WORLD ENERGY COUNCIL

24th CONGRESS
ABU DHABI

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Wednesday, 11 September 2019

AT THE SHOW

Nasser urges bold response to climate challenge

Saudi Aramco chief executive Amin Nasser emphasises the need for the oil and gas industry to respond boldly to the challenge of climate change by driving down its own emissions as much as possible.

Pages 8&9

Saudi Aramco chief executive Amin Nasser
Photo: AP/SCANPIX

Business and government alliance crucial for fair energy transition

EDF Chairman and Chief Executive Jean-Bernard Levy shares highlights from his keynote address at the 24th World Energy Congress.

For the energy sector business as usual is not an option. The first is that, for the energy sector, business as usual is not an option.

Over the years we have seen our industry navigate through many transformations, transitions, and even shocks.

But this time is different.

Simultaneous shifts and shocks from all angles have become day-to-day business for us. This 360-degree uncertainty signals a bumpy road ahead marked with unprecedented volatility.

Climate is one issue: Can we limit warming to below 2°C, as science and the Paris Accord tell us we must? Or will we remain on the current path that leads us to 3°C? We should clearly do our utmost to achieve a 2° scenario. Yet the challenge at hand is enormous: it requires significant changes in how we produce, transport, distribute and consume energy. But make no mistake: business as usual is not an option on a 3°C pathway either. The effects of global warming will hit even harder than today, and major adaptation efforts will be necessary. At EDF, we have already invested hundreds of millions of dollars to adapt our facilities to the current warming trend of just under 1° Celsius.

Then there is the issue of technologies. Only one degree separates a world that is 2° or 3° warmer, yet the energy mix required by each are worlds apart. A two–degree scenario means deploying carbon-free technologies on a massive scale over the coming decades, and leaving large amounts of fossil fuels underground. While in a 3° scenario, unabated fossil fuels are still widely used in 2050.

Another issue is geopolitical trends.

The geopolitics of oil continues to play a major role. And yet, this role is also evolving: The shale gas revolution disrupted the allocation of resources. And new dimensions are emerging. Ownership of new and rare resources as well as mastering new technologies are now becoming increasingly strategic.

Technological leadership is what gives the edge today. Where future technologies are developed and produced will determine where future economic growth and employment will thrive.

Looking to the changes that lie ahead we cannot lose sight of the systemic challenges our sector faces along the way.

On the contrary, as major industry players, we must be the ones to tackle them. Innovation is not only about technology; it is also about governance of the energy sector.

Together with governments and regulators, industry plays a crucial role in helping address the long-term issues facing the sector. A more consumer-centric world means enhanced corporate social responsibility for energy companies.

All of us have a pressing responsibility in building the collective solutions needed to rise to the challenges ahead – and the first and foremost is climate change."

EDF Chairman and Chief Executive Jean-Bernard Levy
Photo: REUTERS/SCANPIX

Congress Programme

Wednesday 11 September

09:00 — 09:50	**Keynote Address**	*ICC Plenary*
10:00 — 11:15	**Opening plenary** **Driving innovation: The role of governments in the future of energy** *Speakers:* **H.E. Diego Mesa Puyo**, Viceminister of Energy, Colombia **H.E. Joao Galamba**, Secretary of State for Energy, Portugal **Serge Colle**, Partner, Global Power and Utilities Advisory Leader, EY	
11:15 — 11:45	**Break**	
11:45 — 13:00	**Parallel sessions** **The new energy security agenda**	*Hall 4, Block 1*
	Progressing the vision for regional integration	*Hall 4, Block 2*
	New regional perspectives: Forging new avenues for Europe's energy policy	*Hall 4, Block 3*
	Communities and the social license to operate	*Conference Room A, Block 5*
	Energy, water, food: An ecosystem on the cusp	*Conference Room A, Block 6*
	Accelerating action on the SDGs and the carbon+agenda	*ICC Fishbowl*
	Market design: Enabling the energy transition	*Conference Room A, Block 4*
13:00 — 14:15	**Lunch Break**	*Halls 2&31*
14:15 — 15:30	**Parallel sessions** **Enhancing energy security and electricity integration in the MENA region**	*Hall 4, Block 1*
	Rethinking the energy trilemma: Synergies and co-benefits	*Hall 4, Block 2*
	Navigating the future: What's on top of mind for energy professionals?	*ICC Fishbowl*
	Stepping up on climate action	*Hall 4, Block 3*
	New regional perspectives: What will fuel North America's future energy system?	*Conference Room A, Block 5*
15:30 — 16:00	**Break**	
16:00 — 17:15	**Closing plenary**	*ICC Plenary*
	Power, policies and purpose: a new era of energy geopolitics *Moderator:* **Carlos Pascual,** Senior Vice President, Global Energy & International Affairs, IHS Markit *Speakers:* **Christian Zinglersen,** Head of Secretariat, Clean Energy Ministerial Secretariat **Francesco La Camera,** Director General, IRENA **Frederick Kempe,** President and Chief Executive Officer, Atlantic Council **Jean-Marie Dauger,** Co-Chair, World Energy Council	

Solar panels at a shopping mall car park in Nairobi, Kenya

Photo: AFP/SCANPIX

Policy Reform for Energy Transition in Kenya

The global transition to a low carbon economy has never been more urgent than it is today. Greenhouse gas emissions have raised temperatures to an unprecedented high level reaching 414.7 parts per million (ppm) in May this year.

To mitigate against the worsening climate change, leaders from 195 countries met in Paris during the 21st Conference of Parties (COP21) of United Nations Framework Convention on Climate Change (UNFCCC) and adopted what is known as the Paris Agreement on Climate Change.

World leaders committed to reducing the world's temperature rise to less than 2 degrees Celsius above pre-industrial levels.

Climate change mitigation, is, therefore, a key driver for an energy transition from fossil-based energy systems to low or zero-carbon energy systems.

However, this transition cannot be driven by the current regulatory systems and policies. What is required is a reformed policy environment that balances the three pillars of the energy triangle namely economic development and growth, energy security and access and most importantly, environmental sustainability.

According to the recently released report by the World Economic Forum, Fostering Effective Energy Transition 2019, countries with strong regulatory frameworks and policy stability are experiencing more success in their efforts to transition towards a low carbon economy.

They are able to install larger renewable energy capacity and reduce their carbon emissions at a faster rate than those without such frameworks in place.

African countries share the common challenge of poor regulatory frameworks and policy instability especially in regard to the energy transition.

African countries though lagging behind in terms of development and regulatory framework supporting the energy transition however have an unprecedented opportunity to utilize the abundant resources at their disposal to make this transition.

According to the United Nations, Accelerating SDG 7 Achievement Policy Brief 18, Africa has an installed capacity of around 170 gigawatts.

Africa however, has an abundance of natural resources which African governments can take advantage of to implement modern, low carbon technologies to create zero/low carbon energy for their growing populations.

The challenge is that many, if not all of these governments lack a policy framework to design and implement visionary and progressive interventions that would see the continent leapfrogging the rest of the world and becoming the lead in energy transition.

Kenya is an example of a country formulating and implementing transformative policies to accelerate its transition to a low carbon economy.

In the last three years, Kenya has enacted two transformative laws that directly affect its transition to a low carbon economy.

The first was the Climate Change Act 2016 and the most recent, the Energy Act 2019.

The Climate Change Act 2016 provides a regulatory framework that promotes an enhanced response to climate change and provides mechanisms and measures to improve resilience to climate change and promote low carbon development.

This Act addresses the pillar of environmental sustainability by strengthening the relationship between energy generation and consumption and society.

It does this by creating an avenue for citizens to hold governments and corporations accountable for reducing greenhouse gas emissions.

The Act has provisions allowing citizens to sue private and public entities that frustrate efforts to reduce the impacts of climate change.

Empowering the consumer, a powerful demand pull policy ensures that transition is not only a top-down directive but an initiative of the people who are directly affected by climate change.

In addition, the Act offers supply push provisions for organizations by advocating for incentives to pursue low-carbon development and promotion of research and development on clean technologies.

The Energy Act 2019 has created a regulatory framework to ensure Kenya achieves its goal of universal energy by 2030 whilst reducing its greenhouse gas emissions.

The Energy Act 2019 provides the framework for the devolution of the provision of energy services to the grassroots level.

Under the new framework, energy plans will be designed and implemented at the county level, with the national government only working to harmonize these plans into a national plan.

This fosters inclusiveness and energy equity as policies and plans are tailored to income and spatial distribution.

In addition, county governments are tasked with designing least-cost power plans taking into account the environmental impact and social impact of technologies to be used.

This will compel county governments to, first and foremost, use locally available resources in the design of their energy plans.

Energy planning at the grassroots level increases the level of demand management and energy efficiency which allow the pursuit of decarbonization of the energy system at large.

Improved demand management and energy efficiency can lead to the decoupling of economic growth from energy consumption thereby resulting in a system that is less energy-intensive.

Grassroots energy planning also has the advantage of providing data for better targeting of energy subsidies to low-income households.

The Act also empowers county governments to build local renewable energy centres creating a platform for technology transfer and technology development.

This will assure counties of energy independence in the long run if local content regulations are strictly implemented.

This framework puts Kenya at the forefront of the energy transition race in East Africa.

However, further support is needed to address market failures. Incentives to support technology transfer and technology development such as early adopter incentives, tax incentives and providing test beds for demonstration could all accelerate the transition to a low carbon economy.

In addition, punitive measures such as environmental taxes or carbon taxes could be implemented in order to distribute the costs of decarbonization.

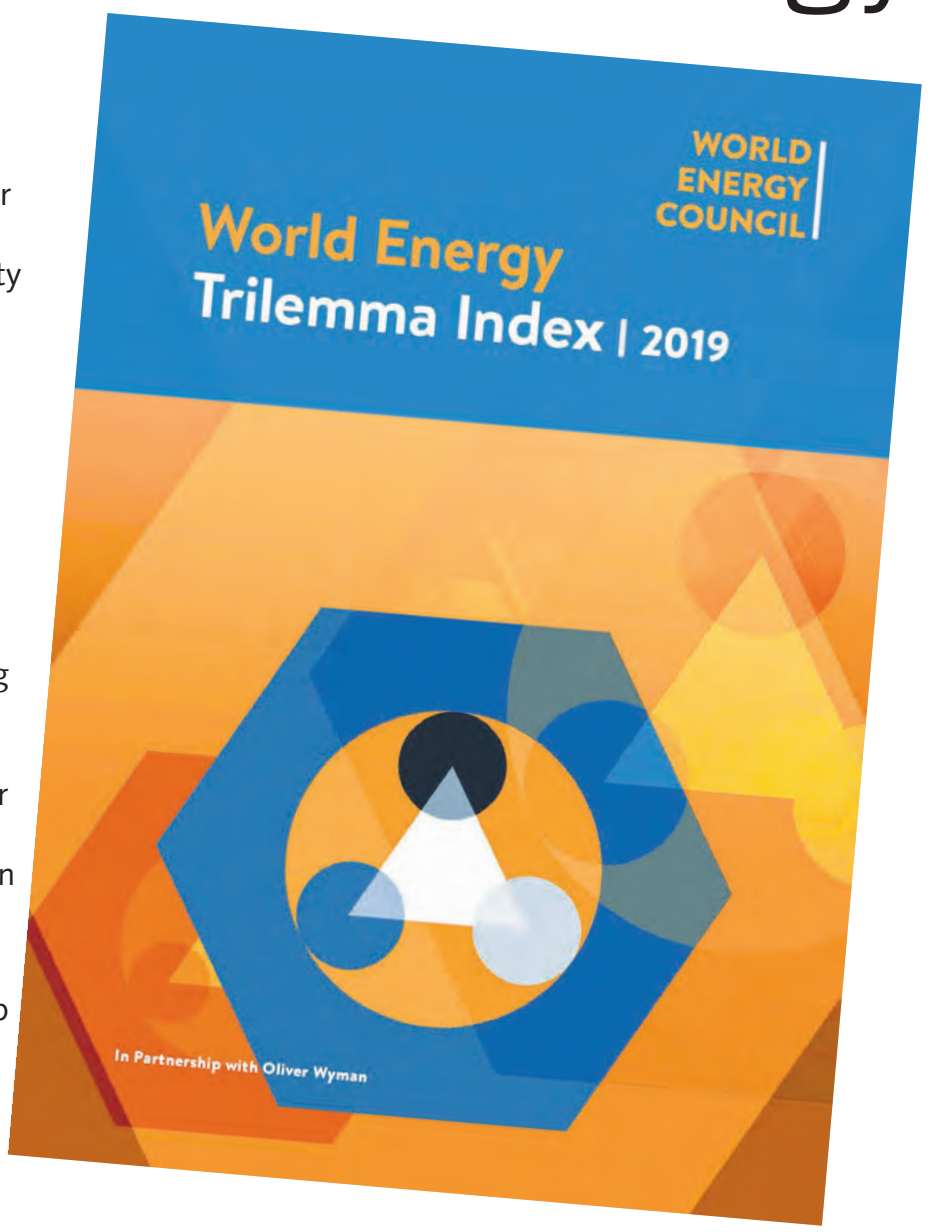
With such measures in place, the growth of green jobs and industries would increase offering the young population jobs.

This framework cannot only be used as a case study for other countries, but for regional power pools as well.

It exemplifies the need to plan energy from the grassroots level, using locally available resources promoting energy equity and independence.

• *Lois Gicheru, Chief Executive Officer, Solafrique Limited*

Energy Transition is Accelerating Across Countries Worldwide According to 2019 World Energy Trilemma Index



Today, the World Energy Council in partnership with Oliver Wyman, unveiled the latest progress for almost 130 countries on developing policies for Energy Security, Equity and Environmental Sustainability.

The 2019 World Energy Trilemma Index, created by the World Energy Council, in partnership with global consultancy Oliver Wyman, a business of Marsh & McLennan Companies, provides an objective rating of national energy policy and performance across three dimensions: Energy Security, Energy Equity and the Environmental Sustainability of Energy Systems.

Launched today during the 24th World Energy Congress in Abu Dhabi, United Arab Emirates, the World Energy Trilemma Report and Index provide a ranking of countries' energy performance using global and national data.

New this year is the analysis of historic trends, which will give policy makers an opportunity to track their policy performance over time.

The new World Energy Trilemma methodology includes indexation and scalability.

Key highlights:

• 10 countries achieve the top AAA balance grade, representing top quartile performance in every dimension.

• There has been a general trend of improving energy policy performance. Since 2000 nearly 120 countries have been improving their overall Trilemma scores over the 20-year period while only nine countries have seen their overall performance decline.

• The historic analysis shows that the "Trilemma" of balancing the differing policy priorities remains relevant with no country having consistently improved in each dimension every year since 2000.

• The rate of improvement in overall Trilemma performance increases as the transition progresses — globally, performance in all three dimensions are advancing and accelerating.

Dr. Angela Wilkinson, Senior Director Scenarios and Business Insights, World Energy Council said: "For the very first time, the World Energy Trilemma Index provides new insights into energy policy performance over time.

"Since the turn of the century, there has been a positive trend with nearly 130 countries improving their Trilemma performances.

"An integrated and coherent policy pathfinding approach is essential in managing robust transitions.

"Every policy maker can and should use the Index as an unique and useful tool to establish their national baseline and explore how best to improve their energy policy performance."

Francois Austin, Partner and Global Head of Energy, Oliver Wyman said:"The 2019 Trilemma Index shows that the significantly improved nations are undergoing a faster-paced energy transition by balancing policy, corporate action, national resource usage and changes to individual behaviour with environmental concerns.

"Looking at these trends in aggregate as well as at the national and regional level can give policymakers and business leaders direction to shape the future of energy."

Comprehensive data and analytical insights are a necessary tool for policymakers to develop a coherent approach to the global energy future.

To make these insights widely available, the World Energy Council and Oliver Wyman also launched a new Trilemma interactive online tool featuring countries' energy profiles and Trilemma performance since the year 2000.

The Trilemma Index and interactive online tool feature a variety of findings about the state of energy around the world. The Index can be reviewed at www.trilemma.worldenergy.org

• Switzerland, Sweden and Denmark are the top three rated countries across all three Trilemma dimensions in 2019. These countries have maintained consistent and balanced performance coupled with steady economic and population growth for a number of years.

• Cambodia, Myanmar and the Dominican Republic have shown the biggest improvements in the overall Trilemma over the past 20 years, as a result of a focus on electrification, energy generation diversity, and infrastructure investment.

• While the top Environmental Sustainability performers in 2019 are also Switzerland, Sweden and Denmark, counterintuitively China and Poland have significantly improved and are rapidly and tangibly decarbonizing, making the greatest change to their 2000 baseline Sustainability performance.

• The rate of improvement in overall Trilemma performance also appears to be increasing — half of the countries have consistently improved overall scores since 2015, while fewer than 20 countries consistently improved scores since 2000.

How women can power the future of the energy industry

H.E. Eng. Fatima Alfoora AlShamsi, CEO, 24th World Energy Congress Organising Committee
Photo: WORLD ENERGY CONGRESS

So far, the 24th World Energy Congress has facilitated a range of high-level ministerial discussions and top multinational business deals across the energy spectrum.

But there is another conversation taking place in Abu Dhabi National Exhibition Centre that deserves an equal amount of attention.

This week, I had the privilege to give a talk to a group of women inspiring the next energy leaders at an event hosted by the Leadership Excellence for Women Awards & Symposium (LEWAS).

It was encouraging to see the high number of women engaging with their teams and I would urge all Congress delegates to visit their stand in the exhibition space.

As an engineer myself, increasing the number of women taking jobs in the industry is something about which I am hugely passionate.

Events like the 24th World Energy Congress provide a platform for women to learn from each other, enhance their knowledge and skills, as well as networking with other women in energy from around the world.

Energy is an industry that is still seen to be very male dominated. In part, that reflects reality but in the United Arab Emirates we are different.

For many years, the UAE government has created programmes and initiatives that have helped attract more women to all fields including the energy industry.

This is part of the vision of the UAE's founding father — the late Sheikh Zayed bin Sultan Al Nahyan - who made it clear that that the progress and development of our society can only be achieved when we empower women by encouraging their participation and enabling professional growth.

The evidence shows that companies can be successful when they bring women to the forefront, diversifying their boardrooms with different skillsets, backgrounds and knowledge.

With platforms like the 24th World Energy Congress, it can help give women both the opportunity and the voice to champion the importance of women in the industry.

The special, plenary and parallel sessions are well represented by women with 21% (63 out of 305) of speakers being female while 60% (53 out of 80) of the sessions will have a female speaker.

Our youth zone at the Congress aims to inspire and encourage more young men and women to get involved with the UAE's booming energy industry.

Hearing from so many inspiring women across the industry, such as Angela Wilkinson from the World Energy Council, H.E. Mariam Hareb Al Mehairi, the UAE's Minister of State for Food Security, and H.E. Kersti Kaljulaid, the President of Estonia, (to name a few) shows the powerful role women can have in our society and in our businesses.

We are all great role models for our future energy leaders, many of whom are attending the Congress this week.

What a great legacy it would be if these young men and women go home at the end of tomorrow with the passion and drive to bring more women into the energy industry.

• *H.E. Eng. Fatima Alfoora AlShamsi, CEO, 24th World Energy Congress Organising Committee*

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ENVIRONMENT

Nations must work together in climate fight

Speakers say countries **must be allowed to develop resources** but need to join forces to meet targets

ANAMARIA DEDULEASA
Abu Dhabi

NATIONS should be allowed to embark on their unique route to decarbonisation and choose the most accessible resources but international regulatory certainty and collaboration is required if climate change targets are to be met, according to speakers at a session of the World Energy Congress.

The world is increasingly demanding clean energy but not all such energy sources are available in different parts of the globe, speakers pointed out in the panel on driving change for sustainable energy.

They argued that in the fight against climate change, countries need to work to develop available resources including gas, renewables, hydro, solar, electrification and also nuclear.

Rachel Kyte, special representative of the UN Secretary General and chief executive of Sustainable Energy for All, an international organisation working to achieve universal energy access, said: "We need energy systems that are decarbonised and the technology and know-how to do this already exists in large part.

"Science tells us we now need to go further and speed up (energy transition)... to achieve the net zero target for emissions by 2050 (set under the Paris Agreement)."

To this end, Kirill Komarov, first deputy director general for corporate development and international business of Russian nuclear player Rosatom, said that while the country is rich in oil, gas and hydro, some regions are difficult to supply with reliable energy sources without nuclear power.

"Today, in the world, the share of nuclear is around 10%; it's the second largest source of clean energy after hydropower," he said.

"If you are serious about climate change and reducing carbon emissions, we cannot avoid nuclear energy... the biggest advantage of nuclear is that it works 24/7."

As part of its efforts to supply remote regions of Russia with energy, the company has developed a floating nuclear power plant.

"This year we are finalising a floating nuclear power plant, which is now in the final stage of commissioning before becoming operational in December," Komarov said.

"It will establish 70 megawatts of capacity... which is a better solution that using diesel, both from an economic point of view and also for the climate.

"Each country should develop its own energy resources and look at the opportunities available (locally)... depending on what types of problems it wants to solve.

"A lot of people still have no stable access to electricity. That's why, when choosing an energy model, they should look at what is reliable and clean."

However, nuclear is not an immediate option in the US, where Steve Berberich, chief executive of California Independent System Operator, said the state is focused on developing renewable energy.

"In the US, even economically, nuclear power would not work because it's too expensive. The plants we had are being shut down, which is a policy statement," he said.

Berberich argued that renewables such as wind and solar, or storage, would cost less than nuclear investments.

"That's what we need to come to terms with... that renewables are rapidly falling in cost, and combinations of solar and wind, or solar and storage, are getting to the point where they are cheaper than conventional power," he said.

However, in other places renewables are less of an option but there are commitments to be met under the Paris Agreement to reduce emissions. In the case of Singapore this means learning to use less.

Wong Kim Yin, chief executive of Singapore Power said: "Singapore is a small country, which does not have access to the same solutions as others.

"Almost all the energy consumed in Singapore is fired by natural gas. But we have committed to the Paris Agreement and aim to lower our carbon intensity by 36% from 2005 levels. We are serious about meeting it... but for this, we have to think more about consumption.

"How we can consume less, how to recycle and reuse more. Using centralised cooling, potentially looking at carbon capture or renewable energy credits," Wong said.

Meanwhile, Martin Brudermuller, chairman of Germany's chemicals giant BASF argued that actions to tackle climate change can be competitive if the right regulatory framework is in place.

"Looking at the journey of transition, my biggest worry is that... there is not enough incentive to make the transition," he said.

"In Germany we have very high electricity costs, basically incentivising to use less."

Mohamed Al Hammadi, chief executive of the Emirates Nuclear Energy Corporation (ENEC), added that while each country has its unique set of circumstance... development has to be in sync and "realistic".

"Proven technology is available. And when we started in the United Arab Emirates in 2007, we looked at what was technologically available, what was commercially possible and then we developed our policy and strategy. Nuclear energy was an option then; it is now a reality," he said.

Kyte added that co-operation between nations and companies and sharing "know-how" is essential for the widespread adoption of clean energy and to lower emissions.

"We can't build a sustainable and inclusive society without taking care of the 1 billion people who do not have access to energy," she said. "The way in which (cleaner energy technology) is deployed quickly to... give countries that are far behind in terms of energy transition the opportunity to leapfrog will be absolutely fundamental... because while the journey that each country will embark on is different, the destination is the same.

"Those who are not afraid of disruption have enormous opportunity. For those energy companies who are hedging their bets - calling for a carbon price but spending most of their time lobbying against it, calling for clean energy but only investing 5% to 10% in its development or (looking at) small clean energy acquisitions, these companies will get called out; not just by the consumer but by investors," she said.

Screen time: Rachel Kyte, special representative of the UN Secretary General and chief executive of Sustainable Energy for All, at the World Energy Congress

Photo: ANAMARIA DEDULEASA

Clean energy clarity call

INVESTORS are increasingly drawn to renewable energy projects but are looking for clarity on policies from governments and developers, according to panellists at the World Energy Congress session on clean energy finance, *writes Anamaria Deduleasa*.

Steve Bolze, senior managing director at investment company Blackstone, welcomed the growth in renewables' capacity and said around $360 billion is set to be invested between now and 2030 to give the sector a further boost.

"Transition is happening; the opportunity is real," he said during the panel session.

"There is a huge appetite for renewable energy projects.

"We care about putting large amounts of capital to work over a long period of time to make transformational changes," he added.

Speaking at the same session, Mohamed Jameel Al Ramahi, chief executive of Abu Dhabi's Masdar, also welcomed the advances made in the renewable energy sector in the past decade, and called for further expansion into emerging countries which, he said, have "massive potential" for new investments, alongside enhanced efficiency and electrification.

However, Mohammad Ali Abunayyan, chairman of ACWA Power International, said that despite the growth in investments experienced by the sector, the reality is that some projects are more difficult to finance than others.

"In this part of the world (the Middle East) there is no issue in financing projects. But we cannot say the same for Africa where, without Chinese money, nothing would have happened," Abunayyan said.

Both Abunayyan and Bolze said investors look at risks associated with permits and policy changes, while also looking to balance out risks between governments and operator or developer.

Meanwhile, Ahmed Ali Attiga, chief executive of Arab Petroleum Investments Corporation, said an attractive feature for investors is a "standardised approach", which includes consistent policies to develop and implement projects as well as transparency when doing so.

Similarly, Vijay Iyer, chief operating officer of the Multilateral Investment Guarantee Agency, part of the World Bank Group, also advised developers to keep an eye on standardisation for their projects to avoid facing financing challenges, while also urging governments to speed up the permitting process.

"Governments have to recognise that it's a fast-moving industry and business opportunities, if you take three years to decide on a solar project, you have missed the bus," Iyer said during the panel session.

INDUSTRY OUTLOOK

Priority: Saudi Aramco chief executive Amin Nasser

Nasser calls for bold respon

Saudi Aramco chief executive urges oil and gas sector to drive down emissions as much as possible in drive to **global energy transition**

NISHANT UGAL
Abu Dhabi

SAUDI Aramco chief executive Amin Nasser has emphasised the need for the oil and gas industry to respond boldly to the challenge of climate change by driving down as much as possible its own emissions.

However, the head of the Saudi state oil company also argued against suggestions there will be a rapid transition away from oil and gas, saying that it will remain at the heart of the global energy mix for decades to come.

Speaking at the World Energy Congress in Abu Dhabi on Tuesday, Nasser argued that the "entire industry must come together to make oil and gas much cleaner across the full spectrum and make it their urgent priority".

"It needs (in its plans for cleaner energy) to be comprehensive. Efforts by the oil and gas industry should articulate clearly a carbon management long-term strategy," he said.

Nasser said Aramco is taking a number of steps towards reducing its own greenhouse gas emissions but added that a lot more needs to be done to achieve a cleaner energy future.

He highlighted Saudi Arabia's master gas system, which has been significantly expanded in recent years.

The system has managed to end gas flaring in the Middle East nation and thereby has eliminated 100 million tonnes of carbon dioxide equivalent in annual emissions since it was established in the 1970s, he said.

"Our upstream carbon intensity in the kingdom — from well to refinery gate — is one of the lowest in the world at about 10 kilogrammes of CO_2 equivalent per barrel of oil equivalent," he said.

Nasser added the kingdom's methane intensity last year, based on third party assessments, for greenhouse gas emissions was 0.06%, which is also among the lowest in the world.

"This is especially important given that methane gas is 80 times more harmful to global warming in the first two decades after its release compared with CO_2," he said.

Aramco is working on a range of technologies to bring in greater efficiencies and lower emissions, Nasser said.

"We aim to be the world leaders in CCUS (carbon capture, utilisa-

Photo: AFP/SCANPIX

nse to beat climate change

tion and storage); turning a waste product like CO_2 into something very valuable," he said.

Nasser added that while Aramco supports the growing contribution that alternative forms of energy are making to the help meet rising demand, he believes that a broader energy transition could take much longer than many expect.

"All energy transitions, including this one, take decades and will involve many challenges," he said.

Nasser noted the world needs a "major awareness that oil and gas is still essential and will be at the heart of global energy mix for decades to come". He said the world has seen the impact of a 'crisis of perception' on long-term investments in the oil and gas industry and, if it continues, supply shortfalls will follow.

"That would hurt the competitiveness of national economies; threaten their energy security; and, potentially, create social disruptions by making energy less affordable," he said.

Nasser too raised concerns about energy policies by governments around the world that do not consider the complexity and long-term nature of the global energy industry and the need for an orderly transition.

He argued that many governments are adopting policies favouring rapid transition that "seem to assume there are quick and easy answers to the many challenges that alternatives pose".

"The world can no longer afford policy miscalculations... [they] could lead to supply shortfalls," Nasser cautioned.

> *We aim to be the world leaders in CCUS.*
>
> Saudi Aramco chief executive Amin Nasser

Aramco's IPO due 'very soon'

SAUDI Aramco chief executive Amin Nasser has confirmed the Saudi state oil company is making itself ready for a domestic as well as an international initial public offering (IPO) but made clear that the timing of the process would be decided by the government, *writes Nishant Ugal.*

Speaking on the sidelines of the World Energy Congress in Abu Dhabi yesterday, Nasser said the IPO would happen "very soon", with the first listing likely to be local.

However, he added that Aramco is also prepared for its international offering.

"We have always said Aramco is ready whenever the shareholder makes a decision to list and as you heard from his Royal Highness Prince Abdulaziz that it is going to be very soon, so we are prepared and that's the bottom line," Nasser said.

Saudi Arabia is thought to be seeking to sell up to a 5% stake in Aramco by 2020-2021, in what could be the world's biggest IPO.

While Nasser declined to comment on how much of the Saudi Arabian state-owned oil giant would be listed on the local exchange, local media reports have suggested that 1% of the company is likely to be sold later this year through the local route.

A larger stake in the company is then likely to be offered in the international market after that initial process has taken place.

Saudi Aramco in recent days has been reported to be moving ahead with preparations for its mega-IPO and is said to be finalising the roles banks will play in the offer.

Nasser also welcomed the recent appointment of Yasser al-Rumayyan as Aramco's new chairman, saying he brings "a lot of riches" with his vast experience.

Cabinet changes in Saudi Arabia earlier this month saw the promotion of al-Rumayyan, who heads the kingdom's sovereign wealth fund PIF, to the role of new Aramco chairman.

Saudi Arabia's new Energy Minister Prince Abdulaziz bin Salman this week also confirmed his ministry would separate its role from running Saudi Aramco as the state oil giant prepares for its IPO.

New role: new Aramco chairman Yasser Al-Rumayyan

Photo: AP/SCANPIX

DECARBONISATION

Ready for talks: Panel on investments, divestments and decarbonisation Photo: GARETH CHETWYND

Investing in energy transition

World Energy Congress panel discusses factors at play for **potential investors** as **decarbonisation** increases

GARETH CHETWYND
Abu Dhabi

GAUGING carbon intensity is an increasingly important factor for lenders and investors, but the energy transition is seen as depending on providing competitive solutions to the problems faced by developing countries.

A debate on the impact of decarbonisation in driving investment and divestment decisions at the World Energy Congress on Tuesday tackled the growing influence of carbon-tracking factors in financial markets.

"Demands start from just providing transparency for investors to make their decisions but extend to the keep-it-in-the-ground movement which sees fossil fuels as inconsistent with meeting the two-degree limit for climate change," said panel moderator Carste Rolle of the Federation of German Industries (BDI).

The divestment trend is clearest in the coal sector, especially in the more regulated European Union context, but the panel discussion on "To invest or divest: New realities and responsibilities" showed how this presents more complex issues for developing countries.

"We see how the financial sector is becoming more reluctant to fund coal, but in South Africa we have seen some social push- back against renewables because mine workers unions see a threat to livelihoods," said Wendy Green, an energy advisor with Fusion Energy Holdings.

The complexity of energy transition is also very evident in India.

Gurdeep Singh, chairman and managing director of India's NHPC asked: "We have just connected 26 million homes to the grid... You have to ask how we can meet this demand. We can go for de-carbonisation on a worldwide scale, but can you justify depriving people of electricity?"

India is pursuing its own expansion of renewable energy capacity, targeting 175 gigawatts by 2022, but Sinha argued that recognising that citizens should be given the right to use electricity must be the starting point even if this means that India will require some "additional capacity" of coal-fired power too.

"The challenge for India is how to make the mix cleaner and see how we can blend or integrate renewables to reduce overall emissions," he said.

Harry Boyd-Carpenter, head of energy and sustainable infrastructure at EBRD, a London-based development bank, said investments contributing to development goals had to strike a balance between security, affordability, sustainability.

From a European perspective, new investment in coal is increasingly out of the picture due to a carbon emissions profile that is double that of natural gas.

"We are challenged on natural gas which has a big part to play for many countries, especially in the transition phase. The question is if gas is consistent with the 2-degree trajectory," Boyd-Carpenter said.

In his view, calculations on the value of such investments should take account of the concept developed by the UK's Noble prize-winning economist Lord Stern.

"Carbon emissions are described as the biggest market failure in history because the true economic costs of hydrocarbons are not incorporated in the price... If you ignore this cost, you are subsidising it, only for it to be paid elsewhere, by the poor and by later generations. This is the challenge for hydrocarbons?" Boyd-Carpenter said.

A middle view was provided by Equinor's executive vice president for strategy and new business, Al Cook.

At the table: the panel on investment, divestments and decarbonisation Photo: GARETH CHETWYND

"Norway is very high ranking for sustainability, with electric vehicles, and pension funds deciding not to invest in fossil fuels, yet the economy still has reliance on oil and gas," he noted.

Cook said Equinor wants to recognise the balancing act between meeting demands for energy and facing the "biggest threat we've had" in climate change.

He listed the company' own growing investments in renewables, such as offshore wind and solar power, but said the challenges of a country such as India should also be recognised.

"We need to keep working to find ways of providing energy more cheaply and cleaner," he said.

Michele Fiorentino, chief investment officer with Abu Dhabi National Oil Compay (Adnoc) added: "We need a sustainable road map for us to get from A to B, and finance can follow that. This is not necessarily going to be what we want but what we need."

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ENERGY TRANSITION

Africa not ready for full energy transition drive

Continent needs to **develop baseload** before fully embracing renewables, say **panel speakers**

EOIN O'CINNEIDE
Abu Dhabi

Discussions: Nigeria's Minister of State for Petroleum Resources Timipre Sylva
Photo: BARRY MORGAN

AFRICA is not yet ready to fully embrace the energy transition as countries on the resource-rich continent must first be allowed to increase their electricity baseload before renewables can have any large-scale impact, according to speakers at a World Energy Congress panel on Tuesday.

Gas can play a critical role in both driving up this baseload and cutting carbon emissions but access to capital is crucial to help build the infrastructure necessary for regional power distribution, delegates were told.

"We in Africa do not yet have the baseload," Timipre Sylva, Nigeria's newly-installed Minister of State for Petroleum Resources, said on an Africa-focused panel discussing critical enablers for the continent's energy transition.

"The world must allow Africa to develop the baseload before we begin to join seriously the discussion about renewables," Sylva said.

Abubakar Sani Sambo, former director general of the Energy Commission of Nigeria and current special advisor to President Muhammadu Buhari agreed, pointing to current levels of electricity access in Africa of around 50% as against an average of 90% across the rest of the globe.

"Africa needs to come up to about 75% or 80% before you start to talk about a transition in Africa," Sambo said.

The continent still has an estimated 650 million people without stable access to electricity.

"Of course, we cannot discount the room for renewables for small communities that do not have access to the grid," Sylva added, although discounting the impact renewables can currently make on grid systems with the current low baseload in African countries.

Gas — either pipeline gas or liquefied natural gas — is seen as a significant potential contributor to increasing that baseload, with Sylva saying: "One way we think we can create that baseload is gas.

"We are trying to build a pipeline to go across the continent — we are calling it the AKK (Ajaokuta-Kaduna-Kano) pipeline."

The AKK pipeline is being developed by state player Nigerian National Petroleum Corporation and is the first phase of the Trans-Nigeria Gas Pipeline project. The hope is for Nigeria to be able to utilise its large gas resources to feed into the grids of regional countries.

Sitting alongside Sylva, Equatorial Guinea's Mines, Industry & Energy Minister, Gabriel Mbaga Obiang Lima, pressed the case for the continued exploitation of hydrocarbons in Africa.

"Oil and gas are good for Africa... the solution for Africa is oil and gas... we have to be responsible with our resources — and use them," said Obiang Lima. He added the "entire island of Bioko" — which hosts the EG LNG plant — runs on gas, while the "majority" of its discoveries are gas fields.

However, Equatorial Guinea — and the Africa at large — needs access to finance to build the necessary infrastructure projects.

"Since day one of oil and gas, we have thought about doing something with the gas," said Obiang Lima while adding that not a single African country can currently take any of its LNG cargoes, due to a lack of infrastructure.

"We need the access to capital to build the infrastructure for African countries. We can't continue exporting the gas out of the continent," he said.

"If you do not give us funds to utilise our oil and gas, we won't have electricity... (hydrocarbons) can transform the continent."

AMER8 in push for balance

HYDROCARBON producers have a responsibility to invest more to ensure that enough resources are available for consumers, especially as energy demand in Asia increases, according to United Arab Emirates Energy Minister Suhail Mohammed al-Mazrouei, *writes Amanda Battersby.*

"But also we have responsibilities as energy ministers to ensure that there is a balanced formula between fossil and non-fossil fuels," Mazrouei told the 8th Asian Ministerial Energy Roundtable (AMER8) held alongside the 24th World Energy Congress.

"The oil producing nations are not worried about [meeting] the demand, I can tell you. The worry is the lack of investments because of the fluctuation [in oil price]," Mazrouei said.

Despite the global move towards the energy transition, Asia's reliance on fossil fuels will continue to grow, according to Sun Xiansheng, secretary general of the International Energy Forum.

"Asian oil demand in 2040 will be 40 million barrels per day compared to 31 million bpd in 2017," Sun told the Roundtable.

"More specifically, China will become the world's single largest consumer of oil in the 2030s."

Asia Pacific will also drive gas demand growth in coming decades.

However, there must be investments in new green technologies so as to reduce greenhouse gas emissions even as regional use of fossil fuels continues on the up, added Sun.

"We must open our minds and think positively since no one technology can be [the saviour] as we plan for future generations," he said.

Sun added that although governments had improved energy access over the years, more planning is necessary [to reduce energy poverty].

India's Petroleum & Natural Gas Minister Dharmendra Pradhan agreed and said: "People must have universal access to a clean, affordable, sustainable supply of energy."

Mazrouei told the assembled energy ministers from nations including Japan, Bangladesh, Thailand, Cambodia and Brunei Darussalam: "The longer you wait, the more expensive environmentally it will be.

"We share the planet. We need to be sensible consumers and we need to be sensible producers as well."

He said the UAE has come up with a policy to produce hydrocarbons in a "sensible" way with zero flaring and a drive to reduce venting.

Opec secretary general Mohammad Barkindo, International Gas Union president Joe Kang and International Energy Agency executive director Fatih Birol also attended AMER8.

TECHNOLOGY

BP looks to cloud out emissions

UK supermajor to use gas cloud imaging technology tested at Khazzan field in Oman

ANAMARIA DEDULEASA
Abu Dhabi

UK supermajor BP is introducing new measures on its oil and gas projects around the world to detect, measure and reduce methane emissions, including by using new remote technology and drones.

BP on Tuesday unveiled a plan to introduce continuous measurement on all major projects worldwide that will see the UK giant roll out instruments such as gas cloud imaging (GCI) after installing and testing the technology at its giant operated Khazzan gas field in Oman.

The data generated will help BP identify the largest opportunities to tackle methane emissions, drive efficiency and develop best practice — and is ultimately aimed at delivering and improving on BP's methane intensity target of 0.2% from its upstream operations, the company said.

Gordon Birrell, BP's chief operating officer for production, transformation and carbon, said: "For gas to play its fullest role in the energy transition, we have to keep it in the pipe. This new technology will help us do that by detecting methane emissions in real time.

"The faster and more accurately we can identify and measure leaks, the better we can respond and, informed by the data collected, work to prevent them."

In addition to the plans for continuous methane measurement, in the North Sea, BP has already tested a pilot project designed to remotely monitor emissions offshore.

The pilot combined highly advanced sensor technology with a fixed-wing remote piloted air system (RPAS), or drone.

The drone circled the Clair platform at a radius of 550 metres for 90 minutes, travelling for a total of more than 185 kilometres.

The pre-programmed unit, once airborne, managed itself autonomously.

Throughout the flight, the RPAS live-streamed data collected by the methane sensor.

Project manager, Joe Godwin, Clair field environmental lead, said: "The drone itself was tracked and remotely controlled by a team of three qualified pilots using satellite communications and radio link from the remote Island of Papa Stour — the team never had to leave their base onshore".

Morag Watson, BP's vice president of digital innovation, added: "Technologies like GCI enable us to have continuous measurement.

"Coupled with complementary intermittent tools like drones equipped with lasers and methane 'sniffing' technology we are now creating a step-change in how we operate our new major projects, so that, inspections that used to take seven days will now be able to take 30 minutes. That time saving will allow us to continue to innovate and deliver better results," Watson added.

The specialist drone will be deployed to all of BP's North Sea assets in 2020.

Programme: the BP-operated Khazzan field in Oman

Photo: BP

Three cheers off Brazil

US supermajor ExxonMobil has added a trio of offshore exploration blocks in the deep-water section of the Sergipe-Alagoas basin to its growing portfolio off Brazil.

ExxonMobil, Brazilian independent Enauta and US independent Murphy Oil acquired blocks SEAL-M-505, SEAL-M-575 and SEAL-M-637 for a combined signature bonus of 7.8 million reais ($1.9 million) in Brazil's permanent offer licensing process.

ExxonMobil has a 50% stake in the group with Enauta on 30% and Murphy on 20%.

The consortium has committed to total investments of 97 million reais but this only includes seismic and no drilling.

The same consortium already operates six offshore blocks in Sergipe-Alagoas.

The Brazilian National Petroleum Agency had offered 15 blocks in the shallow-water portion of the Campos basin but no bids were submitted.

However, in addition to the ExxonMobil award, a number of mostly local players picked up onshore blocks under the permanent offer.

Winners included local independent Eneva, which won six more blocks in the Parnaiba basin, where it operates a gas-to-wire model, and Petro-Victory, which gained 15 onshore tracts in the Potiguar basin.

Barkindo speaks out

OPEC Secretary General Mohammed Barkindo decried increasingly tough legislation on climate change, saying producers are finding it difficult to finance projects amid reluctance by banks to provide funding.

He said on the sidelines of the World Energy Congress that the future of energy supply is under threat by severe restrictions on carbon emissions and campaigns aimed at demonising the hydrocarbon industry.

"The issue at stake is emissions. It's not about replacing one source of energy with another," he said.

Barkindo added he knew of several Opec countries that are increasingly finding it difficult to access oil and gas funding which, he said, would continue to dominate the energy mix for many years to come.

He argued climate change will not be addressed by subjecting oil and gas to demonisation or coming up with scenarios and calculations that exclude these two energy sources from the energy basket in the transition.

"That is not realistic and is not driven by science or data. It would be a challenge to supply," said Barkindo.

EUROPE

Commitment: Brindex chairman Robin Allan speaks at the Offshore Europe 2019 conference in Aberdeen

Photo: OGUK/ABERMEDIA

UK independents take action on emissions

Brindex group to adopt more transparent and consistent standards to help drive to **reduce greenhouse gas emissions**

ROB WATTS
London

A group of UK-based independent oil and gas companies is to commit to adopting more transparent and consistent standards for reporting how their businesses affect the climate, in support of the UK government's ambitious target to cut greenhouse gas emissions.

The Association of British Independent Exploration Companies, known as Brindex, which includes Premier Oil, EnQuest, Serica Energy, Cairn Energy and Parkmead Group among others, has made the commitment in support of the UK government's ambitious target to cut greenhouse gas emissions.

Brindex chairman Robin Allan said the association accepted that fossil fuel consumption "impacts" the environment and that less carbon-intensive forms of energy will need to grow to meet the requirements set out in the Paris Agreement on climate change.

Brindex said its members would commit to reducing the energy consumption of their operations around the world and to cutting the carbon footprint and greenhouse gas emissions of their own operations and throughout their supply chain.

They also plan to communicate climate change performance and processes for "governance, risk management and target-setting with internal and external stakeholders in a transparent and consistent manner".

Allan said the group's members are committed to playing a "leading role" to support the UK government's decision in June to become the first G7 nation to adopt an ambitious law to reduce greenhouse gas emissions to net zero by 2050.

Brindex also noted the report earlier this year by the UK government's independent climate advisors, the Committee on Climate Change (CCC), that predicted gas demand would remain significant to 2050 and beyond.

Under the CCC's recommended pathway to net zero greenhouse gas emissions, much of this gas would be used as both as feedstock for making hydrogen and a back-up supply for generating electricity. Large-scale carbon capture, storage and usage technology would also enable the UK to achieve its net zero target.

Allan said Brindex members were "proud" that the oil and gas industry was an "essential component in delivering secure, efficient and cost-effective energy".

He argued that delivering a domestic source of affordable energy was key to "a nation's security of supply, growth of its economy, powering homes and contributing to satisfying the growth of energy demand".

Greenhouse gas emissions from the running of UK oil and gas platforms currently stand at about 14.5 million tonnes per annum, or about 3% of the UK economy's total output.

Ross Dornan, market intelligence manager with trade association Oil & Gas UK (OGUK), last week pointed out that the CCC has said the industry could afford to emit only 500,000 tonnes per annum in a so-called "net zero" world.

In terms of carbon intensity, this would mean going from 24,000 tonnes of carbon dioxide equivalent for every 1 million barrels the UK industry produces to less than 4000 tonnes of CO_2 equivalent for every 1 million barrels of production — an 85% improvement.

"Make no mistake, that is a huge challenge for industry," said Dornan last week at the Offshore Europe conference in Aberdeen.

OGUK has said that, alongside increasing societal and investor pressures, greater financial exposure to rising carbon prices has brought more focus on the importance of reducing emissions.

These issues will be factored into decisions around recovery from some fields and could mean that some resources become unattractive to develop, it said.

However, new technology — such as using renewable energy to power installations or methods of reducing flaring and venting gas — is offering lower carbon means of producing oil and gas.

The UK government and regulators also insist hydrocarbons, gas in particular, will play a crucial role in the the country's energy mix for decades.

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DP World Cargospeed systems, powered by Virgin Hyperloop One technology, will allow for synchronized, seamless and intelligent movement of cargo.

A Cargo Solution for the 21st Century

By Harj Dhaliwal, Managing Director, Middle East and India, Virgin Hyperloop One

We are seeing a dramatic shift in how goods are being delivered thanks to the rise in e-commerce and the on-demand economy. By 2020, the e-commerce market is expected to grow to $4 trillion globally and the market for express and parcel freight is set to increase to $516 billion by 2025. While consumers want their packages delivered yesterday, businesses want ever-more efficient supply chains that unlock greater capacity for growth. In order to support these shifts in consumer and business behavior, we need a system that expands freight transportation capacity and meets increasing rates of supply and demand efficiently and seamlessly.

DP World Cargospeed solves the pressing challenges the cargo industry is facing today. Born from a partnership between global trade enabler DP World and Virgin Hyperloop One in 2018, DP World Cargospeed is an international brand for hyperloop-enabled cargo systems to support the fast, sustainable, and efficient delivery of palletized cargo. Powered by Virgin Hyperloop One's revolutionary technology, DP World Cargospeed systems will deliver high-priority goods, like fresh food, medical supplies, electronics, and more at the speed of flight and closer to the cost of trucking.

Virgin Hyperloop One Pod on display at WEC 2019.

Sultan Ahmed bin Sulayem, DP World Group Chairman and CEO, and Chairman of Virgin Hyperloop One, shares his vision for the future of logistics at the DP World Cargospeed launch in April 2018.

DP World Cargospeed is about more than getting from A to B – it's about optimizing the entire end-to-end journey. It can connect to other modes like ships, planes, and autonomous vehicles. It revolutionizes supply chain-manufacturing, helping to reduce finished goods inventory by 25%, cutting required warehouse space by 25%, and shrinking inventory lead times. It is a mixed-use system that fully utilizes system capacity and maximizes economic and social benefits. In short, DP World Cargospeed will transform logistics, support economic zones, and create thriving economic megaregions.

Hyperloop can deliver high-priority goods through sustainable operations and powered by renewable energy, utilizing network capacity for both freight and passengers.

In a time of extreme climate urgency, DP Cargospeed also has major environmental benefits unimaginable elsewhere in the cargo industry. Where greenhouse gas emissions from the transport sector have more than doubled since 1970 and are expected to nearly double by 2050, DP World Cargospeed supports a transition away from fossil fuels. DP World Cargospeed can run on a 100% electric hyperloop system and can source renewable energy directly from the grid. As a result, DP World Cargospeed shifts away from a reliance on fossil fuels seen in air, train and ship freight, and instead, reduces emissions and mitigates severe corridor congestion in cities across the globe.

By combining the highly innovative technology of Virgin Hyperloop One and DP World's vision to create global commerce and trade networks of the future, we can revolutionize logistics and the supply chain, making it faster, more efficient, sustainable, and cost-effective for everyone.

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