

## INSIDE THIS ISSUE



Exclusive interview:  
Hwan-Eik Cho,  
President & CEO of  
KEPCO

**“We have a leadership role  
in reducing  
greenhouse gas emissions”**

**“Since the World Energy Congress in Daegu, Korea, in 2013, the Korean people have developed a deep interest in reducing greenhouse gas emissions”, says Hwan-Eik Cho, President and CEO of KEPCO (Korea Electric Power Corp). “And KEPCO has been assigned a leadership role in realising this ambition.” In an exclusive interview with World Energy Focus, Cho explains how his company is living up to the climate challenge. “We are focusing on energy storage systems and energy efficiency and see great prospects for electric vehicles.” In its overseas activities, the Korean electricity giant, with \$52 billion revenues in 2015 and a presence in 21 countries, wants to invest more in renewables and nuclear.**

For KEPCO, a vertically integrated behemoth along the entire supply chain from generation and distribution to sales of electricity in Korea, the world is changing rapidly. The company, this year ranked by Forbes as the best utility in the world based on sales, profits, assets and market value, is faced with the challenge of leading the transition to a low-carbon economy in Korea, at the same time as it has to respond to calls for more competition. With Israel, Korea is the only OECD country in which the retail power market has not yet been liberalised.

For Hwan-Eik Cho, who has been President and Chief Executive Officer at KEPCO since December 17, 2012, the direction his company has to go is clear. “At the Paris Climate Conference last year, it was understood by all participants that global warming is the most serious threat faced by mankind. We are already seeing catastrophes happen around the world.”

In Korea itself the public has also become highly aware of the climate

challenge and the role energy production and use plays in it. Cho says this was in part thanks to the World Energy Congress which Korea hosted in 2013. “Before then Korean people did not have a high understanding of the energy industry. Now they have become much more interested.”

So what activities is KEPCO pursuing to change the Korean energy economy? Currently, says Cho, of Korea's total generation capacity of some 96 GW, 65% is derived from thermal energy, divided more or less equally between coal and gas fired power. In addition, 22% comes from nuclear power. Renewables still only make a small contribution. “We have a nationwide target to reduce greenhouse gas emissions by 37% in 2030. We aim to increase installed renewable energy capacity to 21% by 2029. So we will be reducing coal power and making significant investment into renewable energy.”

Cho feels more investment will go into solar than into wind. [> see page 2](#)

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An important reason is that solar can be combined with battery storage, which is a field in which Korea is very active. “We are highly advanced in energy storage systems, fortunately. Of the top-five companies in the world in this area, three are located in Korea.”

“Global warming is the most serious threat faced by mankind. We are already seeing catastrophes happen around the world”

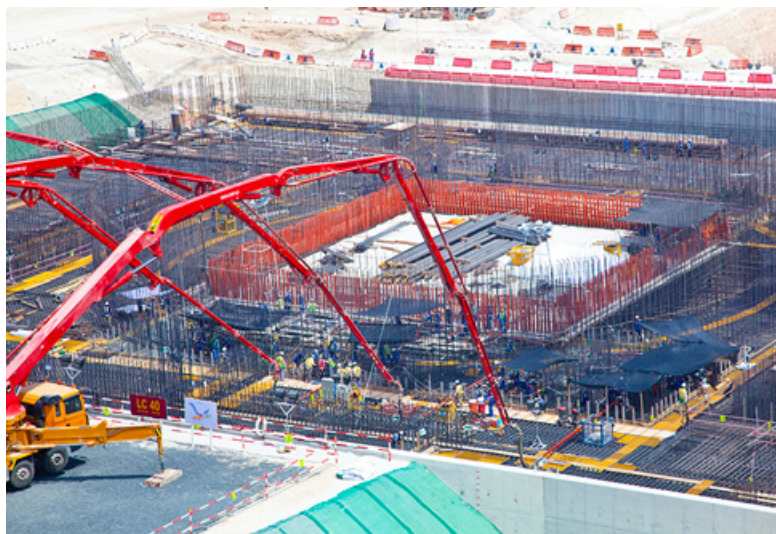
The concept of Energy Storage Systems (ESS) stands for intelligent storage technology that allows for more storage when the sun shines and dispatches more when there is less sunshine. “ESS enhances the stability of solar supplies. It is an important part of smart electricity management systems in homes, buildings and industries and eventually in smart cities. This is something we want to focus on.”

With regard to nuclear power, Cho believes “Paris” was a turning point. “After Fukushima, nuclear was regarded as something to be avoided. But against the backdrop of the threat

of climate change, there is now more understanding of the necessity of nuclear generation. Many countries, including China, are further developing nuclear power. So the prospects for nuclear are not bleak. But the competition will be stiff. Incidentally, an interesting market will also emerge for the dismantling of old nuclear power stations.”

KEPCO is leading a consortium that is building four nuclear reactors in the United Arab Emirates (UAE) and is looking for more nuclear orders abroad. The company has a substantial overseas business accounting for 8% of overall revenues and is seeking to expand that. But it is changing its emphasis, says Cho. “We realise that there are limits to building new thermal power plants, especially coal-fired, both environmental and financial. We want to focus on what we do best: energy efficiency, smart grids, micro-grids. And we want to become more active in renewable energy overseas.”

Another area in which Cho sees strong growth prospects in Korea is electric vehicles (EVs). “We are lagging behind Europe and North America in numbers, but I believe the future is bright for EVs in Korea.” He notes that conditions for EVs in Korea are favourable. “We have an electricity supply with the same frequency on a national scale, so charging and recharging will be quite easy. We are very advanced in IT. And we also have world renowned battery manufacturers.”



KEPCO as a company will facilitate the development of EVs actively, says Cho. “We will expand charging infrastructure, beginning on Jeju Island, which will be a carbon-free island, and then nationally.” He adds that KEPCO sees “great potential” in vehicle-to-grid

technology, in which EVs not only draw electricity from the grid, but also help to balance the electricity system. “We will make significant investments in this as well.”

Will all these activities be enough – and be timely enough – to save the world from climate disaster? Cho is moderately optimistic, but remains cautious. “Now with the Paris Agreement we have a new climate change regime, which is very different from the regimes we had in the past, especially Kyoto. What is positive is that we see major companies, like that of Bill Gates, and major countries, like the US and China, actively participating. So in that sense I am hopeful. But the climate regime is voluntary, so it remains to be seen whether countries will live up to their commitments.”

“The climate regime is voluntary, so it remains to be seen whether countries will live up to their commitments”

*A KEPCO-led consortium is building the Barakah Nuclear Power Plant in Abu Dhabi*

According to Cho, “we need to see whether it will be necessary to make the commitments binding after all.” He also notes that it still remains to be seen how international rules on carbon trading will work out. “There are a number of issues we need to pay close attention to.”

For Cho the tasks are clear. “As a publicly owned company, we carry a lot of responsibility. We have to make consistent efforts to develop new technologies, to improve our competitiveness, to respond adequately to the calls for market opening, and to make a contribution to the Korean and global economy. And we have to be a leader on climate change.” ●

**HWAN-EIK CHO** has been President & CEO of Korea Electric Power Corporation (KEPCO) since December 2012. Before that he was President of the Korea Trade-Investment Promotion Agency (KOTRA), CEO of Korea Export Insurance Corporation and Vice-Minister of Commerce, Industry and Energy. He holds a Ph.D. from Hanyang University, an Honorary Ph.D. from Korea Polytechnic University and an MBA from New York University.



# Offshore wind a revolution is on the horizon



**The Netherlands has shown how to drive the cost of offshore wind down to previously unimagined levels. This paves the way to turning the European North Sea into a giant power generating region. The European offshore wind model could be an example to the rest of the world.**

While auctions in sunny countries like the United Arab Emirates achieve record-low solar power costs (3 cts/kWh), a windy European country, the Netherlands, has just broken a world record with an unprecedentedly low cost for offshore wind. In July, a tender for two offshore wind farms in the North Sea (Borssele 1 and 2), representing a combined 700MW of output, was awarded to Danish utility Dong Energy at €72.70 (\$94.50) per MWh. This easily surpassed the Danish

wind farm Horns Rev 3, awarded in 2015 to Sweden's Vattenfall AB at a then-record-low cost €103 per MWh. According to the Dutch Ministry of Economic Affairs, additional connection fees for the offshore wind park are around €14/MWh.

Offshore wind has always been the most expensive kind of renewable energy. The latest levelised cost (LcoE) figures from Bloomberg New Energy Finance put offshore wind at \$174/

MWh, significantly more than onshore wind (average of \$83), solar PV (\$122) and coal or gas (which in a country like Germany have LCOEs of \$106 and \$118/MWh respectively). This makes the Dutch figure all the more impressive, even with connection fees included.

"With Borssele 1 and 2, we're crossing the levelised cost of electricity mark of €100 per MWh for the first time and are reaching a critical industry milestone more than three years ahead of time," Samuel Leupold, executive vice president and head of wind power at Dong Energy commented. Dong and the rest of the industry say the winning Borssele tender demonstrates

*Kentish Flats offshore wind farm.  
Photo Vattenfall*

the great potential of offshore wind. Indeed, they insist grid parity is in sight, proclaiming 2025 as the target date for offshore wind to finally competing on its own, without large subsidy support.

## TENDER MODEL

Yet the question remains: can this cost reduction pace be sustained? Or is the Borssele project an outlier owing its low price to exceptional circumstances?

Dong, the world's biggest developer and operator of offshore wind farms, might have put in a low bid to capture the market in order to muscle out the competition. There were also cyclical factors at work, such as low steel prices, access to low interest rates, and an oversupply of installation vessels. In addition, Borssele 1 and 2 are sited close to shore (22 kilometres) in shallow waters, affording planners lower logistical and transmission costs.

But experts agree that the key factor in bringing the price down was the business model used by the Dutch government. "There were a number of reasons for the low bid but the key one is that the Dutch government took a lot of the risk out of this project," says Oliver Joy, the political affairs spokesperson at WindEurope, the European association of wind power producers. It shows, says Joy, what's possible when

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technological innovation combines with clear regulatory signals.

To begin with, the Dutch put on the table a systematic roll-out plan of considerable size, with five auctions of 700MW a year up until 2020. The first Borssele tender is, by itself, now the largest offshore project in Europe, surpassing the London Array (630MW), off Kent in the outer Thames Estuary in the United Kingdom.

Moreover, the Dutch government offered developers a 15-year subsidy period, five years longer than what is currently offered in the UK. The appointment of a single grid operator, Tennet, to build one standardised transmission system helped embolden contractors to take on more risk. And the Dutch government further simplified the process by performing all the environmental and geological studies before offering up the auction.

The Dutch model, based on the example of Denmark, identifies who can build the cheapest capacity on an already-developed offshore wind site, says Jerome Guillet of Green Giraffe, a company that specializes in renewable energy financing. "It limits project risk by merging into a single point the decision-making on the permits and contracting."

### GLOBAL AMBITIONS

Offshore wind is on track to becoming a mainstream power, but only if it can further drive down costs. The industry believes this is possible. Michael Hannibal, CEO of Offshore Wind at

Siemens' Wind Power and Renewables Division, makes the point in the week following the Borssele announcement, his attitude buoyant for the good news it portends for the industry in Europe and beyond. "It is positive to see this downward trend, because this is what we have been promising," says Hannibal, citing a 2025 goal that would see the industry deliver offshore energy at a price of €80 per MWh.

Siemens will soon approach an average €100 price point, ahead of its own 2020 target date, and has long played a role internationally in markets like China where it has a licensing agreement with Shanghai Electric to deliver 4 MW turbines. Japan is also viable, says Hannibal, with the help of floating platforms developed in Europe in deep-sea locations off Portugal and Scotland.

With 11 GW installed, Europe still accounts for more than 90% of all offshore wind installations in the world, with the remainder located largely in China, followed by Japan and South Korea.

Siemens entered the Japanese waters in 2015 with a semi-offshore 3MW turbine, but it's in China where the market is more evolved, having passed the 1GW mark at the close of 2015. China now stands as the fourth largest market globally, a testament to governmental support, but also in Hannibal's estimation a reflection of the viability of the European offshore model.



The key, says Hannibal, is "predictable" long-term support. "Look at the incentive regime behind Borssele," adds Hannibal. "It stretched over many years... and that's really what we are requesting, predictability."

The "central scenario" from the European Wind Energy Association (EWEA) shows that by 2030 offshore wind capacity in Europe can be expanded to 66 GW, able to deliver 5% of total European electricity demand. For the countries around the North Seas, the contribution of offshore wind to their electricity mix would be considerably higher.

### WIND-CONNECTOR

The offshore wind industry makes relentless efforts to bring costs down, for example by increasing the size of turbines. Yet conditions are also becoming more challenging. In order to find suitable areas, new capacity has to be located farther out to sea.

Of new deployments in the UK, Germany, Denmark and the Netherlands, an estimated 40% will be installed far offshore, according to forecasting by the Dutch research program on Far and Large Offshore Wind energy (FLOW).

FLOW was created, in part, to accelerate "far offshore" deployments, and according to its director, Ernst van Zuylen, the five-year R&D effort is succeeding. "We were surprised by the Borssele outcome," says van Zuylen, but even for projects sited in more challenging waters he predicts average costs in the €7 cent kWh range before 2030.

Suction bucket jackets and concrete gravity-based foundations could reduce the need for hydraulic drilling of costly steel in waters deeper than 50 meters. There are now floating platforms for housing maintenance crews, as well as floating turbines,

per six 5MW turbines being tested by Statoil 24 km off the coast of Scotland.

Still further gains could be had in linking several offshore wind farms with onshore grids in different countries. The Dutch offshore grid operator, Tennet, is now pushing several programs in this direction, including a meshed grid concept that has the backing of nine North Sea partner countries, as well as a hub-and-spoke island dubbed "Wind Connector".

This would be an island in the middle of the North Sea, which would connect far offshore wind farms and transmit the electricity over direct current cables to the surrounding countries. But that's still a few decades ahead. What is clear after the latest results is that the North Sea countries will continue to pursue their offshore wind ambitions vigorously. They may serve as inspiration to the rest of the world. ●

## Chinese market shores up moderate growth in nuclear

**Some recovery is evident in the nuclear industry, as ten new reactors with a total capacity of over 9 GW were put into operation in 2015, according to The World Nuclear Industry Status Report 2016.**

Published in July, the annual report [<http://bit.ly/2addHHV>] is available in English and Japanese, and is supported by groups critical of nuclear energy: the MacArthur Foundation, Natural Resources Defense Council, Heinrich Böll Foundation North America, the Greens-EFA Group in the European Parliament, and the Swiss Renewable Energy Foundation.

There are 31 countries operating nuclear power plants, one more than a year ago, operating 402 reactors—an increase of 11 units compared to the situation mid-2015. The total installed capacity increased by 3.3% to reach 348 GW, which is comparable to levels in 2000.

This capacity growth over the last year is largely due to a 31% increase in nuclear power generation in China. Worldwide, 10 reactors started up in 2015, more than in any other year since 1990, of which 8 were in China.

As of July 2016, 58 reactors were under construction, of which 21 in China, the rest in 13 other countries. Total capacity under construction is 56.6 GW.

“Newcomer countries”, which are building or planning to build nuclear plants for the first time include

Belarus, United Arab Emirates (UAE), Bangladesh, Egypt, Jordan, Poland, Saudi Arabia, Turkey, and Vietnam. Chile and Lithuania have postponed plans, and Indonesia abandoned plans for a nuclear program altogether. The report notes a 10% increase in capacity from 344 GW in 1997 to 378 GW at the end of 2015. This equates to approximately 8% increase in output. Due to rising global demand over the same time period the nuclear contribution to electricity generation has fallen from 17.5% to below 11%.

The nuclear share of the world's power generation has remained stable over the past four years, at 10.7% in 2015. Nuclear power's share of global commercial primary energy consumption also remained stable at 4.4%.

In the context of nuclear's potential to lower carbon emissions, the report concludes: “If nuclear is to make a difference on the global level, it will need to [...] significantly increase its production both within its current markets and expand into new countries.”

Phase-outs, construction delays, competition from renewables, and financial losses of nuclear power providers are the main challenges to growth. ●

## EDF enters Chinese wind energy market

**EDF Energies Nouvelles. A subsidiary of French utility company EDF, has acquired an 80% stake in UPC Asia Wind Management (AWM) which develops and builds wind projects in China. Shareholders of the remaining 20% are local developer UPC China and the US-based investment fund Global Environment Fund.**

China is the world's leading renewable energy market, with strong growth anticipated. The Chinese government aims to reach 200 GW in installed wind energy capacity by 2020, an average increase of 15 GW per year, and is increasingly opening up the market to foreign investors.

EDF Group has had a presence in China for over 30 years through activities in nuclear, thermal and hydro generation, and energy services. The deal increases EDF's wind energy portfolio by more than 1.3 GW in China. Globally, EDF now operates more than 10 GW in installed wind capacity globally.

Jean-Bernard Lévy, Chairman and Chief Executive Officer of the EDF Group said: “Our goal is to accelerate our low-carbon generation, with a diversified energy mix where nuclear and renewable energy balance each other. Our development in high-potential markets such as China is a full part of this dynamic process.” ●

## Record low tariff in Dubai solar bid

**On 27 June, Dubai Electricity and Water Authority (DEWA) announced the selected bidder for the 800 MW third phase of the Mohammed bin Rashid Al Maktoum Solar Park - a consortium led by Masdar, the Abu Dhabi based developer of renewable energy, offering a world-record low tariff.**

The consortium, which includes the Saudi-owned company FRV (Fotowatio Renewable Ventures) and the Spanish Gransolar Group, bid a Levelised Cost of Electricity (LCOE) of 2.99 US cents per kWh.

The consortium was selected following a highly competitive process during which DEWA received 95 expressions of interest. “It is thanks to the technical clarity and transparency provided by DEWA that we have been able to deliver such a highly competitive bid,” said Mohamed Jameel Al Ramahi, Chief Executive Officer of Masdar.

Construction of the 800 MW third phase of the solar park will be based on the Independent Power Producer model. DEWA will develop shareholder and



DEWA announces selected solar park bidder.

power-purchase agreements with a view to signing in the last quarter of 2016.

“Phase three of the Mohammed Bin Rashid Al Maktoum Solar Park is a clear signal that solar power is a reliable and commercially viable technology, and a key part of the UAE's well-diversified energy strategy,” said Dr. Sultan Ahmed Al Jaber, Minister of State, and Chairman of Masdar. ●

## Japan's roadmap for clean coal

As coal-fired power surges in Japan post-Fukushima, the government is planning to fast-track low-emission technology development for thermal generation, reports Reuters news agency.

A plan from the Ministry of Economy, Trade and Industry aims at developing cost-efficient technologies for “clean coal” plants, carbon capture and

storage (CCS) sometime after 2025, and hydrogen power generation by around 2030.

Greenhouse gas emissions in Japan have risen dramatically since 2011 after the closure of the country's nuclear plants. Japan is committed to cutting emissions by 26% by 2030 (from 2013 levels). ●





*Solar powered electric vehicle in Anyang, Chnia, March 2015. Photo: Polywoda.*

These plans are in line with the recent findings of the World Energy Council's 2016 Issues Monitor Report [<http://bit.ly/1MafVI4>]. In the "deep dive" for China, the study highlights that energy leaders in China perceive renewable energies, energy efficiency and coal to be action priorities.

#### INNOVATION AND RESEARCH

China has already become the world's largest investor in clean energy in recent years, but the new Five-Year Plan will further reinforce this trend. China plans to more than double its wind power capacity to 250 GW, nearly triple solar PV capacity to 160 GW and expand hydropower 40% to 420 GW. By 2030, the country wants to meet 20% of its energy needs with non-fossil fuel resources, which is roughly twice as high as today. By 2020, the energy intensity of the economy will be reduced by 15%, coal use by 20% and the share non-fossil energy must reach 15%.

China will invest in innovation and research across a wide range of sectors: wind and solar power, smart grids, next-generation nuclear technology, and energy efficiency and conservation, says Wenke. For example, according to the Five-Year Plan, \$368 billion will be invested in smart grids, ultra high-voltage grids and distribution grids in the next five years.

Electric transport is also "a critical area", says Wenke. "In the next five years, most new cars must be electric." According to a report from think tank E3G, China aims to increase its production of "clean energy vehicles" ten-fold from half a million to 5 million on an annual basis. This would almost completely close the so-called Electric Vehicle (EV) emissions gap. This "gap" refers to the number of EVs that are needed to enable car makers to meet average fuel standards. According to a recent World Energy Council report [<http://bit.ly/29VGWCa>] in China it amounts to roughly 5.3 million, 22% of the projected passenger car sales.

*"We do intend to get more involved in international energy affairs and governance"*

Nuclear power will be expanded from 26 GW to 58 GW by 2020, with further growth projected to 2030 of up to 150 GW. The share of nuclear power in China's energy mix is still quite small, says Wenke. "For China, safety and security in nuclear power are paramount." The country has developed its own "third-generation" reactor, the Hualong One, of which two prototypes will be built in the next few

**Less coal. Less bureaucracy. More renewables. More market. Those are four key elements in the "new balance" China is seeking in its energy sector, after years of huge growth in fossil fuel consumption. Professor Han Wenke, Director-General of the Energy Research Institute of the National Development and Reform Commission (NDRC), China's largest ministry, explains the ramifications of the new Five-Year Plan for the energy sector in an exclusive interview with World Energy Focus. "We want to attract more private investment."**

The most important theme of the 13th Five-Year Plan for 2016-2020, which the Chinese government adopted earlier this year, says Han Wenke, "is rebalance and restructuring". After many years of strong economic growth,

China has accepted that "the new normal" will be characterised by lower – and more sustainable – growth.

For the Chinese energy sector, this means above all four things, says

Professor Wenke, who has been involved in a wide diversity of energy projects in China, ranging from energy efficiency and lighting (China Green Lights Project) to oil import strategy and electric power reform. First, China will greatly reduce its coal consumption. Secondly, it will invest much more in wind power and other forms of renewable energy. Thirdly, energy governance and administration will be reformed. And fourthly, the role of government will be reduced and the role of the market (private investment) will be expanded.

years. It aims to achieve a closed nuclear-fuel cycle in which no waste is generated.

### EMISSIONS PEAK

But China also intends to grow the share of natural gas, says Wenke. "We hope to double it in the next five years from 5% to 10%. We will develop our own resources, both conventional and unconventional, and import more, both from Russia and elsewhere."

"For China,  
safety and security in  
nuclear power  
are paramount"

China has committed to peak greenhouse gas emissions in 2030, but Wenke says it is possible that this peak will be achieved earlier, somewhere around 2025-2028. The country will start a nationwide carbon emission trading market next year, but according to Wenke, this should be seen as merely one of the ways in which China is trying to reduce emissions. "We are still exploring this. China is too big to cover all emitters. The emission market is a supplemental measure, although it may play a big role some day. The major problem is timing."

A crucial part of the Five-Year Plan is reform of energy governance, Wenke notes. "Many approval procedures that are now taking place at the national level will be transferred to the local level. Or abolished altogether." Energy monopolies will be broken up and market pricing introduced. "We want to give more room to the market and to attract private investors."

In many ways, China is now taking the lead in the low-carbon energy transition. That creates challenges of its own, as there are no models anymore to fall back on. According to Professor Wenke, China will seek international cooperation to solve energy challenges together with other countries. Wenke is Co-Chair of the US-China Clean Energy Forum, an example of such an international initiative.

But Wenke does not yet see China as leading the world on its own. "We have not reached that stage yet. But we do intend to get more involved in international energy affairs and governance." The opening up of the Chinese market to private (foreign) investors will help drive that process forward. ●



**PROFESSOR HAN WENKE**  
is Director General of the  
Energy Research Institute  
within China's National  
Development and Reform Commission,  
as well as a research professor. He is also  
Co- Chair, US-China Clean Energy Forum.

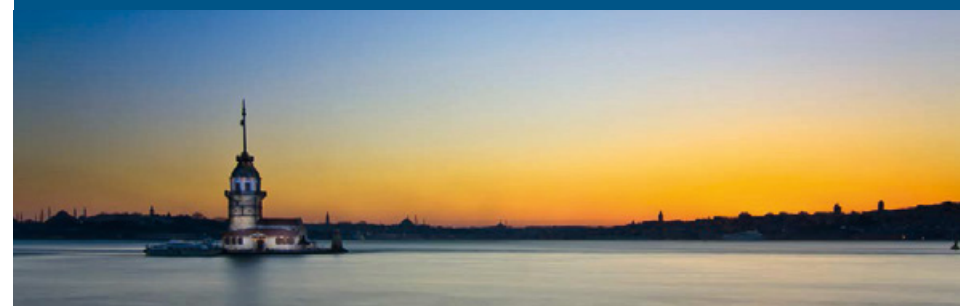
In recent years, he has both led and participated in extensive research and various projects: China's energy conservation technology policy, China Green Lights Project, environment emission mitigation technology options in the urban transportation sector of Asian countries, China's strategy and countermeasures on utilization of foreign high quality energy resources, oil import strategy, sustainable energy industrial policy of the early 21st century, energy development strategy in western areas of China, energy development planning within the 10th Five-year Plan, and electric power institutional reform.

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REPUBLIC OF TURKEY  
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## 2016 World Energy Congress

Istanbul, Turkey, 9–13 October 2016



**253 speakers from 83 countries and over 45 government ministers confirmed to feature at the World Energy Congress in Istanbul.**

10 Oct 2016 (Mon)	11 Oct 2016 (Tues)	12 Oct 2016 (Weds)	13 Oct 2016 (Thurs)
Vision and Scenarios for the Future	Identifying the Business Opportunities: Resources and Technologies	Policy Solutions to Secure Prosperity: Embracing the Trilemma	Africa: Securing a Sustainable Energy Future
Scene Setting			
Keynote Speeches			

Key speakers include Rainer Baake, Germany's State Secretary for Economic Affairs and Energy, and Prince Albert II of Monaco. This year's event will also witness senior representatives from Saudi Aramco, BP, OPEC, ENI, OMV, Gazprom, SOCAR and Total, among others, discussing the implications of the commodity price storm. Speakers from top energy innovators such as Econet, Silver Spring, TTECH, GE, Mobisol and Off-Grid Electric are also signed up. Appearing alongside these business names will be energy leaders such as Fatih Birol from the IEA and Lee Hoesung, from the IPCC Christina Figueres from the UNFCCC.

Over four days, the programme for the Congress will explore the critical priorities facing the energy industry today including of resilience, new business models, governance, climate, financing and market dynamics.

Christoph Frei, Secretary General, World Energy Council commented: "The 2016

World Energy Congress is the event which will define the future direction of the energy industry. It will actively embrace the new frontiers of the sector. We will look at the World Energy Scenarios' Jazz and Symphony models of energy markets. We will explore the importance of innovative business models and the commodity price storm. The calibre and range of speakers is reflective of the priorities which we have outlined."

Frei added "We are in close contact with the Organising Committee and preparations for the Congress continue and are progressing well with heightened security arrangements being put in place. We have some further good news with the conformation of EDF as a Silver Sponsor and additional speakers and delegates confirming attendance every day."

**For more information** on the Congress and registration, visit **the official congress website** <http://www.wec2016istanbul.org.tr> Follow the Congress on **Twitter:** <https://twitter.com/WECongress>

### New energy frontiers and its challenges for Bolivia

**Santa Cruz, Bolivia**

**17-18 August 2016**

International speakers at the 9th Bolivia International Gas & Energy Congress will analyse the global decision on climate change and energy transition and its impact on Bolivia. Bolivian government officials and prominent policymakers and organisations within the oil, gas and energy sectors will convene to discuss issues high on the energy agenda and present their future investment plans.

The Congress is supported by World Energy Council Bolivia and is free of charge for World Energy Council members, and will be held in English and Spanish.

Companies interested in sponsoring the Congress or participating in Expo Bolivia Gas & Energy are welcome to contact [eventos@cbhe.org.bo](mailto:eventos@cbhe.org.bo).

For more information on the Congress and registration, please see <http://www.boliviagasenergia.com>  
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### International Oil Shale Symposium 2016

**Tallinn, Estonia**

**20-23 September 2016**

Celebrating 100 years of oil shale mining in Estonia, attendees at this event will hear about the latest innovations and technology updates, increases in efficiency and applications to reduce environmental impacts of shale. They include professionals in all spheres of oil shale energetics

– connecting resource holders, technology developers, researchers, government representatives and business leaders from across the world. World Energy Council Estonia co-organises this conference, which will be held in English and Estonian (translation available) and also features field trips to industrial scale facilities.

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**Website:** <http://oilshalesymposium.com>

### Energy Day 2016

**Berlin, Germany**

**29 September 2016**

Discussion at this major annual World Energy Council Germany event will focus on the role of Turkey as an energy hub and innovation in the digital energy world. It brings together leading German and international experts from politics, business and academia, confirmed speakers to date include State Secretary Stephan Steinlein, German Federal Office; Helge Tolsdorf, German Federal Ministry for Economic Affairs and Energy and Prof. Dr. Michael Weinhold, CTO Siemens. The conference is free of charge and will be held in German and English with simultaneous translation available.

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SEE MORE COUNCIL EVENTS AT  
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## 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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