

UNDER THE PATRONAGE OF H.H. SHEIKH KHALIFA BIN ZAYED AL NAHYAN, PRESIDENT OF THE UNITED ARAB EMIRATES

THE 24TH WORLD ENERGY CONGRESS PREVIEW

May 2019 | Edition V

WORLD ENERGY COUNCIL | **24th CONGRESS**
ABU DHABI | 9 - 12 SEPTEMBER | 2019

ENERGY FOR PROSPERITY

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SET - 100

Meet our top 100 global energy start-ups at the 24th World Energy Congress

Start Up Energy Transition (SET) is a leading international platform supporting innovation in energy transition. SET is implemented with the conviction that sustainable energy solutions and mitigating climate change are directly linked to a bridge between inventive business models and political will.



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Top 100 global energy start-ups to present their business models at the 24th World Energy Congress

One hundred finalists from the international Start Up Energy Transition (SET) Awards, for the most innovative and effective business models in the areas of energy transition and climate protection, will be participating in the 24th World Energy Congress in Abu Dhabi in September.

The SET Awards are part of the global Start Up Energy Transition (SET) initiative for pioneers in energy transition and the battle against climate change. Across the globe, more than 100 partners from politics,

industry, science and non-governmental organisations are getting involved. The annual rounds of the competition are being supported by partner countries Canada and Sweden, the German Federal Ministry for Economic Affairs and Energy, plus many other sponsors and partners.

The SET Awards are presented by the German Energy Agency (dena) in co-operation with the World Energy Council and are part of Berlin's annual Tech Festival, which has become the world's leading platform for sharing

successful innovations and new business models driving the energy transition.

"Partnering with dena, we work together to systematically identify the most promising innovation ventures around the world and work with leading innovators to understand scope, time frame and success factors of key innovation areas," says Christoph Frei, Secretary General of the World Energy Council.

"This year we are particularly excited that SET 2019 finalists will also be

invited to play an active role in the 24th World Energy Congress in Abu Dhabi. They will have the opportunity to participate in dynamic pitching sessions and interactive presentations, thus bringing a unique entrepreneurial dimension to the Council's innovation activity at the Congress".

Sponsored by DEWA, the SET 2019 finalists will be located in the Innovation Hub, dedicated to showing their products and services and the business models behind them. They will also be participating in various sessions throughout the four-day event, taking place under the theme of Energy for Prosperity, including innovation's role in

driving the energy transition.

The companies on the SET-100 list come from 31 countries, the majority from Europe, North America and Africa. They were selected by experts from the SET network drawn from various energy transition sectors. Most of the companies are active in the award categories of Low-Carbon Energy Production and Energy Efficiency; and Smart Devices and Storage. Other nominees applied in the categories of Intelligent Grids, Platforms & Cyber Security, Special Prize: Quality Access & SDG7 and Innovative Mobility. A total of 450 start-ups from 80 countries applied for

the SET Awards 2019.

More information on the Start Up Energy Transition (SET) initiative and the complete SET-100 list, including a brief description of all nominated companies, is available online at <https://www.startup-energy-transition.com>



H.E. Saeed Mohammed Al Tayer,
MD & CEO of Dubai Electricity
and Water Authority (DEWA)

"The UAE makes developing clean energy a priority in its strategies. It also supports innovation as a forward-looking approach to develop sustainable solutions to the challenges facing the world. Our leadership realises that young people are the driving force towards building a brighter future, and the cornerstone for sustainable development. Dubai Electricity and Water Authority's sponsorship of the SET Award zone at World Energy Congress 2019 supports its strategy to help entrepreneurs in clean and renewable energy; with an integrated system to help shape the future of global energy," said HE Saeed Mohammed Al Tayer, MD & CEO of DEWA.

"DEWA places innovation at the top of its priorities as part of its vision to become a globally leading sustainable innovative corporation. We are working to support creative minds who develop effective solutions to achieve the sustainable development goals and support global efforts to mitigate climate change and global warming. We are doing this by increasing our share of renewable clean energy, increasing energy efficiency, and reducing carbon emissions. This will result in positive global changes that originate from the UAE, the land of peace, happiness, positivity, tolerance, benevolence, and generosity; which has become an incubator for creativity and a destination for innovators from around the world," added Al Tayer.

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Dialogue with Lord Browne

Lord Browne of Madingley, Executive Chairman, L1 Energy and Co-Chairman of Wintershall DEA - one of our distinguished speakers - shares his views on BP's 'Beyond Petroleum' campaign, the role of IOCs and more

1. Was Beyond Petroleum too early, too bold, and too fast for the industry 20 years ago?

'Beyond Petroleum' certainly did not feel fast at the time; it was the product of almost a decade of thinking, listening and consultation both within BP and with stakeholders and experts outside the company. It was a reflection of the journey the company had been on, and the path we planned to take. When BP became the first IOC to acknowledge the threat posed by climate change in 1997, we were accused by our competitors of having 'left the church'. Within a decade, however, there was widespread acceptance across the industry that man-made climate change was happening, and that we had to be part of the solution. So in that respect, I wish Beyond Petroleum had come sooner, and that we had been even bolder in our efforts to go beyond hydrocarbons. However, much of the infrastructure, policy, public opinion and investor appetite needed to go really 'beyond petroleum' was not yet in place. Things are different now.



2. Is the role of an IOC to deliver shareholder value, or to drive positive change?

The role of any business is to deliver value, both to its shareholders and to the societies in which it operates. If it only does one of these, it will not last for long. When you look at history, business has always been an engine of human progress. It is the only institution capable of delivering solutions to society's biggest challenges, such as climate change. That is why I have always rejected 'shareholder value theory' as incomplete. After all, people do not come to work every day simply to make other people richer. They want to improve the future of humanity.

contributed to the perception that it was dangerous, although nuclear power remains the safest form of energy. These concerns about safety have helped to make nuclear power the only source of energy which has become more expensive over time. There is great excitement about small modular reactors, which have great potential. Nuclear fusion, on the other hand, seems many, many decades away.

3. What are the technologies that have failed to deliver on their promise in the last two decades?

The biggest disappointment has undoubtedly been nuclear energy. When I was growing up, we all thought that nuclear power would be the magic bullet that would provide safe, secure and sustainable energy. But it never took off in a big way. A small number of high-profile major accidents

4. Are policy makers doing enough to help businesses deliver better energy?

Public policy has done remarkable things for the development and deployment of new energy technologies. The cost of solar generation capacity, for example, has fallen by more than 99 per cent over the past forty years. That is the result of private sector innovation, supported by a policy environment which has encouraged deployment. Solar has now reached a tipping point, where the cost of its electricity rivals that produced from coal or gas, even without subsidy. This means that the role of public policy clearly has to evolve. For more than twenty years, I have argued that a global carbon tax, applied universally and equitably, is the most important thing we could do to tackle the problem of climate change. I continue to make that case.

Lord Browne of Madingley, Executive Chairman, L1 Energy and Co-Chairman, Wintershall DEA



Lord Browne's new book 'Make, Think, Imagine: Engineering the Future of Civilisation' is released on 30 May and is available to order now.

A few from our 250 speaker line-up

H.E. KHALID AL-FALIH Minister of Energy, Industry & Mineral Resources, Government of Saudi Arabia	MOHAMMAD BARKINDO Director General, Organization of the Petroleum Exporting Countries (OPEC)	PATRICK POUYANNE CEO, Total	DANIEL YERGIN Vice Chairman, IHS Markit	GUENTER BUTSCHEK CEO & Managing Director, Tata Motors Group
MARTIN BRUDERMÜLLER CEO, BASF	FATIH BIROL Executive Director, International Energy Agency (IEA)	ALEXEY LIKHACHEV Director General, Rosatom	PETER COLEMAN CEO and Managing Director, Woodside	ISABELLE KOCHER CEO, Engie

*To view full list of speakers, please visit the website

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Side Events



The Pipe
A submission to the 2016 Land Art Generator Initiative design competition for Santa Monica
Team
Abdolaziz Khalili, Puya Kalili, Laleh Javaheri, Iman Khalili, Kathy Kiany (Khalili Engineers)

LAND ART GENERATOR INITIATIVE



FUTURE ENERGY LEADERS PROGRAMME



WORLD ENERGY LEADERS' SUMMIT



IEF 8TH ASIAN MINISTERIAL ENERGY ROUNDTABLE

Mubadala's Petroleum & Petrochemicals CEO, Musabbeh Al Kaabi optimistic about the strategic influence World Energy Council will play on global energy landscape



1. What role does Mubadala play in the 24th World Energy Congress?

As a global investor, we are honoured to be among the primary hosts who will welcome heads of state, 70 ministers, 500 CEOs and 4,000 delegates to Abu Dhabi. Alongside the other major energy players here in the Emirates, we look forward to familiarising them with the capabilities and expertise that exist within our organization and the asset portfolio we manage that contribute to the leading position that the UAE and Abu Dhabi hold in the global energy sector.

The 24th Congress, will provide a gathering point for current and future energy leaders, and experts in a variety of sectors, alongside a showcase for cutting-edge technologies and opportunities in the future. This is great exposure from an investment perspective and will foster a space for collaboration and enthusiasm to create lasting change.

Our ambition is to ensure that the activity within the Congress will carry on well beyond the closing session to create a prosperous energy future for all.

2. What are the most important strategic areas in Mubadala's portfolio at present? What does Mubadala want to highlight at the Congress?

At the Congress, we want to highlight Mubadala's role as a responsible global investor and our portfolio of companies operating across the energy sector, which together aim to bring safe, secure and reliable energy supplies to markets around the world.

We believe that all forms of energy, including fossil fuels and renewables, produced efficiently and responsibly, will be required to meet future energy demand. Key to that are both the activities of our wholly-owned clean energy champion, Masdar, and our portfolio of petroleum-focused businesses.

Through these businesses, Mubadala is investing in:

Highly competitive and innovative renewable energy solutions; reliable and resilient sources of low-cost oil production; increasing the proportion of gas in our portfolio by developing significant new gas fields such as those in Egypt and Malaysia; building further our position in infrastructure vital to deliver energy supplies to market efficiently and safely; and developing refining and petrochemical facilities required to meet growing demand for fuels and ever more complex lightweight materials key to new technology driven products.

3. What impact do you believe the 24th World Energy Congress will have on the energy sector particularly in the UAE?

Under the Patronage of His Highness Sheikh Khalifa bin Zayed Al Nahyan, the 24th World Energy Congress will attract a broad range of senior players representing the full spectrum of the energy and related industries. It will be the first time the Congress has been held in the Middle East in its 95-year history.

Mubadala is at the heart of Abu Dhabi's global investment strategy, active not just in the energy sector but in many other areas including, very importantly, technology. We look forward to participating in dialogue on the key developments that are impacting the energy landscape, from advances in our traditionally inventive and resourceful oil and gas businesses, to more broadly applicable innovation and disruption coming from digitalization, AI and automation. The focus on innovation and knowledge has never been greater in the region and hosting the Congress will place Abu Dhabi firmly at the center of the global energy debate.

4. What contribution will the Congress have in meeting global energy challenges?

Today, the world is facing significant challenges as we try to balance the issues of energy security, universal access to affordable energy supplies and the environmental impacts of energy

production and use. The 24th World Energy Congress will take place at a time when we look for new ways to innovate and manage this 'energy trilemma' and all the challenges but also the opportunities the world faces.

In line with the UAE's drive for innovation, the Congress will bring the latest trends and disruptive technologies, look at innovative ways of thinking and financing, business models and policies that can deliver real change and 'Energy for Prosperity' – the theme of the 2019 edition – for nations, businesses and individuals.

5. How is Mubadala looking to diversify its energy portfolio through its global investment strategy?

Mubadala manages a diverse global energy portfolio with interests spanning the petroleum value chain, from exploration and production, through refining and petrochemicals. Through the technology and operations experience of its asset companies, Mubadala is working alongside ADNOC to develop Abu Dhabi's downstream capabilities and position the Emirate as the leading hub serving the Middle East and the growing markets of Asia.

Mubadala is also increasing the proportion of natural gas in its portfolio, reflecting the healthy growth expected in the sector, especially in The Middle East and Asia as a key contributor to cleaner of power generation.

Our company also has a distinguished track record of developing, commercialising and deploying renewable energy solutions and advanced technologies. The company, through Masdar, is behind some of the leading clean energy projects in the region and globally, including the region's largest concentrated solar power plant, the 100 MW Shams 1 in Abu Dhabi and projects like the 630 MW London Array wind power development.

As the leading global investment company, we are excited to welcome the 24th World Energy Congress to Abu Dhabi, our home city, which will become

the epicenter of the energy debate in September.

6. Which energy markets do Mubadala hope to network with at the Congress?

Mubadala is a global investor with interests stretching from the Americas, though Europe and the Middle East, to South East Asia and the Far East. Over the past decade we have been evolving and partnering with best-in class businesses to deliver strong financial returns for Abu Dhabi and build the Emirates' capabilities and experience across the energy spectrum.

The Congress will provide a unique opportunity to connect with high-level decision makers, regulators, investors, innovators and thought-leaders across all the markets and sectors in which we are active.

7. What is the strategic importance of a global event like the World Energy Congress coming to Abu Dhabi?

Held every three years, the World Energy Congress is the world's largest, longest-running and most influential energy gathering. It is the only place where the entire global energy ecosystem will come together – not just one energy source, not just one part of the world, and not just one audience.

Today, building on the expertise developed in our country over the past decades and our positioning as an energy hub, we are delivering some of the world's most ambitious, forward-looking and innovative energy projects in line with the UAE Energy Strategy 2050. Hosting the 24th Congress will cement the UAE and Abu Dhabi positions as a global force in international energy policy.

Musabbeh Al Kaabi
CEO, Petroleum and Petrochemicals
Mubadala Investment Company



MUBADALA

Renewables, Community Engagement and Social Licence to Prosperity

Falck Renewables on the four Ds shaping the fast-paced energy transition we are experiencing in our times



There are many “D”s shaping the fast-paced energy transition we are experiencing in our times.

“D” for Decarbonization, where the penetration of renewable energy technologies and energy efficiency solutions help minimize the environmental impact of the energy industry, globally and locally. And by doing so they progressively phase out more traditional fossil fuel-based infrastructures.

“D” for Decentralization, where the transition leads to a scattered spatial presence of energy assets, changing the conventional distance between where the energy is generated and where it is used.

“D” for Digital, the true enabling factor of the entire energy transition, allowing for the combined management of a large heterogeneity of system components, such as technologies, producers & consumers - sometimes blended together into “prosumers”- networks, markets, and so on.

“D” for Demography, that along with another “D” - Development - indicates where & how much energy – and energy services – are needed, or where energy markets are located, both today and prospectively.

other factors fall into places, and this is Democracy. No political implication, just the observation that around our planet, wind and (especially) sun - fast-growing renewable energy sources - are more evenly distributed, and therefore more available, than fossil fuels. Their exploitation, while rebalancing the energy trilemma under a new perspective, widens the number of places that can host energy assets, essentially fostering the production and use of green electricity. This fact poses at the same time an opportunity and a challenge.

The former comes from the fact that the renewable energy business value chain is more connected to the local area, creating new chances for socioeconomic development. Rental is paid to landowners, fees/taxes (in many cases) to local authorities, (part of) the procurement is locally sourced, so is (part of) the needed workforce, along with plant construction and operation. The latter occurs because some local stakeholders, either for ideological reasons or more practical ones, perceive the presence of renewable energy infrastructure as something that reduces the value of the area and limits its usual use.

With this in mind - and with the belief that it is not only about what you do, but also about how you do it and the values you live by & share - at Falck Renewables we have started to look at the local area as a partner with which we share the value generated through our activities. We acknowledge that most of our wealth comes from the land and the natural resources where our assets are located, therefore we are keen to open our business up to local participation.

In fact, we have pioneered a community engagement model, a.k.a. the community cooperative scheme, where locals can be rewarded for collectively investing into our wind farms all along the productive life of the energy asset. In such a way, we manage to transfer part of the profits we make to those individuals living around our plants. We are also offering community ownership schemes, where the local community can purchase a wind turbine - that we operate - and collect the profits from the sale of the electricity generated. Moreover, we place great importance in establishing a preferential relationship with collective customers, such as those belonging to the community energy space.

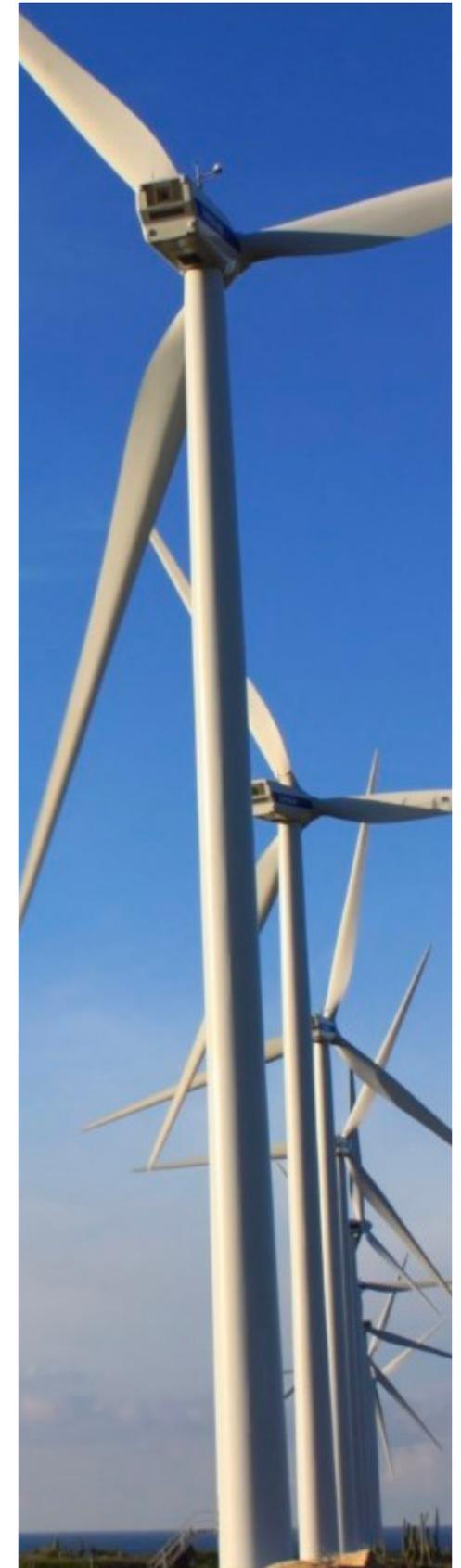
These initiatives are usually combined with a voluntary program of community benefit schemes, to play our part in enabling the implementation of diverse local projects with social relevancy that would not necessarily be given priority in public budgets. Last but not least, we pay great attention to environmental protection in all our actions, encouraging our network of suppliers to do the same. To us, bundling all the above into an action program is a modern, smart way of successfully engaging local communities in the creation of shared value.

In such a way, the traditional perception of the community paradox - democratized access but with the heavy industry/infrastructure in someone else’s backyard - is being overcome by a new approach to achieving a social license to operate. But from Europe to Asia, and throughout the Americas, many other case studies are emerging of renewable installations not just providing clean energy but generating additional value to back up community projects and the sustainable development of the local area, enhancing livelihoods, partnerships and - most importantly -pride.

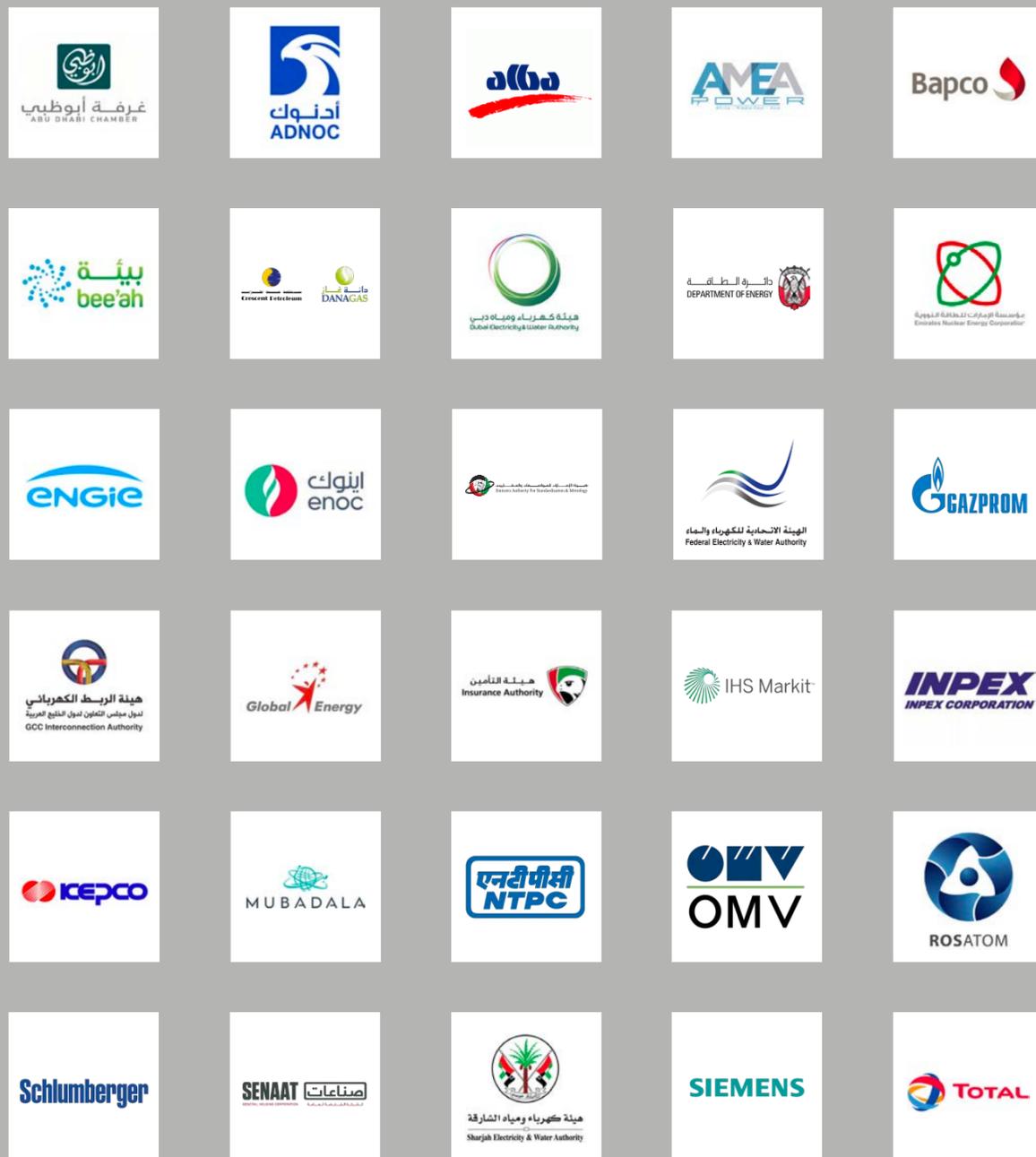
What are, at the end of the day, the ingredients for success, the consequences of failure, and the 360 benefits of smart community participation in project planning and in the sustainable energy business? We want to discuss this broad topic during the upcoming World Energy Congress, identifying what will come next in local engagement solutions.

We will gather the voices of different stakeholders, among them local communities, industry, public administration, international organizations, academia, and the financial sector from all around the world, to build new paths to prosperity through sustainable energy.

Alessandro Costa,
Head of Sustainability - Falck Renewables
World Energy Council Studies Committee member



Some of our exhibitors at the 24th World Energy Congress



Meet the key players of the global energy industry

Held every three years, the World Energy Congress is the world's largest, longest-running and most influential energy gathering. Unique in its coverage of the entire energy spectrum from oil and gas to renewables and nuclear as well as power, the Congress provides a forum for the industry's largest and most diverse conversation.

The Congress will bring together world leaders, CEOs, entrepreneurs and experts in the industry with policy makers, citizens and NGOs to pioneer new ways of thinking and crystalize action around energy to deliver an equitable and sustainable future



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