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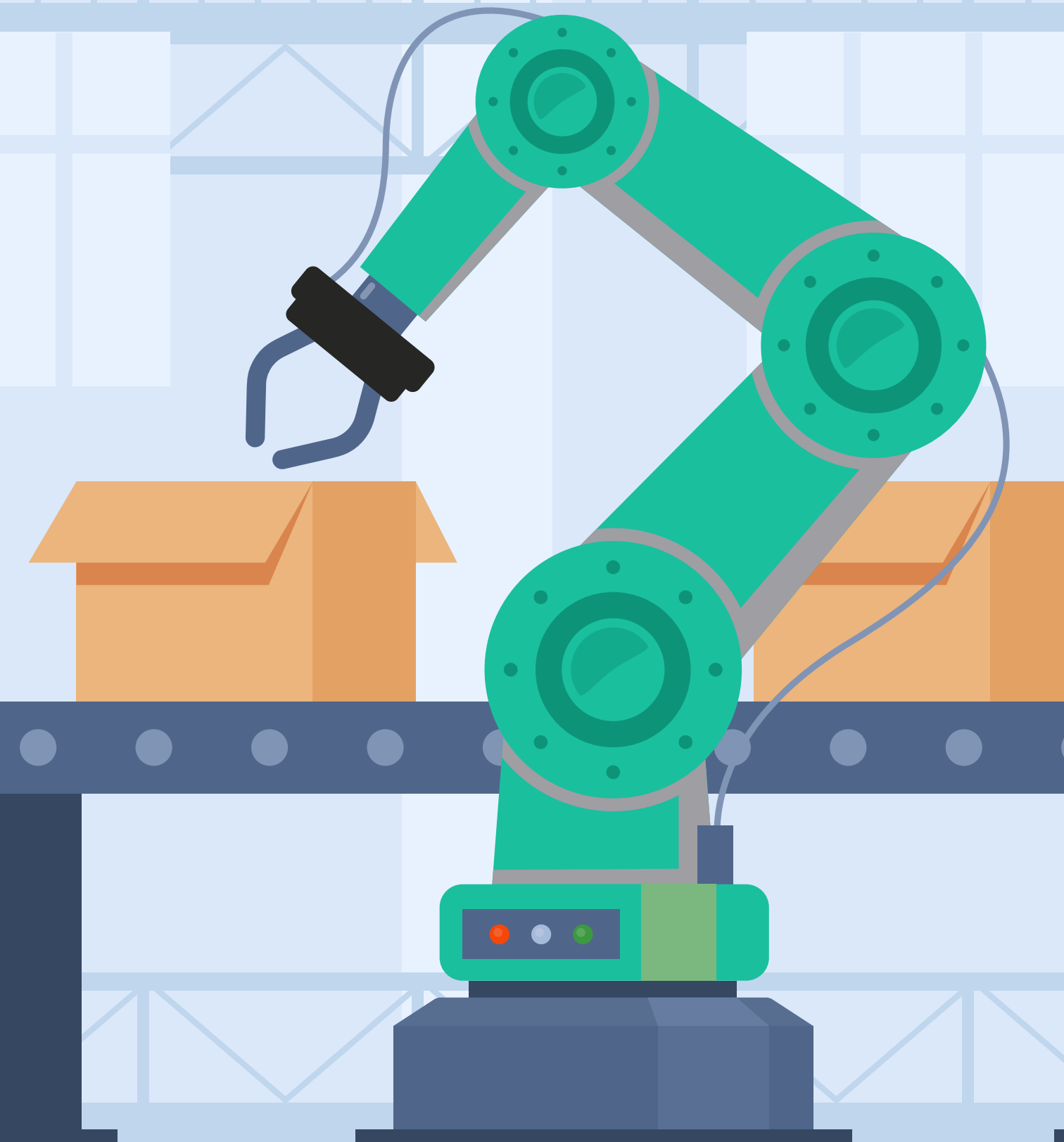
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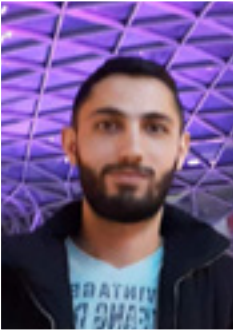
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Food HQ



The Ascendancy of Floating Solar Farms



In the quest for sustainable energy solutions, a novel technology is generating increasing buzz: floating solar farms. These solar panel arrays are built on buoyant structures, transforming reservoirs, lakes, and even oceans into clean energy hubs. This innovation offers a multitude of advantages, propelling its rise as a significant player in the renewable energy landscape.

Land scarcity is a critical challenge for traditional solar installations. Floating farms bypass this obstacle by utilizing underused water surfaces. Additionally, water's cooling effect enhances panel efficiency, particularly in hot climates. Research suggests up to a 10% efficiency boost compared to land-based counterparts. Furthermore, waterborne panels are less susceptible to dust buildup, reducing maintenance requirements.

The environmental benefits of floating solar are equally compelling. By shading reservoirs, they can significantly reduce water evaporation, a major concern in drought-prone areas. Additionally, the panels can create habitat for aquatic life beneath them, fostering a symbiotic relationship with the environment.

The practicality of floating solar is further underscored by its ease of installation and decommissioning. Unlike land-based plants, no permanent alterations are made to the environment. The modular design allows for faster deployment and easier scalability on water bodies.

The global potential for floating solar is vast. China, a leader in the field, boasts the world's largest floating farm, sprawling over 600 hectares. Countries like France, India, and the United States are also embracing this technology, with numerous projects in various stages of development.

As the world strives for a clean energy future, floating solar farms offer a promising solution. Their ability to overcome land constraints, boost efficiency, and minimize environmental impact positions them as a game-changer in the renewable energy sector. The future looks bright for this innovative technology, with its potential rippling across the globe.

In This Issue!

energyHQ's March 2024 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.

Article on page 10 talks about LNG Market Dynamics & Trade

Article on page 17 focuses on Hydrogen Transportation & Infrastructure

Article on page 21 sheds the light on Energetic Transitions

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 & actionable for your business. For any comments, suggestions, or feedback please don't hesitate to contact me.

Best wishes,
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World Energy Digest



BRAZIL



Brazil Surpasses 38 GW Solar Capacity Milestone

Brazil has achieved a significant milestone in the solar energy sector by surpassing 38 gigawatts (GW) of installed solar photovoltaic (PV) capacity. According to data from the local solar association Absolar, solar power now constitutes 16.8% of the country's total power mix, considering both large- and small-scale installations.

The market has seen the installation of 26.3 GW across distributed generation (DG) systems, which involve deploying solar panels on rooftops, facades, and small plots of land. Notably, solar energy is the primary choice for self-consumption systems in Brazil, accounting for 99.9% of all on-site DG arrays in the country. Meanwhile, large-scale solar power plants contribute the remaining 11.7 GW.

The proliferation of solar energy infrastructure in Brazil has attracted investments totaling BRL 184.3 billion (USD 37.1 billion/EUR 34.5 billion) since 2012. This influx of investment has also spurred job creation, with approximately 1.1 million local jobs being generated. Additionally, the adoption of solar energy has had a positive environmental impact, offsetting 46.4 million tonnes of carbon dioxide (CO₂) emissions during electricity generation, as highlighted by Absolar.



UK

Strategic Energy Collaboration Between Saudi Arabia and the UK

In Riyadh, HRH Prince Abdulaziz bin Salman bin Abdulaziz, the Minister of Energy of Saudi Arabia, met with HE Claire Coutinho, the UK's Secretary of State for Energy Security and Net Zero. The discussion revolved around enhancing bilateral ties and exploring collaborative opportunities in energy sectors.

The leaders focused on potential collaborations within the energy sector, building on the existing Memorandum of Cooperation between Saudi Arabia and the UK. They emphasized developing comprehensive clean hydrogen standards with an emphasis on emissions, and discussed policies related to Carbon Capture, Transport, and Storage (CCTS) to promote environmental sustainability.

The meeting also addressed topics like localizing energy components, exchanging knowledge in the energy domain, and formulating regulatory frameworks. The Kingdom showcased proactive efforts to tackle climate change through initiatives like the Saudi Green Initiative, the Middle East Green Initiative, and the Oil Sustainability Program. Both sides expressed keen interest in enhancing collaboration in renewable energy, petrochemicals, power plants, and localizing energy sector components. They envisaged active participation from companies in implementing projects within these sectors, fostering a more sustainable and interconnected energy landscape.

INDIA



India to see investment of \$67 billion in next five to six years in energy sector: PM Modi

Prime Minister Narendra Modi extended an invitation to global stakeholders to participate in India's burgeoning energy sector, emphasizing the country's commitment to expanding its refining capacity and fostering environmentally friendly energy sources. Addressing the second edition of India Energy Week (IEW) in Goa, Modi highlighted India's pivotal role in the global energy landscape as it gears up to become the third-largest economy. With projections indicating a doubling of energy demand by 2045, India is focusing on developing affordable and sustainable energy solutions.

Modi underscored India's achievements in lowering petrol prices and achieving 100% electrification of households, showcasing the nation's capability to influence global energy trends. He announced a substantial investment of approximately \$147 billion in infrastructure development, with a significant portion allocated to the energy sector.

Modi outlined plans to increase the share of domestic gas in the primary energy mix to 15% and highlighted initiatives like the Global BioFuel Alliance and the National Green Hydrogen Mission. Emphasizing India's transition towards renewable energy, Modi urged international investors to explore opportunities in the solar energy value chain.

SPAIN



Spain's Ambitious Investment in Renewable Hydrogen and Energy Transition

Spain has pledged nearly 900 million euros (\$968 million U.S. dollars) to support 10 initiatives focused on renewable hydrogen production, transportation, and advancement. Prime Minister Pedro Sanchez unveiled this commitment during the 27th International Energy and Environment Fair in Madrid, emphasizing the goal of establishing a robust industrial ecosystem across Spain. These projects aim to foster a value chain that revitalizes the nation's industrial sector, Sanchez stated.

He highlighted the growth of electrolyzer manufacturing, renewable hydrogen production, and their pivotal role in decarbonizing manufacturing and transportation sectors. Additionally, Sanchez underscored the potential for exporting these technologies to European nations and beyond.

Sanchez also celebrated the significant job creation within Spain's renewable energy sector, noting that it has already generated over 50,000 jobs in the past five years, with projections indicating the workforce will exceed half a million by 2030.

This transition, he argued, would reduce reliance on fossil fuels, enhance energy autonomy, and mitigate pollution-related health hazards. Recent data indicates that over half of Spain's electricity was sourced from renewables in 2023, resulting in a remarkable 50 percent reduction in CO2 emissions from electricity production compared to 2018, according to official Spanish statistics.

CYPRUS



Cyprus Charts Path to Natural Gas Production and Energy Transformation

Cyprus is poised to enter the natural gas production arena by 2026, a move that could significantly alter its energy profile and provide Southern European nations with an alternative to Russian energy supplies. Commerce, Industry, and Energy Minister George Papanastasiou disclosed plans for the Cronos project, spearheaded by Eni and TotalEnergies, which boasts an estimated gas reserve of 2.5 trillion cubic feet. This initiative is expected to expedite development, with the gas likely destined for Eni's Egyptian facilities. Additionally, Cyprus is eyeing participation in the Great Sea Interconnector, a €1.9 billion EU-funded project designed to link Israel's power grid with that of Europe, with the aim of mitigating the country's notably high electricity prices.

Meanwhile, the Aphrodite field, harboring approximately 3.5 trillion cubic feet of gas, remains a promising venture, albeit subject to ongoing negotiations with a Chevron-led consortium. These strategic endeavors underscore Cyprus' imminent energy transition and its potential to reshape regional dynamics, positioning the island nation as a pivotal player in the broader Mediterranean energy landscape.

EGYPT



Egypt Eyes Power Interconnection with Europe, Targets Renewable Energy Expansion

Egypt's Minister of Electricity and Renewable Energy, Mohamed Shaker, revealed plans on Tuesday for Egypt to establish a power interconnection with Europe, aiming to export electricity to European nations. In a meeting with Gordon Dickie, Chairman of IM Power, discussions revolved around enhancing collaboration between Egypt's energy sector and the British company. Shaker emphasized Egypt's ambition to become a regional energy hub and expressed readiness to cooperate with European partners in constructing a power linkage line.

Acknowledging the significance of renewable energy, particularly wind and solar power, Shaker welcomed collaboration with IM Power in these areas, along with ventures into green hydrogen and the localization of associated industries within Egypt. Egypt has set a target to elevate the contribution of renewable energy to 42 percent of the nation's total power generation by 2030.

Currently, Egypt boasts electricity interconnection lines with Jordan, Sudan, and Libya, and is actively exploring similar initiatives with Saudi Arabia, Greece, Cyprus, and Italy. This strategic move underscores Egypt's commitment to leveraging its energy resources for regional and international cooperation, fostering sustainable development, and meeting growing energy demands both domestically and abroad.

Renewable Energy

07 Geothermal



Unlocking Offshore Geothermal Energy: A Promising Frontier for Clean Power



In the realm of sustainable energy solutions, a groundbreaking revelation has emerged from the recent whitepaper published by CCG, a prominent geoscience technology consultancy. This revelation revolves around the vast potential of offshore geothermal resources hidden beneath the ocean floor. This discovery not only introduces a promising avenue for clean power generation but also serves as a complement to existing renewable sources like solar and wind, addressing the pressing global demand for sustainable energy.

Geothermal energy, derived from the Earth's internal heat, presents itself as a reliable and continuous power source. Unlike intermittent renewables such as solar and wind, geothermal power is available around the

clock, providing a consistent energy supply. Moreover, its manageable infrastructure costs and universal accessibility across diverse geographical regions make it an attractive prospect for widespread adoption.

Traditionally, the geothermal industry has concentrated on harnessing energy from volcanic regions, notably the Indo-Pacific "Ring of Fire," where hot rocks lie closer to the Earth's surface. However, exploration and drilling in these volcanic areas have proven to be costly endeavors, often yielding uncertain results. Consequently, global geothermal production has remained relatively modest, accounting for less than 1% of the world's energy mix.

CCG's recent research has uncovered a

new frontier: the extensive undersea rifts where tectonic plates diverge, known as seafloor spreading zones. Encompassing approximately 65,000 square kilometers, these zones offer a unique opportunity for geothermal development, as they provide consistent access to the Earth's magma. Unlike onshore volcanic regions, success rates in these offshore areas are anticipated to be higher, with more predictable temperatures and benign geothermal fluids.

However, offshore operations present their own set of challenges, including logistical complexities and the distance from existing electrical grids. To address these challenges, CGG proposes innovative solutions. For instance, capturing steam from turbines to produce green hydrogen through electrolysis offers a valuable resource for transportation or industrial use. Additionally, surplus fresh water generated in the process could be efficiently utilized or sold, contributing to resource optimization.

Furthermore, CGG's patent application outlines a comprehensive methodology that integrates geological, geophysical, and engineering technologies to explore and develop offshore geothermal resources efficiently. The company's commitment to facilitating widespread access to this technology underscores its potential to revolutionize the global energy landscape.

While it is premature to assess the Levelized Cost of Energy (LCoE) for offshore geothermal projects, advancements in drilling technology, such as ultra-deep particle beam drilling, hold promise for enhancing their viability. As the demand for clean energy continues to escalate, offshore geothermal energy stands poised to make substantial contributions to the global energy transition.

Despite the considerable potential of geothermal energy, several challenges persist. Location restrictions dictate proximity to tectonic plate boundaries, limiting its applicability in certain areas. Additionally, upfront costs for exploration, drilling, and

power plant construction pose financial hurdles. Environmental concerns regarding gas emissions and water contamination also require careful mitigation strategies.

Nevertheless, the benefits of geothermal energy cannot be understated. Its cleanliness, renewability, and capacity for providing reliable baseload power make it an invaluable asset in the fight against climate change and the pursuit of energy security. Success stories from around the world underscore its potential impact on global energy systems:

- **Iceland:** This island nation harnesses geothermal energy to heat a majority of homes and buildings in its capital, Reykjavik. They've also built geothermal power plants that supply clean electricity to much of the country.
- **The Geysers Geothermal Complex in California:** This massive complex has been operating since 1904 and is the world's largest geothermal facility. It provides a steady source of clean electricity to the Californian grid, regardless of the weather.
- **Oregon Institute of Technology in Klamath Falls, Oregon:** This university utilizes geothermal heating for most of its campus buildings. They have a network of wells that tap into underground reservoirs, providing efficient and sustainable heating throughout the year.
- **Kenya:** The country is a leader in geothermal energy development in Africa. Several geothermal power plants have helped Kenya reduce its dependence on fossil fuels and improve its energy security.

In conclusion, offshore geothermal energy represents a promising frontier in the quest for sustainable power. With continued innovation, strategic investment, and concerted efforts to overcome existing challenges, it has the potential to play a pivotal role in shaping a cleaner and more resilient energy future for generations to come.

Oil & Gas

10 LNG Market Dynamics & Trade



The Evolving Landscape of Global Natural Gas Markets



The global natural gas market is undergoing a profound transformation, propelled by the twin forces of climate change and the transition towards cleaner energy sources. Traditionally, winters have dictated peaks in natural gas demand across the Northern Hemisphere, particularly in Europe. However, the emergence of climate change and advancements in energy technologies are reshaping consumption patterns, with implications extending far beyond regional borders. This article delves into the evolving dynamics of global natural gas markets, examining the impacts of climate change, energy efficiency measures, and the expanding role of renewables.

Climate Change and Winter Gas Demand:

Historically, winter has been synonymous with heightened natural gas demand, driven by the need for heating, industrial processes, and power generation across the Northern Hemisphere. However, climate change is altering this paradigm by raising temperatures and reducing the severity of winters. This shift is evident in Europe, where the number of heating degree days—a proxy for energy needs—has declined significantly over the past few decades.

According to data from the International Energy Agency (IEA), Europe witnessed a 19% decrease in heating degree days from 1979 to 2022, resulting in a notable reduction in winter

gas demand. Similar trends are observed in other regions, such as Japan, which experienced a 14.5% decline in heating degree days from 2000 to 2020. Rising temperatures are expected to continue diminishing winter gas requirements, posing challenges for traditional suppliers and reshaping market dynamics.

Energy Efficiency Measures and Demand Reduction:

In addition to climate change, concerted efforts to enhance energy efficiency are contributing to the decline in winter gas demand. Europe, in particular, has been at the forefront of implementing energy efficiency measures, ranging from building retrofits to the widespread adoption of heat pumps.

Electricity-driven heat pumps, capable of providing both heating and cooling needs, are increasingly replacing traditional heating systems powered by natural gas. The EU witnessed a record three million heat pumps sold in 2022, with projections indicating a significant reduction in natural gas demand by 2030. Similarly, energy efficiency retrofits in buildings are expected to drive substantial declines in gas consumption, further bolstering Europe's transition towards cleaner energy sources.

Renewables and Power Generation:

The expansion of renewable energy sources,



particularly wind power, is also reshaping the winter gas demand landscape. Europe's ambitious targets for wind energy capacity signify a paradigm shift in power generation, with renewables poised to displace traditional fossil fuels.

The EU aims to increase installed wind capacity to 500 gigawatts (GW) by 2030, a significant jump from the 204 GW capacity in 2022. Wind energy's share of electricity generation during winter months has steadily risen, reaching 19% in the winter of 2022/2023. This trend is expected to continue, with wind power competing effectively with natural gas for power generation.

Challenges and Opportunities:

While the transition towards cleaner energy sources presents promising opportunities, challenges remain. Supply chain disruptions, cost inflation, and policy uncertainties pose hurdles to the rapid deployment of renewables and energy efficiency measures. Moreover, the reliance on natural gas for peak demand periods, particularly in regions with limited renewable energy infrastructure, underscores the need for a balanced and diversified energy mix.

Policy Implications and Future Outlook:

Addressing the challenges of climate change and transitioning towards cleaner energy

sources requires coordinated efforts from governments, industry stakeholders, and civil society. Policy frameworks aimed at incentivizing renewable energy investments, promoting energy efficiency measures, and phasing out fossil fuel subsidies are essential for facilitating the transition.

Furthermore, international cooperation and collaboration are crucial for addressing global energy challenges and ensuring energy security. Initiatives such as the Paris Agreement provide a framework for multilateral action on climate change, laying the foundation for a more sustainable and resilient energy future.

The evolving dynamics of global natural gas markets underscore the imperative of adapting to a changing climate and transitioning towards cleaner energy sources. From declining winter demand in Europe to the expanding role of renewables in power generation, the landscape is undergoing a fundamental shift. Embracing innovation, investing in renewable energy infrastructure, and implementing robust policy frameworks are essential for navigating these changes and building a sustainable energy future for generations to come.

By David L. Goldwyn and Joseph Webster
<https://www.atlanticcouncil.org/>

Nuclear

13 Public Perception & Nuclear Energy Policy



Nuclear Energy Policy: A Global Perspective on Decarbonization Strategies

In a landmark decision, the Council of EU member states and the European Parliament have reached an agreement to label nuclear power as a strategic technology for the European Union's decarbonization efforts. This agreement, following months of rigorous negotiations in Brussels over the Net-Zero Industry Act (NZIA), underscores a significant shift in the EU's approach towards nuclear energy as a key component in achieving its ambitious net-zero emissions target.

The NZIA, proposed by the European Commission in March 2023, aims to expedite the deployment of technologies crucial for meeting the EU's sustainability goals in response to global developments such as the US Inflation Reduction Act and China's advancements in clean technology manufacturing. As part of this initiative, nuclear power has been recognized alongside renewable energy sources as a vital contributor to decarbonization efforts.

During the negotiation process, which involved representatives from the Parliament, the Council, and the European Commission, the strategic importance of nuclear energy was affirmed. This includes both established nuclear technologies and emerging advancements such as small modular reactors (SMRs) and advanced nuclear reactors (AMRs), as well as their respective fuel cycles. The agreement reflects a comprehensive approach, accommodating various stakeholders' perspectives and priorities.

Under the NZIA, factories involved in the production of components for nuclear technologies will benefit from streamlined permitting procedures, aimed at expediting the development and expansion of nuclear infrastructure across Europe. Each EU member state retains sovereignty in determining projects deemed strategic within its territory, ensuring flexibility while adhering to common objectives.

French MEP Christophe Grudler, representing the Renew Europe group in Parliament, highlighted the significance of treating nuclear and renewable energies equally in the context of industrial revitalization. The inclusion of



nuclear power in the NZIA represents a pivotal step towards diversifying Europe's energy portfolio and ensuring a sustainable transition.

However, the decision has not been without controversy. Environmental groups have expressed reservations, citing concerns over the perceived risks and costs associated with nuclear energy. Nevertheless, proponents argue that nuclear power, alongside renewables, is indispensable in addressing the climate crisis effectively.

Meanwhile, beyond the European Union, discussions surrounding the role of nuclear energy continue on a global scale. At the World Governments Summit in Dubai, Nuclear Energy Agency Director-General William D. Magwood, IV, emphasized the pivotal role of nuclear energy in the context of geo-energy dynamics and climate mitigation efforts.

In Australia, the debate surrounding nuclear power is gaining traction, particularly regarding the feasibility of small modular reactors. While there is public support for exploring nuclear energy options, challenges related to cost, timeline, and regulatory frameworks underscore the complexities involved in its implementation.

As nations grapple with the imperative of transitioning towards sustainable energy systems, the inclusion of nuclear power as a strategic technology underscores the need for a nuanced and inclusive approach. Moving forward, collaborative efforts and informed decision-making will be essential in realizing the shared goal of a decarbonized future.

Sustainability & Decarbonization

15 Sustainable Transportation Revolutions



Mammoet's electric-powered SPMTs make successful debut at ITER



Zero-emission equipment increases safety and cleanliness of project in controlled environment

Mammoet's new electric battery-powered Self-Propelled Modular Transporters (SPMTs) have begun operation at the international nuclear fusion research facility ITER in southern France.

The equipment is being used to transport heavy components for the construction of the world's largest tokamak: a device used to prove the feasibility of fusion as a large-scale source of carbon-free energy.

Mammoet is supporting its client DAHER, a global logistics specialist, to transport key components, including 367t toroidal field coils and 440t vacuum vessel sectors.

Two combinations of twelve axle lines of SPMT are being used inside the facility to move the components from storage to the assembly area.

Pascal Taconne, Project Manager at Mammoet, said:

"In July last year, ITER asked if we had an electric power pack available, and at that period it was a time when Mammoet had started to develop a new prototype internally. We explained that we could carry out the necessary steps to have it ready for the beginning of 2024."

The next six months saw Mammoet perform extensive testing with third parties, such as soundproofing and electrical interference testing. It also carried out over 100 hours of testing using different types of cargo, to prove the technology could carry out day-to-day jobs with a full battery.

Previously, component transfers were performed using conventional diesel power pack units, which are louder, and generate carbon emissions and fine dust particles that need to be filtered and evacuated from indoor locations.

As the tokamak needs to be built in a clean environment, where moisture, temperature and particulates are all controlled, the new transport solution brings major benefits.

In addition to being cleaner and quieter, the ePPU can power both lines of SPMTs at once. This means even heavier movements, which require them to work in tandem, can be carried out fully electrically.

With the first successful electric component transfer conducted at the site, the project is demonstrating what the future could hold for the movement of heavy components.

Michel Bos, Technical Specialist at Mammoet, said:

"All the things that we have learned, building and testing the unit, and adjusting and making it better, have taught us so much about electrifying our equipment. The feeling that heavy movements cannot be done electrically has totally changed in the last year.

We are now confident we can work day-to-day jobs easily, creating a more comfortable working environment for operators and supporting zero-emission construction areas.

Hydrogen

17 Hydrogen Transportation & Infrastructure



Europe's First-Of-Its-Kind Agreement Signed with Dutch Energy Infrastructure Company Gasunie



PATRIZIA, a prominent player in global real assets, has taken a significant stride towards facilitating a hydrogen-based economy in Germany and Europe. The company has recently announced the signing of option lease agreements with Gasunie, a Dutch state-owned energy infrastructure firm, to develop the first industrial-scale hydrogen storage facility. This initiative will be carried out by STORAG ETZEL, a wholly managed operating company of PATRIZIA, which has been managing large-scale oil and gas storage facilities in underground caverns in Lower Saxony for over five decades.

The project, named H2CAST Etzel, aims to demonstrate the feasibility of hydrogen storage in underground caverns, leveraging the expertise of STORAG ETZEL, Gasunie, and other partners. This endeavor aligns with the European Union's vision of integrating hydrogen into the energy mix to achieve carbon-neutral consumption by 2050. Hydrogen is anticipated to play a substantial role, potentially accounting for up to 20% of the energy mix, particularly in transportation and industry sectors.

The strategic importance of industrial-scale hydrogen storage cannot be overstated, as it serves as a crucial component in balancing the fluctuations of renewable energy generation from sources like solar and wind. Moreover, Germany's future energy strategy involves transitioning natural gas power plants to be hydrogen-ready, further driving demand for hydrogen storage solutions.

The Etzel salt dome, with its extensive cavern field managed by STORAG ETZEL, is poised to

meet this rising demand for hydrogen storage. The cavern field will not only serve Germany's energy needs but also contribute to the envisioned hydrogen pipeline grid, known as the «Kernnetz,» which aims to meet hydrogen demand across the country.

Heiko Süß, Head of PATRIZIA Fund Management Frankfurt, emphasizes the importance of projects like H2CAST Etzel in demonstrating the readiness of caverns for hydrogen storage. The pilot project involves converting two caverns, constructing an above-ground facility, and conducting comprehensive tests to validate the feasibility of high-volume hydrogen storage under real conditions.

Looking ahead, PATRIZIA envisions expanding its caverns storage business to accommodate the growing demand for hydrogen storage. With the potential to convert more caverns at the Etzel facility, PATRIZIA aims to play a pivotal role in the energy transition towards a net-zero economy by 2050.

The company's commitment to investing in the energy transition is evident through the successful track record of its dedicated caverns funds, which have consistently delivered stable and attractive returns for long-term investors. Transitioning the Etzel cavern field into a full-fledged hydrogen storage facility underscores PATRIZIA dedication to fostering sustainable energy solutions for the future.

<https://solarquarter.com/>

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The idea of electric car chargers can be traced back to the early **1900s** when automobiles were first being developed. GE built the Mercury Arc Rectifier electric car charger that was installed in many homes, garages, businesses, and public parking spaces. However, it wasn't until the **1990s** that electric car chargers began to gain popularity.



energy

HQ

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Cover Story

21 Germany's Energy Strategy



Germany's Energy Strategy: Gas-fired Power Plant Acceleration, Hydrogen Conversion, and Industrial Emissions Reduction



In a bid to bolster its energy security and transition towards cleaner energy sources, Germany's ruling coalition has announced plans to expedite the construction of new gas-fired power plants, intending to eventually convert them to run on hydrogen by the mid-to-late 2030s. The move comes as Germany aims to phase out coal-fired power generation and increase the share of renewable energy in its power mix, aiming for 80 percent by 2030.

The government's strategy, outlined by Chancellor Olaf Scholz, economy and climate minister Robert Habeck, and finance minister Christian Lindner, entails the swift establishment of state-supported auctions for up to 10 gigawatts (GW) of new gas-fired power plant capacity. These plants, termed «H2-ready,» are expected to transition to hydrogen-based operation between 2035 and 2040, aligning with Germany's ambitious climate targets.

Despite the emphasis on hydrogen conversion, the term «hydrogen-ready» remains ambiguous, lacking a standardized definition. Nonetheless, the government asserts the importance of these plants as a transitional measure towards a greener energy future.

The energy industry association BDEW has welcomed the announcement, hailing it as a pivotal step towards climate neutrality while maintaining supply security. However, it urges clarity on funding allocation, auction timelines, and plant locations to ensure effective implementation.

Criticism has emerged from environmental groups and the renewables industry, citing concerns over the delayed transition to hydrogen. Simone Peter, head of the renewable industry association BEE, stresses the urgency of converting gas-fired plants to hydrogen by 2035 at the latest, aligning with climate targets.



The agreement also outlines plans for a market-based capacity mechanism by 2028, aimed at ensuring long-term electricity supply security. Additionally, the government pledges support for new technologies like nuclear fusion and power plants solely reliant on hydrogen, alongside streamlining procedures for electrolyzer deployment and gas power plant permitting.

While the government's focus on hydrogen-ready gas plants has garnered support from industry players like Uniper SE and the chemical industry association VCI, concerns persist regarding the timeline for the transition away from fossil fuels. The environmental NGO DUH warns of a «fossil fuel dead end,» advocating for an expedited shift towards renewable energy sources.

In parallel, the European Commission has approved a 4 billion euro subsidy scheme by the German government to reduce emissions from industrial production. Through climate protection contracts, companies will be compensated for transitioning to climate-neutral processes, contributing to Germany's broader climate and energy targets.

The wind energy sector also sees significant progress, with WindEurope's annual statistics indicating substantial growth in wind power capacity across Europe. Germany leads the region in wind energy development, bolstered by improvements in permitting and increased investments. Despite these advancements, challenges remain, particularly regarding grid expansion to accommodate new wind farm projects.

Germany's power sector stands at a pivotal juncture as it charts a course towards decarbonization and climate neutrality. In

a bold move, the German government has unveiled plans to incorporate carbon capture and storage (CCS) technologies into its energy transition strategy, marking a significant shift in approach to address hard-to-abate emissions. The cornerstone of this endeavor is the proposed Carbon Management Strategy (CMS), which aims to mitigate greenhouse gas emissions from both industrial processes and gas-fired power plants through the capture, storage, or utilization of emitted CO₂. While state support for CCS will primarily target industrial projects, notably exempting gas-fired power plants, the inclusion of CCS for electricity generation from fossil gas has stirred debate within the political landscape.

Central to the discussion is the nuanced approach towards CCS implementation. While industry voices champion the initiative as essential for fostering a competitive landscape conducive to climate neutrality, environmental NGOs raise concerns about potential entrenchment of fossil fuel dependency and advocate for a sharper focus on renewable energy sources and emission reduction measures. This divergence in perspectives underscores the complexity inherent in navigating the energy transition while balancing environmental imperatives and economic competitiveness.

The decision to exclude government support for CCS in the context of gas-fired power plants underscores a strategic stance aimed at incentivizing a transition towards cleaner energy sources. However, proponents of CCS argue that its inclusion in electricity generation, albeit without state backing, provides a crucial pathway for reducing emissions in sectors where alternative solutions are limited. The emphasis on pricing all value chain emissions correctly further underscores the government's commitment to aligning economic incentives with climate goals.

As Germany navigates its energy transition, balancing short-term energy security with long-term climate objectives remains paramount. The acceleration of gas-fired power plant construction, coupled with hydrogen conversion plans, reflects the country's commitment to a sustainable energy future while addressing immediate supply concerns. However, achieving a seamless transition will require concerted efforts from policymakers, industry stakeholders, and environmental advocates alike.

Energy Storage & Grids

24 Grid-Scale Energy Storage Projects



Energy Vault Expands Presence in China with Energy Storage Solutions



Energy Vault, a pioneer in sustainable grid-scale energy storage solutions, is strengthening its commitment to the Chinese market with notable achievements and ongoing projects. Recently, the company successfully connected its inaugural EVx 100 MWh Gravity Energy Storage System (GESS) with China State Grid and commenced construction on three additional EVx projects in the region.

In December 2023, Energy Vault reached a significant milestone with the Rudong EVx system achieving China State Grid interconnection and beginning inverse power operation. This accomplishment highlights the effectiveness of Energy Vault's gravity energy storage technology in enhancing China's energy grid stability. With construction underway on three more EVx GESS deployments across China, totaling 3.7 GWh in capacity, Energy Vault, in collaboration with partners China Tianying (CNTY) and Atlas Renewable, is laying the groundwork for future project revenue royalties.

Throughout 2023, Energy Vault's partners initiated several new EVx projects, including a 17 MW/68 MWh EVx GESS in Zhangye City, strategically positioned near a renewable energy site and a national grid interconnection point. Additionally, projects in Ziuquan City, Jinta County, and Huailai Cunrui Town are set to further enhance China's national energy grid by storing and delivering renewable energy.

The importance of Energy Vault's gravity

energy storage technology within China's energy policy framework is underscored by recent recognition. Both the Rudong and Zhangye City EVx systems were designated as «new energy storage pilot demonstration projects» by China's National Energy Administration (NEA) in January 2024. This recognition, accompanied by increased management oversight by provincial-level energy authorities, highlights the pivotal role of gravity energy storage in China's decarbonization efforts.

Robert Piconi, Chairman and CEO of Energy Vault, expressed confidence in the company's prospects in China, citing market adoption and alignment with national energy policies. Andrea Pedretti, Energy Vault's CTO, commended technical expertise and partnerships with China Tianying, emphasizing rapid deployment capabilities in China's dynamic energy landscape.

The successful integration of the Rudong EVx system represents a significant step towards Energy Vault's goal of providing commercial, utility-scale gravity energy storage solutions. With the anticipation of further updates on the Rudong EVx deployment accompanying the announcement of its fourth-quarter and full-year 2023 financial results on March 12, 2024, Energy Vault reaffirms its position as a leader in sustainable energy storage solutions.

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

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Saudi Arabia and Kuwait Strengthen Energy Cooperation, Affirm OPEC+ Commitment



Saudi Arabia and Kuwait Strengthen Energy Cooperation, Affirm OPEC+ Commitment

Saudi Arabia and Kuwait have underscored the crucial importance for all OPEC+ members to uphold the bloc's agreement on oil production cuts, emphasizing its significance for both producers and consumers and its role in bolstering global economic growth.

In a joint statement issued following Kuwait's Emir Sheikh Meshaal Al-Ahmad Al-Jaber Al-Sabah's visit to the Kingdom, the two nations highlighted their strong cooperation in the energy sector. They praised the successful efforts of OPEC+ in stabilizing global oil markets.

The countries also pledged to strengthen collaboration in the oil and gas industry, particularly in areas such as advancing clean technologies for hydrocarbon resources.

In addressing climate change, they committed to enhancing cooperation on international climate policies, with a focus on reducing emissions through the adoption of the circular carbon economy approach. This approach encompasses the transportation, utilization, and storage of carbon with the aim of sustainable emission reduction and achieving carbon neutrality.

Acknowledging the increasing presence of Kuwaiti investors and companies in Saudi Arabia, the two nations expressed their readiness to sign an agreement to prevent double taxation. They eagerly anticipated the upcoming second session of the Saudi-Kuwaiti Coordination Council, slated to take place in Kuwait later in the year, and affirmed their dedication to implementing agreed-upon initiatives.

Regarding the railway connection project between Saudi Arabia and Kuwait, they emphasized its aim to establish a sustainable railway link that would enhance trade and economic growth between the two countries.

On the matter of the Durra field, they reiterated that it falls within Kuwait's maritime territory. They affirmed that the natural resources in the divided submerged area, including the entirety of the Durra field, are jointly owned by both Saudi Arabia and Kuwait. They asserted their full rights to exploit these resources and firmly rejected any claims to rights by any other party in this field or the divided submerged area.

By Khalid Nouh

<https://english.alarabiya.net/>

UAE-France Business Council Ignites Clean Energy Collaboration in Paris



UAE-France Business Council Ignites Clean Energy Collaboration in Paris

In Paris, the second plenary meeting of the UAE-France High-Level Business Council was co-chaired by H.E. Dr. Sultan Ahmed Al Jaber, the UAE Minister of Industry and Advanced Technology, and Mr. Patrick Pouyanné, CEO of TotalEnergies. This significant gathering, attended by H.E. Bruno Le Maire, the French Minister of Economy, Finance, and Digital Sovereignty, underscored both nations' dedication to strengthening their strategic bilateral relationship.

Highlighting France's pivotal role in the Council, Dr. Sultan Al Jaber emphasized its capacity to bolster economic ties and foster sustainable collaboration within private sectors. Minister Bruno Le Maire echoed this sentiment, expressing a shared ambition to cultivate tangible joint projects that promote innovation, industrial advancement, and ecological transition.

Central to the meeting was the signing of a memorandum of understanding (MoU) for the establishment of the «UAE-France Bilateral Climate Investment Platform.» This platform aims to facilitate collaborative investments in clean energy sectors, with a particular focus on decarbonizing hard-to-abate industries. Notable participants in this initiative include ADNOC, Masdar, TotalEnergies, Bpifrance, and CMA-CGM.

Moreover, TotalEnergies Renewables and Masdar penned an MoU, signaling their commitment to collaborate on Renewable Energy Projects in emerging markets. Their partnership will explore opportunities in

solar and wind energy initiatives across Central Asia and Africa.

The meeting's agenda also included a comprehensive review of progress within various working groups, spotlighting key partnerships such as TotalEnergies and Masdar's joint efforts in Sustainable Aviation Fuel production. Additionally, collaborations were discussed in areas ranging from geothermal energy projects to green alternative fuels and water infrastructure development in Uzbekistan.

Dr. Sultan Al Jaber commended France's steadfast commitment to climate action, particularly highlighting TotalEnergies' endorsement of the Oil and Gas Decarbonization Charter at COP28. The meeting concluded with the approval of the Council's 2024 roadmap, which aims to expedite the implementation of collaborative projects.

France's role as a vital partner in this bilateral relationship was further underscored by the impressive growth in bilateral trade, which surged by 12.5% in the first nine months of 2023, reaching AED 25.1 billion. With over 600 French companies operating in the UAE, employing over 30,000 individuals, and the UAE standing as France's second-largest GCC investor, the ties between these two nations continue to flourish.

By Pooja Chandak
<https://solarquarter.com/>

Belgium Hosts Zero Carbon Industry Conference Showcasing European Energy Efficiency Initiatives

More than 150 experts from various sectors, including industry, public service, and academia, gathered in Antwerp, Belgium, for the «ecee Zero Carbon Industry» conference, where two LIFE projects were spotlighted.

Organized by the European Council for an Energy Efficient Economy (ecee), the two-day conference delved into pioneering decarbonization processes, resource and material efficiency, as well as emerging policy frameworks and business models. Among the featured initiatives were two LIFE projects: Energy Efficiency Watch 5 (EEW5) and Odyssee-Mure.

During the opening plenary, Odyssee-Mure took center stage, unveiling its 2023 scoreboard ranking European Member States based on energy efficiency levels, progress, and policies. According to the latest data, Luxembourg, Germany, and France secured the top three positions.

Wolfgang Eichhammer, the technical coordinator of Odyssee-Mure, emphasized Europe's heightened commitment to energy efficiency, citing the revised Energy Efficiency Directive as a cornerstone of EU energy policy. This directive mandates EU countries to collectively achieve an additional 11.7 percent reduction in energy consumption by 2030 compared to 2020 projections.

Dr. Eichhammer stressed the importance of scoreboards in assessing EU Member States' progress and identifying areas needing intensified efforts. The 2023 scoreboard offers a comprehensive view of each country's energy efficiency performance and anticipates future impacts of existing energy efficiency programs using data from the Odysee and MURE databases.

Another significant contributor at the



conference was Energy Efficiency Watch 5 (EEW5), which conducted a workshop on crafting narratives to advocate for energy efficiency in the industry. Led by Daniel Becker, a Guidehouse partner and EEW5 project team member, the workshop gathered insights from businesses already engaged in energy efficiency and decarbonization initiatives to develop compelling arguments for industrial transformation.

Participants also had the opportunity to explore the LIFE Programme's stand, which showcased various projects focused on energy efficiency, decarbonization, and transformation. As industries continue their evolution, events like the ecee conference serve as vital platforms for collaboration, dialogue, and the exchange of innovative ideas.

<https://cinea.ec.europa.eu/>

Industry News

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Saudi Aramco Awards Contracts for MGS-3 Expansion Project

أرامكو السعودية
saudi aramco



The Saudi energy giant has sent preliminary agreements to contractors for 16 EPC packages of the anticipated \$10 billion third expansion phase of the Master Gas System.

Saudi Aramco, the world's largest oil company, has taken significant strides in expanding its Master Gas System (MGS) network with the recent selection of contractors for the engineering, procurement, and construction (EPC) works on the third expansion phase, known as MGS-3. The project, estimated at \$10 billion, aims to bolster Saudi Arabia's natural gas transportation infrastructure to meet the increasing demand from industrial and household sectors.

The ambitious MGS-3 project comprises 17 packages, each focusing on upgrading existing infrastructure and laying new gas transport pipelines across various regions of the kingdom. Aramco has meticulously divided the project to ensure efficient execution and maximum coverage.

Among the notable contractors selected for different EPC packages

include:

- China Petroleum Engineering & Construction Company (China)
- Sepco (China)
- Gas Arabian (Saudi Arabia)
- Mapa (Turkey)
- Sinopec Petroleum Services (China)
- Larsen & Toubro Energy Hydrocarbon (India)
- Nesma & Partners (Saudi Arabia)/ Sicim (Italy)
- Kalpataru Power Transmission (India)
- Bin Quraya (Saudi Arabia)
- Max Streicher (Germany)

The selection process involved issuing letters of intent (LoIs) to contractors, with official contract awards anticipated to occur later in the quarter, as disclosed by sources familiar with the matter. However, Aramco has yet to provide official comments on the developments.

The MGS, originally established in the 1970s and commissioned in 1982, has been a cornerstone of Aramco's



operations, facilitating the distribution of natural gas across Saudi Arabia. With rising gas demand in recent years, Aramco embarked on expansion phases, including MGS-2 launched in 2015, to enhance non-associated gas production and meet growing needs.

In the previous phase, MGS-2, local contractor Arkad Engineering & Construction played a pivotal role in executing pipeline packages, significantly increasing the system's capacity to handle and transport gas.

The tendering process for MGS-3 commenced with the solicitation of interest (Sol) from contractors, followed by the issuance of the main EPC tender encompassing all 17 packages. Aramco received an overwhelming response from contractors globally, indicative of the project's significance in the energy landscape.

The scope of work for the various packages ranges from upgrading existing booster gas compression stations to laying extensive gas pipelines connecting key regions across Saudi Arabia. Each package is

meticulously designed to contribute to the overall enhancement of the MGS infrastructure, ensuring robustness and reliability in gas transportation.

Aramco's commitment to expanding its gas infrastructure underscores its strategic vision to meet the kingdom's energy demands while aligning with global sustainability goals. The meticulous selection of contractors and the forthcoming execution of EPC works mark significant milestones in Saudi Arabia's energy journey, setting the stage for enhanced gas distribution capabilities and socio-economic development.

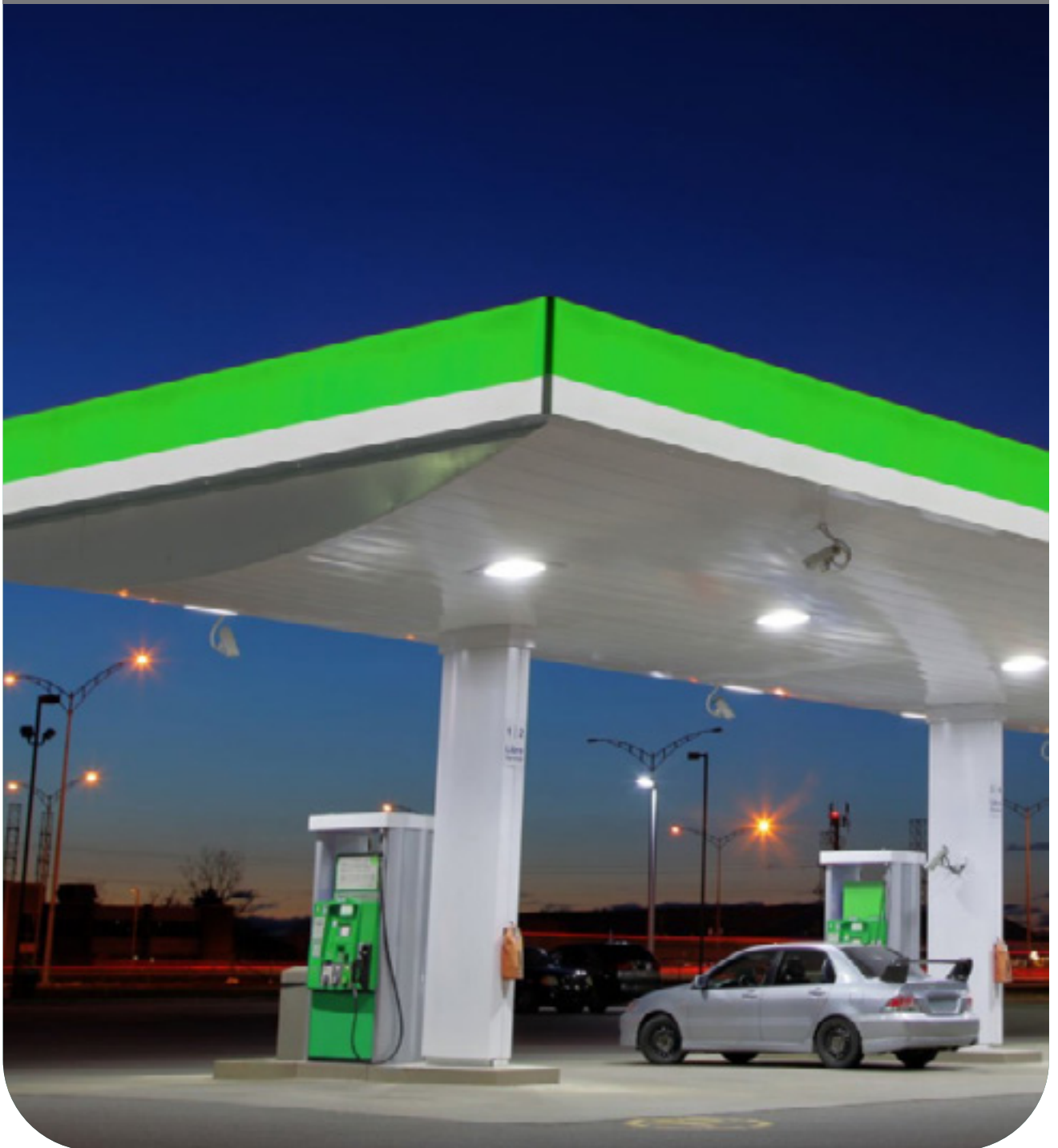
As the project progresses, stakeholders eagerly anticipate the realization of a more resilient and efficient gas network, underpinning Saudi Arabia's role as a key player in the global energy landscape.

By Indrajit Sen
<https://www.meed.com/>

Services

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health HQ

Nurturing Healthier world!

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



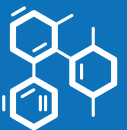
Each vitamin and mineral has its own set of physiological functions in your body



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.



Coming Events

Middle East Energy 2024

Dubai, UAE

16 – 18 April 2024

<https://www.middleeast-energy.com/en/home.html>

Middle East Energy is the region's most comprehensive energy exhibition and conference, hosting more than 1,300 of energy exhibitors from around the world. Explore the latest in energy products and solutions across Critical & Backup Power, Energy Storage, Transmission & Distribution, Renewable & Clean Energy...

Solar & Storage Live UK 2024

Birmingham, UK

01 – 02 May 2024

<https://www.terrapinn.com/exhibition/solar-storage-live/index.stm>

Solar & Storage Live is the largest exhibition for renewable energy in the UK. With over 30,000 attendees and 250 speakers spanning over three days, the event provides a platform to discuss pressing topics in the renewables space, such as energy security, storage, and geopolitics, while networking with peers.

All-Energy 2024

Glasgow, Scotland

15 – 16 May 2024

<https://www.all-energy.co.uk/en-gb.html>

As the UK's largest low-carbon energy and full supply chain renewables event, All-Energy has been running since 2001 and brings together professionals from the full breadth of the renewable sector. Featuring exhibitors and speakers from around the world representing a diverse range of...

POWER TOOLEX 2024

Milan Mela, Kolkata, India

15 - 17 Mar 2024

<https://powertoolex.com/>

POWERTOOLEX is a pure B2B exhibition focusing on the fast-growing hand tools and power tools sector in India. The goal of the POWERTOOLEX is to bring buyers and sellers together in an interactive environment to conduct business...

SNEC International PV Power Generation and Smart Energy Conference & Exhibition

Shanghai, China

19 – 15 June 2024

<https://saudi-sg.com/>

The National Convention and Exhibition Center will host the 17th edition of the SNEC International Solar Photovoltaic and Smart Energy Conference and Exhibition in Shanghai (otherwise known as the SNEC Photovoltaic Conference). The SNEC Photovoltaic Conference is one of the most influential events in Asia and worldwide.

Enlit Asia

Kuala Lumpur, Malaysia

08 – 10 October 2024

<https://www.enlit-asia.com/>

Enlit Asia is an annual conference and exhibition comprising two events in the energy sector: POWERGEN Asia and Asian Utility Week. It attracts 12,000 attendees and 300 exhibitors worldwide to showcase their products, services, and solutions to help accelerate the green transition across Asia.

Intersolar Europe

Munich, Germany

19 – 21 June 2024

<https://www.intersolar.de/home>

Intersolar Europe is one of the world's leading exhibitions in the solar industry, and it has been running for over 30 years. The event's tagline is "Connecting Solar Business," as it brings together solar manufacturers, service providers, project developers, start-ups, planners, suppliers...

ASEAN Clean Energy Week

Manila, Philippines

21 – 22 November 2024

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

In November the SMX Convention Center Manila will host the 7th edition of ASEAN Clean Energy Week. 5000 attendees, of which 1,500 are C-suite executives will come together to discuss how to expedite the green transition in Southeast Asia, which includes some of the world's fastest-growing economies.

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https://www.energyhq.world/energyHQ_Media%20Kit_2023.pdf

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A Game-Changer in Renewable Power Generation



A groundbreaking revelation in the realm of renewable energy has emerged, courtesy of a whitepaper by CGG, a geoscience tech consultancy. Hidden beneath the ocean floor lies a potential energy bonanza, promising a cheaper and more accessible form of geothermal power. Unlike solar and wind, which have limitations, geothermal energy boasts continuous availability, minimal infrastructure costs, and global accessibility.

Traditionally, geothermal energy has been underutilized, constituting less than 1% of global energy production. The challenge lies in accessing the heat trapped beneath the Earth's surface economically. Conventional exploration drilling is costly and often unsuccessful. Consequently, companies have focused on regions with known geothermal activity, such as the Indo-Pacific «Ring of Fire.»

However, CGG proposes a game-changing alternative: harnessing geothermal energy from undersea rifts, where tectonic plates move apart, creating new crust. In these expansive underwater zones, magma is close to the surface, offering a more accessible and consistent energy source compared to onshore volcanic areas. Moreover, success rates in exploration should be higher, with more uniform temperatures and benign geothermal fluids.

Despite the logistical challenge of offshore energy generation, CGG suggests innovative solutions. In areas where connecting to electrical grids is impractical, capturing steam to produce green hydrogen emerges as a viable option. This hydrogen can be converted to ammonia for transport or sold directly. Additionally, the process yields fresh water, creating an additional revenue stream.

CGG's approach integrates geological, geophysical, and engineering technologies to explore and develop these offshore resources. While the company has applied for a patent, it aims to facilitate widespread access by licensing the technology at reasonable costs, prioritizing affordability in underdeveloped regions.

The potential impact of offshore geothermal energy is immense. Although it is premature to assess the Levelized Cost of Energy (LCoE), advancements in drilling technology could further enhance its viability. As the demand for clean energy escalates, offshore geothermal may play a crucial role in meeting global energy needs sustainably.

In conclusion, the discovery of vast geothermal resources beneath the ocean floor presents a promising opportunity for the renewable energy sector. With innovative approaches and collaborative efforts, offshore geothermal has the potential to revolutionize the energy landscape, providing a reliable and environmentally friendly source of power for generations to come.

By Loz Blain



constructionHQ

Building Better World!

constructionHQ was established in 1983 as a specialized B2B magazine called "Arab Construction World" before evolving to become a full-fledged 360° industry platform comprised of various media channels. This platform serves the building materials, construction machinery, electrical systems, digital construction, fire protection systems, and geotechnical & surveying sectors.



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