

WORLD ENERGY COUNCIL



24th CONGRESS

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A photovoltaic plant at Masdar City in Abu Dhabi
Photo: AP/SCANPIX

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24th World Energy Congress celebration of innovation

- **Dmitry Kozak**, Deputy Prime Minister of the Russian Federation, and **Alexander Novak**, Minister of Energy, Russian Federation, announce Russia's hosting of 25th World Energy Congress in 2022
- **His Excellency Suhail Mohamed Al Mazrouei**, Minister of Energy and Industry, and **His Excellency Dr Matar Al Neyadi**, Undersecretary of the UAE Ministry of Energy & Industry and Chair of the 24th World Energy Congress address audience at closing session of four-day congress
- SET finalists pitch their ground-breaking ideas and solutions to industry experts and participate in discussions on future of energy sector



The need for courageous entrepreneurship to tackle tomorrow's key energy issues, using 5G to stimulate a drive towards sustainability and how collaborations can lead to faster, better and cheaper energy were among the issues addressed during the fourth and final day of the 24th World Energy Congress.

Maintaining the momentum of the previous three days of high-level discussions, the closing sessions at the World Energy Congress welcomed some of the United Arab Emirates' highest profile business leaders as well as distinguished industry figures, exciting young thinkers and government ministers under the theme of 'Innovation: The pathway to prosperity'.

Thursday saw extensive debates covering issues critical to the future of energy production, supply and distribution and how bold entrepreneurship can shape the culture of innovation needed in rapidly changing world.

Utilising advances in communication to drive sustainability

The day's keynote speech saw Khalifa Hassan Alforah Alshamsi, Etisalat's Group Chief Corporate Strategy & Governance Officer, explain how the newest generation of mobile technology can be harnessed to promote sustainability in the energy sector.

His address, titled 'Leveraging 5G to drive sustainability and enable innovation in the energy sector' outlined how improved communication between individuals, companies and entities, including greater access to information and better utilization of the internet, can boost the ongoing drive towards sustainability.

Mr Alshamsi said: "5G is a new piece of technology that can revolutionise new industry. It is not only about speed but yes it will be phenomenal for VR and AR experiences."

"5G is a fundamental tool that will benefit cities, countries, factories and refineries because 5G is the cornerstone for industry and key for the future of digital."

"To make the most of what 5G can offer, it is all about collaboration and innovation. This will not happen by just sitting down in the office. We have to connect our minds together and have to experiment. We can do anything if we have the will," said Mr Alshamsi.

Empowering today's entrepreneurs to solve tomorrow's problems

As well as bringing together key figures from the energy sector, World Energy Congress also supports and inspires the leaders, innovators and thinkers of tomorrow.

The session 'Start-up Energy Transition: The power of the bold' saw a panel of experts, among them the winners of this year's Start up Energy Transition Award, debate, discuss and predict the most pressing energy challenges the world will face in years to come.

Marwan Bin Haidar, Executive Vice President of Innovation & The Future, Dubai Electricity and Water Authority (DEWA), joined the delegates to consider the new business models, technologies and ideas that will be at the forefront of the industry's ongoing transition.

Mr Bin Haidar explained that all companies must "innovate or stagnate" and that incorporating brave and bold new ideas developed by start-ups is key to a successful future for established firms.

"The company receives new, bold ideas and solutions while the start-ups can benefit from years of experience and understanding of the industry," said Mr Bin Haidar. "In this way, everyone benefits."

Andreas Kulmann, Chief Executive of the German energy company Deutsche Energie-Agentur, echoed Mr Bin Haidar's comments adding that for start-ups "being bold is one thing, but being smart is another".

"Discovering what is important for all partners and what is important for the market can be difficult, but if start-ups are smart, bold and very well prepared to grow and develop collaboration, they and their partners will flourish," he said.

Finding solutions through creativity, passion and vision

At the session 'Pitch perfect: Best of the Start-up Energy Transition (SET)' Michele Fiorentino, Chief Investment Officer, ADNOC, joined a panel of judges to consider the ideas set out by SET finalists to discover the next global game-changing idea or invention for the energy sector.

An interactive, energetic and highly engaging event, the SET finalists were challenged to outline the benefits of their idea, its practical uses and why investors should get behind them as part of a professional pitch.

Start Up Energy Transition (SET) is a global innovation platform supporting disruption in energy transition.

Selected from a total of 450 applications from 80 countries, 10 startup finalists pitched their innovative ideas to stakeholders, investors and members of the business community.

Included in the final 10 were Germany-based zero emissions company ONO, and home renewables business DC Power Company Limited from Australia.

"Improving urban mobility while facilitating faster delivery of goods is ONO's aim," said Veronica Louis, ONO's Chief Communications Officer. "Our Pedal Assisted Transporter (PAT) improves access in crowded cities and boroughs while also reducing emissions, pollution and congestion."

Emma Jenkins, Co-Founder and CFO at DC Power Company Limited, explained how the company places households with solar panels at the centre of today's power transition. "Individual households will be able to trade energy with the market resulting in an increased transition to renewables," she added.

Celebrating four days of innovation and collaboration

The closing plenary of the 24th World Energy Congress celebrated the event's achievements and successes as well as reflecting on the innovative ideas and bold solutions that were formulated over four impactful days.

Dr. Christoph Frei, Secretary General & Chief Executive Officer, World Energy Council, moderated the final plenary of the week that celebrated the achievements of the first World Energy Congress to be held in the Middle East.

Speaking in front of an assembled audience, His Excellency Suhail Mohamed Al Mazrouei, UAE Minister of Energy and Industry, said the previous days were an important step towards helping to reshape the future of the energy industry.

He said: "It has been an excellent World Energy Congress and the overall result of the discussions between ministers of the governments have led to an excellent outcome. We have agreed that all of us are committed to reduce the emissions that we produce and make sure that we can all work together to help serve the whole industry well."

"It is also important to understand that any type of energy is going to help us going forward. We have to make an impact so that in the future, we have cleaner air and water that will benefit the world."

Joining H.E Al Mazrouei on stage was Alexander

Congress concludes with innovation and entrepreneurship



From left:
Russian Deputy Prime Minister Dmitry Kozak
UAE Energy Minister Eng. Suhail al-Mazrouei
UAE Ministry of Energy & Industry Undersecretary Matar Al Neyadi
 Photos: WORLD ENERGY CONGRESS

Novak, Minister of Energy, Russian Federation. As hosts of the next World Energy Congress in 2022, Mr Novak said Russia will embrace the opportunity to build on Abu Dhabi's success in hosting the energy industry's flagship event in three years time.

Mr Novak said: "I would like to invite all those present here to attend the Russian Energy Week as the perfect opportunity to follow up on the achievements of the World Energy Congress in Abu Dhabi.

"Major trends in the industry including the need to modernize production, capacity and grid management, the need for huge capital investment in the sector, for AI, for improved efficiency, the renewables and hydrocarbon mix and much more have all been discussed at great length by leading experts right here in Abu Dhabi at the 24th World Energy Congress."

Dr Matar hails staging of 24th World Energy Congress

His Excellency Dr Matar Al Neyadi, Undersecretary of the UAE Ministry of Energy and Industry and Chair of the 24th World Energy Congress, addressed the audience for the final time and outlined the importance of staging the 24th World Energy Congress in the region and the impact it will have on the Middle East and UAE for years to come.

He said: "In the past few days we have had the opportunity to examine a wide range of issues impacting our industry. We have delivered a diverse mix

of energy leaders and practitioners from around the world.

"Representing all forms of energy, they have been united in their mission. This Congress agreed that our collective thinking, collaborative strategies and concerted efforts will lead us to our goals.

"It has been a pleasure to work with the World Energy Congress and it will be our pleasure to work with our Russian colleagues to build on this success and make sure that the 25th edition will be another exceptional event."

World Energy Council's Chair addresses audience for last time

The 24th World Energy Congress brought to an end to Younghoon David Kim's role as the Chair of the World Energy Council.

Mr Kim addressed the audience of business leaders and industry figures from around the world for the final time before thanking them for their support. He ended his speech by handing over his role to Jean-Marie Dager, who will officially take over as the chair of the World Energy Council.

Russia Deputy Prime Minister invites experts to 25th World Energy Congress in 2022

Dmitry Kozak, Deputy Prime Minister of the Russian Federation, flew into Abu Dhabi and personally invited the thousands of global experts to the next staging

of the World Energy Congress in 2022. The audience witnessed a presentation that highlights the vision of Russia and the energy sectors and what to expect three years from now in St Petersburg.

Mr Kozak said Abu Dhabi has set the benchmark for success, but Russia will strive to exceed expectations at the 25th World Energy Congress while building on the solid foundations that have been laid by the UAE capital over the last four days.

Farewell speech from UAE's Minister of Energy & Industry

H.E Al Mazrouei, Minister of Energy and Industry of the UAE, took the opportunity to express his gratitude for the thousands of attendees that travelled to Abu Dhabi as well as the support of all the sponsors that helped stage one of the most important Congress' that the UAE has held.

He said: "We are very proud of what we have done in Abu Dhabi and we are going to work with Russia as one team through the World Energy Council to deliver a better and more inclusive World Energy Congress in 2022.

"We have seen great interaction between young and inspired entrepreneurs of all industrial companies this week. We have learnt a lot this week and we are promising that we will improve our policies and continue to upgrade to ensure the future is bright for all generations, not just here in the UAE but all around the world."

Emirates Motor Company & ION provide fleet of luxury vehicles to delegates at World Energy Congress

Delegates, business leaders and VIP guests who attended the 24th World Energy Congress in Abu Dhabi travelled to and from the prestigious event in ultimate style and comfort thanks to Emirates Motor Company and ION.

Emirate Motor Company supplied 10 Mercedes-Benz S-Class, E-Class and GLEs cars while 6 electric Tesla Model S75D vehicles were provided to delegates by ION, allowing them to move freely and comfortably to and from the

Abu Dhabi National Exhibition Centre (ADNEC) throughout the duration of the four-day Congress.

The fleet of luxury cars supplied by Emirate Motor Company and ION were on hand to transport delegates between their accommodations in Abu Dhabi to ADNEC as well as to the range of high-level meetings, debates and exclusive gatherings held over the course of the World Energy Congress.

As the flagship company of the AL FAHIM Group, Emirates Motor Company

has been supplying luxury vehicles to customers in Abu Dhabi since 1962.

The group has achieved phenomenal growth and success throughout the years and is now firmly established as one of the leading automobile company in the UAE capital and beyond.

ION provides sustainable commercial transportation services using the latest generation of electric vehicles, in line with the UAE's National Sustainable Transportation Agenda.

ION develops and manages its fleet of

environmentally friendly electric vehicles with a focus on delivering exceptional services to its clients.

By playing such an important role in meeting the extensive logistical and transportation needs of the international delegates who attended the World Energy Congress, Emirates Motor Company and ION have demonstrated both their own unwavering support and the support of the entire UAE business community to ensuring the Congress was a complete success.



World Energy Scenarios — 2019: Exploring innovation pathways to 2040

From 9 to 12 September 2019, the 24th World Energy Congress was held in Abu Dhabi under the theme of “Energy for Prosperity”.

As the World Energy Council’s flagship event, the Congress convenes the premier global network of energy innovators, industry leaders and policy makers every three years.

The World Energy Council launched its 2019 World Energy Scenarios report on the first day of the Congress, coinciding with its daily theme, “New visions for Energy for Prosperity”.

The report updates the 2016 models produced with Accenture Strategy Energy and the Paul Scherrer Institute: Hard Rock, a fragmented world with inward looking policies, lower growth and less global cooperation; Modern Jazz, a market-led, digitally disrupted world with faster paced and more uneven economic growth; and Unfinished Symphony, a coordinated, policy-led world, with long-term planning and united global action .

Since 2016 this scenario framework has been validated by input from the Council’s extensive energy expert member community and annual surveys of energy leaders who perceived the three scenarios to be more relevant than ever.

Dr Angela Wilkinson, Senior Director, Scenarios and Business Insights at the World Energy Council confirmed that: “Signals of all the three world energy scenarios — Modern Jazz, Unfinished Symphony and Hard Rock — have been detected in all regions.

“By using these tools, energy leaders can realize the drive to thrive in an era of disruption and design energy pathways for prosperity, people and planet.”

Discussion of member input has added interesting nuances to each scenario archetype.

In the 2019 round, the Council has adopted a medium-term time horizon of 2040 and focused on the implications of broader and disruptive innovation for the energy industry.

The 2019 scenarios consider key development of the past three years, from high carbon-centric energy demand to strained multilateral systems in a polarised political scene with uneven impacts throughout the world.

Dr. Tom Kober, head of the Energy Economic Group of the Paul

Scherrer Institute emphasized that “the transformation of the energy economy is a systemic challenge where interdependencies between technologies, actors, markets and the environment play a decisive role on how new energy structures emerge and how successful future energy and climate goals will be achieved.”

Recognising critical uncertainties in the energy sector, this report is designed to help leaders make sense of the fast-shifting landscape of energy, focusing on the phenomenon of “disruption-as-usual” and energy systems innovation.

“Disruptive innovation is driving change in the energy system at an unprecedented scale and pace,” said Muqsit Ashraf , Senior Managing Director, Accenture Strategy , Energy.

“Our new Energy Scenarios highlight the impact of technology, policy, social, and business model changes on the demand and supply side.

“Our report suggests that under plausible scenarios, the climate targets are elusive.

“To achieve competitive agility and manage the economic, environmental and social objectives of the new energy system, industry leaders will have to double down on their response to challenges from peak demand and value, managing emissions, investing in infrastructure, and unleashing digital systemwide. ”

This report makes clear that there are no simple solutions to the challenge of the Energy Transition.

Instead, the scenarios help energy leaders meet this challenge by equipping them with the means of exploring future energy developments and their implications for the economy, society and environment.

Ged Davis, Executive Chair Scenarios at the World Energy Council concluded: “Technological innovation, climate change and more tense geopolitics are disrupting the world of energy. These world energy scenarios provide the perfect tool for assessing these macro-uncertainties and crafting a strategic response for your enterprise.”

• *The “World Energy Scenarios | 2019: Exploring Innovation Pathways to 2040” are available for free on the World Energy Council’s website.*

The World Energy Council's Toolkit Guide

The World Energy Council's Toolkit brings together its online tools, insight briefs and interactive experiences in an easy to use guide.

It provides a platform for flexible cooperation and experimentation essential for managing a timely, global transition to reliable, affordable and sustainable energy.

A guide to the Energy Transition

The World Energy Council's Toolkit Guide, unveiled earlier this year during the PTX: unleash sector coupling? (Power-to-X) panel at the Berlin Energy Transition Dialogue, is now available on the Council's website for free public access.

The Toolkit is a unique resource made for the global energy community and stakeholders to manage the increasingly complex and changing ways that the world produces, consumes and trades energy.

This guide articulates the existing Council publications and Insights as "tools" with the aim of enabling users to achieve a step change in their energy transition management capabilities and performance.

Dynamic tools designed for impact

The Toolkit was developed collaboratively between the Council, its Member Committees and expert communities to understand and effectively intervene in managing energy transitions on a global, regional and national basis.

As a technology and resource-neutral whole-energy system community, the Council promotes the benefits of multiple pathways for accelerating energy transitions.

The current energy transition is a messy, multidimensional, multi-scale challenge fraught with uncertainty.

The five tools included in the Toolkit respond to this by helping leaders find practical workplace and policy solutions:

Our annual Issues Monitor surveys leadership attention to more than 42 issues and tracks the global, regional and national emphasis on the key drivers of the energy transition.

One of these is the increasing attention to the role of innovation. Our Innovation Insights Briefs provides timely insights helping leaders navigate the shifting landscape of innovation.

The speed and complexity of the transition challenge leaders to engage constructively with the uncertainties ahead.

Our World Energy Scenarios offers a relevant and enabling framework for dialogue and decision-making, helping translate new energy visions.

On the policy side, the Energy Trilemma framework helps identify opportunities for policy coherence and integrated policy innovation, in response to the challenge of achieving the first managed global energy transition.

Finally, the Dynamic Resilience framework is aimed at enabling government and industry to better prepare for systemic risks, such as climate change impacts and extreme weather, financial shocks and cybersecurity threats.



A responsive and evolving kit

The Toolkit is a responsive set of tools that translates the complexity of the energy ecosystem into a smart, bespoke approach to managing the transition on the national, regional and global levels.

The Council uses these energy transition tools individually and in combination to convene energy leaders, future energy leaders and experts from across the world and along the energy value chain.

Any one of the tools can be used by leaders across the many parts and levels of the energy systems, to engage stakeholders in conversation and design new collaborative actions in relation to the energy transition. National Member Committees receive even more value from the Toolkit's user community case studies in the form of "impact cards".

The Toolkit's flexible and reliable framework enables different levels of user integration and interactivity.

All five tools have been refined to be used individually or together in synergy to accommodate different needs.

The Toolkit provides an ever-evolving platform through utilisation and feedback, user dialogue and collaboration. Helping countries, companies and innovators to navigate the global context of the energy transition, the Toolkit lays the foundation for the international community to take the next steps towards global energy prosperity.

• *The Energy Transition Toolkit User Guide is available at: <https://www.worldenergy.org/publications/2019/energy-transition-toolkit-user-guide>*

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INDUSTRY OUTLOOK



Overview: Abu Dhabi. The UAE is already taking innovative measures in the move towards decarbonisation

Photo: REUTERS/SCANPIX

Regulations vital for decarbonisation drive

World Energy Congress hears calls for regulatory innovation to help boost **global energy transition**

EOIN O'CONNOR

Abu Dhabi

REGULATORY innovation is crucial to help the energy industry meet decarbonisation and other goals, with interconnection between different sectors becoming increasingly important.

"It is not just about technical innovation or financial innovation, we also need regulatory innovation," Angela Wilkinson, senior director of scenarios and insights at the World Energy Council said at the body's own World Energy Congress in Abu Dhabi.

Wilkinson pointed to innovative measures already being taken in the United Arab Emirates and wider Middle East region, with regulatory changes in various industries and an increasing effort to take a multi-industry

approach to regulation. "Water and energy issues are critical issues around the world. We can't do that with the same regulatory [approach] that we had before. We can't just regulate energy independent of transport, or independent of water and agriculture. So, we are going to see regulatory innovation."

Speaking alongside Wilkinson on the closing plenary of the conference's fourth and final day on Thursday, Mike Howard, chief executive of the California-based Electric Power Research Institute, agreed that regulation and innovation are two of the most crucial factors in determining the future of the energy industry.

He said regulatory certainty would "point a spotlight on where

we [global society] want to go, whether it is decarbonisation or whatever, and technological innovation, business leaders and others will figure out the most economical way to get there".

Howard added: "If you know where you want to go — let's say an 80% reduction in carbon dioxide by some date — then innovation, agility and flexibility will figure it out. It will evolve, society will get us there."

"Society as a whole is convinced that we have to do something different in how we use energy and how we produce energy... there is an awareness that business as usual will not get us there — that is the catalyst."

"It is going to take a lot of technological innovation, a lot of reg-

ulatory innovation and a lot of capital as well.

"There is a tremendous amount of pent-up innovation that is just ready to be unleashed. The world is going to need a lot more energy, and there needs to be a significant amount of decarbonisation to get to where we need to go as a planet."

However, Wilkinson warned about the ever present dangers of over-regulation.

"We don't want regulatory uncertainty but we don't want regulatory rigidity either," she said.

"Regulation is risk averse (and) we have new technologies that need to be taken to the market quickly — they are not proven technologies."

Duo push LNG for shipping

THE World Ocean Council (WOC) and LNG Marine Fuel Institute are teaming up to collaborate in advancing liquefied natural gas as a marine fuel, and the research and development of technical standards, regulations and management strategies for LNG in the global shipping trade.

LNG Marine Fuel Institute chief executive Margot Matthews said: "The World Ocean Council brings together international industry leaders in ocean sustainable development, stewardship and science, and is a consummate partner for LNG Marine Fuel Institute."

"Working in partnership with WOC will provide our members greater access to information and connections. Both organisations are committed to ensuring this partnership is brought to life and not just words on paper."

The institute is a members-based organisation that is committed to establishing LNG as a primary fuel for marine transportation.

WOC chief executive Paul Holthus added: "The LNG Marine Fuel Institute is working to decarbonise shipping, fisheries and other ocean industries."

"As the Global Blue Economy Business Organisation, the WOC provides an international platform to bring leadership companies from the ocean business and investment community to engage with LNG MFI to advance the important global fuel economy transition."

Players eye equity scene

OIL and gas players, including national oil companies, are increasingly hitting up international equity markets to shore up balance sheets and finance their operations.

"If you take the whole energy value chain, the answer will be totally different if you are on the upstream or downstream side of the business," Leila Benali, chief economist at Arab Petroleum Investments Corporation, said of the changing dynamics in public-private collaboration in the oil and gas industry.

"One of the trends that we are seeing is that, even in the oil and gas industry... we are now seeing trends to go into international markets and raise corporate bonds," Benali said at the World Energy Congress in Abu Dhabi.

Benali referenced moves by Adnoc and Saudi Aramco to raise funds through international markets in recent years.

In April, Aramco sold \$12 billion of bonds out of \$100 billion in demand in its maiden international bond issue, while Adnoc's first debut bond issue in late 2017 raised \$3 billion and was also oversubscribed.

MIDDLE EAST

UAE on march towards sustainability targets

Other nations finding challenge more difficult to meet UN's Sustainable Development Goals

AMANDA BATTERSBY
Abu Dhabi

THE United Arab Emirates was involved in the creation of the United Nations' Sustainable Development Goals and remains committed in working towards achieving those aims, according to Abdullah Nasser Lootah, director general of the UAE's Federal Competitiveness & Statistics Authority.

However, not all nations are finding the process as straightforward, he said.

A show of hands from the audience at a panel discussing SDGs and the "carbon+ agenda" at the World Energy Congress indicated that many believe significant progress towards these goals still needs to be made.

"In 2012, UN secretary general Ban Ki-Moon invited 20 countries to participate as consultants and work together to address the goals beyond the Millennium Development Goals ending in 2014 and 2015," said Lootah.

"The UAE... created a team that worked together and worked towards the definitions of the 17 SDGs and the number of targets."

While the UAE itself was "not surprised" by the indicators, Lootah said that some nations are finding it difficult to measure their progress and achievements.

"Many people said that they don't believe there is a way of measuring SDGs or there isn't enough effort to measure SDGs," said Lootah.

"For us in the UAE, the case is quite different because we worked before the SDGs towards Vision 2021 with clear targets for each and every single ministry with clearly required challenges [to be addressed in areas] where the UAE was lagging behind."

Before the SDGs, the emirate measured its progress against global competitiveness reports "so we knew where we were standing in education, food security, the usage of science, innovation, R&D".

The UAE was fortunate that when the SDGs were announced there was a 'beautiful overlap' of around 40% on the goals to which it was already working, added Lootah.

He told delegates that the SDGs "more or less 99.9%" are based on data and statistics.

"So when we report back to global organisations, such as the UN, we provide robust, credible



Flying high: the UAE is focused on attaining SDG targets

Photo: AP/SCANPIX

data that are using the latest methodologies of this world."

Sok Khavan, Cambodia's Secretary of State at the Ministry of Mines & Energy, agreed with Lootah that SDGs are "extremely important" for governments.

"We are making some progress on some aspects — providing [energy] access and efficiency — but we are not making enough progress on other aspects such as the energy mix and more clean energy in the energy mix," said

Khavan. "But the picture is not all gloom and doom.

"I think that with enough effort and resources, some of the really innovative and outside of the box technologies are going to come."

The UN four years ago released 17 SDGs, as part of the 2030 Agenda for Sustainable Development. More than 195 countries today have committed to these goals that contain a total of 169 targets and 233 indicators. "The main

objective of the SDGs is to look at eradicating issues such as poverty and inequality," said session moderator Hanife Ymer of the Mubadala Investment Company.

SDG 1 is to end poverty in all its forms everywhere; SDG 2 (Zero Hunger) aims to end all forms of hunger and malnutrition by 2030; and SDG 7 is to ensure access for all to affordable, reliable, sustainable and modern energy.

5G boon for energy players

ENERGY-RELATED industries can take a share of an estimated \$2 trillion of overall efficiencies that can be reaped by the introduction of 5G technology, writes Eoin O'Connell.

"With the arrival of 5G, all industries will benefit," Khalifa Hassan al-Forah Alshamsi, chief corporate strategy and governance officer at Abu Dhabi-based telecommunications giant Etisalat, said at the World Energy Congress on Thursday.

Alshamsi said the extractive industries, utilities and manufacturing can together take the biggest chunk of the estimated \$2 trillion in value creation from the global application of 5G, which provides high speed, better security and greater interconnectivity than earlier solutions.

"5G is a new technology that will revolutionise your industry and other industries," he said at the Abu Dhabi event.

Speeds offered by 5G are more than 1 gigabyte per second, which Alshamsi said is 10 times faster than 4G, but it is the mass connectivity offered by 5G that is most beneficial.

"5G can connect about one million devices in a square kilometre," he said.

"Imagine an oilfield (with) 100,000 sensors — you can cover it with a single 5G station."

In other energy industry-related sectors — downstream, pipelines, storage — it can optimise inspection, maintenance and repair operations, he said.

"WiFi is not as reliable when it comes to availability or robustness and security."

Alshamsi said the issue of latency that "the time that it takes for a command to go and come back" is key in industrial processes and is where 5G can be a significant differentiator in energy sectors, with 5G offering latency of about 1 millisecond, compared to up to 100 milliseconds with 4G.

"You cannot have a robot in a refinery in a very harsh environment and have some delay in their response — that would create a lot of problems," he said.



Cutting edge: Etisalat is looking to make the most of 5G telecommunications

Photo: REUTERS/SCANPIX

MIDDLE EAST



Powering up: a solar plant in Uyayna, north of Riyadh, Saudi Arabia

Photo: REUTERS/SCANPIX

Call for Middle East to diversify energy sources

World Energy Council's Energy Trilemma Index calls on region to improve security and sustainability

ANAMARIA DEDULEASA
Abu Dhabi

MIDDLE East states must focus on energy diversification, sustainability and security of supply as the region only ranks high on the availability of equity in the World Energy Council's Energy Trilemma Index for 2019.

The council's trilemma dimensions analyse energy security, equity and sustainability.

In the region referred to as Middle East & Gulf States (MEGS), Saudi Arabia, Qatar, the United Arab Emirates, Bahrain and Oman rank high on the index's list of countries with the ability to provide universal access to affordable, fairly-priced and abundant energy for domestic and commercial use.

However, the nations are nowhere near the top when it comes to energy security or sustainability. "MEGS countries have

a range of energy resources and economic diversification but face common environmental challenges including extreme weather, desertification and water stress," the World Energy Council said.

"The (region) is strong in energy access and affordability but increased diversification of energy generation and innovative solutions need to be adopted to meet rising energy demand and improve energy sustainability," the Council continued.

"Renewable and nuclear energy programmes are expected to be deployed throughout the region, improving energy security, system resilience and environmental sustainability.

"The easing of energy subsidies, coupled with energy efficiency measures, have slowed the unsus-

tainable growth in energy demand while freeing up some capital for investment in renewable energy infrastructure," the Council's report said.

The top 10 nations in the Trilemma's energy equity arm are Luxembourg, Bahrain, Qatar, Kuwait, the UAE, Oman, Saudi Arabia, the Netherlands, Iceland and Singapore.

"The average Trilemma triangle for the top performing nations shows a reasonable balance of dimension scores, with equity as the strongest dimension, (in which) all top 10 performers are well developed economies where the challenge of energy access has been solved and is being maintained at a high level," the Council said.

"There is progress to be made in sustainability and security scores,

due to differing speeds in the implementation of the decarbonisation agenda and the associated diversification of energy sources and suppliers," it added.

The top three nations across all three Trilemma dimensions are Switzerland, Sweden and Denmark.

Looking at the individual dimensions, overall the most robust and secure systems able to manage supply and demand effectively, and therefore scoring highest on the energy security dimension, are in Sweden, Denmark, and Finland.

The top of the 2019 ranking for the environmental sustainability of energy systems is held by countries making steady gains towards decarbonisation and pollution control, with Switzerland, Denmark and Sweden leading again.

Market taking a breather

IEA report says oil demand still increasing

THE International Energy Agency (IEA) has said the oil market is taking a "a breather" as supply and demand see some much awaited balance, even though output is still growing strongly on an annual basis, writes Anamaria Deduleasa.

The Paris-based agency said in its latest Oil Market report that in recent weeks, tensions in the Middle East have eased and oil industry operations appear to be normal.

"To date, support for the Opec+ agreement rate has been high but, ahead of the meeting, data for August show the compliance rate slipping to 116%," according to the report.

IEA figures showed that, while in August, Russia, Nigeria and Iraq together produced 600,000 barrels per day more than their allocations, Saudi Arabia produced 600,000 bpd less than allowed, and "it is clearly the lynchpin of the whole deal".

However, the IEA warned "this is only really a breather" as in the second half of the year non-Opec growth, although modest by recent standards at "only" 1.3 million bpd, is measured against the high base set by the enormous production surge seen this time last year.

The IEA noted that in the US, crude output is still growing strongly on an annual basis, rising this year by 1.25 million bpd, with a further 1 million bpd of growth to come in 2020.

In Norway, long-awaited projects are coming on stream earlier than expected and may ramp up to peak production ahead of schedule; while oil production in Brazil is also growing fast, reaching 3 million bpd in August, 400,000 bpd higher than just two months earlier.

"While the relentless stock builds we have seen since early 2018 have halted, this is temporary," the IEA said.

"Soon, the Opec+ producers will once again see surging non-Opec oil production with the implied market balance returning to a significant surplus and placing pressure on prices.

"The challenge of market management remains a daunting one well into 2020," the report said.

Meanwhile, the IEA maintained its demand growth estimate for 2019 at 1.1 million bpd, even though June data show that demand increased year-on-year by less than 200,000 bpd.

"For the second half of 2019 we retain the view that with oil prices currently about 20% lower than a year ago there will be support for consumers," the report said.

"Early data for July suggest that global demand grew by 1.3 million bpd year-on-year," the report added.

ENVIRONMENT

Nations told to invest to adapt to climate change

Global Commission on Adaptation tells industry to invest today or pay tomorrow

AMANDA BATTERSBY
Abu Dhabi

NATIONS — whether rich or poor, large or small — must invest now to protect against the effects of climate change or pay an even heavier price in future, according to the Global Commission on Adaptation (GCA).

A new report by the GCA said trillions of dollars in investment is needed to build adequate infrastructure to avoid the disastrous consequences stemming from climate change.

However, it estimates that if US\$1.8 trillion were invested globally from 2020 to 2030 in adaptation measures like climate-ready infrastructure and mangrove protection, this would translate to \$7.1 trillion in net benefits.

Also, investing in adaptation can also generate a “triple dividend” of avoiding future losses, positive economic gains due to innovation and socio-environmental advantages.

The main conclusion from the report ‘Adapt Now: A Global Call For Leadership On Climate Resilience’ is the world is underprepared for the effects of climate change, which will have an “irrefutable toll on human life” as it exacerbates poverty, water shortages and mass migration.

The study warned the greatest obstacle to avoiding these effects is the current lack of collective political leadership to instigate a “revolution” against global warming.

“I am really concerned about the lack of vision of political leaders... [they] are much more interested in getting elected and climate issues are not in their priorities,” said former United Nations secretary general, Ban Ki-Moon, who chairs the commission.

The GCA’s recommended actions include early warning systems for extreme weather patterns and disasters; developing a food system that can withstand droughts; protecting coastlines and building infrastructure to cope with heatwaves.

Unless these precautions are implemented without delay, 100 million more people risk being driven into poverty by 2030, water shortages will affect 5 billion people and rising sea levels will threaten mass climate migration.

The commission saw global leaders convene to discuss solutions to tackle climate change with contributions from Ban Ki-Moon, Microsoft founder Bill Gates and the chiefs of major



organisations such as the World Bank.

“We are the last generation that can change the course of climate change and we are the first generation that then has to live with the consequences,” added Ban Ki-Moon. Patrick Verkooijen, chief

executive of the Global Center on Adaptation, went further, stating there is the risk of a “climate apartheid”, which sees the wealthy pay to escape and the rest left to suffer.

“That is a very profound moral injustice.”

Study: Global Commission on Adaptation chairman and former UN secretary general Ban Ki-moon speaks at the launch of the GCA report in Beijing

Photo: AFP/SCANPIX

Output pledge for Opec

OPEC has secured pledges from over-producing members Iraq and Nigeria to trim their output, but left a decision on a possible further reduction in its overall output ceiling until December when the group meets in Vienna, writes Nassir Shirkhani.

Producers are keen to prevent an oil glut in the face of rising US shale production and a slowing world economy that threatens demand for crude.

The price of international benchmark Brent crude has tumbled to around \$60 per barrel in recent weeks from its 2019 peak of \$75, amid fears of a global recession.

The slide has resumed since Wednesday after recent strength amid indications the US might be prepared to ease sanctions on Opec member Iran, which has seen its exports reduced sharply in the past year.

The call for quota compliance came when the Joint Ministerial Monitoring Committee (JMMC) formed by Opec and its allies, a grouping known as Opec+, met on Thursday in Abu Dhabi to review the market.

The JMMC said Opec+ has overcomplied on average with its agreed cut of 1.2 million barrels per day, largely because US sanctions have removed Iranian and Venezuelan exports from the market.

Iraq and Nigeria have taken advantage of the situation by producing above their oil quotas.

“All participating countries present, particularly those who are yet to reach full conformity with their adjustments, were unequivocal in providing steadfast assurances of their determination to achieve at least 100% conformity for the remainder of the year,” the JMMC said.

“Those countries who have over-complied also reiterated their voluntary contribution. Resultantly, overall conformity will be brought to record levels.”

Iraq, Opec’s second-largest oil producer, vowed to reduce its output by 175,000 bpd by October, while Nigeria is to reduce supply by 57,000 bpd.

Iraq has been pumping 4.8 million bpd in recent months against a target of 4.5 million bpd. Nigeria produced 1.84 million bpd in August versus its target of 1.7 million.

New Saudi Energy Minister Prince Abdulaziz bin Salman said his country is determined to produce below its assigned output targets at just below 10 million bpd.

The JMMC meeting also discussed rising US shale output and exports, a global economic slowdown and a possible softening of the sanctions on Iran.

Any formal decision on deeper oil cuts could be taken at the next Opec+ meeting in December, Prince Abdulaziz said. The JMMC will meet again before the full Opec meeting in December.

RENEWABLES



On site: a ThysssenKrupp worker at the Carbon2Chem project in Duisburg, Germany

Photo: AFP/SCANPIX

Digital boost for clean energy

Digitalisation aiding collaboration and convergence and helping draw giants such as **BP and Shell into renewables sector**

GARETH CHETWYND

Abu Dhabi

THE advance of digitalisation points to new forms of convergence and collaboration along the road to providing clean, reliable and affordable energy, a World Energy Congress panel heard on Thursday.

The panel, chaired by World Energy Council senior director of scenarios and insights Angela Wilkinson, provided plenty of examples of such collaboration, such as the new mobility paradigm outlined by Jeanne Ng a director of Hong Kong utility CLP Holdings.

Jeroen van Hoof, a global leader for power and utilities with PwC, noted that energy convergence has brought companies such as BP and Shell into the renewables game.

“Renewables are coming more into the system but there are barriers to relying only on electrification,” he said. “In chemicals, for example, part of the energy consumption still needs molecules. This raises the question of whether we use fossil fuels or look for alternatives, such as the notion of the green molecule.”

One recent example of the latter

approach was highlighted through ThyssenKrupp’s Carbon2Chem pilot, where surplus electricity from renewable energies converts carbon dioxide from the steel mill into synthesis gases, providing the building blocks for products such as ammonia, methanol, polymers or higher alcohols.

Tim Nelson, executive general manager for strategy and economic analysis with the Australian Energy Market Commission (AEMC) talked about new shifts taking digitalised energy management to the household level, but noted also the challenging aspects of disruptive technologies

“In Australia, we can see about a quarter of detached houses with solar PV (photovoltaic panels) on their roof, and a growing interest in batteries, he said.

“In some areas, such as Queensland, there is so much solar power coming in that we are seeing negative pricing pretty much every day.

“The same can be said of wind in the south, where we often get negative prices overnight,” he added.

Nelson described an increasing

number and range of companies coming into the market to increase the capability of customers to use automated energy management systems.

“Digitalised technology and the internet of things is coming out of the metre and through devices into homes and businesses,” he said.

“Customers are taking more control of their energy supply situation and we are seeing growing collaboration between players, such as the traditional telecoms industry and energy industry businesses.”

Nelson noted that the top internet companies are developing smart algorithms to help customers better manage their energy without effort.

“Customers don’t want to have to think about it, and it is important to appreciate this as a growing trend,” he said.

Nelson also acknowledged that regulatory agencies, such as the one for which he works, are not always the best-placed to respond to such stress.

“Regulatory bodies are struggling to keep up with the pace in

technology,” he said. Development banks, on the other hand, tend to be institutionally programmed to tackle climate change, noted Aida Sittikova a director with the European Bank for Reconstruction & Development (EBRD).

“Last year emissions were still peaking at record levels... It is fascinating to contemplate futuristic technologies and visionary, but with the pace of climate change we try to be very pro-active in combining clean energy with infrastructure projects, in municipal services, and in transport,” she said.

The key to combining different elements to bring clean power to the table most successfully is to provide the right enabling regulatory framework for the private sector to enter the picture, Sittikova said.

“For financiers wanting to support sustainable development goals it is important to have a team in place which works across the board, covering energy, municipal services and transport,” she added.

Among challenges, panellists mentioned the problem of manag-

ing disruption, such as periodic overcapacity and negative prices, but also the need to win the debate on how to bring a mix to the table during the energy transition.

Rene Kofod-Olsen, chief executive of Topaz Energy & Marine, soon to merge with P&O Maritime, said: “There are plenty of claims about the good that the energy industry is doing, but there is no getting away from the fact that there still has to be a mix, and this has to be explained.

“The industry is getting a lot of things right, and events such as the World Energy Congress are a fantastic opportunity to take this message to the world, but the industry has to go on the front-foot, without any arrogance.

Nelson added: “In an age of social media, everything is painted as either good or bad. Financial institutions were used to seeing things in a more sophisticated way, but today the outcome seems to be that a bank or institution is ‘in’ or ‘out’ of fossil fuels.

“We clearly need to do a better job of communication,” he said.

TECHNOLOGY

3D printing set to be driving

Technology could **unlock \$30bn** of value and save about 2 million tonnes of **carbon emissions**

ANAMARIA DEDULEASA

London

FROM custom-made running shoes to gravity-defying desserts, additive manufacturing, better known as 3D printing, is moving quickly into the mainstream and changing the way we think about manufacturing.

While its use is widespread in industries such as aerospace, automotive and biomedical, experts say the oil and gas sector has yet to fully embrace the technology.

This reluctance comes despite estimates from the World Economic Forum that for upstream operators, 3D printing could unlock \$30 billion of value, while also saving 2 million tonnes of carbon dioxide emissions.

Anglo-Dutch supermajor Shell used 3D printers to prototype its Stones project in the Gulf of Mexico, producing a scaled down plastic version, including all components, in only four weeks.

Efficient assembly

Modelling the floating production, storage and offloading system showed Shell exactly how to improve components before building the real-life buoy in the construction yard.

It also helped the company work out the most efficient assembly sequence and saved \$40 million by highlighting design flaws at an early stage.

In addition, the 3D-printed prototype showed US authorities how the finished design would function in a rough sea environment and helped Shell secure governmental approval, according to the World Economic Forum.

Ron van Wolferen, 3D printing team leader at the Shell Technology Centre Amsterdam, says design validation and novel design applications are just some of the use cases for this technology.

"We are just scratching the surface of what we could do," says



van Wolferen. "In some cases, we would have to wait for 150 days to get a part. We are trying to work around that, using 3D printing."

Joost Kroon, a 3D printing technology expert who manages the Shell Technology Centre Amsterdam says: "With additive manufacturing you have more design freedom, compared to traditional

design, where you have manufacturing constraints. You have more possibilities, you can combine functions, can have multiple components built into one."

For example, Kroon says Shell has used the technology to make a heat exchanger that requires less material, is lighter and takes up less space.

A part such as this could be used on an FPSO, meaning the vessel could potentially be made smaller and more cost-efficient.

Additive manufacturing also can address the issue of obsolete or difficult-to-find replacement parts, as the technology allows for reverse engineering.

Norway's Equinor has six 3D printers offshore printing plastic parts and six onshore for test and demonstration purposes.

The technology has reduced lead time on some required components and proved highly beneficial for repair work, says Equinor digitalisation manager Brede Laerum.

"Instead of replacing components that are worn or corroded, we can print back on the material or part that we are using, meaning we can use the same part for longer," Laerum says.

"We have used 3D printing in the case of an impeller for a corroded sea water pump weighing around half a tonne. We printed

material back onto it so we can re-use it.

"This process would need a service in seven years' time, when it would be checked again.

"But the material used now is highly resistant to corrosion compared to what we had before, so that was another improvement."

Broken fan

In another case, Equinor needed to replace a broken electric heating fan on a motor, but it was difficult to find a match.

Rather than replace the entire motor, as the supplier suggested, Equinor engineers designed a new fan and printed it, saving time and money.

Uses of the technology also extend to optimisation, Laerum says. It opens a new way of manufacturing, offering more freedom in design and the structure of the component.

"For the new platform Johan Castberg, we 3D-printed a goose-neck for a fire water system that is

Moving the base for manufacturing

THE World Economic Forum says that in the not-so-distant future, 3D printing could create a close relationship between design, engineering, marketing and manufacturing, possibly shifting some manufacturing away from low-wage countries closer to the customer base in developed countries, writes Anamaria Deduleasa.

As the upstream oil and gas industry's operations grow in technical complexity and size, demand for replacement parts at remote production sites will increase.

"The conventional approach to supplying these parts – shipping them from a centralised warehouse – can take several days, costing up to \$1 million a day during drilling, and up to \$300,000 a day once drilling is completed," the organisation

says in a white paper. Norway's Equinor says it has already seen cost reductions of between 50% and 90% by 3D printing components needed for repairs, modifications and replacements and expects additional savings of between 25% and 50% when it is able to reduce its physical inventory.

Siemens chief technology officer Vladimir Navrotsky adds: "We have noticed a price drop in the technology, but not to the levels some might think. What we have seen, however, is just how much the technology has advanced. Productivity on printers has increased about four or five times, and now, we are also printing more complicated parts and materials."

As the lifecycle of the components extends, "the overall costs can be reduced", he says.

force for industry



Left and top: Siemens reverse engineered a crucial part for a 100-year-old Ruston Hornsby vintage car using 3D printing and without any original technical drawings

Above, middle: Equinor's head of 3D print implementation Brede Laerum and Equinor senior advisor for innovation Rolf Helland with a titanium gooseneck for the Johan Castberg platform

Above: final machining under way at Equinor's Tjeldbergodden offshore facility on repairs of 500kg seawater pump impeller using 3D print

Photos: SIEMENS/EQUINOR

“We are just scratching the surface of what we could do.”

Ron van Wolferen, 3D printing team leader at the Shell Technology Centre Amsterdam

produced in titanium and will be installed next year. Benefits include the reduced weight of the part, which went from 1 kilogram to half,” he says.

“Also, the part required five different components previously, and with 3D printing, we only require one. In the future, we have the model and we can print it any time.”

The real change will come in the way that operators work, says Siemens chief technology officer Vladimir Navrotsky.

“Companies are interested in understanding 3D printing capabilities and challenges, but in our experience, what they are looking

for is the competences and specialist teams to work with,” says Navrotsky.

“The oil and gas companies’ investment into spare parts warehouses is huge. So to minimise these investments these companies are considering transitioning from physical to digital warehouses from which they can get spare parts on demand (from a digital spare parts database).”

Equinor’s aim is to have 3D printing capacity distributed geographically, meaning that it could produce components where it needs them.

Laerum says: “We could move from a ‘just in case’ strategy to

‘just in time’. Within two to three years, we want to establish a digital value chain with our suppliers. We aim to move from purchasing physical components to virtual ones, working with our suppliers to be able to buy 3D models and print them at a later stage, as needed.

“We need 10 years to reduce the physical inventory.”

Van Wolferen says Shell already is working with some of its suppliers on an “ecosystem”.

“We are looking for qualified parties who understand our business and who can do 3D printing,” he says.

“If our suppliers would have 3D printing facilities, that would be ideal for us.”

Van Wolferen points out that those suppliers would also need to provide a warranty on the printed components.

“We want to have the skill set but we don’t have the capacity to print everything ourselves,” he says.

‘Trust issues’ holding back adoption levels

ADOPTION LEVELS for additive manufacturing in the oil and gas industry remain low due to “trust issues”, according to classification society DNV GL, writes Anamaria Deduleasa.

There currently is no standardised way of proving to manufacturers and regulators that 3D-printed products are safe to use, the company says.

Supermajor BP, which uses 3D printing to manufacture components for its petrochemicals business, says the technology has great potential but “remains relatively unproven” for precision-engineering parts.

“The oil and gas industry has high demand in terms of reliability and durability in extreme conditions, such as high pressures and temperatures in wells, and harsh climates offshore,” BP says.

DNV GL notes that the use of 3D printing is expanding but says the technology needs “technical standards and guidelines for qualifying and certifying equipment, processes, products, materials and personnel”.

Last year, DNV GL opened the Global Additive Manufacturing Technology Centre of Excellence in Singapore, which will focus on finding whether 3D-printed parts can be qualified and certified to standards applied to traditionally made goods.

“Part-by-part certification is costly, time-consuming, and counter to producing and using additive manufacturing parts on demand,” says Sastry Kandukuri, principal specialist for additive manufacturing in DNV GL Oil & Gas.

“So, it is vital to find alternatives to conventional qualification methods, and these will likely be based on validated models, probabilistic methods, and part similarities.”

Joost Kroon, manager of the Shell Technology Centre Amsterdam, describes the critical role of



Standards: Angus 3D Solutions managing director Andy Simpson

Photo: ANGUS 3D SOLUTIONS

validation in 3D printing for research and development. “We have a facility in the Netherlands approved by Lloyds Register, equipped to print out pressurised vessels. From design to validation, we have everything in place, machines, personnel, the ‘know-how’, are able to store all the data, verify parts and put these to the test,” says Kroon.

“In the next four to five months, the next step is to print a pressurised vessel, now that we have the facility certified. We started with 3D printing non-critical parts, rotating parts, now pressure parts,” he says.

Andy Simpson, managing director of Angus 3D Solutions, says: “Having the certification companies set standards would boost confidence in the technology. We need standards in place so that the industry has a reference point.”

“Industries like aerospace, automotive and biomedical have standards in place that must be met, therefore they are confident when using the technology.”

Printing technology is building up layer by layer

A 3D printer follows a digital design and sprays a thin layer of some material, usually plastic or metal, via a nozzle, to build up an object of that material layer by layer.

Andy Simpson, managing director of Angus 3D Solutions, a 3D printing oil and gas-focused company based in Scotland, describes the process.

“A customer would send us a digital file of a component, or we would work to design it together,” he says.

“We can also scan that part. We then set up our software with that digital file, and set up the 3D printer.”

“The software will slice the file up into different layers, and then send it to the printer to prepare layer by layer.”

Much of the company’s work involves prototypes and reverse engineering for obsolete or difficult-to-find parts.

German giant Siemens says when they started looking into 3D printing there were very few design tools around the technol-

ogy or useable software. “We started working with a supplier of printers. They re-designed their printers to suit our needs, because customisation improved the process,” says chief technology officer Vladimir Navrotsky.

“Since then, we have seen significant improvements to the performance and the lifespan of our products using 3D printing.”

“Some of the applications we found were for repairs of damaged or obsolete parts, but also to upgrade the old design of some parts,” he adds.

For example, Siemens reduced repair time for certain gas turbine components from 44 weeks in the case of traditional manufacturing to four weeks using 3D printing.

Navrotsky cites a case in which Siemens was able to print a one-piece version of a replacement part that previously had 30 pieces.

“3D printing allows us to manufacture components when we need them. This technology also allows us to do what we could not do with traditional manufacturing methods,” he says.

Fracking issues in Colombia

Nation looking to boost use of renewables

COLOMBIA'S government might issue a new regulatory decree to overturn an administrative court injunction against the use of hydraulic fracturing in proposed pilot projects even as the country steps up efforts to increase the role of renewables in its energy mix, writes Gareth Chetwynd.

Participating in a World Energy Congress panel in Abu Dhabi on the role of governments in fostering energy transition, Colombia's Deputy Minister for Energy Diego Mesa Puyo outlined plans for a domestic energy mix that draws heavily on hydroelectric resources but still relies on thermo-electric sources for a third of its needs, and where 70% of the population use gas for cooking.

Against a backdrop of dwindling oil and gas reserves, Puyo criticised a decision this week by Colombia's top administrative court that upholds an effective moratorium on fracking.

A new regulatory framework for development of unconventional oil and gas was blocked last year in response to a lawsuit filed against the Energy Ministry by an environmental lawyer, and this decision was upheld in a ruling late on Tuesday.

The ruling prevents companies including ExxonMobil, Canacol, ConocoPhillips and Ecopetrol from proceeding with planned pilot projects for producing shale oil in the Middle Magdalena Valley.

"This is extremely disappointing because our reserves are depleting. We have less than six years of oil left and less than 10 years of the gas that Colombians use for cooking. We see shale as the game changer," Puyo told Upstream after the panel debate.

There is no law against fracking in Colombia and the court ruling targeted the regulatory framework that is crucial for the environmental permitting process to work, which may have left the administration of President Ivan Duque with an opening for a legal counterattack, Puyo believes.

"The ruling is against a specific regulation so we can potentially issue decrees to regulate the pilots. We are looking at our options for overturning this," he said, without giving a timeframe.

The proposed introduction of fracking practices to Colombian fields has sparked a heated debate in the country.

The lawsuit targeted state-controlled oil company Ecopetrol, which has earmarked investments of \$500 million to start ramping up unconventional production over the next three years, starting with the pilot project.

POLITICS



Powering up: a solar electricity hybrid system at Namibia's Gobabeb desert research station

Photo: AFP/SCANPIX

Nations plot paths for future energy sources

Governments must balance between prescription and engaging population constructively, according to **World Energy Congress panel**

GARETH CHETWYND

Abu Dhabi

GOVERNMENTS have a crucial role to play in the transition to future energy sources but they will need to play a balancing act between prescription and engaging the population constructively, a World Energy Congress panel was told on Wednesday.

"First it is important to recognise that we are not on track with targets for climate change... in fact we are on course for more than 3 degrees (Celsius)," said Serge Colle, a global power and utilities advisory leader with consultancy giant EY.

"This raises big demands for electrification and government is the only player that can get us where we need to go for emissions."

Examples of how different nations are striving with these challenges came from Colombia, Namibia and Portugal.

"We already have a high renewable element because two thirds of our power comes from hydroelectric sources but this is weather sensitive, so it was already clear to us that we needed more diversity for reliability," said Colombia's Deputy Energy Minister Diego Mesa Puyo. The remaining third

of Colombia's energy comes mainly from coal and, to a lesser extent, gas-fired power but with natural gas reserves depleting fast and decarbonisation in mind, the focus is falling on renewable energies.

"We have a lot of potential in areas such as solar power but we have so far been lacklustre in developing this potential," Puyo said.

"We are pushing this in our next auctions for power supply and we are seeing a lot of interest from generators and buyers. We want to quickly get renewables up to 8% to 10% in our energy matrix," he added.

Puyo said he believed regulators should try to be an enabler, not a bottleneck.

"This means helping to change attitudes and making sure that renewables growth is tied closely to efficiency," he said.

In Namibia, a history of looking to neighbours for access to energy and water has fostered an approach that values integration, according to Mines & Energy Deputy Minister Kornelia Shilunga.

In a concerted push to both connect the general population and

reduce imports, Namibia began increasing solar power installations in 2017 and developed a 20-year national resource plan to extend these initiatives to other sources such as biomass.

"We have a master plan for electrification, including efforts to connect people through mini-grids when they are far from the main grid," said Shilunga.

"We have two of these mini-grids, and they are working well; with funding for solar power, and this is working well in providing technology such as solar water pumps.

"We are opening up to become a more innovative sector, trying to offer power which is reliable and affordable."

Portuguese Energy Minister Joao Galamba admitted that his own left-of-centre leanings made him comfortable with the idea of central planning on energy and explained why his country was more ambitious even than European Union laws require.

"We already have a lot of renewables, so it is easier to achieve targets and be more ambitious... but it has to be reliable and affordable," he said. "You have to engage

your citizens so that people can see it as an opportunity not a threat," Galamba added, providing details of the Portuguese government's success in achieving low prices in electricity auctions, while also carrying out extensive consultations with stakeholders in communities and in industry.

"(Achieving low electricity rates) also helps the question of political stability. I think all parties agree with this agenda so we can achieve energy transition without permanent overhauls of government policy," he said.

Portugal still has two small coal-fired power plants. Both are scheduled to close before the middle of the next decade but only 400 jobs are threatened.

"In our case this does not spell big job losses in activities such as mining so it is easier than for some countries," Galamba acknowledged.

Colle added: "You just have to look at the case of the yellow jacket protests in France to see that customers need to feel that they are participating in the energy system and changes taking place."