

Lasting power: batteries of the future

Storage solutions
Groundbreaking
Australian project

Clean energy
Sri Lanka's renewables
commitment

Mozambique's big plans
Country Focus

Interview
CFE Mexico CEO

Europe wind sector on course for “bumper” year

The rest of the year will see a rapid increase in capacity but new installations will be concentrated in just a few regions

Europe is on track for “a bumper year” for wind power capacity installations, according to lobby group WindEurope.

The Brussels-based organisation says 6.1 GW of new wind energy capacity was installed in the first half of 2017. Most of this (4.8 GW) was onshore while the remaining 1.3 GW was placed offshore.

The wind supply chain needs a stable calendar of tenders to thrive

WindEurope says, however, that the figures hide some worrying trends. Activity is concentrated in just a handful of markets. New onshore capacity was concentrated in Germany (2.2 GW), the UK (1.2 GW) and France (492 MW). Offshore wind capacity additions were limited to just 18 projects in only four EU Member States (Germany, the UK, Belgium and Finland).

A total of €8.3bn (\$9.9bn) worth of investment in new asset financing was made in the first half of the

year: €5.4bn in onshore and €2.9bn in offshore. The offshore figure has plummeted from 2016's record high of €14bn. Again, the trend for market concentration was visible, with 53% of total investments (onshore and offshore) made in Germany and no offshore investments made in the UK.

WindEurope chief policy officer Pierre Tardieu says: “We are on track for a good year in wind capacity installations but growth is driven by a handful of markets. At least 10 EU countries have yet to install a single MW so far this year.”

He added that the end of the UK Renewable Obligation scheme would lead to even more onshore wind capacity being concentrated in Germany, Spain and France.

“On offshore, the level of finance activity is a concern,” Tardieu said. “Although this won't translate into lower installations for another few years, the industry needs clarity on volumes for the post-2020 period to maintain the current cost reduction trend.”

Tardieu added that member states

should come forward with their national energy and climate change mitigation plans to 2030 “as soon as possible”.

The sector recently received a massive boost with the announcement that a 1.1 GW tender was awarded to wind power capacity in the Spanish renewables auction. The figure adds to the nearly 3 GW won in the previous auction, in May 2017.

The Spanish Wind Energy Association (AEE) says the installation of wind projects this year (and in 2016) will translate into investments in excess of €4.5bn (\$5.33bn) and the creation of 25,000–30,000 jobs during the construction phase.

“It is a positive signal for the wind industry, notably the Spanish supply chain, however, due to the four-year market standstill, we're playing catch-up,” says Tardieu. “The Spanish government is trying to deploy in the next three years what should have been done in seven. These types of stop-and-go policies are extremely disruptive for the wind supply chain which needs a stable calendar of tenders to thrive.” ■

News in brief

CHINA LEADS GLOBAL SMART METER MARKET

A new report from Navigant Research shows that through the first quarter of 2017 China continued to lead the global smart meter market with more than 408m meters installed. This accounts for 68.3% of tracked global installations. The report noted that progress in China continues as the State Grid Corporation of China approaches the tail end of its nationwide rollout in 2017.

EBRD TO FINANCE RENEWABLE ENERGY PROJECTS

The European Bank for Reconstruction and Development has reached an agreement to provide \$500m for implementing renewable energy projects under a feed-in energy tariff system offered by Egypt's ministry of electricity. Egypt aims to source 20% of its energy from renewables by 2020.

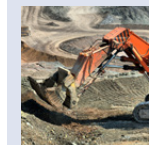
OMAN EYES GRID INTERCONNECTION

Oman is assessing the possibility of interconnecting the electricity networks between Petroleum Development Oman (PDO)'s concession areas in Nizwa and Duqm, and the Dhofar Power System. The Sultanate currently has two main interconnected systems—the Main Interconnected System and the Dhofar Power System. PDO also has its own power network, while governorates like Musandam have their own separate networks. According to a report released by Oman Power and Water Procurement Company, benefits of the proposed interconnection include fuel savings and improved grid security.

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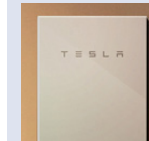
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Sri Lanka's 100% electricity from renewables, bumper year for wind and energy transition creates mineral demand

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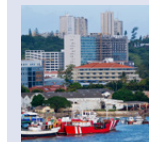
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How one Australian government is battling emissions and energy security at the same time with a revolution in battery storage

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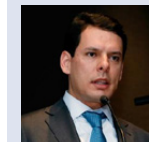
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Mozambique takes on the challenge of bringing electricity to the almost 80% of its population which aren't connected to the grid

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CEO of Mexico's CFE state electricity firm on how the country is opening up its power sector with ambitious energy reforms

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A guide to forthcoming World Energy Council events, including October's Executive Assembly in Lisbon

Sri Lanka goes green

The republic of Sri Lanka aims to meet its electricity demand entirely from renewable energy by 2050—and a new report suggests the country is on track to do so.

The joint report by the UN Development Programme (UNDP) and Asian Development Bank (ADB), [Assessment of Sri Lanka's Power Sector—100 percent Electricity Generation through Renewable Energy by 2050](#) says that the nation will need 34,000 MW by 2050, up from just 3,700 MW today.

The report's creators estimate that

15,000 MW will come from wind power and about 16,000 MW will come from solar. The rest of the country's demand will be met by biomass and hydro-based power plants.

The study also identified a need to increase energy storage capacity by 15,000 MW, which will ensure stability of the electricity grid.

Fossil fuel phase-out

The substitution of imported fossil fuels for renewable energy by 2050 will also save around \$18bn, says the report.

But to make the transition to a fully

renewables-powered energy system, a total investment of \$50bn is needed.

The ambitious target was set one year after Sri Lanka made its commitment to the Paris Agreement— an agreement signed by 195 member countries of the United Nations Framework Convention on Climate Change which aims to mitigate greenhouse gas emissions starting from 2020.

Recent proposals highlighted by the report's creators include a 100 MW floating solar project in the Maduru Oya Reservoir which will be put out to international tender. ■

Alternative jet fuel slow to launch

The aviation industry is aware of its image as an atmosphere polluter and has committed itself to long-term carbon emissions cuts, but lower oil prices are slowing the development of alternatives to jet fuel.

From 2009 to 2020, fuel efficiency is being improved by 1.5% a year, mainly through the introduction of new and technologically advanced aircraft. In 2020, the industry has pledged to stabilise CO2 emissions through carbon-neutral growth.

Then comes the big promise: by 2050, the 191 member countries of the International Civil Aviation Organisation (ICAO) have pledged to cut emissions to 50% of 2005 levels.

The mandatory start-date for this carbon offset and reduction scheme is 2027, but 68 states have said they will begin the process on a voluntary basis from 2021.

Biojet fuel takes flight

The move towards using sustainable aviation fuel is already under way. According to Jane Hupe, environmental protection chief at ICAO, "this year 25 airlines will operate more than 5,000 flights using jet fuel mixed with sustainable alternative fuels on a trial basis."

Yet according to the International Air Transport Association (IATA), the oil price factor has "made alternative

jet fuel business cases more difficult to gain economic approval and obtain necessary finance".

Other problems include the difficulty in sourcing materials, often from different geographical locations, for the complicated process of creating biofuels.

Despite the challenges, IATA says gradual progress is being made. It lists eight major airlines that have concluded long-term offtake agreements with biofuel suppliers, "most of which are reported as price-competitive".

IATA wants governments to put sustainable aviation fuel "on an equal footing with automotive biofuels through equivalent public incentives". ■

Clean energy means more minerals



Minerals and metals will be more in demand as the world transitions to cleaner forms of energy, says the World Bank.

In its report, *The Growing Role of Minerals and Metals for a Low-Carbon Future*, the World Bank forecasts which minerals and metals it expects will be most in demand between now and 2050. It also highlights that this will present an opportunity for mineral-rich countries but they must ensure mining sectors are developed in a sustainable way.

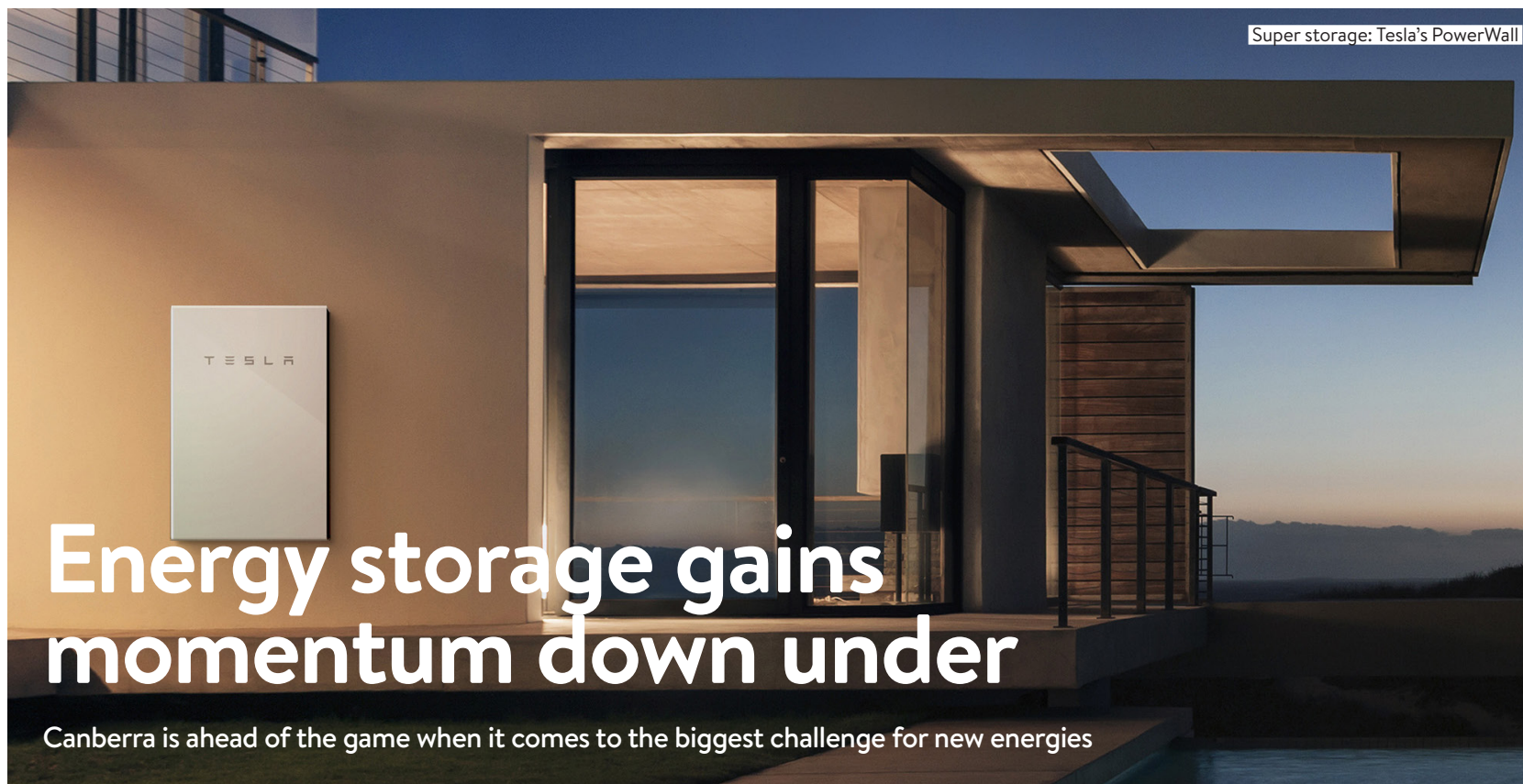
The World Bank expects demand for several minerals and metals to surge including: aluminium, copper, lead, lithium, manganese, nickel, silver, steel, zinc and rare earth minerals such as

It will be an opportunity for mineral-rich countries, but they must develop mining sustainably

indium, molybdenum, and neodymium.

Demand for aluminium, cobalt, iron, lead, lithium, manganese and nickel are expected to skyrocket— because of an increased demand for electric storage batteries growing by more than 1,000%, the report said.

That figure is based on countries taking the action needed to keep global warming at or below two degrees Celsius above pre-industrial levels. ■



Super storage: Tesla's PowerWall

Energy storage gains momentum down under

Canberra is ahead of the game when it comes to the biggest challenge for new energies

Energy storage is widely acknowledged as critical to the effective deployment of intermittent renewable energy, especially solar power. In Australia, the government of the ACT (Australian Capital Territory—the country's federal district) is undertaking the second-largest roll-out of household batteries in the world (after Germany), through a programme specifically aimed at boosting energy storage capacity.

It is an innovative programme, in which the government has adopted a

funding model that goes a step beyond simply implementing feed-in-tariffs (FIT) to support renewables.

"The contract-for-difference FIT model used by the ACT to support the deployment of large-scale renewables doesn't incentivise generators to optimise their revenue by providing storage capacity at peak times," says Brett Phillips, deputy director general of sustainability and the built environment at the ACT government. "Therefore, a new model

of incentivising the uptake of storage was required.

The government now provides grants based on the 'sustained peak output' of the batteries, focusing on their ability to create value by supporting the electricity network during peak demand and times of constraint on the network.

Considerable benefits

Batteries allow households to reduce energy bills by delivering power at peak

Batteries can deliver power at expensive peak times

times—when it is most expensive to buy electricity from the grid. An added bonus of some is that they can provide backup power during an outage.

As well as benefiting individual households, battery storage benefits the ACT's energy grid and saves the territory money by reducing peak

Batteries for storage could reach

250 GW by 2030

World Energy Council's
E-Storage 2016 report

demand on its energy network. It also helps ACT avoid the need for expensive network upgrades that are causing energy bills to increase in other parts of Australia's National Electricity Market.

With estimates showing it is possible to save up to \$220m through the roll out of battery storage, the ACT government decided to launch what it calls its *Next Generation Energy Storage Grants Program*. Ultimately the scheme will see the ACT government provide \$25m in funding to support the roll-out of 36 MW of distributed battery storage in more than 5000 homes and businesses by 2020.

"The programme will not only allow greater self-consumption of solar PV electricity, but (it will) also provide considerable benefits to distribution network infrastructure, ultimately leading to savings for all ACT electricity users," says Phillips.

Through the *Next Generation Renewables Program*, the ACT government has a vision for Canberra to become a globally recognised centre for renewable energy innovation and investment. Industry estimates forecast that the global battery storage market will be worth \$400bn by 2030 and the ACT government sees

its region as an ideal launch pad for national and international businesses wanting to get a head start in this emerging industry.

The ACT is connected to the national energy grid, which runs from Queensland through the eastern states to Tasmania and South Australia. As the location of the renewable energy supply needed to reach the ACT's target is not critical to the territory's emission reduction effect, ACT sources its renewable electricity from generators across eastern and southern Australia.

"While our connection to the National Electricity Market means we don't have concerns about future supply, the ACT government recognises that low-cost energy storage is the missing link in the transition to a 100% renewable national electricity market," says Phillips.

He added: "The ACT is determined to play its part in developing this emerging industry while capturing the benefits for households, businesses and research and trades training institutions. Next generation renewable energy which incorporates energy storage will address any energy intermittency issues. It will also allow for ageing greenhouse gas intensive coal and gas-fired power stations to be retired."

Going through the rounds

ACT's *Next Generation Energy Storage Grants Program* began in 2016 with the government awarding three bursaries of \$200,000 each to install subsidised battery storage in around 200 Canberra homes and businesses in a pilot scheme.

The purpose of the pilot scheme

was to test the battery storage market and find out how well industry could respond to requirements of the programme. It also sought to determine the requirements for the effective and safe installation of batteries in ACT homes and businesses, and how best to encourage participation in the programme and allow for innovation in the industry.

Following the completion of the pilot, a further round of grants were awarded on 29 August 2016. In the second round, the government awarded \$2m in total funding to eight companies through a competitive grants process. This round was aimed at providing subsidised battery storage for around

Low-cost energy storage is the missing link in the transition to a 100% renewable national electricity market

another 600 Canberra homes and businesses by 31 August 2017.

ActewAGL Retail, Energy Matters, EPC Solar, Evergen, ITP Renewables, Origin Energy, Power Saving Centre and SolarHub were the successful winners of the latest competitive grants process. While some of these will be offering Tesla's PowerWall as the

storage battery, the increased number of companies providing subsidised battery storage will encourage competition and innovation, and support a wider range of technologies.

The latest grants round had similar requirements to the Next Generation Energy Storage Pilot, but included obligations that will benefit the local economy, such as battery providers having an office in Canberra for local sales and support.

A range of technologies

A broad range of technologies and battery chemistries have been offered by the installers under the programme. However, the key focus is

to support smart battery management capabilities. The programme has offered consumers innovative battery control systems, allowing them to best meet their needs and maximise the consumption of electricity produced from solar PV. In some cases they even provide customers with profit by allowing them to export electricity to the grid at peak times when wholesale prices are high.

As part of the programme, data is being captured from each battery system installed under the scheme. It includes one-off static data, such as name, address and installation information, as well as operational data such as the amount of power being generated or exported from the system, which will be captured at intervals of one to five minutes. This data will be made available for research and development, once people's personal information has been removed. The database will be one of the largest of its type in the world.

Keeping the momentum

With the pilot successfully concluded and the second round of funding under way, the ACT government is keen to keep the momentum going.

"The second round of funding aims to build on the success of the pilot, continue the momentum of the programme, and to expand on the local industry development objectives of the programme," Phillips said. "This round has recently been extended until 31 December 2017, and the ACT government is currently considering how and when a further grants round should be conducted." ■

STORAGE POTENTIAL

Batteries depend on chemical reactions that occur between the electrodes and generate a flow of electrons through an electrical circuit. Currently the leading technologies in service are lead-acid and lithium-ion, but many other possible battery chemistries are in development or in the research phase, and could well supersede these for specific applications. For example, flow batteries store the electrolytes separately from the electrodes, and therefore storage capacity can be increased by boosting the volume of the storage tanks.

While pumped storage has dominated energy storage for over a century, the growth of electric vehicles and the need to integrate renewable technologies, such as wind and solar, are driving huge

investments in the development of battery storage.

According to the World Energy Council's *E-Storage 2016* report, batteries for storage could reach 250 GW by 2030.

While the report forecasts that costs will fall significantly over the next five years, it notes that direct incentives are not necessarily a prerequisite for energy storage to flourish. Instead, what is needed is a transparent and level playing field that fairly values the services that energy storage can provide, enabling it to compete.

For example, the opportunity to help network operators to defer investment in transmission or distribution assets is not always clearly priced, or even available. Similarly, intervention in some wholesale energy markets has reduced the "spikiness"

or volatility in energy prices, meaning that price arbitrage services are not fairly compensated.

According to the *E-Storage 2016* report, in the short-term (up to five years) the storage industry will focus on the basics of how to put storage projects together. Emphasis will also be placed on project developers working out the components of battery projects, the different supply chain options for procurement and the associated contractual risk.

In the medium term (between five and eight years), the storage industry will place greater emphasis on optimisation. Storage operators will seek to stack more revenue streams together, refining their algorithms both to enable the provision of multiple services and to optimise battery condition and lifetime.

Mozambique: Powering ahead

New floating LNG and plans to increase access to electricity are changing the landscape in the East African nation



New hope: Mozambique's capital Maputo

With a struggling economy and a large portion of the population still not connected to the electricity grid, Mozambique has challenges ahead in its energy sector.

In 112th position its 2016 Energy Trilemma ranking shows that efforts on energy security, access and environmental sustainability.

Yet there are signs the country of nearly 29m people could be facing a brighter future, starting with the

opportunities presented by gas.

A final investment decision (FID) on the \$8bn Coral South floating liquefied natural gas (FLNG) export project was made in June this year.

Initially, the government was not keen on the project, which will be developed by an Eni-led consortium starting with Area 4 in the Rovuma Basin. It will be the first floating LNG facility in East Africa.

Mozambique's rulers had taken the same position on FLNG which Tanzania

does now, which is that it brings too few benefits to the local economy—for a start, few jobs, directly or indirectly. They preferred to focus on onshore developments.

But a scandal involving three secret state-owned companies, which took out \$2bn in state-guaranteed debt to try—and fail—to build a domestic offshore security industry, has hit the economy hard.

With a GDP of \$11bn in 2016, down from almost \$17bn in 2014, the government in Mozambique is now keen to offer a good news story of investment to the public.

The project draws on an estimated 16 trillion cubic feet of gas in place, but the entire output over more than 20 years will be sold to BP. None will supply the domestic market.

The hope is that this FID is only the first of several that will come on the Mozambican side of the Rovuma Basin, which the country shares with Tanzania, and that onshore projects, promised by Eni and Anadarko, will be able to provide gas supply to both domestic and export markets.

Mozambique has some 85 trillion cf of gas reserves in the Rovuma Basin. Meanwhile, oil was found earlier in the year in Mozambique for the first time by petrochemicals firm Sasol. The company now intends to bring it to production.

Getting connected

In 2014, less than a quarter—just 21.2%— of Mozambique's population had access to electricity, according to World Bank data. The organisation has supported an Energy Development and

hydropower potential, especially through the Cahora Bassa dam as the primary source of electrification, while also investing in alternative sources of energy. This includes solar, which remains largely untapped.

The government recently approved its *Renewable Energy Strategy* which seeks to boost energy access to rural areas. The goal is to have 55% of renewables in the power generation mix by 2030. In 112th position its 2016 Energy Trilemma ranking shows ■

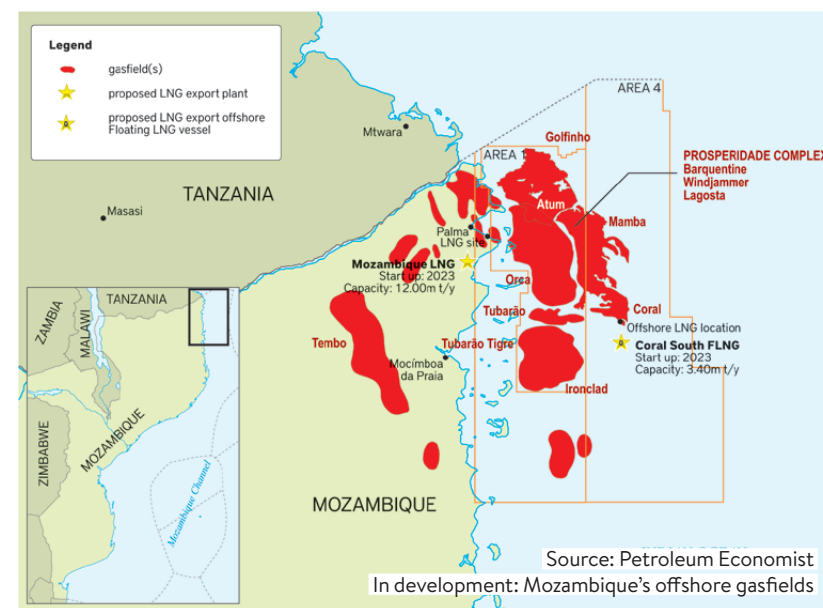
The government in Mozambique is keen to offer a good news story to the public

Access Project (EDAP) to improve this.

Mozambique is one of the countries in Sub-Saharan Africa with the highest rate of new connections to the grid, averaging 120,000 annually over the past five years. The government plans to maximise Mozambique's

21.2%

of people have access to electricity in Mozambique



Times of change

Mexico's energy sector has undergone a radical transformation since far-reaching reforms were enacted four years ago. Next week, Mexico's transformation will be at the heart of the global energy debate, hosting a series of energy events under the theme "Dialogues for the Future of Mexico 2017", including the World Energy Leaders' Summit and the North American Regional Forum. Ahead of his participation to these prestigious events, Jaime Hernández, CEO of the country's Federal Electricity Commission (CFE) who is also the new president of the World Energy Council's Mexico chapter, outlines the impact of these changes

Mexico is undergoing a major energy transformation. How do you see this impacting the sector not only within the country, but internationally?

The Energy Reform, enacted in 2013 by President Enrique Peña Nieto, mandated a deep and radical transformation of both CFE and the Mexican energy sector. A wholesale electricity market was established, where private international and national enterprises compete to generate and commercialise electricity. This market operates under a clear guiding principle: the most affordable electric energy is dispatched first. Therefore, CFE and all competitors have a great incentive to reduce their operation costs.

To successfully compete in this new electricity market, CFE has undergone a transformation that includes a new corporate structure with 13 new

subsidiaries and affiliates.

This division will allow each new enterprise to specialise and create added value within each stage of the electric energy generation and supply processes.

Ultimately, this transformation will allow Mexicans to have access to high quality electricity service that is cleaner and also cheaper.

What impact will Mexico's energy reform have on the future development of renewable power?

Mexico has abundant renewable energy resources. One of the main objectives of the Energy Reform is to push towards a clean electric sector. The Reform sets a national goal of generating at least 35% of electricity from clean energies by 2024. The Constitutional Reform provides tools to increase electricity



New president: Dr. Jaime Hernández

produced from renewable sources to keep pace with the growing energy needs of the country.

To achieve this, the Reform established Long-Term Power Auctions and Clean Energy Certificates (CECs). The auctions for energy, capacity and CECs provide a cost-effective way to bring low-carbon generation in the country.

The first two auctions demonstrated strong private readiness to invest in new solar PV and wind generation. An investment of \$6.6bn has been

Clean energies are critical sources moving forward

allocated to 52 new clean energy power plants, located in 15 states in Mexico. They represent an installed capacity of more than 5,000 MW and will begin operating between 2018 and 2019. These projects will increase Mexico's installed capacity to generate through renewable sources by 27%.

The third auction is on course

and the results will be announced in November of this year.

Are you satisfied with the pace of development of the electricity sector under the reform agenda? What areas have been the most successful? Where are further improvements necessary?

We are certainly on the right track. Electric power transmission and distribution losses are decreasing, electricity access is increasing and



currently stands at 98.5% of the population, and the electricity rates for the vast majority of Mexican households (99%) have remained stable and have not increased in the last 32 months, despite an ever complex and volatile international environment.

There is always room for improvement, though; and we will certainly keep doing our best, day by day, to provide clean and affordable electricity for Mexicans throughout the country.

What is the outlook for the balance between natural gas and renewables for power generation over the next decade?

We don't view these sources as mutually exclusive. According to the Development Program of the National Electricity System (PRODESEN) 2017 – 2031, an estimated 1.665bn pesos will be invested in power generation over the next 15 years; this is 81% of the total expected investment in power

infrastructure projects. Clean energies, wind and solar in particular, are, of course, critical sources moving forward.

CFE is promoting the construction of 25 gas pipelines, which will contribute to the expansion of the National Gas Pipeline Network by 75%. Once they are all operating, virtually all the states in Mexico will have access to natural gas. Also, once all the pipelines are operating, there will be complete routes, from the production areas in the United States to the consumption

zones in Mexico, that will attract more investors from abroad.

The Long-Term Auctions have proven to be extremely useful for CFE and Mexico, allowing more installed capacity on renewables, bringing closer Mexico's goal of generating 35% of its power with renewable sources by 2024, which has already reached 25%. Because of this, our projections show an expected natural gas generation decrease of approximately 13% from 2018 to 2021.

CFE is promoting the construction of 25 gas pipelines, which will contribute to the expansion of the National Gas Pipeline Network by 75%

CFE and others are building significant pipeline capacity to transport natural gas from the US to Mexico. Is there a risk of becoming overly reliant on the US for supply? Will LNG imports continue to play a role in meeting demand?

CFE is not actually building these gas pipelines. Though promoted by CFE, they are being built by the private sector; Several power plants are being converted for the use of natural gas as well as fuel oil, so they can still work in case of gas shortages.

Mexico has a power reserve margin of more than 10%, ready for meeting the supply in case of emergency.

Also, CFE has a mixed power portfolio integrated by coal, gas, liquid

fuels, LNG, hydro, nuclear, and other renewable sources, that continues to grow and provides reliability and security in the system in case of any fuel shortage or critical alerts.

What is CFE's role in promoting renewable energy deployment and helping Mexico to meet its carbon targets under the Paris Accord?

On 21 September 2016, Mexico ratified the Paris Accord. Mexico's climate pledge to the Paris Accord established a decrease of 22%, by 2030, of its Greenhouse Gas (GHG) emissions and 51% for black carbon.

The Energy Transition Law, approved in December 2015, sets a target of 35% of electricity generation from clean energy by 2024. Currently, 20% of power generation in Mexico comes from clean sources. Mexico generated 319,364 GWh of electricity in 2016, 64,868 GWh of which were generated with clean energy.

During 2016, approximately 75% of the energy generated from clean energy sources in Mexico came from CFE. During that year, CFE generated 263,152.83 GWh, 18.32% of which came from clean energy sources.

CFE's strategy to replace expensive and polluting fuels with lower cost alternatives with less environmental impact—such as natural gas and renewable energies—has already produced favorable environmental results: from 2012 to 2016, CFE has reduced its CO₂ emissions related to the use of fuel oil by 44%; this tendency is projected to continue until reaching a 90% reduction in 2020. ■



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**WORLD
ENERGY
COUNCIL**

World Energy Leaders' Summit

*Energy in Transition:
Leading through Change*

12-13 September 2017
Mexico City, Mexico

Hosted by the World Energy Council and the Secretaría de Energía of Mexico (SENER)

The World Energy Council will host the **World Energy Leaders' Summit** in Mexico on 12-13 September, which will form a highlight of a week of energy events co-hosted by Mexico's Secretariat of Energy. Under the theme Dialogues for the Future of Mexico 2017, the Summit will focus on Renewable Energy and Innovative Business Models to Drive and Enable Change; Decentralised approaches to Balancing the Energy Trilemma; as well as Energy System Resilience and Energy Sector Reform. The Summit will bring together approximately 100 Ministers and CEOs from across the world to drive change and deepen understanding of the grand energy transition during a critical time for the sector.

Participation is by invitation only, contact:

<https://www.worldenergy.org/events/2716726e-2cb6-e611-80c3-00155d0511bf/>

2017 Executive Assembly

16-19 October 2017

Lisbon, Portugal

The Executive Assembly is the World Energy Council's annual general gathering of the global energy leaders' network. It convenes over 1000 energy leaders, from industry, governments, academia and others for ongoing dialogue on the challenges and opportunities facing the energy sector. Hosted by Portugal, the week-long event will allow for high level, exclusive CEO and Ministerial discussions, peer-to-peer interaction and sharing of best practices.

The events website can now be consulted for more information and members' registration <http://worldenergyassembly2017.org/en>

ABOUT THE WORLD ENERGY 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: www.worldenergy.org/wec-network

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MEMBER COMMITTEE EVENTS

World Energy Leaders' Summit: Energy in Transition – Leading through Change

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Mexico City D.F, Mexico

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North American Annual Regional Forum & Empowering Energy workshop

13 September 2017
Mexico City, Mexico

The North American Annual Regional Forum will be also taking place in the margins of the summit, bringing together the leadership of the World Energy Council's Canadian, Mexican and United States member committees to discuss relations between the three countries' energy systems including future scenarios for the region, climate policies and energy trade

For more information: <https://www.worldenergy.org/events/273b7d52-d481-e711-80c6-00155d050ff0/>

During the same week, the Council will also host an open session on "Empowering Energy - Scaling up rural energy access through innovation". Co-hosted by the Council, Oxfam Mexico, Fomento Mexicano

and Barefoot College on 13 September, the session will explore the challenges and opportunities in bringing energy to rural areas and how new players and business models create synergies across communities

For more information, visit the website:

http://demex.mx/en/wp-content/uploads/2017/07/EXT_Programme-Empowering-Energy-20170718.pdf

International Summit for Electric Mobility

19-21 September 2017
Bogota, Colombia

This event is aimed at creating a space for discussion between government, private sector and academia for the development of electric mobility in the Latin American region. Electric mobility has been identified by the World Energy Council as a key element to achieve sustainable energy systems at national level and the potential in Latin American countries

is extremely high. Growth in demand for electric vehicles could potentially be fulfilled in a sustainable manner in the region.

For more information: <http://www.movilidadelctrica.energycolombia.org/>

The North Sea Opportunity: The North Sea as a large-scale power plant

26 September 2017
Berlin, Germany

A truly interdisciplinary event, the event will focus on "building resilience to climate change and droughts in Africa". Co-hosted by the Kenyan member committee, the United Nations Environment Programme, World Health Organisation and the International Climate Change Information Programme, attendees will learn from experts about drought specific research, field projects and best practice to foster adaptation among countries in the region.

For more information: <http://www.weltenergiat.de/veranstaltungen/weitere-events/>