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Hydropower's big surge

As spread of investors widens, hydropower looks poised for decades of strong growth

Amidst all the excitement about the growth of wind and solar power, it is easy to forget that by far the largest source of renewable energy is hydroelectricity. In 2013, hydropower capacity grew by 40 GW, more than wind or solar. Global capacity is expected to double to 2,000 GW by 2050. But there will be challenges aplenty – not least in ensuring that hydropower is developed responsibly and sustainably. Ahead of the World Hydropower Congress (WHC) in Beijing later this month – where the World Energy Council will be publicly releasing its latest hydropower report as part of its World Energy Resources series – we look at the status of and prospects for this flexible baseload technology in a world of carbon constraints and intermittent renewables.

It took a century for global hydropower generation capacity to reach 1,000 GW, a milestone it passed in 2013, when it generated 16.4% of the world's electricity. According to scenarios prepared by the International Hydropower Association (IHA), the next 1,000 GW is expected to be

realised by 2050 – perhaps sooner – as hydropower grows by 3-4%/year. The World Energy Council's 2013 Symphony scenario, assuming a view of the world in which environmental sustainability has the highest priority, supports this assumption to 2050 mainly for the emerging markets. The

growth expectations are lower in the Jazz scenario, where climate change is not a priority, but where free market principles apply.

Hydropower has been enjoying a revival driven largely by growing awareness that climate change is upon us and that the energy industry has to adapt. In a carbon-constrained world, hydropower starts to look very attractive. It is a renewable resource that unlike most other renewable resources does not suffer the problem of intermittency, which can play havoc with the management of power grids.

To the contrary, not only is hydropower well suited to baseload operation, it is highly flexible, and > see page 2

can incorporate an element of storage, and so is an ideal complement to the other intermittent renewable energy sources such as wind and solar power. According to the hydropower report that the Council will launch at the Hydropower Congress this month: "Storage hydropower, including pumped storage, represents 99% of the world's operational electricity storage." It is also a resource with large potential in many developing nations. And it can have additional advantages, some of which are hard to value in monetary terms, but which can be highly beneficial. According to the Council's hydropower report, the world's largest hydropower station – China's 22.5 GW Three Gorges Dam – was built not primarily as an electricity generator but to control extreme floods.

"Before the project's completion in 2007," says the report, "a single disastrous flood event in 1999 passed through the site, causing economic losses in the region of US\$26 billion, equivalent to the total investment cost of the entire project. When a similar flooding event took place in 2010, the dam was able to attenuate the peak flood flows, avoiding billions of dollars of economic damage, not to mention protecting the local communities." Which is not to say that the project is not an important generator of electricity. In 2014 it broke the world record for the most electricity generated by a hydropower project.

The upsurge in hydropower development over the past decade

followed a dark period for the industry, as illustrated in the chart on p3. According to the Council's hydro report, from 1999 through 2005 (shown by the orange arrow), hydropower development stalled worldwide, reflecting the impact of the World Commission on Dams (WCD), convened to review the development effectiveness of large dams and develop guidelines for the development of new dams. A WCD report published in 2000 "challenged existing practices and proposed stringent guidelines for dams, which in turn caused a sharp decrease in investments".

From 2005 onwards (see green arrow) hydropower development saw an upswing, which, says the Council's report, "can be partly attributed to the impact of intensive efforts by the IHA and hydropower companies to negotiate sustainability guidelines for the sector". The report adds: "Growing investments in and by emerging economies (mainly the BRICS, particularly China), continued interest in renewable energy, particularly with storage capacity and eventually participation in carbon markets / renewable energy credits have also contributed to the upswing."

But the industry nevertheless faces some daunting challenges in realising its future potential, says International Hydropower Association CEO Richard Taylor: "The decision-making process required for projects to obtain permission to proceed into construction and operations can

be very unpredictable. This is a big challenge because there are so many authorities and stakeholders involved.

"There is also a lack of incentives to orientate investment towards hydropower. This has been borne out of misperceptions about the specific advantages of hydropower, compounded by the lack of reward in the market for those same advantages: the benefits of hydropower don't always have a financial value.

"Risk has to be factored into the process of accessing finance, and hydropower projects, until they're well-advanced in terms of their implementation, are high risk. That risk-sharing will carry a premium. This is a problem for large-scale projects in particular, as these typically require high up-front capital costs, despite their very low operation and maintenance costs."

Other challenges – according to Hans-Wilhelm Schiffer, Executive Chair of World Energy Resources Study at the Council, who will be one of the speakers in Beijing – include: "a potential shortage in technical skills with an increase in demand; the energy-water-food nexus, where competing demands for freshwater may constrain hydropower development; the effects of sedimentation on the operation of hydropower plants and the host water body; managing the environmental and social effects of hydropower projects on the local area more effectively; and

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GLOBAL TOTAL HYDROPOWER GENERATION SINCE 1980



Source: IHA, EIA, REN21 – Renewables 2014 Global Status Report

the potential impacts of climate change on the sector”.

Geographically, Taylor expects to see substantial growth in Asia, Africa and South America, alongside further, though limited, development in North America and Europe. “Whilst there is a great deal of potential in Africa, we have seen relatively low amounts of deployment there to date, but the situation is poised to change,” he says. “As for Asia, which has the greatest potential for development, we are seeing extraordinary growth in hydropower capacity. China’s exceptional development is set to influence investment in neighbouring countries.”

The Council’s report highlights the case of the Grand Inga project in the Democratic Republic of Congo, which

has been in various stages of planning since 1972. “Successive governments have indicated support, although to-date the project has been unable to advance,” says the report. “More recently, in 2014, South Africa has indicated a renewed interest in this project as the major buyer of the electricity that would be generated, potentially providing the revenue certainty needed to move the project forward.”

Grand Inga is an example of the potential for large-scale regional hydro developments, notes Schiffer. “In some countries where the electricity supply market is saturated, hydropower schemes are a source of cheap, exportable electricity to more energy-hungry neighbours. Also, these large-scale schemes could serve as multi-purpose reservoirs, benefits from

which include flood control and drought prevention. These value-added services could be key to the further development of large-scale hydropower.”

While the main purpose of hydropower schemes is usually the generation of electricity, Taylor too stresses the additional benefits that they can bring, especially to water management: “When storage is involved in a hydropower project, water can be provided for agriculture, industry, and urban areas. Navigable parts of the watercourse can also be improved and extended. Storage projects regulate river flows to ensure that minimum flows are sufficient for requirements downstream. The careful operation of storage projects also protects downstream areas from flood events.”

A big boost for hydropower’s prospects has been a change of heart on the part of multilateral development banks, such as the World Bank, and environmental NGOs, such as the Nature Conservancy and the World Wildlife Fund (WWF). Instead of generally opposing large-scale hydropower developments, they have moved towards supporting them, so long as they are planned responsibly and sustainably.

Indeed, the WHC is being sponsored by The World Bank, The Nature Conservancy and the WWF. Also supportive has been the increasing involvement of private investors. Another World Energy Council speaker at the WHC will be the Council’s Chair,

Marie-José Nadeau, who will be addressing hydropower’s role in the “energy-water nexus”:

“Water is deeply intertwined with energy production, in the extraction of raw materials – coal, oil sands, tight oil, shale gas and biomass crops – as well as the generation of electricity: driving the turbines in hydropower plants and serving as coolant in thermal and nuclear plants,” she says.

“The World Energy Council anticipates that the global demand for energy will more than double by 2050. A more water-constrained future, as population and the global economy grow and climate change looms, will impact energy sector reliability and costs. The fuel mix used to meet the rising energy demand has a direct impact on water resources. Moreover, water shortages are already being observed in many parts of the globe. In such a context, the importance of the water-energy nexus cannot be overemphasised.”

As with carbon footprints, the water footprints of power generation options are increasingly being compared. “More and more, energy companies are expected to be transparent on their water use and on the related risks,” says Nadeau. “It is thus important that hydropower producers take a greater interest in and document their water footprints and that they showcase the many benefits of hydroelectricity, including low GHG emissions.” ●

Cover photo courtesy of IHA

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A brave new world for gas

New opportunities and challenges are re-shaping the industry



Jean-Marie Dauger is Executive Vice-President in charge of the Global Gas & LNG business line at Engie (formerly GDF SUEZ). Before the merger of Gaz de France (GdF) and Suez in 2008 he was GdF's Chief Operating Officer. He is also Chair of the World Energy Council Communications & Strategy Committee.

The natural gas industry will soon gather in Paris for the triennial World Gas Conference, where discussions will focus on an array of opportunities and challenges that are re-shaping the industry. They include growing global concern over sustainability, the impact of the oil price plunge on investment, rapid growth of the liquefied natural gas (LNG) market, and what has come to be known as the “energy transition”. In this exclusive interview, Jean-Marie Dauger of ENGIE (formerly GDF SUEZ) gives his views on what the future holds for gas and for his company.

How has the natural gas industry changed since the World Gas Conference last took place in Kuala Lumpur in 2012? And what – in your view – are the crucial issues that the

industry should be addressing this time around?

Let's start with what hasn't changed: there is still a growing need for energy in the future. We have no choice but

to solve this equation by all the means possible, with every energy source and development of new technologies both for production, utilisation and conservation of energy.

One thing that has changed since Kuala Lumpur is that, more than ever, the public policies driving the development of the energy sector worldwide have emphasised the urgent need to take into consideration environmental impacts and climate change: energy, sustainability and climate are now linked and these three issues, with varying local focuses and choices, will increasingly shape the development of energy policies for decades to come.

In that context, thanks to its lower carbon content compared to oil and coal, and its abundant resources, natural gas is well-positioned to play a key role in world decarbonisation: it stands as the best partner of renewable energies to boost the energy transition. Therefore, in nearly every scenario, gas is the only fossil fuel with a growing share of the global energy mix for the next two decades, with its share moving from 21% in 2012 up to 24% in 2040, according to the IEA.

However, in spite of all its advantages, in terms of availability and sustainability, it still has to prove its competitiveness, especially against coal, and security of supply is still an issue in some cases.

Another big event is the dramatic drop in oil prices that occurred six months ago. We can wonder how it will impact on gas markets in the short to medium term, and, in the longer term, for instance, on the most costly LNG projects for which final investment decision (FID) has not yet been taken, such as those of the

eastern coast of Africa or the western coast of Canada. As we don't think oil prices will recover very quickly, there could be some delays in investment decisions, if not cancellations.

Your company has just announced that it has changed its name from GDF SUEZ to ENGIE. Why have you done that?

The energy transition is already a reality for which we have great ambitions. This is the key challenge of our enterprise project. To support and signal our Group's transformation, we made the decision to give ourselves a new name. This new name is simple and strong. It implies energy for all, and does so in all cultures.

How significant is ENGIE's global gas and LNG business in the context of the whole group? And how do you see the relative importance of gas and LNG within the group evolving?

ENGIE is a global energy player and an expert operator in the three key sectors of electricity, natural gas and energy services.

In the gas business we are positioned in nearly all the elements of the value chain, including a strong position in LNG infrastructures and trading. Natural gas contributes around 50% of our total revenue.

We expect that over the coming 10-15 years there will be a huge transformation of the energy industry globally, but not in the same manner everywhere.

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In Europe and other mature economies energy, demand growth will be relatively limited and the main focus will be on energy transition and reduction of carbon dioxide emissions. In those regions the future accent of our business will be on renewables, on efficiency and, of course, on technology – for distributed energy, for big data systems, and for digitalisation.

Some of these technologies are maturing very quickly. For example, distributed energy changes many things. It is changing where decisions are taken. Local decision-makers – regions, towns or even individuals – will play bigger roles. In those mature regions, gas will contribute to the reduction of CO₂ emissions – because we know that for at least the next 15 or 20 years the easiest way to reduce emissions will be to replace coal with gas.

In the rest of the world, that is to say in the developing regions, ENGIE will focus primarily on increasing access to energy, in particular with power generation and with natural gas.

So that is our ambition: in the mature economies, to become a leader of the transition towards more sustainable energy systems and, in the developing countries, to continue developing access to energy, making use of all technologies. In all regions, we are confident that natural gas will be part of the equation for a long time as a contributor to a more sustainable energy system.

Many people see LNG as the most exciting part of the gas business – and GDF SUEZ is a major player. How do you see the industry developing?

The market for LNG doubled during the first decade of the century, and will double again during the second one, which is quite remarkable growth. If natural gas demand grows by 2.2% per year for the next 15 years, LNG may grow at twice that pace. Most of the growth in LNG trading will be in Asia, which already accounts for 70% of demand.

We will see a dramatic increase not only in volumes but also in the number of countries and companies involved. In 2000, there were 12 countries producing LNG and 11 countries importing LNG. Very soon we will have 24 producing countries and 40 importing countries. This means that optionalities will grow, increasing the opportunities for optimisation.

Of course, there are some question marks, such as the impact of the present drop in oil prices or the impact of the economic slowdown of the economic growth in China and in other countries. This is a source of uncertainty, not to the fundamental trend, but possibly to the speed at which the market will absorb the new LNG volumes coming on stream, in particular from Australia.

Presently, the market seems to be changing from a sellers' market to a buyers' market, with the drop in prices



depressing the ability of companies to sanction costly investments for new LNG plants. But, over the long term – say around 2020 – we will see a restart of the LNG business in quite a vivid way.

Also, in a global landscape dominated by rising environmental concerns, cleaner fuels – such as gas, CNG, LNG and electricity – will play an increasing role in the transport sector. The use of LNG as a fuel for ships, enforced by new maritime sulphur emission caps, could represent a potential market estimated at 20-30 Mtpa in the world.

How is GDF SUEZ responding to the oil price plunge?

We think the present oil price is not sustainable for very long. The need for more oil in the world is growing, not diminishing. But, on the other hand, the recovery will probably be relatively slow – three or four years. And the

plateau may not be as high as the one we experienced before, for the next six to seven years.

Our response in our E&P activity is to focus on cost efficiency. We will not stop investments that we have decided already, not only because they are already committed and but also because they are not sub-economic even in the present circumstances.

But we are reducing all the other costs and, if the prices remain where they are, we will reduce our exploration expenses and capital expenditure. Many of the oil companies are reducing their exploration budgets by something like 30% – and we will be doing the same.

So we have taken measures to reduce or to defer investment, but without harming our long-term perspective, which still is positive for gas.

The GDF SUEZ Cape Ann LNG carrier has been converted into a Floating Storage and Regasification Unit and is now doing service at the port of Tianjin in China, an example of how new technology is re-shaping the LNG business.

The International Energy Agency has been saying for some time that it expects a global “Golden Age of Gas”. However, Europe appears to be an exception to the trend, with demand having fallen sharply since 2010. How do you see gas developing in Europe?

We are globally optimistic in our vision for gas. However things look much more contrasted when you look at it from a regional perspective. We are pretty confident about emerging regions and about the US. But in developed and well gasified countries with low energy growth needs, such as Europe, the demand for gas will be flat or diminishing due to energy efficiency improvements and the development of renewables. However, compared to coal and oil, gas as the cleanest fossil fuel resists well in the mature markets.

This doesn't automatically translate into a reduction of gas imports as domestic production decreases, which is why security of supply still is to be considered by Europe in its energy policy: exploitation of domestic energy potential, diversification of routes, storage and LNG capacities that help the creation of a more fluid, transparent and interconnected > see page 6



The topsides for the Gudrun project in the North Sea, a joint venture between Statoil and ENGIE (formerly GDF SUEZ). (Photo courtesy of Statoil / ENGIE.)

internal energy market should remain among our priorities.

We, ENGIE and a group of other major energy companies, have gathered in a group called the Magritte group to advocate to the European Union that it should do more to implement Europe-wide solutions for climate protection and security of supply.

In particular, it should create the conditions for adequate CO₂ market to allow natural gas to be used more in power production to achieve emissions reductions. Clearly the carbon market needs to be transformed so that it is more efficient.

Shell's swoop on BG Group – partly a result of the oil price plunge, but

also something that's been coming for a while – has led to speculation that we may see another wave of consolidation in the oil and gas sector. What's your view?

This operation represents a big step in the industry. Yes it is correct to say that it was made possible by BG's specific situation but it makes a lot of sense from an industrial perspective, both

from an LNG and an E&P perspective. But it is also a sign of Shell's optimism in the future development of LNG and gas in general, and in the recovery of oil price.

There haven't been that many M & A transactions recently – we cannot say that the M & A market is buoyant. But this is maybe because many of the oil producers are still benefiting from their hedging positions, especially in the US. If the present situation continues, they will need to rationalise their portfolios. It will depend on how long the present oil price situation lasts.

GDF SUEZ is itself the result of a series of mergers. What insights can you give about the challenges of integrating companies successfully?

The key success factor is to propose a very strong strategic rationale and financial soundness, meaning you have to be convincing about delivering synergies and growth trajectory. It is also important to mobilise the staff quickly around a clear and realistic strategic vision, so that they can transform the stress of the merger into positive stress for development.

Secondly, the way the acquisition is financed is also very important because it dictates the ability of the new group to grow in the future. If the acquiring

party is mobilising too much cash, recovering the forces for investment and future growth requires very quick implementation of synergy.

The human and the social issues are key. It depends on how much you want or are able to marry various cultures and to mobilise the staff on the new ambition.

In the case of GDF SUEZ, merging Gaz de France, which was more of a gas company, and Suez, which was more of a power company, we wanted to complement our offers and to boost our international presence. The ambition and the strategy were clear so marrying the cultures was easy to achieve.

In December Paris will host the 21st Conference of the Parties to the UN Framework Convention on Climate Change – the most important international climate talks since the disappointment of Copenhagen in 2009. What would be a good outcome for the natural gas industry?

For us a recognition that there has to be a pricing mechanism for carbon is a necessary way to proceed. How much we can involve the emerging regions – which could focus more on their access to energy rather than how that energy is produced – is a question. But we can see progress, in particular in the many consultations we have within the World Energy Council. Today there is no country, no government anywhere in the world that is insensitive to sustainability issues. That's a big change already. ●

Innovation crucial to meeting climate goals, says IEA in technology report

The International Energy Agency has called on policy-makers to triple public spending on the research and development of low-carbon technologies – warning that “a concerted push for clean-energy innovation is the only way the world can meet its climate goals”.

Launching the agency's flagship technology report in May, IEA Executive Director Maria van der Hoeven said: “We are setting ourselves environmental and energy access targets that rely on better technologies. Today's annual government spending on energy R & D is estimated to be US\$17 billion. Tripling this level, as we recommend, requires governments and the private sector to work closely

together and shift their focus to low-carbon technologies.”

The Energy Technology Perspectives 2015 report analyses long-term trends in the energy sector, focusing on the technologies and level of deployment needed to create an affordable, secure and sustainable energy system – the conflicting set of imperatives that the World Energy Council has dubbed “the

energy trilemma”. It highlights recent success stories, such as the rapid growth of solar photovoltaic (PV) power, last year's inauguration of the world's first large-scale power station equipped with carbon capture and storage (CCS) technology (see cover story in the April issue), and fuel economy improvements in cars.

But it also cautions that “we cannot be complacent”, adding that: “R & D alone are insufficient for moving new technologies from ideas to commercial products. Governments have a key role to play in creating the initial market opportunities that send a signal to innovators and drive investment”.

It cites the example of public support for renewable energy technologies, which, while not always efficiently targeted, “has transformed the market outlook

for wind and solar to the extent that they are now the lowest-cost source of power in a number of regions”.

This view is supported by a report published in January by the United Arab Emirates Ministry of Foreign Affairs, the International Renewable Energy Agency (IRENA), and the Masdar Institute of Science and Technology. It concluded that solar and wind are now the “most competitive energy sources in the UAE”.

The IEA report concludes that even if an agreement is reached in the UN climate talks in Paris in December, “It will be challenging for the world to meet its climate goals solely through the UN negotiation process... That leaves the development and deployment of new, ground-breaking energy technologies as key to mobilising climate action.” ●

Tesla launches energy storage for homes, businesses and utilities

Tesla, the US-based maker of electric vehicles, has launched a range of battery products for use by homes, businesses and utilities that will help meet several energy needs. These include storage of intermittent power generated by wind and solar power, lowering energy bills by shifting the pattern of demand to take advantage of cheaper rates, and backup electricity in the event of grid power cuts.

The company said it was “amplifying its efforts to accelerate the move away from fossil fuels to a sustainable future” by “enabling homes, businesses and utilities to store sustainable and renewable energy to manage power demand, provide backup power

and increase grid resilience”. For utility-scale systems, Tesla is offering 100 kWh battery blocks that can be grouped to scale from 500 kWh to over 10 MWh. The products will eventually be manufactured at a \$5 billion “giga-factory” in Nevada. ●



The Tesla PowerWall battery, in the top left of the photo, addresses the problem of the intermittency of wind and solar power. A 7 kWh version is optimised for solar power applications while a 10 kWh version is aimed primarily at backup applications. Round-trip efficiency is claimed to be better than 92%. (Photo courtesy of Tesla)

NEWS IN BRIEF

TURKEY BREAKS GROUND ON FIRST NUCLEAR POWER PLANT

Construction work has begun on the first of three nuclear reactors that Turkey is planning to reduce its dependence on fossil fuel imports. The Akkuyu plant at Merin, on the Mediterranean coast, will have four Russian-designed 1,200 MW pressurised-water reactors and is expected to be completed by 2020. The US\$22 billion plant is being financed by Russia on a build-own-operate basis.

THERMAL PLANTS DOMINATE BRAZILIAN POWER AUCTION

The latest power contracts to be auctioned by Brazil's CCEE electricity trading board have been won mainly by developers of thermal plants as the drought-stricken nation seeks to reduce dependence on hydroelectricity. Out of a total of 1,973 MW of new capacity, 1,516 MW is accounted for a gas-fired plant to be constructed by Genpower, based in Rio de Janeiro. The other winners were three biomass-fuelled plant totalling 111 MW and ten hydro plants totalling 346 MW. The plants will come on stream in 2020.

OIL PRICE CONTINUES TO RALLY

The price of oil recovered strongly during April with Brent crude briefly rising above \$67/barrel on the 4th May, up almost 50% from a low of \$45 in January. However, even at that price oil is more than 40% cheaper than the high of \$116 reached during June 2014. All eyes will be on OPEC next month when it holds its next meeting on 5th June to decide on whether to cut output.

Iran and foreign investors ready themselves as nuclear deal deadline looms

With hopes at the highest level ever that Iran and western powers will be able to hammer out a deal on Iran's nuclear activities by the end of June deadline, Iran and potential foreign investors are preparing themselves for the hoped-for lifting of sanctions. Iran's petroleum ministry has said it is about to publish a list of oil and gas projects that will be open to foreign investors once sanctions are lifted. Meanwhile, foreign energy companies have been quietly preparing themselves for a return to a hydrocarbons province with world-class – but largely unrealised – potential."

While it remains to be seen whether a deal will actually materialise – many thorny issues have yet to be worked out – the framework deal reached

in Lausanne at the start of April by Iran and the P5+1 powers (the five permanent members of the UN Security Council plus Germany) has

left many observers believing a deal is now possible. The framework deal was warmly welcomed by many Iranians, who are looking forward to their lives improving once their country's international isolation ends.

The list of 49 oil and gas projects to be opened to foreign investors will be announced at a conference to be held in Tehran in the second week of May, according to a report in *Middle East Economic Survey (MEES)*. It will, says *MEES*, "comprise a host of projects at various stages of development that the ministry sees as central to its push to boost the country's production profile, on both the oil and gas fronts". ●

Shell offer for BG Group sparks talk of industry consolidation

Speculation that Shell might one day swoop on BG Group has been under way for nigh on two decades. In early April that speculation turned to reality as Shell announced a £47 billion cash and share offer for a company that has been having a tough time in recent years.

The deal – which if it comes to fruition will be the biggest in the oil and gas industry in more than a decade – prompted speculation that it might be the start of a wave of industry consolidation like the one that took place in the late 1990s/early 2000s as a response to low oil prices. According to Shell CEO Ben Van Beurden, as reported by the *Financial Times*, Shell had long seen BG Group

as an attractive proposition but was deterred by the company's high share price during an era when former CEO Frank Chapman was a darling of the London stock market.

However, even before the oil price plunge it had been reported that BG's fortunes had taken a downward turn – with production failing to meet expectations and the company's LNG

operations in Egypt starved of gas supply as the nation suffered a supply crisis, prompting the government to divert gas to the domestic market. The result was that BG's share price had fallen dramatically, a slide that was accelerated by the oil price plunge, making the company look a bargain. BG's LNG interests when combined with Shell's will make the new entity a very powerful player in an industry expected to grow rapidly over the coming two decades. Also attractive are BG's significant interests in Brazilian oil.

BG Group became the first company to bring onstream an LNG project fuelled with coal-seam gas (also known as coal-bed methane), with the recent commissioning of the Queensland Curtis project in Australia. ●

Japan's first nuclear power station restart expected in July

Japanese utility Kyushu Electric Power Company expects to restart one of two reactors at its Sendai nuclear power station in June/July – following a series of approvals and a landmark court decision in April. It would be the first time nuclear power has been generated in Japan since September 2013, when the last of the fleet of 48 reactors shut for obligatory maintenance.

Safety concerns after the events at Fukushima in 2011 have meant that as reactors were shut down for obligatory periodic maintenance they were not allowed to restart without safety reviews and approvals from the new Nuclear Regulatory Authority (NRA) and local governments. The NRA concluded in September 2014 that the reactors conformed to new safety standards and in November both the local government of the region that hosts the power station and the Kagoshima Prefecture governor agreed to restarts.

In April a court in Kagoshima rejected a bid to block the restarts, clearing the way for the utility to begin the process of bringing the reactors back online as soon as final NRA approval is granted. An NRA official is reported to have said that this approval will be issued "very soon". ●

NEWS IN BRIEF

RUSSIAN PRESIDENT RATIFIES EASTERN-ROUTE CHINA GAS SUPPLY DEAL

Russian President Vladimir Putin ratified a 30-year contract for the supply of 38 bcm/year of natural gas to China via the so-called eastern route on 1st May. Russia and China signed the US\$400 billion supply contract in May last year after a decade of negotiations. Deliveries are due to begin in 2018, following completion of the 4,000 kilometre Power of Siberia pipeline through Russia, now under construction.

SECOND SE4ALL FORUM TO FOCUS ON FINANCE

The second Sustainable Energy For All (SE4ALL) Forum in New York later this month will focus on the challenges of financing the extension of energy access to the one-in-five people who still lack electricity. The forum will assess progress on the SE4ALL initiative and will feature the first-ever Global Energy Ministerial Dialogue at the United Nations, to reaffirm the Rio+20 determination "to act to make sustainable energy for all a reality".

<http://www.SE4AllForum.org>

MAJOR ECONOMIES MISS CLIMATE PLEDGE DEADLINE

The 31st March UN deadline for Intended Nationally Determined Contributions (INDCs) to climate change passed with many countries failing to make their submissions. The countries that have so far submitted INDCs are: the United States, Russia, the 28 countries of the European Union, Andorra, Gabon, Liechtenstein, Mexico, Norway and Switzerland.

Leveraging the work of the World Energy Council A lesson from New Zealand



In little over two years, New Zealand's World Energy Council member committee – the BusinessNZ Energy Council (BEC) – “has breathed new life into the relationship between our members and the Council,” says Secretary-General, John Carnegie. In the process the BEC has become a listened-to voice in New Zealand's energy debate. Even the energy minister now talks about the World Energy Council's trilemma framework. Read on for the inspiring tale of “the little member committee that could”.

When you look closely at New Zealand's energy sector, it comes as no surprise that this small isolated country – population just 4.5 million – scores highly on the World Energy Council's Trilemma Indexes. The nation is blessed

with ample natural resources, giving it a strong position in renewable energy supply. It was a pioneer of electricity market liberalisation, introducing wholesale competition in 1996 and full retail competition in 1999. It is

Mighty River Power / Tauhara North No.2 Trust's Nga Awa Purua geothermal power station.

also the only country outside the European Union and Kazakhstan to have introduced a nationwide carbon emissions trading market. In the most recent Trilemma rankings, New Zealand managed a creditable 10th place.

Famous as the location for the filming of the Lord of the Rings movie trilogy, New Zealand has spectacular mountainous scenery, which means it has many rivers suitable for hydroelectricity schemes – so more than half the nation's power comes from hydro. Situated on the Pacific Ocean's “Ring of Fire”, it is also a world leader in geothermal power. And it can get a bit breezy, making it an ideal location for wind power. Statistics from the Ministry of Business, Innovation and Employment (MBIE) show that in 2014 almost four-fifths of New Zealand's electricity came from renewable sources.

Geothermal electricity became a bigger contributor to the mix than natural gas. Hydropower contributed 57.1% to the mix, geothermal 16.2%, gas 15.6%, wind 5.2% and coal just 4.4%.

But the nation nevertheless faces energy challenges. For example, growing concerns over the rising price of electricity over the past decade meant that in last year's election opposition parties called for intervention in the competitive market. They were defeated so their ideas appear to have

fallen away, but the proposals caused a lot of fuss. The rising cost of power has been partly responsible for New Zealand dropping from 8th place to 10th place in the trilemma rankings – a development that John Carnegie describes as “a canary in the mine”.

It was to help address the nation's energy challenges that the country's largest business advocacy body, BusinessNZ, decided to set up the BEC at the start of 2013 – taking over the role of World Energy Council member committee from the former Energy Federation of New Zealand and absorbing its membership. “We've breathed life into the relationship between our members and the World Energy Council,” says Carnegie. “We've worked really hard to get the trilemma language into the heads of policy-makers and ministers – and we've got our energy minister now referring openly to the World Energy Council trilemma, which is a pretty good thing from our perspective.”

Despite the BEC's newness and leanness – “we run off the smell of an oily rag,” says Carnegie – it has embarked on several ambitious initiatives. New Zealand is one of 25 countries to have compiled its own “energy issues map”, following the template provided by the World Energy Council, by polling its membership on the issues that keep energy leaders awake at night. “We had the largest national committee response rate for our map – nearly a hundred responses,” says Carnegie. The results showed that

New Zealand's energy leaders share some of the concerns of the global community, such as climate framework uncertainties. But there are also issues that scored particularly highly for New Zealand, one being the uncertainties that companies face from new disruptive technologies.

The BEC has also just launched a Young Energy Professionals Network (YEPN) that aims “to strengthen future opportunities” for future energy leaders.

Perhaps BEC's most ambitious initiative is a project to develop national energy scenarios using the framework that the World Energy Council used for its Jazz and Symphony scenarios to 2050. “We're the first member committee to take that scenario framework and apply it at a country level,” says Carnegie. He expects the results to be a significant contribution to New Zealand's energy debate and to demonstrate its potential to other member committees.

“One of the attractions of the World Energy Council is that it seems to be an organisation that speaks truth to power. It's frank. You can have honest conversations. That suits our style. Another thing we like is the ease with which the Council delivers its analytical insights and frameworks. The Trilemma Indexes and the energy issues maps are just gold for us. We can do a bit of work here to leverage off a framework that the Council provides and get a high-profile output at the end of it. We're then able to stimulate a domestic conversation about policy.” ●

EVENTS

World Energy Leaders' Summit Manila, Philippines

17–18 June 2015

A high-level, invitation-only event held within the Asia Clean Energy Forum (<http://bit.ly/13kHEZ>). The summit provides a platform for the global energy leaders' community to facilitate dialogue on energy issues. It will be co-hosted by the President of the ADB and will include a private meeting of ministers.

Executive Assembly

Addis Ababa, Ethiopia

26–30 October 2015

The World Energy Council's annual meeting, welcoming the Council's community and representatives from the African and global energy sectors.

2016 World Energy Congress Istanbul, Turkey

10–13 October 2016



The World Energy Congress is the triennial flagship event of the

Energy and Geostrategy

Madrid, Spain

13 May 2015

WEC Spain will present its latest publication "Energy and Geostrategy 2015" at this event, co-organised with the Spanish Ministry of Defence. The minister himself has been confirmed to attend the gathering. Speakers will discuss current energy issues from a global geopolitical perspective. Topics will include Russia and Europe's energy security, the effects of conflicts in the Middle East on the energy industry, the prospects for nuclear energy, energy poverty, and the energy industry of the Arctic.

Download last year's edition at: <http://bit.ly/1zaZOzi>

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World Energy Council. It has gained recognition since the first event in 1924 as the premier global forum for leaders and thinkers to debate solutions to energy issues. The event also provides an opportunity for executives to display their technologies and explore business opportunities. With the upcoming Congress in Istanbul – to be held under the theme "Embracing new frontiers" – the event will have taken place in 21 cities around the world.

Catch up on the 2013 Congress at: <http://bit.ly/1n1WVW>

MEMBER COMMITTEE EVENTS

2015 Canadian Energy Summit

Toronto, Canada

26–28 May 2015

There is an important, but typically untold, story about the role that energy plays in the economic, social, environmental and regional fabric of Canada. The Energy Council's conference will address this knowledge gap. Sessions will include: external influences; energy economics; infrastructure; social impacts; First Nations' projects and partnerships; and energy and the financial sector.

<http://www.energy.ca>
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3rd International LNG Conference (ConferenzaGNL)

Rome, Italy

11–12 June 2015

Focusing on LNG-as-fuel applications in marine and road transport in the Mediterranean region, the conference will gather national and international experts from business, research, and civil society. Organised by WEC Italy in partnership with Symposia.

<http://www.conferenzagnl.com/>
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Bolivia Gas and Energy International Congress 2015

Santa Cruz, Bolivia

19–20 August 2015

The 8th annual Congress of the Bolivian

Chamber of Hydrocarbons and Energy (CBHE) will analyse the realities of the energy and hydrocarbons sectors. This year's event will be held under the theme "Energy challenges of the next decade – crisis or opportunity?"

Catch up on last year's event at: <http://bit.ly/1C46UIt>
<http://boliviagasenergia.com/2015/>
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International Beirut Energy Forum

Beirut, Lebanon

9–11 September 2015

With continuous oil price fluctuations, how is the world's sustainable energy sector being affected? What are the dynamics of fuel-based economy and sustainable energy development? Energy ministers and leaders from around the world will look at these and other issues at this platform for discussion of topics related to renewables, energy efficiency, and green buildings in the MENA region.

Catch up on last year's event at: <http://bit.ly/15InlgB>
Contact: Pierre El Khoury
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SEE MORE COUNCIL EVENTS AT
www.worldenergy.org/events/future

ABOUT THE COUNCIL

The World Energy Council has been at the forefront of the energy debate for nearly a century, guiding thinking and driving action around the world to achieve sustainable and affordable energy for all. It is the UN-accredited energy body and principal impartial network, representing more than 3,000 organisations – public and private – in almost 100 countries.

Independent and inclusive, the Council's work covers all nations and the complete energy spectrum – from fossil fuels to renewable energy sources.

JOIN OUR NETWORK

Join the debate and help influence the energy agenda to promote affordable, stable and environmentally sensitive energy for all. As the world's most influential energy network, the World Energy Council offers you and your organisation the opportunity to participate in the global energy leaders' dialogue.

Find out how you can:

- join a Member Committee;
- become a Project Partner, Patron or Global Partner;
- take part in annual industry surveys, study groups and knowledge networks;

by visiting our website and contacting our team on: <http://www.worldenergy.org/wec-network>

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