WORLD ENERGY COUNCIL
CONSEIL MONDIAL DE L'ÉNERGIE
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WORLD ENERGY FOCUS

monthly insights from the Council's global leadership community

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Confronting a 'harsh reality'

The industry has much to do if natural gas is to fulfil its potential in the future energy mix

Photo courtesy of Wintershall

The chemical make-up of methane – four atoms of hydrogen to one of carbon – makes gas the least polluting of the fossil fuels, in both its climate impact and its contribution to local pollution in cities. So in an increasingly carbon-constrained world, expected to be still heavily dependent on fossil fuels by 2050, gas has a crucial role to play in mitigating greenhouse emissions and meeting projected energy demand growth. Yet last month in Paris at the industry's largest regular gathering – the triennial World Gas Conference – the clear message was that the role of natural gas in the future energy mix can no longer be taken for granted. The industry urgently needs to step up its advocacy efforts to convince policymakers of the benefits of gas, reduce the climate impact of its value chain, and cut costs to make gas more competitive with other energy sources, especially coal.

It was no coincidence that the CEOs of six of the world's largest international oil and gas companies – Shell, BP, Total, Eni, Statoil and BG Group – chose the opening day of last month's World Gas Conference to publish a joint statement calling for the introduction of carbon pricing around the world. Calling out to governments and to the United Nations Framework Convention on Climate Change (UNFCCC) they said: "Our industry faces a challenge: we need to meet

> see page 2

INSIDE THIS ISSUE

Shell CEO Ben van Beurden: "Three things are crucial: better policies, fewer emissions and lower costs."
(Photo courtesy of WGC 2015.)

greater energy demand with less CO_2. We are ready to meet that challenge and... we firmly believe that carbon pricing will discourage high-carbon options and reduce uncertainty that will help stimulate investments in the right low-carbon technologies and the right resources at the right pace."

Most of these CEOs then turned up in Paris to give keynote speeches at what is the industry's most influential regular gathering, where their joint statement was a central part of their presentations. This is hardly surprising, because while these companies are generally referred to as "international oil companies", most of them are either already bigger producers of gas than oil or soon will be.

Shell already produces more gas than oil; Total's CEO, Patrick Pouyanné, said his company's gas production had risen from 35% of total output ten years ago to 50% today; while BP's CEO, Bob Dudley, said "today gas accounts for around half of BP's upstream production globally... and it won't be long before gas is in the 60% range in our portfolio". All these CEOs believe that meaningful carbon pricing would enable gas to be much more competitive than it is today, especially against its main rival in electricity generation: coal.

AN UNCERTAIN FUTURE

It used to be a given in the natural gas industry that the obvious benefits of its product would guarantee its place in the future energy mix of an increasingly carbon-constrained world. The consensus in Paris was that gas is projected to grow by 2%/year over the long term, making it the biggest fossil fuel by market share by 2040 – truly a "fuel of the future". However, as was made abundantly clear in Paris, a great deal of uncertainty hangs over the industry, especially from policy developments and potential impacts from disruptive technologies.

The reality today is that the fortunes of gas have turned out to hinge on regional factors, with the picture looking very different in the three main consumption centres: North America, Europe and Asia Pacific.

In North America, the shale gas revolution has led to very cheap gas, boosting its share in electricity generation and prompting numerous companies to pursue LNG export projects. One consequence has been a sharp drop in greenhouse gas (GHG) emissions in the US. Hopes that the shale gas revolution might be replicated outside North America have yet to be realised, with numerous obstacles in the way in most regions.

At the other end of the spectrum, in Europe, gas demand has been plummeting, pushed out of the generation mix by cheap coal, some from the US, and heavily subsidised renewables. The CEO of Engie (formerly GDF Suez) Gerard Mestrallet, told *World Energy Focus*: "European utilities have decided to close down almost 50 GW of gas-fired power stations, equivalent in power capacity to 50 nuclear stations." And these are mostly modern, "world-class" plants.

'DIFFICULT FOR GAS TO COMPETE'

The situation in Asia Pacific was spelt out in some detail by the Paris-based International Energy Agency (IEA), which took the opportunity of the WGC to launch its annual Medium-Term Gas Markets Report, which makes forecasts five years ahead. "One of the key – and largely unexpected – developments of 2014 was weak Asian demand," said Executive Director Maria van der Hoeven. "The experience of the past two years has opened the gas industry's eyes to a harsh reality: in a world of very cheap coal and falling costs for renewables, it was difficult for gas to compete."

So what should the industry be doing? Several speakers at the conference made suggestions for what should be on the agenda.

A common theme was that the industry needs to work much harder to promote the advantages of gas over other fuels to decision-makers so that an appropriate policy environment emerges – whether that be carbon pricing as proposed by the oil and gas majors in their joint statement, or capacity mechanisms as proposed by, among others, Gerard Mestrallet.

In a speech that centred on the opportunities for gas presented by the pollution problems of Asian mega-cities, Woodside Energy's CEO, Peter Coleman, observed that the coal industry had succeeded in gaining a lot of currency for the phrase "clean coal". "Why did we let that happen?" he wondered.

Shell CEO Ben van Beurden stressed the need for the industry to reduce the climate impact of its operations, by reducing methane leakage in the production and transportation chain, and by minimising flaring. Engie's CEO-in-waiting, Isabelle Kocher, added that biogas could be mixed with natural gas to reduce its climate impact.

Van Beurden also emphasised the need for the industry to reduce production costs so that gas becomes more competitive against other fuels. "Frankly, the cost trends that our industry has experienced over the last two decades are simply unsustainable," he said. "As an industry we need to get better at driving costs down. Cost will be critical in making natural gas a natural choice for as many countries as possible." ●

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.

Preparing for the energy transition

'We can make all kinds of policies and laws and regulations, but no legal system is powerful enough to violate the laws of physics'

What should policymakers and industry leaders be doing to mobilise the huge investment that will be needed over coming decades to meet energy demand fairly, securely and sustainably? In this exclusive interview, Dean Oskvig – President and CEO Black & Veatch Energy, part of Black & Veatch, the US-based global engineering and consulting company – gives his views, based on his four decades of experience in energy. Among the issues needing urgent attention are infrastructure resilience, cybersecurity and responding to the surge in distributed and off-grid electricity generation.

We are witnessing an accelerating transition in the production and consumption of energy, especially in electricity. What, in your view, are the fundamental drivers?

The fundamental drivers of energy consumption, and consequently production, are population, economic activity and regulation. For instance, the world's population is growing by about 80 million people per year and is becoming increasingly urban-based. What is new in electricity is the implementation of renewables that require two-way power flows. Over the past century or so our electricity system has evolved according to a central plant concept. But if you're past the edges of this integrated system of central plants, and bulk transmission and distribution, your access to it is limited. With renewables comes the opportunity for more self-generation and the need to integrate these resources into the grid.

Another major driver in North America is the shale gas revolution, which has pushed down gas prices – and a big primary use of gas is in electricity generation. To the extent that North America is going to export LNG to other places, shale gas will change the economics of gas throughout the world.

How is the energy transition likely to play out in industrialised and emerging economies?

The industrialised world and the emerging economies have different drivers and contexts. In the industrialised world we have low economic growth, high household incomes and aged infrastructure – so a lot of focus is on optimisation, energy efficiency and resilience. In the emerging economies, there are high economic growth rates but low household incomes – so the challenge is demand for capacity. The latest World Energy Council Trilemma Report lays out the regional differences and priorities in the context of climate change and balancing the trilemma – ensuring energy equity, energy security and environmental sustainability.

For instance, in Europe it's about efficiency and low-carbon energy. In North America it's about innovation, technology deployment and gas. In Sub-Saharan Africa it's about tapping the potential for renewables and gas to meet demand from people beyond the edges of the traditional grid.

It's been projected that more than $50 trillion of investment will be needed to balance the energy trilemma while limiting the rise in global temperature to 2°C. Having said that, there's money looking for a good place to go. But if there's uncertainty – particularly regulatory uncertainty – that money will be timid.

What should policy-makers be doing to prepare the ground for investment on that scale?

Policymakers should ground all this in science and math. Because we can make all kinds of policies and laws and regulations, but no legal system is powerful enough to violate the laws of physics. So start with the math and science, understand the economics, and then set about balancing the trilemma.

I also like the World Energy Council's Jazz and the Symphony scenarios. Scenario thinking helps the decision-making process by defining the edges of possibility. Also, if you look at the World Energy Council's Issues Monitor you can see the concerns of energy leaders on the various energy components. Policymakers need to look at the work that the World Energy Council puts out. It's very useful.

How are advances in telecoms, automation and data analytics changing the way in which energy utilities and customers interact? And how far are we from seeing the vaunted concept of "smart cities" become a reality?

As the generation mix changes and becomes more distributed, the means for managing, coordinating and controlling energy sources have to change. Data analytics is important because we now have the ability to gather lots of data.

> see page 4

"With renewables comes the opportunity for more self-generation and the need to integrate them into the grid." *Photo Black & Veatch*

But then you have to do something with it. Analytics drives this process at two levels: firstly, insights on how to best to manage grid costs and resiliency, and meet sustainability goals; and, secondly, how to manage owners' assets and customer participation in generation and demand response programmes.

Smart cities, in the biggest context, centre on quality of life and increased urbanisation. As I've said, we're adding 80 million people a year to this earth and becoming more urbanised, which emphasises the need for cities to be much smarter.

The timeline for this will vary from city to city. It's going to be an evolution. We have technology now to give us a good start on it. And we have in this world a whole generation of young people that really want to embrace these capabilities.

The past year has seen a rise in concerns over cybersecurity. How can the threats best be managed?
Recently, I went to a CEO Forum in Washington DC where one of the main themes was cybersecurity. Energy leaders have a myriad of operational and financial concerns to manage. One strategy for dealing with risk and change is to wait and see what's going to happen next. You can't do that with cybersecurity because there are people constantly trying to get into your system and cause problems.

We were told in this CEO forum by some high-level experts that cyber attackers have usually been in your system for 200 days before you start noticing. You can never be satisfied with what you have in place to detect events, fix, recover and get on, because the people on the other side are constantly innovating themselves.

Another issue keeping energy leaders awake at night is infrastructure resilience in the face of threats from, for example, climate change and terrorism. Is enough being done to address these threats?
In the past we designed and built our systems primarily on the basis of resistance rather than resilience. Now the thinking is moving towards resilience. That has to do a lot with how to recover when something happens. For example, super storm Sandy in the US was a wake-up call and many utilities are now taking steps to enable them to recover faster.

Are we doing enough? More could be done. Regulators and policymakers need to accommodate the corresponding investments we need to make. We're doing a lot more now for our clients in the area of resilience planning and implementation, dealing with possible floods, storms or other physical/cyber attacks.

The shale gas revolution has led to a shift towards gas in the US power generation fuel mix. Meanwhile, the US Environmental Protection Agency is working on new rules for carbon emissions from power stations. And we are seeing rapid growth in renewables. How do you see the US power fuel mix evolving?
The Energy Information Administration projects that 34% of US electricity will still come from coal by 2040, down from 39% in 2013; not as much of a change as one might picture. Gas goes up to 31% from 27%. Nuclear fades from 19% to 16%. And renewables go from 13% to 18%.

We've done some scenarios of our own. In one of them, depending on how prices evolve, over half of generation in 2040 could be from gas. Coal could go down to as low as 9%. Renewables, if you include hydro, would be about 17-18%. And nuclear would be at about 15-16%.

Two technologies that could have big potential impacts on the electricity industry are battery storage and carbon capture and storage (CCS). How quickly this might happen?
Battery storage will have a major impact on the electricity industry. Right now the price points are such that it's not near term. But there's a lot of R&D going on. Battery technology will probably be competitive with other sources of energy in three to five years. Meanwhile, there will be demonstration projects to wring out the operational complexities.

CCS has been demonstrated as technically viable. But it's expensive to build and operate because it imposes an energy penalty. So you have to oversize your generating facility to accommodate the parasitic load. I don't think it's going to occur quickly at any scale. When there's a tax or a price on carbon maybe you'll see more of it happening. But in the developing world there is little incentive to embrace CCS because of the cost; their focus is more about energy access and energy equity. But let me be clear here: we'd be happy to design and build them.

Distributed and "off-grid" generation appear to be set for real growth. How quickly do you expect them to grow?
In my 40 years in this industry there have been three distributed resources waves, but when the waves have hit the shore they've already flattened out. This time it's real because of different drivers that have come into play. We now have technology that can accommodate two-way power flows, coupled with low natural gas prices that make deployment of micro-turbines and fuel cells more feasible. Overall, people are still fundamentally going to be connected to the grid.

It's an opportunity. I have observed that traditional utilities – who some would expect to be resistant to this change – are embracing it. One of the best pieces of work about this subject is a report published by Electric Power Research Institute called "The Integrated Grid – Realising the Full Value of Central and Distributed Energy Resources". (*http://bit.ly/1pc7Z6O*)

So far, distributed generation, even when it's been connected to the grid, has not really been integrated. But now we have the technology to integrate it and make those individual small pieces what I call "good citizens of the grid". Distributed energy resources and the grid don't have to be competitors; they can be complementary to each other. But it's going to require a lot of collaboration.

We're going to have to have interconnection rules, communication protocols and the technologies all synchronised – because it's going to have implications for system operation, reliability and power quality. ●

Dean Oskvig became President and CEO of Black & Veatch Energy business in 2006. He is also Vice Chair North America of the World Energy Council and Chairman of the Advisory Council at the Electric Power Research Institute (EPRI).

Energy markets 'return to business-as-usual' after period of 'eerie calm'

The volatility of energy markets over the past year is a "return-to business-as usual" after four years of "eerie calm", according to analysis conducted by BP as part of its Statistical Review of World Energy – and the industry needs to respond accordingly. So said the company's CEO Bob Dudley, one of 20 speakers confirmed for the 2016 World Energy Congress, as he launched the widely read reference work in London last month: "We need to maintain discipline on capital and costs and adjust to this new world, but we also need to make the right choices about where to keep investing."

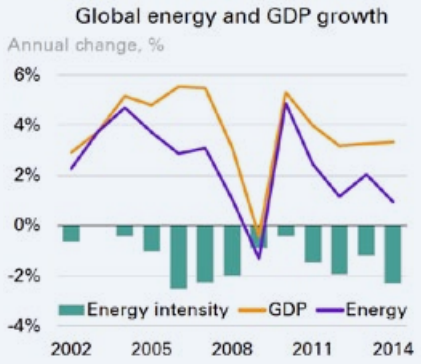
Dudley said that analysis of 2014 data by BP's team of economists, led by Chief Economist Spencer Dale, revealed "three key signals as we plan ahead": a supply-side shift in oil, driven primarily by the shale revolution in the United States and by strong production growth in Canada and Brazil; a marked slow-down in the aggregate growth of global primary energy consumption, "partly due to much slower growth of energy consumption in China"; and the marked impact that slower growth had on carbon emissions from energy use, which grew by 0.5% – the slowest rate of growth since 1998, except for a short period after the global financial crisis.

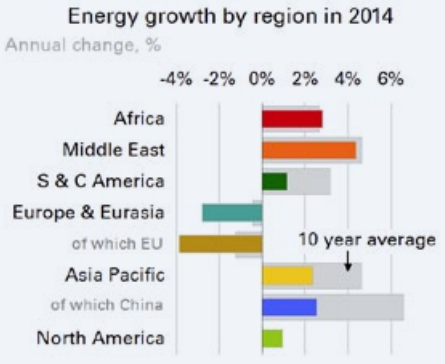
Energy consumption grew by just 0.9% in 2014, well below the 2.0% of 2013 and the 10-year average of 2.1%. Growth was concentrated in emerging economies, as it has been over the past decade, but even in these countries consumption growth of 2.4% was below the 10-year average of 4.2%.

RENEWABLES GREW FASTEST

Almost a third of the increase in primary energy came from non-hydro renewables, including biofuels, which were up 12%. However, this was below the ten-year average of 15.4%, mainly because of a slow-down in wind-power, which grew at less than half of its ten-year rate. Despite rapid growth, renewables accounted for only a 3% share of primary energy. Hydropower accounted for a record 6.8% share.

Focusing on the oil price plunge, Spencer Dale said:"The data for 2014 as a whole make clear that the sharp fall in oil prices was a supply story. The increase in oil consumption in 2014 was very close to its recent historical average; there was nothing particularly exceptional about demand growth in 2014. In contrast, supply growth was almost off the charts."





Growth of primary energy consumption decelerated in 2014 despite economic growth being similar to 2013. Consumption rose for all fuels, reaching record levels for every energy source except nuclear power. *(Source: http://www.bp.com)*

China, US, Brazil and South Korea submit climate pledges

Four of the world's largest economies – China, the US, Brazil and South Korea – last month submitted their climate pledges for the UN Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP21) in Paris in December. The latest pledges, or Intended Nationally Determined Contributions (INDCs), mean that the UNFCCC has received pledges accounting for more than 70% of global greenhouse gas (GHG) emissions. Meanwhile, the International Energy Agency (IEA) has published an analysis of what would be required to meet current climate goals.

China, which made a vaunted joint climate change announcement with the US last November, said it aimed to cut GHG emissions by 60-65% from 2005 levels by 2030. It has already committed to seeing its carbon emissions peak by 2030 and to increase the share of non-fossil fuels in its energy mix to 20% by 2030. The US and Brazil both said they aimed to get 20% of their electricity from non-hydro renewable energy sources, such as solar and wind, by 2030. South Korea said it intended to cut GHG emissions by 37% from business-as-usual levels.

Several large economies – including India, Japan and Australia – have yet to submit their INDCs.

The IEA's *Special Report on Energy and Climate Change* http://bit.ly/1JLUMky, part of the forthcoming 2015 *World Energy Outlook*, recommends – as one of four "pillars for success at COP 21" – that "the goal of keeping the increase in long-term average global temperatures to below 2°C also be expressed as a long-term GHG emissions target, making it more straightforward to apply in the energy sector". The World Energy Council makes the same recommendation in its recent *2015 World Energy Trilemma report* http://bit.ly/1NONz1M *(for details see the cover story of our June issue)*.

The other three pillars proposed by the agency include: setting conditions to achieve an early peak in global energy-related emissions; review of national climate targets every five years "to test the scope to raise ambition"; and establishing a process to track achievements. "As IEA analysis has repeatedly shown that the cost and difficulty of mitigating GHG emissions increases every year, time is of the essence," said Executive Director Maria van der Hoeven. ●

Ethiopia to build power interconnection to Kenya

State-owned power utility Ethiopian Electric Power has signed a US$120 million contract with China Electric Power Equipment and Technology to construct a 433 km high-voltage transmission line from Wolaita in the south of the country to the Kenyan border.

Ethiopia, which currently exports less than 10 MW to its southern neighbour has signed a contract to export 400 MW of electricity to Kenya through this new 2,000 MW line, due to be commissioned in 2018. The country is developing large hydropower projects that will raise its installed capacity from 2.4 GW to more than 10 GW, and another 12 GW could be added by 2020. On top of power exports to Kenya, Ethiopia plans to increase its exports to Sudan, Djibouti, Rwanda and Tanzania. ●

Asian Infrastructure Investment Bank to start up this year

Preparations for the proposed China-led Asian Infrastructure Investment Bank (AIIB) took a key step forward last month when 50 of the 57 prospective founding members signed the bank's articles of association. The others have until the end of this year. The bank, to be headquarted in Beijing, is due to start up before the end of 2015. ●

China's President, Xi Jinping, met with the heads of delegations representing 57 prospective founding members following the signing ceremony of the articles of agreement of the Asian Infrastructure Investment Bank in Beijing last month.

Japan builds 7 MW offshore wind turbine

One of the world's largest offshore wind turbines is being commissioned 12 miles from the site of the March 2011 Fukushima nuclear incident in Japan.

The 7 MW machine is part of a three-turbine project that will generate up to 14 MW of power when completed. The other two turbine will be 5 MW and 2MW. ●

NEWS IN BRIEF

POPE FRANCIS CALLS FOR ACTION ON CLIMATE CHANGE

In an unprecedented contribution to the debate over anthropogenic climate change, the leader of the Catholic Church, Pope Francis, last month issued an encyclical, entitled *Laudato Si'* calling for "every living person on this planet" to participate in "a new dialogue about how we are shaping the future of our planet". The strongly worded condemnation of humankind's contribution to climate change comes just months before the COP 21 climate treaty talks in Paris.

IRAN NUCLEAR TALKS INCHING TOWARDS HISTORIC DEAL

The negotiations under way in Vienna over Iran's nuclear activities and the lifting of sanctions continued beyond the end of June deadline as six world powers and Iran worked on a deal. As *World Energy Focus* was going to press, a deal looked imminent, with US Secretary of State John Kerry reported as saying: "We are not where we need to be. But we are closer than we have ever been." Foreign energy investors have for some time been positioning themselves to exploit potential opportunities.

OPEC MAINTAINS CRUDE OUTPUT TARGET

The Organisation of Petroleum Exporting Countries (OPEC) last month agreed to maintain its output target at 30 million b/d, as most observers expected it would. Brent crude which was trading at around $65/b at the start of the month fell below the $60/b level in early July, down 47% on a year ago. OPEC's next meeting is scheduled for 4th December.

Buhari sets about fixing Nigeria's energy sector

President Buhari has vowed to improve Nigeria's electricity supply – a top priority in a nation with only 4,000 MW of operable capacity to meet the needs of 175 million people. *(Source: mbuhari.ng)*

Nigeria's new president, Muhammadu Buhari, was sworn in at the end of May amidst an acute energy supply crisis in the country. And yet Nigeria – Africa's largest oil producer – has abundant resources of energy, including substantial proven reserves of oil and gas and much undeveloped potential for hydropower. Here, Professor Abubakar Sani Sambo, Chair of the Nigerian National Member Committee of the World Energy Council, sets out the energy challenges that Buhari faces.

It is not surprising that Nigeria's new president has taken a very special interest in the Nigerian energy sector. He is acutely aware that fixing Nigeria's bedevilled energy sector will be crucial to the nation's social and economic development. Moreover, as a former petroleum minister himself, he has more knowledge than most of what will be needed if he is to succeed.

Home to around 175 million people, Nigeria is Africa's most populous country. It relies heavily on the oil and gas sector for revenues, so the plunge in the price of crude oil has taken a harsh toll. Oil price is currently well below the level needed to balance the national budget and most state governments are struggling to pay their commitments.

Economic development is hamstrung by the very low level of available electricity of around 4,000 MW, meaning that power cuts are widespread and frequent, and by the poor performance of the nation's four refineries, which restricts the availability of petroleum products. Ten new gas-fired power stations lie idle because there is insufficient gas supply to fuel them, despite Nigeria's substantial gas reserves. Those who can afford it use costly diesel-fuelled standby generators, but one consequence of that is many imported goods, especially those from China, are cheaper than those produced locally.

BUHARI'S PRIORITIES

As his presidency gets under way, Buhari is focusing on three areas: security/insurgency; widespread corruption, not least in the energy sector; and boosting electricity supply. The nation currently relies mainly on gas and hydropower for its electricity and there is a need to expand the electricity mix to include solar, wind, biofuels, coal and nuclear.

Also high on the list of priorities will be reforming the upstream oil and gas sector, which will involve reviewing the draft Petroleum Industries Bill (PIB), which despite years of work has yet to become law, and presenting it once again to the National Assembly. Only then will the opportunities that the opening up of the oil and gas sectors presents be attractive to the private investment that will be needed if the country is to realise its full potential as an oil and gas producer.

Much work has also been done on a new Energy Policy and Masterplan and the Energy Commission of Nigeria is doing what it can to get them passed into law to ensure their speedy implementation.

REMOVING SUBSIDIES

Downstream, the nation's four refineries, built during Buhari's tenure as petroleum minister, need to be fixed so that they operate optimally, and the government should create a business environment conducive to private sector participation so that more are built to meet Nigeria's needs.

That will involve the tricky political task of removing heavy subsidies on petroleum products that the government can ill afford, especially at the current level of crude oil prices.

In electricity, the private sector has failed to invest despite having bought the generation and distribution entities from the government.

The government therefore needs to get the new owners of the sold entities to adhere to the terms of the sales agreement and invest in the new companies. In this way, the generation and distribution companies would function better and could be expanded to move towards meeting the nation's power demand.

Since its inception, the Nigerian National Committee of the World Energy Council has been functioning as a think tank on energy policies, offering the government advisory viewpoints on all aspects of the energy sector.

The Committee concurs with the Council's views on the need to balance the energy trilemma – energy equity, security and sustainability – and agrees with the objectives of delivering a predictable and stable policy framework, especially in the areas of energy security, energy efficiency and energy prices.

As in most of the rest of sub-Saharan Africa, much of Nigeria's population lacks access to modern energy services and the social, health and economic benefits that they bring. The national focus in Nigeria is therefore to ensure that access is extended to the entire country and that the energy mix is increased substantially to make that possible.

Professor Abubakar Sani Sambo is Chair of the World Energy Council's Nigerian Member Committee. A former Director-General of the Energy Commission of Nigeria, he was named the Special Adviser to the President of Nigeria on energy in 2011.

EVENTS

Executive Assembly
Addis Ababa, Ethiopia
25–28 October 2015
The World Energy Council's annual meeting, welcoming the Council's community and representatives from the African and global energy sectors.

World Energy Leaders' Summit
Addis Ababa, Ethiopia
28-29 October 2015
A high-level, invitation-only event held after the Executive Assembly that provides a platform for the global energy leaders' community to facilitate dialogue on critical energy issues. It will be co-hosted by the Prime Minister of Ethiopia and will consist of the CEO Roundtable, the Trilemma Ministerial Roundtable and the Africa Ministerial Meeting.

2016 World Energy Congress
Istanbul, Turkey
9–13 October 2016
The World Energy Congress is the triennial flagship event of the World Energy Council. It has gained recognition since the first event in 1924 as the premier global forum for leaders and thinkers to debate energy issues. The event also provides an opportunity for executives to display their technologies and explore business opportunities. The upcoming Congress in Istanbul will be held under the theme "Embracing new frontiers".

Just some of the confirmed speakers.

The Congress website is now online with information on the exhibition, call for papers, and sponsorship. You can register at: http://www.wec2016istanbul.org.tr

MEMBER COMMITTEE EVENTS

Action for Energy for 2015
Johannesburg, South Africa
30 July 2015
The South African National Energy Association (SANEA), the World Energy Council's South African National Member Committee, will be hosting its 2nd Action for Energy for 2015 event under the theme: Energy-Related Challenges faced by Small Consumers.

The objective is to obtain the energy end-users' perspective: What are the top five energy-related issues facing this segment of the economy? What is the way forward with regard to each of the challenges?

http://bit.ly/1SE37cn
Contact: Sarita Cronje
saritac@mweb.co.za

Bolivia Gas and Energy International Congress 2015
Santa Cruz, Bolivia
19–20 August 2015
The 8th annual Congress of the Bolivian Chamber of Hydrocarbons and Energy (CBHE) will analyse the realities of the energy and hydrocarbons sectors. This year's event will be held under the theme "Energy challenges of the next decade – crisis or opportunity?"

Catch up on last year's event at:
http://bit.ly/1C46UIt
http://boliviagasenergia.com/2015/
Contact: Ronald Fessy Málaga
dircom@cbhe.org.bo

International Beirut Energy Forum
Beirut, Lebanon
9–11 September 2015
With continuous oil price fluctuations, how is the world's sustainable energy sector being affected? What are the dynamics of fuel-based economy and sustainable energy development? Energy ministers and leaders from around the world will look at these and other issues at this platform for discussion of topics related to renewable energy sources, energy efficiency, and green buildings in the Middle East and North Africa (MENA) region.

Catch up on last year's event at:
http://bit.ly/15InlgB
Contact: Pierre El Khoury
pierre.khoury@lcecp.org.lb

Alternatives for social and environmental viability of large energetic projects
Bogotá, Colombia
27 August 2015
The event will identify practices and policy guidelines to promote efficient management of social and environmental impacts to ensure the energy sustainability in Colombia.

http://www.cocme.org/
Contact: Daniel Diaz
a.tecnico@cocme.org

Annual Joint Energy Congress
Acapulco, Mexico
9–11 September 2015
The Council´s Mexican Member Committee will host its 2015 congress: *Progress in the Implementation of the Energy Reforms in Mexico*. The Committee is organising the session *Energy Trilemma and Competitive Energy Markets*. It will discuss the situation in Mexico as regards the three dimensions of the energy trilemma: equity, security and sustainability.

http://www.wecmex.org.mx/
Contact:
Dr. Pablo Marcelo Mulás del Pozo
pmulas@iie.org.mx

SEE MORE COUNCIL EVENTS AT www.worldenergy.org/events/future

ABOUT THE COUNCIL

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

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

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