Italy last year in spite of the recession, and installed renewable energy capacity in Italy now stands at around 41 GW.

But the boom has placed a burden on taxpayers in Italy.

Some estimates put the cost of the incentive scheme at $59 billion over the next 20 years.

In Spain the tariff deficit is the result of the country's generous renewable subsidy scheme and has set a target of reducing it to €1.5 billion this year.

In March the German Cabinet approved a plan to cut solar feed-in tariffs (FITs) by 20-30 per cent, while the UK government is also introducing cuts to solar FITs later this year.

GE, Siemens and Eletrobras see potential in Nigeria

- Deals to 'fix' power sector
- Eletrobras considers Mozambique dam

Siân Crampsie

Nigeria's government is tapping overseas expertise and investment in a bid to address the country's severe power shortages.

The government recently signed agreements with GE, Siemens and the Brazilian power firm Eletrobras in a move to boost power generating capacity and kick-start investment in the failing power sector.

Blackouts occur daily in Nigeria and little investment has been made in the power infrastructure there since the 1970s in spite of its oil wealth. Overcoming the problems in the power sector would help the country to achieve its economic potential and improve development.

GE has signed a memorandum of understanding that paves the way for GE to help Nigeria build new power plants by providing equipment and services. It could also take stakes of 10-15 per cent in individual projects.

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

Jonathan has also signed an agreement with Siemens to boost generating capacity, and Siemens has also announced plans to build a new service workshop in Nigeria for heavy duty gas turbines.

Siemens has also agreed to support Nigeria with a study on the integration of renewable energy, and in April signed a deal with Scanpower to build a 1600 MW gas turbine power plant in Lagos state.

Both GE and Siemens view Nigeria as one of the most important markets in Africa.

It has the world's seventh-largest reserves of natural gas but a lack of infrastructure has so far prevented the fuel from being used extensively in power generation. The government is also aiming to reform and privatise the power sector but concrete plans to sell state assets have been repeatedly delayed.

In a separate deal, Nigeria has signed a memorandum of understanding with Eletrobras paving the way for the Brazilian firm to build hydropower plants in the country. The deal is to be backed by a similar agreement between Brazilian development bank BNDES and Nigeria's Bank of Industry.

Eletrobras is also looking to other African countries to fulfil its expansion plans.

The Brazilian state-controlled power company is considering proposals to help Mozambique build a $6 billion hydropower plant and transmission lines in the north of the country.

According to local reports, Eletrobras could take a stake of up to 49 per cent in the 1500 MW project.

AfDB supports Kenya's geothermal growth


Amazing resource: Kenya is tapping into geothermal

The development of a key geothermal energy resource in Kenya has come a step closer with a commitment from the African Development Bank (AfDB) to support the project.

The AfDB and Kenya's Geothermal Development Company (GDC) have officially launched the Menengai geothermal project and say that up to 400 MW of capacity from the project will be operational by 2016.

The AfDB has approved a $125 million loan for the project as well as a $25 million grant under the Climate Investment Fund (CIF), a fund managed by the World Bank and aimed at supporting low-carbon projects.

The project is the first of its kind to be approved by a multilateral development bank under the CIF to a low income African country.

Silas Simiyu, GDC's managing director and CEO, said: "We are happy that the Bank found it fit to provide the necessary finances. The loans will be critical in affording Kenya an opportunity toward energy sustainability and independence."

Located in the African Rift system, the Menengai project is expected to set the stage for investments to help meet Kenya's rapidly increasing demand for power, and transform the country into a competitive clean energy economy. Kenya has targeted the development of at least 5000 MW of geothermal capacity by 2030, and says that 19 companies have already expressed an interest in developing the country's geothermal resources.

The 400 MW Menengai project is to be developed as a private-public partnership. The field is thought to have a total potential of 1600 MW, while Kenya's total geothermal capacity is estimated at 7000 MW.

"Kenya has been sitting on this amazing natural resource and today, at long last, the ingredients for tapping into it seem to be coming together," said AfDB regional director for East Africa Gabriel Negatu.

According to the GDC, which is a state-owned company responsible for developing Kenya's geothermal energy resources, a second phase of development for Menengai will result in a further 800 MW being developed by 2017.

Earlier this year GDC awarded Ormat a contract to build and operate the first well-head generator at the Menengai geothermal field. The plant will have an output of 5-10 MW and will be operational by August 2013

Turkey, China sign nuclear agreements

China has become a serious contender to build a new nuclear power plant in Turkey.

The two countries have signed two agreements covering cooperation in the nuclear energy sector and the peaceful use of energy, a move that paves the way for more detailed talks about how China could help Turkey to achieve its nuclear goals.

Turkey wants to develop two nuclear power plants – one at Akkuyu on the Mediterranean coast and a second at Sinop on the Black Sea. Akkuyu is being developed by Russian firm Rosatom while Turkey is seeking a partner for the second.

Chinese nuclear energy firms are keen to become global suppliers of nuclear energy technology and have the advantage of being able to finance projects overseas.

However, they have limited overseas experience and their technology is not as advanced as other global suppliers.

Last month Canada's Candu Energy signed an agreement with Turkey's energy ministry to undertake a study on building a new 3000 MW plant at Sinop.

Turkey initially tapped South Korean firm Kepco for a bid to build the Sinop plant but failed to reach an agreement because of Seoul's insistence on government guarantees.

Japan's Tepco also indicated an interest in the project, but withdrew after Fukushima.


Turkish Prime Minister Recep Tayyip Erdogan and his Chinese counterpart Wen Jiabao were in Beijing to sign agreement

Ukraine initials EU agreement


Ukrainian President Viktor Yanukovych: Kiev is ready to sign a far-reaching pact with the EU

Ukraine has enhanced its ties with the European Union by finalising negotiations on an Association Agreement aimed at establishing political association and economic integration between the two parties.

Ukraine is keen to cooperate more closely with the EU in order to enhance trade cooperation as well as improve energy security. It is planning to join the European Network of Transmission System Operators (ENTSO-E) and could also gain from cooperation with the EU in areas such as nuclear safety and technology research.

The Association Agreement will serve as the contractual basis for relations between the two. It comes just over a year after Ukraine acceded to the Energy Community, a move that requires it to make commitments concerning the restructuring and governance of its energy sector.

In March the EU Commissioner for Enlargement Štefan Füle met with the Energy Minister of Ukraine Yuriy Boyko. After the meeting Füle stated: "The overall goal of the Ukrainian government for closer integration with the EU cannot be achieved without transparency in the energy sphere."

"Meeting our energy commitments is very important to us and we should continue to work hard so that the opportunities foreseen by the Energy Community Treaty could be used to the full benefit of Ukraine," Commissioner Füle said.

He added that this was also essential for the country's future energy security and independence.

Around 70 per cent of Russian gas supplies destined for the EU pass through Ukraine's territory, making the country a strategic energy partner for the EU. Ukraine is also highly dependent on Russia for its own energy supplies and closer ties with the EU could give the country greater weight in its negotiations with Russia.

IP agrees GDF Suez takeover

Mestrallet: the acquisition is a major step in the development of the group

GDF Suez is targeting Latin America, Asia and the Middle East for growth opportunities.

Siân Crampsie

The takeover of International Power by GDF Suez will allow the French utility to take advantage of rapid growth in emerging markets.

GDF Suez recently reached an agreement with International Power to buy the 30 per cent stake in the firm that it does not already own.

The deal values UK-based International Power at £22.8 billion and the revised offer put forward by GDF Suez in mid-April illustrated its eagerness to take full control of the company.

GDF Suez bought 70 per cent of International power in early 2011 but the company wants to increase its exposure to the rapidly growing markets where International Power operates as Europe's power generation sector stagnates.

International Power's directors agreed to GDF Suez's cash offer of 419p/share, having rejected an earlier bid of 390 p/share. The deal is the second-largest M&A deal this year.

"The acquisition of the minority stake in International Power, based on a strict financial discipline, constitutes a major step in the development of the group. It will allow the group to fully capture growth in fast growing markets," GDF Suez's Chairman and Chief Executive Gerard Mestrallet said.

To help finance the deal and reduce the impact of the group's debt, GDF Suez increased its divestiture programme by selling an additional €3 billion of assets. It is unlikely to sell assets in its home markets of France and Belgium.

The company will also increase the proportion of its capital expenditure spent in emerging markets to 40-50 per cent, up from 30 per cent, as a result of the deal. GDF Suez now expects its net recurring profit group share for 2012 to be €3.7-4.2 billion, up from an initial objective of €3.5-4 billion.

GDF Suez says that the integration of International Power to its business since 2011 has strengthened its position in power generation. Its installed capacity now stands at 117.3 GW globally, just over half of which is outside Europe. It also has around 14.8 GW of new capacity under construction, 87 per cent of which is outside Europe.

International Power's pipeline of projects includes the 3750 MW Jirau hydropower plant in Brazil, the 564 MW gas fired plant in Peru, 1488 MW of gas fired capacity in Oman and a 2.9 GW portfolio of geothermal, natural gas and coal fired power plants in Indonesia, Pakistan and Thailand.

In Europe, GDF Suez is facing declining margins due to stagnant energy demand as a result of the recession as well as other challenges such as increased environmental regulations and political risk. It is 35 per cent owned by the French government and was reportedly keen to seal a deal with International Power before the French presidential elections in April.

In Belgium, the group is also awaiting a key political decision on nuclear energy policy before deciding on the future of its own nuclear strategy in the country.

GDF Suez owns and operates seven nuclear reactors in Belgium and is waiting to hear whether the Belgian government will allow their lifespans to be extended.

In France, Socialist presidential candidate Francois Hollande is planning to gradually reduce the country's dependence on nuclear energy, while incumbent president Nicolas Sarkozy is pro-nuclear. GDF Suez owns stakes in two French nuclear power plants and has proposed the construction of a third generation ATMEA1 reactor there.

Tata targets South African growth

India's Tata Power is aiming to expand its operation in Africa through a new joint venture with mining company Exxaro Resources.

The two companies have launched Cennergi Ltd with the aim of exploiting opportunities in southern Africa. The initial focus will be on the development of renewable energy projects in South Africa, Namibia and Botswana.

Cennergi's strategy will be to create a balanced portfolio of generation assets and will be based in South Africa. It will combine Tata's power market and renewable energy expertise with Exxaro's experience in southern Africa.

"Cennergi has been created by companies from developing nations to serve developing nations. We expect Cennergi to play a key role in the African electricity generation market," said Sipho Nkosi, Exxaro's chief executive officer.

Cennergi is likely to participate in renewable energy tenders being held in South Africa, which is diversifying its energy sources. At the EWEA wind energy conference in Copenhagen last month it was revealed that the country has the wind resources to generate 10 GW from wind and plans to add 400 MW/year of onshore wind during the next decade.

"Our intention is to become partners with Eskom and to actively contribute towards solving the energy challenges facing South Africa today," said Thomas Garner, Cennergi CEO. "With the Department of Energy's commitment to renewable energy, Eskom's drive to solving the country's energy challenges, the desire of South Africa's people and of our neighbours for access to electricity to power the development so urgently required on this continent, we have no doubt we will exceed our dreams."

"Cennergi aims to be the leading cleaner energy independent power producer (IPP) in Southern Africa, serving an expanding energy market," added Nkosi.

"The company's diverse project portfolio confirms its commitment to both people and planet. Through Cennergi we will be powering progress in the areas in which we operate. This partnership with Tata Power will add the skills and capabilities necessary to create a world class energy company in this region with enormous growth opportunities."

Battery JV is energy storage stepping-stone

Hyundai Heavy Industries (HHI) is hoping that the creation of a successful battery business for the electric vehicle market will provide it with a stepping-stone to the energy storage market.

The Korean firm has established a joint venture company with Magna E-Car to co-develop and grow a battery cell and battery-pack business aimed at the electric and hybrid-electric vehicle market.

The joint venture will be known as Mahy E-Cell and will conduct engineering, design, development and testing activities on lithium-ion battery technology. HHI wants to use the technology in the energy storage market and link it with its renewable energy products.

"The establishment of Mahy E-Cell is a reflection of Hyundai Heavy's determination to become a leading eco-friendly integrated energy company by advancing into Europe and North America's electric car batteries market and energy storage systems business," said Lee Choong-dong, COO of HHI's Green Energy Division. "We see solar energy, wind power and energy storage systems as integral to our future growth."

Short-term chief restructures Westinghouse

- Ferland leaves post after three days
- New agreement for SMR development

Westinghouse Electric Company says that the restructuring of its nuclear power plant business will strengthen the company and better position it for growth.

Westinghouse announced plans to create two distinct segments in its nuclear plant business: nuclear power plant project delivery and nuclear power plant business development.

"These changes will enhance our ability to meet the unique needs of our existing new plant customers and to focus on new approaches in developing new plant opportunities globally," said Westinghouse's former president and CEO Jim Ferland, who held his position at the firm for only a few days last month before resigning suddenly. "While both organisations have distinct roles, they will be closely aligned to ensure the overall success of the AP1000 programme."

Westinghouse is building four new AP1000 plants in China and a further four in the USA. It is also pursuing new build opportunities in Europe as well as plans to commercialise small modular reactor (SMR) technology.

The nuclear power plant project delivery segment will focus exclusively on delivering new plant projects to Westinghouse customers while the nuclear power plant business development organisation will aim to capture new plant opportunities worldwide.

In April, Westinghouse announced an agreement with Ameren Missouri to participate jointly in a US Department of Energy (DOE) funding opportunity announcement for the development and licensing of SMR technology.

The Westinghouse SMR is a 225 MWe integral pressurised water reactor (PWR), with all primary components located inside of the reactor vessel. It utilises passive safety systems and proven components, as well as modular construction techniques that are already licensed in the AP1000 reactor.

Westinghouse and Ameren Missouri will jointly apply for DOE support and then seek design certification of the technology as well as a combined construction and operating license from US nuclear regulatory authorities.

Ferland officially took the helm of Westinghouse at the start of April after the retirement of Aris Candris but resigned after just three days in the post to take up the position of CEO at Babcock & Wilcox.

Chairman of the board Shigenori Shiga is serving as interim CEO of Westinghouse.

Tenders, Bids & Contracts

Americas

Bechtel to build Catalina PV plant

EDF Energies Nouvelles subsidiary, enXco, has awarded Bechtel a contract to build the Catalina solar photovoltaic (PV) power plant in southern California.

Bechtel will be responsible for the engineering, procurement and construction of the 110 MW facility, as well as for construction of an 11.6 km transmission line from the plant to a nearby substation.

Construction is scheduled to start in May 2012 pending final approval from the California Public Utilities Commission.

LIPA selects Landis+Gyr smart solutions

The Long Island Power Authority (LIPA) has selected Landis+Gyr to deploy a smart grid demonstration project that will test consumer response to dynamic pricing signals as well as the scalability of smart grid technology.

The project will use Landis+Gyr's Gridstream RF smart grid network, along with advanced meters and in-home energy displays in the town of Farmingdale on Long Island, NY. The project is being supported by a smart grid investment grant from the US Department of Energy.

Gridstream RF technology uses a radio mesh network to communicate with meters, in-premise devices and distribution automation equipment.

Texas books FACTS technology

US utility Oncor has placed orders worth around $45 million with ABB to provide electrical solutions that will increase transmission capacity, ensure grid stability and facilitate the integration of renewable power in Texas.

ABB is to install its flexible alternating current transmission systems (FACTS) into the grid. The orders are part of the Competitive Renewable Energy Zones (CREZ) programme, which aims to increase the contribution of renewable energy in Texas by up to 18 GW.

Equipment to be installed includes one static var compensator and two series compensators.

Asia-Pacific

Bergen wins Asian orders

Bergen Engines AS has secured orders with a combined value over $70 million to supply 26 Bergen engines, associated power plant equipment and design services to customers in Bangladesh and Indonesia.

The orders include a $45 million contract to supply 16 engines to Energypac Power Generation Limited for a 108 MW project in Chittagong, Bangladesh, and a $21 million contract for six engines for Midland Power Co. Limited for installation at the Ashuganj power plant in Bangladesh.

In Indonesia, Bergen will supply PT Medco Power with three B35:40V20 gas engines to add 24 MW of power to a power generation plant on the island of Batam.

PLN seeks network bids

Indonesia's state-owned power company PT Perusahaan Listrik Negara is to solicit bids to build a $20 billion high voltage electricity network between the islands of Sumatra and Java.

Construction of the 700 km network, which will facilitate the transmission of up to 3000 MW of electricity between Sumatra, Java and Bali, is slated to begin in 2013 and reach completion by 2017. The project is being funded by the Japanese International Cooperation Agency (JICA), with matching funds from PLN.

NTPC awards boiler contract

India's National Thermal Power Corporation (NTPC) has awarded BGR Energy Systems a contract worth INR18.55 billion ($352.13 million) to supply two boilers for a power project in India's Maharashtra state.

The contract to supply two 660 MW boilers will be executed in the next four years by BGR Boilers Pvt. Ltd., a joint venture between Hitachi Power Europe GmbH and BGR Energy. It forms part of a tender issued by NTPC for 11 boilers.

BGR Boilers said in a statement that it is expecting to receive orders for a further four boilers from NTPC.

Areva to build India CSP

Areva Solar is to build the largest concentrated solar power (CSP) plant in Asia after being awarded a contract by India's Reliance Power Limited.

Under the contract, Areva will build two 125 MW CSP plants using its Compact Linear Fresnel Reflector (CLFR) technology and will provide construction management services for the project. The first phase of the project is under construction, with a target commercial operation date of May 2013.

The solar power plants, to be located in Rajasthan, will help India reach its goal of adding 20 000 MW of solar energy by 2022.

Brown unit taps Canadian firm

The energy subsidiary of listed holding firm A. Brown Co. Inc. has appointed a Canadian construction firm for engineering works in its 200 MW power plant in Western Visayas, Philippines.

"Palm Concepcion Power Corp., A. Brown's subsidiary and the proponent of the proposed coal fired power plant project in Concepcion, Iloilo, recently signed an agreement with one of the leading engineering and construction groups in the world, SNC-Lavalin Inc.," the company said in a disclosure.

In July, A. Brown announced it will spend $200 million or roughly Peso8.5 billion for the 200 MW clean coal fired power plant. The power plant, which will be commissioned in the third quarter of 2015 for phase one and fourth quarter of 2016 for phase two, will supply the power needs of the Visayas grid.

"As the owner's engineer, SNC-Lavalin will be providing technical advisory services from the engineering stage to completion of the power generation project," A. Brown said.

South Korea orders third Siemens H-class unit

Power utility Korea Southern Power Co Ltd has placed an order with Siemens for a power plant based on its H-class gas turbine technology.

The Andong combined cycle power plant will consist of one H-Class gas turbine, one steam turbine, one generator and one heat recovery steam generator (HRSG).

The order is Siemens' third for its H-class technology from South Korea. At the end of March, Siemens also received an order from to supply the power island for the Ansan combined cycle power plant. This consists of two innovative SGT6-8000H gas turbines, one steam turbine, three generators, and two heat recovery steam generators. Andong will have a gross installed electrical capacity of 416 MW and a gross efficiency of over 61 per cent. It will be designed for a high degree of flexibility, with 250 starts per year. Start of commercial operation is scheduled for April 2014.

Europe

ABB boosts hydro efficiency

Swiss utility Axpo has awarded ABB orders worth around $20 million to refurbish the generators at two hydropower plants.

The work at the Mattmark and Mauvoisin power plants in the Swiss canton of Wallis will help to improve their availability, efficiency and reliability, says ABB. The two plants can generate 680 MW and account for around 15 per cent of the canton's installed capacity.

Voith delivers pit turbines

Voith Hydro is equipping the Štetí hydropower plant in the Czech Republic with the largest pit turbines in Europe.

The hydropower specialist has signed a contract with Czech consortium Mertostav a.s. and the plant's general contractor, Zakládáni staveb a.s., to deliver the complete electromechanical equipment for the small hydro station.

Voith's delivery scope includes two 3.5 MW turbines, associated control systems, the transmissions for speed control and the synchronous generators. With a runner diameter of 5.1 m, the three-blade Kaplan bulb turbines are the largest pit design turbines in Europe.

Commissioning of the new plant is scheduled for July 2014.

Largest wind farm in Bavaria

Turbine manufacturer Nordex has received a contract from VenSol Neue Energien GmbH and Honold GmbH Windkraftanlagen for the delivery of ten turbines for the Zöschingen wind farm in Germany.

Located in the northwest of the shire of Dillingen and scheduled for completion by the end of the year, the planned wind farm project will have an installed capacity of 24 MW, making it the largest wind farm in Bavaria. Nordex will equip the facility with its N117/2014 wind turbine, which is designed for areas with low wind speeds.

Juwi signs Kenersys turbines

Renewable energy developer Juwi is to install 16 Kenersys wind turbines at its project sites in central and southern Germany.

The two companies have inked an agreement for the delivery of Kenersys' K110 2.4 MW wind turbines, which are specifically designed for low wind speed sites. The units will be installed on 145 m-high concrete-steel hybrid towers

Hotel group buys CHP

Hotel company the Ability Group has reached an agreement with EuroSite Power Inc. for the installation of combined heat and power (CHP) systems at four hotel sites in the UK.

Under the deal, EuroSite will install and operate CHP systems in hotels owned by Ability and managed by Hilton Worldwide. It will allow Ability to reduce energy costs, cut carbon emissions as well as avoid costs relating to service, repair and maintenance. Lionel Benjamin, Head of Hotel and Leisure Division for The Ability Group said: "We liked EuroSite Power's approach because it required no capital investment and guaranteed us a saving, whatever happens to energy prices in the future."

Nordex repowers Netherlands wind farms

Four Dutch energy firms have awarded wind turbine manufacturer Nordex contracts to repower the Kreekraksluis wind farm.

Under contracts with Delta NV, Eneco NV, Windvast BV and Scheldewind BV, Nordex will dismantle and replace 26 of the existing 500 kW wind turbines at the site with more modern, larger turbines.

The project will increase the capacity of the site by 60 MW.

International

GE turbines debut in Turkey

The first European installation of GE's 1.6-100 wind turbine will be at Fina Enerji's Tayakadin wind energy project near Istanbul, Turkey.

GE has announced that it is to supply 31 of the machines to the 50 MW project, which is expected to be completed in early 2013.

Fina Enerji currently has 35 of GE's 2.5-100 wind turbines in operation at two wind power plant sites in Turkey's Izmir and Hatay provinces for a total capacity of 87.5 MW. Tayakadin is the third site where Fina Enerji will employ GE wind turbines.

The 1.6-100 wind turbine has a 100 m rotor diameter and an 80 m hub height. It has the highest efficiency of any wind turbine in its class, says GE.

EDF and Mitsui selected for Morocco wind project

A consortium led by Electricité de France (EDF0 and Japan's Mitsui & Co. has been selected by the Moroccan national electricity office as the preferred bidder for the 150 MW Taza wind power project.

Located in northern Morocco, the Taza wind project will be equipped with 50 Alstom wind turbines. It was launched in May 2011 as a public-private partnership scheme and is a key part of Morocco's plans to develop 2 GW of wind power capacity by 2020.

Morocco is to launch a tender round for an additional 850 MW of wind power capacity in 2012.

Cennergi prefers Suzlon

Wind turbine manufacturer Suzlon has been selected as the preferred supplier by Cennergi Pty Ltd. for a 138 MW wind energy project in South Africa.

If the two companies can reach a definitive agreement, Cennergi will use 66 of Suzlon's S97-2.1 MW turbines for the project in Eastern Cape province. Suzlon would deliver the turbines as part of a full engineering, procurement and construction contract.

Voith secures Turkey orders

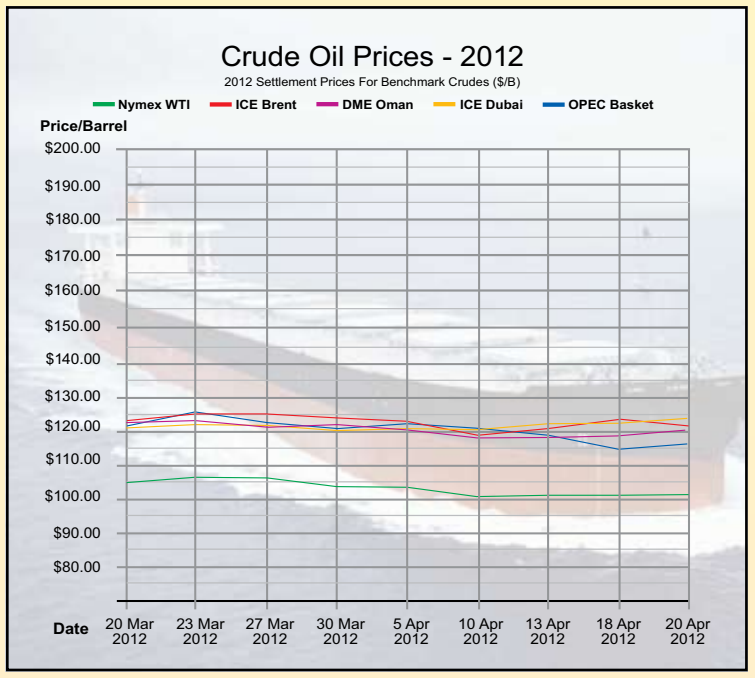
Voith has received an order from Turkey's Kalehan Energy production for the supply of three generators for the Beyhan-1 hydropower plant.

Beyhan-1 is the first within a scheme of four new hydro plants in Turkey's Elazig province. In addition to supplying the three 235 MVA generators, Voith will also supply the excitation and monitoring systems.

Beyhan-1 is scheduled for commissioning in January 2015.

Oil

Crude prices slip as stocks increase



- Sluggish oil demand
- Stockpiling in Saudi Arabia and China

David Gregory

Crude oil prices trimmed a little during the last month, but not enough to provide relief from the sense that the high cost of oil is restricting global economic recovery. Brent crude was selling at just under $120/b in late April and West Texas Intermediate (WTI) was priced at under $105/b, compared to $125/b and $105/b-plus, respectively a month ago.

The global market being what it is leaves individual consumers and world economies struggling with its vagaries as speculators seek profits and political machinations influence pricing shifts throughout the trading day.

The fundamentals of supply and demand still carry some weight, but high prices show that those factors do not command the respect that economic theory would have one think.

The Paris-based International Energy Agency (IEA) said in the April issue of its Oil Market Report that first quarter 2012 fundamentals show a clear shift from "the seemingly relentless tightening evident over the prior 10 quarters" – from the third quarter of 2009 to the fourth quarter of 2011. "An increase of 1.2 million b/d in Opec crude and gas liquids supply versus fourth quarter 2011, alongside sluggish oil demand, imply a potential global build in stocks of over 1 million b/d, despite patchy non-Opec supply performance," the IEA said.

The agency attributed the stock-build to an increase of by around 500 000 b/d in OECD countries, plus crude stockpiling in Saudi Arabia and China that it estimated amounted to a combined volume of 700 000 b/d.

"The cycle of repeatedly tightening fundamentals evident since 2009 has been broken for now," the IEA said in the report. But it added that while some of the extra oil "is now well positioned to meet rising summer demand from May onwards, its impact on prompt prices has been blunted by ongoing geopolitical uncertainties."

Political unrest in Sudan/South Sudan, Yemen and Syria has removed close to a million barrels per day from the market in recent months.

Speaking in London on April 26, US Energy Secretary Steven Chu said he remained very concerned over high crude oil prices that are burdening consumers and hampering the global economic recovery, an opinion expressed frequently by officials working to put the world's economy back on track.

Recent comments by Saudi Arabia's Minister of Petroleum have also probably played a role in the slight fall of oil prices. Speaking in Seoul in mid-April, Mr. Naimi said Saudi Aramco was producing crude at a rate of 10 million b/d and that stocks held by consuming countries was on the rise.

"We are seeing a prolonged period of high oil prices," the minister said, "and we are not happy about it." The market was balanced and there was no lack of supply, he said. Saudi Arabia's inventories around the world were full, he stated, adding that the country had the capacity to produce crude at a rate of 12.5 million b/d.

Commenting on the Saudi oil ministers remarks, the London-based Center for Global Energy Studies (CGES) said in its latest *Monthly Oil Report*, released on April 23, that Saudi Arabia "has seldom been quite so candid about its oil production levels and plans, but it should be applauded for bringing some much needed transparency to the oil supply picture." It added: "Perhaps the full risks of high oil prices to the global economic recovery are finally becoming apparent."

It also noted that the IMF has said an oil price spike that could spark 'a major slump reminiscent of the 1930s' was one of the key risks faced by the global economy.

"Such a slump, the [IMF] warned, would 'hurt many emerging and developing economies' and it is on these economies, particularly China and India, that Saudi Arabia depends for its future oil sales," the CGES said.

The consultancy added that Saudi Arabia had "openly favored an oil price of around $100/b for this year, but until now has done little to actively achieve it." It said that that has now apparently changed, not just by Saudi Arabia raising its production, "but by also giving the market clarity over what it is doing and, more importantly, what it intends to do."

Gas

Zemach committee makes gas policy recommendations

With an offshore natural gas resource now estimated at some 736 billion cubic metres, Israel now faces a dilemma that it has never before considered – an abundance of energy, enough to meet its domestic demand for decades.

Mark Goetz

Until recently, Israel was energy-poor, relying on imports of crude oil, petroleum products and coal. Following recent significant gas discoveries in its East Mediterranean offshore, it must now decide on how to develop and maintain its energy security and how best to exploit the offshore resources for financial benefit.

Israel's geopolitical complications caused some Israeli analysts to argue that the country should hold all of its resources in reserve, but many others – political leaders and investors – realise that Israel stands to make considerable financial gains through gas exports.

A report released in early April by the Committee for Examining Government Policy Regarding the Natural Gas in Israel – also known as the Zemach Committee, as it was headed by Shaul Zemach, director general of the Ministry of Energy and Water – determined that Israel should retain sufficient gas reserves to supply it for 25 years and export the balance.

The inter-ministerial committee made numerous recommendations on how the country should expand its domestic natural gas distribution system and encourage a competitive market among suppliers and give fair access for producers to gas export facilities.

Based on data gathered by the US Geological Survey (USGS), the committee estimated the potential of offshore natural gas reserves in Israel at around 1400 billion cubic meters (bcm) and calculated that Israel gas demand would amount to 420 bcm by 2040.

Israel's two main gas resources are the Leviathan and Tamar fields with gas resources estimated at around 17 tcf (481 bcm) and 9.1 tcf (257 bcm) respectively.

Tamar is under development and is due to begin deliveries to Israeli state-owned and private companies in mid-2013. The Tamar partnership is the only entity at this time capable of delivering gas to the Israeli market.

Israel's reliance on its offshore gas is expected to widen its use of the resource for electricity generation, transport and industrial purposes.

For this reason and for the sake of ensuring security, the Zemach Committee urged that the number of companies supplying gas to the country's transmission system be increased and that the number of points where gas will arrive onshore be increased as well.

It said more receiving terminals and treatment facilities should be established and that the regasification buoy currently being put in place offshore Hadera should be complete by end-2012.

The committee urges the construction of an eastern pipeline transmission system running north to south and link-ups with independent power plants, plus the doubling of the existing transmission system in central Israel, and synchronising the management of electricity and natural gas systems.

For security purposes, and those of efficiency, the committee stressed the importance that Israel has several points along its coastline where natural gas enters the national transmission grid. It said that to supply the energy sector in a reliable and stable manner, future receiving terminals must be dispersed in relation to the transmission system and in relation to the demand requirements for gas.

Israel should create two similar systems, in the north and in the south, and split the supply system into four entries of similar capacities, with two separate and non-adjacent systems, each with a capacity of supplying 2 million m^3 of natural gas per hour.

One of these systems should be located in Hadera, it said, adding that the Mari-B gas field near Ashdod, soon to be depleted, should be used as a strategic gas storage reservoir.

Exports would prove to be an efficient tool for developing additional reservoirs (by encouraging more exploration), the committee report said. But it said that there needed to be regulations regarding the number of suppliers that could use the facilities and that they should pay their pro-rata share in the construction of the export facilities.

The report recommended that any LNG plant used to export Israeli gas be located either on the Mediterranean Sea coast or in Eilat. Space is limited in both locations and could pose a new dilemma. The committee also said export facilities must be controlled by the government and that private companies are to cover the cost of their construction.

Furthermore, export volumes would depend on the size of the field. Those holding more than 200 bcm would have to keep 50 per cent in reserve. Those with reserves of 100-200 bcm would be required to keep 40 per cent. Fields with 50-100 bcm would hold 25 per cent in reserve. Smaller fields would be obliged to hold less.

Israel will now debate the committee's recommendations and the Knesset, the government's legislative branch, is expected to decide on a national policy in mid-June.

Preparing for the coming transformation

The Energy Roadmap 2050 shows how Europe might achieve its emissions targets, while ensuring a competitive and secure energy supply. Ahead of the Annual Eurelectric conference in June, **Hans ten Berge,** Secretary General of Eurelectric, elaborates on how policymakers can support the electricity industry in achieving its decarbonisation goal.

With the launch of the Energy Roadmap 2050, the European Commission has taken a step forward in steering the debate about the EU's long-term energy strategy. Coming at a time when Europe is facing historic challenges such as the on-going economic and financial crisis, the uncertainty surrounding a future global climate agreement and the repercussions of the Fukushima nuclear disaster, the Roadmap is a timely effort to look beyond the 2020 horizon and concentrate on the future ahead.

Through an analysis of illustrative scenarios, the Roadmap charts possible ways how Europe might reduce its greenhouse gas emissions by 80-95 per cent by 2050, while ensuring a competitive and secure energy supply. The five decarbonisation scenarios are: high energy efficiency, diversified supply technologies, high renewable energy sources (RES), delayed carbon capture and storage (CCS) and low nuclear.

The European Commission stresses that these are not absolute forecasts of reality, but that the conclusions drawn from them could give fundamental signals to shaping Europe's future energy policy. Yet what all these scenarios have in common is a much greater role for electricity, which is expected to double its share in final energy demand to nearly 40 per cent in 2050. Indeed, electricity is the best vehicle to reduce carbon emissions in sectors that would otherwise be far more difficult to decarbonise, such as space/water heating and transport.

As expressed in the declaration by more than 60 chief executives of power companies in March 2009, the electricity industry is strongly committed to delivering carbon-neutral electricity in Europe by 2050. It is now time to enable further progress and permit the sector to fully play its role as a major driver for a cost-effective decarbonisation of the energy system.

In our response paper to the Roadmap, Eurelectric, the association of the European electricity industry, elaborates on how European policymakers can support the electricity industry in achieving its decarbonisation goal.

Firstly, the paper argues that a long-term vision shaping Europe's future energy policy should rely on markets and market-based instruments, notably a well-functioning single European energy market and an effective EU Emissions Trading Scheme (ETS). They are the best way of ensuring a cost-effective transition to a low-carbon economy, while guaranteeing security of supply and system stability.

The Roadmap should therefore tackle the transformation of the energy landscape in a technology-neutral and least-cost oriented manner – which would let the market decide which low-carbon technology is most effective in achieving the EU's decarbonisation target. Instead, the Roadmap broadly appears to be aimed at justifying renewable and energy efficiency targets for 2030.

By contrast, we believe that the most appropriate way to give investors clarity and long-term certainty in the energy transition is a policy framework based on a single driver – the carbon price. The EU ETS should remain the cornerstone for decarbonising the European economy. Yet however effective the ETS proves to be in reducing carbon emissions, if Europe does not embark on a global climate agreement, decarbonisation will ultimately remain an empty concept. Eurelectric therefore welcomes the Roadmap's commitment to promoting a global solution involving all major emitting economies.

To support such international efforts, the EU should enhance the role of the EU ETS as the driver of EU decarbonisation policy and adopt ambitious, economy-wide greenhouse gas reduction targets for 2030 and beyond.

In addition to a strengthened ETS, the development of fully-fledged EU energy markets will significantly contribute to a cost-effective pathway towards carbon-neutral electricity. In this context, it is important to continue progress towards delivering an internal electricity market by 2014, a goal reaffirmed at the European Council on Energy in February 2011. The emergence of an integrated North Western European (NWE) region is a promising step, but the current momentum must not be lost.

There is a risk that actions at national and EU level are undermining the development of such a market. The reality today is one of multiple uncoordinated policy instruments that distort markets and market instruments. For example, the EU ETS is undermined by overlapping instruments such as renewables and energy efficiency targets in the same sectors. Meanwhile, the different regimes across Europe for renewables support, capacity payments, price caps and carbon floors have a detrimental impact on low-carbon generation and customer choice.

Hans ten Berge: the prospect of making the most of low-carbon technologies looks rather dim

> "The Roadmap should tackle the transformation of the energy landscape in a technology-neutral and least-cost oriented manner"

Indeed, the introduction of national RES subsidy schemes, which greatly vary in their mechanisms and their level of support, has produced significant distortions in the functioning of electricity markets. This is likely to lead to reduced cross-border capacity and hamper the creation of regional wholesale markets as a stepping-stone towards an integrated single European market. Inefficient markets, an increase in system costs and a loss of social welfare are the inevitable result.

To reach the 2050 target of 80-95 per cent reductions in carbon emissions, markets must therefore be underpinned by a coordinated and European approach. Moreover, it is important that market arrangements offer cost-effective solutions that are clearly communicated to the wider public. With this in mind, Eurelectric welcomes the European Commission's approach of presenting an energy roadmap to 2050 based on a comprehensive, coordinated EU-wide strategy. More coordination is needed to keep track of how each national system is affected by decisions in neighbouring countries and to provide clarity about the overall direction of energy policy.

Similarly, a cost-effective energy policy should be complemented by a transparent and predictable regulatory framework, able to spur investments in low-carbon technologies. Eurelectric has long argued that all generation options – ranging from more and better renewable technologies to nuclear and carbon capture and storage – would be needed to achieve carbon-neutrality in the most cost-effective way. But looking at recent developments across Europe, such as Germany's planned nuclear phase-out by 2022, the prospect of making the most of low-carbon technologies looks rather dim.

The Roadmap's analysis shows that the biggest share of energy supply technologies in 2050 will be generated by RES: renewables are expected to account for at least 55 per cent of energy consumption, compared to a mere 10 per cent today. Recognising the manifold advantages of renewables in mitigating climate change, the European electricity industry has already become a major investor in this area. For example, it is responsible for 40 per cent of worldwide wind investments. We have further fleshed out this strong commitment in our action plan on renewables development in Europe, which Eurelectric published last year.

However, with a growing share of RES in the power system, the need for more flexibility in the electricity system becomes imperative. Tools like flexible back-up power plants, demand-side management, storage and smart grids will be required to make the most of Europe's renewable resources.

Developing RES is a key investment opportunity for our sector, but ensuring a cost-effective, market-oriented and European energy transition is a challenge.

Part of the challenge can be addressed through targeted research and development. There is a clear need for more research and innovation to bring low-carbon technologies to the market. Enhanced research, development and deployment are needed to propel low-carbon technologies towards competitiveness, enabling them to compete on a level playing field with other technologies. Public support after 2020 should be primarily oriented towards high-potential low-carbon technologies that have not yet reached market maturity. This would substantially enhance cost-effectiveness in the power system.

Even more importantly, the task of embarking on an energy transformation by 2050 means that investment in the power sector will become a matter of urgency. Although 2050 may seem far off, investment cycles in energy are long and take time to produce results.

Infrastructure built 30-40 years ago needs to be replaced, and the sector already needs to look ahead to anticipate the system's future needs.

Although there is still generation over-capacity in most European markets today, the shut-down of nuclear plants in some EU countries for instance will create a capacity gap which needs to be filled in a timely manner. In addition, adequate transmission and distribution infrastructure will be needed to integrate an ever-growing share of variable renewable generation into the power system up to 2020 and beyond.

The Energy Roadmap 2050 estimates that, depending on the decarbonisation scenario, investments in distribution grids until 2050 could be four to five times higher than for transmission grids. Developing appropriate incentives that encourage distribution system operators to invest in grid improvements is therefore of utmost importance. Such investment incentives must be delivered together with a sound market model that encourages customer participation.

Moreover, electricity companies not only face typical business risks such as long lead times, possible investment delays, and fluctuating fuel prices or demand. Instead, they also face political and regulatory risks, which are more difficult to manage and have become an increasing hurdle. Together with a dwindling economic case for conventional capacity and an economic and financial climate that has made lenders more risk-averse, these risks threaten to stop the necessary investment from getting off the ground.

How can the investment deadlock be overcome? First, a consistent and stable policy framework – both at national and European level – must be set to enable industry to deliver. Second, energy prices need to reflect market fundamentals in supply and demand. This entails a move away from market distortions such as price caps in traded markets and regulated end-user prices.

To be clear, making Europe's power sector fit for the coming energy transformation and the carbon-neutrality challenge will not be easy. But the electricity sector is ready to meet this challenge if the right policy framework is put in place. A European approach that focuses on cost-effectiveness and competitiveness is vital in this regard.

Bumps in the road

In spite of the current headwinds, there are still plenty of reasons for optimism in the global clean-tech sector, say Ernst & Young's **Gil Forer** and **Thomas Christiansen.**

The clean energy industry is being hit by multiple storms: the Eurozone crisis; reduced policy support; low profitability for manufacturers; competition from Asia; decreasing carbon prices and in the US, tax credit uncertainty and a shale gas boom. But even now, there is reason for optimism.

Driven by technology and scale-induced cost reductions, clean energy is closer than ever to being cost competitive with fossil fuel generation. Many countries are redoubling their clean energy goals. While in the West, public policy support is being reduced due to fiscal challenges, developing countries are introducing new incentive mechanisms.

As clean energy eventually starts to deliver even lower costs and higher unsubsidised returns to investors of generating assets, it is the general hope that the consolidated industry will enter a phase of stable, more profitable growth again.

The Eurozone crisis is triggering increasing capital scarcity for renewable projects. As sovereign interest rates in peripheral Eurozone countries rise, increases in borrowing cost are passed on to renewables. This hits a sector especially hard that relies on cheap financing because of the high capex to opex ratio of generating assets.

In addition many European banks are seeking to rebuild balance sheets and increase loss reserves, and their risk appetites are relatively low. Recent rapid pull-backs of public incentives have increased the risk perception of renewables in the banking sector, doubling the harm to the sector, as banks pull back even further or increase risk premiums.

Strong headwinds: the wind industry is being challenged to reduce the rate of cost reductions

As European governments implement austerity measures and clutch at straws for growth-enhancing policy measures, renewables have come into the firing line. In many cases the policy support mechanisms, especially for solar, moved from "too hot" to "too cold" too quickly. This accentuated a "boom and bust" cycle that has been the norm in many European photovoltaic markets since Spain first removed its policy support in late 2008.

For wind energy, the removal of support has been ongoing, albeit at a much more measured pace. The wind industry is now challenged to increase the rate of cost reductions to enhance its profitability and reach unsubsidised price competitiveness with fossil generating assets.

After some years of above average profitability, the margins in the main clean energy sectors (photovoltaics and wind energy) have been coming down dramatically. In both cases, there is now significant oversupply, leading to price-cutting. Larger wind projects are being commissioned and utilities are increasing their activity in the market, leading to a concentration with larger suppliers who, it is believed, can honour future warranties.

While suppliers from Asia and particularly China have come to dominate certain portions of the photovoltaic supply chain, they too are now suffering under module pricing that decreased 40 per cent in 2011 alone. As it stands, the module is starting to become a less significant portion of the total cost of a solar system, moving from 70 per cent in 2008 to around 45 per cent today. In wind, head-on competition from Asia is yet to develop in European markets. However, with public equity values for manufacturers depressed, it is more likely that the market will instead witness M&A activity from east to west.

Many Asian firms seem undeterred by the low margins in the solar and wind supply chains. Korean conglomerates have been entering the photovoltaic and wind turbine businesses and are targeting these areas for future growth. Likewise, Japanese companies such as Panasonic, Hitachi, Kyocera and Toshiba, are looking at clean-tech manufacturing as a major growth opportunity.

Meanwhile in the US, the expiration of the Treasury grant option in December 2011 led to a boom in wind installations in 2011. In December 2012, the Production Tax Credit (PTC) is due to expire again.

Because of the length of the wind development cycle, this is reducing turbine order activity for 2013 to an extremely low level, putting the value chain and jobs in the US at risk. Though the PTC has many congressional supporters, it again risks being impacted by politics in the year of the presidential election campaign.

The shale gas boom is also challenging the clean-tech sector in the US, where natural gas prices have been driven down to $3/mmBtu, versus $12/mmBtu in Europe and $18/mmBtu in Asia. This is greatly reducing the cost of electricity generated from natural gas. Utilities are responding by closing down, rather than retrofitting, old coal fired plants and reducing their investment in renewables. In states with ambitious Renewable Portfolio Standards (RPS), this policy mechanism somewhat limits the negative impact on renewables. It is unclear when or if this low pricing or price differential to the rest of the world and other forms of energy such as crude oil will arbitrage out. In the meantime, the US economy is benefiting from the shale gas bonanza.

Amid much pessimism of upstream producers in the West, there is great and growing optimism in developing countries around the use of clean technology. As prices decrease, clean technologies are coming within economic reach of investors and consumers in these countries.

Here, they work to solve real economic, health and quality of life challenges. In much of Africa and many less developed countries in Asia, off-grid solutions enable rural electrification. Startups such as Eight19 and Simpa Networks have created 'pay as you go' PV systems for the rural poor that enable them to pay for the cost of the system much the same way as they would pay for kerosene.

Rural microgrids can be run economically with photovoltaics and other renewables. While these systems are still more expensive initially, they often replace diesel generators which are increasingly expensive to run and maintain, ensuring payback in a reasonable time frame. Microgrids enable small-scale local businesses and manufacturing, which in turn increase local employment and incomes. The opportunity will grow rapidly. Pike Research estimates that the global market for rural microgrids will grow from its current $3 billion to about $10 billion by 2017.

> Many Asian firms seem undeterred by the low margins in the solar and wind supply chains

The attraction of renewables in rapidly growing economies can also be explained with a combination of benefits: peak load shaving, reliability enhancement, grid infrastructure investment postponement and fuel savings. This shows that if well planned and placed, renewables in developing nations often have additional economic benefits beyond the generation of electricity at a certain cost.

In countries with midday peak loads, photovoltaics contribute to lessening the need for peak load power plants or load shedding, reducing societal and economic cost of power outages. When renewable assets such as wind turbines or small hydro assets are placed in areas with strained grid infrastructure, they can also enhance local reliability, reduce system losses and postpone the need for grid enhancements.

Renewables also enable fuel savings, which have multiple benefits. For developing countries, this can improve the terms of trade, as they have to import less fuel with scarce foreign currency. It also reduces the funding need for strained infrastructure to move the fuel, such as ports, railroads, roads and pipelines, and these funds can be redeployed to other uses. As fossil fuels are often subsidised in developing countries, reducing use often also decreases government subsidy cost, freeing funds for other uses. Many Middle East and North Africa (MENA) countries that are net energy importers are looking to increase renewables to lessen the import burden and enhance economic growth.

In developing countries, the main challenge centres around financing the initial investment. While this has been a strong focus of development for banks and donors, funding availability is still lagging demand. As developing nations institute stable policies around renewables and the costs continue to decrease, these challenges will gradually be addressed.

Innovative financing such as 'pay as you go', community investments and social banking will address the small-scale investments. For larger-scale investments, donor financing, governments, utilities, insurance, pension or infrastructure funds are needed to bridge the gap in the short term. As observed in developed markets, insurance companies are already entering into direct ownership of renewables to add risk diversification to their investment portfolio and reduce the correlation of returns.

As the incentive mechanisms in the West become less predictable, risk minimising investors will seek renewable business models that do not require government incentive payments. Recent announcements by Gehrlicher Solar and Würth Solar point in this direction. Both German firms are planning large photovoltaic power plants in the near future in Spain that will be profitable without incentives, indicating that 'grid parity' is imminent in Spain.

Other innovations include direct producer to consumer arrangements for power sales. As industrial consumers pay anywhere from €0.06-0.18 per kWh in Europe, a wind turbine or other asset can profitably supply electricity in many instances, even accounting for network and other costs. For commercial customers who pay even higher prices, the incentive is even greater.

Corporate self-generation using renewables is yet another innovation. As the levelized cost of electricity (LCOE) for various renewables drops below the electricity price, it is becoming increasingly attractive to generate electricity on site, partially offsetting utility deliveries. A key game changer is the further spread of 'remote net metering', as passed in the State of New York. It enables owners of various real estate locations to count renewable power fed into the grid from one location against power usage in another location.

But despite these innovations, the price of carbon continues to be a major drag on the clean-tech sector. The failure to secure strong agreements in Durban and Cancun is setting a negative signal for global carbon pricing. The EU has so far let the carbon price in the EU ETS fall to current level pricing of about €7 per tonne. The EU is looking to agree on a carbon set-aside for 2013, thereby reducing the supply of carbon credits and supporting the market price. It is unclear if there will be agreement on this or if more stringent general goals will be implemented. Current pricing is improving the economics of carbon emitting technologies and acting as a disincentive to investing in low carbon clean energy.

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Italy's smart approach to storage

Image courtesy of Siemens

A pilot energy storage project began operation in Italy at the end of February. The project is an important part of a wider programme that will go some way to demonstrating the smart grid concept.

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Smart grids are essential to any future energy scenario that envisions the seamless integration of all energy sources – including renewables, electric vehicles and rooftop solar systems – in a system that dynamically balances generation while at the same time manages demand on the consumer side.

Smart grids, however, will not be realised without the ability to store energy. At the end of February Italian utility giant, Enel, began operating a pilot energy storage project on its distribution system. The pilot is not only important to developing commercial scale energy storage systems but is also a crucial part of its wider smart grid development plan.

Ms Paola Petroni, Head of Network Technologies at Enel Distribuzione, Italy's largest Distribution System Operator (DSO), outlined the significance of the project.

"For Enel, this project is an important step in terms of developing commercial scale energy storage. Most existing storage installations are aimed at energy management purposes or at addressing the integration of renewable plants within the grid; in both cases the c-rate (ratio between installed power generation capacity and installed energy capacity of the storage system) is strongly <1. Enel Distribuzione is only testing storage with c-rate >1, under an overall new concept," she said.

The storage will be used as a DSO network component for the needs of the DSO itself. Several Enel smart grid solutions will be tested through this pilot, with the idea that the storage is part of these solutions, as well as being part of the overall Enel smart grid vision.

"If the pilot provides positive results, new business opportunities will be available for both DSOs and storage manufacturers," noted Petroni.

Work on the pilot project began with a kick-off meeting in December 2010. It is part of a wider project, named "Progetto Isernia", that started in 2011. Isernia is a province in the Molise region of Italy. Covering an area of 1529 km^2, it has a population of nearly 90 000 spread across 52 communes.

The energy storage project will be used to explore new Enel smart grid solutions for: voltage regulation; integration of renewables within the medium voltage (MV) network; integration of electric vehicle charging stations within the MV network; black start (grid reactivation following a blackout); as well as network automation.

> If the pilot provides positive results, new business opportunities will be available for both DSOs and storage manufacturers

The pilot uses Siemens' Siestorage system, a technology that, according to the company, is a modular system that combines cutting-edge power electronics for grid applications with high-performance lithium-ion batteries able to provide up to 8 MW at a capacity of 2 MWh.

Batteries and control electronics are inserted in cabinets as plug-in units, which facilitates maintenance and the exchange of individual units. Each energy storage cabinet contains up to 16 replaceable battery modules, each with a maximum voltage of 60 V DC.

The required power and capacity can be adjusted to meet the project requirements through a parallel connection of several cabinets on their AC side. An intelligent battery management system (BMS) monitors the state of charge, voltage, and temperature of the individual battery modules, and other parameters.

At the heart of the Siestorage system, is what Siemens calls its SIPLINK converter product platform. The batteries are charged and discharged at the AC grid using SIPLINK active front ends. The SIPLINK power electronics were specifically developed for sophisticated grid applications such as MV DC grid couplings, and are the basis of the various Siestorage applications.

The control components for the storage unit are housed in a separate cabinet. The storage control system (SCS) can be controlled either on-site or remotely via the internet. Information on the system's operating state, for instance on batteries, auxiliary systems, medium-voltage switchgear, and error messages, are displayed on the human machine interface (HMI).

Up to 12 energy storage cabinets can be connected to one control cabinet and one grid connection cabinet. This results in additional redundancy in the control system of larger units.

Commenting on the technology, Petroni said: "The Siemens solution based on lithium-ion batteries and the long-standing experience in large power conversion was really attractive for us. Our pilot project has 20 battery racks with embedded converter connected to two MV/LV transformers that operate in parallel. Each rack has its own BMS. The BMS, converter and protection equipment are coordinated and/or controlled by the storage control system (SCS), which is the 'portal' to operate the storage in manual and automatic mode via a connection between the SCS and the Enel systems."

The Siestorage system is currently connected at a specific point in the MV network. An MV/LV substation will be transformed to a "complex" node integrating: several EV charging stations connected to the LV network; the Li-ion storage system (750 kVA - 500 kWh) connected to the MV network; a photovoltaic (PV) power plant (50 kW) connected to the LV network; and a new local control system. The node is integrated with Enel's Distribution Management System (Enel DMS).

The local control system will use the energy storage system to optimise the (active and reactive) power exchange between the node and the line.

Petroni said: "This is not just to reduce the impact of the PV system and the electric vehicle recharge stations on the network but is a real optimisation, as both local and global parameters will be taken into account, thanks to the integration with the Enel DMS."

Following finalisation of the installation in December 2011, the storage system has been in operation since the start of March 2012. The installation is now undergoing a two-part test programme to first test the functionality of the Siestorage system, and the applications related to grid operation.

The plan is to complete testing before the end of 2013. However, Enel will also test the storage system within the framework of the ADDRESS European project to simulate demand response in the network.

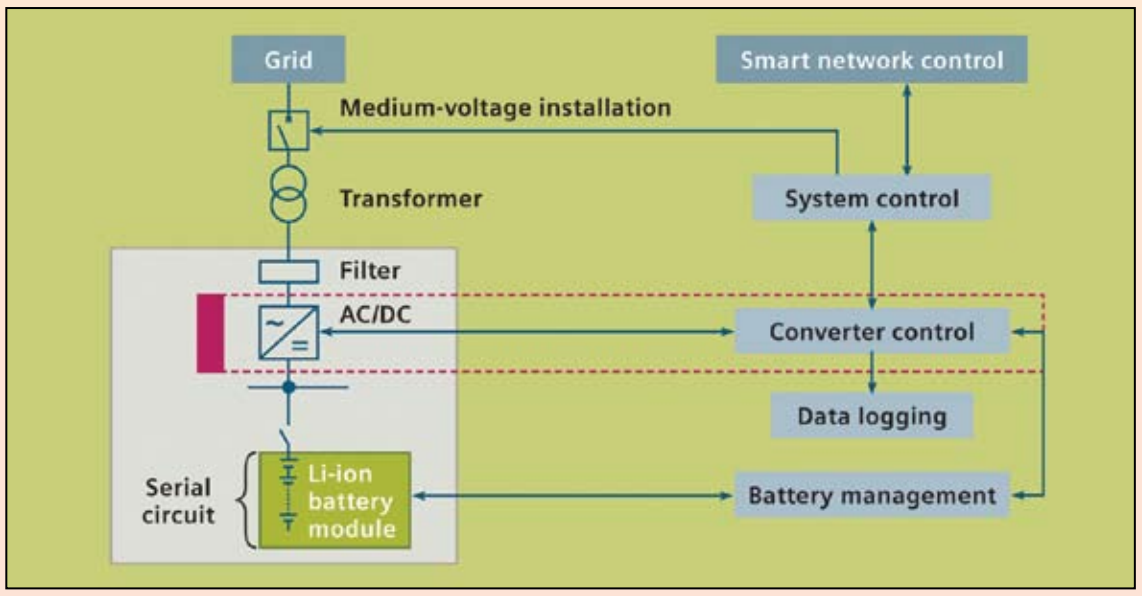
"Enel is planning to further test this technology and different applications for storage systems. Once we have accumulated enough experience, we will have a complete idea on the outlook for storage technologies in distribution networks," said Petroni.

One area that will be of interest to observers is the battery life. Although battery life is dependent on use, Enel expects the battery to have a lifetime of 10 years or 2000 full cycles (charge plus discharge).

Going forward, as with any new technology, energy storage faces both technical and commercial challenges. Siemens says it will be looking at how to scale-up the technology from 16 kWh to several MWh and notes that high battery costs are a challenge.

At the moment calculating the economics of a commercial system is difficult. However the case for the technology goes beyond purely financial considerations.

As Petroni concluded: "The DSO market in Italy is a regulated market, so the payback time is determined by the regulator. However, storage is a solution to address grid weaknesses, in competition with the traditional solutions (for example the construction of new lines). Nowadays, traditional solutions are often cheaper. Nevertheless, projected cost reductions will increase the competitiveness of storage systems."



The pilot project will transform an MV/LV substation into a "complex" node

Junior Isles

The energy battleground

As Arthouros Zervos put it: "Energy is a battleground." And in this economic crisis, the battleground is getting messy.

Speaking as President of the European Wind Energy Association (EWEA) at last month's annual EWEA conference in Copenhagen, Zervos noted: "Everyone is debating energy – Obama and Romney; Sarkozy and Hollande. In Germany, UK, Spain, China, Japan – what is the future of nuclear? Are renewables affordable? … Above all, in an economic crisis every penny counts – so which energy technologies should get our money?"

The last question is currently the one that matters most and one that particularly strikes a chord with the clean-tech and renewables sector.

By and large, renewables have been a success story. In Europe, mandatory targets have seen the share of renewables increase from 8.5 per cent in 2005 to 12.4 per cent in 2010. Wind has played and will continue to play a crucial role.

In his keynote address, EU Energy Commissioner Günther Oettinger noted that Member States' action plans envisage wind production going from 70 TWh in 2005 to almost 500 TWh in 2020. More than 5000 wind turbines with a capacity of nearly 10 GW were installed in 2011 and cumulative capacity is expected to pass 100 GW this year.

Christian Kjaer, EWEA's, chief executive noted: "The world installed 50 per cent more wind capacity last year alone, than the world has installed nuclear capacity in the last decade."

This public swipe at the nuclear industry showed that, for those in the wind corner at least, the kid gloves are off when it comes to persuading governments and investors as to "who should get our money".

Certainly, the noise from the renewables camp is getting louder as the old argument that they are not competitive weakens. Speaking at the Clean Energy Ministerial (CEM) in London recently, Michael Liebreich, chief executive of Bloomberg New Energy Finance (BNEF) noted that the best onshore wind farms are competitive with gas fired plants when gas is $6/mBtu, and also compete with new coal plant. He also said the price of solar modules has fallen by 75 per cent in the last three years.

> In some cases it seems that renewables support has been used as a scapegoat by governments in economic or financial difficulties

Speaking at a WWF press conference on the sidelines of the CEM, Germany's Deputy Director General of International Cooperation said the cost of electricity from large PV solar installations had fallen from €0.45/kWh some years ago to €0.135/kWh and would fall even further. "Solar costs will reach €0.07/kWh by 2017," he said.

Although progress is being made, it is arguable that work needs to be accelerated, especially in the case of offshore wind. As one Siemens executive put it: "there's always more juice to squeeze out of the lemon."

In his EWEA keynote speech Dr Felix Ferlemann, CEO, Siemens Wind Power said: "We must make it competitive with traditional energy sources and we must do this soon… In the past we managed to reduce costs by 40 per cent every 10 years. In the future we need to be even quicker.

"And this means the wind industry will not only need to continue, but to step up investments in innovation and industrialisation."

He added: "Currently the profitability is not always a given. The wind industry struggles with low margins. This is not a sustainable situation. We are under pressure to reduce costs quickly. And we have made this our highest priority."

Reducing renewable costs is good for consumers and will help both wind and solar grow their share in the energy mix but it will naturally lead to some 'collateral damage' and infighting. Falling profit margins, as both prices and subsidies come down, will result in consolidation. Already some solar companies have exited the market. Last month rumours surfaced that two of China's large wind turbine manufacturers – Sinovel and Goldwind – were contemplating a takeover of Vestas. Vestas CEO, Ditlev Engel made no comment on the claims.

With the game getting tougher the inevitable cries of foul play have come, as manufacturers of wind turbines and solar modules fight to defend their position. With the ongoing trade dispute between China and the US over China's alleged unfair subsidising of wind and solar equipment exports, the issue of unfair competition was a topic of fierce debate at the EWEA conference.

One debate discussed whether Asian wind turbine manufacturers would be a threat to European manufacturers over the next decade. But rather than seeing Asia as a threat, perhaps the increasing activity of Asian manufacturers in the international market should be seen as an opportunity to accelerate cost reduction and maintain momentum in increasing the global share of renewables.

Speaking at a press conference on the sidelines of the main EWEA conference, Oettinger noted: "Your [wind] industry is in a global competition. I think competition in a global market and competition in an internal European market on a fair, level playing field is what we want. But it must be fair competition involving all competitors from the US, China and the EU.

"[But] We need to think about what is meant by fair competition."

The issue of subsidies, whether fair or otherwise, is often like the grenade in the field. Everyone wants one – whether it is the nuclear industry lobbying for support to build a new fleet of projects in the UK, or the coal sector to support carbon capture and storage, or renewables – yet when things are not going quite according to plan their use is universally criticised for the damage they cause.

And it is not just industry. Governments will use subsidies to advance particular political, economic, social or environmental goals or to address problems in how markets operate but then blame them when it suits. In several countries we have seen the burden of subsidies used as a reason for reducing renewables support.

Oettinger said: "In some cases it seems that renewables support has been used as a scapegoat by governments in economic or financial difficulties. However, public deficits are not caused by support for renewables. In total numbers, support for renewables is not that high; moreover the money usually does not come from the public budget."

Nevertheless, falling support is having an impact. According to BNEF, after a record in 2011, new financial investment in clean energy (renewables, energy efficiency and smart grids) in the first quarter of 2012 was the weakest since the depths of the financial crisis in Q1 2009.

Liebreich said: "The weak Q1 2012 number reflects the destabilising uncertainty over future clean energy support in both the European Union – driven by the financial crisis – and the US – driven by the expiry of stimulus programmes and the electoral cycle. There is no sign of a rapid turnaround in either of these regions in the next 12 months. Clean energy technologies, particularly solar photovoltaics and onshore wind, continue to fall in price and approach competitiveness with fossil-fuel power – but politicians in many countries appear to be ducking the decisions that would ensure that the sector maintains its growth trajectory."

Noting the seeming unfairness of these cuts in renewable support, Zervos fired a volley at the fossil fuel power generation sector. "The International Energy Agency says that for every dollar of government support given to renewables – not just wind – at least six are given to fossil fuels," he said.

In spite of promoting the wasteful use of energy, fossil fuel subsidies are likely to continue to enjoy a favourable position for some time to come – fossil fuels are tradable, taxable commodities that producers and governments can generate revenue from. Unfortunately for renewables proponents, the wind and sun are not.

Yet in any battle, a weakness can also be a strength. The wind and sun may not be tradable commodities but at least their price never changes – they will always be free.

The world is a big place. Not everywhere has sun or wind; some places have coal and gas, while some do not. Ultimately, the key word is portfolio – we will need all sources – but in tough economic times, the pennies spent on the energy battleground will likely go to the technology that offers the most bang for the buck.