

energy

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Issue 08

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301 Al Gurg Tower 1, Baniyas Road, Deira
P.O. Box: 5561, Dubai, U.A.E.
Tel: +971 (4) 228 3617 Fax: +971 (4) 221 1783
Contact Person: Ghanem Hamed – General Manager
Email: inquiry.mena.da@hitachi.com

Hitachi Asia Ltd.

30 Pioneer Crescent, #10-15 West Park Bizcentral
Singapore 628560
Tel: +65 6304 7426 Fax: +65 305 7401
Contact Person: James Fong
Email: jfong@has.hitachi.com.sg
URL: <http://www.hitachi.com.sg/ice>

Hitachi Industrial Equipment Systems Co.,Ltd.

<http://www.hitachi-ies.co.jp/english/>

AKS Bldg.,3,Kanda Neribeicho, Chiyoda-ku, Tokyo, 101-0022 Japan International Sales Dept (SX Dept)
Tel: +81 3 4345 6527 Fax: +81 3 4345 6914 Email: kondoh-shimpei@hitachi-ies.co.jp

It's Time To Put Pedal To The Metal On Renewables Roll Out: Aemo Report



Nowadays, a lot of market operators are taking the initiative to transition to renewable energy. Recently, The Australian Energy Market Operator's (AEMO) 2023 Electricity Statement of Opportunities (ESOO) report makes it abundantly clear that the transition to renewable energy must be fast-tracked immediately.

Over the last 10 years, there has been an ongoing loss of reliability and projected coal plant closures. This shows that there is a need to active clean energy projects waiting in the pipeline. This has been crucial especially for the Australia's energy system to maintain its reliability.

For Australians to maintain their reliability, it is crucial for governments around the country to actually deliver on the commitments already made that is based on ESOO report.

To delve into this matter, we will check experts opinions on a similar report.

Climate Councillor and energy expert Andrew Stock said:

"AEMO's report shows that accelerating the rollout of renewable energy, storage, and transmission projects is key to fortifying Australia's energy supply.

"Critical to this transition are not only sources like wind and solar but also supporting technologies like advanced batteries and efficient transmission lines that can bring this generated energy to where it's most needed. "With a wealth of clean energy projects ready for implementation, Australia has no excuse for inaction. The consequences of maintaining our dependence on unreliable fossil fuels is a future fraught with climate and energy instability and risk. By industry, governments and communities working together to accelerate renewables, storage and transmission, Australia will ensure its energy future is both clean and reliable.

Climate Council Head of Advocacy Dr Jennifer Rayner added:

"This report leaves no room for complacency. Leaders must act now to deliver on the commitments they've made to bring online new, clean energy generation. This isn't the moment to bottle it.

"Clinging on to polluting fossil fuels will steer us into a climate and energy disaster – they are part of the problem now, not the solution. The only way through is to rapidly roll out clean, cheap renewable energy to power our homes, businesses and industry.

"This moment calls for cool heads and strong, decisive action. A sustainable, reliable energy future for Australia is within our reach, but it takes more than promises: now we need the delivery."

In This Issue!

energyHQ's August 2023 issue covers the most recent developments and events pertaining to the energy industry, as well as including valuable insights, details and spec sheets / peer reviews related to latest technologies, innovations, products, services, and projects of relevance to the industry and its audience. The article on page 8 talks about Wind Turbine Generators, the article on page 14 Sheds the light on Pellets, and the article on page 20 focuses on Solar Wind Energy. Additional content is also available covering the latest activities of manufacturers, importers, and exporters – worldwide!

We hope you benefit from this issue's content and find it useful for your business, and welcome receiving your comments, suggestions, or feedback. Please send them to h.mourtada@1world.xyz.

Best wishes,
Hassan Mourtada
Editor-in-Chief / Content & Research Officer.
h.mourtada@1world.xyz

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World Energy Digest



Brazil

Brazil eyes tax perks for energy sector, sparking 'green' vs oil debate

Brazil's government aims to make more energy projects eligible for key tax benefits, however the main ministries involved disagree about whether to favor a "green" agenda or include oil projects and refineries, according to a senior official and a document seen by Reuters.

President Luiz Inacio Lula da Silva's government has vowed to lead a transition to next-generation renewable energy sources, but is still committed to developing a state-led petroleum industry.

The proposed tax incentives are part a broader agenda for a "green transformation" of Brazil's economy, which would include creation of a regulated carbon market and issuance of the country's first 'sustainable' sovereign bonds.

However, senior officials at the Mines and Energy Ministry are pushing to broaden the incentives to include oil refineries and fuel storage facilities. At a meeting with Finance Ministry officials last week, shown in their public agendas, they framed the matter as a strategic priority in light of higher oil prices during the war in Ukraine, the source said.

Brazil's Energy Ministry has called for a technical note to expand incentives for oil and natural gas exploration, production, and transportation. The ministry argues that targeting tax benefits too narrowly would curtail oil and gas investments. The ministry also emphasizes the importance of decarbonizing refining projects for energy transition and energy security. Petrobras, Brazil's state-run oil firm, has forecasted oil production for the next four decades, despite ramping up renewable energy investments.



Ethiopia

The UAE and Ethiopia's enduring partnership goes back 30 years

UAE-Ethiopia has a long history of diplomatic ties, dating back to the UAE's founding. The UAE's Founding Father, Sheikh Zayed bin Sultan Al Nahyan, believed in fostering partnerships and people-to-people ties with African nations, including Ethiopia. President Sheikh Mohamed has continued this legacy, focusing on fostering stability, prosperity, and peace through their efforts. Sheikh Mohamed and Ethiopian Prime Minister Abiy Ahmed discussed international issues such as climate change, economic growth, and sustainable development. They cooperate in areas as wide-ranging as agriculture, finance, culture, tourism, government development, food security, renewable energy, trade, investment, industry, and advanced technology. Sheikh Mohamed advocates for bold action and diverse partnerships for a sustainable future. Both countries prioritize sustainability initiatives, advancing renewable energy and stimulating economic growth through climate innovation.

Earlier this year, the UAE's Masdar signed an agreement with Ethiopia to jointly develop a solar project with a capacity of 500 megawatts. This will diversify Ethiopia's energy mix and widen access to clean, affordable energy. The positive results are expected to further boost technical and economic co-operation between the two countries.

On the sidelines of this visit, 11 memorandums of understanding were signed between the two governments to further reinforce the bilateral commitment to joint action in various areas, including sustainability and food, water and energy security.

A memorandum of understanding between the UAE's Talc Investment and the Ethiopian Ministry of Agriculture pledges to increase wheat production near the Omo river basin to build domestic capacity and enhance food security in Ethiopia. Moreover, a memorandum of understanding between DP World and the Ethiopian Ministry of Transport will advance Ethiopia's logistics infrastructure, thereby enabling the government to hold strategic reserves of key commodities and future-proof the country from supply chain disruptions.

Another agreement will see Abu Dhabi Ports work with its Ethiopian partners to develop fuel storage and distribution depots in different locations in Ethiopia, ensuring that critical facilities, businesses and communities have access to fuel that powers livelihoods.



Norway

Government Norway Approves 15 Billion Euro Investment In Oil And Gas Industry

The Norwegian government announced its approval for the expansion of 19 oil and gas fields through investments that surpass 200 billion Norwegian crowns (€15 billion, \$18 billion, £13 billion). This is seen as a strategic move to extend the country's oil and gas production lifespan into the coming decades.

Temporary tax breaks were introduced by Norway's parliament in 2020 to stimulate petroleum investments amidst a period of decreased activity. This prompted a wave of submissions from energy corporations.

Final approval for field development was granted on Wednesday to nine projects led by Aker BP, three led by Equinor, and various others managed by Wintershall Dea and OMV.

"These initiatives will play a significant role in maintaining a high and stable output from Norway's continental shelf, while fostering job creation and value generation," said Terje Aasland, Minister of Petroleum and Energy, at a press briefing.

The augmentation of Norway's petroleum production has met with strong opposition from environmentalists and others who are alarmed about the carbon emissions resulting from burning oil and gas, which exacerbates climate change.

The Norwegian government maintains that the country's oil and gas assets are crucial for Europe's energy security and will remain in demand for the foreseeable future.

Norway ascended to the position of Europe's leading gas supplier last year, surpassing Russia when it reduced supplies during the Ukraine conflict.

Iran



Iran signals oil output boost as regional relations improve

Iran plans to raise oil production to near full capacity by the end of the summer, the country's oil minister has said.

Speaking to the energy committee in Iran's parliament, Javad Owji stated that the country had boosted oil production by 50 percent over the last two years and production is expected to increase to 3.4 million barrels a day (bpd), just below the capacity of 3.8 million bpd.

According to monitoring service TankerTrackers.com, Iran was able to ship 2.2 million bpd up to 20 August, as reported by Bloomberg - a marked increase on the first seven months of 2023, in which Iran export over 1.5 million bpd in a single month.

As well as oil, Iran also plans to increase its production capacity of natural gas by 500 million cubic meters per day (Mcm/d), according to S&P global. Its current production standing is at 1 billion cubic meters per day.

Included in this increase is the beginning of production from Phase 11 of Iran's South Pars gas field after decades of delays. The current output of phase 11 stands at 11 million cubic Mcm/d, although Iran plans to increase output to 56 Mcm/d.

Iran's increase in the production and export of energy comes as its relations with its Gulf neighbours strengthen, with Iran and Saudi Arabia reopening embassies following a Chinese brokered deal between the two last March. Chinese Foreign Minister Wang Yi said that recent warming of relations between the two would lead to a "wave of reconciliation" in the region.

Along with deals between its neighbours, Iran has also entered into diplomatic talks with Washington and has agreed to free US citizens in exchange for the release \$6 billion of Iranian assets frozen in South Korea.

Spain



Tunisia

Tunisia's energy production drops as trade deficit widens

Tunisia's energy production decreased by 8% to 8,470 gigawatt hours in June due to an increased energy trade deficit, with local market production down 5%, and electricity purchases from Algeria and Libya covered 12%.

Tunisia's national power utility, Société Tunisienne de l'Electricité et du Gaz, produced 95% of the country's electricity by late June 2023. Natural gas-fired power generation dropped by 8%, while renewables accounted for 2.5% of total production.

Electricity sales fell by 1% between late June 2022 and late June 2023, and the energy trade deficit widened by 5%. Trade dynamics in Tunisia's energy sector are sensitive to traded volumes, the dollar-Tunisian dinar exchange rate, and Brent crude oil prices. The World Bank predicts a 2.3 percent growth in Tunisia's economy this year and a 3% growth in 2024.



Spain is moving away from coal and towards renewables

Spain is accelerating towards a coal-free power sector, with plans to phase out the polluting energy source by 2025 - five years earlier than initially planned, as announced in June.

This month, it was confirmed that the country's biggest coal plant, located in As Pontes, Galicia, is due to shut down by August 2024.

This will make way for renewable energy projects that leverage Spain's abundance of sun and wind.

The country is on track to generate more than half of its power from renewable sources this year. This will make it the first of the top five European countries by power demand - including France, Germany, Italy and the UK - to accomplish this feat, according to Rystad Energy. The research company says this comes down to a history of strategic investments and early adoption of technologies like onshore wind.

Under an update requested by the EU, Spain released a revised version of its energy and climate plan in June, which is currently out for public consultation. It increases emissions reductions targets by close to 10 per cent (to 32 per cent) by 2030. It also almost doubles the amount of solar power expected to be rolled out by the end of the decade.

Renewable Energy

08 Wind Turbine Generators





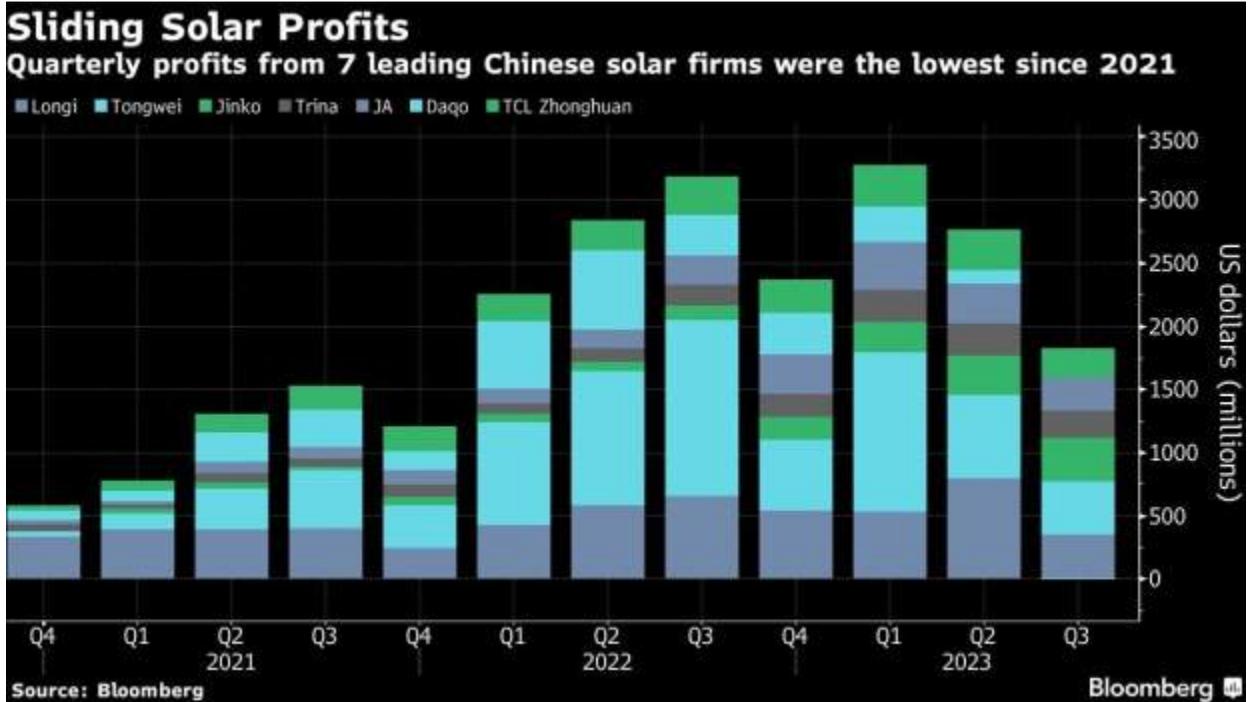
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World's Top Renewable Firms Reel Even as Installations Surge



The biggest manufacturers of wind turbines and solar panels are facing their most serious financial challenges in years even as deployments of clean energy head for an annual record.

About 500 gigawatts of renewable generation capacity will be added this year, according to the International Energy Agency, and at least \$1 billion a day is being spent on new solar additions alone. Yet companies in the sector are being squeezed by volatile costs, snarled projects, high interest rates and — in the solar sector — a rush to add new capacity that's overwhelmed demand.

Xinjiang Goldwind Science and Technology Co., the No. 1 wind turbine maker, just reported a 98% slump in third-quarter profits. The head of Longi Green Energy Technology Co., the top solar manufacturer, said on Tuesday that panel prices were at "irrationally" low levels.

Even as installations rise, "wind and solar equipment companies are not a good exposure to this trend," said Vicki Chi, a Hong Kong-based portfolio manager at Robeco, which managed about \$197 billion globally as of June and invests in energy companies. The wind and solar sectors are both highly competitive and there are "more attractive exposures" in electricity grid equipment and software, where demand should exceed expectations and entry barriers are much higher, she said.

The renewable industry's travails are being

reflected in a rapid drop in company share prices. The S&P Global Clean Energy Index has fallen 30% this half, while the broader S&P 500 Energy Index has risen over the period.

At the moment, it's the wind sector that's faring worse than solar. After falling in 2022 for the first time in four years, wind installations are on pace to rebound this year, but they will barely surpass 2021 levels outside of China, according to BloombergNEF. Projects from New York to the UK are at risk as developers ask for more money and tax breaks to ensure profitability amid rising costs.

European wind turbine makers, who account for as much as 300,000 direct and indirect jobs, have been particularly hard hit. Orsted A/S, the world's biggest builder of offshore wind farms, said it was ceasing the development of some projects as it announced a third-quarter net loss. Siemens Energy AG has been forced to seek government guarantees due to ballooning problems with faulty turbines.

European wind companies are facing increased competition from Chinese firms, who are targeting overseas markets and offering discounts of about 20% to European and US producers, BNEF said.

In the solar sector, the main problem is overcapacity. Global demand for panels is on track to rise 55%

this year, according to BNEF. But the around 400 gigawatts of expected installations this year is dwarfed by nearly 1,000 gigawatts a year worth of module factories that are operating or being planned for construction.

While the surge in production has removed kinks in the supply chain that caused rising prices last year, it's pushed panel prices down to record lows, squeezing margins and threatening a wave of bankruptcies and consolidation.

Combined third-quarter profits from seven major manufacturers in China, where more than 80% of global production is based, were at the lowest since the end of 2021. Longi has warned that more than half of the firms in the sector could be forced out of business in the next two to three years.

Panel prices are likely to continue to drop through the end of 2023, making it difficult for even the best companies to make healthy profits, BNEF analyst Youru Tan said in a note. Smaller, non-integrated firms will struggle to make any money at all, he said.

In the US, solar panel maker First Solar Inc. has been

relatively resilient, as its outlook has been buoyed by the Biden Administration's Inflation Reduction Act, which promises to pour billions of dollars into domestic clean tech manufacturing. The firm's third-quarter earnings expanded by almost 300% this year.

Still, rooftop solar in the US has been pressured by rising interest rates that make it more expensive for consumers to borrow for the up-front investment. Inverter makers Enphase Energy Inc. and SolarEdge Technology Inc. posted disappointing third-quarter results, while SunPower Corp., which reports earnings Wednesday, has dropped by around three-quarters this year, making it the worst performer on the S&P clean energy gauge.

"Current prices make it very hard for anybody across the supply chain to make profit," Longi President Li Zhenguo said on an earnings call on Tuesday. Some companies may soon start abandoning plans to build new solar plants, he said.

Bloomberg News

With assistance from Ewa Krukowska

<https://www.bnnbloomberg.ca/>

Saving energy up to 21 % with Solar High Efficiency borehole pumping systems

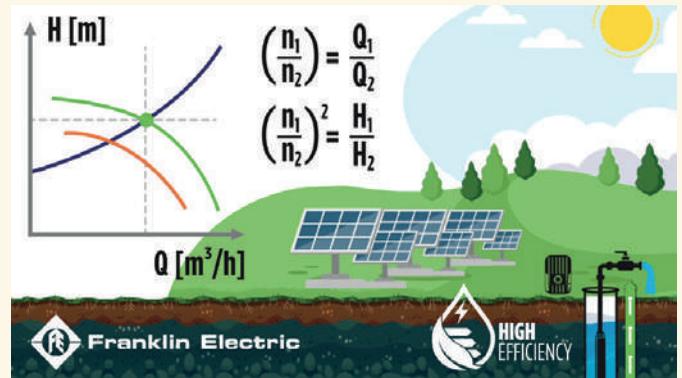
Superior efficiency through permanent magnet technology

In times of rising energy costs, new systems put more and more emphasis on the best possible efficiency. Here, Franklin Electric has set a new benchmark with its High Efficiency borehole systems (HES). Compared to standard asynchronous motors, energy savings of up to 21 % have been achieved in numerous systems installed worldwide. The key factor for energy savings and superior efficiency is the permanent magnet technology of the motor. Instead of a short-circuit induction type rotor, the high efficiency motor contains a permanent magnet rotor design with buried magnets. The system can be operated with grid or solar supply. The variable frequency drive (VFD) offered by Franklin Electric can be controlled remotely by using the Franklin Electric mobile app and a smart device. This not only allows operator monitoring, but also assistance from the Franklin Electric Service team to support the customer during commissioning, system setup, readjustment of parameters and application settings, or troubleshooting.

Voltage Speed Head

When operating a pump with solar energy, it is important to generate sufficient electrical power, but even more important is sufficient voltage. The pump speed and thus the system performance is determined by the electrical voltage. To generate enough voltage, you need to connect enough solar panels in series. This will generate the voltage level needed to operate at full speed. But if weather conditions change, the voltage can drop, causing the system to immediately reduce pump speed to keep running. This reduces the amount of water pumped, but not just linearly. Due to pump affinity laws, the pump head or pressure is reduced squared, which then leads to a further reduction in water flow as you run at a different pump operating point. If the solar system has not sized carefully, or if less efficient components are used, then the risk of running the pump in a dead-head situation increases. In such case, the pump is still operating, but it's not generating

enough head to overcome a certain level, and the result is that water flow stops. With the lower energy consumption of the High Efficiency System, you have an additional safety reserve that allows you to pump more water, or longer.



Advanced Solar Voltage boost

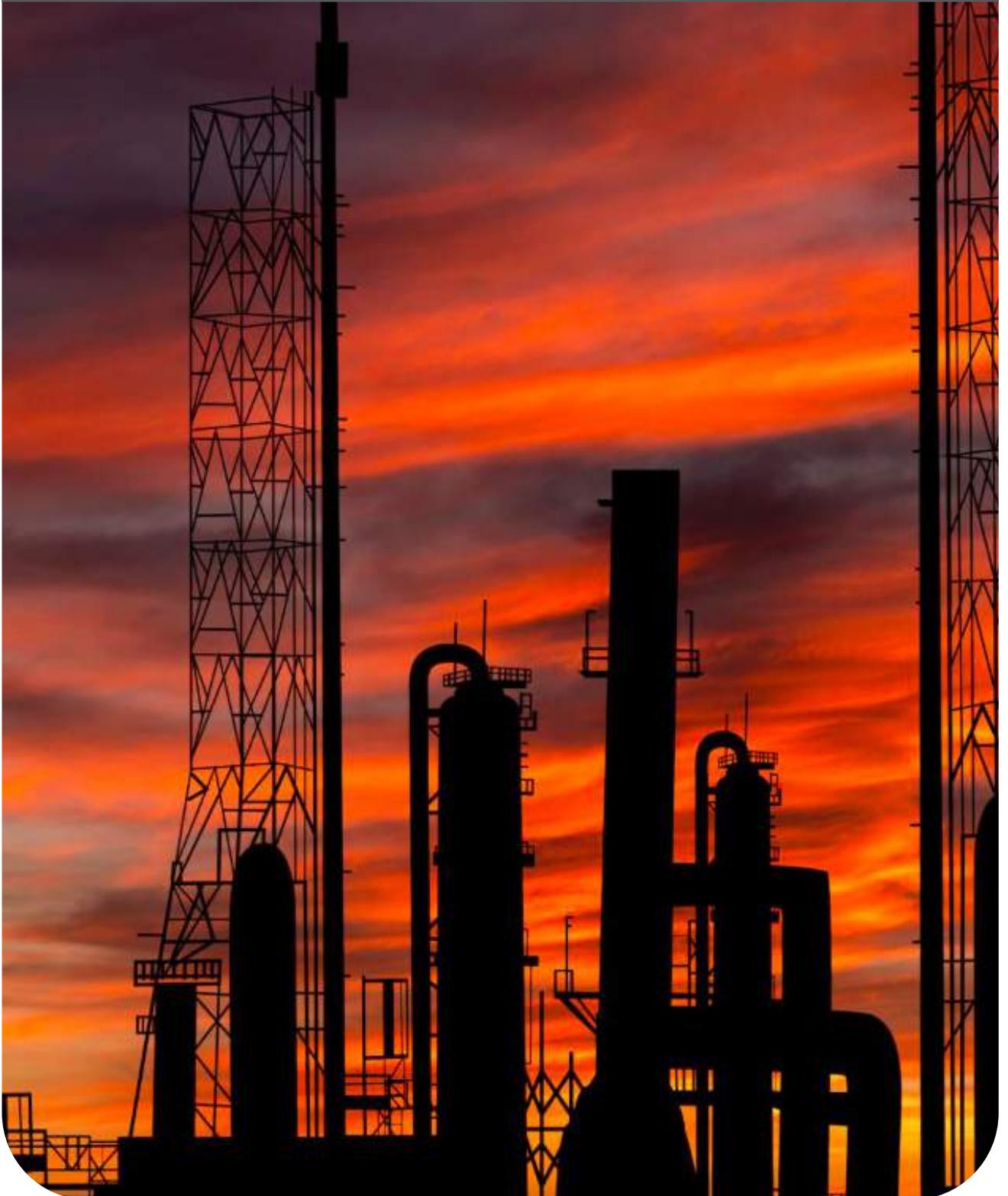
Franklin Electric has further enhanced its Solar systems and provides an advanced voltage boost function. The voltage boost feature makes it possible to size your system based on power rather than voltage, saving you up to 50% on solar panels compared to a standard system without the voltage boost feature. This further reduces the required number of solar pv-panel, initial investment and installation cost.

So the High Efficiency Borehole system has superior efficiencies to save energy and reduce operating costs by up to 21%. For solar applications, you can also significantly reduce the number of solar panels. You save even more money and have more water available for a longer time period.

Read more success stories of Solar applications on franklinwater.eu.

Oil & Gas

11 Geological Sciences



5 misunderstandings about offshore energy geoscience



The energy world is surrounded by misconceptions, fueled by a lack of overall understanding, concerted efforts to misrepresent or vilify the industry, and the perennial challenge of translating the technical and scientific complexities of what energy companies do every day to the public.

Correcting the record is critical when you consider just how fundamental energy is to everyone on the planet.

Offshore energy, in particular, struggles with misconceptions for all of the reasons above. For those of us in the energy geoscience world, that communication and understanding gap widens while

sharing the same contours of misunderstanding.

Many people outside of energy are unfamiliar with our cornerstone role in producing the energy people around the world use every day. Energy geoscience is the intersection of where energy and earth science meet.

EnerGeo Alliance represents the geoscience companies, innovators and energy developers that use earth science to sustainably discover, develop and deliver energy and low-carbon solutions to the world. As a non-partisan and not-for-profit trade association, we advocate for geoscience-driven energy policies that connect more people and

communities to accessible energy around the world.

Even though by current market capitalization, our companies are a small part of the energy supply chain, we are the first link when it comes to accessing energy in any given region. Our industry is the tip of the spear for nearly all energy sources and lower-carbon solutions, and the work our companies do is essential for energy today and tomorrow.

Role of offshore geoscience

The offshore industry knows energy geoscience well, because without it, the frontiers that offshore energy companies have continued to establish and expand for decades under the oceans would not be possible.

Geoscience surveys have been used globally for more than six decades for natural gas and petroleum exploration. These same survey techniques are also used for offshore wind, geothermal energy and low-carbon solutions such as carbon capture and storage. Whatever the future of our energy evolution looks like, geoscience is going to play a central role.

When you think of cutting-edge technology and innovation that translates into cost savings, protection of the environment and increased access to safe affordable energy that transforms the world, you are thinking of us—whether you realize it or not.

What the offshore energy and the geoscience industries share are common misconception gaps, ones we are confident we can play an essential role in changing for our industry and the industries we serve.

Professionalism

We all know that energy exploration is a highly technical and scientific activity, but the world does not—in large part because communicating the technical is challenging in and of itself, and again, because there is an entire cottage industry built around vilifying energy companies.

In our industry, that means geologists, geophysicists, hydrologists, chemists, engineers, soil and plant scientists, and more are needed to bring affordable energy to the world. This industry is not only high-tech but has blazed the path for Big Data and a host of modern innovations enjoyed by citizens of the world today. Geoscience technology and innovation have literally transformed energy.

Energy poverty

Then let's talk about the big-picture misconception: that the energy industry doesn't care about people. Wrong again.

Energy is something everyone takes for granted until they don't have it, or need it. Consider the following: By 2050, the world's population is set to approach 10 billion people, and total energy use is expected to increase 50%.

Today, 30% of the world has no access to clean fuels for cooking and 10% has no access to basic electricity, and over 60% of the world is living in

some form of energy poverty. Energy poverty is a global issue, and even in the US, many populations, especially communities of color, are at even greater risk now as the gap between energy supply and energy demand widens.

Those are daunting, stark facts about our fellow humans, and we are in a position to do something about it. Eliminating energy poverty remains a top priority of UN Sustainable Development Goals, so we need all sources of energy at the table to meet skyrocketing demand for energy security and energy accessibility.

Energy geoscience connects people around the world to energy, especially in the developing world where energy abundance can truly transform countries. Just look at the offshore energy work happening in Guyana and the fundamental national change for the better—greater wealth, employment and the essential services that follow—developing as a result.

That could not have happened without the offshore and geoscience energy industries working together.

Energy transition

Another enormous misconception involves the so-called “energy transition.”

At EnerGeo Alliance, we don't use the term “transition” because that implies leaving one source of energy for another, or that we have the problem solved with one set of solutions. No matter what anyone says, however well intended, that is not true. We prefer to call what is happening the “energy evolution.” Depending on where you live in the world, the energy evolution looks very different. You may be diversifying your energy mix with alternative sources such as offshore wind or geothermal, or you may be one of the 30% in the world that is cooking over dung, wood or coal until you have access to cleaner natural gas.

Wherever you are on the path of the energy evolution, we are expanding and evolving to meet growing demand, and geoscience is part of the equation of adding more energy while reducing the world's carbon footprint.

As nations develop and implement their energy evolution goals to make reliable, affordable energy available to their citizens and meet net-zero emissions policy ambitions, it is important to understand that those goals cannot and will not be realized without the critical data and technology the geoscience industry provides.

No geoscience, no net zero, no energy evolution.

By Nikki Martin and Gail Adams, EnerGeo Alliance
<https://www.offshore-mag.com/>

Nuclear

14 Pellets



TVEL Develops Accident-Tolerant Fuel (ATF) Pellets

The AA Bochvar Research Institute of Inorganic Materials (VNIINM), a subsidiary of Russian nuclear fuel manufacturer TVEL, has successfully developed the technology and manufactured experimental fuel pellets from uranium disilicide for light water reactors. The move is part of a program for the development of so-called accident-tolerant fuel (ATF).



TVEL President Natalya Nikipelova was recently shown the innovative technology during a visit to VNIINM. She was shown areas for developing technology for manufacturing fuel pellets, melting and casting uranium disilicide pellets (Image: TVEL)

TVEL said the introduction of this technology at the Elemash Machine-Building Plant - a TVEL facility in Elektrostal, in the Moscow region - made it possible to launch the production of fuel pellets from uranium disilicide and experimental fuel elements for subsequent tests in a research reactor. The uranium disilicide fuel composition has a number of advantages, according to TVEL. These are high density and uranium content, which can allow a transition to longer fuel cycles without increasing uranium-235 enrichment, as well as high thermal conductivity combined with low heat capacity, which means less heat stored in the reactor core and lower fuel cladding temperatures in emergency situations. Another advantage is the lower operating temperature of the fuel pellet compared to uranium dioxide, which improves the performance of the fuel.

Since the beginning of 2019, Rosatom has been conducting reactor tests of accident-tolerant fuel assemblies for light water reactors. The experimental assemblies have passed three full irradiation cycles in the MIR research reactor at JSC «SSC RIAR» in Dimitrovgrad, in the Ulyanovsk region. These assemblies contain fuel rods with four different combinations of cladding and fuel matrix materials: in addition to uranium dioxide, uranium-

molybdenum alloy with high thermal conductivity has been also used for fuel pellets fabrication.

In September 2021, the first Russian-made fuel bundles with experimental ATF fuel rods were loaded into the VVER-1000 reactor core at unit 2 of the Rostov nuclear power plant in southwest Russia. Three fuel assemblies which each contain 12 experimental rods were loaded into Rostov 2. Six rods have cladding made from chromium-nickel alloy, and the other six have a standard zirconium alloy cladding with chromium coating. The experimental rods contain uranium dioxide fuel pellets.

ATF designs aim to enhance performance during normal operations at nuclear power plants and provide operators with more time to respond in the event of loss of active cooling. Such fuel may incorporate the use of new materials and designs for cladding and fuel pellets. **Framatome, GE/GNF** and **Westinghouse** are also all developing ATF concepts for light-water reactors, with the help of funding from the **US Department of Energy**. China and Japan are also developing such fuel.

By World Nuclear News

<https://www.world-nuclear-news.org/>



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Electric

17 Batteries



Researcher develops electric car battery to last three times longer and costs less



The transition to electric vehicles (EVs) is a critical step in addressing the environmental challenges posed by traditional combustion engine vehicles. One of the primary concerns with EVs has been the longevity and cost of their batteries. However, a groundbreaking development at the Argonne National Laboratory in the United States offers a promising solution to this challenge. The research led by Tongchao Liu, an assistant chemist at the laboratory, has resulted in the creation of electric car batteries that not only last three times longer but also come at a significantly reduced cost.

Battery life in electric vehicles has long been a concern, with many experts and researchers working tirelessly to address this issue. Liu's research has shed light on a previously contentious topic – the primary cause of battery failure. Through meticulous experimentation and innovative thinking, Liu has determined that a significant portion of lithium battery defects are concentrated at the cathode, where electric current exits the battery.

The cathode, a critical component in any battery, experiences expansion and contraction during each charging cycle. This physical stress leads to wear and tear, ultimately reducing the overall lifespan of the battery. In response to this problem, Tongchao Liu and his team have engineered a groundbreaking solution by introducing a new cathode structure based on perovskite.

The introduction of perovskite in the cathode structure marks a pivotal moment in battery technology. This innovative approach has tripled the lifespan of electric vehicle batteries, addressing one of the most significant concerns among EV owners. Furthermore, the manufacturing costs have been reduced by a substantial 25%, making EVs more cost-effective and accessible to a wider range of consumers.

Perovskite, a versatile and promising material, has also recently gained attention for its applications in solar cell technology. Researchers have successfully incorporated perovskite in the development of solar cells, demonstrating its potential to revolutionize the renewable energy sector.

One of the most remarkable aspects of this breakthrough is its environmental impact. The utilization of perovskite eliminates the need for cobalt, a mineral that has long been associated with severe environmental and human rights issues. Cobalt mining has been linked to soil contamination, depriving farmers of their livelihoods, and causing severe health problems for those living in mining regions due to exposure to dust and pollutants. Furthermore, the radioactivity of cobalt is a significant concern for miners in countries such as the Democratic Republic of Congo and Russia, where most of the world's cobalt is sourced.

In addition to the environmental benefits, the reduction in cobalt dependency is expected to have positive socio-economic ramifications. Workers in cobalt mines, especially in the Democratic Republic of Congo and Russia, have historically been vulnerable to exploitation and unsafe working conditions. The shift away from cobalt-based batteries represents a significant step toward a more ethical and sustainable battery production process.

While the innovative electric vehicle batteries

developed by Tongchao Liu and his team are not yet market-ready, they have already piqued the interest of several companies in the automotive and renewable energy sectors. These batteries promise to make electric vehicles more accessible and cost-effective, potentially accelerating the global transition to sustainable transportation.

Tongchao Liu's remarkable work in battery technology has not gone unnoticed by the scientific community. The MIT Technology Review has recognized his contributions by including him in their prestigious «35 Innovators under 35» list for 2023. This recognition underscores the significance of his research and its potential to revolutionize the electric vehicle and renewable energy industries.

In the long-term, Liu's vision extends beyond simply extending battery lifespan; he aspires to create batteries that are entirely resistant to physical strain, further enhancing the reliability and durability of electric vehicles. This ambitious goal holds the promise of reshaping the future of transportation and energy storage.

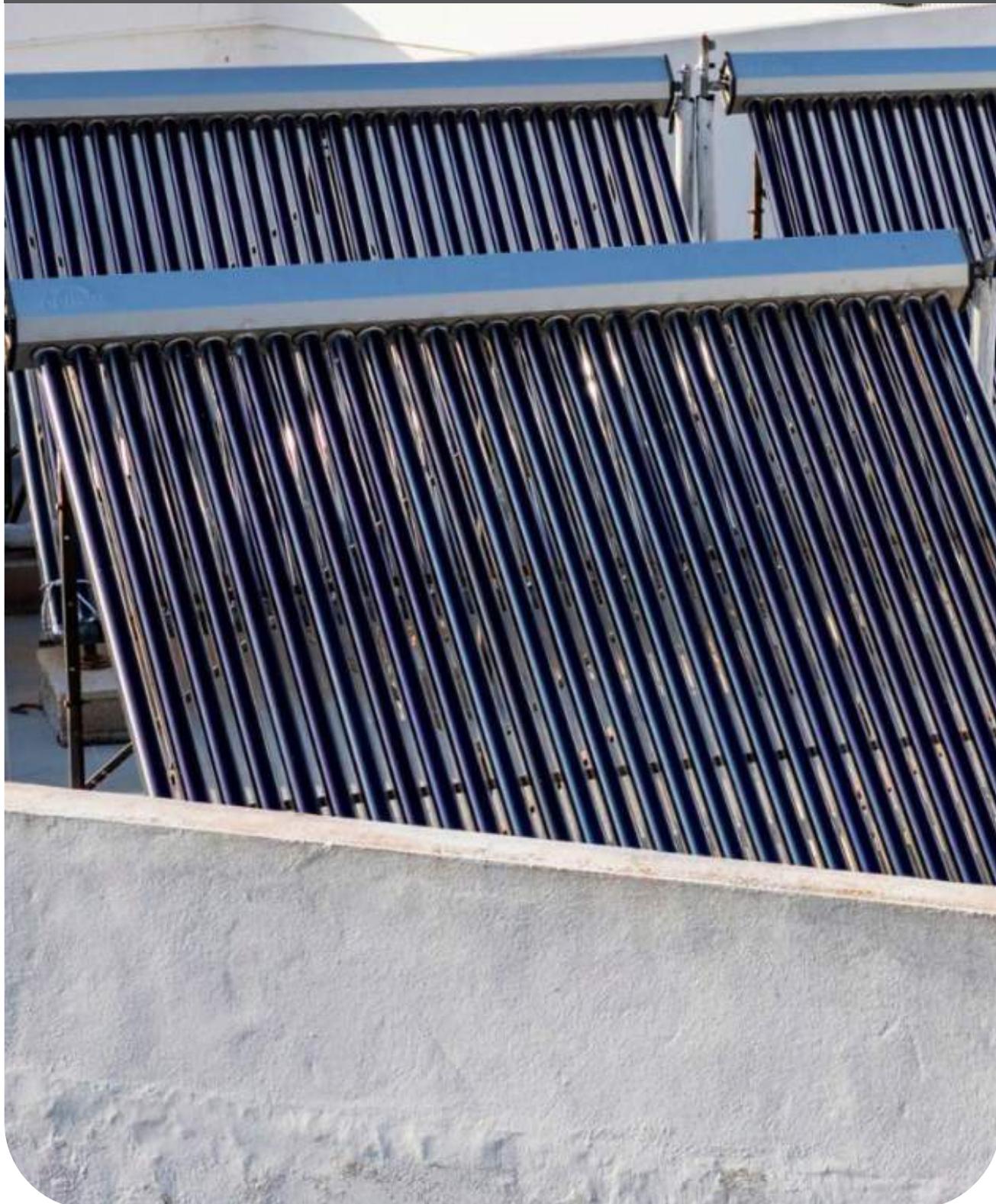
In conclusion, the development of electric car batteries with tripled lifespans and reduced manufacturing costs represents a significant leap forward in sustainable transportation and renewable energy. The groundbreaking work at Argonne National Laboratory, led by Tongchao Liu, has not only addressed the critical issue of battery longevity but has also taken significant steps toward reducing environmental and socio-economic challenges associated with battery production. While the market-readiness of these batteries remains on the horizon, the interest from various industries and the recognition from esteemed publications indicate a bright future for this innovative technology. Tongchao Liu's inclusion in the «35 Innovators under 35» list further emphasizes the potential impact of his research, fueling hope for a more sustainable and efficient future in electric transportation and renewable energy.

Nicole Dominikowski

<https://www.notebookcheck.net/>

Products

20 Solar Water Heaters



Industrial Solar Water Heaters Have Become An Important Part Of The Industries As The Government Eco-System Compliance Policies Are Implemented



The global industrial solar water heaters market is likely to accumulate a market value of US\$ 791.8 Million in 2022 and is expected to accumulate a market value of US\$ 1,138.9 Million by registering a CAGR of 3.7% in the forecast period 2022 to 2032. The growth of the industrial solar water heaters market can be attributed to the increasing demand for the same from end-user industries and commercial sectors. The market for industrial solar water heaters registered a CAGR of 3.1% in the historical period 2016 to 2021.

Industrial solar water heaters have become an important part of the industries as the government eco-system compliance policies are implemented. Industry owners adopt these solar water heaters systems to limit commercial emissions. The commercial solar water heating system holds high performance and low cost, making it the first choice for small and mid-range industries.

Hospitals, hotels, hostels, and commercial spaces have also adopted solar-based energy systems. These systems all together help in cleaning the environment.

The trend of applying new elements in solar water heaters, such as inbuilt electric power back-up, aluminum reflectors, and glass wool insulation.

Governments around the world have started providing subsidies and tax cuts for industries that adopt solar energy alternatives, such as industrial solar water heaters.

Regional Landscape

Europe holds the highest market share of 24% due to the higher industrialization and urbanization, while dynamic weather pushes people to adopt new alternative fuel technologies.

Countries like India, China, and other Asian countries have started implementing alternative energy resources in different sectors. An international solar alliance led by India has signed treaties among the 75 signatory countries across the globe to reduce emission levels while promoting higher adoption of solar technology, including industrial solar water heaters. Hence, Asia Pacific is likely to hold a 21% market share of the industrial solar water heaters market.

Another factor that fuels the sales of industrial solar water heaters is the rising construction industry.

Developed countries like the US and Canada also have seen an increase in the adoption of solar technology. New companies launching solar technology that integrates with the existing systems have also helped the infrastructure. Hence, witnessing a growth of 18% market share.

The Paris Declaration & ISA

The Paris Declaration has established the International Solar Alliance (ISA) states that the countries share the collective approach to undertake innovative and concerted efforts to reduce the cost of finance and technology for the deployment of solar generation assets. This is expected to push the sales of solar products such as water heaters.

Industrial solar water heaters are heating equipment powered by solar cells which in turn is used for applications such as heating of water, space heating, and industrial process such as obtaining hot water, or preheating steam before it enters the industrial boilers. The primary source of energy is solar energy which can be utilized for various industrial applications.

Industrial solar water heaters are increasingly finding applications in commercial uses for hospitals, laundries, schools, breweries, and process heat in various end-use industries such as automotive, petrochemical, construction, etc.

Solar water heaters for industrial applications are more complex and operate at a higher efficiency as compared to residential applications. These systems require comprehensive design and to be installed for optimal performance.

Important factors such as the flow rates, hydraulic configuration, control system, and collector arrangement are considered accurate for the design and installation of industrial solar water heaters. The market for the industrial water heater is estimated to grow with a positive impact as there is no requirement for fuel for the production of energy.

Which are Some Prominent Drivers of Industrial Solar Water Heaters Market?

Currently, manufacturers of industrial solar water heaters have been focusing aggressively on innovative product developments to develop and launch new industrial solar water heaters that

are strong and provide proper output heat with a minimum amount of energy from the sun.

It should be noted that the demand for new heating applications in various end-use industries such as automotive, petrochemical, construction, paints & coating, etc. is one the prominent driving factor for the global market. This increase in demand for heating with solar applications will, in turn, fuel the global demand for Industrial Solar Water Heaters in the future.

In developed economies, industries are looking for solar heating equipment equipped with advanced diagnosis and automation. Through research, development, and innovations in advanced automation systems, manufacturers have significantly improved their reaction time for such custom requirements from various consumers. This trend is anticipated to boost the global market and create vast opportunities over the forecast period.

Market Competition

Key players in the industrial solar water heaters market are ATR SOLAR, SunEarth, Racold, Heliodyne, Inc., Alternate Energy Technologies, LLC, Excel Innovations Private Limited, Apricus Solar Co. Ltd, Chandrlok International, SunMaxx Solar, Greentek India Pvt. Ltd, SUNPEAK USA Inc., and American Water Heaters.

In January 2022, SunEarth partnered with Nyle Water Heating System to launch a scalable water series for the commercial sector. Leveraging solar water heating and heat pump efficiencies allow SunEarth's scalable Solar Series Heat Pump Water Heater to provide up to a 90% reduction in system operation cost over historical water heating solutions.

In November 2020, Indian company Racold introduced the #DontBeAHeaterHitesh digital marketing campaign for promoting its Omnis product range. The campaign was conceptualized by WATConsultant. It consists of two films promoting the Omnis Lux Plus and Omnis Wi-Fi water heaters. The former is endowed with a unique Silver Ion Technology which prevents bacteria proliferation, while the latter comprises an intelligent 'Smart Bath Logic' function for customizing bathing requirements.

Future Market Insights

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Tesla Solar Roof

Tesla Solar Roof will replace your existing roof. You get a tough skin for the top of your house that produces power and retains a sleek look, unmarred by big, clunky panels mounted on top of it.

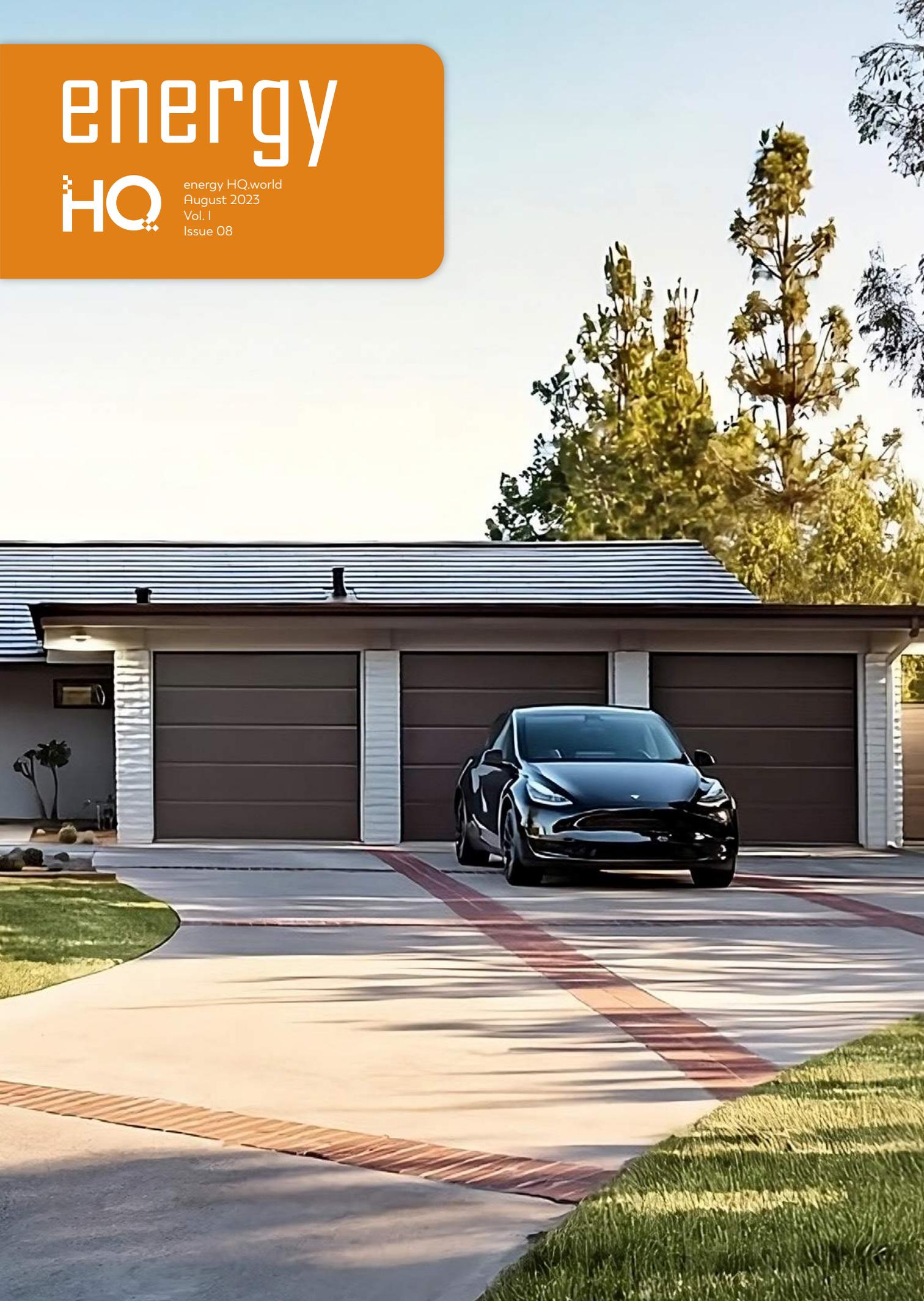
Tesla's Solar Roof is made up of smaller solar shingles and matching blank ones. The solar shingles are shaped somewhat like conventional roofing shingles but consist of photovoltaic cells. The Tesla Solar Roof is integrated into your roof.



energy

HQ

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August 2023
Vol. 1
Issue 08



Services

26 Ventilation



health HQ

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Vitamins and minerals make up essential parts of your diet



Vitamins and minerals work together to support the cellular metabolism



Vitamins and minerals also offer health benefits because of their ability to maintain tissue strength



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There are a total of 13 vitamins that are divided into two categories based on how your body absorbs them.



Vitamin A, K and E are stored in your liver and vitamin D is stored in your fat and muscle tissues.



The power of demand-controlled ventilation and smart technology for more energy efficient buildings



The UK construction industry is in the midst of a groundbreaking transformation fuelled by efficiency, sustainability and decarbonisation. This sweeping change is in perfect sync with the industry's mission to attain net zero objectives by 2050 - igniting an intense scrutiny of every system installed within a building's fabric, leaving no room for under-performance.

As energy costs surge higher and emissions regulations grow ever more stringent, a seismic shift is underway in building construction. These developments are creating a pressing need for substantial improvements in the calibre of our constructed spaces and, unsurprisingly, digitisation and innovative technology is leading the way.

But despite these improvements, around 80% of existing buildings adhere to outdated construction regulations. Astonishingly, only one in five buildings has adopted a Building Management System (BMS) to regulate and oversee their inner workings. Consequently, most commercial buildings right now operate at a mere Class C energy efficiency level.

2050 targets

A critical part of achieving our 2050 targets will be renovating and retrofitting these older structures. The incorporation of advanced controls as part of the BMS could prove pivotal in unlocking superior building performance. Building regulations, Part L (Conservation of Fuel and Power) and Part F (Means of Ventilation), have established stringent

standards for buildings and infrastructure, aimed at ensuring both existing and new structures are energy-efficient and environmentally responsible. However, addressing efficiency challenges in older operational buildings is a complex challenge, with issues ranging from overheating to ventilation effectiveness and heat retention.

When it comes to the balance between energy efficiency and air quality, the majority of buildings in the UK rely on natural ventilation through high levels of air permeability. Yet the strive for more airtight properties means that building developers must carefully specify natural and background ventilation methods to provide adequate levels of air movement throughout the building.

However, if ventilation cannot be achieved to standard through these methods, a continuous mechanical extract ventilation system needs to be installed. When fitted and then controlled through the BMS of a building using current sensor technology, these systems can provide increased savings in energy and costs.

The switch to on-demand

Energy loss due to ventilation accounts for approximately one fifth of space-heating energy demand in an older, poorly insulated building, whilst in a new, energy-efficient building, the high insulation levels mean that the proportion of space-heating demand due to ventilation increases to around a third. However, natural air infiltration alone can result at times in too little ventilation.

This can lead to poor indoor air quality and other, more readily visible impacts such as condensation and mould on indoor surfaces. Therefore, the objective of a good ventilation strategy is to provide a balance between energy efficiency and indoor air quality.

Approved Document L

Approved Document Part L has been designed to accelerate progress toward net zero carbon buildings. It introduces higher performance benchmarks and places greater emphasis on low carbon heating systems. Additionally, the regulations stipulate that building services systems must incorporate suitable controls to achieve reasonable energy efficiency standards during usage.

Under these regulations, building systems are expected to respond to the specific energy requirements of the spaces they serve. Each space is treated as an individual control zone, equipped with independent timing and temperature control and, when applicable, ventilation and air recirculation rate control.

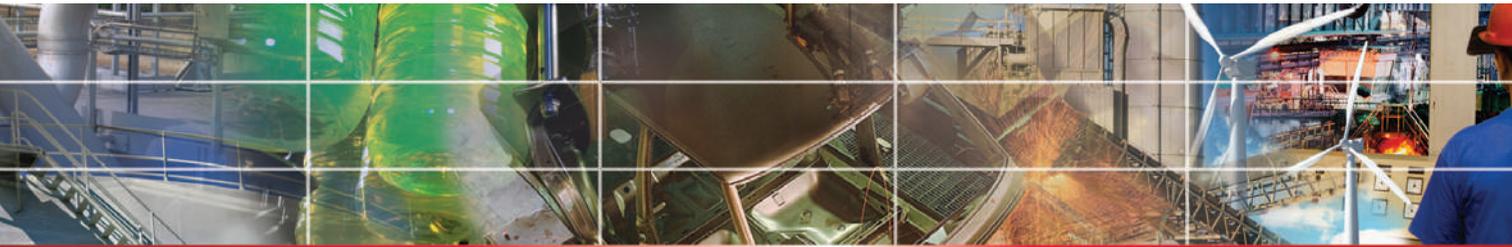
Wasted energy

Most traditional ventilation systems are mechanical and not connected to the Building

Management System. They are either on or off, or work from timer controls to adapt the air flow into the building. This is problematic for two reasons; first, if the system is turned off, say at the weekend in an office space, air pollutants build up over time and the system must work harder when switched back on to purge and replenish the air within the building. And secondly, timed ventilation controls don't adapt to fluctuating building occupation. For example; if staff work from home during the week and the building is only half occupied, the system is still running at full power and wasting energy and money.

Modern ventilation method

The installation of Demand Control Ventilation (DCV), mapped into the Building Management System is now being hailed as the modern ventilation method. DCV doesn't just outperform traditional commercial ventilation systems; it completely redefines the game. DCV systems employ a sophisticated array of sensors capable of monitoring an array of environmental variables within a building - think humidity, temperature, carbon monoxide, carbon dioxide, motion detection etc. The objective is clear; ensure that the ventilation airflow rate is always in perfect sync with the building's real-time demands.



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Cover Story

29 Innovative Power Solutions



How Energy Industry Trends Are Driving Innovative Power Solutions



The energy sector is undergoing a paradigm shift as the world clamors for more environmentally friendly energy solutions — and with it, the need to develop innovative power products.

“11% is expected growth in solar and wind energy consumption during 2023.”

Economist Intelligence

However, it is essential to acknowledge that while these innovations may have some differences, they all share a common goal — prioritizing sustainability and increasing our reliance on renewable energy sources. ELEKS’ Head of Product Design Office, Oleg Slyusarchuk shared his expert opinion on the main trends that are driving the development of sustainability-driven digital products for the energy sector.

In this ever-changing landscape, the energy industry is undergoing a remarkable transformation driven by the growing importance of sustainability. Technological advancements have already revamped many facets of the energy sector, from production to transmission and storage. The mere presence of smart grids, energy-efficient appliances and other innovative energy solutions is invaluable.

1. Renewable Energy Revolution

The world is undergoing a renewable energy revolution, and it’s time to embrace this change. With the increasing demand for energy and the growing concerns about climate change, green energy sources such as solar, wind, and hydropower are becoming more popular.

Harnessing the power of renewable energy revolves

around a fundamental principle — tapping into an endless supply of natural resources within our environment and converting them into practical electricity or sustainable fuels. In this pivotal endeavor, product design assumes a crucial role, driving the creation of groundbreaking solutions to capture, store, and effectively harness renewable energy.

As consumer demand for sustainable energy sources like solar and wind power continues to rise, energy companies find themselves at a pivotal juncture to proactively meet this demand. They have an opportunity to embrace renewable energy themselves and provide customers with renewable energy choices. These options can encompass community solar initiatives and eco-friendly energy tariffs, empowering consumers to participate in the clean energy movement.

Moreover, individuals are increasingly interested in generating power through Distributed Energy Resources (DERs) like solar panels and energy storage systems. By offering DER solutions and services such as net metering and virtual power plants, energy companies can effectively cater to this growing preference for decentralized energy generation and consumption.

With an array of innovative technologies available to generate power from renewables, this trend has become one of the most significant developments within the energy industry today, and many governments, companies and individuals are already reaping its benefits.

Renewable Energy: Real-life Applications

With the help of the European Union, small and medium enterprises in Kosovo have embraced the promising realm of renewable energy, reaping remarkable rewards. For instance, Forma SHPK, a medium-sized enterprise specializing in plastic product manufacturing, made a strategic investment in solar panels. The outcome has been twofold: a substantial reduction in energy expenses and a significant stride towards environmental preservation. Forma SHPK successfully installed a robust 112kWp solar panel system, resulting in an impressive 80% reduction in energy costs.

2. Energy storage transformation

While renewable energy sources offer immense benefits, they often face a significant challenge: maintaining a consistent output throughout the year. Solar panels excel in sun-drenched regions but cannot generate power at night or during cloudy days. Similarly, wind power can be a potent source of electricity, but it relies on the whims of the wind. Recognizing this, the renewable energy sector has embraced a crucial trend: finding innovative ways to store surplus power when production conditions are optimal.

Storage projects in power applications primarily aim to accumulate excess renewable energy

and unleash it when needed. This stored energy is pivotal in alleviating grid strain during peak periods while empowering prosumers to profit from expensive energy purchases.

Energy storage technologies, including batteries and pumped hydro storage, are increasingly vital in shifting toward customer-centric energy ecosystems. Energy storage enhances resilience by effectively balancing the grid and providing backup power during outages. Furthermore, it enables customers to store energy generated from their own distributed energy resources, harnessing it at their convenience.

Many companies have entered the energy storage market diligently working to address the energy storage challenge.

Energy storage: real-life implementations

By leveraging the intermittent power generated by renewable sources like solar and wind, Energy Vault's, a Swiss startup, the innovative solution ensures a consistent supply of baseload power around the clock. Inspired by the proven concept of pumped-storage plants, their system harnesses the power of gravity and the movement of water to deliver unparalleled performance.

Another example is STOREH Energy Storage Technologies' solution, that revolves around a hydrogen on-demand (HOD) system. Setting itself apart from conventional methods, this innovative system eliminates the need for compressors and tanks by producing hydrogen precisely when needed. Furthermore, STOREH's storage solution employs natural and environmentally friendly materials like zinc and water.

3. Digitalization Revamping Energy Industry

The imperative of digital transformation reverberates across industries, with the energy industry no exception. As the array of energy sources expands, managing such a dynamic system requires highly sophisticated automation and analytics. Supporting technologies, including predictive artificial intelligence, machine learning, the Internet of Things, and blockchain, play a pivotal role in studying demand patterns and dynamically adjusting power allocation across distributed grids. The power of digitalization and data analytics takes center stage in the seamless integration of distributed energy resources and energy storage into the grid. By harnessing these transformative technologies, customers can access real-time information about their energy usage and associated costs. Thus, customers can make informed decisions about their energy consumption, optimizing efficiency and cost-effectiveness. Simultaneously, utilities benefit from the ability to effectively manage the grid, promptly responding to fluctuations in supply and demand. This synergy of digitalization and data analytics empowers customers and utilities to navigate the energy landscape with precision, ensuring a harmonious and dynamic energy ecosystem.

At the forefront of this digital revolution, smart grid infrastructure is a prominent trend in the energy industry. Smart grids leverage advanced sensors

and automation systems to enhance efficiency and curtail power wastage within distribution networks. This empowers utilities to optimize resource management, bolstering reliability by mitigating issues like overloaded circuits or equipment failures, thus minimizing outages.

In technological advancements, autonomous energy systems are poised to gain significant traction in the coming years, primarily fueled by strides in AI and ML. These innovative systems enable utilities to monitor their operations autonomously, identifying areas for improvement and optimizing performance with minimal reliance on manual intervention from on-site operators and technicians. This pioneering shift towards autonomy promises enhanced operational efficacy and streamlined maintenance processes.

Digitalization in energy industry: real-life solutions ELEKS developed a digital solution, DAKAR, for real-time power systems management within power networks. This solution empowers organizations with automated system stability analysis and optimized load flow calculations, resulting in unparalleled operational efficiency. By centralizing data storage and equipping users with specialized data management tools.

DAKAR's impact extends beyond the realm of efficiency as well. During times of adversity, such as constant missile attacks on the electric power system in Ukraine, DAKAR played a pivotal role. By modelling the optimal plan to power critical infrastructure, it skillfully balanced reduced power generation and current consumption, creating a schedule for emergency shutdowns. This critical functionality helped maintain the stability of the power system, safeguarding essential services even in the face of imminent threats.

Conclusions

The energy industry is undergoing a remarkable transformation driven by the need for sustainability and the increasing demand for environmentally friendly energy solutions. Technological advancements have revolutionized various aspects of the energy sector, developing innovative power products. These products prioritize sustainability and rely on renewable energy sources, aligning with the global movement towards a more sustainable future.

Renewable energy, innovative energy storage solutions and digitalization are among key trends shaping the energy industry. Real-life examples illustrate the successful implementation of these trends. From medium-sized enterprises in Kosovo adopting solar panels and reducing energy costs to Swiss startup Energy Vault's innovative solution for consistent baseload power, there are tangible benefits to embracing renewable energy and energy storage. The impact of digitalization is evident through software solutions like DAKAR, which revolutionize power systems management and ensure operational efficiency and stability.

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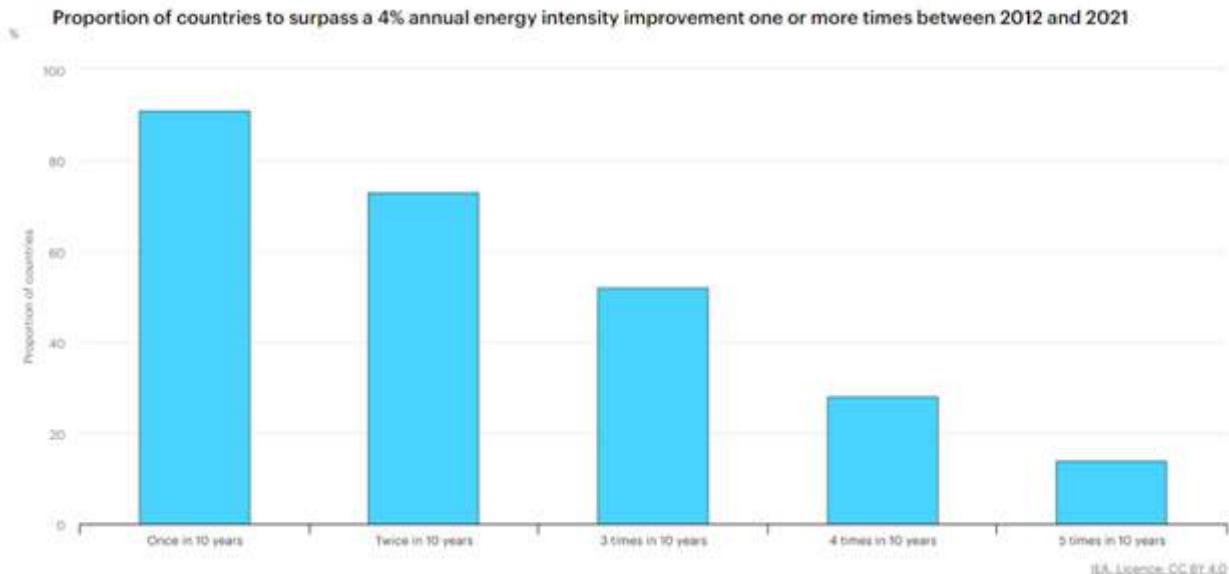
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Technology

32 Energy-Efficient Integrations



Annual Energy Efficiency improvements must double to meet climate targets. We know how to do it



Global energy intensity – a measure of how efficiently the global economy uses energy – improved by just over 2% in 2022. That needs to double to 4% annually to 2030 to meet global efficiency targets, explains Brian Motherway at the IEA. If achieved, by 2030 one unit of energy used will generate 40% more economic output than today. That’s huge, and shows why few other policy areas offer such widespread benefits.

More than half of the 150 countries analysed by the IEA hit a 4% improvement at least three times in the last decade. So we are tantalisingly close. Five G20 countries – China, France, Indonesia, Japan and the UK – have in recent years managed to sustain an average of 4% or more over a five-year period. The IEA’s Energy Efficiency Policy Toolkit can guide governments to take the necessary steps, says Motherway. We know what to do, and have the technologies in the key areas like air conditioners, lighting, building codes, car fuel economy, electric motors and heavy industry. Now is the time for the right policies, support and incentives to be put in place.

Governments at COP28 should build on this year’s momentum and commit to doubling energy

efficiency improvements

The updated Net Zero Roadmap from the International Energy Agency (IEA) shows that while the path to limiting global warming to 1.5 °C has narrowed, it is still achievable – if governments build on strong growth in clean energy technologies such as solar PV and electric vehicles with even greater ambition. However, the next few years are critical. Without decisive action this decade, the window will close, and the world will be locked into even more dangerous impacts from climate change.

With the United Nations Climate Change Conference (COP28) in Dubai just weeks away, the IEA has identified actions that are essential to ensure the 1.5 °C goal stays within reach. This includes a tripling of renewable energy capacity by 2030 and an orderly decline in the use of fossil fuels. Also crucial is doubling the rate of energy efficiency progress this decade.

Many political leaders have already shown support for a target to double efficiency. In June, 46 governments agreed to work together towards this goal in the Versailles Statement released at the IEA’s 8th Annual Global Conference on Energy

Efficiency. Prioritising “two and three” – doubling energy efficiency progress and tripling renewable capacity by 2030 – was also discussed at this year’s G7 and G20 meetings. European Commission President Ursula von der Leyen has proposed “an initiative to work towards global targets for energy efficiency and renewable energy,” noting they could be developed by COP28 “together with organisations like the IEA.”

The key now is to ensure energy efficiency stays high on the agenda, building consensus towards stronger global commitments and action.

Doubling energy efficiency improvements means stronger policies and actions that improve people’s lives

The IEA’s Net Zero Roadmap shows what must happen by 2030 if governments are serious about achieving net zero emissions by mid-century and limiting global warming to 1.5 °C. The goals of doubling energy efficiency progress and tripling renewable capacity, alongside a 75% cut in energy sector methane emissions and a massive ramp-up in the electrification of heating and transport, would together account for 80% of emissions reductions needed this decade to meet the 2050 target.

During the global energy crisis that followed Russia’s invasion of Ukraine, energy efficiency gained fresh recognition as a mechanism to simultaneously address energy security, energy affordability and climate change. Measures to promote energy efficiency and incentives for efficient technology were a strong part of the policy and legislative response. In fact, IEA analysis shows that new or strengthened efficiency measures were introduced in countries representing over 70% of the global economy. As a result, the world has seen record investment in energy efficiency, while consumer interest in reducing energy use is higher than ever.

Due to these measures, global energy intensity – a measure of how efficiently the global economy uses energy – improved by just over 2% in 2022. This means that a unit of energy consumed in 2022 generated 2% more economic output than it did in 2021. At more than twice the improvement rate of the previous four years, this was a welcome step.

However, doubling energy efficiency progress going forward means increasing this rate of improvement twofold, to just over 4% on average every year between now and 2030. This would mean that in 2030, one unit of energy used will generate 40% more economic output.

Few other policy areas offer such widespread benefits

The potential payoff is enormous. Achieving this target would lead to energy savings in 2030 equivalent to all the oil that the global road transport sector consumed in 2022. Key actions to double efficiency progress – namely improvement in the technical efficiency of buildings and equipment, material efficiency, behavioural changes, and greater electrification – reduce emissions by more than 7 Gt in 2030 in the IEA’s net zero scenario, accounting for nearly half of all reductions achieved that year.

Wasting less energy also results in a smaller energy system that requires less physical infrastructure. Doubling would therefore provide substantial cost savings to industry and governments. Consumers also reap the benefits of improved efficiency, including healthier, more comfortable homes and workplaces, lower energy bills and more breathable air. Moreover, doubling would result in the creation of over 3 million jobs, with more workers needed to help retrofit buildings and install energy-saving technologies.

Doubling progress is difficult – but it can be done

Doubling efficiency progress is a challenge that requires a global step change in ambition. But many governments have set a precedent. In fact, of 150 countries analysed by the IEA, almost all (91%) improved their energy intensity by 4% or more at least one year in the past ten. More than half (52%) did so at least three times. The challenging task ahead for governments, however, is to meet this benchmark consistently for almost a decade. Five G20 countries – China, France, Indonesia, Japan and the United Kingdom – have in recent years managed to sustain an average of 4% or more over a five-year period.

[Brian Motherway](#)
[Head of Energy Efficiency and Inclusive Transitions Office at the IEA](#)
[IEA Newsroom](#)

Country Reports

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Mitsubishi Power signs upgrade and reliability agreement extension for Egyptian power plants



The signing ceremony took place at the St Regis Almasa Hotel in Egypt's New Administrative Capital. (Image source: Mitsubishi Power)

Mitsubishi Power, a power solution brand of Mitsubishi Heavy Industries, has signed a contract agreement with the Egyptian Ministry of Electricity and Renewable Energy, to upgrade the Sidi Krir and El-Atf power plants.

This JICA-financed agreement follows the successful ongoing execution of a long-term service agreement signed in May 2021 for six M701F Gas Turbines at Cairo North, Sidi Krir and El-Atf power plants. This extended the power plants' lifespan, improved power supply stability, reduced maintenance downtime and costs, and positively contribute to recovering performance, resulting in fuel savings and lessening the effects of climate change.

Mohamed Shaker, Egyptian Minister of Electricity and Renewable Energy, remarked, "Egypt and Japan celebrate strong bilateral relations across multiple sectors. Our longstanding partnerships have not only strengthened bonds of friendship and alliance, but have propelled growth, particularly in the power and critical infrastructure sectors; thus, contributing to the socio-economic development of our nation. Our partnership with Mitsubishi Power enables us to harness the power of innovation, technology, and expertise of our Japanese partners to enhance power generation and efficiency to ensure energy security and availability to power Egypt's growing demand for electricity."

Javier Cavada, president and CEO of Europe, Middle East and Africa at Mitsubishi Power, added,

"We are proud to be here today with our Egyptian partners to celebrate the success and continuation of our collaboration to support the critical power sector in Egypt, which is a pillar of the country's economic development. This latest agreement harnesses Mitsubishi Power's heritage in Egypt, built on delivering our industry-leading, reliable technology and service excellence and ensure the availability of power for the people of Egypt."

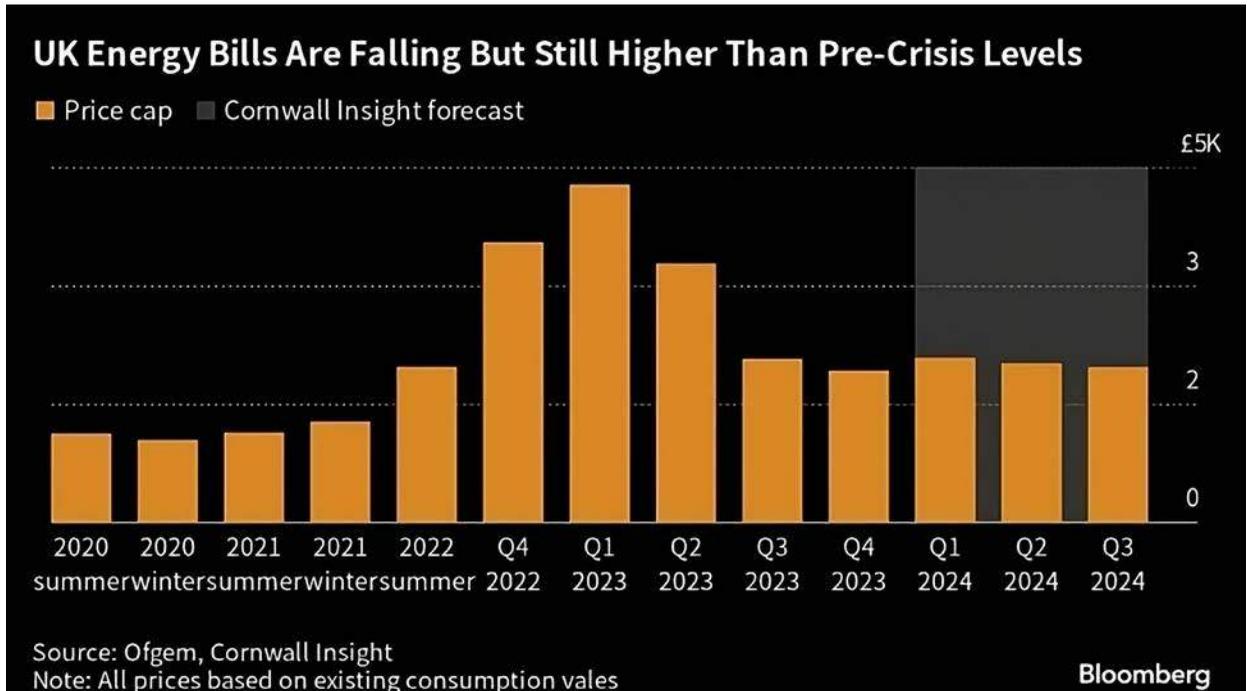
"We are committed to continue supporting the growth and advancement of Egypt's energy sector, as it pursues its ambitious energy transition and fulfil its vision to build a hydrogen ecosystem and regional decarbonisation hub, with our cutting-edge and comprehensive carbon neutral technologies."

Kato Ken, JICA chief representative Egypt office, said, "Relations between JICA and the Government of Egypt have strengthened in recent years, and we have made significant progress towards expanding cooperation on sustainable development and climate change, particularly in the field of energy. In pursuit of the Paris Agreement and towards the fulfilment of Egypt's Climate Strategy and Nationally determined contributions, this latest project with Mitsubishi Power adds to the successful projects JICA has had with the Government of Egypt, reflecting Japan's continued support for this crucial sector, and the sustainability and reliability of Japanese technology."

Gavin Maguire

<https://www.reuters.com/>

UK Energy Price Cap Falls But Millions Set to See Higher Bills



UK energy bills are set to fall starting October 2023 though millions of households could still face higher costs in the coming months, following the phase-out of government support.

The national price cap will drop 7.3% to £1,923 for the last three months of the year, from £2,074 previously, regulator Ofgem said Friday. The pricing mechanism, set on a quarterly basis, limits how much suppliers can charge per unit of energy. This is the first time the usual energy bill will fall below £2,000 a year since April 2022. Still, as many as 7.2 million households in England could face higher energy bills this winter, with some paying £100 more, the Resolution Foundation said in a study this week. Ofgem is also increasing standing charges for pre-payment meters, to cover the cost of supply connections. The meters are often installed in lower income or vulnerable households. The regulator is changing the way the earnings allowance for suppliers is calculated and that will add about £10 to each household bill, Ofgem said.

Britain remains in the midst of an historic cost-of-living crisis, with consumers having to pay more for everything from food to fuel housing costs. While inflation has eased from the highest level in decades, it's still stubbornly elevated. The Bank of England's chief economist recently warned that rising energy costs could derail efforts to keep overall prices in check.

Ofgem's cap is meant to shield consumers from market volatility, but it effectively became the UK's universal energy rate last year, after Russia's invasion of Ukraine and curtailment of gas supplies triggered a supply crunch.

Bills are "way higher" than pre-crisis levels, Ofgem chief executive officer Jonathan Brearley said on BBC radio. "Many families are struggling, there are alternative options that may adapt better to these volatile prices," he said commenting on a possible scrapping of the cap

in future.

Last winter, the typical annual residential energy bill was around £2,100, as the government's Energy Price Guarantee and £400 rebates benefited consumers, according to the Resolution Foundation. Now that the supply crisis has receded, government aid has been significantly scaled back.

Consumer charity Citizen's Advice is calling on the government to do more to help people from falling into fuel poverty, such as expanding the support that lower-income households are eligible for, like the Warm Home Discount. The group says record numbers of people are seeking help from energy debt, which is now more than £1,700 — a third higher than it was in 2019. Campaigners are also pushing the government to consider subsidizing some households through a social tariff.

"The price cap is no longer fit for propose," Simon Oscroft, Co-Founder of supplier So Energy Trading Ltd said. "In its place we need short term targeted support this winter, but also a more permanent replacement in the form of ongoing targeted support for those customers most in need." For now, lower wholesale energy costs are enabling providers to offer more fixed tariffs for their power bills, allowing some consumers to lock in rates. But prices typically rise during the winter, and gas futures for February are now more than 50% more than the level for October, the start of the heating season. Ofgem's price cap is also expected to rise again at the start of the year.

"While a small decrease in October's bills is to be welcomed, we once again see energy price forecasts far above pre-crisis levels, underscoring the limitations of the price cap as a tool for supporting households with their energy bills," said Craig Lowrey, principal consultant at Cornwall Insight.

By Eamon Akil Farhat, Bloomberg News
<https://www.bnnbloomberg.ca/>

Russia & South Korea Will Provide Uganda's First Nuclear Reactors



Uganda has chosen Russia and South Korea to build two nuclear power stations, president Yoweri Museveni has been quoted as saying.

The state-run Turkish Anadolu news agency said the two new stations would generate a total of over 15,000 MW, but the figure was not confirmed and seems unrealistic. It would involve building around 10 large-scale nuclear reactors.

“The nuclear project comes at a critical time when nations are dealing with how to ensure energy security for socio-economic development,” Museveni recently told a summit in the capital Kampala.

He said negotiations with Russia and South Korea have concluded, but gave no further details. According to the Kampala-based Daily Monitor, no timeline for construction has been set and funding has yet to be secured.

In March 2023, Uganda's energy and minerals minister Ruth Nankabirwa Ssentamu said the country expects to start generating at least 1,000 MW from nuclear power by 2031 as it moves with other sub-Saharan African nations to diversify its sources of electricity and accelerate its energy transition, a key part of its response to climate change. Mrs. Ssentamu said the first nuclear

project, the two-unit Buyende nuclear power station, would be at Buyende, about 150 km north of Kampala.

“Preparation to evaluate the Buyende nuclear power plant site is ongoing to pave the way for the first nuclear power project expected to generate 2,000 MW, with the first 1,000 MW to be connected to the national grid by 2031,” she said.

The Uganda Media Center, the government's official news outlet, has said Uganda is taking “firm steps” to integrate nuclear energy into the electricity generation mix to ensure energy security and provide sufficient electricity for industrialization. It said six other sub-Saharan African countries have committed to having nuclear as part of their energy mix between 2030 and 2037. They are Ghana, Nigeria, Sudan, Rwanda, Kenya and Zambia.

The only commercial power station in Africa is the two-unit Koeberg near Cape Town, South Africa. Russia is helping Egypt build a four-unit station at El-Dabaa. Electricity demand in Uganda, a country of 43 million people, has increased significantly in recent years in line with its growing economy.

By David Dalton
<https://www.nucnet.org/>

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39 Events



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7th Caribbean Infrastructure Forum

RITZ-CARLTON COCONUT GROVE, MIAMI FLORIDA
18 - 19 Sep 2023

<https://newenergyevents.com/>

At CARIF 2023, we will present and explore a multi-sectoral view of the opportunities to invest in and develop resilient and sustainable infrastructure. What are the infrastructure priorities of island governments and are they being effectively implemented? Is there sufficient incentive and access for private sector sponsors and financiers to support the project pipeline?

Energy, Fuels and Decarbonisation Expo (EFD)

Birmingham, UK
13 - 14 Sep 2023

<https://www.resonates.com/>

EFD's two-day trade show will cover energy from secondary materials, technologies, energy management and decarbonisation....

European Battery Raw Materials 2023

Amsterdam, Netherlands
18 - 20 Sept 2023

<https://www.fastmarkets.com/>

Fastmarkets European Battery Raw Materials Conference gives you a front-row seat to access insights and analysis of the battery raw materials market from the leaders and innovators shaping the industry.

Accelerating the transition to a better energy future

P&J Live, Aberdeen, Scotland
05 - 08 Sep 2023

<https://www.offshore-europe.co.uk/>

SPE Offshore Europe is the energy industry's platform for navigating towards a better energy future. Our 50th anniversary event will create a space for collaboration and learning in order to drive the oil and gas sector forward, bringing together the entire energy value chain back to business, face to face.

Women in Hydrogen: Scaling up Clean Energy

United States, FTI Consulting 1166 6th Avenue 15th Floor New York, NY 10036
18 Sept 2023 4:00 pm - 6:00 pm

<https://www.energypolicy.columbia.edu/>

The momentum for clean hydrogen has never been greater. With a landmark U.S. national strategy, policy and funding support in place, what's needed next to ensure the technology's potential is fully realized and meaningful climate, economic and community benefits are delivered?

World Hydropower Congress

Bali
31 Oct - 02 Nov 2023

<https://10times.com/>

The World Hydropower Congress gathers top leaders, innovators, and decision-makers for a virtual summit to prioritize hydropower development. Speakers will emphasize the importance of investing in sustainable...

Minnesota Sustainability Tour

Minnesota (In person & virtual)
07 - 08 Oct 2023

<https://www.cleanenergyresourceteams.org/>

The Minnesota Sustainability Tour, hosted by Minnesota Renewable Energy Society, showcases homes and businesses that feature solar installations, energy storage solutions, water-saving landscapes and much more.

Tanzania Energy Congress

Dar es Salaam, Tanzania
20 - 21 Sept 2023

<https://africa-eu-energy-partnership.org/>

The Tanzania Energy Congress, which is held under the patronage of His Excellency January Makamba, Minister for Energy of the United Republic of Tanzania, will highlight the plans and priorities of the Ministry of Energy with regards to the next strategic steps in both the energy and hydrocarbons sector in Tanzania

Agent

For more information, please contact:

Mrs. Taghreed Mahdi

Administration & Data Officer /Community Officer

T: +961-1-748333 Ext: 271

t.mahdi@1world.xyz

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1W Team** (Email domain is @1world.xyz)**Departments (Personnel) by alphabetical order*i. Accounting & Finance (AF)**

Hala Nizam – Accounting & Finance Officer / Administrative & Data Officer
(accounting@1world.xyz)

ii. Content & Research (CR)

Hassan Mourtada – Content & Research Officer/Community Officer
(content@1world.xyz)

iii. Graphic Design (GD)

Shadi Al Masri – Design Manager
(design@1world.xyz)

iv. Management (MA)

Abdul Rahman Hallak – Administrative & Data Manager (info@1world.xyz)
Mohamad Rabih Chatila – CEO
(info@1world.xyz)

v. Marketing & Sales (MS)

Mrs. Taghreed Mahdi – Administration & Data Officer /Community Officer
(t.mahdi@1world.xyz)

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Courier Address

Hamra, Commodore Area, Barouk St.,
Chatila & Chehab Bldg, 2nd Fl. Beirut -
Lebanon

Postal Address

P.O.Box: 13-5121 Chouran
Postal Code: 1102 2802
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Contact Us

T: +961 (01) 748333
M: +961 (70) 100094
E: info@1world.xyz
W: www.energyHQ.world

The Future of Energy is Distributed: An Increased Role for Microgrids and Virtual Power Plants



The growth of distributed energy resources (DERs), such as solar photovoltaic (PV) panels and battery storage, is accelerating traction for DER aggregation platforms such as microgrids and virtual power plants (VPPs). Though related, these two concepts are distinct. Microgrids are a set of resources located within a confined boundary that leverage onsite generation and storage. They generate electricity when the grid goes down, optimize for energy cost savings or provide electricity to regions where a traditional grid network is not in place, such as Africa, Latin America, and parts of the Asia-Pacific region.

VPPs, on the other hand, are a temporary aggregation of DERs that can help balance the larger grid through demand response or frequency regulation. (For more details on the similarities or differences, see this blog.)

Working together, microgrids and VPPs can help deliver significant synergies to create a more reliable and sustainable electricity infrastructure while also delivering immense economic benefits.

Growth of Microgrids and Virtual Power Plants

The growth of microgrids and VPPs is being driven by several factors, including:

- The increasing and volatile cost of electricity,
- The need to decarbonize the global economy,
- The desire for more energy independence, and
- New technologies that make microgrids and VPPs more efficient and affordable.

As the growth of DERs continues, microgrids and VPPs will play an increasingly important role in delivering essential energy services. These DER portfolios are vital to the world's decarbonization efforts, from energy access for emerging economies to balancing wholesale wind and solar resources in industrialized markets. They can help improve grid reliability, reduce greenhouse gas emissions, and reduce consumers' energy bills.

Flexibility is the Future - A Win-Win!

If combined, microgrids and VPPs can leverage artificial intelligence (AI) and new business models, such as energy-as-a-service (EaaS), to optimize buildings and the surrounding grid network to meet sustainability and economic goals. For example, VPPs could be created by aggregating multiple microgrids, and then those fleets can be tapped as DERs for data to optimize operations for resiliency and environmental benefits.

With the help of AI, the performance of these aggregations will improve over time. Layering VPP optimizations on top of these EaaS microgrids allows end-users to capture new revenue streams from market participation in the form of demand response, frequency regulation, or capacity without the need for heavy upfront capital. Microgrids can also use VPP software to access the grid to supplement their own on-site power generation.

The Distributed Energy Future

In short, in the future the grid will need to be nimble and adjust to constantly shifting supply and demand curves. Power flows will be bidirectional. Rather than top-down, solutions will need to be bottom-up. Flexibility is the buzzword. And both VPPs and microgrids fall under this broad category of resources that stretch across supply, load, and forms of energy storage, including devices such as electric vehicle (EV) charging.

Microgrids and VPPs provide diverse flexibility services separately, but when combined, they offer a compelling value proposition across the new energy landscape. Combining the resiliency now possible with microgrids with the flexibility services embedded in the VPP concept offers an exciting hybrid opportunity for the future.

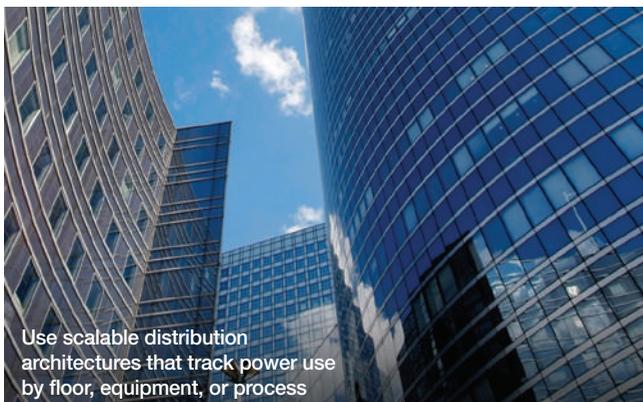
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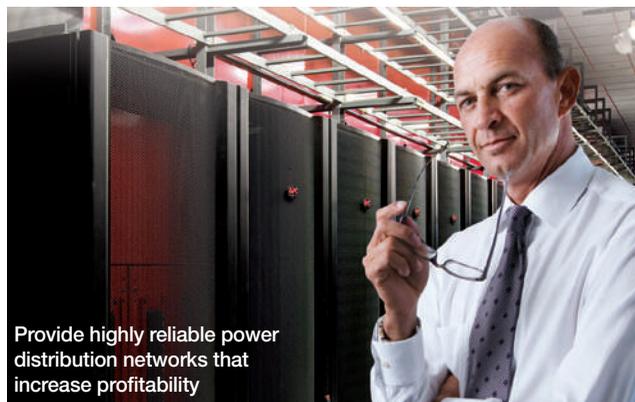
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