

Coal sector to COP: we are part of the solution



Clean coal technologies should get the same kind of government incentives to reduce CO₂ emissions as other energy sources, such as nuclear power and renewables, are getting, say proponents of coal energy. They warn that if policymakers continue to see coal only as an enemy to be combated, rather than an ally to be supported, the world will fail in its attempt to limit global warming to acceptable levels.

Just about two months before the COP21 climate summit in Paris, proponents of coal energy say they are fighting an uphill battle to get the world to recognise how coal-fuelled electricity plant modernisation and carbon capture and storage (CCS) systems can be a key component to a dramatic reduction in global greenhouse gas emissions.

Increasing the efficiency of coal-fired plants to over 50 percent will be a crucial milestone in cutting global carbon dioxide emissions by 80 to 95 percent of 1990 levels, says Hans-Wilhelm Schiffer, the head of the World Energy Resources programme at the World Energy Council, and consultant to the largest German coal-power producer RWE.

However, the public perception of coal is so low, that it is hard to get governments to support even the most innovative technologies, says Schiffer. "Coal is being portrayed as the bogey man, responsible for only negative environmental problems." Schiffer is concerned that opponents ignore the benefits "coal has in human development."

ECONOMIC CASE

Cartan Sumner, Vice President of Public Policy at Peabody Energy, the largest private-sector coal firm in the world, and Associate Member of the International Energy Agency (IEA)

Boundary Dam Power Station photo SaskPower

Coal Industry Advisory Board, shares Schiffer's concerns. He points out that over 40% of worldwide electricity is produced with coal and adds that "coal is going to continue to be used at a dramatic rate". He cites a projected tripling of coal use in the ASEAN region between 2011 and 2035. "Coal has been the world's fastest growing fuel, and as the IEA pointed out in its most recent World Energy Outlook, coal demand is approaching that of oil."

A recent study published in the Proceedings of the National Academy of Sciences in the US, supports these claims and states that "we are witnessing a global renaissance of coal majorly driven by poor, fast-growing countries that increasingly rely on coal to satisfy their growing energy demand." (<http://bit.ly/1iNHIQ7>)

Given the world's continued reliance on coal, say Schiffer and Sumner, policymakers should devote much more attention to supporting the coal sector in its efforts to lower greenhouse gas emissions, for instance through carbon capture, utilisation and storage (CC(U)S). Right now, they are primarily thinking in terms of punitive measures, such as raising carbon prices. However, says Schiffer, "there will not be an economic case for CCS unless CO₂ allowance prices rise substantially – in the EU to more than 10 times > see page 2

EXCLUSIVE INTERVIEW

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The past is not a guide anymore to the future. That's the key message to come out of a new major report from the World Energy Council: "The Road to Resilience – Managing and Financing Extreme Weather Risks". In an interview with World Energy Focus, Agostino Galvagni, CEO of Swiss Re Corporate Solutions, a contributing partner to the report, says energy companies and investors need to assess the impact of unexpected extreme weather events much more than they did in the past.

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today's prices. But this would cripple industry." For this reason, Schiffer says CCS should be given policy parity with other low emission energy technologies such as renewables in international climate mechanisms.

SUPER CRITICAL

But is it possible for the coal power sector to contribute to reducing CO₂ emissions? Yes, say Schiffer and Sumner emphatically.

The first step to global environmental improvements is upgrading coal-fuelled plants worldwide, Schiffer says. Citing a figure from the Coal Industry Advisory Board Submission to the IEA, he claims moving the current global average efficiency rate of coal-fired power plants from 33 to 40 % by deploying more advanced technology could cut CO₂ emissions every year by approximately 2 Gt, which is as much as the total annual emissions of India, the world third largest emitter, after China and the US.

"If all the world's coal-fired power plants were brought up to the latest standards, the CO₂ saved would be more than that saved under the Kyoto Protocol," Schiffer adds.

As an example of upgrading, he mentions using waste heat for the fluidised-bed drying of lignite before combustion. RWE installed a prototype of this concept at its Niederaussem facility. It improves efficiency by as much as four to five percentage points, and can safely dry up to 80 tonnes



Clean coal technology fair in US
photo America's Power

of lignite per hour, says Schiffer. New capabilities to handle steam temperatures of 700°C at 350 bar have given coal operations another four percentage points gain in efficiency.

Sumner mentions the further development of High-Efficiency, Low-Emissions (HELE) plants that "continue to push the envelope of technology in terms of efficiency." To that end Peabody invests in advanced coal technology initiatives around the world, he notes, including China's GreenGen IGCC project in Tianjin, while funding academic research at the University of Wyoming and Washington University in St. Louis.

"We want to see the best technology used," Sumner says. "It's critical to our future." The hope is that the ventures will lead to more implementation of super critical coal power facilities, and a reduction in cost of CCS systems.

NEW TECHNIQUES

In the long term, CC(U)S is obviously going to be key to reducing greenhouse gas emissions. Schiffer says that after having been upgraded, plants could be

fitted with carbon capture facilities, and the CO₂ could be either used or stored.

Schiffer and Sumner have high expectations of SaskPower's CCS project at Boundary Dam near Estevan, Saskatchewan in Canada. Sumner calls this project "iconic to the coal argument." Upgrading Boundary Dam Power cost 1.47 billion Canadian dollars (US\$1.1 billion), according to state-owned SaskPower, with roughly CA\$ 900 million going to the CCS system. Canada's national government contributed CA\$ 240 million to help defray project costs at the 110 MW facility.

Prior to the upgrade, the plant produced 139 megawatts and released 3,604 tonnes of CO₂ per day. Now it releases 354 tonnes per day, effectively capturing about 90 percent of CO₂ emissions. SaskPower calculates their plant captures a million tonnes of carbon dioxide per year.

The company applied for a 15.5 percent rate increase from 2014 through 2016. The government approved a 10.5 percent hike through 2015 instead. But SaskPower believes the costs for using carbon capture in their next installation will drop by 20 to 30 percent as they have identified potential design improvements and gained experience in implementation.

Sumner says this is "absolutely" possible, saying costs will drop significantly once the process is adopted in more parts of the world. Schiffer also notes that CCS as

a process is improving, with new scrubbing techniques that can reduce CCS energy consumption by 20 percent while using less solvent.

DARK AGES

CCS projects such as Boundary Dam are criticised by advocates of renewable energy because they argue it makes more sense to invest in wind and solar energy instead. Schiffer is also in favour of an increased use of renewables, but says the only way to guarantee the availability of electricity during peak periods is having conventional power plants that are able to meet that demand when renewables do not provide enough. He looks to one point during 21 March 2013 when wind and solar were barely able to meet two percent of German energy demand. Three days later, the two power sources were able to provide 69 percent of the country's demand.

He supports new boiler-turbine control systems that allow coal power plants to run at a partial-load level of under 20 percent. Modernised coal-fuelled power plants are capable of scaling between partial load and full load at three percentage points per minute, Schiffer says, providing security to the energy supply even as the amount of installed renewable capacity continues to grow. "Coal provides the same flexibility as gas in power generation. Thus coal is not in contrast with an increased use of renewable energies, but instead coal and renewables complement one another and are partners in meeting present and future energy needs."

Nevertheless clean coal will only have a future if policymakers recognise its benefits, say both Schiffer and Sumner. According to Schiffer, it is vital that an accord formed at the Paris climate summit in December should provide incentives for the sector to deploy advanced coal-fueled technologies, including CC(U)S, to reduce greenhouse gas emissions. This would be less costly than relying solely on renewable energy. "Encouraging investment in the more efficient use of coal has to be part of the solution. Eliminating coal use would push many back into the Dark Ages." ●

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The past is not a guide anymore to the future. That's the scary message to come out of a new major report from the World Energy Council: "The Road to Resilience – Managing and Financing Extreme Weather Risks". In an interview with World Energy Focus, Agostino Galvagni, CEO of Swiss Re Corporate Solutions, a contributing partner to the report, says energy companies and investors need to assess the impact of unexpected extreme weather events much more than they did in the past. "Most investment plans neglect market disruptions resulting from climate change."

After the World Energy Congress in Daegu, Korea, where it became clear how urgent the energy sector's investment needs are, the World Energy Council started working on a unique project, Financing Resilient Energy Infrastructure (FREI), to map out the major external threats to energy investment. It was decided to focus on three major risks: water stress, cyberthreats and extreme weather events. The working group on extreme weather events, supported by Swiss Re, Marsh & McLennan and the European Bank for Reconstruction and Development (EBRD), is the first to come out with a report.

When he started working with the World Energy Council on FREI, Agostino Galvagni, the Italian-born chief executive of Swiss Re Corporate Solutions, one of the world's leading re-insurers, was surprised to discover how much money needs to be invested in energy assets over the coming decades – even though he is used to big numbers. "\$53 trillion by 2035, according to figures from the International Energy Agency! A tremendous amount."

But what is more, this figure from the IEA, he notes, does not even take into account the effects of climate change on energy investment needs. "This will add hundreds of billions more."

STORMS, BLIZZARDS, DROUGHTS

What has become clear from the FREI research, says Galvagni, is that the impact of extreme weather events as a result of climate change will be much larger than most people realise. "We can see from our own data that the frequency and intensity of extreme weather events has already increased significantly in recent years. In particular we have seen an increase in storms and high temperature extremes. And as global warming will take hold, this will only get worse."

As the Road to Resilience report puts it: "Extreme hot and cold temperatures will raise overall energy demand and strain peak capacity. The energy supply also faces reduced efficiency of thermal plants, cooling constraints on thermal and nuclear plants and increased stress on transmission and distribution (T&D) systems. More extreme events such as tropical storms, blizzards, droughts or floods may not only



"Energy sector must wake up to the threat of extreme weather"

Interview Agostino Galvagni, Swiss Re

impact energy production and revenue streams, but also the equipment itself."

Although events like Hurricane Sandy in the US and the prolonged drought in Brazil, have sounded alarm bells, the energy sector is as yet insufficiently aware of the climate change threat, says Galvagni. "Most of the project

planning in the energy sector currently does not take into account the market disruptions that may be the result of this increase in extreme weather. That needs to change. Every energy infrastructure project needs to consider pro-actively what kind of risk mitigation or protection measures need to be in place."

FINANCING RESILIENT ENERGY INFRASTRUCTURE

The report "Road to Resilience – Managing and Financing Extreme Weather Risks" <http://ow.ly/T2bbF>, is the first in a series of three that are part of the Financing Resilient Energy Infrastructure Project, which the World Energy Council initiated after the 2013 World Energy Congress in Daegu, Korea.

The ultimate aim of this unique project, which the World Energy Council is undertaking in partnership with reinsurer Swiss Re, services firm Marsh and McLennan, and with the support of the European Bank for Reconstruction and Development (EBRD), is to ensure that sufficient capital will be made available for investment in energy infrastructure in the coming decades.

Specifically, the project addresses three types of external risks that, if not properly addressed, could scare away investment in energy infrastructure: extreme weather, water stress and the energy-food-water nexus, and cyberthreats. The reports on water stress and cyberthreats will come out in the first half of 2016.

FROM STRONG TO SMART

So what should be done? "What our research shows", says Galvagni, "is that it is not sufficient anymore for companies to take conventional 'hard' protection measures, like putting in extra sea and flood walls or backup generators. They need to have strategies in place

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that include 'soft' resilience measures. These could include disaster management planning, engagement with local communities, the use of natural defences, and also insurance and financial hedging. We need to move from strong to smart measures."

Galvagni gives the example of the state utility company of Uruguay which recently entered into a hedging deal to get financial protection in the event of prolonged drought. Uruguay is 80% dependent on hydropower.

Making energy infrastructure resilient to the new climate change threats is not only necessary for energy companies themselves, it is also vital to be able to attract investment from institutional investors. "The trillions that need to be invested in energy infrastructure can only be brought together with the help of institutional investors, such as pension funds, investment funds and insurance companies", notes Galvagni. "Many utilities are suffering financially in the

For us the situation is a bit scary. A lot of our underwriting is based on historical data



current market. They don't have the financial ability anymore to make these huge investments. Government budgets are also under pressure."

Institutional investors, however, look for long-term steady returns and are averse to risk. "They will want to be sure that their investments are well protected against extreme weather risks."

BUSINESS OPPORTUNITY

Regulation enters into it as well. "Currently institutional investors are prevented from investing substantially into energy infrastructure because of solvency regulations", notes Galvagni. "Also a regulatory framework is needed defining reliability and environmental standards for energy infrastructure, to allow investors to invest with

confidence in new assets and related resilience measures."

Galvagni notes that, apart from the effects of extreme weather, the expansion of intermittent renewable energy is changing the nature of risks in the energy sector. "In the traditional fossil fuel sector, by far the most important risk is environmental liability. Think of Deepwater Horizon. This type of risk doesn't exist in renewable energy."

The risks in the renewable energy sector are less related to the environment, or price, but more to the intermittency of the production, which in turn is highly dependent on the weather. "In renewable energy there is a very high correlation between revenues and weather." For an insurance company like Swiss Re

Corporate Solutions, which employs meteorologists and commodity market experts who assess weather and energy risks and make long-term forecasts, this presents a business opportunity, says Galvagni.

On the other hand, the inherently unpredictable nature of extreme weather events is a cause for some concern for the company. "For us the situation is a bit scary. A lot of our underwriting is based on historical data. With climate change the past isn't necessarily indicative for the future." That's exactly why climate change effects need to become a higher priority, he adds. "That's why we are calling on the sector to go beyond traditional supply-demand projections and include climate change scenarios in their planning." ●

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China, US commitment will encourage other countries to act on climate



The Chinese and US joint announcement on 25 September last month to further strengthen their climate policies means “other major economies will have one less excuse to not act on climate change”, says Barry Worthington, executive director at the United States Energy Association, the World Energy Council’s US member. China’s announcement to launch a national emission trading scheme in 2017 will give fresh impetus to global efforts for carbon pricing.

September’s China–US link-up sends a strong signal that the two countries – which together are responsible for nearly 40% of current global emissions – are taking the lead to galvanise other countries to make meaningful carbon reduction commitments ahead of the Paris climate talks, says Worthington. “China’s stepping forward will encourage countries – particularly other industrialised countries – to do something that they would otherwise be very reluctant to do. It will be very difficult for other industrialised countries to say, ‘we’re not going to do anything’, because they’ve been saying for 20 years that ‘we’re not going to do anything until China does’.”

Similarly, China’s move could quell criticisms within the US of President Obama’s Clean Power Plan, which was finalised in August. “Domestically people don’t have the excuse that they had in the past 20 years with China,” adds Worthington.

The announcement – which also saw US making further commitments to limit emissions – followed the countries’ historic pledge in November 2014 to jointly tackle climate change, when China committed to peaking its emissions by 2030. Now China said it will launch a national emissions trading system by 2017, covering key industry sectors such as iron and steel, power generation, chemical,

building materials, paper-making, and nonferrous metals.

Emissions trading is not new to China. In 2012, China initiated pilot schemes in seven cities and regions, making it the second largest carbon market after the EU. Carbon prices varied widely in the different schemes but were considered to “score quite well” (<http://bit.ly/1uoqtWu>), at as high as \$20 per tonne of CO₂ equivalent in the Shenzhen market.

However, the lack of transparency has dogged the schemes, as the lack of clarity in the policymaking process had deterred companies from making long-term plans, and traders complained of potential corruption as it was not possible to check if some companies were allowed to break the rules. These difficulties could well surface in the national system and will need to be addressed, observers say. <http://reut.rs/1MarW9g>

Nevertheless, experts have welcomed its announcement. “China is teaching the world a lesson in how to introduce reform: first try it out at a small scale in a variety of forms, and then scale up the most successful,” John Mathews, Professor of Strategic Management at the Macquarie Graduate School of Management, Macquarie University commented on The Conversation. <http://bit.ly/1Z2waJB>

Combined with China’s existing efforts to reduce emissions and air pollution by reducing coal use, upping energy efficiency, and promoting renewables,

United Nations adopt energy goals for the first time

At a special summit at the UN headquarters in September, governments from 193 countries unanimously adopted new Sustainable Development Goals, which for the first time included “affordable and clean energy” among them.

In a reaction, Christoph Frei, Secretary General of the World Energy Council, says: “The adoption of energy among sustainable development goals is timely, critical and historic. Timely because we need to master the energy transition at a time of greatest uncertainty in the energy sector. Critical because we will not solve energy access or achieve energy efficiency objectives without moving the agenda from those who want to those who can. And historic, because the development community for the first time recognises the fundamental role energy is playing in the achievement of most of the other sustainable development goals.

Rachael Kyte, the incoming CEO of the UN Sustainable Energy for All (SE4ALL), a global initiative launched in 2011 by UN Secretary General Ban Ki-Moon, said: “Without sustainable energy we cannot realise the full ambition of many other goals.” ●

the emission trading scheme will “take its place as an initiative that helps to solidify China’s trajectory towards greening its energy systems,” according to Mathews. ●

NEWS IN BRIEF

FOSSIL FUEL SUBSIDIES REMAIN HIGH – OECD REPORT

Government support to fossil fuels in OECD countries and key emerging economies remains high, at US\$160–200 billion per year, according to a new report from the Organisation for Economic Co-operation and Development (OECD). <http://bit.ly/1QT2VUD>

NEW DEAL FOR AFRICA

The African Development Bank has launched the New Deal for Energy in Africa to help end energy poverty by 2025. The New Deal will focus on mobilising support and funding for an African energy financing facility. Addressing energy poverty of Africa would require \$4.2 billion, according to the Bank’s new President Akinwumi Adesina, who unveiled the initiative at the Bank’s headquarters in Cote d’Ivoire last month. <http://bit.ly/1GrCgYD>

NEW ETHIOPIA HYDRO PLANT STARTS PRODUCTION

The Gibe III hydro power plant in Ethiopia has started electricity production on a trial basis with three turbines. When complete, the plant on the River Omo will have a capacity of 187 MW using 10 turbines. The plant is the third project following two dams further upstream, which are already operating. Ethiopia’s Water, Irrigation and Energy Minister, Alemayehu Tegenu, said that the new plant will also regulate water flows and supply water to downstream projects.

Energy efficiency – “missing piece of the puzzle”

As country carbon reduction pledges – so-called “intended nationally determined contributions” (INDCs) – are being submitted to the UN, many experts believe that they will not be enough to keep warming to 2°C. Gerald Davis, Chair of the World Energy Council's energy scenarios work, calls for more focus on energy efficiency.

As the Paris climate summit in December is getting closer, it is becoming clear that the bottom-up approach that is being followed – having countries submit their own climate targets – is leading to positive responses from many countries. However, as NGO Climate Action Tracker reports, implementing the INDCs submitted to the UN so far would still lead to a warming of 2.7°. <http://bit.ly/1N48Elq>

These findings are confirmed by the World Energy Council's scenarios, which

in 2013 found that current policies and technologies will not be enough to meet climate goals. <http://bit.ly/1OeF9SQ>

Davis says that to reach 2°C there needs to be a much greater emphasis on energy efficiency across many sectors: in buildings, transport fuels, and putting greater emphasis on public transport. “It's much easier to reach the 2°C target and envisage a sensible mix of fuels which could include some fossil fuels even by 2050, if we do a really good job on efficiency,” he says.

He made the remarks after his scenarios working group convened in London in September to look at adaptation measures of poorer countries and the consequences of extreme weather events, which will form the Council's scenarios to be released in October 2016 at the World Energy Congress. ●

German World Energy Council committee calls for carbon pricing

In a new (German language) report – Climate Change: What it means for the energy economy – the German committee of the World Energy Council issues a plea for a global carbon pricing system. The Weltenergieat Deutschland notes that despite a large growth in renewable energy capacity, German carbon emissions have hardly gone down. The main reason for this, it says, is that the EU emissions trading scheme (ETS) does not put a sufficiently high price on CO₂ emissions.

The German committee also notes that the famous German “Energiewende” (energy transformation), which led to a huge growth of solar and wind power in the country, is not an aberration. “The German strategy is in line with what worldwide research is showing”. ●

IEA: renewables to lead world power market growth to 2020

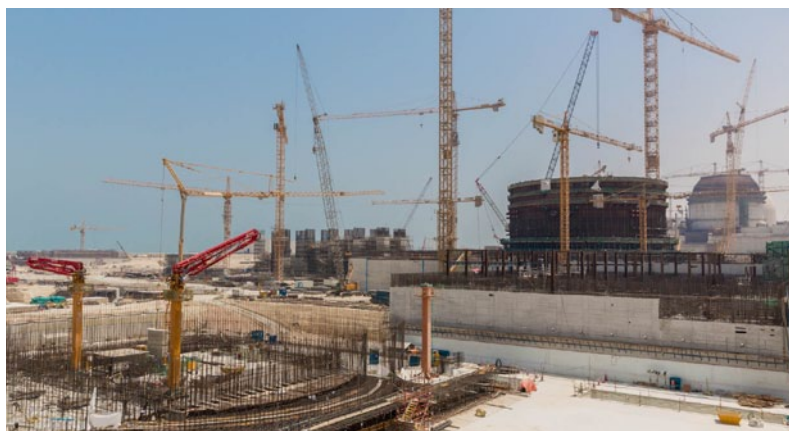
Renewable energy will represent the largest single source of electricity growth over the next five years, driven by falling costs and aggressive expansion in emerging economies, the International Energy Agency (IEA) said on 2 October in an annual market report. Pointing to the great promise renewables hold for affordably mitigating climate change and enhancing energy security, the report warns governments to reduce policy uncertainties that are acting as brakes on greater deployment.

“Renewables are poised to seize the crucial top spot in global power supply growth, but this is hardly time for complacency,” said IEA Executive Director Fatih Birol as he released the IEA's Medium-Term Renewable Energy Market Report 2015 (MTRMR)

at the G20 Energy Ministers Meeting in Istanbul. “Governments must remove the question marks over renewables if these technologies are to achieve their full potential, and put our energy system on a more secure, sustainable path.”

Renewable electricity additions over the next five years will top 700 gigawatts (GW) – more than twice Japan's current installed power capacity, said the IEA. Non-hydro sources such as wind and solar photovoltaic panels (solar PV) will represent nearly half of the total global power capacity increase.

The report sees the share of renewable energy in global power generation rising to over 26% by 2020 from 22% in 2013 – a remarkable shift in a very limited period of time. ●



CONSTRUCTION OF FOURTH UNIT AT UAE NUCLEAR PLANT GETS UNDERWAY

Construction of the fourth reactor at the UAE's Barakah nuclear plant at Abu Dhabi has started. The plant's state-backed owner, the Emirates Nuclear Energy Corporation, says that construction of the reactor is on track for operations to start in 2020. The first unit at Barakah is due to complete in 2017, with the second and third units coming on stream at 12-month intervals. Each unit will have a capacity of 1400 MW. <http://bit.ly/1hkT2SG> ●

Separating capture from transport/storage could help boost CCS

Separating CO₂ capture from transport and storage could facilitate the commercialisation of carbon capture and storage (CCS) in Europe, according to a paper published last month by the European Zero Emissions Platform (ZEP), the European Commission's advisory body for CCS.

The paper, “An executable plan for enabling CCS in Europe,” spells out how

the European Commission and Member States could provide effective support for CCS uptake. <http://bit.ly/1LamSky>

The business model and liability provisions for CO₂ capture and storage/transport are very different, according to the work. “So there's a clear logic in separating those markets for forward development,” says Graham Sweeney, who chairs the ZEP. ●



Tanzania is actively diversifying its energy mix and moving away from its decades-long dependence on hydro. Modern infrastructure, the development of considerable national gas reserves and ensuring secure and affordable energy for Tanzanians are critical for the country's future growth. Now a comprehensive national policy with widespread political support has been launched, aimed at attracting much-needed investment. Prospects are good: according to the Tanzanian committee of the World Energy Council, Tanzania is open for business.

Traditionally Tanzania has been heavily dependent on hydropower, but in recent years recurring droughts have crippled the operations of the country's major hydro facilities. The East African nation responded by tapping into its big reserves of natural gas to generate electricity, making up for the hydropower shortages with natural gas-fired turbines.

Tanzania has proven reserves of natural gas in excess of 50 trillion cubic feet – about ten times current total gas consumption in the whole of Africa. This is more than enough to put the country on a faster economic

development path and help it build energy independence, but at the cost of higher carbon emissions. As of September 2015, the total installed electricity generation capacity is 1,246 MW; composed of hydro 562 MW (45%), natural gas 441 MW (or 35%) and liquid fuel 243 MW (or 20%).

The droughts that hit hydropower capacity not only led to rationing, but also to higher prices. In 2014, domestic and industrial energy consumers faced a 40% increase in electricity tariffs. Currently, only 24% of Tanzanians are connected to the grid; in rural areas only 7%.

“Although we have seen some achievements recently, there are still many challenges to be faced”, says James Andilile, Assistant Commissioner for Energy Development at Tanzania's Ministry of Energy and Materials. “We must increase access to modern sources of energy and support research and development of appropriate energy technologies, increase private sector participation, expand our infrastructure, and raise the finance to do this. Security of supply, and reducing the cost of supply are very important. Environmental protection is also a factor and at present there is inadequate awareness of the benefits and methods of energy conservation and efficiency.”

POLITICAL WILL

The National Energy Policy 2015 has been formulated to address these challenges. The policy was the result of an intense process in which a large number of dedicated people participated, including Development Partners (a group of 17 bilateral and five multilateral development agencies, including the UN). The policy was approved by the cabinet in May 2015. “There's no doubt that there's a political will towards ensuring that the policy is fully implemented”, says Andilile.

The new policy is expected to increase access to modern energy services, promote security of supply, encourage energy efficiency and renewables, promote cost-reflective pricing mechanisms and reduce dependence on imported petroleum.

The National Energy Policy follows upon the Electricity Supply Industry (ESI) Reform Strategy and Roadmap announced last year. Aims of this roadmap include: increasing investment from both private and public sectors, enhancing private sector participation, increasing connection and access levels to electricity, diversifying sources of energy for electricity generation and supply, and enhancing affordability and reliability of electricity supply. A key challenge of implementation is the restructuring of state-owned TANESCO (Tanzania Electric Supply Company Limited). Following the recommendations in a series of external consultants' reports, the Roadmap proposes the staged unbundling of TANESCO, provision for TANESCO paying off its current debts, and the retirement of costly emergency power producers (EPPs).

BUSINESS PROSPECTS

The private sector is participating in the energy sector under independent power project (IPP), or public-private partnership (PPP) arrangements. It has been a mixed experience to date, with delays in delivering the projects and private companies demanding excessive guarantees from government to make projects risk-free. Nonetheless, overall experience has been positive and PPPs have been extended to the development of midstream and downstream infrastructure projects, as well as transmission and distribution networks. Many African countries, such as South Africa and Nigeria, have started on

power sector reforms to reduce the dependence on state-owned utilities and to encourage private sector investment and IPPs. According to Andilile, “Tanzania is actively building on other countries' experiences to get the legislative, regulatory and policy framework right.” ●

INTERCONNECTIONS

Tanzania is also tackling its energy challenges by improving electricity interconnections with its neighbours. Currently, Tanzania imports electricity from Uganda (8 MW), Zambia (5 MW), and Kenya (1 MW). The country takes part in a number of regional generation and transmission projects, predominantly through the Eastern Africa Power Pool (EAPP), which Tanzania joined in 2010. Members are Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Libya and Uganda. Tanzania's flagship project through the EAPP is Rusumo Falls, an 80 MW hydropower project which is being jointly developed by Tanzania, Rwanda and Burundi. Also as part of the EAPP, feasibility studies are underway on four regional transmission projects:

- Kenya (Rongai/Kisumu) – Tanzania (Nyakato/Mwanza) 220kV interconnector
- Masaka (Uganda) – Mwanza (Tanzania) 220kV transmission line
- Burundi (Zege – Itaba/Jiji – Mulembwe) – Tanzania (Kigoma) 220kV transmission line
- Tanzania - Zambia 400kV transmission line

EVENTS

Executive Assembly

**United Nations Conference Centre
Addis Ababa, Ethiopia
26–30 October 2015**

The World Energy Council's annual meeting, welcoming the Council's community and representatives from the African and global energy sectors, will discuss sustainable energy systems on national, regional and global levels. Together with more than 20 Energy ministers that have already confirmed their attendance, leaders from business, finance and academia will share best practice and identify solutions to the energy trilemma during dedicated sessions including the **Trilemma Summit, Future Energy Leaders' Summit**, and the private invitation-only **World Energy Leaders' Summit**. The event is hosted by the Prime Minister of Ethiopia.

<http://bit.ly/1SopMvr>

REGIONAL EVENT 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 (SANE), the Council's national committee. It is supported by the African Union Commission and the NEPAD Planning and Coordinating Agency.

www.africaenergyindaba.com

MEMBER COMMITTEE EVENTS

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
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Website: <http://bit.ly/1OJJQBn>

Energy Demand & Climate Change: a Mediterranean nexus

Milan, Italy - 15 October 2015

Ahead of COP21 representatives from institutions, academia and policy discuss the opportunities and challenges for sustainable development related to climate change and global warming.

Contact: Agata Carone
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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.

Contact: Branka Jelavic
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Website: http://www.hed.hr/forum_e.html

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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by visiting our website and contacting our team on: <http://www.worldenergy.org/wec-network>

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2016 World Energy Congress

**Istanbul, Turkey
9–13 October 2016**

Only 12 more months until the 23rd World Energy Congress kicks off in Istanbul under the theme "Embracing New Frontiers". To date 66 speakers have confirmed their attendance; and since 1 October papers can be submitted. More information and registration, visit the official congress website <http://www.wec2016istanbul.org.tr> Follow the Congress on Twitter: <https://twitter.com/WECongress>

