



# China's changing fuel mix

Why pollution concerns are starting to change the game

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**China remains overwhelmingly dependent on coal for its energy supply, but the nation's fuel mix is changing. Natural gas consumption is expected to grow to around 420 Bcm/year by 2020; renewable energy is growing at a "spectacular" rate; numerous nuclear reactors are under construction and planned; and even transport, traditionally the province of oil, is moving to lower-carbon sources, such as electricity, LNG, compressed natural gas and LPG. It will take time to make a big dent on consumption of oil and coal, but the trends are unmistakable.**

At the root of these changes are government policies to clean up pollution, both localised air pollution, which at times is a severe hazard

to health, but also carbon dioxide emissions as China's leaders long ago accepted the reality of global warming and the need to take action.

It will be a huge challenge to improve China's ranking from the current position of 78 in the WEC's energy sustainability index (for details go to: <http://bit.ly/UfFkml>). China has the world's largest population, many of whom are still very poor, and has become the largest emitter of carbon dioxide. So reconciling the imperatives of maintaining rapid economic growth to lift people out of poverty, keeping energy affordable so that industry remains competitive, and at the same time mitigating the environmental

impacts of energy production and consumption is a monumental task.

"China has been taking real actions to slow global warming," says Qinhua Xu, Associate Professor at the School of International Studies of the Renmin University of China, and a committee member of the WEC. "China is resolute in reducing emissions as shouldering its due responsibility in the matter is not only a commitment to the world but also a must for its own development.

"Chinese authorities have long realised a green and low-carbon path will be the only choice for the nation's sustainable development, given its large population, limited resources and vulnerable environment.

### POLICIES IN PLACE

"Although China's emissions are rising and may continue to rise until its urbanisation peaks, the country has policies in place to limit emissions and is taking steps to boost its renewable energy industries, force power generators to clean up their coal plants and use more clean energy."

One of the biggest challenges will be to reduce the share of coal in electricity generation, given the nation's large reserves and its relatively low cost.

According to Olivia Boyd, a Beijing-based analyst for IHS Energy Insight, 2014 energy targets and policy priorities announced earlier this year were "an > see page 2

### EXCLUSIVE INTERVIEW

#### The new face of nuclear energy

The CEO of the Emirates Nuclear Energy Corporation, Mohamed Al Hammadi, explains why the UAE has chosen to develop nuclear energy, why he is confident the reactors will come on stream on time and within budget, and why the nation sees itself as a model of how nuclear power can be developed cost-effectively and safely

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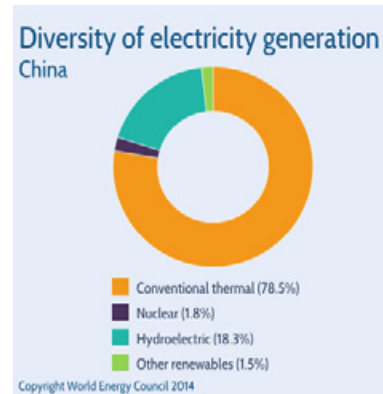
intensification of previously announced targets". An example is a new target to reduce the share of coal in the energy mix from 67% in 2012 to 65% in 2014, a year earlier than previously planned. "In the wake of record-breaking air pollution levels in 2012/13," says Boyd, "the government has stepped up its programme of switching coal-fired capacity to natural gas."

Increased use of gas is a central plank of the government's diversification strategy. "In 2012, the National Development and Reform Commission (NDRC) issued the 'Notice on Printing and Distributing the Twelfth Five-Year Plan for Natural Gas'," says Qinhua Wu. "Its aim is to expand the scale of

the use of natural gas and to promote development of natural gas industry."

China's gas consumption has been growing rapidly, from just 25 billion cubic metres (Bcm) per year in 2000 to 144 Bcm/year in 2012 – an average annual growth rate of 15.9%. Last year it reached 170 Bcm, 18% up on 2012. Estimates of how quickly gas demand will rise in the future vary widely. The government recently announced that it expects demand to rise to 420 Bcm in 2020. The International Energy Agency is less bullish. It estimates that demand will rise to 360 Bcm in 2019. However there are some who believe it could reach as much as 500 Bcm in 2020.

To reach the government's expected level, China would have to find an additional 250 Bcm/year of supply within six years and construct massive



**Electricity generation in China is still mostly thermal, with coal taking by far the largest share of the fuel mix. For more information go to: <http://bit.ly/UFfkmL>**



**Severe air pollution in China has prompted the government to take action on several fronts to reduce coal consumption. (Photo courtesy of Gazprom)**

gas infrastructure. It would be an unprecedented rate of growth.

The government also has big plans to grow zero-carbon generation – nuclear, hydropower and non-hydro renewables. "China has 21 nuclear power reactors in operation, 27 under construction, and more about to start construction," says the World Nuclear Association. "Additional reactors are planned, including some of the world's most advanced, to give more than a three-fold increase in capacity to at least 58 GW by 2020, then 150 GW by 2030, and much more by 2050."

Non-hydro renewables have been growing very rapidly. According to the IEA's latest medium-term outlook for renewables, "China remains the

[global] anchor of renewable capacity deployment, accounting for almost 40% of the global expansion and over 60% of non-OECD growth . . . Renewables should account for nearly 45% of incremental power generation over the medium term, ahead of coal."

It will however take time to make a big impact on China's energy mix, says Karl Rose, the WEC's senior director for policy and scenarios. "China is investing more than anybody else in almost every single energy source, and they will also have to invest more in energy efficiency than anybody else. It's true that they're investing more in renewables than anybody else but they are still growing coal. So the relative effect between these two is a lot more marginal than we would want." ●

## 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.





## The new face of nuclear energy

**The United Arab Emirates will be the first of the Gulf Co-operation Council nations to develop nuclear power – and only the second in the Middle East after Iran. In this exclusive interview, the CEO of the Emirates Nuclear Energy Corporation, Mohamed Al Hammadi, explains why the UAE has chosen to develop nuclear energy, why he is confident the reactors will come on stream on time and within budget, and why the nation sees itself as a model of how nuclear power can be developed cost-effectively and safely.**

*The United Arab Emirates has taken a leading role in the Middle East and North Africa region with its future energy initiatives, as embodied by Masdar, and is also rich in oil and natural gas. Why the need for nuclear power?*

We expect an average annual growth of 9% in electricity demand and the forecast is that by 2020 it will reach around 40 GW. It's a challenge to meet that demand for electricity so in 2006 and 2007 we carried out a very comprehensive energy study. We looked at all of the options to generate electricity and we tried to create a diversified portfolio of energies that would supply the needs of the nation, to become developed and to become sustainable.

We looked at coal and at renewables and at nuclear. We also have gas and diesel to make electricity. And with all that stacked up, economically and environmentally nuclear came out as one of the viable options. So did renewables and that's why Masdar was initiated. The more we scrutinised nuclear, the more it looked a viable option – in that it is safe, clean and environmentally friendly, and also very economical compared to other options.

*How will the start-up of the proposed four nuclear reactors between 2017 and 2020 affect the UAE's energy mix and its emissions of carbon dioxide? And what will be the impact on consumption of natural gas?*

The current four plants we are building will cater for around a quarter of

the electricity generation for the nation – and will contribute a saving of around 12 million tonnes of CO<sub>2</sub> emissions annually. Gas will not be impacted. Even with the current gas and oil available in the country, plus the nuclear, plus the renewables, we are still also buying LNG from outside.

*Your nuclear programme is being implemented under a US\$20 billion contract agreed with Korea Electric Power Company. Why did you choose to award that contract to KEPCO?*

We did a very comprehensive study for almost a year to analyse the different parameters. Our key was choosing somebody who has done it before and succeeded in doing it in a systematic manner – and managed to build the human capacity, one of the most important factors. The Koreans have a third-generation reactor – the AP 1400 – and they offered us a comprehensive deal that was commercially viable. They met all our pre-conditions to sign the contract, to be able to deliver on time, on budget, safely. We are executing the project today with them and we are seeing that the choice we made in 2009 was the right choice.

*Nuclear programmes in some countries have suffered severe cost over-runs and construction delays. How confident are you that your reactors will come on stream on time and within budget?*

When we selected the Koreans we were very blunt and very thorough in our review. We had guys from the international nuclear community, with

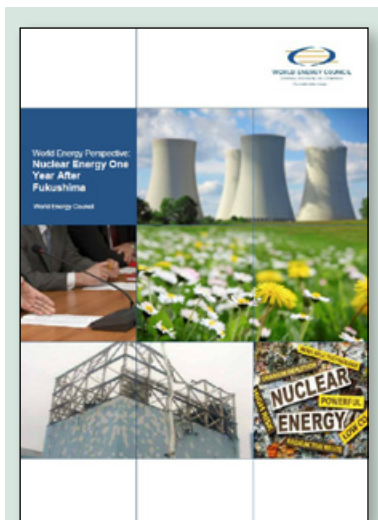
experience in building nuclear power plants, who went to Korea. They sat with the engineering companies, with the utilities, with the suppliers, with the manufacturers, and questioned and tested them on their quality standards and their management and methodologies. Whatever the Koreans promised they've been delivering to us.

Also, the UAE has been very successful in major project developments in oil and gas and other major infrastructures in the country. We have the confidence and expertise to tackle major project challenges.

*The Fukushima event in Japan in 2011 led to some countries deciding to phase out nuclear power. Japan itself is torn over the role that nuclear power should play in its future energy supply. What impact did Fukushima and its aftermath have on the thinking of the UAE government and ENEC?*

We did our design and technology selection in 2008 and signed a contract in 2009. Fukushima was designed in the 1960s and commissioned in 1971, so the engineering was done more than 40 years ago. The revolutionary design that the Koreans have used, and have offered us, has the privilege of getting lessons learnt throughout 40 years of improvements in nuclear power plants.

Looking at other countries, Japan's new energy plan has nuclear as one of the options. Looking at Germany, it's a very expensive bill that they're paying – by having to build coal or other not very environmentally > see page 4



**READ THE WEC REPORT**  
“World Energy Perspective:  
Nuclear energy one year after  
Fukushima”, on <http://bit.ly/1eYSb2B>

friendly plants and having to buy expensive energy from France and other neighbouring countries.

*Several major concerns with nuclear power surround the nuclear fuel cycle. How will you be sourcing fuel? And what will you be doing to make spent fuel and other hazardous materials safe?*

Currently we have a diversity of supply of the fuel, between countries and suppliers. We break the fuel supply chain into five phases, or cycles, all the way from mining to fuel assembly. In each one of those steps we have multiple suppliers. We have contracts signed with over six companies today to supply the first segments of the fuel.

For fuel storage, our policy paper talks about three options: the short, the medium and the long term. Medium term is the 160 or 200 years option. Short term is from 6 to 20 years.

The first option is either we keep the spent fuel inside spent fuel tanks which can hold the fuel for 20 years of the fuel used in the power plant. Or after every six years we can transfer fuel from the short term to the medium term, which is the option used in a lot of developed nations. We put the nuclear fuel inside lead-shielded concrete dry casks that have very low maintenance. It's a very safe solution.

Longer term we have the option of re-processing fuel outside the country, with friendly nations like France and others who have the technology. But that only will be done when the re-processed fuel is cheaper than fresh fuel. The last resort will be to bury the used fuel underground.

*Nuclear technology requires specialist skills that are in short supply. What is ENEC doing to ensure the ready availability of trained people? And how many of them are likely to be UAE nationals?*

The UAE has been very successful in infrastructure projects because we bring a lot of international expertise, who come with their best practice and experience. Today I have over 1,100 people working in the ENEC organisation. That number is split roughly 50:50 between people managing the project construction



**Unit one is now 55% complete, and the whole project more than 35% complete. The aim is to commission the first reactor in 2017 with three more plants coming online each year to 2020. (Photo: ENEC)**

and operations people who will run the power plant. In 2008 it was myself and a couple of people.

Roughly 65% of them are Emiratis, who are rubbing shoulders with experts with more than 25 years of experience and learning from them. They will be leaders in this industry because as you know today we are building the biggest nuclear project in the world. Nobody else is building four units at one go, on one contract.

On the educational training of Emiratis we have four streams. Stream one is re-tooling qualified experienced Emiratis from mechanical, electrical and other fields to become acquainted with nuclear standards. Another is on the academic side where we take people from mechanical and electrical and other majors and send them for a quick masters degree. The third is a long-lead process, a bachelors degree. And we have a fourth tranche, the technicians and technologists who

will be operating the power plant and maintaining it.

*A concern with nuclear power is the non-proliferation of technology and materials that could be used to make weapons. What is the UAE's policy on non-proliferation?*

The UAE has adopted a very high standard when it comes to non-proliferation. By law we will never re-process fuel in the country. There are many other commitments. Our regulator is responsible, in coordination with the Ministry of Foreign Affairs and the IAEA, for having a comprehensive accounting system for all the fuel that comes on board – so that the IAEA and the countries who are selling us fuel know where our fuel comes from, where it goes and where it is stored.

When it comes to operational transparency we have our international advisory board. They report directly to the president of the country and they publish reports on the progress of the

nuclear programme on their website. It is a very transparent, very open critique.

*The UAE has said it wants to be a model of how nuclear power can be developed cost-effectively and safely. What practical steps are you taking to make this a reality?*

We are working very hard. First of all, we have been blessed by starting a programme from a blank sheet of paper. That's where you can really learn from everybody globally, bringing the best ideas and learning from the mistakes.

A key contributor to our success is the transparency of our nation to the international community, with friendly nations bringing their expertise and know-how to implement the nuclear programme to the highest standards of safety and security. We have achieved much bigger scopes than we hoped for in the initial days. ●

**Interview by Alex Forbes**

Mohamed Al Hammadi also chairs the World Energy Council's Knowledge Network and High-Level Advisory Board on Nuclear and Uranium. The group, to be launched later this year, will gather the knowledge of close to 20 nuclear energy chief executives and experts to look at the future of nuclear technology and resource. Their findings will contribute to the next edition of the WEC's World Energy Resources study.

## 'Responsible' energy taxes key to achieving sustainability, says IMF

**A report from the International Monetary Fund calls on policymakers around the world to ensure that energy is priced "responsibly", with taxes that reflect health and environmental costs. The report provides estimates of the tax levels needed to incorporate health and environmental costs into the prices of coal, natural gas, gasoline and diesel for over 150 countries.**

Launching the report at the Center for Global Development in Washington DC, the IMF's managing director Christine Lagarde said: "Two years ago I made a commitment that the Fund would provide practical guidance – a kind of toolkit – to help our members ensure they are pricing energy responsibly. Today we are following through on that commitment by releasing a new book: *Getting Energy Prices Right: From Principle to Practice*."

According to Lagarde, energy is currently "pervasively mispriced". With appropriate reforms, the IMF estimates that premature deaths from the use of fossil fuels could be reduced by 63%



**IMF's Christine Lagarde: fiscal policy "must take centre stage" in energy pricing. (Photo: CGD)**

and carbon emissions by 23%, while raising revenues by 2.3% of GDP. "We have been pushing hard for the elimination of subsidies, which are bad for the planet, bad for the economy, bad for the budget and bad for social equity," said Lagarde. "But we need to go well beyond the elimination of direct cash subsidies and make sure that energy tax systems around the world properly reflect environmental side effects ... Taxing energy is not the only route. We can certainly think of good alternatives like programmes where governments sell rights to pollute."

Commenting on the IMF's proposals, Joan MacNaughton, the WEC's Executive Chair, World Energy Trilemma, said: "We interviewed energy leaders globally in 2012 for our WEC Trilemma report [for details go to <http://bit.ly/1r31t6M>] and we asked them what kind of policy framework they needed in order to have confidence to invest – because investment is one of the big energy challenges. The group's overwhelming view was that the best approach to dealing with the environmental issue is market-based carbon pricing." ●



**Students celebrate breaking ground on a biomass toilet project that will generate enough energy to power their school. (Photo: Rudy Gharib/USAID)**

## World Bank commits US\$5 billion to Power Africa initiative

**The World Bank Group has committed US\$5 billion in direct financing, investment guarantees and advisory services for energy projects in six African countries participating in the Power Africa initiative – Ethiopia, Ghana, Kenya, Liberia, Nigeria and Tanzania. Across Africa 600 million people still lack access to electricity, despite it having some of the world's largest hydropower, geothermal, wind and solar potential, as well as sizeable oil and gas reserves (for details go to <http://bit.ly/1x0bxCw>).**

Announcing the commitment at the first US-Africa summit last month, the World Bank's president Dr Jim Yong Kim said: "The US government and the World Bank Group are now working on specific tasks and milestones which could help to achieve one-quarter of Power Africa's goal of generating 10,000 MW of new power in sub-Saharan Africa."

Power Africa is a five-year initiative launched by US president, Barack

Obama, in 2013 to support economic growth and development by increasing access to reliable, affordable and sustainable electricity. ●

According to the WEC's World Energy Scenarios, on current paths 266–402 million people in Sub-Saharan Africa will still have no electricity access by 2050. Find out more on: <http://bit.ly/1dfc9et>

## Announcing the World Energy Focus annual edition, 2014

**We hope you are enjoying the World Energy Focus monthly edition, produced by Energy Post Productions (EPP). We have had very positive reactions so far. We are pleased to announce that we are working with EPP once again to produce our prestigious annual printed publication, the newly titled *World Energy Focus 2014*.**

The *World Energy Focus 2014* is the new official WEC magazine, packed with interviews, essays and analyses, which will be distributed to all participants at the WEC's World Energy Leaders' Summit and Executive Assembly in Cartagena, Columbia, taking place from 20 to 24 October 2014. It will also be made available to the WEC member organisations in over 90 countries.

The *World Energy Focus 2014* will provide businesses with a unique opportunity to directly reach top decision-makers from across the world. If you are interested, please contact: Matthew James, EPP, [info@worldenergyfocus.org](mailto:info@worldenergyfocus.org)

## UK launches shale gas licensing round amid strong public opposition

**The strength of political support for shale gas development in the United Kingdom was highlighted at the end of July when the government announced an onshore oil and gas bidding round. However, the announcement came amid mounting opposition to the extraction of hydrocarbons from shale using hydraulic fracturing, or “fracking”.**



**Cuadrilla’s drilling activities in southern England sparked protests in the summer of 2013. (Photo: Cuadrilla)**

Attracted by the example of the United States – where the shale gas and oil revolution has contributed to an economic and industrial renaissance – UK ministers are adamant that shale gas and oil can be developed safely if regulated properly.

Moreover, gas production from the North Sea has long been in a phase of seemingly inexorable decline, which has led to the UK having to import increasing volumes of gas by pipeline and in the form of LNG. The dispute

over Ukraine, and the possible impact on Russian gas supplies to Europe, have heightened concerns about dependence on foreign energy supplies – with the IEA having been asked at the recent Rome summit of G7 leaders to “present within six months options for individual and collective actions of the G7 in the field of gas security.”

The big question now facing the industry is how much opposition it will face when drilling activities get under way. Last summer saw big demonstrations in southern England when Cuadrilla Resources conducted drilling activities. Controversy was heightened when, a few days after the bid round was announced, the government published a redacted report entitled “Shale Gas: Rural Economy Impacts”. The report examined the impact of shale gas drilling on house prices and local services. ●

## IEA and BNEF differ on outlook for renewables

**Reports on the outlook for renewable energy just published by the International Energy Agency (IEA) and Bloomberg New Energy Finance (BNEF) differ significantly in their projections for growth – emphasising the uncertainty that still surrounds the development of wind and solar power.**

BNEF sees over half of the world’s power coming from renewables by 2030. Advisory board chairman Michael Liebreich comments: “This technology-by-technology forecast of power market investment is more bullish on renewable energy’s future ... than some other forecasts, largely because we have a more bullish view of continuing cost reductions.”

The IEA – while noting that renewables have been growing very rapidly – warns of a slow-down. Executive director Maria van der Hoeven says: “Just when renewables are becoming a cost-competitive option ... policy and regulatory uncertainty is rising.”

Karl Rose, the WEC’s senior director for policy and scenarios, cautions

that: “Cost reductions of equipment, say solar panels, have become less important. System integration costs are the real costs for renewables. When volatility of the system and power lines, or storage systems, becomes an issue then suddenly the costs are much higher than expected.” ●

**World Energy Scenarios finds that renewables grow exponentially to 2050, reaching 20-30% of the global primary energy mix. However, fossil fuels will remain the dominant energy source, supplying 59-77% of the energy mix. Find out more on: <http://bit.ly/1dfc9et>**

## Giant turbine ‘will cut wind power costs’

**Germany’s Siemens is gearing up to begin serial production of a large-scale wind turbine that it claims “marks a significant step towards reducing the cost of energy”. The company has just received a €650 million order for 67 of the machines for a wind farm offshore of the UK.**



The new 6 MW machine has a 154-metre rotor and is said to be one-third lighter than comparable systems.

“This weight advantage,” says the company, “provides improved economic viability across all project phases, from assembly to transport, foundations, and installation, all the way up to operation.”

Development of the turbine recently passed a significant milestone when the machine was type-certified by DNV GL, an energy advisory firm and certification society. The certification includes a 25-year design lifetime – five years longer than previous Siemens designs. ●

**How much wind resource is there in your country? Explore World Energy Resources data on: <http://bit.ly/1q29Uzi>**

## NEWS IN BRIEF

### FIRST SAFETY APPROVAL FOR JAPANESE NUCLEAR PLANT

Japan’s Nuclear Regulatory Authority has given draft safety approval for the Sendai 1 and 2 reactors in Japan, the first such approval since the Fukushima incident in 2011, which led to the closure of the nation’s entire nuclear fleet. However, according to a report from ratings agency Moody’s, it is likely to be at least another six months before the reactors are re-started. (For more on Japanese nuclear power see page 8 in issue 1.)

### CHILE STARTS WORK ON ENERGY STRATEGY TO 2050

Chile’s energy ministry has started work on an 18-month project to develop a long-term energy strategy, says a report in Business News Americas. It quotes Energy Minister Máximo Pacheco as saying: “We want to move from a reactive energy policy to a long-term strategy.” Energía 2050 will include goals to be reached by 2035 and a general strategy for 2035–50. The plan was promised by President Michelle Bachelet in her 2014–18 energy agenda.

### SECOND US LNG PROJECT TAKES FINAL INVESTMENT DECISION

The sponsors of the Sempra Energy-led Cameron LNG project in the United States have reached final investment decision (FID) on their 12 million tonne/year project. Cameron LNG becomes only the second LNG project to start construction in the Lower 48 states, after Cheniere Energy’s Sabine Pass. Another five FIDs are expected in the coming 12 months. (For more on US LNG see page 6 in issue 2.)

## 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. A week of events will welcome the WEC community and representatives from the Colombian, Latin American and the global energy sectors to seek options for sustainable energy.

25 energy ministers and leaders from business, finance and academia will share best practice and identify solutions to the energy trilemma during 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.

Register on: <http://bit.ly/1pBTRle>

### Africa Energy Indaba

**Johannesburg, South Africa**  
**17–18 February 2015**

Africa Energy Indaba is the foremost African event for energy professionals. Designated the WEC's African regional event, it gathers experts to share insights and solutions.

<http://www.africaenergyindaba.com>

### Energy 2014 – how to predict development in an unstable environment

**Brno, Czech Republic**  
**23–24 September 2014**



This seminar will focus on the status and impact of energy policies and legislation for the Czech Republic and other EU Member States. Discussions will include the design of new market rules, Europe's electricity and gas markets and long-term security of supply for the Czech Republic, and electricity and commodity prices.

These issues are key to the functionality and stability of not only the energy sector of the Czech Republic but also the whole of Central Europe due to the interdependence of the industry across neighbouring countries.

The conference will be held in the Czech and Slovak languages.

<http://www.egubrno.cz>  
Contact: Dr Jiří Ptáček  
[Jiri.Ptacek@egubrno.cz](mailto:Jiri.Ptacek@egubrno.cz)

### Clean Energy Week 2014

**Harare, Zimbabwe**  
**23–27 September 2014**

Clean Energy Week will be Zimbabwe's biggest event for renewable energy and energy efficiency. It will incorporate a trade exhibition, awards ceremony, and a high-level Clean Energy Forum that has already attracted prominent speakers from government and industry.

Hosted by Zimbabwe Energy Council, the WEC national committee, the event will look at the latest on policy initiatives, technology developments, and financing mechanisms.

<http://www.zimenergycouncil.co.zw>  
[cleanenergy@zimenergycouncil.co.zw](mailto:cleanenergy@zimenergycouncil.co.zw)

### SANEA Action for Energy Open Dialogue for the Gas Industry in South Africa

**Johannesburg, South Africa**  
**1 October 2014**

Natural gas is increasingly viewed as an option to address South African's energy challenges.

The aim of the SANEA Gas Industry Dialogue is to finalise an agreed view of the short-term (3–5 years) imperatives regarding the development of the nation's gas industry, with consideration from national government for policy review.

### German Energy Day 2014

**Berlin, Germany**  
**30 September 2014**

WEC Germany's 2014 Energy Day will be organised around the theme of "Energy strategies of tomorrow". EU Energy Commissioner Günther Oettinger, German State Secretary Rainer Baake, plus others will share their views of a European energy market. A panel of experts from France, Poland, Sweden and Germany will discuss their national energy strategies and how they fit into the European system. WEC Secretary General Christoph Frei will give a keynote speech on current global energy challenges.

<http://bit.ly/1mpvVmB>  
Contact: Sarita Cronjé  
[saritac@mweb.co.za](mailto:saritac@mweb.co.za)

### 7th Annual Energy Supply Forum

**Washington DC, USA**  
**2 October 2014**

Corporate executives will gather to discuss topics ranging from unconventional energy resources to onshore exploration and production to technological advances in the supply sector.

The Energy Day is WEC Germany's major annual conference. Every year it gathers around 200 delegates from the national and international energy sector. Read about last year's event on: <http://bit.ly/1eGpFTV>

<http://bit.ly/1mMw7MV>  
Contact: Nicole Kaim-Albers  
[kaim@weltenergiert.de](mailto:kaim@weltenergiert.de)



Topics include: US exports of crude oil, natural gas, and coal; the shale revolution; the future of coal and nuclear power; promoting technological innovation; domestic production advances; and the future global outlook.

<http://bit.ly/1rx3kDk>  
Contact: Kim Grover  
[kgrover@usea.org](mailto:kgrover@usea.org)

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## Mexico puts out welcome mat for private investors

The reforms signed into law last month by President Enrique Peña Nieto herald a new energy era for Mexico. Pablo Mulás, Executive Director of the WEC's Mexican Committee, explains what the ending of decades-old monopolies means for Mexico and for prospective new investors.

In December 2013, constitutional amendments to overhaul Mexico's energy sector – based on a proposal made by President Enrique Peña Nieto – were approved by both houses of the Congress. In oil and gas the reforms opened the upstream (exploration and production) and the downstream (transport, refining and commercialisation) to the participation of foreign and private Mexican companies. The electricity sector was re-organised to create a wholesale market with a competitive generation and commercialisation scheme.

In April, a proposal of nine new laws and modifications to 12 existing laws was sent to Congress to create an operational framework for the new energy system; this package was approved at the end of July.

The changes are radical as, until now, only public enterprises – Petróleos Mexicanos (Pemex) in oil and gas and Comisión Federal de Electricidad (CFE) in electricity – were allowed to operate in this sector (with some exceptions). Pemex carried out all the exploration, production, processing, refining, transporting and commercialising of oil and

gas and their products, and CFE was responsible for the generation, transmission, distribution and commercialisation of electricity.

Pemex and CFE will continue to operate but now in their respective markets. Two regulatory agencies – the Comisión Nacional de Hidrocarburos (CNH) and the Comisión Reguladora de Energía (CRE) – will regulate the markets. A transition period is planned such that the competitive markets in oil and gas and in electricity will start operating at the beginning of 2016.

A cap-and-trade system is to be set up to promote utilisation of clean energies; clean energy certificates will be available for trading. The Law on Climate Change specifies that by 2024, 35% of the kilowatt-hours generated should come from renewables, nuclear or fossil with carbon capture and sequestration (CCS). The trading system will be operated by the CRE.

### EXPECTED BENEFITS

The introduction of competition is expected to increase the efficiency and effectiveness of operations – because some areas in the system are below



President Peña Nieto signed the secondary legislation into law on 11 August

world standards. This should translate into lower prices for sectors that are not subsidised. Moreover, there is an intention to reduce the direct subsidies and cross-subsidies that presently distort management of the system.

Participation of private companies should increase investment and energy production. Participation of foreign energy companies in oil and gas and in electricity is expected to increase foreign direct investment in Mexico substantially – as has happened in other countries that have gone through a similar process.

An important expected result is that more public finance will be liberated and re-directed to solving pressing social problems.

The Mexican Petroleum Fund that will administer the income received by the government will have as its main objective the fostering of medium- and long-term development.

With these reforms, Mexican private investors and foreign investors have a whole spectrum of new opportunities that were previously closed to them. The government predicts that Mexico should be able to increase oil production from today's 2.5 million barrels/day (Mb/d) to 3.5 Mb/d by 2025 and gas production from 8 billion cubic feet/day (Bcf/d) to 10.4 Bcf/d.

The electricity sector is expected to grow rapidly. Between 2012 and 2027, generation capacity is expected to rise from 63.7 GWe to 98.7/114.9 GWe, depending on the technology mix chosen, and generation from 271 TWh to 498 TWh. These figures should interest all investors now that Mexico's energy sector has opened and competitive markets are on the way. ●

Information on Mexico'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.

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