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WORLD ENERGY FOCUS

monthly insights from the WEC's global leadership community

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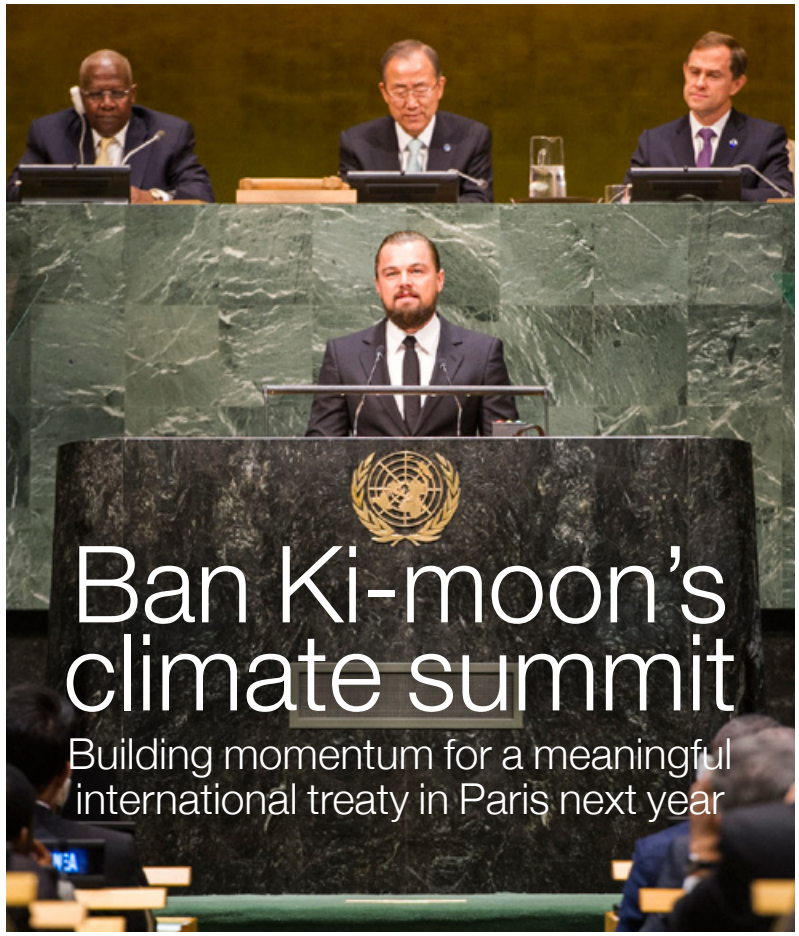


Ban Ki-moon's climate summit

Building momentum for a meaningful international treaty in Paris next year

Last month's one-day United Nations climate summit in New York may not have met everyone's expectations but it certainly went a long way towards building awareness of climate change and pushing the issue up the political agenda – precisely what it was meant to achieve. We have yet to see whether world leaders can achieve what they failed to achieve in Copenhagen in 2009: a meaningful international climate treaty at the COP 21 talks in Paris at the end of next year. But Ban Ki-moon's summit and the thousands of demonstrations around the world that preceded it sent a clear message – the world is watching ... and waiting.

Actor Leonardo DiCaprio – newly appointed UN Messenger of Peace – tells political and business leaders: "The time to answer humankind's greatest challenge is now . . . You can make history, or you will be vilified by it." (UN Photo/Mark Garten)

The UN Climate Summit 2014, held on Tuesday 23 September at the United Nation's headquarters in New York and the brainchild of Secretary General Ban Ki-moon, attracted around 100 heads of state and government, along with 800 leaders from business, finance and civil society. It was preceded the previous Sunday by thousands of climate change demonstrations in cities around the globe, including more than 300,000 people who turned out in the streets of New York.

The day before the event, the Rockefeller Brothers Fund attracted much media interest when it announced in New York that it would be selling off its interests in fossil energy – with an "immediate focus on coal and tar sands, two of the most intensive sources of emissions of carbon dioxide" – and investing instead in clean energies.

The fund joins 800 institutions and individuals that have pledged to withdraw a total of $50 billion in fossil fuel investment as part of the Divest-Invest movement. Given that the Rockefeller fortune was based on oil, the move was seen as highly symbolic.

A shrewd move on the part of Ban Ki-moon was to appoint popular actor Leonardo DiCaprio (see photo) as UN Messenger of Peace in the run-up to the event, adding to the media excitement around it. DiCaprio warned political and business leaders: "The time to answer humankind's greatest challenge is now... You can make history, or you will be vilified by it."

Ban Ki-moon was clearly pleased with the outcome. "This was a great day," he told the assembled leaders. "The purpose of the 2014 Climate Summit was to raise political momentum for a meaningful universal climate agreement in Paris in 2015 and to galvanise transformative action in all countries to reduce emissions and build resilience to the adverse impacts of climate change ... We have delivered." He also published a long list of what he described as the "most significant announcements" at the summit (for details go to: *http://bit.ly/1voyBl9*).

'HUGE MISMATCH'

Not everyone was happy with the outcome, however. Among those disappointed was the widow of the Nelson Mandela, Graça Machel, who told the summit: "There is a huge mismatch between the magnitude of the challenge and the response we heard here today."

But this event was never planned to be where the solutions to the challenges of climate change would be hammered out.

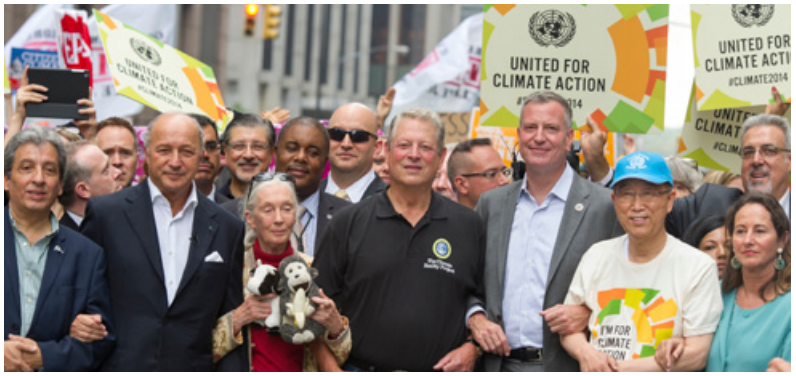
> see page 2

INSIDE THIS ISSUE

If that is to happen at all it will be at the Conference of the Parties (COP 21) to UN Framework Convention on Climate Change (UNFCCC) in Paris next year, where, it is hoped, a meaningful international treaty will be signed to deal with the mitigation of and adaptation to climate change. Those who take a keen interest in the issue remember the bitter disappointment of COP 15 in Copenhagen in 2009 – the last time that world leaders attempted to agree such a treaty, but failed.

The big question is: what happens now? Optimists point to the fact that much has changed in the intervening five years. For one thing, the uncertainties over anthropogenic climate change have lessened significantly. The latest scientific assessment (AR5) from the Intergovernmental Panel on Climate Change (IPCC) not only confirms that the climate is changing in radical ways, it also assigns a higher probability that human activities are the primary cause than AR4 did back in 2007.

Climate change will impact all sectors of business and industry, including the energy sector, which will face increasing challenges in production and transmission because of the effects of climate change, according to a briefing (*http://bit.ly/YGTTnJ*) based on the findings of AR5 and published earlier this year by the WEC, the University of Cambridge Institute for Sustainability Leadership, the Cambridge Judge Business School, and the European Climate Foundation.



UN Secretary General Ban Ki-moon (in blue cap) at the People's Climate March in New York. Also pictured (from right): Ségolène Royal, Minister for Environment, Sustainable Development and Energy of France; Bill de Blasio, Mayor of New York City; Al Gore, former Vice President of the United States and Nobel Laureate; UN Messenger of Peace Jane Goodall. (UN Photo/Mark Garten)

One of the big climate milestones on the road to Paris in November 2015 will be the publication of the final IPCC synthesis report for policymakers at the end of this month. Another will be COP 20, which takes place in Lima, Peru at the end of this year. It is there that officials will be preparing the first draft of the treaty to be negotiated at COP 21 in Paris.

The task is daunting but there is hope. At the launch of the WEC's 'World Energy Trilemma – Agenda for change', a set of recommendations for governments, business, and finance on how to make energy systems more sustainable, the UNFCCC's Christiana Figueres said: "The good news is that the money, technology and policy tools to shift the current emissions trajectory and steer humanity out of the danger zone are available. The Trilemma report demonstrates that a sustainable energy future is possible."

Crucial to the success of COP 21 will be the attitudes of the two nations that matter most in reaching an agreement – China and the United States, the two biggest emitters of greenhouse gases (GHGs). Again, the optimists point to a significant improvement in awareness of climate issues and willingness to address them on the part of both.

The US President, Barack Obama, attended the Climate Summit and said: "Our citizens keep marching. We cannot pretend we do not hear them." Over the past two years Obama has indeed been taking action to use his executive powers to push through climate change measures, such as the Clean Power Plan announced by the US Environmental Protection Agency last June (*see World Energy Focus Issue 1, p5 and Issue 2, p8*). But when it comes to agreeing an international treaty, the US Congress will still be a formidable obstacle to overcome.

The Chinese President, Xi Jinping, did not attend, though Vice-Premier Zhang Gaoli did. "As a responsible major developing country, China will make an even greater effort to address climate change and take on responsibilities that are commensurate with our national conditions." He added that China was on track to reduce carbon intensity by 40% from 2005 levels by 2020.

There is no doubting the increasing sense of urgency to take action to limit global warming to within 2°C of pre-industrial levels. But there remains the intractable issue that developing nations see industrialised nations as responsible for most of the GHG emissions in the atmosphere and find it hard to accept that their economic development should be fettered by action to mitigate climate change – even though China has overtaken the US to become the largest emitter.

Is the world finally ready to agree a meaningful international climate treaty? We now have just over a year to wait to find out. ●

The WEC will be at COP 20 in Peru, where it will showcase the findings of the Global Electricity Initiative on the actions of electricity utilities in tackling climate change and widening access.

ABOUT
WORLD ENERGY FOCUS

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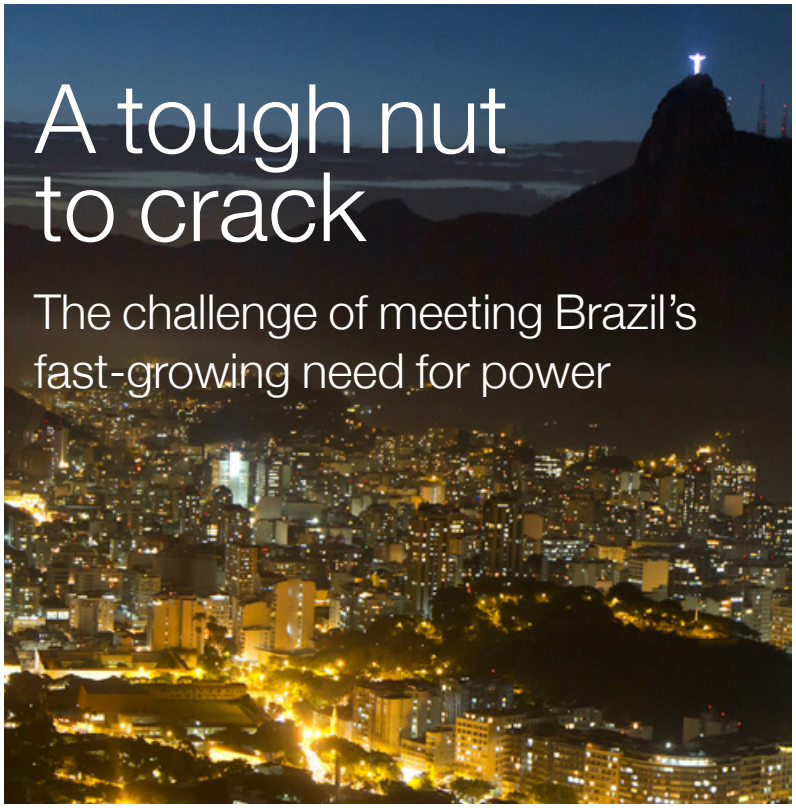
Alex Forbes has been reporting on energy developments and analysing trends for more than three decades. His expertise covers all the mainstream energy sources, policy, regulation and climate change. In 2013, Alex received the annual award from the International Association for Energy Economics for Excellence in Written Journalism.

A tough nut to crack

The challenge of meeting Brazil's fast-growing need for power



Rio de Janeiro at night. © Galinasavina | Dreamstime.com

Electricity is projected to meet an ever-increasing share of fast-growing energy demand in emerging economies. Meeting this demand growth securely, affordably and sustainably will be especially challenging in Brazil, South America's largest and – with more than 200 million people – most populous country. José da Costa Carvalho Neto is the CEO of Eletrobras, Brazil's largest electricity company. In this exclusive interview, he explains how his company is preparing itself to meet his country's future electricity needs.

Eletrobras claims to be "the main company responsible for the Brazilian energy matrix, considered the second cleanest and most renewable in the world". This is explained by 85% of your generation coming from hydropower and another 8.5% from nuclear. What are the advantages and disadvantages of hydropower being so dominant in your installed capacity?

Hydropower is a cheap way to produce energy. Furthermore, it doesn't cause so much damage to the environment in the long term. Brazilian rivers are among the largest in the world. It would be a waste not to use hydropower and instead use more expensive and polluting resources, such as oil. A predominantly hydroelectric system, like the one we have, requires a combination of complementary reservoirs and thermal power to maintain reliability.

We must do whatever is possible to mitigate the impacts of these constructions. Eletrobras has always had this concern. Tucuruí, Furnas, Xingó, Itaipu and the dams we are building in the Amazon – such as Belo Monte – are good examples. In all these constructions we try to combine environmental initiatives that promote local populations and bring economic benefits to the region, with the supply of quality power.

Regarding Belo Monte, we must highlight not only the environmental commitments, but also the social investments we have made in that region. We provided sewage, proper water and drainage systems. We invested in school facilities that benefited over 20,500 students and in health facilities, building and equipping 27 basic health units. We registered an 85% reduction in malaria cases. Not to mention the energy that the Belo Monte power plant will supply to 60 million Brazilians.

José da Costa Carvalho Neto: "The challenge is to meet demand with reliable, quality power, sustainably and at low tariffs"

Earlier this year there were reports that rain patterns were threatening an electricity crisis because so much of Brazil's electricity generation – around four-fifths – comes from hydropower. What is the current situation?

This has been one of the driest periods in Brazil since we started measuring rain levels 80 years ago. But we managed to maintain supply, thanks to recently built thermal plants and interconnections between the watersheds – which enable regions with highest hydroelectric production to supply energy to other regions.

Eletrobras is pursuing several more very-large-scale hydropower projects. For example, the Belo Monte project will add 11,233 MW. You are also involved in studies for hydropower projects on the Tapajós river, and at Garabí and Panambí on the Uruguay River. Would it not be better to diversify your generation mix?

Diversification is already happening. Besides those projects you have mentioned, we are building: the Angra 3 nuclear power plant, with 1,405 MW of installed capacity; eight wind farms with total capacity of 1,263 MW; and the 590 MW Maua 3 thermal power plant in Manaus, Amazonas. As I've already said, Brazil has been blessed with its rivers and it wouldn't make sense – in economic and environmental terms – not to use them. The hydroelectric potential of Brazil is 260 GW. Despite this, we intend to continue diversifying.

There are people who see large hydropower projects as inevitably disruptive to the environment. What do you say to them?

We have learned that hydroelectric power can be cheaper and less harmful to the environment than other energy sources. In recent studies, our Research Center for Electrical Energy (Cepel) has shown that the carbon emissions of a hydroelectric plant may, in some cases, even be negative. The impacts of power plant construction can be properly mitigated when building methods respect social and environmental parameters.

> see page 4

How is technological innovation contributing to the challenges you face?

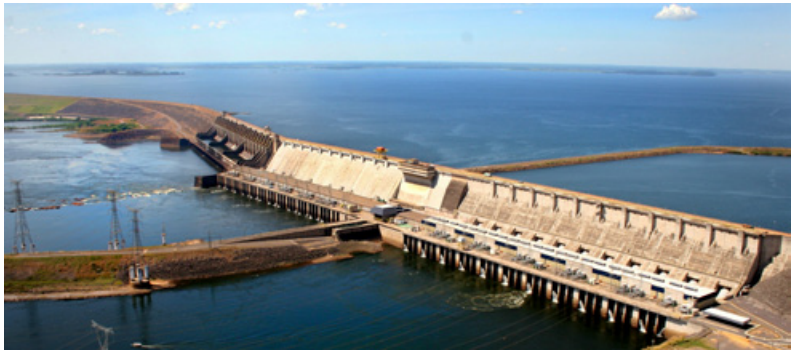
We need to optimise the use of our resources. To do so, innovation is key. Technology can make a difference in many areas – for instance: in the storage of energy from wind and solar; in capturing carbon molecules, allowing the use of polluting sources without impacting the environment; and, of course, in smart grids. Eletrobras elected innovation as the key message in our 2015 communication planning.

A challenge identified by the United Nations and others is to enable access to modern energy sources for the billions of people who either have no access to electricity or who still rely on traditional fuels for cooking. What is Eletrobras doing to widen access to electricity in Brazil?

Thanks to the Luz para Todos (Energy for All) programme – a federal government initiative managed by Eletrobras – an additional 15 million Brazilians have access to electricity. Eletrobras is also responsible for the Centro Comunitários de Produção (CCP) project, which promotes co-operatives within the regions where Luz para Todos programme takes place.

What plans do you have to expand nuclear generation?

We have two nuclear plants in operation – Angra 1 and Angra 2, with total installed capacity of 2,000 MW – and their performance levels are among the highest in the world. We are building Angra 3, with capacity of 1,405 MW. Brazil already has the sixth-largest uranium reserves in the world and we have prospected only a third of our territory. Also, Brazil is one of the few countries to have mastered uranium cycle technology. So if the government decides to expand the nuclear programme, Eletrobras will be interested in participating.



Around four-fifths of Brazil's electricity comes from hydropower.

What about non-hydro renewables such as wind and solar power?

We have wind potential of 340 GW onshore. Wind power is the fastest growing source in Brazil today and should remain so for a while because, unlike in other countries, wind power doesn't need subsidies here. Eletrobras and its companies have 150 MW of wind power in operation and over 1,263 MW under construction.

Concerning solar power, Brazil has great potential because of the high incidence of sunshine throughout the year. We have a project in the south, managed by our company Eletrobras Eletrosul, called 'Megawatt Solar', that has connected 1 MW of solar power to the national interconnected system. We also have some experience in micro-generation, using solar panels in isolated systems to supply small communities in Acre and Amazonas.

What concrete actions is Eletrobras as a corporate entity taking to prepare itself for the future? In particular, what are the company's investment plans?

Right now we are revising our Strategic Plan, setting a business horizon for 2030. Within it, our Business Plan for 2015–2019 has set some actions:

* to optimise the corporate and organisational structure;

* to improve our management system by sharing services and promoting the standardisation and computerisation of processes – and also the automation of operations in some facilities; and

* to reduce operating costs by conducting a retirement incentive plan, which has reduced the number of employees – now younger people have more opportunity to ascend.

Internationalisation is another initiative, especially in Latin America and Africa.

Between 2014 and 2018 we plan to invest R$ 60.8 billion (US$25 billion) – around R$ 44.8 billion (74%) to expand generation facilities and transmission lines and R$ 5 billion (8%) to expand distribution.

You recently became president of the Global Sustainable Electricity Partnership. What is your agenda as GSEP president?

The main challenge is to meet demand with reliable, quality power, sustainably and at low tariffs – and we have to do all that within a scenario where demand is growing and costs too, because each day we face more environmental constraints. We are having discussions with GSEP's 12 members on how we should interact with stakeholders. We have to find ways to convince and negotiate. We must answer the question: 'What are the best practices and the limits of our business?' These are some of the subjects we will discuss during our meetings in Foz do Iguaçu, Recife and Rio de Janeiro between now and mid-2015.

Eletrobras companies have 150 MW of wind power in operation and 1,263 MW under construction.

How much of a role will regional integration play in making energy in Latin America more secure, affordable and sustainable?

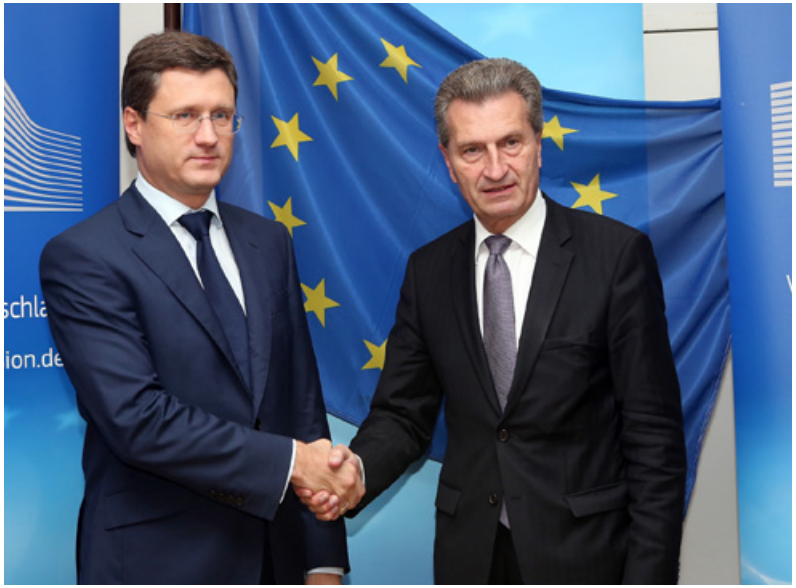
Latin American integration is an opportunity for all countries. However we must recognise that there is still a long way to go, with many diplomatic and technical negotiations taking place gradually to ensure real integration. Brazil, because of its size and because it is bordered by almost every country in South America, has a key role to play. And we must keep in mind one basic philosophy – partnerships must always be win-win. ●

Interview by Alex Forbes

José da Costa Carvalho Neto chairs the WEC Programme Committee (*http://bit.ly/1taJzMH*) and is a member of the Advisory Board of the Global Electricity Initiative (*http://bit.ly/1oa3z30*). He is also President of GSEP (*http://www.globalelectricity.org/en/*), a group of companies formed to promote sustainable electricity development.

Efforts to resolve Ukraine gas dispute intensify as winter looms

With summer over and winter looming, the need to resolve the gas payment and pricing dispute between Russia and Ukraine has gained a renewed sense of urgency.



Russian Energy Minister, Alexander Novak, and Vice-President of the EC in charge of Energy, Günther Oettinger, at the Russia-Ukraine-EU gas talks.

Russia ceased supplying gas to Ukraine in June because of non-payment, insisting that Ukraine pays up-front for new gas supplies. So far, Ukraine has got by on gas from storage and reverse flows from its neighbours in Europe. Meanwhile, transit volumes to Europe have flowed normally. But all the parties involved realise that a solution is needed soon.

On 26 September, Russia's Energy Minister Alexander Novak, Ukraine's Energy Minister Yuri Prodan, and Günther Oettinger, the EU's Energy Commissioner, agreed the basis of an interim deal, while the international arbitration court in Stockholm decides on referrals from Russia and Ukraine. The court's decision is not expected until next year.

Oettinger, who helped broker the deal, said: "This could . . . break the deadlock and ensure that gas supply to Ukraine and the EU is assured for the coming winter."

The proposal envisages Ukraine settling its debts at a preliminary price of US$268.5/1,000 m^3 by paying $3.1 billion by the year-end. A further 5 billion m^3 priced at $385/1,000 m^3 would be delivered over the winter, with Ukraine having the option to order more if needed.

The details of the proposal now need to be discussed by the governments of Russia and Ukraine – and a further round of trilateral talks may then follow.

Solar power 'could be biggest energy source by 2050', says IEA

Solar power could be the world's largest source of electricity by the middle of the century if policy-makers put their minds to it. So says the International Energy Agency in two reports released at the end of September.

The two "road-maps" are claimed to show how solar photovoltaic systems could be generating 16% of the world's power by 2050, with solar thermal electricity contributing a further 11%.

"The rapid cost decrease of photovoltaic modules and systems has opened new perspectives for using solar energy," said IEA Executive Director Maria van der Hoeven. "However, both technologies are very capital intensive. Lowering the cost of capital is thus of primary importance."

The reports highlight priority actions and milestones for governments, research and industry stakeholders.

Read "World Energy Scenarios to 2050", the WEC's exploratory work on what the energy world would look like by mid-century based on the decisions made today: *http://bit.ly/1dfc9et*

Power-to-gas pilot plant reports successful first year

A power-to-gas (P2G) pilot project constructed in eastern Germany by utility E.ON has injected more than 2,000 megawatt-hours of hydrogen into the natural gas pipeline system in its first year.

The novel technology provides a possible answer to a pressing question: what to do with surplus wind-generated electricity when the wind is blowing strongly but demand is low? The answer E.ON has come up with is to use the electricity to produce hydrogen by the electrolysis of water. The hydrogen is then injected into the regional gas transmission system, becoming part of the natural gas mix.

The P2G unit at Falkenhagen, which has a capacity of 2 MW, can produce 360 m^3/hour of hydrogen.

"Falkenhagen has given us valuable experience that will help us refine all aspects of power-to-gas technology, from conducting the regulatory approvals process to building and operating P2G units and marketing their hydrogen output," said E.ON Deutschland CEO Ingo Luge. "After just one year we can already say that P2G has significant potential."

E.ON is now building a second P2G unit near Hamburg with more compact and efficient electrolysis equipment.

Nuclear energy 'must address construction risk' to flourish

The nuclear energy industry has a promising future, despite the Fukushima event in Japan in 2011. However, it urgently needs to address a number of challenges that threaten its credibility and bankability. One of the most daunting is to demonstrate that it is capable of building projects on time and within budget.

That was the overarching message to emerge last month as industry players gathered in London for the World Nuclear Association's annual symposium – the largest regular meeting in the industry's calendar. This year the event was also a celebration of the 60th anniversary of the start of commercial nuclear generation in 1954.

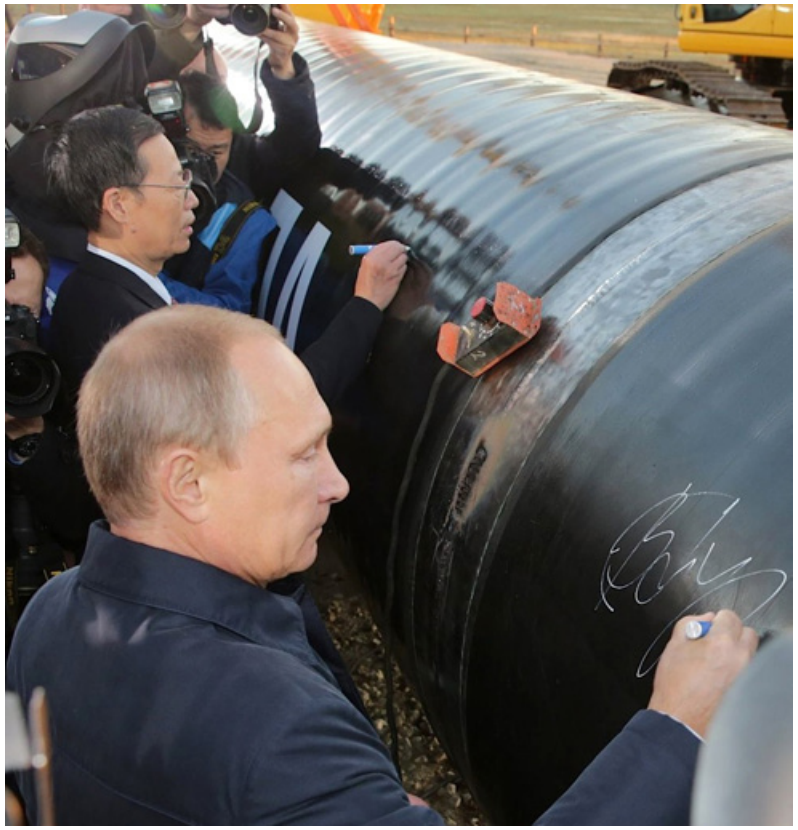
Several speakers, among them Sir David King, a climate change representative for the UK government, stressed that global electricity demand is set to grow robustly over coming decades, not just because of population growth but particularly because of the very rapid growth of middle classes in emerging economies, especially China. In a climate-constrained world, nuclear energy has the big advantage of being a proven zero-carbon energy source. Jerry Hopwood, Vice President at Candu, noted that as nuclear energy moved from being state-owned to being private – as it has in some countries, such as the UK – new models of financing were needed. There are currently 70 nuclear reactors under construction. ●

Read the WEC report on the status of nuclear energy one year post-Fukushima: *http://bit.ly/1eYSb2B*

WEC launches resilient energy infrastructure investment initiative

The WEC has teamed up with Swiss Re, the global re-insurer, and Marsh, an insurance broker and risk management consultant, to mobilise investment in energy. The Financing Resilient Energy Infrastructure project will explore how energy, finance and other sectors can work together to meet future needs.

"New emerging risks are posing ever greater threats to the energy sector," said WEC Secretary General, Christoph Frei. "Our initiative will develop the necessary understanding as catalyst for continuing to mobilise the capital flows required to expand, replace and transition our energy infrastructure." ●



Russia's President Vladimir Putin and Zhang Gaoli, First Vice Premier of China's State Council, make their mark on the first few sections of the Power of Siberia pipeline at a ceremony held on 1 September in Yakutia. September was a milestone month for new import pipelines for China. On 13 September, another ceremony was held in Tajikistan to break ground on the 30 bcm/year Line D of the Central Asia–China gas pipeline. It was attended by the Chinese president Xi Jinping and his Tajik counterpart Emomalii Rahmon. Then, on 17 September, Gazprom Chairman Alexey Miller informed Putin that negotiations had begun with the Chinese for a second import pipeline via the so-called "western route". Power of Siberia will supply gas to China via the "eastern route". The Chinese government expects the nation's gas consumption to rise from 170 bcm in 2013 to 420 bcm by 2020 – an unprecedented rate of gas market growth that presents major production, infrastructure and import contracting challenges. (Photo: Gazprom)

NEWS IN BRIEF

CHINA PRESSES ON WITH GAS PRICE REFORMS

China has taken another step towards market-based gas pricing. Prices for existing non-residential supplies rose by around a fifth in most provinces from 1 September. The last such increase was in July last year. The government has embarked on price reform to encourage new supply from indigenous production and imports. China's big energy companies have seen mounting losses on gas sales because of the difference in what they pay for gas and what they can charge for it.

UAE APPROVES ANOTHER TWO NUCLEAR POWER REACTORS

The Emirates Nuclear Energy Corporation (ENEC) has received approval to construct reactors 3 and 4 at the Barakah nuclear energy project. The licence from the Federal Authority of Nuclear Regulation (FANR) is for another two Korean-designed APR1400 reactors due to come on stream in 2019 and 2020. Reactors 1 and 2 are already under construction. Each reactor has a capacity of 1,400 MW. *(For an exclusive interview with the CEO of ENEC, see Issue 3, p3)*

ALASKAN OIL HEADS FOR KOREA

In yet another manifestation of the shale oil and gas revolution in the US, a tanker of Alaskan crude oil is on its way to South Korea – the first in over a decade, according to a report from Reuters. Rising oil output in the Lower 48 states is starting to crowd out Alaskan oil at west coast refineries. Alaska is largely exempt from the decades-old ban on US exports of oil.

WEC EVENTS

Executive Assembly

Cartagena, Colombia
20–24 October 2014

The Executive Assembly is the WEC's annual meeting. It will be hosted in Cartagena by COCME, the WEC Colombian member committee. The full week of events will welcome the members of the WEC community and representatives from the Colombian, Latin American and the global energy sectors for a series of open and private discussion sessions on energy issues, where participants will seek options for delivering sustainable energy systems on national, regional and global levels.

Energy ministers and leaders from business, finance and academia will share best practice and identify solutions to the energy trilemma during dedicated sessions, including the World Energy Leaders' Summit, the Future Energy Leaders' Summit, and the Energy Trilemma Summit.

The event will also host the WEC's major governance meetings, culminating in the full Executive Assembly Plenary, where members will agree on the strategic direction of the organisation.

http://bit.ly/1pBTRIe

Africa Energy Indaba

Johannesburg, South Africa
17–18 February 2015

Africa Energy Indaba (AEI) is the foremost African energy event for energy professionals from across the globe. The event gathers international and African experts to share their insights and solutions to Africa's energy crisis, while exploring the vast energy development opportunities in Africa. The Africa Energy Indaba includes a conference and an exhibition.

Designated the WEC's African regional event, the AEI is presented by the South African National Energy Association (SANEA), the WEC national committee. It is supported by the African Union Commission and the NEPAD Planning and Coordinating Agency.

http://www.africaenergyindaba.com

WEC MEMBER COMMITTEE EVENTS

Capacity Market – Solution for Poland?

Warsaw, Poland
29 October 2014

This conference will seek to find out if a capacity market is the solution for Poland to ensure the secure and adequate supply of energy from the country's power system. Panellists from science, industry, and government will discuss which market model should be implemented.

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First ISAFF Annual Workshop

Rome, Italy
4 November 2014

The Italian Sustainable Aviation Fuel Forum's (ISAFF) workshop will review initiatives in alternative fuels and biofuels for aviation in Europe, with emphasis on initiatives to support large-scale production. A joint project between ENAC (the Italian Civil Aviation Authority) and WEC Italy (*http://bit.ly/XVPigZ*), it is open to European energy and aviation stakeholders.

More on: http://bit.ly/1uwC20q

Contact: Secretariat ISAFF
segretariatoisaff@wec-italia.org

Annual Conference of the WEC Spanish Committee

Madrid, Spain
20 November 2014

The event will centre on the energy geopolitics debate, the role of energy companies regarding human rights, and the future of energy in the Transatlantic Trade and Investment Partnership (TTIP). Geopolitics has climbed high in the global energy discourse as the private energy sector works to implement the United Nations' "Protect, Respect and Remedy" framework. The event will be conducted in English.

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World Energy Trilemma 2014

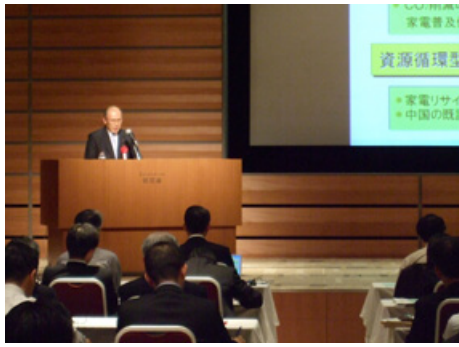
Washington DC, USA
24 November 2014

Marks the release of the WEC's 2014 World Energy Trilemma report, which assesses how efficient countries' policies are in managing the energy trilemma: delivering energy securely, sustainably and affordably. The report includes the world's most comprehensive ranking of countries' energy policies.

Register to attend on:
http://bit.ly/XLjjQe

Energy Top Executives Seminar

Tokyo, Japan
5 December 2014



Japan's energy industry has been going through big changes since the events at Fukushima. This seminar will look at the industry's challenges and actions.

Participants will hear from the most senior figures from Japan's oil, gas, goal, electricity, and electrical equipment/machinery sectors. Organised every three years by the Japan Energy Association, the WEC Japanese member committee, this seminar is open to the public.

Contact: Hideaki Tanaka
tanaka@jea-wec.or.jp

SEE MORE WEC EVENTS ON
www.worldenergy.org/events/future

A gas plant at Margarita, one of Bolivia's three large gas fields.

Bolivia looks to energy for its economic development

With the great potential of its primary energy sources, Bolivia has a range of promising opportunities to develop its economy. The challenge for the country's leaders is to take appropriate decisions to make the most of these opportunities – one of which is to become an exporter of electricity, ***writes Yussef Akly Flores, Sub Director of the Bolivian Chamber of Hydrocarbons and Energy and a member of the Bolivian WEC Committee.***

Bolivia currently has natural gas reserves of 10 trillion cubic feet (Tcf), produces 60 million m^3/day and exports 45 million m^3/day of this to Brazil and Argentina. The state receives US$5.5 billion a year in taxes and is pursuing the development of industrial projects such as urea and petrochemicals plants.

The development of Bolivia´s gas sector took off in the 1990s when reforms led to the modernisation of the industry, which led to significant investment, the discovery of substantial gas reserves and the export of gas to Brazil – the country's greatest commercial achievement up to that time. The sector is presently being further developed. Moreover, gas exports to Argentina have bee re-established with a contract that will ramp up to a volume of 27 MMcm/d by 2026.

Bolivia also has great potential in alternative energy generation. Currently the country is supplied with electricity from two main sources: natural gas-fired thermal power stations and hydroelectric power plants. However, Bolivia is keen to develop non-hydro renewables, such as wind, geothermal and solar energies. Over the past year the government has been undertaking small-scale projects to develop these energy sources.

In the case of gas, a priority at the present time is to invest in an intensive exploration programme. The President of the Bolivian Chamber of Hydrocarbons and Energy (CBHE) and Chair of the Bolivian Committee of the World Energy Council (COBOCME), Claudia Cronenbold, recently said: "The hydrocarbons sector being one of the pillars of the Bolivian economy, the government, through the different entities, is responsible for designing strategies to make the exploration programme finally achieve the results that the country needs – an imperative work for the state."

The authorities are working on this priority to ensure that gas reserves and, hence, state revenues from the gas sector are sustained over the long term.

The WEC Bolivian Committee, chaired by the CBHE, recently held its annual Bolivian Gas & Energy Congress. It took place in August and had as its central theme "energy globalisation – the future of oil, gas and other energies".In addition to the main Bolivian energy authorities, a dozen international speakers participated in what was an ideal opportunity to analyse Bolivia's energy situation against the backdrop of global energy developments.

The President of the state oil company YPFB, Carlos Villegas, told delegates that "from 2006 to 2013 the sector has invested US$7.1 billion, and in 2014 the figure is US$3.0 billion". The President of the national electricity company Empresa Nacional de Electricidad (ENDE), Arturo Iporre, said Bolivia intends to have 6,000 MW of electricity generation capacity by 2025, up from 1,400 MW today. The Deputy Minister of energy development, Franklin Molina, added that "diversifying the country's energy matrix is one of the government's objectives". For his part, the Vice President of the Plurinational State of Bolivia, Álvaro García, said that the country intended to develop nuclear energy, along with solar, wind and geothermal energy. COBOCME's Cronenbold emphasised the need to "work on the constant search for a more competitive energy sector to continue contributing to Bolivia's development".

Together, these messages show that Bolivia's private and public energy sectors are well aware of the challenges that the country is facing. COBOCME intends to continue supporting the development of Bolivian energy – as the nation moves towards becoming a substantial exporter of electricity as well as gas. ●

Information on Bolivia's energy resources is available at: *http://www.worldenergy.org/data/resources/*

ABOUT THE WEC

The World Energy Council (WEC) 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 WEC's work covers all nations and the complete energy spectrum – from fossil fuels to renewable energy sources.

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