

Energy.

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**TOP
10**

Women
in energy

SCHNEIDER ELECTRIC: HOW SUSTAINABLE SMART ENERGY IS POWERING THE WORLD

An **EXCLUSIVE** interview
with **Rohan Kelkar**, EVP
of Global Power Products



IBM

How RPA
is boosting
energy
efficiency

**Mitsubishi
Electric**

The important
role of heat pumps
for a sustainable future

FEATURING:

Amp X

TotalEnergies

Apple

SUSTAINABILITY LIVE

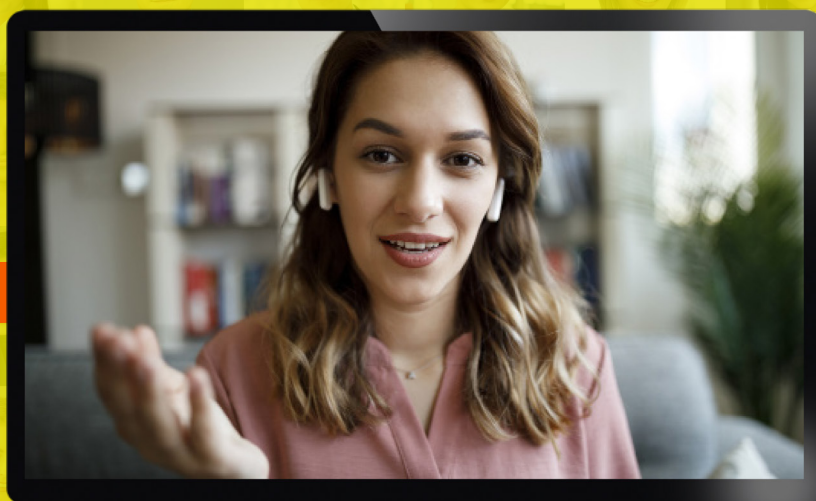
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19TH APRIL 2023

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Are you looking to be ahead of the curve on all sustainability topics? To become a part of the conversation, cement existing relationships, and make meaningful new business connections?

On April 19th 2023, Sustainability LIVE New York is bringing together the greatest voices in the industry to further the discussion about what should, can, and must be done for a sustainable future. Brought to you by BizClik, and in association with Sustainability Magazine, this exclusive one-day virtual event, which includes renowned keynote speakers, engaging fireside chats, and panel discussions are a crucial deep dive into challenges facing the future of sustainability, net zero, and ESG.

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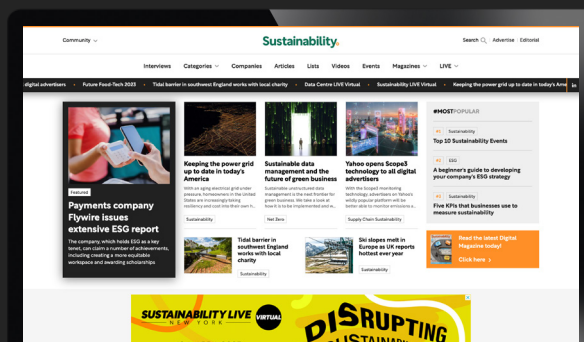
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in



Celebrating diversity and inclusion within the energy sector

We often hear, with the backing of substantial evidence, that the energy industry is falling behind in diversity and inclusion: women make up just 22% of the labour force, while only a shocking 1 in 10 professionals in the profession are non-white.

Changing this reality and, alternatively, fostering a culture of inclusivity is the responsibility of every individual within the energy sector. Environmental, Social, and Governance (ESG) metrics – which were previously considered supplementary measures – are now rapidly transforming into mandatory policies and, consequently, are an essential prerequisite for any energy organisation seeking investment.

In April's issue, we hear from a range of trailblazing women within the sector, namely IBM, LG Energy Solution, and Apple, all of which continue to break barriers, going above and beyond to spearhead innovation within their respective roles.

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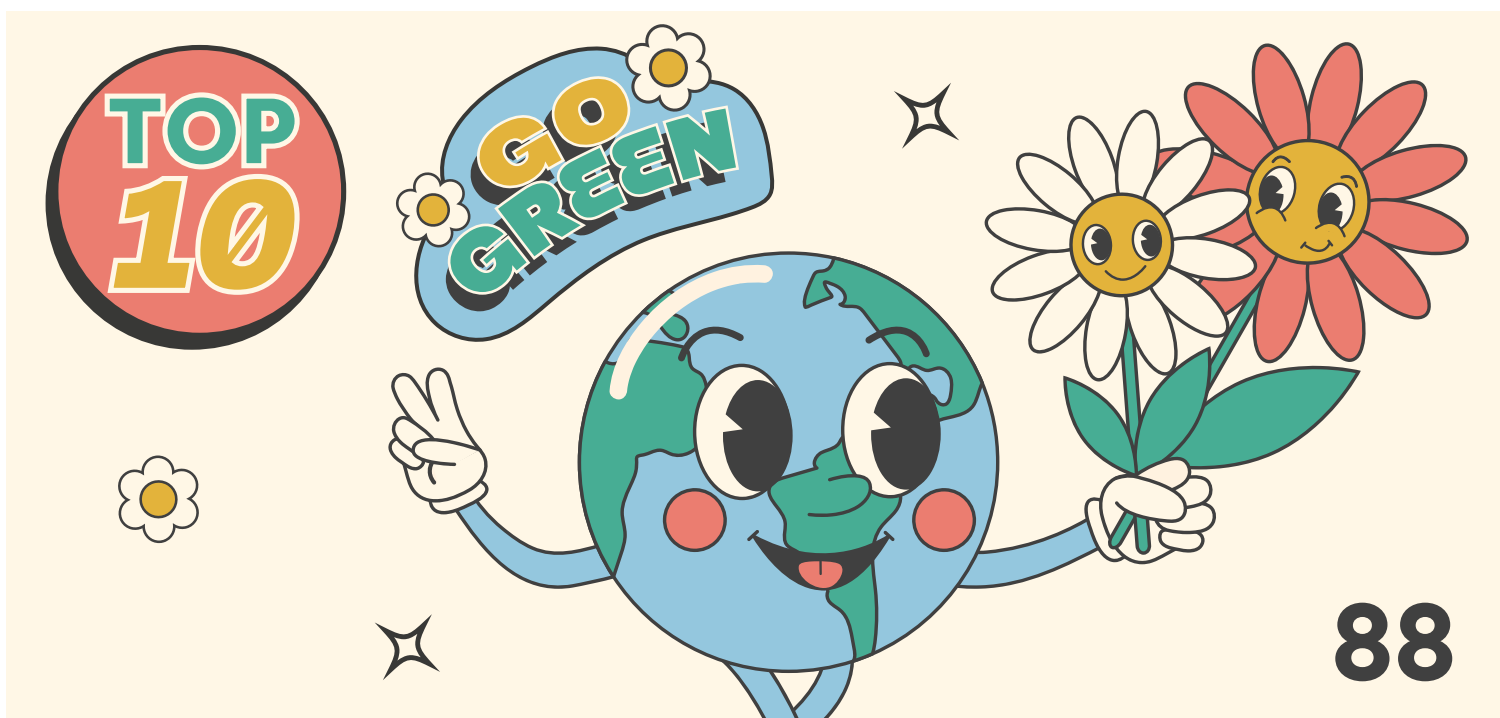
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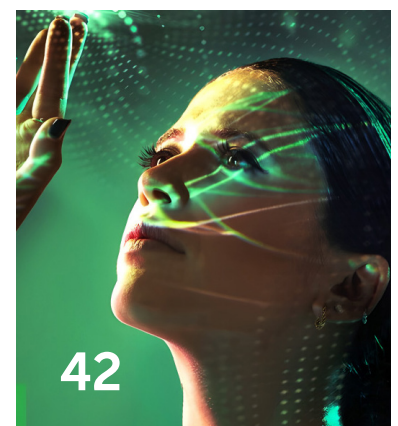
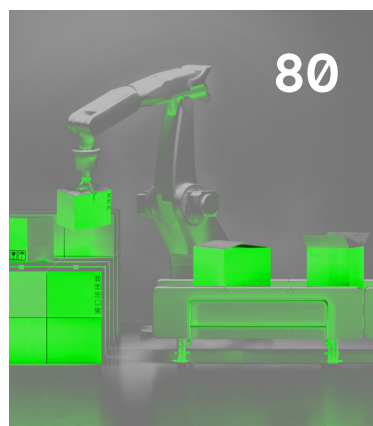
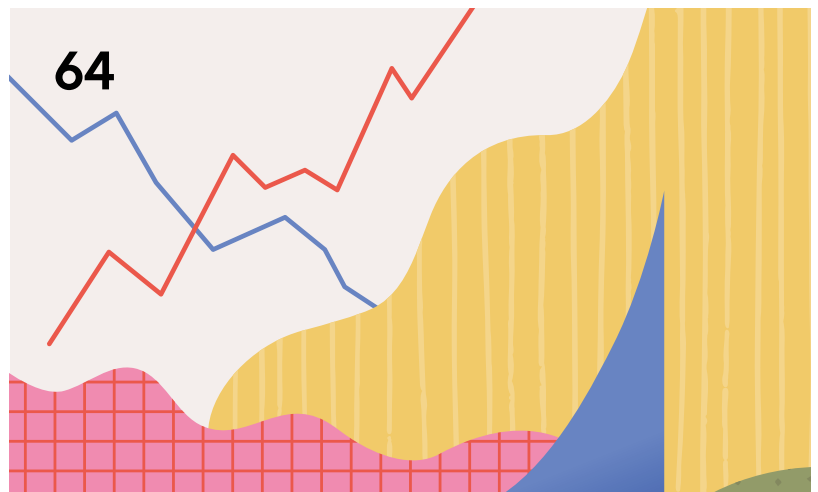
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Women in the energy sector



Sustainability.



THE **TOP 100 WOMEN** IN **SUSTAINABILITY**

OUT NOW

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Amp X is future-proofing
for the energy transition

BIG PICTURE



Image credit:
McDonald's Corporate



McDonald's adds another renewable energy source

📍 Louisiana, USA

McDonald's Corp has entered into a power purchase agreement (PPA) with Lightsource bp to facilitate the development of a solar park with a capacity of 145MW AC/180MW DC in Louisiana. It is expected to provide about 630 restaurants' worth of renewable electricity annually. Construction will begin this year, with operation expected in late 2024. 🌞

THE BRIEF

“Continually optimising business processes by discovering and eliminating operational deviations can be used to help reduce the carbon footprint and resources consumed”

EBRU BINBOGA

Director of Data,
AI and Automation,

IBM



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“As we move away from fossil fuel boilers to reach net zero, looking for more sustainable forms of heating and hot water for our homes, heat pumps provide a renewable source of energy”

RUSSELL DEAN

Residential Product
Group Director,
Mitsubishi Electric



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“The implementation of Electricity 4.0 will lead to a significant transformation in how we manage, consume, conserve, and distribute energy”

ROHAN KELKAR

EVP of Global
Power Products,
Schneider Electric



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BY THE NUMBERS

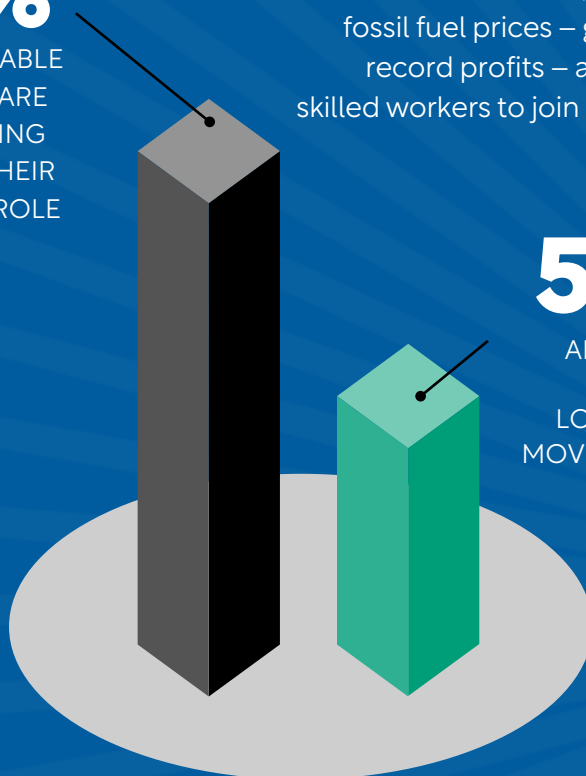
87%

OF RENEWABLE
WORKERS ARE
CONSIDERING
LEAVING THEIR
CURRENT ROLE

The **renewable energy industry** is having a hard time retaining talented individuals, as surging fossil fuel prices – generating record profits – are causing skilled workers to join oil and gas

51%

ADMIT THAT
THEY ARE
LOOKING TO
MOVE INTO OIL
AND GAS



Nuclear energy could be a key component in solving the climate crisis

Nuclear power generates no emissions during its operation, and, throughout its entire lifecycle, it emits a comparable amount of carbon-dioxide-equivalent emissions per unit of electricity as hydroelectric power.

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Hydrogen market to surge in 2023

GlobalData reports that hydrogen production is expected to hit 4.5mtpa by the end of 2023, translating to a 165% growth increase from 2022

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Renewable energy to become top source of electricity by 2025

A report from the International Energy Agency has found that renewable energy sources are expected to fulfil most of the growth in worldwide electricity demand, thereby decreasing the probability of a substantial increase in carbon emissions within the power industry.

According to the report, the most rapid rate of expansion is projected to originate from emerging and developing nations in Asia, with China, India, and Southeast Asia anticipated to account for over 70% of the surge in worldwide electricity demand.

Executive Director of IEA, Fatih Birol, says: “Renewables and nuclear power are growing quickly enough to meet almost all of this additional appetite, suggesting we are close to a tipping point for power sector emissions. Governments now need to enable low-emissions sources to grow even faster and drive down emissions so that the world can ensure secure electricity supplies while reaching climate goals.”

↑ GREEN SUBSIDIES

Wind turbine manufacturers are anticipating a reversal of fortunes in 2024 due to increased investment in response to US legislation and faster permitting processes from European policymakers.

↑ SOLAR POWER EXPANSION

The International Energy Agency predicts that solar photovoltaic capacity will surpass that of hydropower next year, gas-fired generation in three years, and coal in four years to become the leading power source.

↓ SUV EMISSIONS UP

A strong increase in sales of electric models, increasing by 60%, was not enough to prevent carbon dioxide (CO₂) emissions from SUVs worldwide reaching almost 1bn tonnes in 2022.

↓ EUROPE ENERGY CRISIS

The expenses of European nations safeguarding households and businesses from escalating energy prices have risen to nearly €800bn – equivalent to around US\$850bn.

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TIMELINE

POWERING UP

A history of the state's **booming energy sector**. From oil to wind and solar energy, the Lone Star State is the undisputed leader of US energy production.

1901

Spindletop Hill oil geyser

On January 10, 1901, an oil geyser erupted from a drilling site on Spindletop Hill in Jefferson County, southeastern Texas. The geyser reached 150 feet and produced nearly 100,000 barrels a day, surpassing any previous oil discovery in power. This event led to a thriving oil industry in the area.

1970s

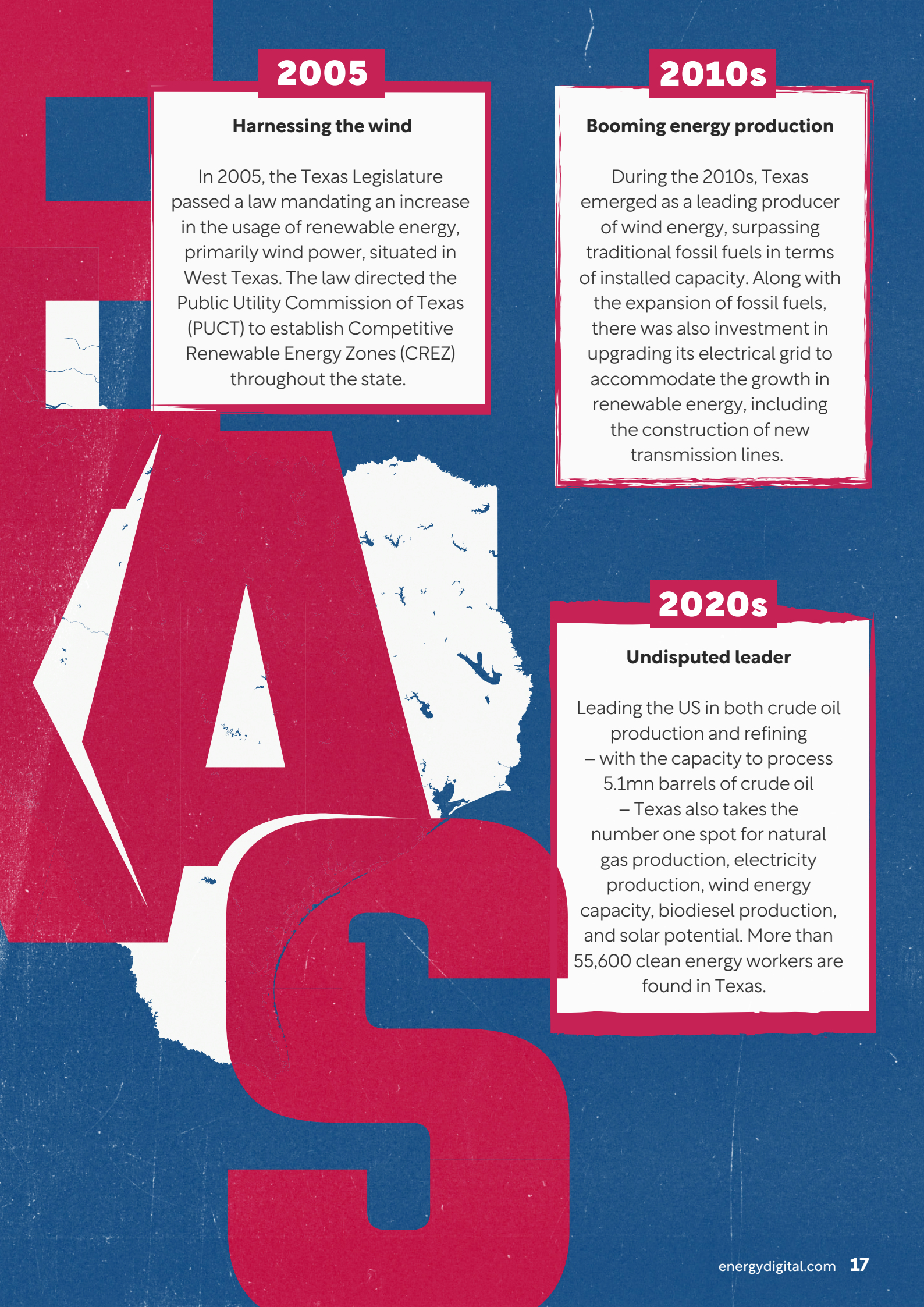
Energy crisis

The energy crisis, rooted in substantial petroleum shortages as well as elevated prices, led to the Texas energy advisory council, which commissioned studies on different energy sources. In 1974, a study was conducted on wind power, then, in 1977, another was conducted on a range of options such as solar, wind, biomass, and algae.

1980s-1990s

Deregulation

The Texas energy market was deregulated during this period. In 1999, Texas established its Renewable Portfolio Standard (RPS) as part of the restructuring of the state's electricity market. The original objective was to install 400 megawatts (MW) of new renewable energy by 2003 and to continuously increase capacity every two years, reaching 2,000MW by 2009.



2005

Harnessing the wind

In 2005, the Texas Legislature passed a law mandating an increase in the usage of renewable energy, primarily wind power, situated in West Texas. The law directed the Public Utility Commission of Texas (PUCT) to establish Competitive Renewable Energy Zones (CREZ) throughout the state.

2010s

Booming energy production

During the 2010s, Texas emerged as a leading producer of wind energy, surpassing traditional fossil fuels in terms of installed capacity. Along with the expansion of fossil fuels, there was also investment in upgrading its electrical grid to accommodate the growth in renewable energy, including the construction of new transmission lines.

2020s

Undisputed leader

Leading the US in both crude oil production and refining
– with the capacity to process 5.1mn barrels of crude oil
– Texas also takes the number one spot for natural gas production, electricity production, wind energy capacity, biodiesel production, and solar potential. More than 55,600 clean energy workers are found in Texas.

BLAZING A SUSTAINABLE TECH TRAIL AT APPLE

As VP of Environment, Policy & Social Initiatives at Apple and Head of the company's Racial Equality and Justice initiative, Lisa Jackson is tackling systematic inequalities

LISA JACKSON

TITLE: VP, ENVIRONMENT,
POLICY AND SOCIAL INITIATIVES
COMPANY: APPLE

The importance of Apple in today's world cannot be overstated. The company is the undisputed leader of innovative tech – with 1.65 billion active users, Apple has reached near-mystical status.

One of the company's recent innovations are implementing a rigorous environmental policy, as well as hiring a field expert to enact real change.

Enter, Lisa Jackson. Having previously made history as the first-ever Black Environmental Protection Agency administrator during the Obama administration, Lisa Jackson is now VP of Environment, Policy & Social Initiatives at Apple, and Head of the company's Racial Equality and Justice initiative at Apple, where she is already making significant reforms.

Lisa Jackson helped Apple achieve **100%** renewable electricity

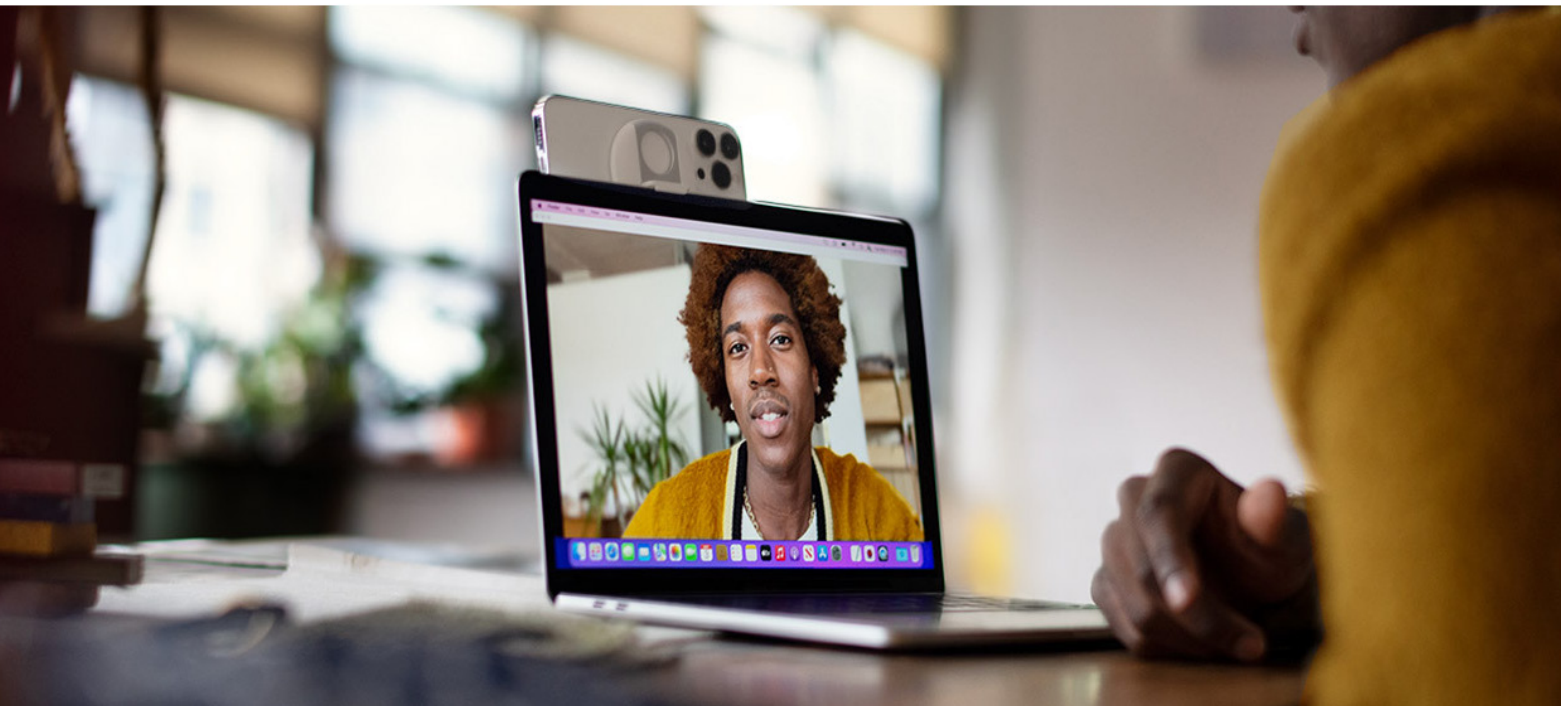
Recycle, recycle, recycle

Reporting directly to CEO Tim Cook, since Jackson took a leading role in 2018, Apple's global operations have run on 100% renewable energy. In 2020, Apple committed to ensuring its supply chain and products are 100% carbon-neutral by 2030.

"Apple thrives on innovation and not just trying to solve challenges, but to solve them in a delightful and cool way," says Jackson. "If we can do that with something like climate change, then we've turned an issue that can feel depressing into an opportunity."

Jackson has enacted some real change – under her leadership, Apple has declared that 100% of its rare earth metals are reused and





40% of computer retina displays are made with recycled materials, implementing a diligent recycling programme at the corporation.

“They said it was impossible, and I was like, ‘Being better is always possible!’,” she states. “I believe you should be able to have the latest, newest device. But it should not be made with new materials. To me, that’s where the hard work is.”

The push for clean energy

One of the advantages of being the undisputed market leader means that where Apple leads, others follow suit. 70 of Apple’s suppliers have adopted

clean energy, which Apple has fully implemented in its offices, data centres and stores without leaning on offsets.

“The company’s supply chain partners of all sizes are ripe for doing something differently. Because we’ve always said that climate change is an economic opportunity, how can we make sure that opportunity is spread equally?” Jackson states.

“Every one of our suppliers has to be on clean energy, and then all the energy that people use when they charge their products has to be clean. We also have to be really smart about where the materials we use in

Apple committed \$100mn to a Racial Equity and Justice Initiative (REJI)



products come from; whenever you use recycled material instead of something that has to be mined from the ground, you save a tonne of potential pollution and climate emissions. Last year, nearly 20% of the material we shipped in our products were recycled – I'm really, really proud of that,"

In addition to a more circular system at the manufacturing level, Jackson has also guided a more seamless trade-in programme at the retail level, with direct recycling silos to reduce energy waste.

Empowering communities

More often than not, systematic issues are intertwined, and Jackson wants to

identify these intersections through her role as Head of Apple's Racial Equality and Justice initiative.

Jackson's dedication to addressing issues of racial equality and justice was further reinforced recently upon observing the severe impact of poor air quality and high COVID-19 death rates in historically marginalised communities on the front lines.

"It all comes together because we know that the co-pollutants of CO2 from fossil fuel – and from the fossil fuel-burning power sector and transportation sectors – are all part of that justice equation," she said.

As part of its Racial Equity and Justice Initiative (REJI) focused on representation, inclusion, and accountability, Jackson intends to use Apple's influence and resources to empower marginalised communities by increasing the hiring of coders of colour and fostering wealth in underrepresented areas through partnerships with suppliers owned by people of colour.

Jackson has been instrumental in Apple's \$100mn contribution to its Racial Equity and Justice Initiative to support organisations working towards these causes.

"One of the things we did in the economic empowerment space is come up with this idea of an impact accelerator," she said. "How can we grow some Black and brown-owned businesses that are working on the issue of climate change? Because we've always said that climate change is an economic opportunity, how can we make sure that opportunity is spread equally?" ●

DENISE GRAY

Energy Digital Magazine spends five minutes with LG Energy Solution's Head of External Affairs and Government Relations, North America, Denise Gray

An aptitude for maths and engineering coupled with unrivalled ambition meant that, from a young age, Denise Gray was always destined to be an industry leader.

A pioneer within the energy industry, known by insiders as the 'Battery Czar', Gray is now heading the External Affairs & Government Relations for LG Energy Solution – one of the world's largest makers and suppliers of automotive batteries for electric vehicles (EVs).

Q. TELL US ABOUT YOURSELF AND YOUR ROLE WITHIN LG ENERGY SOLUTION (LGES)

» "I began my engineering career over four decades ago as a Kettering University co-op engineering student, sponsored by GM's Tech Center. It was a perfect match because I grew up in Detroit, where most people I knew worked for or dreamed of working in the automotive industry.

While at GM, I was amazingly blessed to support the company by designing and developing advanced technology such as:

infotainment systems; automatic braking systems; engine/transmission controls for better fuel economy and reduced pollutants; and battery systems for a range of electric vehicles (EVs).

The battery system work led me to LG Energy Solution, where I have had a relationship for more than 17 years, including working directly for nearly eight years.

I was CEO/President of the LGES North American Research & Development Center, responsible for cultivating business relationships and demonstrating EV battery technology readiness by designing production battery systems for companies such as Volvo, Stellantis, and Ford.

In 2022, I transitioned to Head of the External Affairs and Government Relations Department for North America. My role is to ensure LG Energy Solution's activities in the US/North America meet government and industry R&D and manufacturing objectives.

EXECUTIVE BIO

DENISE GRAY



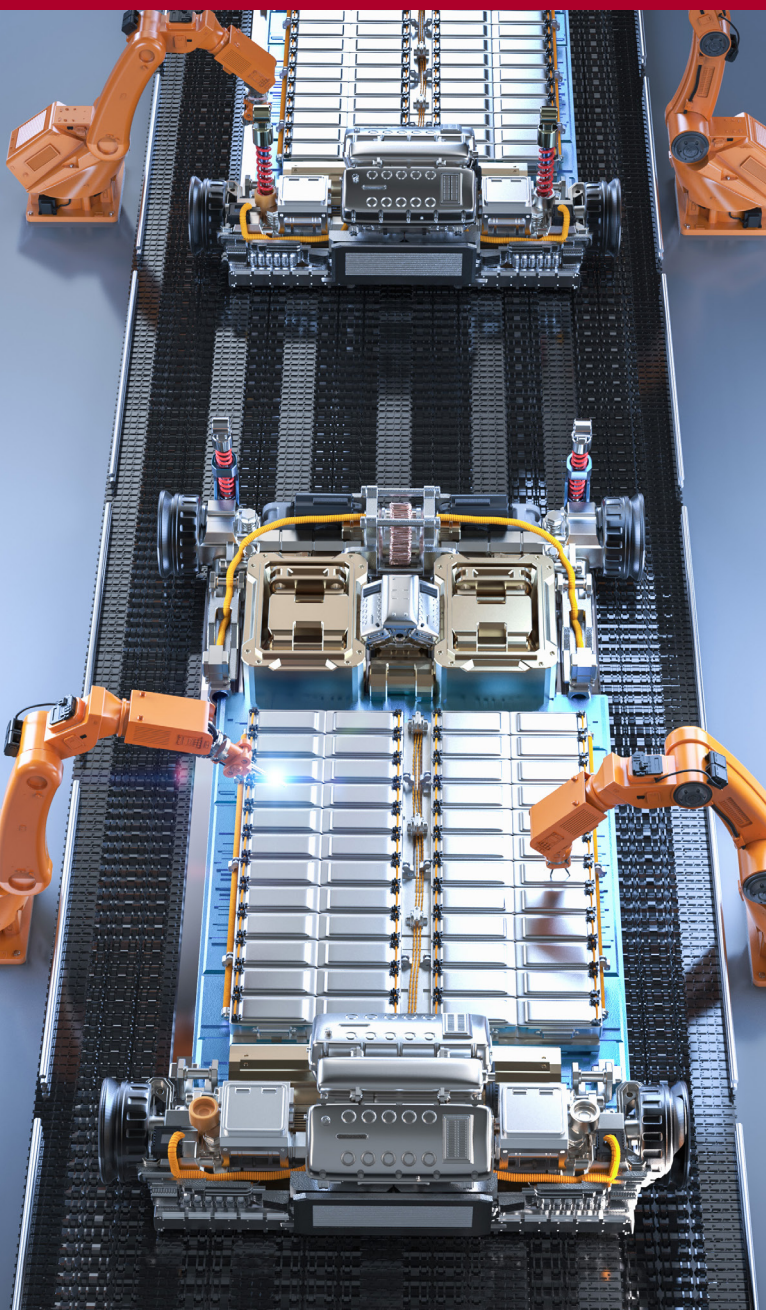
**TITLE: HEAD OF EXTERNAL AFFAIRS
AND GOVERNMENT RELATIONS,
NORTH AMERICA**

LOCATION: MICHIGAN, USA

» Denise Gray is the Head of External Affairs and Government Relations, North America, of LG Energy Solution, a lithium-ion battery producer headquartered in South Korea. She has also served as President and Board of Director Member for the Tech Center of the company's U.S.-based subsidiary, LG Energy Solution Michigan, Inc. In that role, her team developed battery solutions for automotive and non-automotive applications.



**THROUGH 2025,
LG ENERGY SOLUTION
HAS PLANS TO INVEST
MORE THAN \$4.5BN IN
ADDITIONAL EV BATTERY
MANUFACTURING
CAPACITY**



Q. WHAT ARE SOME RECENT MAJOR DEVELOPMENTS AT LG ENERGY SOLUTION THAT YOU ARE MOST PROUD OF?

» I am most proud of LG Energy Solution's 30-year commitment to research, development, and production of battery technology. It's not easy to continue to invest in an industry where the return on investment is uncertain.

In the last few years, LG Energy Solution has announced billions of dollars of investment in the US market – alone and in collaboration with General Motors, Stellantis, and Honda. This investment supports the US/North American objective of localised battery manufacturing.

Q. HOW FAR AWAY DO YOU THINK WE ARE FROM ADOPTING EVS ON A LARGE SCALE?

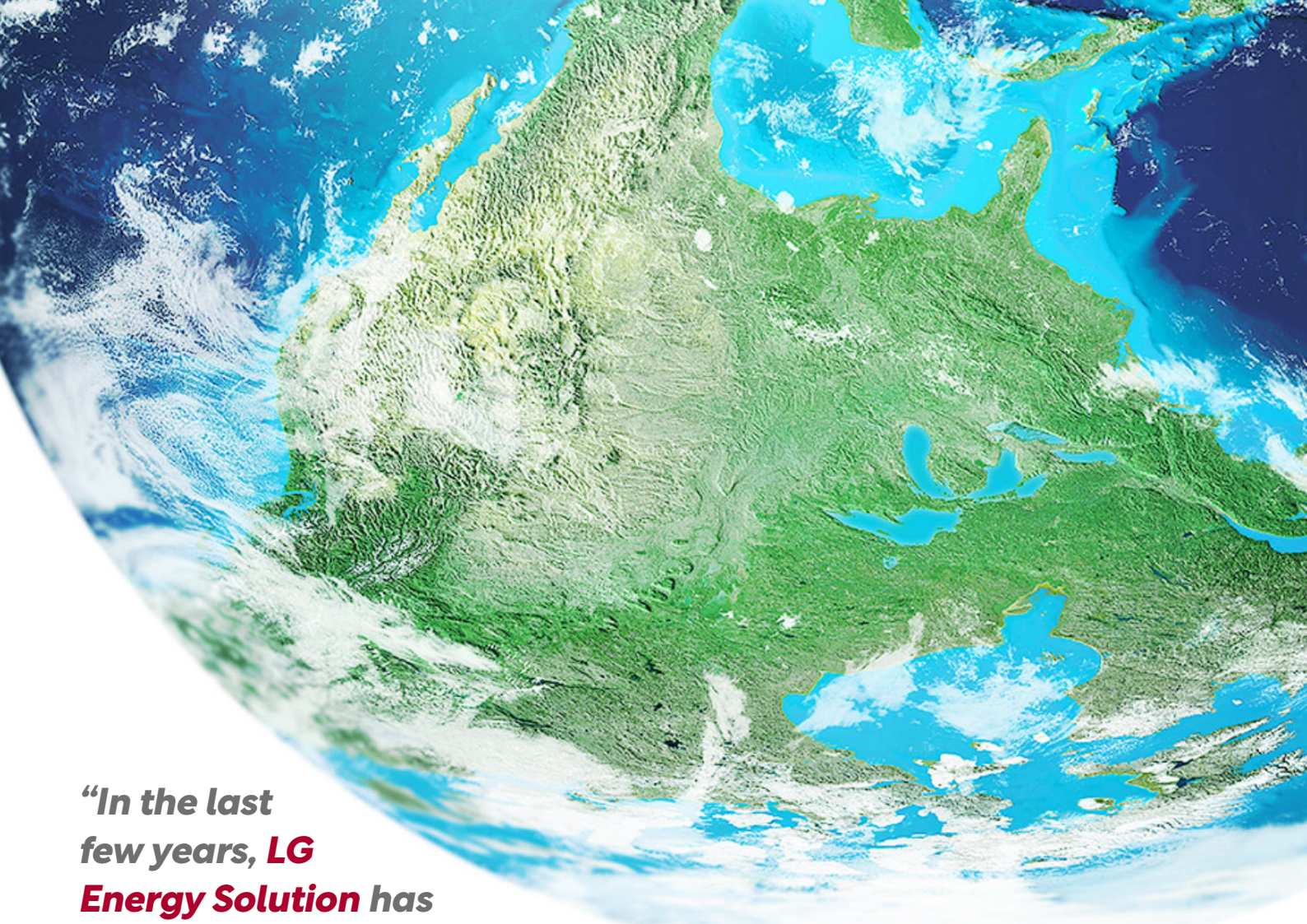
» For passenger vehicles, the transition started more than 10 years ago with a small number of EVs on the road. Those vehicles demonstrated the possibilities and the required challenges ahead to reach large-scale adoption.

Today, EV passenger cars are very close to large-scale adoption due to the reduced costs of batteries, increased customer and company/shareholder acceptance, and renewed US government support.

Q. HOW CAN MORE WOMEN BE ENCOURAGED TO ENTER THE ENERGY SECTOR?

» The energy sector is filled with the need for innovative and courageous women. There are not enough great minds to support the technological advances that are before us.

Encouragement can start at the most rudimentary level (at home and school) and the earliest ages (elementary school age).



“In the last few years, **LG Energy Solution** has announced billions of dollars of investment in the US market – alone and in collaboration with General Motors, Stellantis, and Honda”

Women must be made aware of the need for them to contribute to the global challenges in the energy sector. Women must be granted the opportunity to experience these careers in an exploratory way. Women must be shown the accomplishments of other women for them to think, ‘if they can do it, so can I’.

Lastly, with so many additional outlets to reach people today, I think social media should play a more effective role. Not just for highlighting careers in movies, music, or sports, but also highlighting the need for women and amplifying the call to action in medicine, finance, education, and the energy sector.

Q. WHAT HAS BEEN YOUR BIGGEST PERSONAL STRUGGLE AND HOW DID YOU OVERCOME THIS?

» Family is extremely important to me. I had been fortunate to have my family living in close proximity to me all of my life. So, when opportunities in a different state (California) and country (Austria) were presented, the decision to leave my family was my biggest personal struggle. With quality time to reflect on my faith and family, my decision became clearer – GO. I finally discovered that the right opportunities are afforded to those deserving them. You define your success. Having meaningful contributions and gaining growth experiences have always been my definition of success. If I were to continue to successfully grow, I had to ‘GO’. It was a very good decision. ●

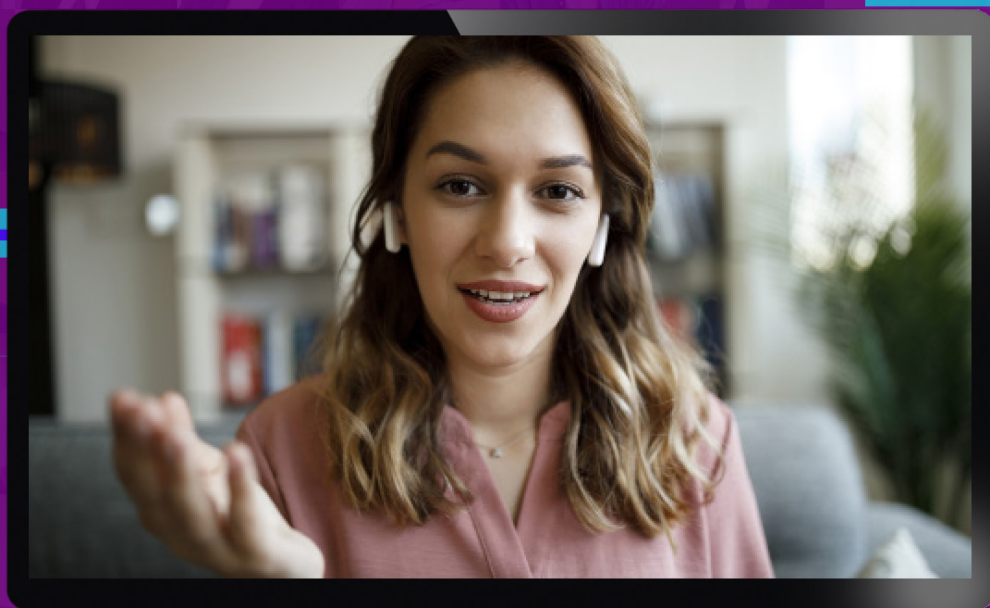
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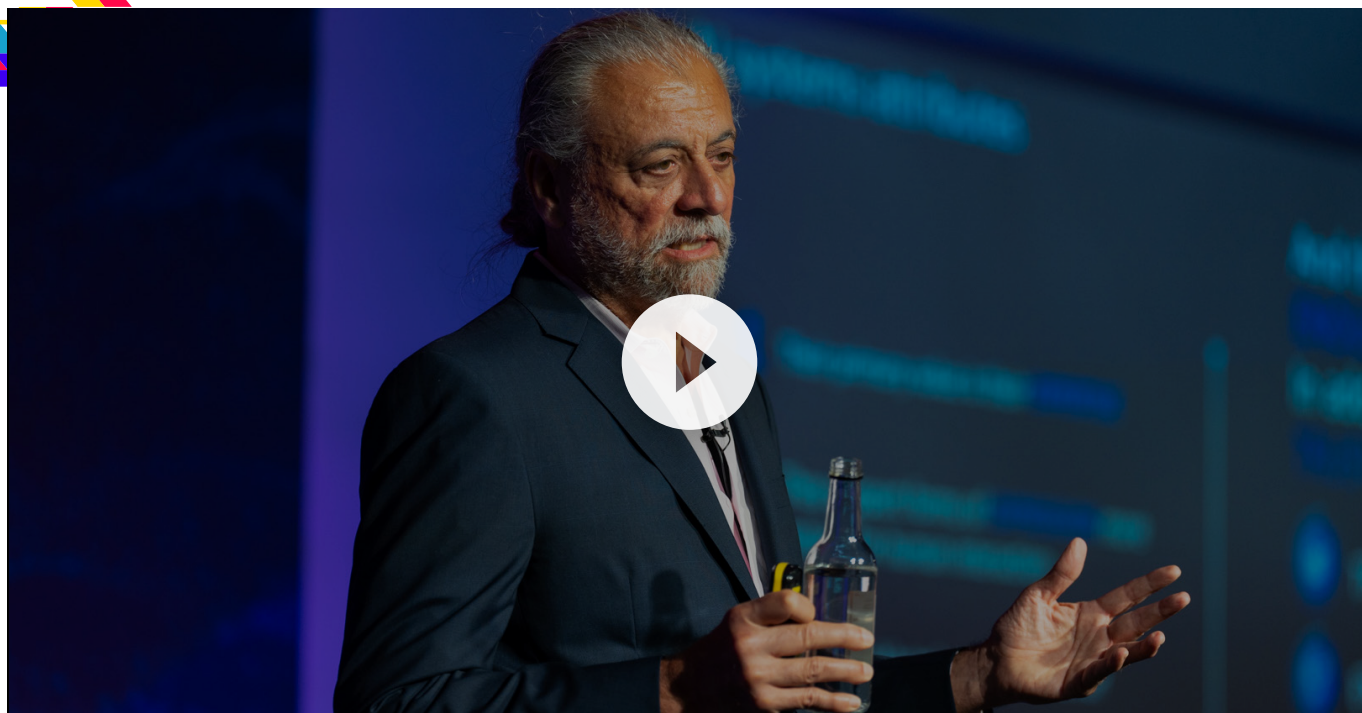
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TotalEnergies on bitumen supply & sustainable solutions

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TotalEnergies' Bitumen division **Garr Chau**, Supply Chain Manager, & **Rick Ashton**, Market Development Manager, on the road to sustainable solutions

TotalEnergies is a multi-national energy company, founded in 1924 in France. Previously known as Total, in 2021 the Company rebranded as TotalEnergies – in line with its transformation into a broad energy company and a world-class player in the energy transition, including through its own carbon neutrality commitments. TotalEnergies has activities in more than 130 countries worldwide.

TotalEnergies is one of Europe's largest producers of bitumen and its affiliate, TotalEnergies Marketing UK, has been a market leader in UK bitumen supply for decades, including through the supply of pioneering bitumen products manufactured in its Preston production site. Bitumen is the black viscous substance used to construct roads.

Garr Chau is the Supply Chain Manager for TotalEnergies Marketing UK, a role he landed through a graduate scheme.

"My role involves overseeing a team of planners and the supply of bitumen and additives to our supply locations, imported via ship, rail and road, in addition to road deliveries of bitumen products to our customers from those supply locations."

TotalEnergies is transforming into a broad energy company and has committed to the Paris Agreement and the United Nations Sustainable Development Goals.



TotalEnergies' on bitumen supply & sustainable solutions

WATCH NOW

“The impacts of climate change are irrefutable”

GARR CHAU
HEAD OF SUPPLY CHAIN,
TOTALENERGIES MARKETING UK LTD.

“We have an ambition and that is to help with the world's energy transition, to reinvent the production and use of energy and to reach Net Zero by 2050 together with society,” says Chau.

TotalEnergies has set objectives to reduce its emissions.

The first step is to reduce Scope 1 and 2 CO₂ emissions from TotalEnergies' worldwide operations.

“We've set ourselves measurable short, medium, and long-term goals - so, by the year 2030, we've committed to reducing Scope 1 and 2 emissions at our own facilities by over 40% versus 2015 levels,” explains Chau.

In addition to decarbonisation, the company seeks to achieve this through improving efficiency across all operations, as well as achieving zero routine flaring at refineries, cutting methane emissions leaks in its gas operations and also by investing significantly in carbon capture and storage capacity as well as natural carbon sinks.

TotalEnergies has also set a 2030 target to reduce its global Scope 3 emissions - i.e. those from the energy products used by its customers - to below 2015 levels.

“The way we can influence this is to work with society - our customers, suppliers, partners and public authorities. We have

to transform the way that we all use energy so that we can be sustainable.”

“We are changing our energy mix as a company, hence why we are transforming from being an oil & gas company into an integrated and broad energy company. We are reducing the carbon intensity of petroleum products sold by more than 30%, whilst we also plan to produce and sell 30% more energy products, especially through growth in electricity and liquefied natural gas (LNG). LNG, in particular, is a very important fuel in the transition, as the lowest carbon fossil fuel,” says Chau.

The UK has recently witnessed extreme weather events, first with the heatwaves and then with resulting scenes of flash flooding - examples of how our climate is changing.

“The impacts of climate change are irrefutable,” says Chau.

“The general public expects governments and large companies, like TotalEnergies, to act on this. In Europe, around 80% of greenhouse gas emissions come from energy production and consumption, so energy producers have a vital role to play.”



1955

Year founded

250+

Number of employees

EXECUTIVE BIO

DR. GARR CHAU



TITLE: **HEAD OF SUPPLY CHAIN**

INDUSTRY: **OIL & ENERGY**

LOCATION: **PRESTON, UK**

Garr Chau is currently the Head of the Bitumen Supply Chain for TotalEnergies Marketing UK Ltd, where he's responsible for: primary supply via ship and rail import; stock management and quality control of the 3 terminal locations; and ensuring the safe and cost efficient distribution of finished products to TotalEnergies' bitumen, PMB and emulsion customers.

During his 17-year career at TotalEnergies, Garr has (amongst other roles) served as: a Chemical Engineer at the Lindsey Oil Refinery, responsible for energy optimisation of the combined heat and power (CHP) unit, steam methane reformer (SMR) unit, fired heaters and boilers; Operations Manager of the long distance pipeline and aviation assets; JV Director of the HOSL terminal operation; HSEQ Manager responsible for safety and mitigating the environmental impact of the bitumen business.

Garr earned both a PhD and MEng in Process Engineering from University College London (UCL).





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RICK ASHTON



TITLE: **MARKET DEVELOPMENT
MANAGER**

INDUSTRY: **OIL & ENERGY**

LOCATION: **PRESTON, UK**

I started in the sector in 1989 in an aggregates and asphalt testing laboratory with Hanson covering quarrying and asphalt operations. I studied construction materials technology with Bath College, then quarrying and asphalt technology with Doncaster College. I joined Aggregate Industries as a Technical Manager, managing on-site asphalt testing, laboratories, and various R&D projects before joining TotalEnergies as Market Development Manager in 2011. My role involves marketing communications, technical liaison, market development and representing TotalEnergies at international conferences and seminars. I'm a member of the Chartered Institute of Highways and Transportation, Institute of Quarrying, and a Branch Chairman of the Institute of Asphalt Technology. Also, the Asphalt Industry Alliance PR Committee liaising with 'The All-Party Parliamentary Group for Better Roads' and have assisted BSI working groups in the writing and publication of the current UK Asphalt standards.



Sustainable solutions for customers

According to Rick Ashton, Market Development Manager at TotalEnergies Marketing UK, offering customers a range of sustainable solutions is essential in modern manufacturing.

One such solution is the increased adoption of low temperature bitumen that can be used in warm mix asphalt.

"The focus at the moment is lowering the temperature of asphalt," Ashton explains.

"Conventional asphalt is mixed at around 180°C and that takes a lot of energy. If we can lower the manufacturing temperature by chemically



modifying the liquid bitumen, we can reduce the energy demands by up to 30%.”

Representing TotalEnergies, Ashton is also working alongside industry bodies towards net-zero carbon goals and contributing to CO2 reduction in the UK.

“The All-Party Parliamentary Group for Better Roads put together a report for all the local authorities in the country on how to support this.

“The report claims if all asphalt production in Great Britain for 2017 had been switched to warm mix asphalt, it would have saved at least 61,000 tonnes of CO2 – the equivalent of cutting almost 300 million miles of car journeys. *(Citation: Working for better roads Warm Mix Asphalt: reducing carbon emissions and improving efficiencies)*

“When you mix the materials 30 °C lower, it means products are cooler to install. This allows faster roadworks as the asphalt can cool to a point where it won’t be too soft to traffic causing deformation. You use less energy to heat the product, because a big part of the energy used in asphalt production

“The focus at the moment is lowering the temperature of asphalt”

RICK ASHTON
MARKET DEVELOPMENT MANAGER,
TOTALENERGIES MARKETING UK LTD.



TotalEnergies has committed to reducing its Scope 1 and 2 emissions by over

40%

TotalEnergies is reducing the carbon intensity of petroleum products sold by more than

30%

Around

80%

of greenhouse gas emissions come from energy production and consumption



is to get the product to a workable state. Our low temperature ECO2 bitumen, for example, allows the same workability at 140°C - or 40°C cooler.”

Ashton says that this will support road workers, too. “It’s a safer environment for them because they’re not walking or driving through steam when there’s live traffic going past just on the other side of the traffic cones.”

The TotalEnergies team conducted trials to measure the typical cooling times of asphalt. For a traditional hot mixture, a layer can typically be 100mm thick and it will take

two hours in normal ambient temperatures before traffic can run on the asphalt. Lowering the temperature by 40°C can halve this cooling time.

“Our customers may only have a five-hour slot where they can get in there and actually do the roadworks on a local urban road,” explains Ashton. “If they can add an hour’s surfacing into that slot or get the road open an hour quicker, it’s a 20% efficiency benefit.”

“We have an ambition and that is to help with the world's energy transition, to reinvent the production and use of energy”

GARR CHAU
HEAD OF SUPPLY CHAIN,
TOTAL ENERGIES MARKETING UK LTD.

National Highways, who manage the motorway and trunk road networks, also estimate that an increase in shift outputs of 20% could be provided by using this technology on its network, saving up to £70mn a year. (*Citation – Report, The All-Party Parliamentary Group on Highways: Working for better roads Warm Mix Asphalt: reducing carbon emissions and improving efficiencies.*)

“Society needs to focus on ways to reduce energy consumption and it’s the case with prolonged road works and wasted energy if using conventional hot mix asphalt. We know our low temperature energy saving ECO2 products stop this waste.”

Asphalt is the most recycled material globally and, like its hot mix equivalents, TotalEnergies ECO2 is also 100% recyclable back into asphalts in the future, giving further embodied CO2 reduction benefits, helping to prevent waste and conserving natural resources as less aggregate needs to be quarried.

Styrelf® is one of TotalEnergies’ premium products. The name comes from adding a cross-linked polymer into bitumen, called styrene.

“It’s historically been used in high profile sites like at the Monaco Grand Prix

Circuit and the Mersey Gateway Bridge. We perform a huge amount of research and development, both here in the UK and in Europe, and the last 30 years have seen continuous improvement for these products,” explains Ashton.

A new grade in development, Styrelf® Long Life, aims to delay the onset of roadworks. Historically, highways engineers have to predict how long a road will last before potholes begin to form and a road needs to be repaired.

“It’s oxidation that makes the surface more brittle, and eventually it cracks. As it cracks, water gets into the cracks, they get bigger – then you’ve got a pothole, which somebody needs to repair. To do that, you’re going to have to cause disruption.”

TotalEnergies is working with local authorities and those responsible for maintaining roads on this matter. To get things moving, Ashton is involved in a number of industry bodies such as being a branch Chairman of The Institute of Asphalt Technology (IAT).





“If we can lower the manufacturing temperature by chemically modifying the liquid bitumen, we can reduce the energy demands by up to 30%”

RICK ASHTON
MARKET DEVELOPMENT MANAGER,
TOTALENERGIES MARKETING UK LTD.

Then there's a group called the Asphalt Industry Alliance (AIA) whose purpose is to promote the benefits of asphalt. This is a joint venture between the Minerals Product Association and Eurobitume UK, the two principal bodies that represent the suppliers of the raw materials used to produce asphalt, as well as asphalt producers and laying contractors. This then feeds into central government via the All-Party Parliamentary Group for Better Roads.

Supply Chain Partnerships in an Evolving World

TotalEnergies has a partnership with transportation and supply chain company Hoyer Gas & Petrol Logistics Limited, which provides services to the company in the form of planning, safe loading, road transport and delivery of bitumen products to its UK customers.

"TotalEnergies was Hoyer's first client for bitumen transportation in the UK," says Chau.

"I'm proud to say that a lot of expertise, experience and procedures have been developed in collaboration between TotalEnergies and Hoyer."

Chau states that Hoyer understands the vital ingredients for a successful partnership.

"It's strong and good quality communication that can only come through trust and mutual respect. That communication needs to be strong on all levels of management and day-to-day operations. If that communication breaks down on any one level, then things can quickly go awry".

The next 12 months will continue to be interesting for the supply of bitumen into the UK.

In the wake of the Russian invasion of Ukraine, the government announced that the UK would sanction crudes and petroleum



products of Russian origin from the end of this year.

"What that means for the bitumen world is quite significant because Russia has been important for bitumen in Europe. So this presents some challenges for the industry and supply chains need to evolve and adapt."

TotalEnergies is moving with the times and transforming its bitumen supply chain across the UK. In the future, it is expected that more bitumen will need to be imported into the UK, potentially from further afield.

"We're extending our partnership with Navigator Terminals, a very large independent bulk liquids storage provider. We are expanding through a new position in Teesside in addition to an existing facility we have with them in London, for importation of bitumen by sea."

The combined storage of the positions will give TotalEnergies significantly more storage capacity.

In a testament to TotalEnergies' long-term commitment to its bitumen customers, these assets will ensure TotalEnergies' bitumen supply into the UK is truly national and resilient. ○



SCHNEIDER ELECTRIC: HOW SUSTAINABLE SMART ENERGY IS POWERING THE WO

Electricity coupled with digital transformation will be the focal point of the energy transition, says **Schneider Electric's EVP of Global Power Products, Rohan Kelkar**

WRITTEN BY: MARIAM AHMAD

When the same mysterious force energises someone's touch, a stroke of lightning, and buildings across the world, a curious duality ensues: despite being a ubiquitous part of our lives, we simultaneously manage to take electricity for granted and marvel at its might.

In the Stated Policies Scenario, global electricity demand is projected to grow at 2.1% per year until 2040 – twice the rate of primary energy demand. This raises electricity's share in total final energy consumption from 19% in 2018 to 24% in 2040. The next question arises, then, is how will conversations surrounding sustainability and net-zero affect the rapid growth of electricity usage?

According to energy industry leader Schneider Electric, electricity will be the focal point of the energy transition. The company believes that the key to achieving ambitious net-zero targets is by prioritising Electricity 4.0, which involves the integration of digital technologies and electricity on a huge scale.

This rapidly growing digital economy will demand 50% more power by 2030; combining digital and electric resources will provide a solution. The implementation of Electricity 4.0 will lead to a significant transformation in how we manage, consume, conserve, and distribute energy. The convergence of digital and electric power enables enhanced control, visibility, connectivity, and intelligence, resulting in greater efficiency and reduced waste.

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We sat down with the EVP of Global Power Products at Schneider Electric, Rohan Kelkar, to discuss just how the company is planning to grow within the renewable energy space during the crucial global energy transition phase

Driving innovative solutions as EVP of Global Power Product

As the EVP of Global Power Products at Schneider Electric since 2021, I am responsible for spearheading innovation to deliver sustainable and future-ready low-voltage electrical products and solutions in commercial, industrial, and electro-intensive applications that will help us achieve net-zero targets.

At Schneider, we believe in the power of the partner ecosystem to deliver end-user



Rohan Kelkar

TITLE: EVP OF GLOBAL POWER PRODUCTS

COMPANY: SCHNEIDER ELECTRIC

LOCATION: UNITED STATES

» Rohan Kelkar has been the Senior Vice President of Power Products, North America, at Schneider Electric since 2019, bringing with him over 22 years of experience in top multinational corporations. His expertise covers various areas such as Global Operations, Services, R&D, Product development, and Business management.



value. Though we have the technology and solutions to help decarbonise our economies, our partners have a critical role to play, and, through our Partnering for Sustainability programme, I am also focused on empowering our ecosystem of partners with resources and tools to accelerate towards a sustainable future.

Schneider's investments within the renewable energy space

A climate-neutral world is only possible if everyone plays their part. Only 25% of Fortune 500 companies have made public commitments to achieving net zero.

“We must ensure that energy is used efficiently with the help of digital and electric solutions – or Electricity 4.0”

ROHAN KELKAR
EVP OF GLOBAL POWER PRODUCT,
SCHNEIDER ELECTRIC



Leading by example is a big part of our culture and we're already making massive strides in the renewable and clean energy space with initiatives in place at various Schneider Electric locations. For example, we have solar panels at sites in Vadodara (India), Bangpoo (Thailand), geothermal energy and the solar rooftop at The Hive (France), and solar panels and wind turbines at our new office park IntenCity (France). These initiatives are supported by our technical solutions, EcoStruxure Power and EcoStruxure Grid, both of which help to reduce energy consumption.

We're also focused on off-site, long-term procurement through Power Purchase Agreements (PPAs). Long-term PPAs are a way to lock in energy prices for up to 20 years, mitigating some of the price volatility we're seeing. This approach will help us secure additional financing required for renewable electricity projects and acquire renewables respectively.

How a localised approach is key to reaching net-zero goals

The energy crisis proved that there is a finite amount of energy for purchase, with IEA estimating electricity generation

Sustainability Efficiency

Electricity 4.0: Powering the Fab of the Future | Schneider Electric

PHILIPPE DELORME

EVP Energy Management

will increase by 2,450TWh from 2022-2025, increasing the urgency attributed to switching to green energy sources.

Yet, it is these very energy sources that complicate our power consumption. It presents grid congestion issues like the ones we're witnessing in The Netherlands or US states like California and Texas, stressing the need to deploy an intelligent, local energy system that is not dependent on the central grid. Smart decentralised bi-directional grids stabilize the energy systems while supporting the move to a more decentralised model where power is generated closer to point of use.

There is also value in a local proposition for solutions. For companies that are balanced globally, it is possible to pick one geography where the manufacturing was centralised. However, COVID-19 and the subsequent turbulence have shifted us to shorter supply chains. It has highlighted the importance of supply chain resiliency and we're in the

“Only 25% of Fortune 500 companies have made public commitments to achieving net zero”

ROHAN KELKAR

EVP OF GLOBALPOWER PRODUCT,
SCHNEIDER ELECTRIC

process of creating these localised solutions approach, particularly in countries in Singapore that is impacted by rising sea levels and at greater risk of supply chain issues.

How saving 'US\$18-33bn' (annual costs of severe weather in the US alone) can be saved through localisation

One of the biggest issues facing our generation is climate change. In 2022, 10 extreme weather events caused more than approximately \$3bn worth of damages each. Though we are seeing real progress towards protecting the planet take shape at scale, we must ensure that energy is used efficiently with the help of digital and electric solutions – or Electricity 4.0 – to remain on target to be net-zero by 2050.

As extreme weather events increase in frequency and severity, the resilience of distribution grids are crucial, as critical services such as emergency departments and social infrastructure being cut off from power can have disastrous, costly effects.

We can increase the grid's resilience to extreme weather by investing in transforming the grid into a smart, bi-directional, decentralised energy grid of the future. This would allow us to better leverage technology in the grid to predict the location of impact, reroute the energy, and mobilise repair resources – keeping operational costs and

damages to a minimum. Transitioning to smarter grids based on data is crucial to the shift towards greener energy. Smart grids can accommodate up to 70-80% decarbonised power generation mix. It's estimated that two-thirds of efficiency potential remains untapped, by leveraging digital technologies, grids can be improved with sustainable materials while reducing costly disruption.

The critical role of energy storage solutions and other DERs play in creating a decentralised grid

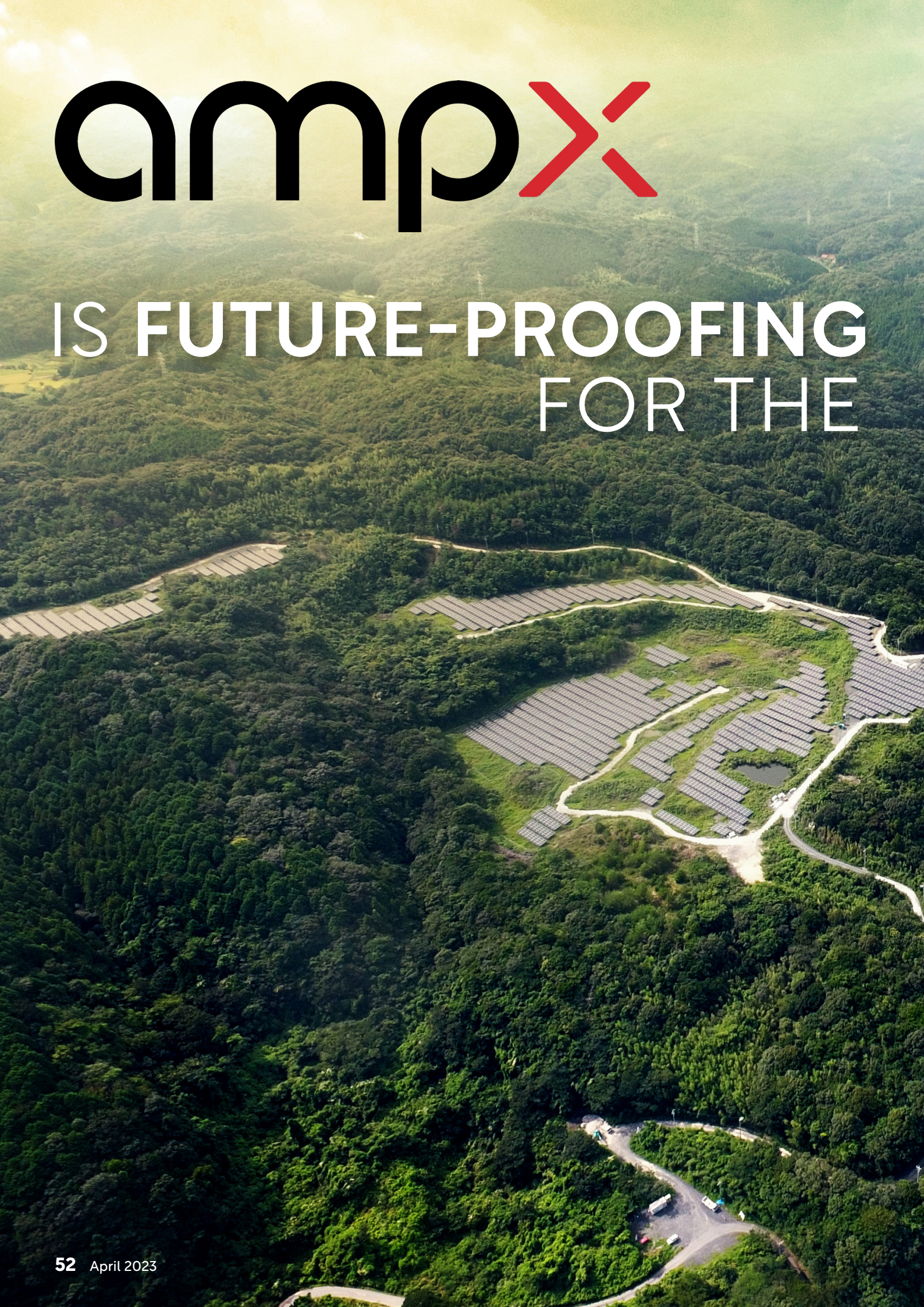
Luckily, Distributed Energy Resources (DER) connections to the grid are rapidly increasing. While grids were initially designed for continuous, centralised energy production, today's consumers seek more control over their energy, driving the presence of DERs. These Grids of the Future enable sustainability because they can better incorporate DERs to improve resilience. They adapt faster, are more responsive to weather crises, are sustainable and reliable, and can reduce operational costs with predictive maintenance strategies.

To put it into context, the IEA estimates that, from 2017-2020, there were 179GW of distributed solar added, while electric vehicle stock tripled to over 11 million. The convergence of digital solutions, combined with more leaders looking for sustainable offerings mean we can offer smarter, interoperable solutions and systems at scale.

We have already seen various types of DERs being used like solar and wind. They allow a variety of renewable clean energy sources to be integrated into the grid. With six times more electricity expected to come from renewable sources by 2040, DERs offer a resilient solution that is safe and sustainable. 🟢





An aerial photograph of a solar farm installed in a cleared area within a dense, green forest. The solar panels are arranged in several rectangular arrays, following the contours of the land. A dirt road or path winds through the solar farm and the surrounding forest. In the bottom right corner, a small parking lot with a few vehicles is visible. The background shows rolling hills covered in lush green trees under a bright, hazy sky.

amp>

IS FUTURE-PROOFING
FOR THE

ENERGY TRANSITION

AD FEATURE
WRITTEN BY:
TOM
SWALLOW

PRODUCED BY:
ASHLEY
KIRBY

Dr. Irene Di Martino discusses Amp's use of subsidiary group, Amp X, and its wider strategy encouraging sustainable transition to renewable energy options

The switch to sustainable energy is essential; indeed, the energy sector is in the midst of an unprecedented transition associated with an ever increasing level of decentralisation and digitalisation, that should ultimately lead to a carbon-free grid by 2050.

In 2019, only around 11% of global energy supply came from renewable sources, whereas today the world is experiencing an impressive rate of adoption of renewable generation. As this switch takes place, more organisations are facing challenges that include grid instability and the intermittency of renewable energy sources that requires battery energy storage to be connected to the grid. To address these, it is essential that cost-effective solutions become available to analyse, predict and manage the multitude of assets across different segments of the grid.

Digital disruption in the energy sector

Speaking with Dr. Irene Di Martino, executive vice president of Amp and Head of Amp X, delves into the company's position within the industry and how Amp X provides its parent company with the benefits of artificial intelligence (AI).

"In my career to date, I've been witnessing the most significant transition of the energy sector from a largely fossil-fuel-based ecosystem to one that is now creating the conditions to accelerate the transformation







Amp X delivers grid flexibility in renewable energy markets

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of the grid itself,” says Dr. Di Martino. “The digital energy space is clearly one of the most disruptive, and it’s the one we’re trying to make a game-changing contribution to with Amp X.”

Dr. Di Martino describes Amp as an ‘innovator’ and a ‘disruptor’ as she outlines how the organisation has developed energy infrastructure for over 12 years, expanding its operational portfolio from solar energy applications to battery energy storage and wind. Amp recognised very early on that battery storage is an essential technology in the energy transition, but that realising the full potential benefits of investments would require highly efficient and responsive operational capabilities.

The formation of Amp X was a strategic response for monitoring, controlling and optimally dispatching energy assets across different markets and segments of the grid. Leveraging AI and ML capabilities, Amp X’s digital platform monitors the health and performance of different assets, and uses proprietary algorithms to gain insights into system activity, from grid-level infrastructure to individual behind-the-metre appliances and electric vehicle chargers.

Amp X has developed its robust predictive models to assess the impact of weather conditions on both the production of solar and wind energy and trends in demand, enabling the prediction of pricing and delivering optimised dispatch of battery storage assets.



“It is thanks to the insights gained from data through the use of appropriate and proprietary AI algorithms, that Amp X has developed a number of interoperable solutions which are not point-focused since they are the result of a systemic approach to future-proof the grid,” Dr. Di Martino says. “In view of the increasing level of decentralisation of the energy system, it's even more important now to address the changes in supply and demand, as the grid has been moving away from polluting, yet readily dispatchable fossil-fuelled generation assets.”

Low-voltage network insights will be made available through the Amp X's proprietary smart transformer – also known



DR. IRENE DI MARTINO



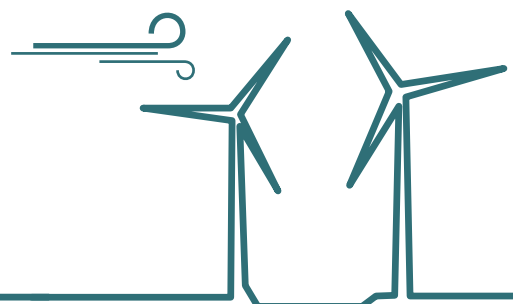
TITLE: **EXECUTIVE VP & HEAD OF AMP X**

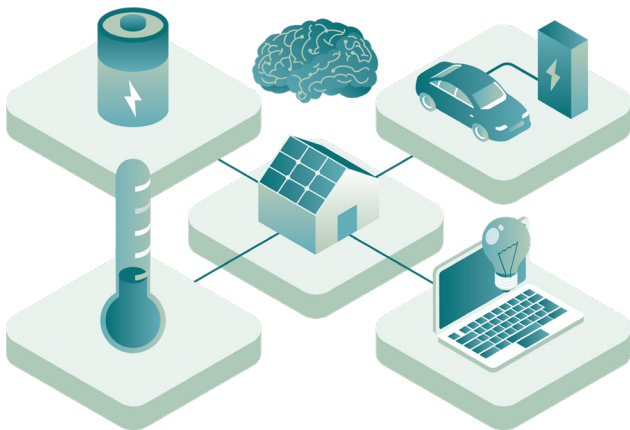
LOCATION: **LONDON**

>> Irene has over 20 years' experience in the energy sector, with a robust engineering background and an industry-sponsored PhD. She has spent most of her career to date at Engie, leading strategic programmes aimed to optimise performance and profitability of the generation portfolio. More recently, Irene led a World Energy Council international programme on energy blockchain.

Irene has been leading Amp X since its establishment in September 2019, focusing on the delivery of a digital energy platform that caters for a number of autonomous and interoperable products to future-proof the grid, unlocking flexibility from the edge of the grid at a large scale, whilst improving system resilience and stability at the lowest possible cost.

EXECUTIVE BIO





Delivering flexibility in renewable energy

A disruptive energy platform and a subsidiary of Amp, Amp X is supporting the organisation in navigating the transition to renewable energy. With critical systems already in development, Amp X provides monitoring and optimisation capabilities for its parent company and is branching out to further support its clients.

The smart transformer – or Smart Tx – is a solution for providing dynamic voltage control and optimising the distribution of energy. Smart Tx maximises penetration of distributed energy resources while improving grid stability, resilience and visibility within the distribution network.

One of the advantages of real-time insights is flexibility. The transactive-ready platform allows energy distributors to respond to changes in demand and energy consumption trends, even granularly across digital devices.

The overall mission of Amp X is to unlock grid-edge flexibility in a dynamic, transactive market to maximise the integration of renewable energy and provide both customers and consumers with clean, resilient, affordable energy as the world moves towards a renewable energy future.





as the ‘Smart Tx’ – which will replace conventional transformers in the distribution network to resolve the challenges that network operators have been facing as a result of the increased penetration of Distributed Energy Resources (DERs).

“Historically, distribution network transformers have been passive assets that were not smart or digitalised. There were no electric vehicles, solar PV or other assets that impacted grid stability, and the technology didn’t exist to gather, analyse and make use of the data that could be gathered from different nodes across the grid,” Dr. Di Martino says.

Leveraging AI and ML

Amp X’s digital platform monitors the health and performance of different assets, and uses proprietary AI and ML algorithms to gain insights from this enhanced visibility of system activity, from grid-level infrastructure to behind-the-metre individual appliances and electric vehicle chargers.

Amp X relies on its robust predictive models to assess the impact of weather conditions on the production of solar and wind energy, providing insights into how the energy demand requirements in different periods of the day can be balanced with the output from renewable power generators, whilst also leveraging the optimised dispatch of battery storage assets.

“It is thanks to the insights gained from data through the use of appropriate and proprietary AI algorithms, that Amp X has developed a number of interoperable solutions which are not point-focused since they are the result of a systemic approach to future-proof the grid,” Dr. Di Martino says.

“In view of the increasing level of decentralisation of the energy system, it’s even more important to address the changes

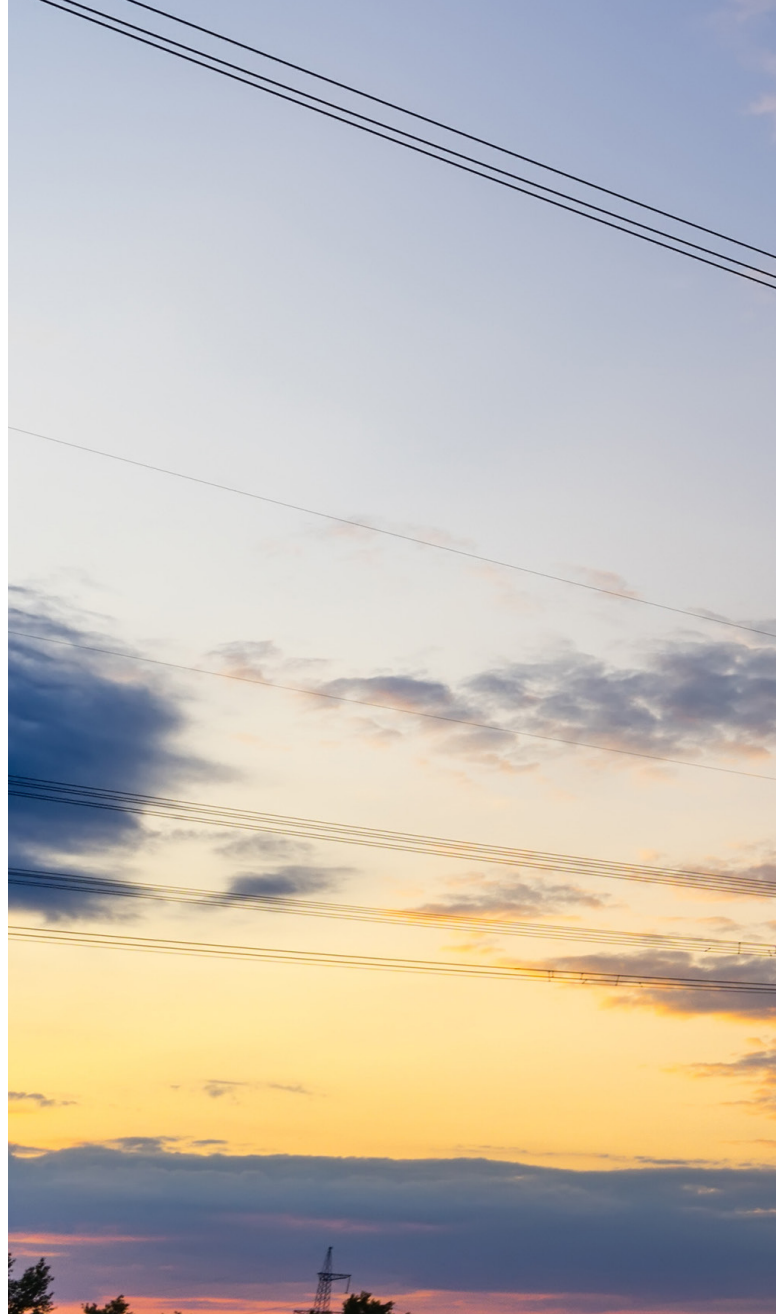
in supply and demand, as we have moved away from what was the secure and readily dispatchable supply from centralised fossil-fuelled generation assets.”

Low-voltage network insights will be made possible thanks to the Amp X’s proprietary smart transformer – also known as ‘Smart Tx’ – which will replace conventional transformers within the distribution network to resolve the challenges that network operators have been facing as a result of the increased penetration of Distributed Energy Resources (DERs).

“Historically, distribution network transformers have been passive pieces of hardware that were not smart or digitalised. It wasn’t necessary, or even possible. There were no electric vehicles, solar PV or other assets that impacted grid stability, and the technology didn’t exist to gather, analyse and make use of the data that could be gathered from these nodes within the grid,” Dr. Di Martino says.

“Now we’re seeing more homes with solar panels and batteries, and in the future, single streets may have dozens of EVs recharging in the evenings or feeding power back into the grid. Having network insights is critical in order for Distribution System Operators to maintain secure and reliable supply, whilst avoiding unnecessary and costly network reinforcements.”

“Our smart transformer is going to help stabilise voltage dynamically – which is an increasingly significant challenge for network operators – as well as optimise power factor which will make the transport of electricity across the network more efficient and less costly. The Amp X Smart Tx is also able to act in conjunction with other Smart Tx units and other assets managed by the Amp X platform, in order to provide synthetic inertia into the system, hence helping it remain in balance,” explains Dr. Di Martino.



“The Amp X Smart Tx will be deployed on grid in the U.K. in a few weeks’ time and will be the first smart transformer for the low-voltage network.”

Leveraging the value of utility-scale electricity

Amp has several major upcoming projects in the works – Renewable Energy Hub of South Australia, community solar farms in the US, and a recently acquired wind portfolio in Spain. The Amp X digital energy platform enables the profitability of battery energy storage assets to be maximised.

“This is a core part of what we do, and that’s why we started optimising the dispatch of Amp assets in North America:



identifying the most effective ways to dispatch that stored energy is the critical advantage provided by Amp X,” Dr. Di Martino explains. “Amp X’s approach already supports the Amp ambitions of growth to an increasing portfolio of assets across different markets. Third parties too have recognised the strategic value of Amp X’s approach and are adopting its solutions”

Switching to electric enables grid flexibility

“Amp X has a critical role to play in future-proofing the energy system. Our Virtual Power Plant solution has been in commercial operation now for several months in North America,” Dr. Di Martino says.

Dr. Di Martino also explains that Amp X is working with other companies across different strategic markets – such as U.K and Australia – to optimise battery operations, in front and behind the metre. This, she says, is a prime example of Amp X’s ability to respond to the rapid uptake of storage assets which are critical to meet the challenges associated with the increased presence of renewable generation across different markets. “Amp X continues to work in order to accelerate the electrification of heat and transport; such trends can triple the energy demand of a single household which puts a significant strain on the network.”

However, Dr. Di Martino points out that smart charging of EVs can be leveraged to provide an increased level of flexibility to the

AMP X

“Our smart transformer is going to adjust voltage and optimise power factor in real time, contributing to increased system stability and flexibility”

DR. IRENE DI MARTINO
EXECUTIVE VP & HEAD,
AMP X



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grid itself. Indeed, EV users can participate in Demand-Side Management (DSM) markets, by using Amp X's digital energy platform which enables dynamic load-shaping of EVs and other appliances according to price signals and/or carbon intensity.

As Amp X continues to serve its parent company and customer base, it expects to see further growth by the end of 2022. Already mentioned is the game-changing role to be played by the Smart Tx, which will be rolled out in the coming months to address the challenges which network operators face in maintaining an efficient, secure and resilient network.

"Our Smart Tx is going to provide a set of key functionalities that are way beyond those currently available at substation level by incumbent technology. The deployment of our Smart Tx on the U.K. distribution network is definitely one of the things we look forward to the most in 2022. We will aid Amp's ambitions by driving toward a fully transactive grid in which every point of consumption or generation helps to make the grid greener, more stable, flexible and secure, whilst making electricity more affordable for consumers. Amp X is an example of the bold approach that is required to overcome energy challenges and enable growth."

Dr. Di Martino adds that "modernising and future-proofing the grid is what Amp X is all about".

"That makes Amp perfectly placed to become a global renewable energy leader. We're combining our highly disruptive digital platform with a fundamental understanding of the electricity system and the energy market so that our solutions are robust and innovative." 



SMART ENERGY

FROM CRISIS TO OPPORTUNITY



CRISIS TO OPPORTUNITY:

HARNESSING DATA FOR ENERGY SOLUTIONS

WRITTEN BY: **MARIAM AHMAD**

As the world grapples with the energy crisis, **data-led solutions** could be seen as a vital asset in the path towards recovery

As the Europe-Russia energy relationship lies in ruins, unpredictable prices raise doubts about the viability of fossil fuel investments and infrastructure. The energy crisis has triggered a significant shift in international energy trade, bringing new risks and addressing long-standing vulnerabilities.

The shape of the new world is still evolving, and there's no possibility of returning to the past. History has shown that adjusting to energy crises is not a seamless process – governments have made commitments to transition to clean, renewable energy, which will occur within the context of this process.

Unlike fossil fuels, however, renewable energy generation is inconsistent.

Utilising data effectively will play a crucial role in enhancing the efficiency and output of both conventional and renewable energy assets, while concurrently equipping businesses with the means to expand and meet evolving customer demands.

Predicting future demand

Pablo Boixeda, Solutions Engineer Manager at data powerhouse, Cloudera, believes that there are several challenges that companies need to tackle from the perspective of renewable source power generation.

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“With the right insights, energy production from renewable assets can be optimised, meaning future supply and demand can be better predicted”

PABLO BOIXEDA
SOLUTIONS ENGINEER MANAGER
CLOUDERA

“Effective use of data can directly impact the cash flow of wind and solar-generation companies in areas such as real-time decision-making. With the right insights, energy production from renewable assets can be optimised, and future supply and demand can be better predicted,” he states.

“Organisations working in traditional energy generation will have to adjust costs by improving the efficiency of these plants.

In this respect, several studies project that the proper use of advanced analytics implies savings of between 5% and 7.5%. This is due to an improvement in plant uptime, supported by predictive maintenance applications and coupled with optimisation of the fuel consumption that powers these plants, alongside fine-grained performance monitoring that eliminates over-production.”

Boixeda says the need to have a data platform that allows for a fine-tuned analysis and prediction of supply and demand will become essential if energy companies are to operate in a more efficient, profitable way.

Ensuring energy security through the grid

In its 2022 report, the International Energy Agency highlighted the importance of increased cooperation and data sharing

SMART ENERGY

between transmission and distribution grid operators in helping to ensure energy security. The organisation believes this can be achieved through the coordinated operation and planning of transmission and distribution systems between operators.

This view is also expressed by Boixeda, who says the issue of grid management is key.

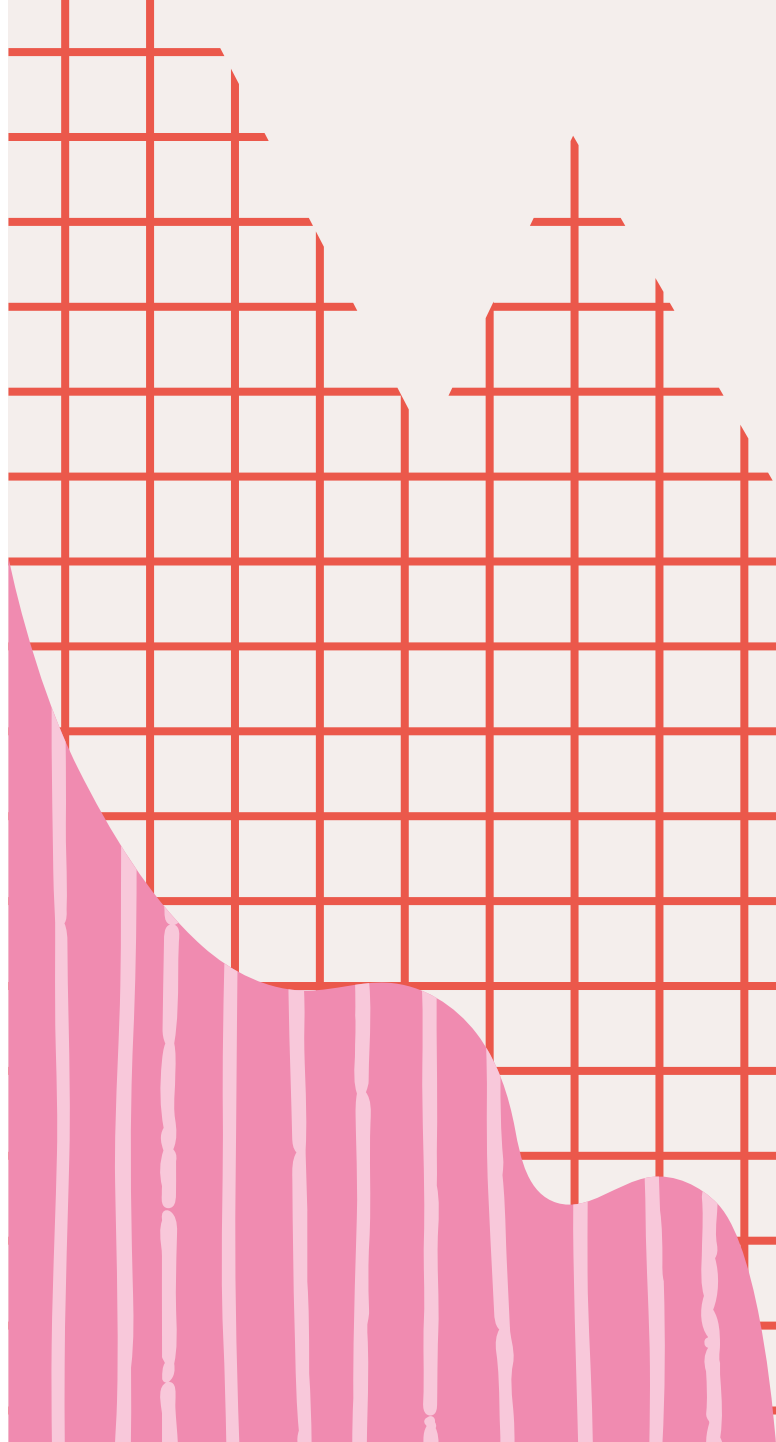
“The business of energy transmission and distribution has undergone little change in recent years but can be impacted by a number of factors. Changes in consumption habits – like an increased demand from charging electric vehicles at home and the injection of energy from solar panels – means daily demand patterns are becoming more volatile,” he states.

“So, to cope with these changes and to avoid overloads, distribution companies will have to invest in optimising the grid, which may put pressure on profitability and cash flows. Investment is unavoidable, so the question is: how do companies future-proof their assets as well as prepare themselves for the future?”

Boixeda believes grid management has been made easier due to the implementation of IoT solutions, boosted by the introduction of communication improvements such as 5G. Through advanced analytics, energy companies can collect and analyse data in real time, allowing them to optimise operating costs, and even define predictive maintenance policies that guarantee the level of service and savings.

Sustainable green cloud approach

To ensure long-term growth as well as meet the increasing demand for cloud computing and data management for the energy sector, it's crucial to manage the rising energy consumption and carbon emissions in a fully sustainable manner.



“30% of large data centres servers are unused, that means a waste of \$30bn annually”

VAERIE DA FONSECA
WW SALES AND GTM DIRECTOR
GREENLAKE SERVICES
HP ENTERPRISE



As companies move away from traditional on-premise data centres to cloud computing, green technology offers an opportunity for organisations to reduce carbon emissions – both for their own financial benefit and for the benefit of the environment.

Countless tech companies are reducing energy costs by utilising a green cloud approach. As stated by Valerie Da Fonseca, WW Sales and GTM Director of Greenlake Cloud Services at HP Enterprise: “30% of large data centres servers are unused, that means a waste of \$30 billion annually.

“I really try to help address the key causes of inefficiencies while helping our customers execute an efficient hybrid, multi-cloud delivery model because this helps deliver many of the sustainability benefits that we commonly associate with the public cloud, such as decreasing energy use through dematerialised infrastructure. Using them as a service consumption model really helps our customers get exactly the same experience with the benefits of sustainability.”

Da Fonseca explains that HPE modelling indicates customers are transitioning from

“The business of energy transmission and distribution has undergone little change in recent years, but can be impacted by a number of factors”

PABLO BOIXEDA
SOLUTIONS ENGINEER MANAGER
CLOUDERA



a traditional CapEx model to an Azure service like the HPE GreenLake model, which can achieve more than a 30% reduction in energy costs.

Ensuring customer satisfaction

With increasing pressure on the energy industry to put customers first and to respond to fluctuating demand, company services must be vigilant in ensuring that consumers don't seek out other providers who have adapted faster.

This, coupled with the fact that environmentally aware customers are increasingly on the lookout for sustainable and energy-efficient services, means that organisations must be flexible in meeting new demands.

As explained by Boixeda: "Understanding customer experience in detail is crucial, as is maximising customer satisfaction. It is here that utilising advanced data analytics – and 360° profiling of customers 360° – can allow companies to have a better understanding of their customers, thereby increasing lifetime value and reducing churn.

"This includes solutions such as automated voice analytics in call centres, the integration of these analytics with communications systems like mobile applications or the corporate website, as well as automatic consumption analysis and energy price."

Boixeda believes that data analytics can help energy companies better assess customer creditworthiness and consumption variation, which can minimise defaults and prevent fraud. Research shows the impact of the use of different analytical techniques in this field increases the profitability of these companies by 5% to 10%, at the same time increasing the brand value via customer satisfaction.

It becomes clear to see that the correct implementation and facilitation of data management has a direct impact on the entire value chain of any energy business. While traditional energy suppliers are often limited by complex legacy IT infrastructure that inhibits agility and innovation, valuable lessons can sometimes be taken from smaller suppliers, who are able to take on the bigger players by leveraging advanced analytics.

Advanced data analytics can help energy companies lower production costs, increase distribution and transmission efficiency, and, most importantly, improve customer loyalty. ○

THE HEAT IS ON

Russell Dean, Residential Product Group Director, Mitsubishi Electric, on the renewable solution to solving the heating challenge

WRITTEN BY: **MARIAM AHMAD**



Just a few months into 2023, it has grown increasingly apparent that the renewable energy journey – in particular, the issue of heating – cannot be addressed by one solution alone. Only by adopting a holistic approach towards renewables, and considering a range of tried and tested alternatives, will we be able to deploy the right method for each building and decarbonise heating more effectively by 2050.

This is a topic that Russell Dean is particularly passionate about, having spent the past 18 years of his career at Mitsubishi Electric, 11 of which have been specialising in renewable heating.

“In my current role as Residential Product Group Director, I am responsible for our Residential Heat Pump offering in the UK. I am also Vice President of the Sustainable Energy Association, which is a technology agnostic trade association offering innovative policy solutions that link up building-level technologies and the wider energy system to achieve a low carbon, secure energy future,” Russell explains.

Mitsubishi Electric and sustainability

“At Mitsubishi Electric, we place sustainability at the heart of product development. Building services such as air conditioning, ventilation and heating can be significant energy users in all buildings.

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Our focus is on providing products that lower energy use, reduce building carbon emissions and help customers make the best use of renewable technologies,” states Russell.

“Ultimately, with these products, it’s about making homes ultra-efficient, decarbonisation and meeting net zero. This will be achieved by innovation and collaboration between the build fabric, low-carbon technologies, controls, SMART use of energy, and the consumer interface.”

Russell believes that although this is a challenge, manufacturers are working together so their technologies work in

**“OUR ENVIRONMENTAL
SUSTAINABILITY VISION 2050
DEFINES ENVIRONMENTAL
PROTECTION AS A CORPORATE
PRIORITY AND STIPULATES
INCREASED INITIATIVES
TOWARD THIS END”**

RUSSELL DEAN
RESIDENTIAL PRODUCT
GROUP DIRECTOR,
MITSUBISHI ELECTRIC



synergy. For example, Mitsubishi Electric is very active in facilitating mass-market adaptation of heat pumps, which, along with technologies such as solar panels, are the way forward to help reach net zero.

“The transition to technologies that enable us to attain net zero is a concern to many in the industry, particularly those working on older properties – not just concerned about retrofitting older homes to offer the insulation necessary for such technologies to function best, but of creating the spaces and infrastructure for the technology itself,

and in training people to install heat pumps,” he continues.

Russell and his team at Mitsubishi Electric are currently training 400 installers a month, with the capacity to train up to 4,000 workers a month as the demand for the technology grows.

On the path to net zero

Mitsubishi Electric has set a target of net zero greenhouse gas emissions in the entire value chain by 2050, and a reduction from factories and offices of 50% or more (compared to 2013) by 2030.



“Our Environmental Sustainability Vision 2050 defines environmental protection as a corporate priority and stipulates increased initiatives toward this end. It establishes Mitsubishi Electric’s future course toward 2050 in the form of the Environmental Declaration, Environmental Action Guidelines, and Key Initiatives,” says Russell.

‘Heat pumps are the future’

Part of Russell’s work at Mitsubishi Electric is focusing on and funding renewable ‘clean’ heat energy. He believes that heat

pumps are the future of residential heating: all types of homes are suitable for heat pumps and they work in temperatures as low as -25°C.

“As we move away from fossil fuel boilers to reach net zero, and look for more sustainable forms of heating and hot water for our homes, heat pumps provide a renewable source of energy. In addition, they are more efficient than, for example, gas boilers, harvesting renewable energy from the outdoor air to produce 3 or more kW of heat energy for every kWh of electricity consumed.

For households, this also means they use less energy, which potentially is also a cost saving for them,” explains Russell.

Heat pumps not only heat our homes and provide us with hot water, but they also reduce our use of carbon.

Government involvement is key

Russell believes that Government intervention and collaboration are key, and that the following four measures will help support consumers and businesses in the transition to decarbonisation:

- Support, incentivise and encourage households to insulate their homes so as to use less energy. The government is well positioned to run public information campaigns to create greater awareness of the need to reduce energy demand and so lower household bills – insulating homes is a primary method of achieving that.
- Decouple the cost of electricity from gas and rebalance taxation away from green economy catalysts for the price of energy. While the price of electricity is pegged to the cost of gas, dependent upon its demand and supply, or open to weaponisation as is the case with war in Ukraine, it will remain at risk of continued price hikes that is not the making of its suppliers.
- Set a legally binding end date for installing all fossil-fired boilers (not phasing out). Following the government’s phase-out date for the installation of fuel fired boilers in all new build properties, the government should be definitive and set an end-date for their installation, whether that



“AT MITSUBISHI ELECTRIC, WE PLACE SUSTAINABILITY AT THE HEART OF PRODUCT DEVELOPMENT”

RUSSELL DEAN

RESIDENTIAL PRODUCT
GROUP DIRECTOR,
MITSUBISHI ELECTRIC

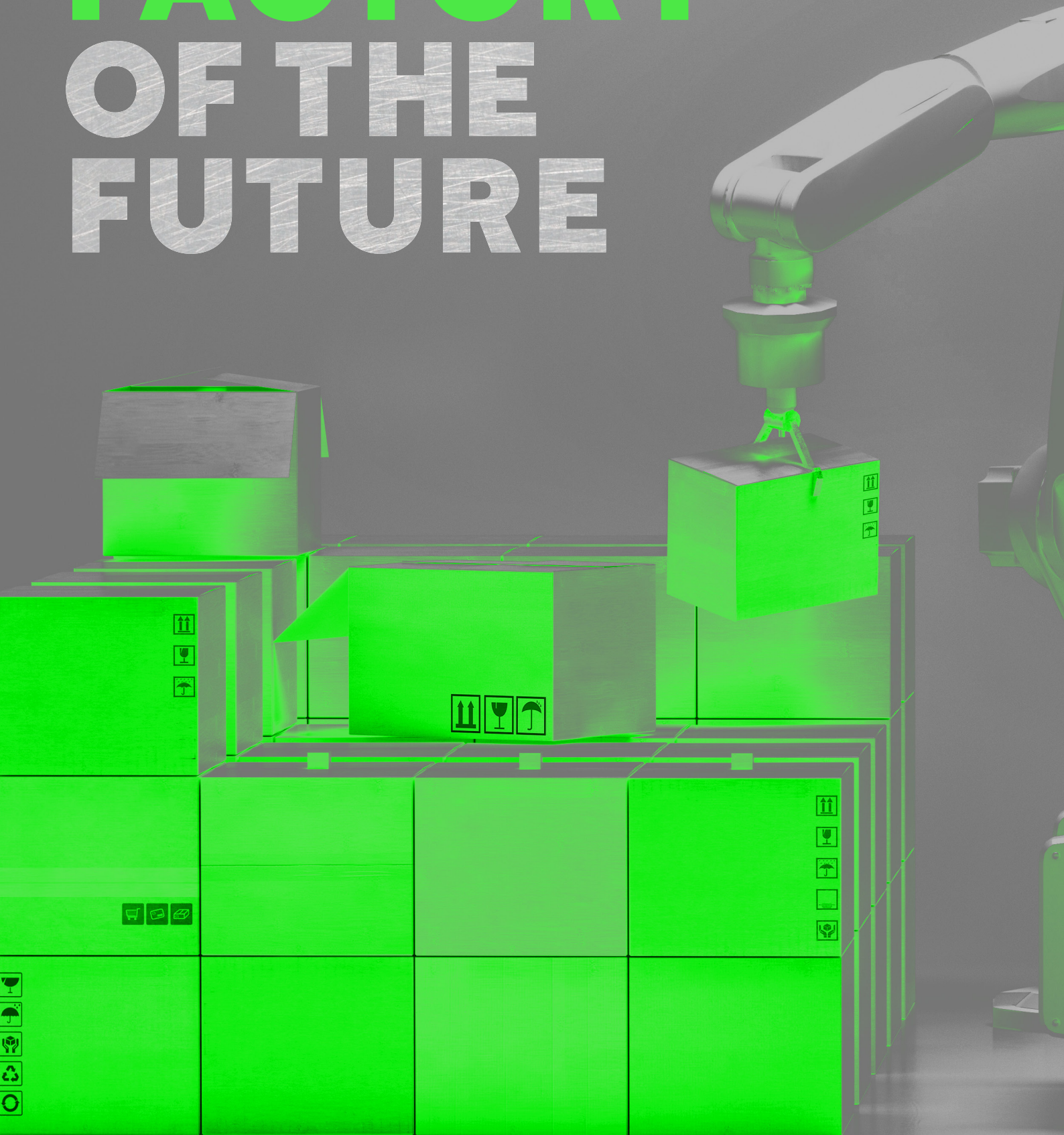
is for new build properties or retrofit. This will be a similar position to that taken by the government banning the sale of petrol and diesel cars by 2030. Just like the car industry and market have adjusted, the heating market and industry will adapt to an end date of installing fossil fuel-fired boilers – the CCC’s recommendation dates would be a good starting point for this.

- Support training of more heat pump installers. As the demand for heat pumps increases, more installers are needed. Government should also support young people to train in this growing green business and encourage plumbers, electricians and heat engineers to upgrade their skills to install heat pumpers.

Inspiration

“I am inspired by people who have the courage and the tenacity to make changes for the better. Good ideas are voiced all the time, but there is typically a huge commitment to take that concept to reality,” concludes Russell. ○

THE FACTORY OF THE FUTURE



The fourth **industrial revolution** is among us in the form of robotic process automation. So, what is the energy sector set to gain from this?

WRITTEN BY:
**MARIAM
AHMAD**

At the FANUC robotics factory in Japan, automated machinery forms orderly columns across the work floor, intermittently completing monotonous duties that were once tasked to human workers. The factory can, reportedly, operate unsupervised for up to 30 days.

Examples of smart manufacturing do not stop there. The Siemens plant in Germany enables online monitoring of globally distributed machine tools, and, over at Hirotec Manufacturing, there's a mix of IoT, cloud-based technologies, and small servers on factory floors. The result was a 100% reduction in manual inspection time.

The 'lights out' production concept – one in which Robotic Process Automation (RPA) handles manufacturing and tasks almost entirely – is growing exponentially. Energy experts are increasingly aware of the benefits of RPA, and how technology can save organisations both time and money. Navigant Research estimates that the energy and utility industry's RPA investments alone are expected to reach approximately \$470mn by 2027.

Increased agility in the energy sector

Embracing digital transformation, including the adoption of RPA tools, can improve the skill of energy companies. In the utility industry, RPA involves the utilisation of software bots to automate labour-intensive tasks, enabling these companies to adapt to changes in operations quickly.

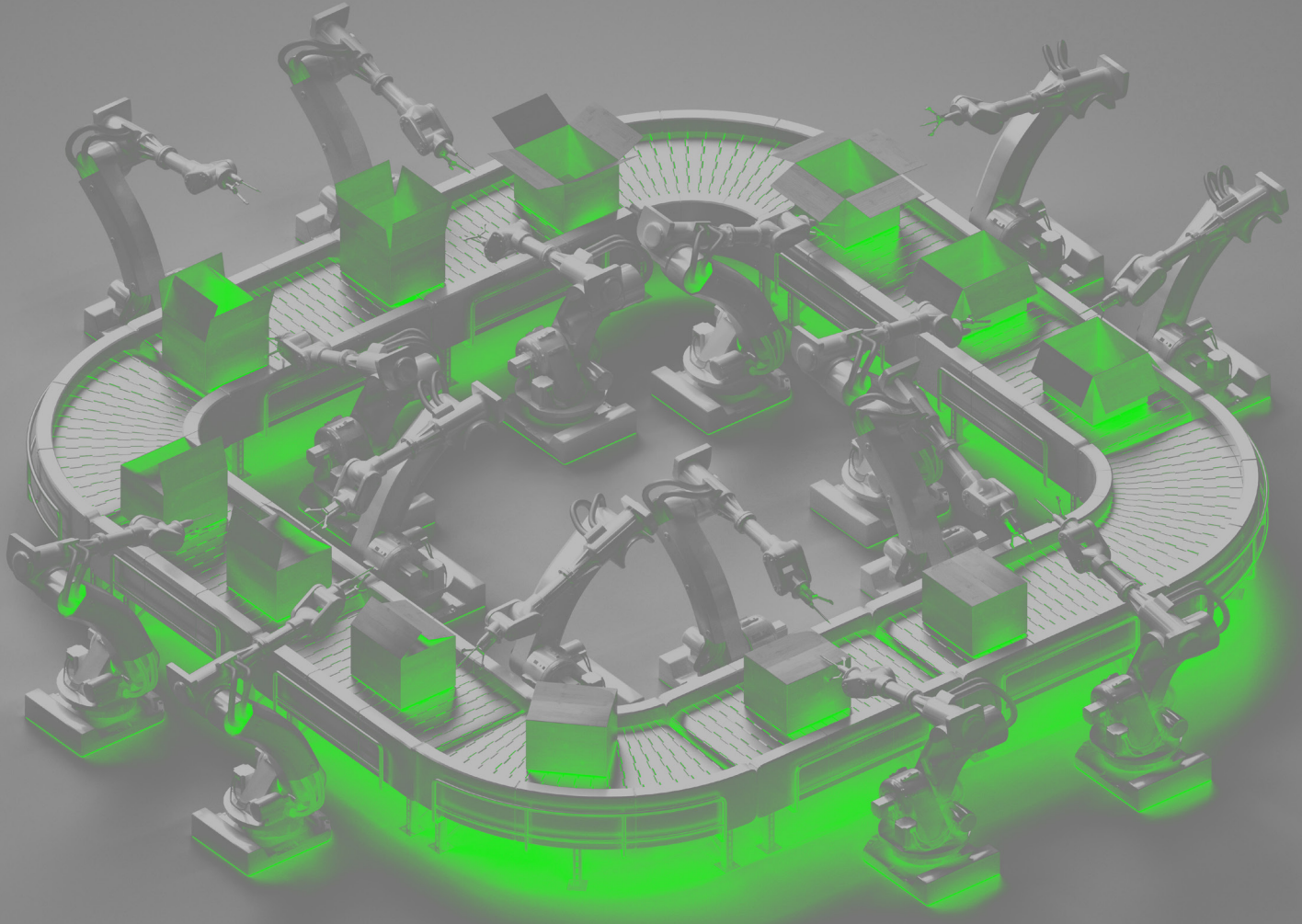


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“RPA and Process Mining allow us to do data-led innovation across multiple levels of the enterprise”

EBRU BINBOGA

DIRECTOR, DATA, AI AND AUTOMATION,
IBM TECHNOLOGY SALES UK & IRELAND

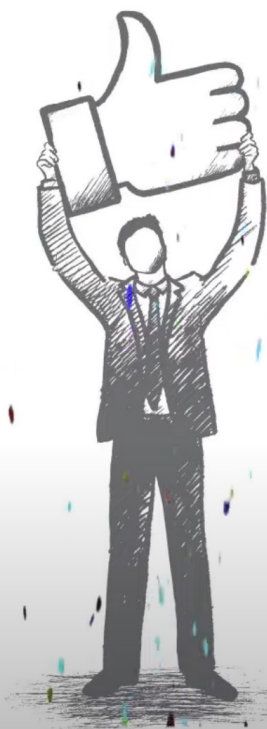
Ebru Binboga, Director of Data, AI and Automation at IBM Technology Sales, United Kingdom & Ireland, believes that leveraging AI is essential for this because it gives companies a range of advantages – from better predicting customer demand and creating hyper-personalised offerings to detecting and preventing fraud in real-time. “Automation technology is also becoming increasingly crucial for organisations, as they work to reduce costs, overcome a skilled

labour shortage, meet sustainability goals, and maximise the value of their employees’ time and talents. Intelligent automation is the combination of AI and automation technologies,” Binboga explains.

Supporting leaner, greener business practices

In the pursuit of creating more efficient and environmentally-friendly businesses, two technology solutions have proven particularly effective: process mining and robotic process automation (RPA).

When utilised together, these tools give business leaders the ability to create a valuable framework for meeting their sustainability objectives and successfully implement a green transformation of operations. By using process mining,



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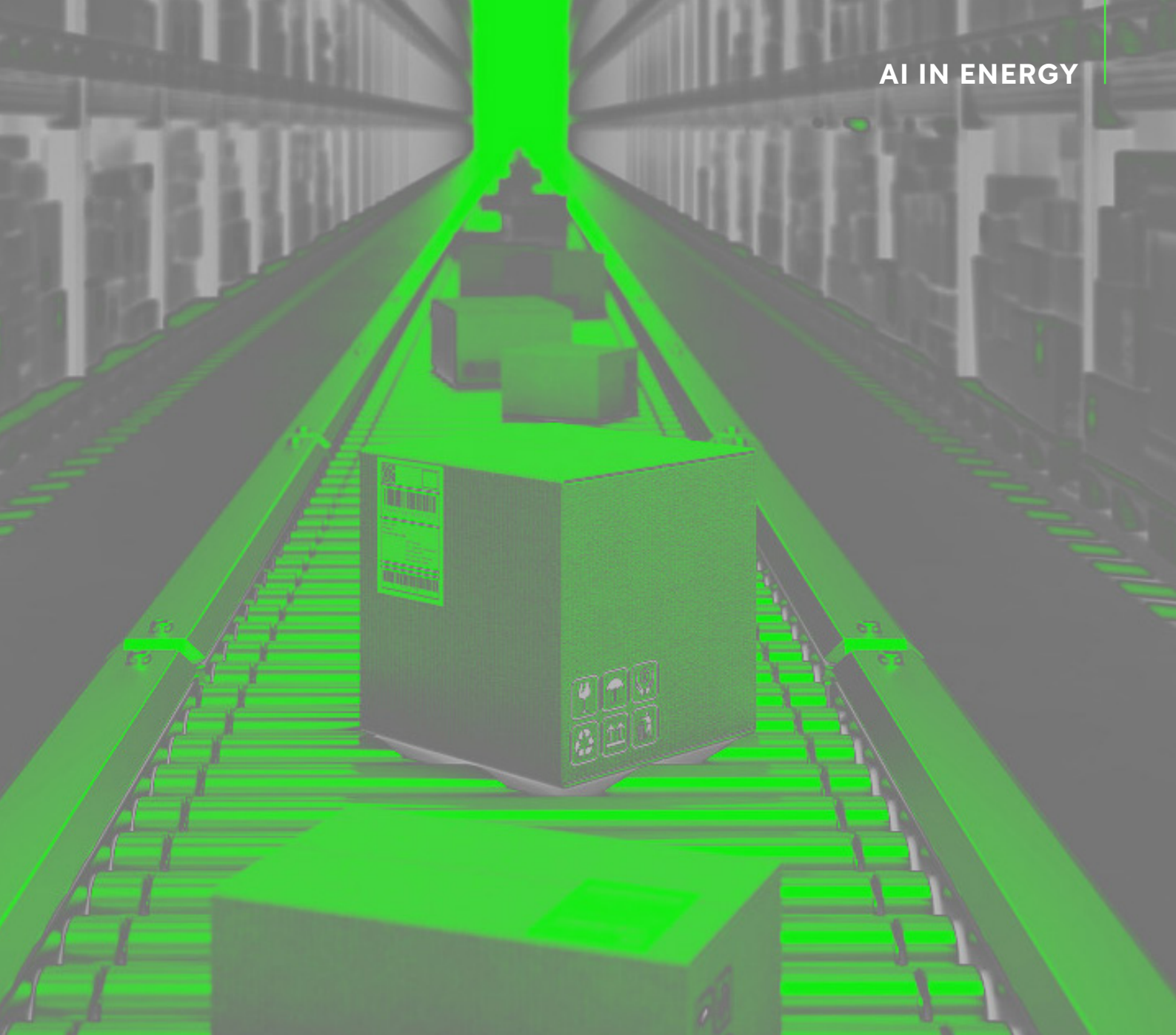
“Continually optimising business processes by discovering and eliminating operational deviations can be used to help reduce the carbon footprint and resources consumed”

EBRU BINBOGA

DIRECTOR, DATA, AI AND AUTOMATION,
IBM TECHNOLOGY SALES UK & IRELAND

organisations can examine and track current workflows, thus determining the best processes to improve. RPA then enables teams to create software robots to automate those improvements.

“Investing in RPA is also wise from a sustainability standpoint. In the area of enterprise asset management, for example, we are embedding RPA and machine learning (ML) to make those processes more energy efficient and effective. Those innovations, developed and used internally, are now being shared with our customers. RPA and Process Mining allow us to do data-led innovation across multiple levels



of the enterprise, in basic analysis, within a workflow, and even across ecosystems contributing to new levels of sustainability,” states Binboga.

“When it comes to sustainability initiatives, continually optimising business processes by discovering and eliminating operational deviations can be used to help reduce the carbon footprint and resources consumed.”

An example of this can be seen in a recent study by CapGemini, where it was found that NextEra Energy, a US-based Fortune 200 energy company, is applying machine learning to optimise operating parameters for its wind turbine fleet.

The aim is to maximise output and perform predictive maintenance.

“We operate at \$3 to \$4 [per MWh] better, including availability and operating costs, on the wind side than anyone else in the country,” says Jim Robo, CEO of NextEra Energy.

Raising productivity, cutting costs

Lowering expenses, increasing productivity and generating more chances for growth in market dominance – it’s not by chance that companies utilising RPA are the ones that are separating themselves from the competition.

One example of this in practice is the Chinese green energy company ENN Group Ltd, which tapped into hyper-automation to boost productivity and reduce costs.

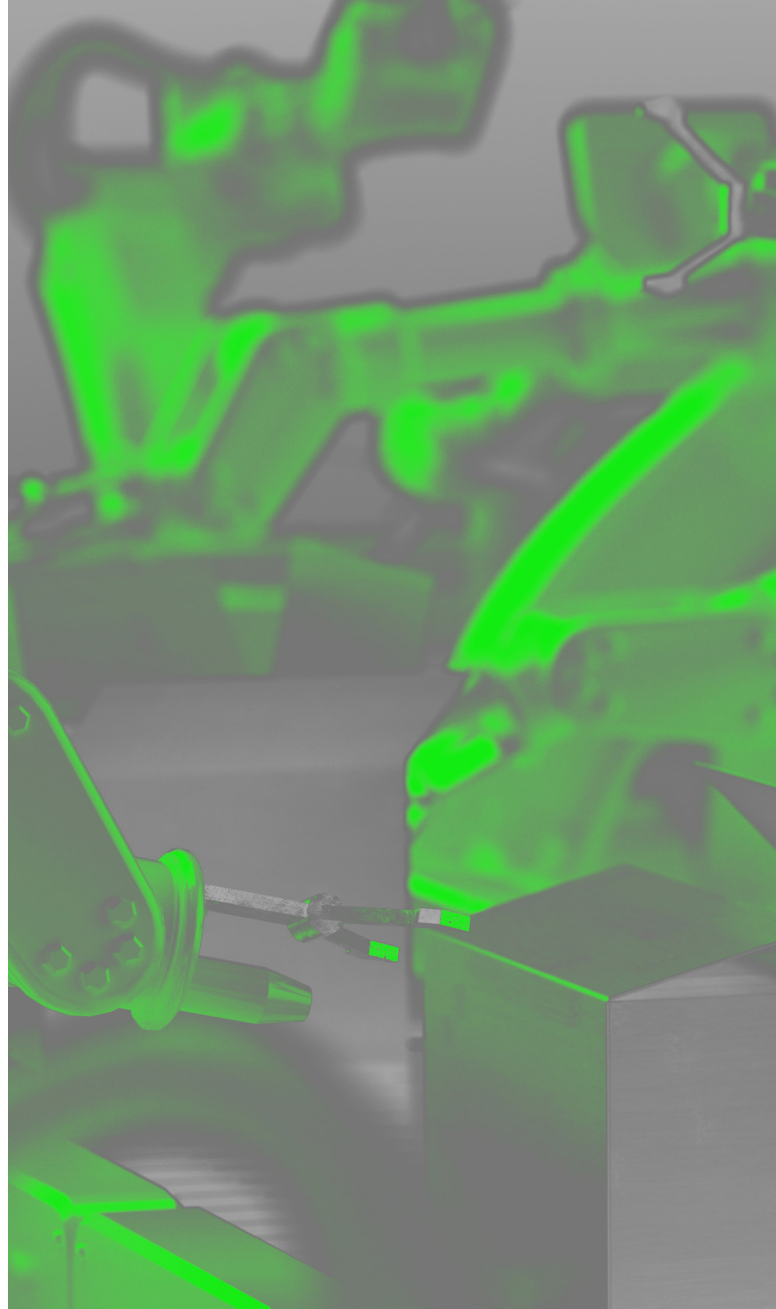
At a time of remote work during the pandemic, the energy giant – serving customers across 80 cities in China – launched a cutting-edge virtual assistant that merged AI from IBM Watson® Assistant and IBM Watson Discovery, while incorporating the automation capabilities of IBM® Robotic Process Automation (RPA) with Automation Anywhere. This new tool was able to understand and answer IT employee service desk requests. In just half a day, the virtual assistants significantly improved the remote work experience for thousands of employees, providing them with the technology they required.

According to Li Qiang, the IT Platforms Executive at ENN Group Co. Ltd., the company's AI automation platform enhances the work of employees by providing them with AI-powered tools and freeing them from mundane, repetitive tasks. This allows employees to tap into their creativity and imagination. The platform, based on IBM RPA technology, also features an automated financial assistant that can handle basic back-office duties, such as generating reports and managing monthly ledger entries.

The results were impressive, with the assistant completing 2,000 to 3,000 tasks daily and supporting over 70 business scenarios. The impact was substantial, resulting in millions of dollars of value and a 60% reduction in processing time.

Shaping the energy market of tomorrow with RPA

Adopting RPA, cutting-edge analytics, and AI is crucial in attaining climate change



objectives and satisfying the increasing demand for clean, affordable energy. Promoting widespread usage in support and technical functions will play a crucial role in the enhancement of efficiency and customer satisfaction, as well as in transforming operating and business practices.

Older business models with long-term agreements backed by large capital expenditures are being replaced by smaller players and projects – such as shale oil, rooftop solar panels, and microgrids. For the energy and utilities sector to thrive in this dynamic environment, it's imperative to adopt automation and AI on a large scale. ●





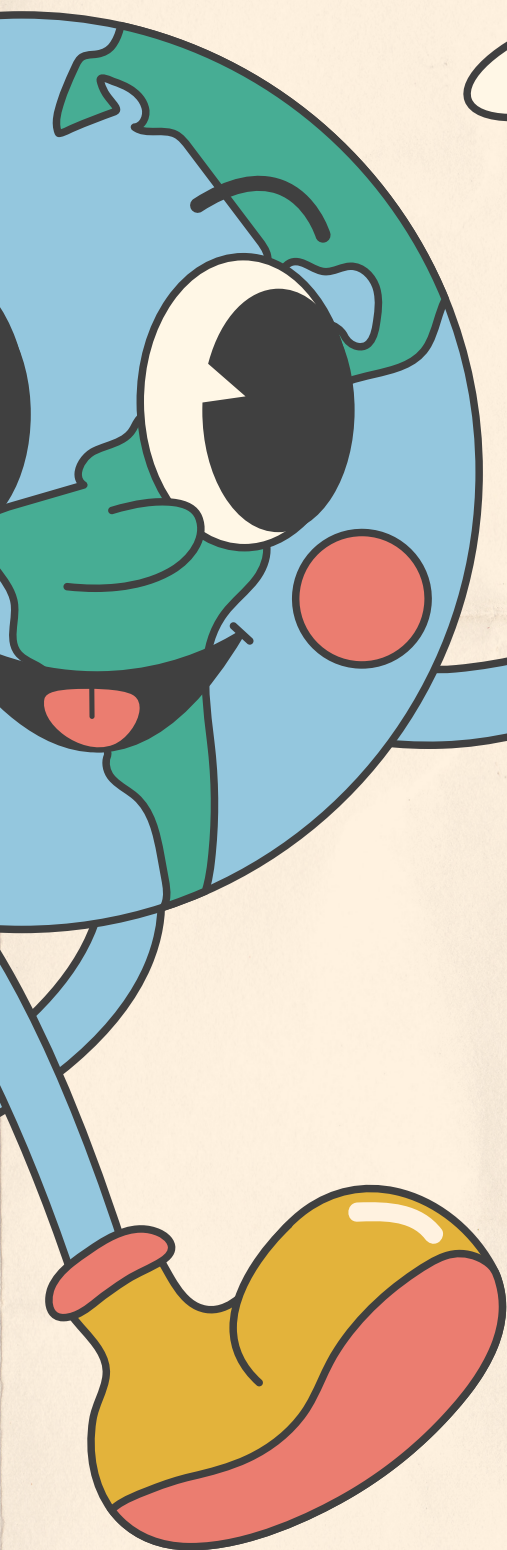
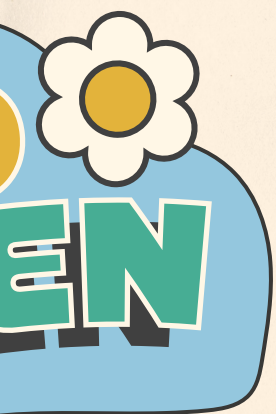
WOMEN WITHIN THE ENERGY SECTOR



From Samsung to ABB, Energy Digital takes a look at the top 10 women who are shaking up the energy sector, as they continue to **break glass ceilings**

WRITTEN BY: **MARIAM AHMAD**





Despite the obstacles, women in the energy field aspire to reach the highest positions in their organisations, not only to contribute to the company's success but also to serve as examples and impact the workplace culture positively. However, their endeavours alone will not suffice.

Encouraging more women to join and remain in ER&I will necessitate a long-term commitment from individual firms and the industry as a whole. For those companies willing to confront the primary difficulties head-on, the path ahead is apparent: broaden the pool of entry-level candidates, and ensure that hiring and promotions are equitable.

We take a look at influential women leaders within the energy sector.



in

10

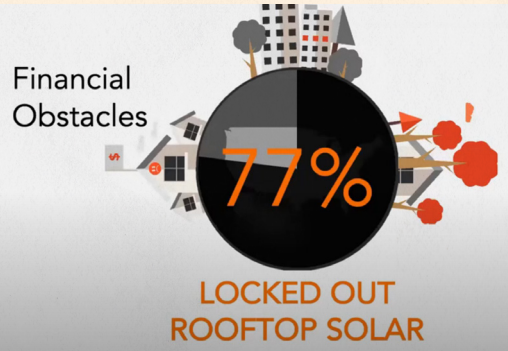
Tanya Weller

Marketing Director
of Home Appliances

Samsung

Tanya Weller is responsible for the Samsung customer experience in retail and online. In her role, Tanya has been instrumental in helping Samsung's customers to feel better informed and more empowered about the decisions they make in the home. This has been made possible by the huge leaps in innovation and technology spearheaded by Samsung, and brought to life through the vision of Tanya and her team.

Prior to her current role, she was Director of Samsung KX, the UK's first showcase and experience-led store where visitors get hands-on with Samsung's innovative products.



in

09

Steph Speirs

CEO and Co-founder
Solstice

As the CEO and Co-Founder of Solstice, Steph Speirs' mission is to significantly increase the number of US households accessing clean energy through community solar farms. Solstice has introduced a groundbreaking underwriting standard called EnergyScore, which is more precise in predicting utility bill payments and is more inclusive of low-income Americans than the industry's commonly-used FICO credit scores.

Among many other accolades, she was elected as an Echoing Green Climate Fellow, a Kia Revisionary, and a Renewable Energy World 40 Under 40 in Solar.





08

Jeanette Gitobu

Director

Women in Wind Global Leadership Program

Based in Nairobi, Kenya, Jeanette Gitobu is an award-winning renewable energy practitioner and a past participant in the Women in Wind Global Leadership Program, previously working as a Project Developer at Windlab. Gitobu aims to reduce gender disparity within the wind industry, utilising the industry's exceptional talent to facilitate the transition towards sustainable energy.

Gitobu was awarded the Energy Institute Young Energy Professional of the Year 2021 and McKinsey's Women's Achievement Award in 2020.



07

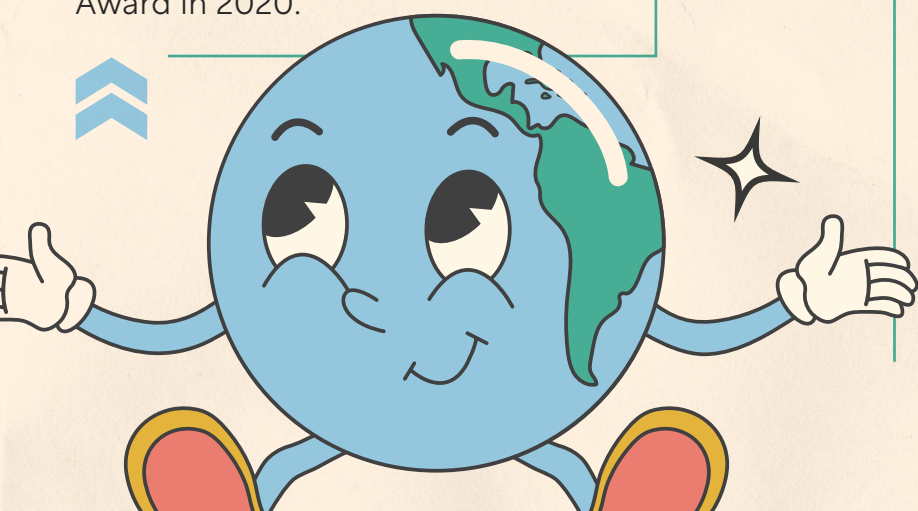
Mei-Yin Chia

Senior Business Leader
for Carbon Capture

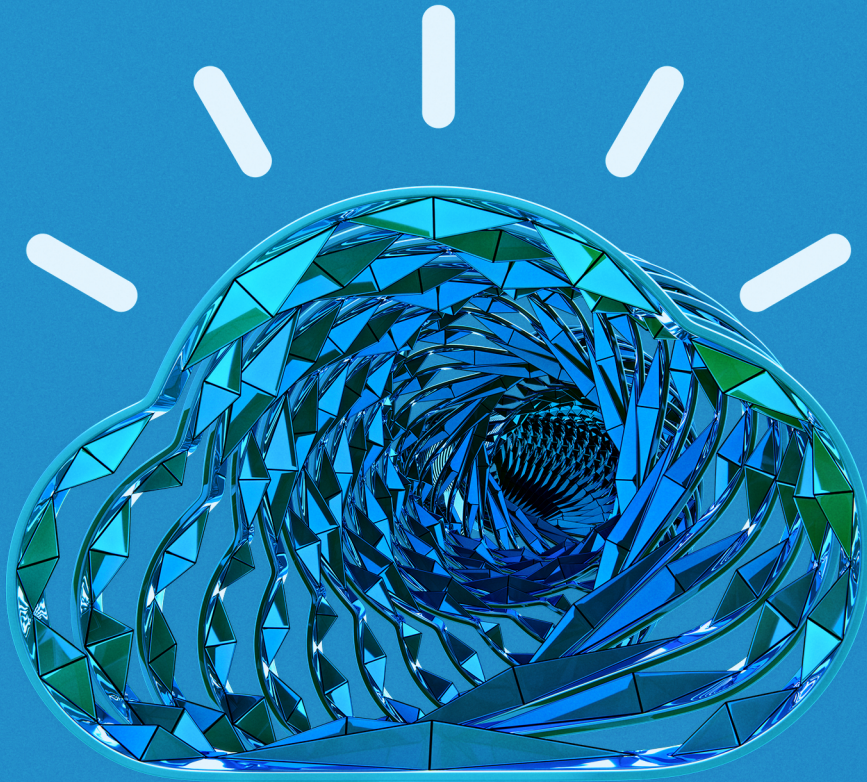
Honeywell

Mei-Yin Chia is a Senior Business Leader for Carbon Capture within Honeywell's Sustainable Technology Solutions (STS) and is focused on developing offerings that address today's environmental, economic, and social challenges through the development of sustainable technologies.

Chia works on Honeywell's solutions that pave the way for a lower carbon economy through processes and technologies that can efficiently recycle plastic waste, significantly improve energy storage, and convert renewable feedstocks into cleaner-burning fuels.



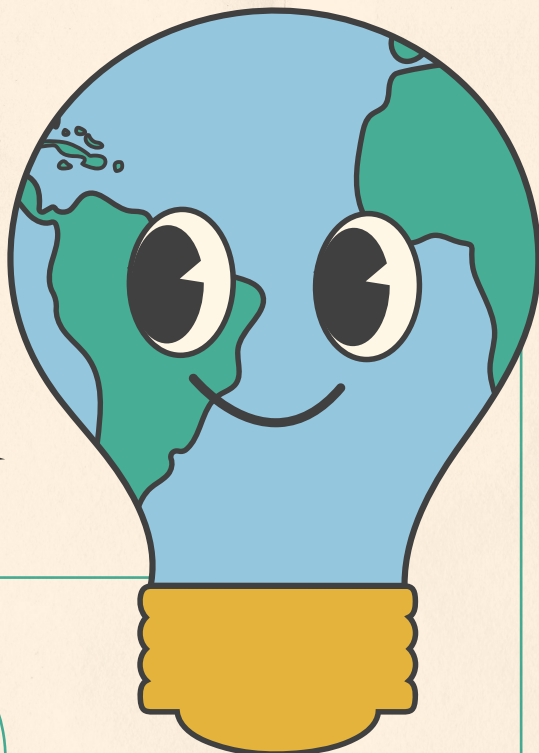
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06

**Marie-Helene
Westholm-Knebel**
Sustainability Manager
ABB

Marie-Helene began working at ABB in 2018 and currently holds the position of Sustainability Manager for ABB's Process Automation business, which supports industrial automation, electrification, and digitalisation of the energy and process sectors. Based out of Switzerland, she is focused on guiding the company to embed sustainability within its core activities, ensuring ethical and sustainable practices are applied across processes and to strategy and targets.



05

Lynn Good
CEO
Duke Energy

As the Chair, President, and Chief Executive Officer of Duke Energy – one of America's biggest energy holding firms – Lynn Good is spearheading the nation's most extensive shift to clean energy, while also ensuring that the company continues to provide dependable and cost-effective service to its customers.

Under her direction, Duke Energy is committed to achieving its ambitious climate objectives through an aggressive clean energy plan, including a minimum 50% reduction in carbon emissions by 2030, 80% by 2040, and achieving net-zero electricity generation by 2050.

**THERE IS NO
PLANET B**



04

Katie Jackson

EVP of New Business Development

Shell

Since 2018, Katie Jackson has been responsible for leading Shell's efforts to identify and develop new business opportunities in emerging areas such as renewable energy, electric vehicles, and digitalisation.

Jackson is widely recognised as a leading expert in the energy industry – particularly in the areas of energy transition and innovation – and is a founding member of Shell's Women's Network, in addition to serving as a mentor to many women throughout her career.



03

Angela Wilkinson

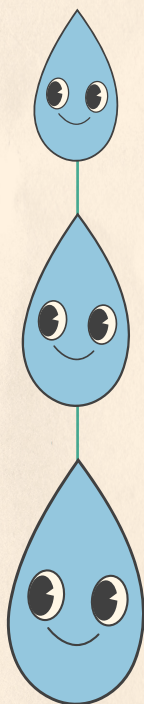
CEO & General Secretary

World Energy Council

Angela is one of the world's leading global energy futures experts, an experienced energy executive, a distinguished Oxford scholar, and a published author. She has 30 years of experience in global multi-stakeholder transformation initiatives on a wide range of economic, energy, climate, and sustainable development-related challenges.

Angela joined the Council in 2017 to create a practical energy transition leaders' toolkit and direct a new strategic insights programme.

Recently, Angela was appointed as a speaker at COP27 and Abu Dhabi Sustainability Week, where she discussed the road to net zero.



in



Giulia Chierchia

EVP, Strategy, Sustainability & Venture

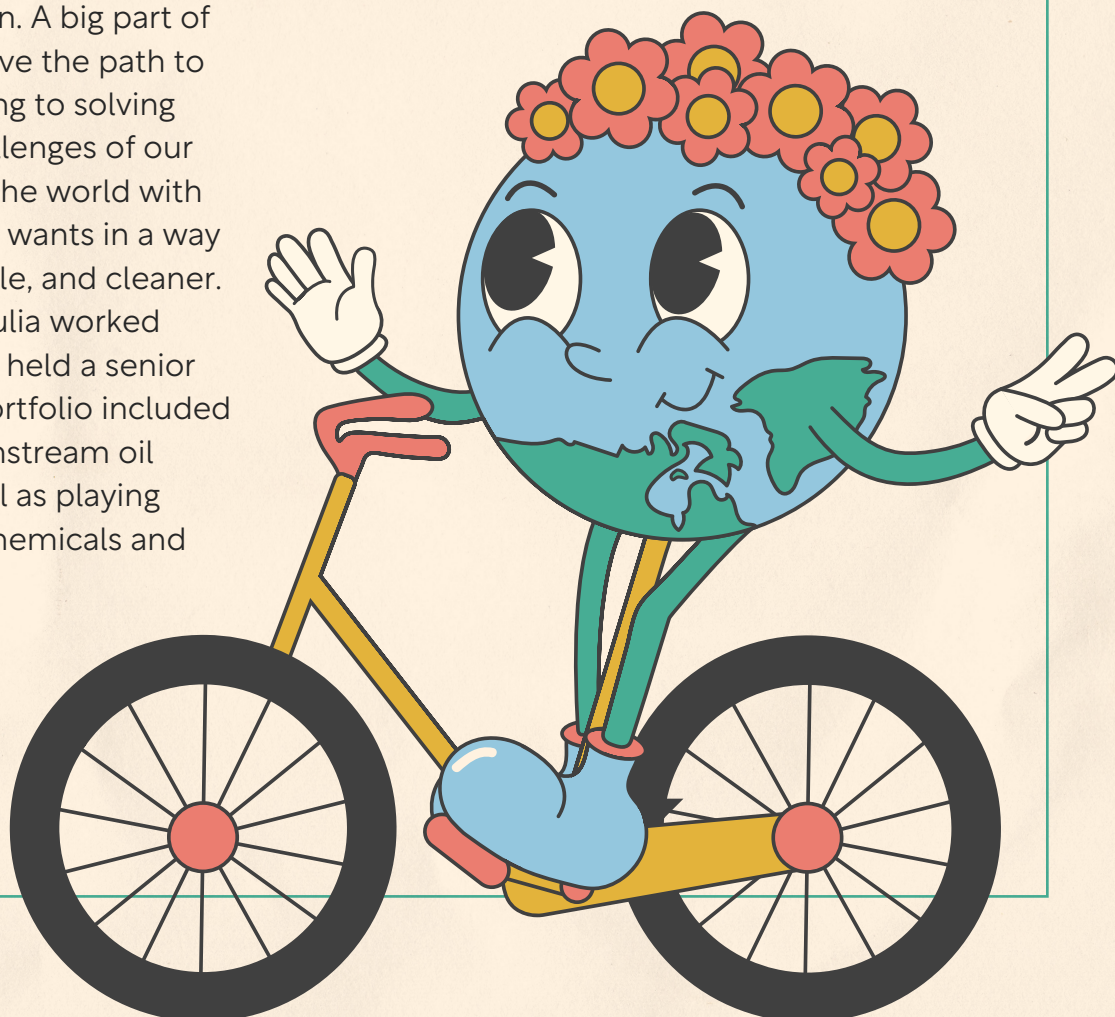
BP

In April 2020, Giulia was appointed as the Executive Vice President for Strategy & Sustainability at BP. Her responsibilities involve overseeing BP's strategy, sustainability, and ventures agenda, as well as the ethics and compliance organisation. A big part of her role is helping to pave the path to net zero and contributing to solving one of the greatest challenges of our time – how to provide the world with the energy it needs and wants in a way that is reliable, affordable, and cleaner.

Before joining bp, Giulia worked at McKinsey, where she held a senior partner position. Her portfolio included leading the global downstream oil and gas practice, as well as playing an integral role in the chemicals and

electricity, power, and natural gas practices.

With over a decade of experience in the energy sector, Giulia has assisted several companies in shaping their strategies for the energy transition.



Energy.

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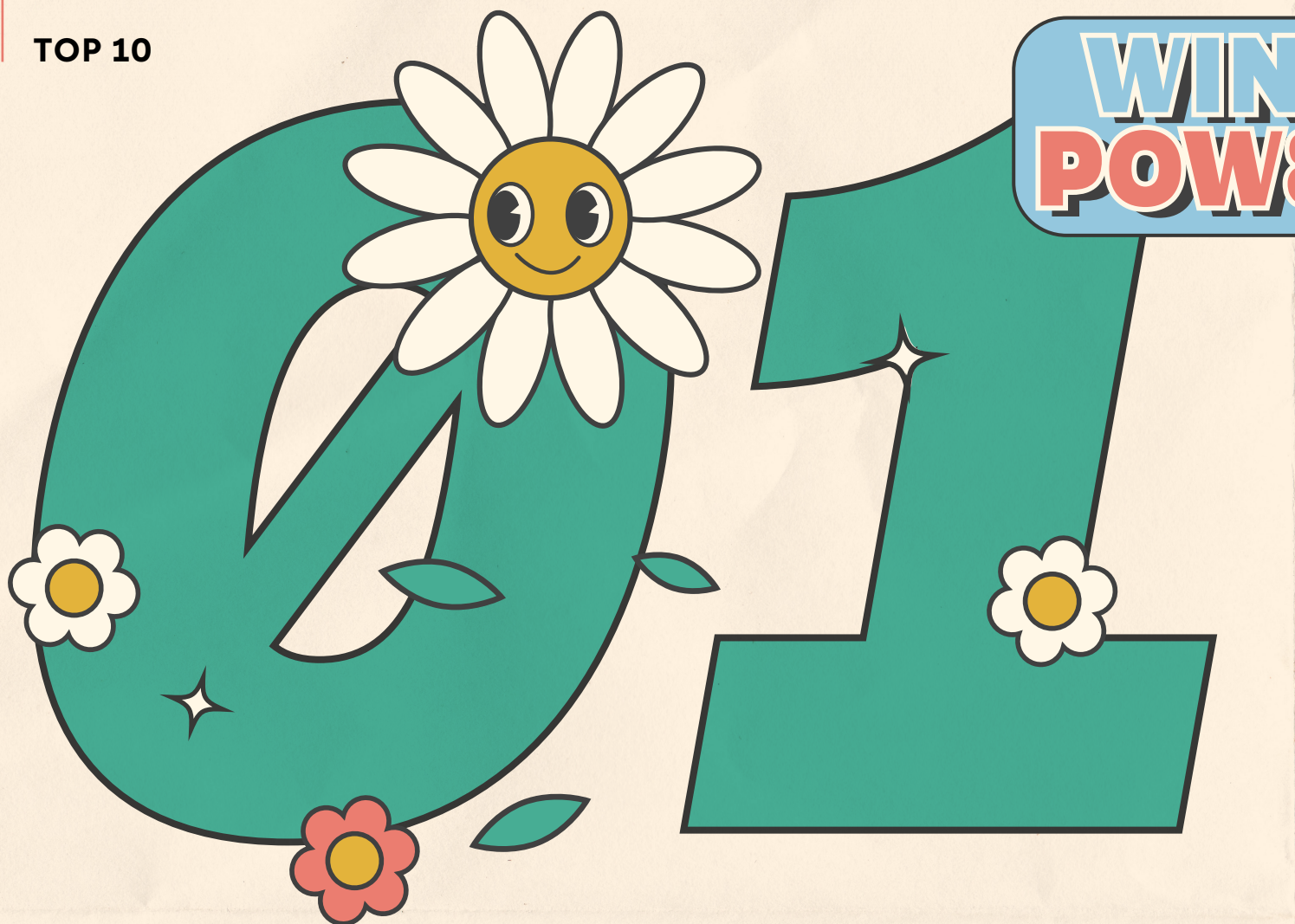
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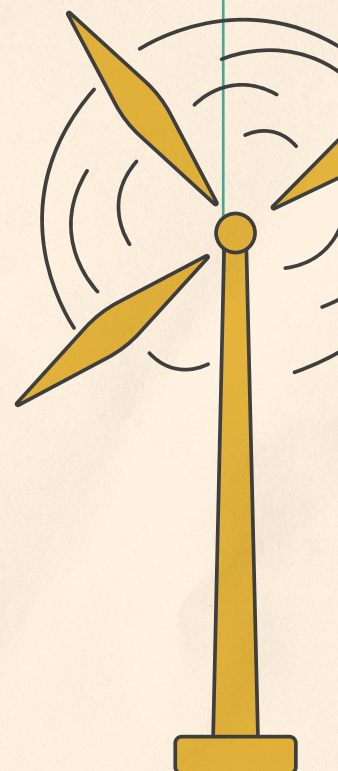
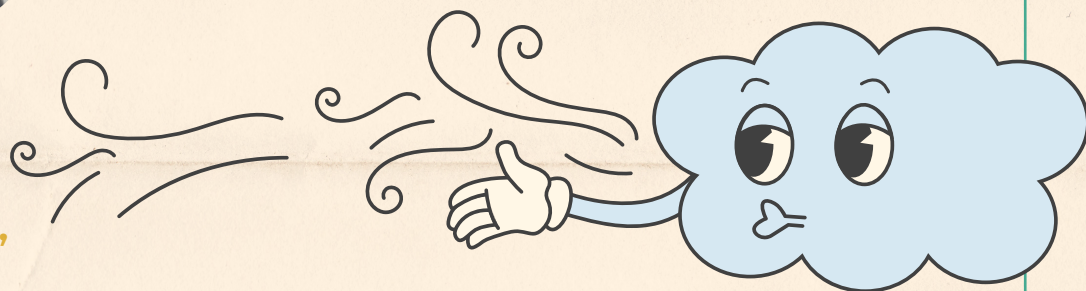
Kelly Becker
President
**Schneider Electric,
UK & Ireland**

Kelly is a driving force behind Schneider Electric's ESG and business strategy, taking the UKI business to new heights since her appointment in January 2021.

She has been instrumental in transforming building design, construction and maintenance to reduce waste and emissions, epitomised by her role in the design of The Forge, a net zero office development on London's Bankside. Under Kelly's stewardship, the company has ramped up its commitment to creating net-zero homes and businesses. This has resulted in helping

customers and suppliers make significant decarbonisation progress, reducing their CO2 emissions by 407mn tonnes since 2018 and providing 7.5 million people with access to green electricity by Q3 2022, up from 4 million at the end of 2021.

Before her current role, Kelly led the Irish market for Schneider and, before that, was VP of the Power Solutions Division in the US. Coming from a non-engineering background, Kelly is now one of the women who make up more than 30% of the top executive roles at Schneider Electric. ●



DATA CENTRE LIVE

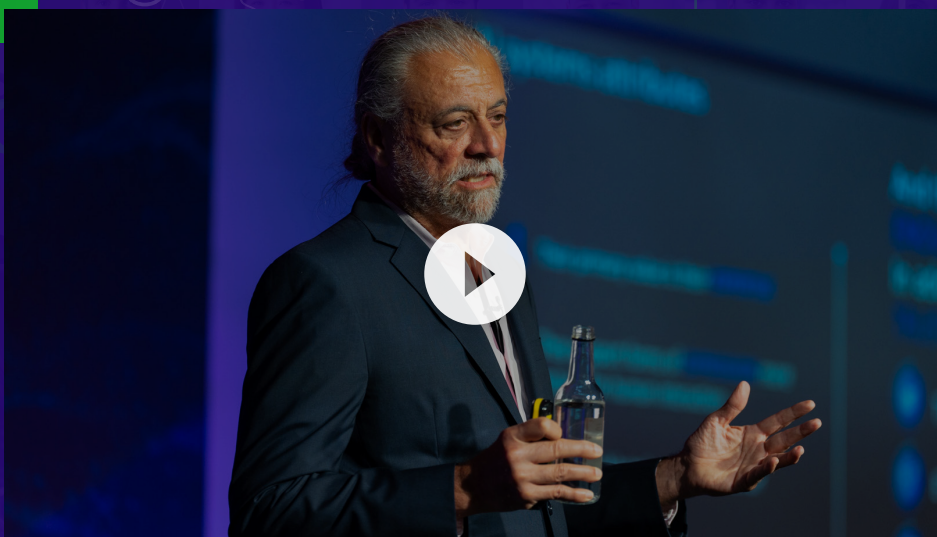
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