

Interview Hoesung Lee, new Chairman IPCC

"I want to interact more with the energy sector"

The new chairman of the IPCC, Dr Hoesung Lee, intends to interact more with the energy industry. "We are prepared to broaden our scope of collaboration", he says, in an exclusive interview with World Energy Focus. Lee, a professor in the economics of climate change, energy and sustainable development at Korea University in Seoul, says "industry, the energy sector in particular, needs to be part of the solution to climate change". He sees "enormous value" in the "large-scale" deployment of carbon capture and storage (CCS).

Can the Intergovernmental Panel on Climate Change (IPCC), the UN body that publishes the world famous Assessment Reports on which international climate policy is based, take a backseat, now that the nations of the world overwhelmingly agree that a major effort to combat climate change is needed?

"We know more than enough about the science of climate change to take action", affirms Hoesung Lee, the man who is to lead the IPCC in what is likely to be a new phase.

Lee was elected Chairman on 6 October after the resignation of the flamboyant and sometimes

controversial Rajendra Pachauri, who headed the organisation for thirteen years. During this time the IPCC's Assessment Reports became increasingly confident that man-made greenhouse gas emissions are causing global warming, which will attain catastrophic proportions if left unchecked.

For the Korean economist, this implies that the focus of his organisation should change. It means "we need to increase our focus on solutions", he says. And that means: collaborate more with industry and the energy sector, including producers of oil, gas and coal. One of the solutions they should pursue, according to Lee, is carbon capture and storage (CCS).

Can the fossil fuel sector be part of a solution to the climate problem?

"Industry in general, and the energy sector in particular, need to be part of the solution to climate change. For example, we need more investment in carbon capture and storage technology. As Working Group III of the Fifth Assessment pointed out, it will be very difficult to reach zero carbon emissions without it. And this is clearly an area where energy companies have a vested interest in ensuring that the technology is further developed and implemented."

CCS would require huge investments which would not actually produce anything of concrete value unlike

e.g. renewables. That's why a lot of people don't believe it will take off. "With all due respect, I do not agree with your premise. There would be enormous value if CCS were able to prevent additional emissions. So far, CCS has not been applied at scale. But the right regulatory incentives could change that. For the large-scale future deployment of CCS, well-defined regulations concerning short- and long-term responsibilities for storage are needed, as are economic incentives."

What are the main barriers to CCS?

"Barriers to large-scale deployment of CCS technologies include concerns about the operational safety and long-term integrity of CO₂ storage as well as transport risks. But a growing body of literature suggests that there are solutions to these concerns."

Could CCS prevent existing fossil fuel reserves from becoming stranded assets?

"Yes, the degree to which they become stranded assets depends on the degree to which we can develop carbon capture and storage technologies. The better this technology becomes – the more carbon it can prevent from entering the atmosphere – the less these assets need to be kept in the ground, and vice versa."

Another way to achieve net zero emissions is by > see page 2

FEATURE

The great oil shake-out: IEA Chief Fatih Birol on oil market 3

Low prices are shaking up the oil industry. How long will this go on? We spoke with Fatih Birol, the new Executive Director of the International Energy Agency (IEA) and three other experts about how they see the oil market develop. And got some surprising answers.

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planting new forests. But this would require huge land areas. Is this feasible?

"The degree to which we need to take action in any one specific area, including reforestation and the planting of new forests (afforestation), will depend on the degree to which we make progress in other areas. We need to pursue multiple options. There is no silver bullet. But reforestation and afforestation are compelling because they provide so many co-benefits by resorting entire ecosystems and indigenous economic models."

Now that the IPCC's Assessment Reports have found wide acceptance, do you see a new role for your organisation?

"Robust scientific analysis will always be core to the IPCC's mission. But we know more than enough about the science of climate change to take action. And that means we need to increase our focus on solutions."

Working Groups II and III from the Fifth Assessment Report looked at options for adaptation and mitigation, respectively, and I think that work was particularly useful. But when it came time to announce these reports, much of the attention continued to focus on the perils, not the solutions. While we need to remain well informed about the dangers of

unmitigated climate change, we need more attention on how to prevent them. That means an even more in-depth assessment of the solutions."

Do you mean you would work together with industry more than in the past?

"Yes, it also means more interaction with industry to learn how they are approaching adaptation and mitigation. Remember, the IPCC has always assessed relevant literature produced by industry, so this would be nothing new. What will be new is the degree to which we interact with industry. We are prepared to broaden our scope of collaboration with other international organisations to the extent that such collaboration would strengthen scientific assessment of climate change and its solutions."

The World Energy Council has called for some form of carbon pricing. You have said in an interview that carbon pricing is "the most important work in climate change issues". Yet carbon pricing is not mentioned in the draft agreement of COP21?

"Studies have shown that carbon pricing can be particularly effective, but it is not the only solution. The IPCC's Fifth Assessment provided a range of options for

policymakers to choose from so that each country can devise its own path forward in a way that meets their needs and special circumstances. Although carbon pricing can be a very effective means for lowering carbon emissions, there is no single solution to climate change. The global community needs multiple options."

But a carbon price can be important because it will prompt producers to pursue processes and investments that will reduce carbon emissions, consumers to demand goods and services that will have less of a carbon footprint, and investors to fund projects that will have lower emissions. It is necessary that the carbon price should be designed to reflect the social cost of carbon emissions so that the carbon price is an efficient and effective instrument for mitigating climate change."

What do you regard as the key barriers to carbon pricing?

"The key barrier is political feasibility, i.e. the political willingness to adopt and implement carbon pricing in a manner that minimises uncertainty about the long-term commitment of capital required for low-carbon technology development and deployment." ●

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The great oil shake-out: how far will it go?

photo Micah Dushal

Low oil prices are shaking up the global oil industry. Will they stay low? For how long? And how low is low anyway? These are some of the crucial questions hanging over the global energy sector. World Energy Focus spoke to three experts and the IEA's Executive Director Fatih Birol, who put the current market in perspective – and offer a view of the future. Some say we are in a fairly normal cycle. Others see fundamental changes coming.

Has the world entered a protracted – perhaps even permanent – period of low oil prices? There are some market watchers who indeed believe this. **Roberto F. Aguilera** of Curtin University in Australia and **Marian Radetzki** of Luleå University of Technology in Sweden, authors of a brand-new book, “The Price of Oil”,

don't hesitate to proclaim that “the period of excessively high oil prices has come to an end”. More or less permanently: “Our optimistic scenario sees a price of \$40 by 2035.”

The main reason for their bearish outlook is that they expect a “a large-scale global shale revolution”. “In our

view”, says Aguilera, “the shale boom in the US is just a humble beginning. As it develops and expands internationally, it will have an overwhelming impact on global oil supply. Using simple and reasonable methodologies, we estimate that the shale revolution outside the US will yield an additional 20 million barrels per day (bpd) by 2035.”

In addition, the two authors note that there is another revolution taking place, namely “the application of horizontal drilling and fracking to conventional oil formations in the world outside the US.” This technology, they say – which gets much less publicity than the shale one – will yield a further addition of 20 million bpd in the same period, summing up to a spectacular total rise of over 40 million bpd by 2035, equal to almost half of global oil output in 2014.

That's just the supply side. Looking at the demand side, many observers see downward risks, mainly as a result of climate change (energy efficiency) policies and the growth of alternative transport fuels (electric cars, gas, biofuels). With supply exploding and demand contracting, could this be the End of the Oil Age – in the sense that oil would no longer rule the world?

Aguilera and Radetzki, however, do not go as far as that. “The cost of a deep climate policy is so high, and the confusions and inactions ever since the signature of the shallow Kyoto protocol in 1997 so pervasive, as to make us doubt that a severe policy will be launched”, says Aguilera. Nevertheless,

Aguilera insists that the coming shale oil glut alone will be enough to keep prices in the doldrums.

STEEPER DECLINE RATE

Not everyone shares their view. **Fatih Birol**, as of 1 September the Executive Director of the International Energy Agency (IEA), does believe that “oil demand growth will slow down”, although there will still be some growth. This slowdown on the demand side will take place regardless of economic growth, says Birol. “It will be mainly a result of energy efficiency measures.”

But, adds the man who until recently was Chief Economist of the IEA, and responsible for the IEA's famous annual World Energy Outlook (WEO), this does not mean that prices will stay low. “We think for oil prices to stay at this price level for much longer is rather unlikely.”

There are several reasons for this, explains Birol. He notes that “even if demand were to stay level, we will need huge investment in the oil sector, mainly to replace existing fields that are in decline. This is because the natural decline rate of fields is becoming steeper.”

According to the latest WEO, published on 10 November, over the next 20 years some \$650 billion needs to be invested each year to compensate for this decline. “This is equal to what until recently was needed both to compensate natural decline and meet demand growth.”

Hence, with so many projects currently being cancelled or delayed, it is very likely that prices will bounce back, according to Birol. “Just an example: if this price level continues for some years, US tight oil production would go down by 3 million bpd.” He notes that “many projects in the US make sense at around \$65.”

What about the possibility that the US shale oil revolution will be exported to other parts of the world? Birol does not believe this is very likely to happen at a large scale. “There will be some limited production in some countries, e.g. Canada, and maybe a > see page 4

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Bangkok traffic jam Photo Roger Price

little bit in Russia or Latin America. But this won't come close to what we have seen in the US."

REASONABLY NORMAL

Cyril Widdershoven, who works as senior expert for MEA Risk, a private consultancy based in Florida, and the Dubai-based consultancy NAMEA Group, concurs with that assessment. "The shale oil revolution will not be exported across the world, certainly not at the prices we're seeing now", he says. "The circumstances in the US are better than anywhere else. Oil is found not too deep, close to market. There is a good infrastructure, a liberal ownership regime, enough water. This isn't the case in most other places."

According to Widdershoven, who is a Middle Eastern specialist and has tracked oil markets for decades, we are going through a reasonably normal cycle. "Oil production increased for many years, then there was a financial crisis. Now production is taking a hit, while demand outside the OECD is still growing. So prices should go

back up, under normal circumstances to some \$55-\$60 at the end of next year." Geopolitically one of the greatest uncertain factors is Iran, says Widdershoven. "If Iran is not coming back into the market, prices will increase even more."

Looking at the longer term, it is no doubt true, says Widdershoven, that "at some point in the future demand may flatten out". But, he adds, "it's not going to happen now". Admittedly, too, "if the world puts carbon pricing in place at COP21, there is a possible scenario that oil and gas will become too expensive. But most national oil companies I talk to do not believe their governments will let that happen to them."

This does not mean that the oil industry can sleep quietly, notes Widdershoven. The current market is especially painful to international oil companies (IOCs), like Shell, ExxonMobil and BP. The Dutch risk analyst says the IOCs may well be swallowed up – by the National Oil Companies, the NOCs. "I think the IOCs will be the dinosaurs of the 21st

Century. The market will be dominated by NIOCs – National International Oil Companies. I am surprised that they have not put money on the table yet to buy the likes of Shell or BP."

A NEW ERA

Ged Davis, Executive Chair of the World Energy Scenarios, the World Energy Council's flagship study, takes a long-term view of oil market developments. He notes that there have been successive periods in oil market history ruled by different pricing mechanisms. "First there was the period when the Seven Sisters controlled prices. This led to large demand in the 1960s, when prices were about \$20 a barrel in today's money. Then OPEC took over. They became swing producer. They moved prices up to \$60 and later even \$100 in today's terms."

These high prices, which lasted from the early 70s to the mid-80s, triggered a drastic reduction in demand growth thanks to "dramatic improvements in energy efficiency", notes Davis. As a result, prices collapsed to around \$30. This low price period lasted from about 1986 till 2004 and was followed by another period of high prices, partly thanks to strong Chinese demand. "Each period contains the seeds of its own destruction."

According to Davis, who is also CEO of consultancy Forescene and in the past worked for the World Economic Forum and Shell, among others, what we are seeing today is "is almost certainly the beginning of a new price formation

era". He thinks prices are likely to stay around current levels for quite some time. "You can see now that the Iranian budget is coming in at \$42-\$50. The Russian government is budgeting at \$50. This is not so dissimilar from what we saw in real terms from the mid-80s and into the 90s."

"The shale oil
revolution will not be
exported across the
world, certainly not at
today's prices"

So does Davis believe that eventually this period too will end in its own defeat – and prices will go back up? Yes, eventually, as in other eras, prices will rise as a consequence of a cut back in higher cost oil projects and a boost to oil demand. But longer term he does not rule out that oil market fundamentals will change fundamentally. Not just because of shale oil – he believes the US experience is fairly unique, although the opportunity for development exists in many countries. But there has been a vast improvement in productivity, which has lowered costs, particularly for shale oil production. In addition, electric vehicles could suddenly take off post-2020, especially because of air pollution concerns. And what if substantive carbon pricing systems are put in place? One day, the industry may look very different." ●

ABOUT WORLD ENERGY FOCUS

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Massive shifts to renewable energy, massive energy efficiency improvements, improved land management, radical changes in urban planning and transport, tens of thousands of major companies ready to take action, thousands of mayors and regional governments ready to restructure their cities and regions - all these commitments have been made by countries across the world in the run-up to COP21. All told, they signal a "major economic transformation", notes the UNFCCC, the UN body responsible for global climate policy, in a surprisingly upbeat report on the more than 140 climate action plans that countries have submitted ahead of the Paris Climate Summit (30 November-10 December).

The report (<http://bit.ly/1PYuHQM>), published on 30 October, assesses the impact of the "Intended Nationally Determined Contributions" (INDCs) submitted to the UNFCCC by 146 countries, indicating what they are prepared to do to combat climate change. The UNFCCC concludes from these plans that "an unprecedented worldwide effort is underway to combat climate change".

Together, the national climate plans will lead to a reduction of greenhouse gas emissions per capita of 8% in 2025 and 9% in 2030, says the report. The INDCs "have the capability of limiting the forecast temperature rise to around 2.7 degrees Celsius by 2100, by no means enough but a lot lower than the estimated 4, 5 or more degrees of warming projected by many prior to the INDCs", said Christiana Figueres, Executive Secretary of the UNFCCC.

If those 146 countries do what they promised, it will be "possible and affordable by 2030 to stay below a 2 degree temperature rise", notes the report, which adds that 75% of the commitments are made unconditionally.

One reason for the optimism of the UNFCCC - and its prediction of a "major economic transformation" - is that over half of all INDCs include "a long-term perspective" on the energy transition. The report notes that many countries see "multiple economic benefits" from climate policies.

In addition, says the UNFCCC, there is no reason to assume that countries' achievements will be limited to what is in their plans: "as a floor they provide a foundation upon which every higher ambition can be built", said Figueres. "I am confident they are not the final word in what countries are ready to do." ●

World Energy Council: Give us a carbon price

The World Energy Council is not as confident as the UNFCCC about the outcome of Paris. At its Executive Assembly in Addis Ababa on 29 October, the Council, representing the global community of energy leaders, expressed "concern about the progress and ambition of the climate talks".

The World Energy Council supports the INDC-track in the negotiations, but notes that this is not sufficient to bring about the changes that are needed. "The addition of the INDCs is an important step. However, translating the international objective to the national level for energy requires an Energy Trilemma approach, which balances the needs of energy security, environment and social agenda." What is needed most of all, notes the Council, is for the international community to put a price on carbon. The Council has written a letter to all Parties of the UNFCCC, asking for "a clear

carbon pricing scheme in line with the global objectives that will allow all to make efficient economic decisions". Secretary-General Christoph Frei said: "We want to affirm to the Parties that the energy sector across the world is ready to respond to a strong signal from Paris to accelerate the energy transition."

Marie-José Nadeau, Chair of the World Energy Council, noted that "from all parts of the energy sector the message is clear: we need a clear signal." She added: "A historic energy transition is needed. An energy transition is taking place in many countries, but in the boardrooms and in the energy ministries, leaders need the right framework to enable real world solutions that will unlock the finance and enable the technologies needed to be scaled." ●



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Energy Trilemma Index: it's getting harder to make progress

The World Energy Council has long emphasised that environmental sustainability of energy systems should go hand in hand with energy security and affordability. In its annual World Energy Trilemma Index it ranks countries on all three dimensions.

The new 2015 edition <http://bit.ly/1Htouug>, just out, shows that only two out of 130 countries achieve a triple A score: Switzerland and Sweden. Although the Index shows "overall improvements across the three dimensions of the trilemma", it also "reflects the challenges that countries across the world are facing in balancing the trade-offs of the trilemma goals and dealing with financing the transformation of their energy systems".

Two new countries have been added to the "negative watch list" which already includes Germany, Italy, Japan and the UK. These are South Africa, due to its electricity crisis, and the United States, "where lack of investment in ageing infrastructure and exposure to extreme weather events pose threats to the country's currently strong energy security performance".

Joan MacNaughton, Executive Chair of the World Energy Trilemma study, notes that the report's findings highlight a real issue: that of translating the Intended Nationally Determined Contributions from international objectives into national level actions for energy. It will require an energy

trilemma approach and investment in energy infrastructures if countries are to balance the three dimensions of the trilemma and meet their goals."

The report is being sent to all parties attending COP21 and will form the basis of a post 2015 ministerial dialogue which will take place at the World Energy Congress in October 2016 in Istanbul. MacNaughton adds: "For countries to move up in the rankings they must adopt prudent, forward-looking energy policies to meet decarbonisation goals and maintain competitiveness. This report provides a map for the long road from Paris to help policymakers and business chart a sustainable course." ●

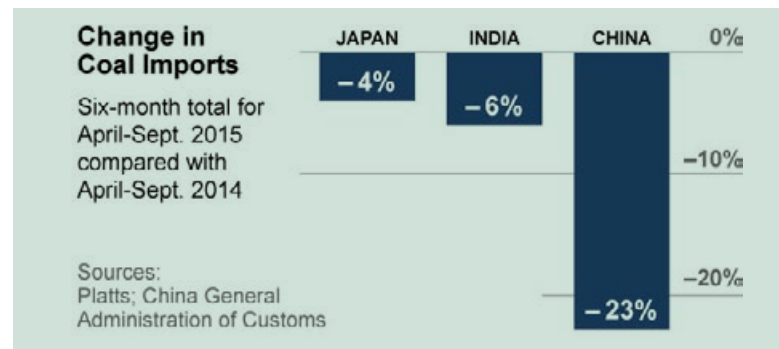
AND THE WINNER IS ...

The energy system of Switzerland is ranked as the world's most sustainable. Canada has the highest energy security, the United States the best affordability.

In Latin America, Uruguay is the highest-ranked country in the overall Index. In Sub-Saharan Africa Gabon leads, and in Asia New Zealand has the top rank.

Southeast Asia bucks fossil fuel trend

Whereas in many parts of the world the share of fossil fuels in the energy mix is declining, in Southeast Asia the trend is the other way, according to a new report from the International Energy Agency.



The World Energy Outlook Special Report on Southeast Asia (<http://bit.ly/1Wyx7L6>) notes that "rising demand, constrained domestic production and energy security concerns lead to a greater role for coal, a sharp rise in the region's dependence on oil imports and the reversal of its role as a major gas supplier to international markets". The IEA projects in a "central scenario" that by 2040 the region's net imports will more than double to 6.7 million barrels per day, equivalent to the current oil imports of China. In addition Southeast Asia will turn from a gas exporter (54 bcm in 2013) to an importer (around 10 bcm by 2040). The demand for electricity almost triples by 2040, "an increase greater than the current output of Japan".

The growth will mostly be met by coal. According to the report, the average efficiency will increase by 5 percentage points, but "less efficient subcritical" technologies will still account for 50% of the region's coal power fleet by 2040, if no measures are taken. In another report, the US-based Institute of Energy Economics and Financial Analysis (IEEFA) notes that in contrast to Southeast Asia, the three largest coal-import markets in Asia - China, India and Japan - are all seeing reduced coal imports. In China, coal imports were down almost 30% in the first nine months of 2015. In Japan, they were down 4% in the period April-September 2015. In India they were 6% lower in the first half of this year. According to the IEEFA, "peak import coal has happened in China and Japan and it will happen this year in India." ●

NEWS IN BRIEF

CANADA'S HYDROPOWER ON GROWTH PATH

Canada's hydropower capacity will increase from 77.6 GW in 2014 to an estimated 84.8 GW by 2025, according to a market report from research and consulting firm GlobalData. Hydropower will provide almost 50% of Canada's power generation capacity ten years from now. Other renewable sources (wind, solar, biomass, biogas) will have a 20% share with 35 GW.

MOROCCO SOLAR SUPERPOWER

Morocco is "poised to become a solar superpower" with the launch of a mega solar project on the edge of the Sahara desert, reports the British newspaper The Guardian. [LINK] The first of four concentrating solar power (CSP) facilities with a total capacity of 580 MW, will be turned on sometime this month. When the four plants are finished, they will be the largest CSP facility in the world, occupying a space as big as Morocco's capital city Rabat, says the Guardian.

SOUTH AMERICA INVESTS BILLIONS IN SMART GRID

South American investment in smart grid infrastructure will reach over \$38 billion by 2025, says a report from the Northeast Group. Brazil is by far the largest market, having announced the deployment of three million smart meters already. But countries such as Colombia, Ecuador, Chile and Argentina are also serious about grid modernisation and planning significant investment, notes the report. In South America some 9% of electricity is stolen. Better infrastructure is likely to reduce that number.

Portugal's energy success story: lessons for other countries



Portugal has accomplished a remarkable feat in recent years. It has successfully liberalised its energy market, greatly expanded its renewable energy sector, lowered CO₂-emissions, and made great advances in integrating its electricity and gas sectors with Spain. All of this while the country was hit by a severe economic crisis. Bento de Morais Sarmento, the Executive Secretary of the Associação Portuguesa da Energia, the Portuguese Member Committee of the World Energy Council, explains what lessons can be learned from the success of Portuguese energy policy.

Portugal began opening its electricity market some ten years ago in compliance with European Union legislation. Today 87% of electricity users have migrated from the regulated sector to the free market. By 2017, Portugal expects the liberalisation to be completed for electricity as well as for gas. The benefits of this process are being clearly felt, says Morais Sarmento. "Liberalisation, in conjunction with competition and regulation, brought innovation and better service to consumers."

It has also brought lower prices, although this may always not be

obvious to consumers. "Many people worried that private companies would use their bargaining power to raise prices. To find out whether this was so, turned out to be quite complicated. This is why the Portuguese World Energy Council Committee asked Deloitte, with help from the Regulator, to investigate the evolution of electricity tariffs from 2011 to 2013 for households and other small clients."

The resulting study (<http://bit.ly/1I93IGI>) concluded that competition had worked: prices for households would have been lower if it had not

been for external factors (such as fuel prices, taxes, grid charges and so on).

The Portuguese Committee also decided to investigate customers' perception of the energy sector, in its 2014 study "Energy in Portugal", undertaken by Accenture <http://bit.ly/1XRXOHW>. This flagship study is carried out every four years to assess developments in Portugal's energy sector. Not surprisingly, says Morais Sarmento, "the country's difficult economic situation was reflected in the outcome. People were concerned about higher energy prices. Nevertheless, most respondents, both households and companies, were satisfied with the services delivered by the energy companies."

So how did Portugal manage to liberalise its market so successfully? "The correct steps were taken", says Morais Sarmento. "Transmission and distribution of electricity, natural monopolies, were separated from generation and supply activities, where competition was introduced. An independent regulator was set up and rules were put in place to protect consumers. A similar process was followed for natural gas, and the market was liberalised gradually, in phases."

A key move was the creation of a single transmission system operator, REN <http://www.ren.pt>, responsible for both the gas and electricity networks, plus gas storage and the LNG terminal in Sines. "REN is actually expanding internationally now, for instance in

Mozambique", says Morais Sarmento. "The same goes for EDP, the incumbent electricity company, which has become an international player with activities in Brazil and the US, through its renewable energy subsidiary EDP Renováveis."

In conjunction with the liberalisation of the market, the Portuguese government also embarked, in 2001, on an energy transition, through the E4 Programme, consisting of various measures to promote energy efficiency and the use of renewables and introducing natural gas into the market to replace coal and oil. This was done not just for the sake of the environment, but also to modernise the economy and increase competitiveness, says Morais Sarmento.

This programme has been a great success, with renewable energy accounting for 61% of electricity consumption in 2014. Portugal's total installed renewable capacity was 11.7 GW at the end of 2014. Half of it was hydro. In 2013 the country ranked third in the EU in share of renewable energy and number two in wind energy.

What remains to be done for Portugal, notes Morais Sarmento, is to further integrate its energy market with Spain and the rest of the EU. "This is important to be able to achieve efficiency improvements and make use of economies of scale." Through MIBEL <http://bit.ly/1MK7baN>, the Iberian electricity market platform, Portuguese and Spanish companies are already working under the same rules and tariffs. Cross-border interconnection

capacity, however, is still limited: it is 4% of total capacity. The EU has a goal of 10% in 2020.

"Liberalisation brought innovation and better service"

In the gas sector, an Iberian market is also being created through MIBGAS <http://bit.ly/1M3vQUh>. Portugal receives gas from Algeria through a pipeline shared with Spain and LNG at Sines from various origins.

In June, the European Commission, France, Portugal and Spain set up a High-Level Group to 'break the energy barriers' between the Iberian peninsula and the rest of Europe. <http://bit.ly/1MDXBBE> "With proper interconnections to the rest of Europe, Portuguese companies will be able to participate in the EU market and export renewable electricity, to help Europe meet its environmental targets", Morais Sarmento says.

Indeed, Portugal is ready to showcase its energy achievements to the world: Lisbon was chosen as the host city for the Council's next Executive Assembly meeting in 2017, after the 2016 World Energy Congress in Istanbul. Morais Sarmento: "We are very happy that we can share our experiences with the world." ●

REGIONAL EVENTS

Africa Energy Indaba

Johannesburg, South Africa
16-17 February 2016

The 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 and investment opportunities in Africa. The AEI has been designated the World Energy Council's African regional event and is presented by the South African National Energy Association (SANEA), the Council's national committee. It is supported by the African Union Commission and the NEPAD Planning and Coordinating Agency.

www.africaenergyindaba.com

2016 World Energy Congress

Istanbul, Turkey
9-13 October 2016

With only 11 months remaining until the 23rd World Energy Congress kicks off in Istanbul under the theme "Embracing New Frontiers", the excitement is mounting.

Already 90 top level energy leaders from 35 countries have confirmed to speak; and since 1 October paper submission is open.

The programme planning for day 1 has "Vision and Scenarios for the Future" as underlying theme,

day 2 "Identifying the Business Opportunities – Resources and Technologies",



Day 3 "Policy Solutions to Secure Prosperity".

Day 4 is completely dedicated to the African continent, "Securing a sustainable energy future". For more information and registration,

Governing Energy: The Atlantic Basin and Global Institutions

Madrid, Spain
19 November 2015

The main objective of the "Energy and the Atlantic Basin" round table is to analyze the shifting energy landscape in this region and debate if its current and near- to midterm potential energy sources may create a self-energy system. The "Governance of Energy Institutions" round table will try to evaluate the role of international

organizations and the options to promote the cooperation in the global fragmented energy scene. Participants will also evaluate the current state of the art for COP21 and the results of the Spanish Energy Issues Monitor will be presented. The event will be conducted in English.

Contact: Javier Jiménez Pérez
E-mail: jjimenezp@repsol.com
Website: <http://bit.ly/1OJJQBn>

EU Energy Policy after COP21

Zagreb, Croatia
27 November 2015

Discussion in the Forum will focus on the right measures to achieve the CO₂ emission reduction goals by 2050. Speakers will examine current models of climate protection, energy efficiency (especially in buildings), traffic, energy and emission market models, how to encourage growth of renewable energy sources, technological development and also the right legislative framework.

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Website: http://www.hed.hr/forum_e.html

MEMBER COMMITTEE EVENTS

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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