

INSIDE THIS ISSUE



Interview Christoph Frei,
Secretary General
World Energy Council

“The key message
from Paris:
be part of the
innovation frontier”

Photo Grantly Lynch

The key message of the COP21 Paris climate agreement is that business should be part of the drive towards renewable energy and part of the “innovation frontier”, says Christoph Frei, Secretary-General of the World Energy Council in an interview with World Energy Focus. “The long road from Paris is to build on the best technology, to develop and deploy innovation. If you are not on the forefront of this, you may not be around in the foreseeable future.” Frei (47), who has been the Council's leader since 2009, spells out what ‘Paris’ means for the utility sector, oil and gas companies, coal companies and investors. He notes the world is going through a triple transition: a decarbonisation transition, a market design transition and a resilience transition. To navigate these transitions, “you have to be very clear on where your priorities are.”

Does Paris provide a clear enough signal for energy companies and investors to set them on a new course for the future? That is after all what the energy sector has been asking for [<http://bit.ly/1K1zpHL>] most of all from policymakers: an end to uncertainty, predictable policy, balanced regulatory frameworks. According to Christoph Frei, who has worked tirelessly to unite the global energy sector behind a vision towards

a sustainable future, the answer is a clear yes.

“Paris has made it absolutely clear that we need to get started on the decarbonisation pathway. True, we do not have an international carbon price, which would be the best solution for the energy sector. But we have a shadow price: we know that implementation of the INDC's (national climate plans) will reduce emissions from 59 GT to 55 GT in 2030. That may be a second-best solution, but it provides one aspect of clarity. And we know it's just a start. It's only one-third of where we need to get. The plans will be reviewed and ambitions will be ratcheted up to meet the goals.”

Frei says the outcome of Paris exceeds expectations. “A year ago, we hoped to get some 100 countries to submit an INDC. In the end we got 185 countries. Yes, there are gaps to be closed – an ambition gap, a financing gap – but there is a deal. That was never obvious.” He adds that it was clear that Paris was not going to lead to a clear carbon price. “That was not even on the agenda.”

If you were CEO of a big energy company, what would you do now?

“You have to put another piece in there that's very important: innovation. The INDCs are a commitment to promote renewables and cleantech. You have to combine that with the innovation story. Twenty countries > see page 2

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Special report World Energy Council: Why energy storage may be less expensive than we think. 3

A narrow focus on ‘levelised cost of energy’ (LCOE) can be misleading when looking at the business case for energy storage. This is one of the major conclusions of a study carried out by the World Energy Council into the real costs of energy storage. According to the study, many storage applications provide additional value that is not included in the cost picture

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are doubling their RD&D budget over the next five years. Industry leaders have announced a Manhattan-type innovation drive. If you are not on the forefront of that as an energy company, you are going to lose out. There may be no legally binding deal to force you to do things, but if you are not part of the innovation frontier, you may not be around in the foreseeable future. That is the biggest outcome of Paris. It's a huge pressure but also a massive opportunity."

We know there is a carbon budget now that will limit growth of fossil fuels. How should companies active in fossil fuels deal with that?

"Well, a number of companies, such as Eon and RWE, have already decided to split off their fossil fuel activities. If you are coming from a traditional

"We could not support the logic of the industry that coal is needed to provide access to energy for the poor"

context, and you have to move to a new environment, with different types of investors, different timeframes, dealing directly with households, that requires different skills. That said, we will also need a system backbone. We

will need gas in many economies for a very long time. We also need the skills, the investors, the policy measures, to deliver this backbone. So these players have their justification as well."

Utility companies may be able to split up, but what about oil and gas companies?

"The demand for oil is mostly driven by transport. If you get growth in natural gas, biofuels and e-mobility, you will want to make sure as a company that has infrastructure that you can use and monetise this infrastructure in the future as well. You will want to have fuelling stations that can offer a mix of fuels. On the supply side, many international oil companies are changing from oil to gas but they are also investing in renewable energy. I expect some major announcements on that front. On the upstream side, some serious questions need to be asked. OPEC has been ruled for a long time by the Hotelling logic [<http://bit.ly/10TuMAH>], which holds that as the availability of a finite resource is reduced over time, its marginal value will go up (named after a theory of the US economist Harold Hotelling, editor). The whole discussion on unburnable carbon destroys the Hotelling logic. Oil-rich countries will have to rethink the context in which they produce and this will weaken cartel thinking. The logic to produce as much as you can now is becoming stronger."

What about coal companies, what future do they have?

"In our latest scenarios report [<http://bit.ly/1dfc9et>] we already said coal

faces great uncertainty, which was not a story the companies really wanted to hear. We could not support the logic of the industry that coal is needed to provide access to energy for the poor. This certainly does not apply in sub-Saharan Africa, which has a rural agenda, not the centralised one that coal stands for. And we said that CCS (carbon capture and storage) would not be as easily picked up as many were claiming. So it is not easy to have a view of a prosperous future for coal. Companies need to get really proactive on CCS if they want to believe in the future of their resource. If they don't come up with a coherent long-term vision for CCS development, it's going to be difficult to do anything that shows true scale and goes beyond a project by project approach."

The World Energy Council has set up a Global Gas Centre [bit.ly/1O8gwqx] to provide a better understanding of the role of gas in the energy mix. Do you see gas as a bridge to the future?

Gas is still a strong story for the near future. As a substitution for coal, but also as a bridge in other areas, for example, in transport, or as storage medium for renewable energy. There will be a lot of opportunities for gas. This is why we have set up a Global Gas Centre. We believe gas has a key role to play.

What about energy efficiency? As usual we are not hearing much about that.

This is one area where reality has fallen short of what he hoped for. Yes, we are making progress. Over the last 20

years, we have made energy intensity gains of 1.3% per year on average. In the decade before 2000 it was 1.6%,

"I think it's a mistake to call energy efficiency a low-hanging fruit"

then in the first decade of the 2000s it was 1%, in 2010-2012 it was back up to 1.7%. Still, this is far below the 2.6% which we assume in our scenarios and in the Sustainable Energy for All programme. A much greater effort must be made. I think it's a mistake to call energy efficiency a low-hanging fruit. It requires complex cross-constituent and cross-sectoral leadership, whether it's in transport, shipping, housing, and so on.

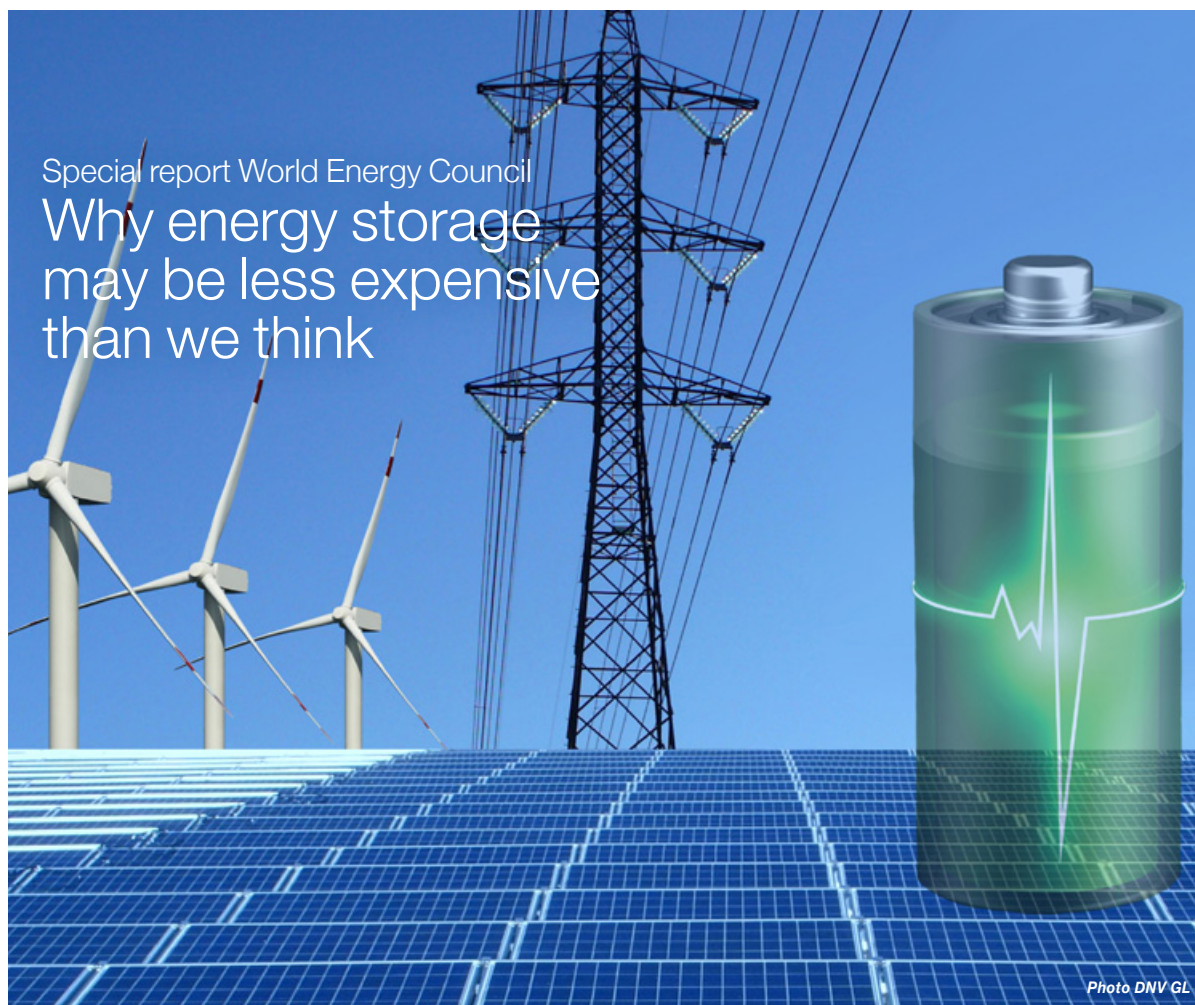
Do you think climate change has become a bigger story lately in developing countries and in resource-rich countries that have traditionally been defensive on this topic?

A country like Saudi Arabia has embraced solar energy and energy efficiency, because they know if they don't do that, it will limit their export opportunities for oil. That's not motivated by climate change of course. If you look on the climate side, the biggest change I have seen is in Latin America, which has been hit

hard by extreme weather events, such as droughts and floods. You also see that in parts of Asia and Africa. People are becoming aware that the unlikely events of yesterday have become today's reality. That affects the way they look at climate change. But the biggest change I've seen is in business. People are now looking at renewables as a business model in many more places than before.

How do you see the activities of the World Energy Council develop with regard to climate change?

What is important to understand is that after Paris the world is entering a triple transition. First the transition of decarbonisation. Then there is what you might call the market design transition: the need for new regulatory frameworks and incentives to adapt to the new realities caused by the renewable energy revolution. This goes much beyond electricity, it also affects gas, transport and other sectors. Third, there is the resilience transition. This is where we are doing a lot of work with our Financing Resilient Energy Infrastructure project [<http://bit.ly/1OR78eJ>], where we look at the impact of extreme weather events, cybersecurity threats and the energy-water-food nexus on the energy sector. This implies a different way of thinking about infrastructure and critical systems. To navigate these transitions with limited resources, you have to be very clear what your priorities are. This is exactly what our scenarios, our work on the energy trilemma and on resilience is about. ●



Special report World Energy Council Why energy storage may be less expensive than we think

Photo DNV GL

A narrow focus on 'levelised cost of energy' (LCoE) can be misleading when looking at the business case for energy storage. This is one of the major conclusions of a new study 'Wind and solar with storage: shifting from cost to value' carried out by the World Energy Council into the real costs of energy storage. According to the study, which is due out on 19 January, many storage applications provide additional value that is not included in the cost picture.

Storage has often been described as the Holy Grail of the transition to a low-carbon energy system. Affordable, efficient storage would enable variable renewable energies to be better integrated into electricity systems, it would greatly improve the economics

of home solar systems, even allowing people to go off-grid, it could help catalyze a revolution in electric cars and it could solve problems of grid overload. The problem is that this Holy Grail is still eluding us. The main reason is that storage is regarded as too expensive.

But is it? There are reasons to believe the picture for energy storage is actually considerably brighter than what is commonly understood. A new study from the World Energy Council, with DNV GL as lead authors, shows that the LCoE metric, which is used as a standard in measuring electricity generation costs, can be highly misleading when applied to energy storage. The most important reason for this is that this formula is incomplete, since it ignores the revenue side – it ignores the value that storage can bring.

In electricity generation, revenues are fairly easy to measure and compare, but when it comes to storage, the value supplied varies depending on the application. For example, storage can enable suppliers to deliver energy at specific hours, when the price is higher. It can also provide generation capacity that is needed in certain circumstances. Or it can allow users to go completely off-grid, which can be beneficial in rural or isolated locations. There may also be indirect benefits, such as greater security of supply or reduced price volatility.

DIFFERENT ELEMENTS

According to Hans-Wilhelm Schiffer, Chair of the World Energy Resources

study group, which coordinates 15 Knowledge Networks within the World Energy Council, including the fairly new Storage Knowledge Network, storage should be viewed as a totally new, separate element in the energy system. "There are four different elements in the energy system: conventional and renewable generation, grids, customers and storage", he says. "You cannot simply apply LCoE values of, for example, conventional generation to storage applications."

Schiffer gives the example of a village where a diesel generator is replaced by a solar-plus- [see page 4](#)

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storage system. "Storage can increase reliability, help reduce air pollution, lessen dependence on external sources, help integrate other new renewable sources. LCoE alone does not capture these values."

According to the study, the preoccupation with cost stems from a number of areas. First, it is a hangover from the renewables industry, "which tends to have a narrow focus on LCoE due to benefiting from policy mechanisms which derisk its revenue streams". Second, it has to do with the fact that "in most energy markets, flexibility is not sufficiently valued or monetised". Too often, "industry is only equipped to talk about one half of the profit formula: cost", the study notes.

Storage is usually not
getting the same kind
of policy support as
renewables

POLICY RECOMMENDATIONS

Schiffer says policymakers and regulators should look at the broader picture when designing regulatory frameworks. "Storage is usually not getting the same kind of policy support as renewables or as other flexibility options like demand response. In many countries energy storage is seen as belonging to end customers. That means: the electricity which is taken into storage is charged with dues and

fees, in addition to the dues and fees the customer has to pay on electricity. This is a double burden which is not justified." We believe there should be a level playing field. And more should be invested in R&D."

The study has led the authors to make three broad recommendations for policymakers:

To go beyond a narrow levelised cost approach to storage technology assessment. The renewables industry has become accustomed to technology assessment based on levelised cost, where only the lowest cost technologies are rewarded. This LCoE assessment is then used to inform policy development, so that the cheapest technologies are promoted. But this approach won't cut it for storage. The cheapest technologies might not necessarily deliver the greatest value.

To examine storage through holistic case studies in context, rather than place faith in generic cost estimations.

The best way to understand the value of storage is to consider specific applications - such as solar in combination with storage - or else specific services being offered by storage - such as frequency response. It is also important that these case studies are not examined in a geographic vacuum: the local energy market is what critically determines the revenue available for each service.

To accelerate the development of flexibility markets, working with

COSTS OF STORAGE SET TO DECLINE 70%

The Storage Network's study not only shows that a narrow focus on cost can be misleading, it also concludes that costs will come down rapidly in the coming years!

The findings show a significant drop in cost for the majority of storage technologies from 2015 to 2030. Battery technologies show the greatest reduction in cost, followed by sensible thermal, latent thermal and supercapacitors. Battery technologies show a reduction from around 100-700 €/MWh in 2015 to 50-190 €/MWh in 2030; this is a reduction of over 70% in the upper cost limit in the next 15 years. Sodium sulfur (NaS), lead acid and lithium-ion technologies leading the way. Pumped storage shows the lowest cost reduction, due to the current maturity level of the technology, followed by compressed air energy storage.

system operators, transmission operators and regulators. The growth of deployment in variable renewables is creating new urgency around flexibility markets, including the need to ensure that ancillary services markets are designed so as to be a level playing field for all. The development of flexibility markets will help address the revenue risk associated with storage plant. As clearer monetary signals are assigned to flexibility services, this will increase the energy sector's literacy on flexibility, and help to build the business case for storage. ●

ABOUT WORLD ENERGY FOCUS

The **World Energy Focus** magazine is published monthly by Energy Post Productions.

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CEOs of utilities: change requires high CO₂ prices

A new survey by the Global Electricity Initiative (GEI) of electric power utilities reveals that the real price of CO₂ is a fundamental trigger for them to change their business model. 40% of CEOs surveyed said they need a price of over \$100/tonne to make them change their business model, far higher than current market prices.

The GEI, led by the World Energy Council and the World Business Council for Sustainable Development, aims to enhance electricity utilities' efforts to ensure reliable electricity supply, improve access and mitigate the impacts of climate change. The utilities participating in the GEI are from countries that together account for more than 80% of global installed generation capacity and the CEOs who have completed the survey come from five continents.

on greenhouse gas emissions reduction a priority. For them the real price of CO₂ is a fundamental to trigger a shift in utilities' business models."

Altogether 94% of CEOs participating in the survey confirmed that their companies are already being affected by extreme weather events. All of them responded that they are regularly consulting and working with governments on the development of energy policies, strategies and regulations.

The survey, presented by Joubert to key stakeholders during the climate conference in December in Paris, also found that:

- 89% of utility CEOs consider a global agreement on greenhouse gas emissions vital to their business sustainable success
- Nearly two thirds of utility CEOs agree that the CO₂ emissions price should be determined globally and by the market, whereas the other third would prefer a price introduced by mandatory fiscal measures on a national level
- 72% of utility companies have already introduced voluntary



Philippe Joubert, Executive Chair of the Global Electricity Initiative, said: "Our survey shows that utilities consider the introduction of a meaningful agreement

Power production at risk from climate change

More than 80% of thermal power stations and 61-74% of hydropower stations in the world will suffer decreases in usable capacity as a result of climate change, according to a new paper published in Nature Climate Change [<http://bit.ly/1Urc8nY>]. The reasons are changes in water availability and higher water temperatures as a result of global warming.

The researchers have investigated 1400 thermal power plants and 25,000 hydropower systems, representing 28% and 78% of global capacity. They

have brought together their results in two maps as shown below.

According to the research, lower water availability and higher water temperatures will lead to an average annual reduction in power of 7-12% for thermal plants and 1-4% for hydropower plants. In some months capacity reductions could exceed 30%. Dr Michelle van Vliet of the International Institute of Applied Systems Analysis

(IIASA), one of the authors, said in a press release that "in particular the US, southern South America, southern Africa, central and southern Europe, Southeast Asia and southern Australia are vulnerable regions."

The research confirms the findings of a study by the World Energy Council published in September last year, which alerted the world to the risks of extreme weather events for the energy sector and the need to improve "resilience". ●

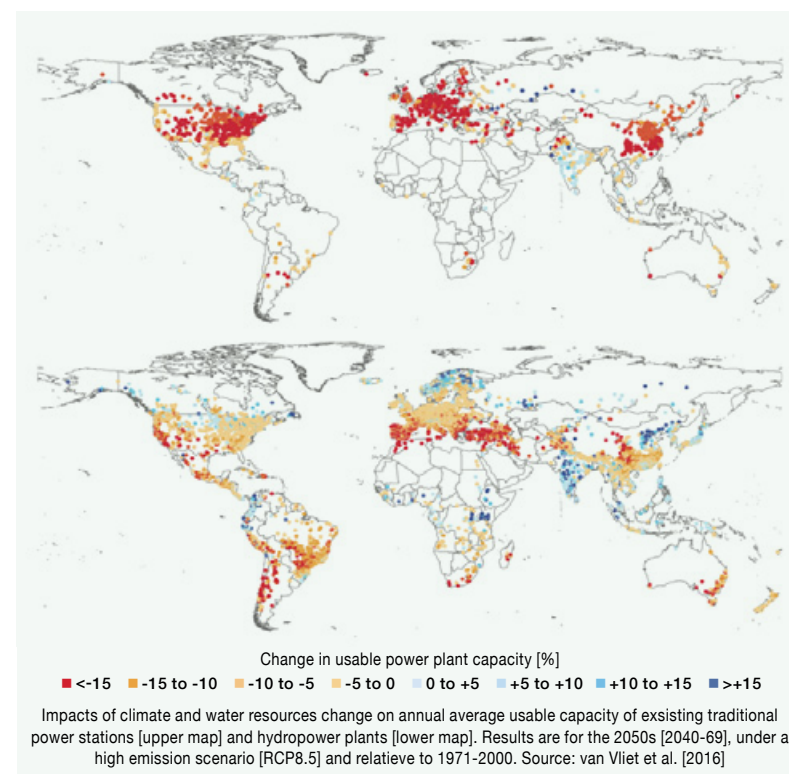
Where climate change could hit electricity production



- measures to limit greenhouse gas emissions
- Access and security of supply rank among the highest business priorities.

The great importance electricity utilities attribute to climate policy is also reflected in the preview results of the 2016 edition of the World Energy Council's World Energy Issues Monitor Report: A global climate framework is one of the most critical issues for the participating utilities, in terms of uncertainty and impact.

Visit <http://bit.ly/1oa3z30> for more information on GEI. ●



OPEC warns of future oil shortage

While oil prices continue to probe new lows, OPEC warns that another price spike may loom down the road, as investment may be inadequate to meet future demand.

In its annual World Oil Outlook, published in December, OPEC sees oil demand rise from 91.3 million barrels per day (mbpd) in 2014 to 97.4 mbpd in 2020 and 109.8 mbpd in 2040, driven by population and economic growth:

Long-term oil demand outlook in the Reference Case

mb/d

	Levels							Growth 2014–2040
	2014	2015	2020	2025	2030	2035	2040	
OECD	45.8	46.2	45.6	43.9	41.9	39.9	37.8	-8.0
Developing countries	40.3	41.4	46.4	51.4	56.5	61.5	66.1	25.8
Eurasia	5.2	5.2	5.5	5.7	5.8	5.9	5.8	0.6
World	91.3	92.8	97.4	100.9	104.3	107.2	109.8	18.4

To meet this growing demand, almost \$10 trillion in investment (in 2014 dollars) is required, most of it in non-OPEC countries. With oil companies cutting back spending, OPEC worries that this investment may not be forthcoming. “The market could find that there is not enough new capacity and infrastructure in place to meet future rising demand levels, and this would obviously have a knock-on impact for prices”, writes Secretary-General Abdalla Salem El-Badri in the foreword to the report.

In spite of the Paris Climate Agreement, OPEC believes fossil fuels will continue

to dominate global energy supply. It sees the share of oil go down from 31.5% to 25.2% in 2040, and that of coal from 28.4% to 24.6%, whereas gas will grow from 22.1% to 27.9%. Nuclear will provide 5.9% of primary energy demand (up from 4.9%) in 2040, hydro 2.5% (stable), biomass 9.5% (down from 9.8%) and “other renewables” 4.3% (up from 0.9%). According to Salem El-Badri poor people in developing countries “need access to

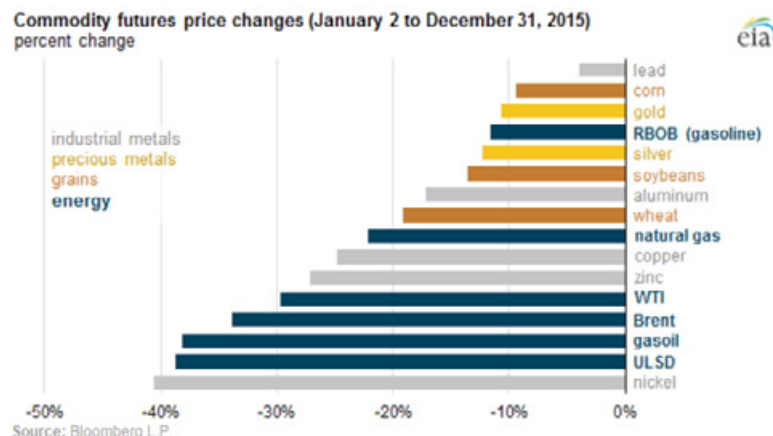
reliable, safe and secure modern energy services”. For them, he notes, “it is not about reducing emissions or using more energy efficiently”.

OPEC does not believe electric vehicles will make great inroads into the transport sector. By 2040, only 6% of the passenger car stock will be running on non-oil fuels. “Without a technology breakthrough, battery electric vehicles are not expected to gain significant market share in the foreseeable future. Besides the high purchase price, there are serious challenges in terms of convenience, such as range limitations and poor battery performance.” ●

Energy prices plunge in 2015

Prices of oil and gas declined 41% on average last year, reports the US Energy Information Administration (EIA), based on the S&P Goldman

Sachs Commodity Index. This price drop is considerably higher than price reductions in other commodities, as shown by this graph:



US adopts “largest energy efficiency standard in history”

The US Department of Energy in December announced “historic new efficiency standards for commercial air conditioners and furnaces”. Developed with industry, utilities, and environmental groups, “these standards will save more energy than any other standard issued to date”, said the Department. Thanks to the new standards, US businesses will

save \$167 billion on their utility bills and carbon pollution will be reduced by 885 million metric tons.

During the Obama administration, the Department of Energy has finalised new efficiency standards for more than 40 household and commercial products, including commercial refrigeration equipment, electric motors, and fluorescent lamps, which will save consumers nearly \$535 billion and cut greenhouse gas emissions by over 2 billion metric tons through 2030. ●

NEWS IN BRIEF

SOLAR COOPERATION RUSSIA AND INDIA

The Solar Energy Corporation of India (SECI) and Russian Energy Agency (REA) have signed a memorandum of understanding (MoU) to set up large scale solar photovoltaic (PV) projects in India between 2016 to 2022. The two agencies have agreed to draw up a roadmap for the development of solar projects and equipment of manufacturing facilities in India. REA will offer its ‘state-of-the-art’ advanced technologies and low cost financing, while SECI will assist in securing relevant approvals and clearances.

DUBAI ANNOUNCES \$7.3 BILLION IN RENEWABLE ENERGY TENDERS

The Dubai Electricity and Water Authority (DEWA) has announced it will float tenders worth Dh 27 billion (US\$7.35 billion) to set up renewable energy projects. The projects are expected to be commissioned through the independent power producers model. Dubai has set a target to increase the share of renewable energy in its total energy mix to 7% by 2020. The medium-term and long-term targets for renewable energy share are 25% by 2030 and 75% by 2050.

BANGLADESH, RUSSIA AGREE \$12 BILLION NUCLEAR DEAL

Bangladesh and Russia have reportedly agreed to invest \$12.65 billion in a project to build two 1200 MWe nuclear power units at Rooppur. According to Reuters, the agreement was signed on 25 December by Bangladesh Atomic Energy Commission (BAEC) and Russia's Rosatom. Russia will finance up to 90% of the total cost of the project.



France's pragmatic energy transition

Sarrans hydropower plant France, Photo jbdodane

France last year adopted a comprehensive 'energy transition for green growth law' that enjoys broad acceptance throughout society. Jean Eudes Moncomble, Secretary-General of the French Committee of the World Energy Council (Conseil Français de l'Énergie), views it as an example of pragmatism. "It is a mixture of evolution and transformation that could serve as an inspiration for other countries – but each country has to find its own way forward", he notes. He adds that this is also what the Paris Climate Agreement is about: to let all countries move in the same direction, but according to their own plan.

Jean Eudes Moncomble is proud of what his country achieved at the COP21 climate conference in December. "The main success is that we have an agreement. I know some people would like to have seen detailed prescriptions. But we must be pragmatic and reach effective and efficient solutions." The review process of the INDCs (the national climate plans) will ensure that progress will be made, he says. "It's a naming and shaming agreement."

Moncomble, who worked for more than 10 years in the corporate strategy division of EDF, the largest European utility, and was also professor of energy economics at the Ecole Centrale de Paris for many years, says he was shocked by some of the ideas he heard in the media from so-called 'experts' in the months prior to the summit. "I heard some very unrealistic proposals." He is convinced that in order to meet the climate challenge, "there is no place for ideology, only for pragmatism."

Each country must find its own way forward, depending on its resources and priorities."

FRONTRUNNER

France is generally not perceived as a frontrunner in renewable energy such as solar and wind power. But that doesn't mean the country is not interested in clean energy. Far from it. "We may not be leaders in solar and wind", says Moncomble, "but we are in hydropower and energy efficiency, as we have ambitious initiatives in building and transport. And mainly thanks to our high share of nuclear power, we have very low CO₂-emissions (4.8 t CO₂ per capita; the EU28 average is 6.6 t CO₂ per capita)."

Despite the country's favourable climate profile, the government felt the need for a comprehensive new energy and climate policy. This started in 2012 with a broad public debate organised by the previous (conservative) government and eventually led to the adoption of the energy transition act (transition énergétique) in July 2015. As a result, says Moncomble: "we now have a comprehensive law that enjoys broad acceptance throughout society".

The law has six main objectives:

1. To reduce greenhouse gas emissions by 40% in 2030 compared to 1990
2. To decrease fossil fuel consumption by 30% in 2030 compared to 2012
3. To increase the share of renewable energy in final energy consumption to 32% and in electricity generation to 40% in 2030
4. To reduce final energy consumption

by 50% in 2050 compared to 2012

5. To diversify electricity generation, including reducing the share of nuclear energy to 50%, in 2025
6. To decrease waste in landfills by 50% in 2050

TEETHING PROBLEMS

In some media reports, the impression has been given that the new law means that France has embarked on a gradual nuclear phase-out, but Moncomble says this is certainly not the case. "Actually, the law says that the generation of nuclear power must be maintained at the current level (63.2 GW). So to build a new nuclear power plant an old one must be closed." In practice, this is likely to translate into a reduction of 70% to 50% of nuclear in the power mix, because electricity consumption is expected to go up (in contrast to total energy consumption).

According to Moncomble, it will be very difficult to reach the 1.5 or 2 degree climate targets without nuclear power. "Of course nuclear power must be safe and competitive, but we can't do without it." As to the French EPR reactors developed by Areva, the first ones of which are now being built in Finland and France, they have experienced some difficulties as they were the first in a new series. But this, he says, are teething problems. "We know now how to solve them and reduce costs." EDF is planning to build new EPR reactors in the UK at Hinkley Point and in China.

With regard to energy efficiency, the target of a 50% consumption reduction

in 2050 (in absolute terms) is very ambitious, Moncomble admits.

ELECTRIC CARS

In renewable energy, France is looking to promote not only solar and wind, but also energy production from biomass and waste, as well as hydropower. Feed-in-tariffs are more and more replaced by bidding auctions. Auctions are more efficient, says Moncomble, especially for large projects like offshore wind. He does not see any reason why France, which currently derives 14% of its energy from renewables, should not be able to reach its renewable energy targets.

Moncomble says it's not possible to describe the French energy transition as either a 'revolution or an 'evolution'. "It's a complex picture and a matter of perception. Some people may see a revolution where some will only see an evolution. I see it as a revolution in energy efficiency, an evolution in renewable energy, stability in nuclear power. We also have strong programmes for clean transport – including electric cars – and the circular economy."

It's the pragmatism behind the French approach that Moncomble believes should serve as an example for other countries. In this France differs from the more radical, ideological approach taken by Germany with its Energiewende. "But even if the results of the German model do not look encouraging yet, I hope we will all be successful." ●

REGIONAL EVENT

Africa Energy Indaba

Johannesburg, South Africa

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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

2016 World Energy Congress

Istanbul, Turkey
9-13 October 2016

With only 9 months remaining until the 23rd World Energy Congress kicks off in Istanbul under the theme "Embracing New Frontiers", more than 100 top level energy leaders from more than 50 countries, including 20 energy ministers, have confirmed to speak.

Running since 1924, the triennial World Energy Congress is the World Energy Council's global flagship event that enables dialogue among Ministers, CEOs and industry experts on critical developments in the energy sector. As the world's premier energy gathering, the Congress offers a unique opportunity for participants to

better understand energy issues and solutions from a global perspective.

"The Congress has an unrivalled reputation as a global platform for governments, businesses and specialists in terms of addressing important energy-related issues in the context of meeting the needs of producers and consumers", Hasan Murat Mercan the Chair of the Organising Committee said [\[bit.ly/1IU9HKf\]](http://bit.ly/1IU9HKf).

The World Energy Council invites authors to provide their insights by the end of February on a theme of their choice relating to **World Energy Scenarios, World Energy Resources and Technologies, World Energy Trilemma and Financing Resilient Energy Infrastructure.**

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E-mail: KGrover@usea.org

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



Register quickly to benefit from a discount on the registration fees and be included in the draw of a further discount plus the opportunity to win a Istanbul city tour. Also, media registration is now open.

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

MEMBER COMMITTEE EVENTS

Asia-Pacific Energy Leader's Summit - Delivering Resilient Energy Infrastructure

Wellington, New Zealand

16-17 March 2016

The Leader's summit will explore how the Asia-Pacific energy system can build resilience and prepare for the new normal. Providing a unique platform to challenge ideas and look to future-proof the energy systems of the Asia-Pacific region, participants will seek to develop a shared understanding of the growing resiliency risks and challenges presented by climate change, emerging technologies, extreme weather events, cyber security, and the energy water-food nexus. The summit, preceded by a Future Energy Leaders event and an Asian Regional Meeting on the 15th of March, will give Asia-Pacific energy leaders an opportunity to discuss existing and emerging solutions and/or mitigate these risks and challenges.

Contact: John Carnegie

E-mail: jcarnegie@businessnz.org.nz

Website: <http://www.bec.org.nz/summit>

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.

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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