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Monitoring transformers to guard against the impact of solar flares p.24

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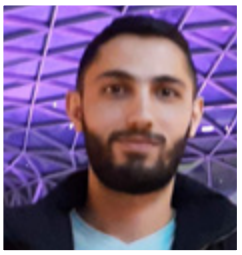
Power Up Your Grid: Why Transformer Monitoring is the Key to Efficiency and Reliability



In today's dynamic energy landscape, ensuring a reliable and efficient power grid is no longer a luxury, it's a necessity. Transformers, the workhorses of the grid, play a critical role in transmitting electricity across vast distances and varying voltage levels. But with rising energy demands and the integration of renewable sources, traditional transformer management is reaching its limits. This is where transformer monitoring steps in, offering a powerful solution for the modern energy industry.

Why Monitor Transformers?

Transformers are complex pieces of equipment susceptible to various issues like overheating, moisture ingress, and insulation breakdown. Left undetected, these problems can lead to catastrophic failures, resulting in costly downtime, power outages, and damage to other grid components. Transformer monitoring provides real-time insights into the health and performance of these vital assets, enabling proactive maintenance and informed decision-making.

Benefits of Transformer Monitoring Systems

- **Enhanced Reliability:** By continuously monitoring key parameters like temperature, vibration, and dissolved gas analysis (DGA), transformer monitoring systems identify potential problems early on. This allows for timely intervention and prevents minor issues from escalating into major failures, significantly improving grid reliability.
- **Optimized Maintenance**: Transformer monitoring data empowers a shift from reactive to predictive maintenance. Utilities can schedule maintenance based on actual equipment needs, maximizing equipment lifespan and reducing unnecessary maintenance costs.
- **Improved Efficiency:** Monitoring systems provide valuable insights into transformer loading and performance, allowing for optimized load management. Utilities can identify overloaded transformers and redistribute loads, minimizing energy losses and improving overall grid efficiency.
- **Integration with Smart Grids:** Modern transformer monitoring systems seamlessly integrate with smart grid technologies. The real-time data collected can be used to optimize grid operations, improve power quality, and facilitate the integration of renewable energy sources.

The Rise of Advanced Monitoring Technologies

The transformer monitoring landscape is undergoing a significant transformation with the integration of cutting-edge technologies.

The Future of Transformer Monitoring

As the industry moves towards a more digitalized and distributed grid, transformer monitoring will play a central role. By leveraging advanced technologies and data analytics, utilities can ensure a resilient, efficient, and sustainable power grid for the future.

By investing in transformer monitoring solutions, energy companies can gain a significant edge in today's competitive market. Improved grid reliability, optimized maintenance strategies, and enhanced efficiency will translate to cost savings, a stronger brand reputation, and a more sustainable energy future.

In This Issue!

energyHQ's June 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 7 talks about Tidal and Wave Energy

Article on page 16 focuses on Thorium-Based Nuclear Energy

Article on page 24 sheds the light on Monitoring Transformers

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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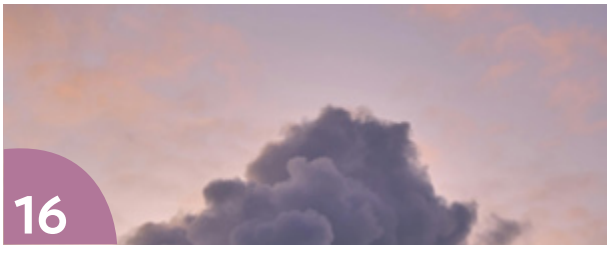

Hydrogen

Standards and Regulations for the Hydrogen Economy

Issue Contents

Energy World Digest

Bahrain

Masdar and Bapco Energies to develop up to 2GW of wind projects in the Kingdom of Bahrain

Masdar enters Bahrain market in strategic move with national energy leader, Bapco Energies

Agreement will focus on exploring the joint development of near-shore and offshore wind projects

Agreement supports the Kingdom of Bahrain's National Energy Strategy target to cut emissions by 30 percent by 2035

Abu Dhabi Future Energy Company PJSC – Masdar, the UAE's clean energy powerhouse, has signed an agreement with Bapco Energies, the integrated energy company leading the energy transition in the Kingdom of Bahrain, to jointly explore the development and investment in wind projects in the Kingdom with a capacity of up to 2 gigawatts (GW).

Marking a strategic entry into the Bahrain market for the UAE's clean energy champion, the agreement for near-shore and offshore wind farms is Masdar's first in the Kingdom and will be the first project of its kind in the region and the Middle East. At up to 2GW, this clean energy collaboration will support the Kingdom of Bahrain to accelerate the decarbonization of critical industrial sectors and open avenues to develop new market sectors. The Kingdom of Bahrain aims to reduce emissions by 30 percent by 2035 and achieve net-zero emissions by 2060, as outlined in its National Energy Strategy.

Russia

Russia's Energy Role in Europe: What's at Stake With the Ukraine Crisis

The threat of a large-scale Russian invasion of Ukraine has put the United States and its European allies on high alert in part due to the potential for major disruptions to the European energy market, which remains highly dependent on Russian oil and gas. Russia's recognition of Ukrainian separatist territories in Donetsk and Luhansk has already put the Nord Stream 2 (NS2) pipeline to Germany on hold, while Russian President Vladimir Putin has threatened to restrict energy exports.

In an effort to mitigate such a crisis, the White House is spearheading efforts to redirect energy supplies to Europe, but experts say any solution will come at a painfully high cost.

What is Russia's energy situation?

Russia is an energy giant—the world's third-largest producer of oil and second-largest producer of natural gas. By some estimates, fossil fuels account for 14 percent of the nation's economic output. Revenue from the sector is responsible for more than 40 percent of the federal budget.

In recent years, Russia has used energy revenue to accumulate some $630 billion in foreign exchange reserves. In 2021, for example, the Kremlin balanced its budget with a relatively low oil price expectation of $45 per barrel; that year, prices averaged nearly $70 a barrel.

This conservative fiscal approach, as economic historian Adam Tooze points out, has allowed Putin to largely insulate his government from the effects of economic sanctions imposed after Russia's 2014 annexation of Crimea.

UAE

UAE's Masdar Aims For 500% Increase In Global Green Energy Capacity By 2030

Masdar, the UAE's premier renewable energy company, aims to elevate its global green energy capacity by 500% to 100 GW by 2030, as stated by Suhail bin Mohammed Al Mazrouei, Minister of Energy and Infrastructure.

The UAE has emerged as a significant investor in renewables, earmarking Dh200 billion for clean energy projects domestically until 2030, with Dh160 billion already invested. Additionally, the UAE has allocated Dh185 billion for renewables projects across more than 40 countries, signaling its commitment to green energy on a global scale.

Masdar, renowned for its leadership in clean energy, has already made significant investments worldwide, boasting a total capacity of 20 GW installed or in development. As a key driver of the UAE's sustainability vision, Masdar is poised to accelerate global clean energy expansion and contribute to the UAE's Net Zero by 2050 initiative.

Al Mazrouei emphasized the UAE's approach to climate action, which emphasizes balancing economic development with environmental protection through the adoption of low-carbon energy solutions. Speaking at the "Green Molecules and Hydrogen" session during the World Economic Forum in Riyadh, Al Mazrouei highlighted the UAE's National Hydrogen Strategy 2050 and its goal to become a leading hydrogen producer by 2031.

Kuwait

Mitsubishi Power Awarded Major Contract from Kuwait Ministry of Electricity & Water & Renewable Energy

Mitsubishi Power, a power solutions brand of Mitsubishi Heavy Industries, Ltd. (MHI), announced today that a consortium of Mitsubishi Power as consortium leader and Heavy Engineering Industries and Shipbuilding Co. K.S.C (Public) (HEISCO) has been awarded a landmark contract by the Kuwait Ministry of Electricity & Water & Renewable Energy for the optimization, rehabilitation of eight units at the Az-Zour South Power Station, which will recover steam generation capacity, increase reliability of the grid and support Kuwait's growing power needs.

By replacing deteriorated boiler components with new and upgraded components, and boiler operation optimization with upgrading control systems and combustion systems, it is anticipated that this large-scale rehabilitation project increases the boiler efficiency and leads to a reduction of greenhouse gas emissions.

This significant project underlines the trust and confidence that the Kuwait Ministry of Electricity & Water & Renewable Energy places in Mitsubishi Power's power technology and comprehensive service offerings.

The Az-Zour South Power Station has been built in the middle of 1980's and counted as a cornerstone of Kuwait's energy sector and one of its main pillars providing a total capacity of 2,400 MW. Under the new contract, Mitsubishi Power is providing services for the rehabilitation of the steam units, which aims to improve operational reliability by overhauling deteriorated components and integrate a new Distributed Control System (DCS).

India

India's renewable energy sector achieves nearly 95% of FY24 bidding target

The tenders included vanilla solar and wind, as well as innovative procurement formats, and tenders with storage components.

The Central Government narrowly missed its target of 50 GW for annual renewable energy tendering in 2023-24.

A year ago, India's government announced plans to seek bids for 50 GW of renewable energy capacity each year for five years, from FY24 to FY28. These bids, for Inter-State Transmission (ISIS)-connected renewable energy capacity, also include establishing at least 10 GW of wind power annually.

The Union Minister of New and Renewable Energy (MNRE), R K Singh, indicated that the targeted bid capacity for FY24 would be divided among four renewable energy implementing agencies (REIAs) – NTPC, NHPC, SECI, and SVJN. These agencies could issue bids for solar, wind, solar-wind hybrid, RTC RE power, etc., with or without storage, based on their assessment of the renewable energy market or government directives.

In FY24, the designated REIAs announced tenders for 47.5 GW (out of 50 GW) of renewable energy capacity, with vanilla solar and wind comprising 28% and 15%, respectively. Innovative procurement formats made up 57% of the total, according to a report by the CEEW Centre for Energy Finance (CEEW-CEF).

The REIAs met about 95% of the bidding trajectory target for FY24, achieving approximately 74% (7.35 GW) of the 10 GW target for wind tenders. About 27 GW (46.9%) of the bids were successfully auctioned in the same year.

Japan

Japan to set fiscal 2040 energy mix goal to spur investments

Japan plans to set fiscal 2040 targets for renewables and other energy sources in the national electricity mix by March next year, outlining long-term goals for decarbonization to spur business investment in related areas.

The targets will be part of Japan's new Strategic Energy Plan, which is updated every three years. The Ministry of Economy, Trade and Industry is considering including a goal to reduce the country's greenhouse gas emissions by 66% in fiscal 2035 from fiscal 2013.

The international Paris Agreement on combating climate change requires governments to submit targets for 2035 by around February 2025.

Japan's energy plan issued in 2021 seeks a 46% reduction in emissions by fiscal 2030 from fiscal 2013 levels. It seeks to achieve this by having renewable energy account for 36% to 38% of power generation nationally and for nuclear power to make up 20% to 22% of this energy mix by then, up from 21.7% and 5%, respectively, in fiscal 2022.

Japanese businesses have pushed the government to outline its long-term energy goals so they will have clear ideas of where the renewables sector is headed. The Japan Business Federation, which is the country's leading business lobby and known as Keidanren, is expected to urge Tokyo to lay out plans through 2050 under the update.

Renewable Energy

07 Tidal and Wave Energy

Wind, Wave, Tidal Resources Could Help Alaska Meet Future Energy Needs

Cook Inlet, Alaska (Photo by Levi Kilcher/NREL)

Researchers with the National Renewable Energy Laboratory determined that offshore wind makes sense for decarbonizing energy production and building energy security and independence when it comes to ocean renewable energy production in Alaska's Outer Continental Shelf (OCS).

Their report, "Feasibility Study for Renewable Energy Technologies in Alaska Offshore Waters," was conducted for the Bureau of Ocean Energy Management (BOEM) to evaluate the feasibility of ocean energy projects in federal waters, including wind, wave and tidal resources. The study area also included state waters outside of BOEM's jurisdiction to allow broader consideration of tidal and wave energy that often have the best resources closer to shore.

"Offshore wind development could be a viable option in Alaska waters, particularly in areas closest to Alaska's population centers. It is also important to remember that all ocean energy development efforts must incorporate just and equitable approaches for energy transitions," said Elise DeGeorge, a senior project leader at NREL and a co-author of the report, which examines ocean renewable energy opportunities in Alaska in the next 10 to 20 years.

"Alaska is rich in natural resources, and that includes offshore renewable energy resources," said Givey Kochanowski, director of BOEM's Alaska OCS Region. "Near Anchorage, Cook Inlet alone has significant wind- and tidal-energy potential. We are happy to work with any interested party to help explore opportunities for tapping those vast resources."

The 131-page report, which was written by 11 researchers working in eight areas, recommends the Alaska office of BOEM assess interest in demonstrating the potential for ocean energy through a pilot study or other critical research initiatives.

Alaska's OCS holds the potential to generate 3,800 GW of electricity from wind, wave and tidal resources. But because of constraints such as the long distances to customers and potential conflicts with other ocean users and wildlife, only a small fraction of these resources can practically be developed. Alaska derives about 30% of its electricity from renewable sources, primarily hydropower. The rest comes from fossil fuels, but the cost is expensive in rural villages because of the reliance on diesel generation and having to transport the fuel.

The researchers examined the ocean-based resources available for producing energy and conducted case studies of hypothetical utility-scale projects. In addition, they examined the production of clean hydrogen as a longer-term solution to serving end users and creating an external market from the ocean renewable energy produced.

Most Alaskans live in the Railbelt area, a large section of south-central Alaska that sits north of Cook Inlet and stretches from Anchorage to Fairbanks. The vast majority of electricity is generated in this same area, primarily from natural gas. Outside of the region, more than 200 remote grids serve rural villages.

The researchers calculated the levelized cost of electricity (LCOE) generated by offshore wind and tides. "Wave energy could also be a viable option in certain regions, but we didn't calculate LCOE as time to commercialization may extend beyond the report's planning period," DeGeorge said.

In the case studies, the researchers considered 1-GW offshore wind scenarios, for floating and fixed-bottom turbines, and a 65-MW array of tidal devices. The LCOE projections for offshore wind in locations further from Alaska's Railbelt included the clean hydrogen component as one potential external market to make development costs more feasible. The lowest LCOE was for a fixed-bottom turbine in Lower Cook Inlet, at $83/MWh.

The tides in Cook Inlet rise and fall by as much as 35 feet, but the LCOE for a tidal array there was still higher than for offshore wind, at $280/MWh. NREL researchers are working with the Alaska Center for Energy and Power on finalizing a road map for developing tidal energy projects in Cook Inlet.

The NREL report recommends BOEM remain involved with the existing working groups focused on tidal energy and clean hydrogen.

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy LLC.

Alaska's diverse renewable energy resources present a significant opportunity to diversify and stabilize its energy grid. Transitioning to ocean-based renewable energy could bring substantial economic and environmental benefits. Harnessing offshore wind, wave, and tidal energy can reduce dependency on imported fossil fuels, which is critical for remote and rural communities facing high energy costs and logistical challenges. Developing these resources can create jobs and stimulate local economies through construction, maintenance, and operation of renewable energy facilities.

Environmental benefits include reduced greenhouse gas emissions and mitigation of climate change impacts, which are already acutely felt in Alaska. The state's coastal and marine ecosystems, highly sensitive to environmental changes, could benefit from a shift away from fossil fuels.

Community involvement and stakeholder engagement are essential for success. Ensuring that renewable energy development benefits are equitably distributed and addressing concerns of indigenous and local communities are critical. Educational and training programs can prepare the local workforce for new opportunities in the renewable energy sector. By capitalizing on its rich offshore energy resources, Alaska can lead in sustainable energy development and set a precedent for other regions with similar potential.

Elizabeth Ingram
https://www.hydroreview.com/

Sustainability & Decarbonization

10 Carbon offsetting & Carbon Neutrality Strategies

Carbon Neutral: Strategies for A Commitment of Zero Emissions

Achieving carbon neutrality involves balancing the emissions generated by a company with an equal amount of emissions reductions or offsetting activities.

In this article, we will explore various strategies and tactics that businesses can employ to achieve zero emissions and fulfill their carbon neutral commitment.

Carbon Neutral Explained

First, let›s delve into the concept of carbon neutrality. Achieving carbon neutrality means that a company›s net carbon dioxide emissions are zero. This is accomplished by calculating the emissions produced by the company›s operations, supply chain, and product lifecycle, and then taking steps to reduce these emissions. Carbon neutrality can be achieved through various methods, including carbon offsets and transitioning to renewable energy sources.

When a company aims to become carbon neutral, it goes beyond simply reducing its emissions. It takes a comprehensive approach by considering all aspects of its operations and supply chain. This includes not only direct emissions from manufacturing processes but also indirect emissions from activities such as transportation and energy consumption. By accounting for these emissions and implementing measures to reduce them, companies can make significant progress towards carbon neutrality.

Transitioning to renewable energy sources is a crucial step in achieving carbon neutrality. By replacing fossil fuel-based energy with clean and renewable alternatives like solar, wind, or hydroelectric power, companies can greatly reduce their carbon footprint. This shift not only reduces emissions but also helps to drive the growth of the renewable energy sector, contributing to a more sustainable future. Moreover, integrating sustainability into core business strategies enhances long-term viability and aligns corporate objectives with environmental conservation efforts.

Carbon Offsets

One strategy for achieving carbon neutrality is through the use of carbon offsets. Carbon offsets involve investing in projects that reduce or remove greenhouse gas emissions from the atmosphere. These projects can include activities such as reforestation, renewable energy initiatives, or methane capture at landfills. By supporting these projects, companies can offset their own emissions

and contribute to global emissions reduction efforts.

Carbon offsets provide a way for companies to compensate for emissions that are difficult or costly to eliminate entirely. For example, in industries where it may not be feasible to completely eliminate emissions, such as aviation or heavy manufacturing, carbon offsets offer a valuable solution. By investing in projects that remove or reduce emissions elsewhere, companies can effectively balance out their own carbon footprint.

Carbon offset projects often have additional environmental and social benefits. Reforestation projects, for instance, not only absorb carbon dioxide but also help restore ecosystems, preserve biodiversity, and provide livelihoods for local communities. By supporting these projects, companies can contribute to a range of positive impacts beyond emissions reduction.

Net-Zero vs Carbon Neutral

It›s important to clarify the difference between net-zero and carbon neutrality. Net-zero refers to the balancing of greenhouse gas emissions by removing an equivalent amount of emissions from the atmosphere. This can be achieved through activities like carbon capture and storage. Carbon neutrality, on the other hand, focuses on balancing emissions through reductions and offsets, without necessarily removing the emissions from the atmosphere. Both approaches are valuable in the quest for zero emissions.

While net-zero aims to completely eliminate emissions by removing them from the atmosphere, carbon neutrality takes a more holistic approach. It recognizes that some emissions may be difficult to eliminate entirely and instead focuses on reducing emissions as much as possible and offsetting the remaining emissions through various means. Both net-zero and carbon neutrality are important strategies in combating climate change and transitioning to a sustainable future.

Business Adaptations

To achieve carbon neutrality, businesses must make significant adaptations across their operations. This includes implementing operational changes and addressing the different scopes of emissions.

When it comes to achieving carbon neutrality, businesses need to go beyond just making small changes. They need to implement operational changes that have a substantial impact on reducing their carbon footprint. These changes can involve optimizing energy efficiency, reducing waste, and implementing sustainable practices in their daily operations.

One effective way for businesses to reduce their carbon emissions is by switching to LED lighting. LED lights are not only energy-efficient but also have a longer lifespan compared to traditional incandescent bulbs. By making this simple switch, businesses can significantly reduce their energy consumption and, in turn, their carbon emissions. Additionally, incorporating eco-friendly building materials and practices into corporate facilities can significantly enhance a company›s sustainability efforts.

In addition to improving lighting, businesses can also focus on improving insulation. Proper insulation helps maintain a consistent temperature within a building, reducing the need for excessive heating or cooling. By investing in insulation upgrades, businesses can reduce their reliance on energy-consuming HVAC systems, resulting in lower carbon emissions. Furthermore, companies engaged in eco-tourism can incorporate these energy-efficient building practices to not only reduce their carbon footprint but also enhance the sustainability of their lodging facilities and attract environmentally conscious travelers.

Another area where businesses can make a significant impact is by optimizing transportation routes. By analyzing and reevaluating their transportation logistics, businesses can find more efficient routes that reduce fuel consumption and emissions. This can be achieved through the use of advanced routing software and real-time data analysis, allowing businesses to make informed decisions that minimize their carbon footprint.

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Oil & Gas

13 Oil and Gas industry Adaptation & Transformation

Digital Transformation in Oil and Gas – How Digital Technologies are Revolutionizing Exploration and Production

For over a century, the oil and gas industry has flourished by extracting crude oil from beneath the earth's surface, driven by resilience, intuition, and powerful hardware. However, the modern era is now dominated by a paradigm shift towards digitalization.

Digital technologies are rapidly infiltrating the oil and gas landscape (no pun intended), revolutionizing how we explore, extract and manage the resources.

As we stand at the cusp of a notable digital transformation in the oil and gas sector, the industry is embracing new technologies to improve operations, enhance efficiency, and cut costs.

Digital technologies like data analytics, artificial intelligence, robotics, and the Internet of Things are transforming the entire oil and gas value chain. This digital revolution isn't just about upgrading technology but creating value across all business areas.

According to Accenture, 70% of industry leaders see enterprise-wide transformation in the oil and gas industry as detrimental for competitiveness. This will showcase a commitment to reinvention when tackling challenges like volatile prices, environmental concerns, and evolving regulations.

Understanding Digital Transformation In the Oil And Gas Industry

Digital transformation in the oil and gas industry represents a significant shift in how traditional processes are approached, carried out, and improved. This transformation entails the incorporation of state-of-the-art digital technologies to elevate exploration, production, and overall operational effectiveness.

Simply put, oil and gas digital transformation signifies a strategic integration of cutting-edge digital technologies at every stage of the value chain.

One of the major objectives of digitalization in the O&G sector is to improve operations by utilizing smart sensors and data analytics for real-time monitoring. This approach enables efficient equipment maintenance and maximizes production process efficiency.

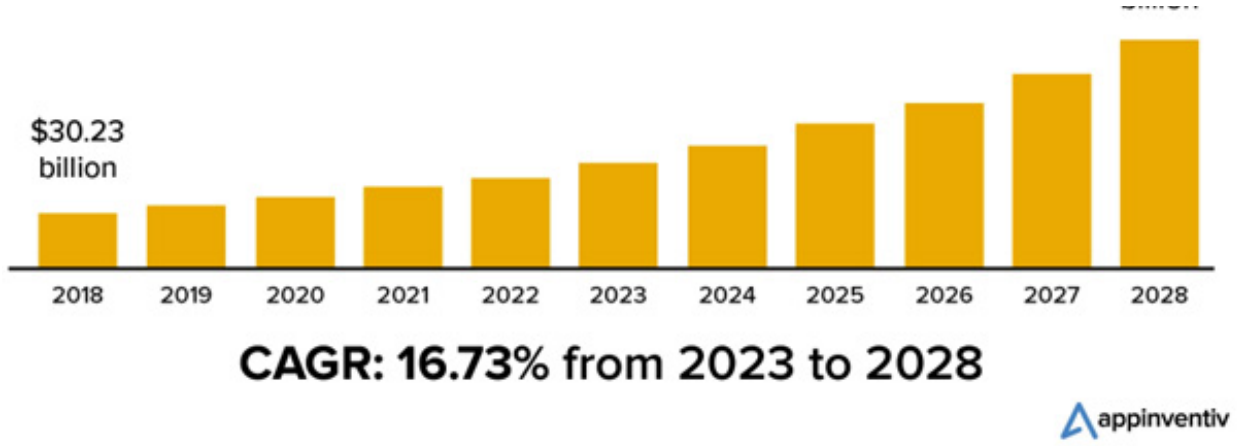
Additionally, the integration of automation and robotics in the industry not only enhances efficiency but also takes over repetitive tasks, leading to increased precision and allowing human expertise to focus on strategic decision-making.

Furthermore, cutting-edge AI technology examines operational data to proactively detect potential hazards, protecting the miners from accidents while keeping a safer environment. This significant influence also extends to the exploration stage, as advanced seismic surveys and data analysis methods help in uncovering concealed reservoirs, enhancing the efficiency and precision of exploration efforts.

According to a McKinsey survey, digital technologies have proven to be highly beneficial in the oil and gas sector. Major players in the industry are utilizing digitization to lower costs, increase production, and optimize efficiency throughout the value chain. These companies are now striving to integrate technology-driven operations into every aspect of their business.

To do so, they must enhance their workforce's capabilities and redesign their information infrastructure, all while ensuring that their digital initiatives provide tangible value. This strategic shift highlights the industry's dedication to fully harnessing the potential of digital advancements for long-term success.

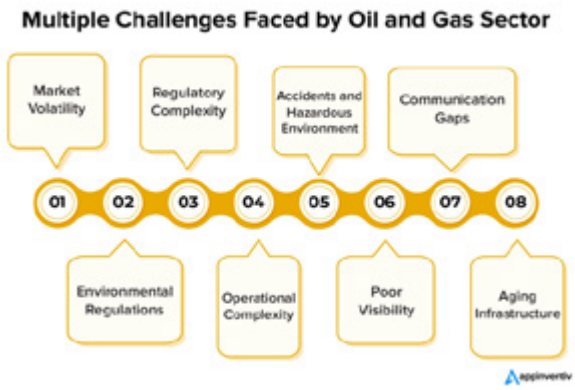
Another report from Technavio states that the digital transformation in the oil and gas industry is expected to reach a valuation of $68.64 billion in 2028, witnessing a CAGR of 16.73% between 2023 and 2028. The increasing market size can be attributed to the increased investments, mounting pressure to enhance operational efficiency, and the escalating demand for advanced technologies in exploration activities.



Incorporating digital transformation services in the oil and gas industry is not only bound to increase overall efficiency but also proactively ensures safety and drives precision across exploration efforts. As industry leaders embrace digitization, this shift is more than a technological upgrade; it's a commitment to unlock the digital potential for enduring success.

Major Challenges Faced by the Oil and Gas Industry

From complex drilling processes to hazardous environments and communication gaps, the oil and gas industry faces multiple challenges. Let us understand them in detail below:



Market Volatility

The oil and gas industry faces the challenge of dealing with unpredictable shifts in commodity prices. These fluctuations can significantly affect their earnings and financial stability. As a result, there's a need for flexible strategies that can swiftly adapt to market changes, ensuring continued profitability.

Environmental Regulations

Stringent environmental regulations usually pose financial and operational challenges to the oil and gas industry. This further requires substantial investments in sustainable practices. It is vital for companies to strike a balance between meeting environmental standards and maintaining cost-effectiveness.

Regulatory Complexity

Adapting to changing regulations and locational uncertainties presents challenges in strategic planning and long-term investments for the oil and gas industry. Skillful management of regulatory changes is vital to maintain compliance and minimize operational risks.

Operational Complexity

Exploration and drilling in the oil and gas industry are complex and require precision. These processes involve the use of heavy machinery and rely heavily on accurate data. Challenges like long drilling periods, the potential for inaccurate well placement, equipment downtime, and high exploration costs contribute to operational complexities in the industry.

Accidents and Hazardous Environment

In the downstream sectors, major risks involve accidents caused by heavy machinery and health issues due to hazardous gas release. Accidents can be prevented with proper measures, resulting in disruptions, health complications for workers, environmental pollution, and vandalism that impacts the supply chain.

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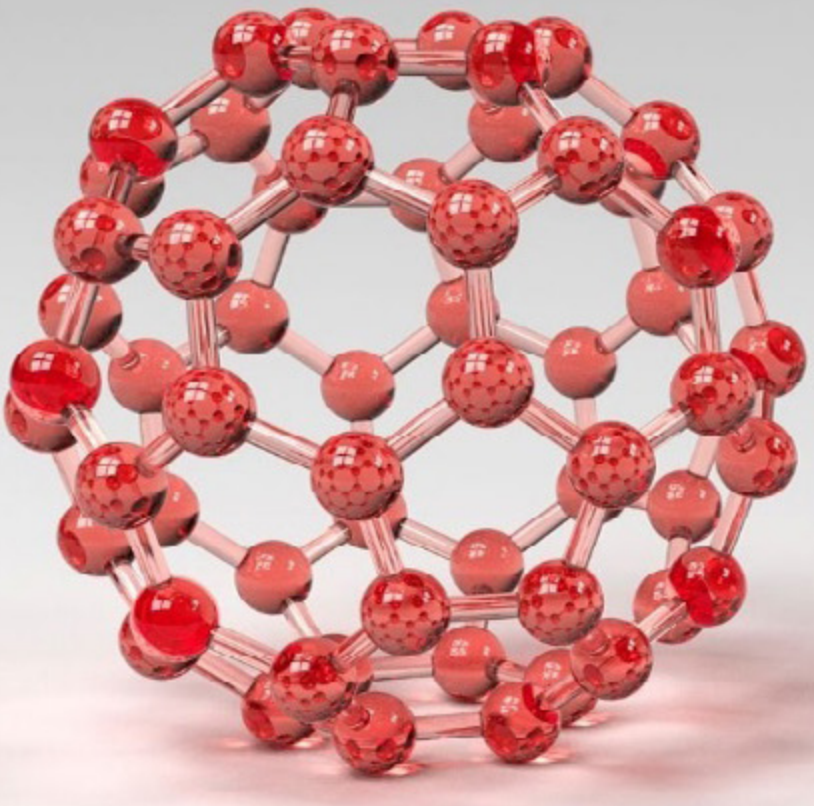
Nuclear

16 Thorium-Based Nuclear Energy



Could Thorium Power the Next Generation of Nuclear Reactors?

Thorium pellets used inside the Bhabha Atomic Research Centre (BARC) nuclear research reactor in Mumbai, India

As climate change makes the planet less pleasant to live on, nuclear power is getting more attention. Solar and wind energy can help cut greenhouse gas emissions, but if a solution can be found to climate change, nuclear power is probably going to be part of it.

Although nuclear power doesn't produce the climate-altering gases that create a problem with other sources of electricity, it carries with it certain risks. For starters, disposing of radioactive waste from nuclear power plants presents a difficult problem — what to do with such dangerous byproducts? Also, what happens if the core melts down and creates an environmental catastrophe, as happened in Chernobyl, Ukraine, in 1986? There are other concerns as well, but given our current energy predicament, there are plenty of reasons to keep plugging away at making nuclear power safer.

Nuclear reactors are run by fission, a nuclear chain reaction in which atoms split to produce energy (or in the case of nuclear bombs, a massive explosion).

«Approximately 450 nuclear reactors are in operation worldwide, and they all need fuel,» says Steve Krahn, a professor in the department of civil & environmental engineering at Vanderbilt University, in an email. He noted that for the most part, these reactors operate on uranium-235 (U-235), and the nations that partially recycle the fuel — France, Russia and a few other countries — mix in recycled Plutonium-239 to make what›s called mixed-oxide fuel.

Plutonium is a byproduct of used fuel from a nuclear reactor and it can form the basis for recycling nuclear fuel from today's nuclear reactors, as is done in France and several other countries. However it›s highly toxic and it is the most frequently used material for nuclear weapons, which is one reason scientists have continued to explore other options.

What Is Thorium?

Some scientists think the element thorium is the answer to our nuclear power problems. Thorium is a slightly radioactive, relatively abundant metal — about as abundant as tin and more abundant than uranium. It›s also widespread, with particular concentrations in India, Turkey, Brazil, the United States and Egypt.

But it is important to note that thorium isn›t a fuel like uranium. The difference is that uranium is "fissile," meaning that it produces a sustainable chain reaction if you can get enough uranium in one spot at one time. Thorium, on the other hand, is not fissile — it's what scientists call «fertile,» meaning that if you bombard the thorium with neutrons (essentially jump-start it in a reactor fueled with material like uranium) it can transmute into a uranium isotope uranium-233 which is fissile and suitable for creating power.

Thorium Pros and Cons

Thorium was used in some of the earliest nuclear physics experiments — Marie Curie and Ernest Rutherford worked with it. Uranium and plutonium became more heavily associated with nuclear processes during World War II, because they provided the clearest path to making bombs.

For power generation, thorium has some real benefits. Uranium-233 formed from thorium is more a more efficient fuel than uranium-235 or plutonium, and its reactors may be less likely to melt down because they can operate up to higher temperatures. In addition, less plutonium is produced during reactor operation, and some scientists argue thorium reactors could destroy the tons of dangerous plutonium that has been created and stockpiled since the 1950s. Not only that, a fleet of reactors operating on thorium and uranium-233 is thought by some scientists to be more proliferation-resistant, since more sophisticated technology is needed to separate uranium-233 out of the waste products and use it to make bombs.

There are downsides to thorium, however. One is that, thorium and uranium-233 are more dangerously radioactive to chemically process. For that reason, they are harder to work with. It is also more difficult to manufacture uranium-233 fuel rods. Also, as noted earlier, thorium is not a fuel.

"If we are going to power our planet using a fuel cycle that employs thorium and uranium-233, sufficient uranium-233 must be produced in other types of reactors to fuel the initial uranium-233 reactors," says Krahn. "If that can be accomplished, methods to chemically process thorium-232 and uranium-233 and manufacture fuel from them are fairly well established; however, facilities to accomplish these processes would need to be constructed."

Using Thorium for Energy

There are several ways thorium could be applied to energy production. One way under investigation now is to use solid thorium/uranium-232 fuel in a conventional water-cooled reactor, similar to modern uranium-based power plants. In fact, more than 20 reactors world-wide have been operated with fuel made of thorium and uranium-233.

Another prospect that has been exciting to scientists and nuclear power advocates is the molten salt reactor. In these plants, fuel is dissolved in liquid salt that also acts as the coolant for the reactor. The salt has a high boiling point, so they can be more efficient in electricity generation and even huge temperature spikes will not lead to massive reactor accidents such as occurred at Fukushima. It might sound like this kind of reactor is almost the stuff of science fiction, but just such a reactor was operated in the United States in the 1960s and is currently being built in the Gobi Desert in China.

Daniel Araya
https://www.cigionline.org/

“

Miller Big Blue 400X PRO CAT Turbo with ArcReach

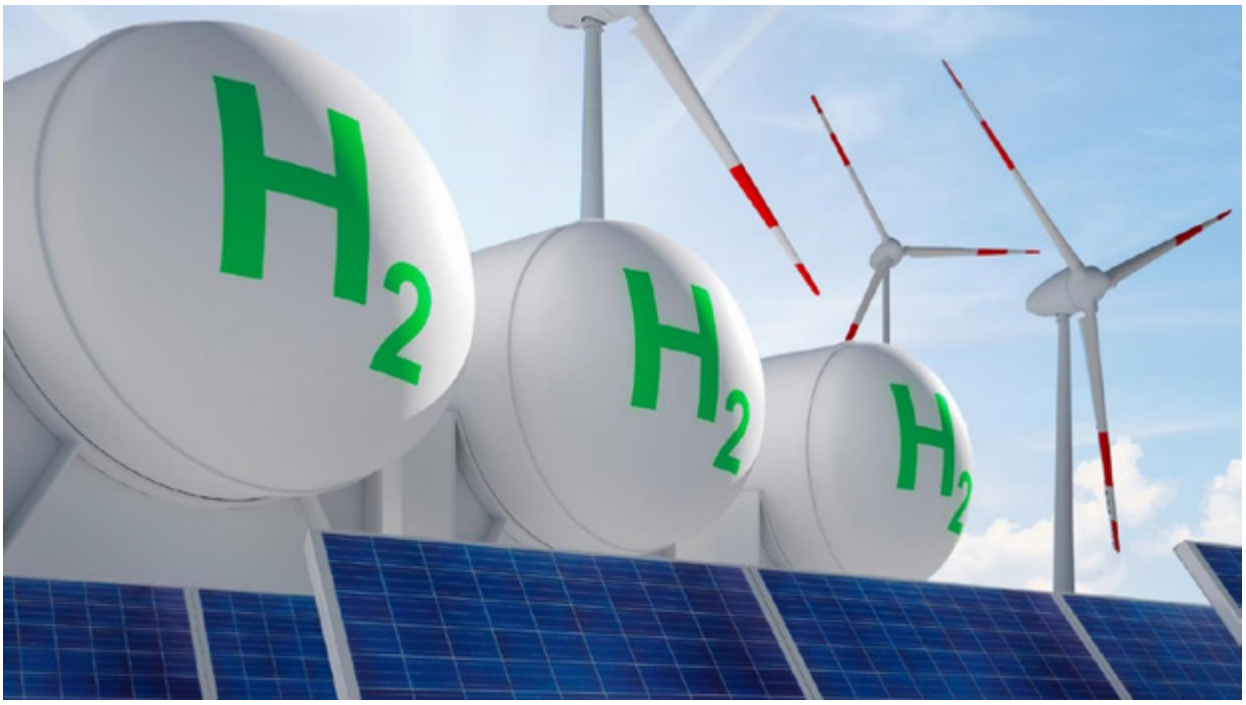
The Miller Big Blue 400X PRO CAT Turbo engine driven welder with ArcReach is designed with the welding professional in mind. The Big Blue 400X PRO CAT Turbo with ArcReach is the best engine driven welder due to its ease of use, reliability, and low fuel consumption.

energy HQ
energyHQ.world
June 2024
Vol. II
Issue 6

Hydrogen

21 Standards and Regulations for the Hydrogen Economy

Navigating The Global Hydrogen Ecosystem



What's preventing progress and how to gain momentum?

Limiting climate change with clean hydrogen?

Clean hydrogen is widely acknowledged as the solution to reduce carbon emissions in difficult sectors, including steel production, the chemical industry and long-haul truck transportation, as well as a feedstock for PtL fuels for aviation and shipping. For this reason, clean hydrogen has been given a significant role in national and regional strategies to limit climate change. Despite these ambitions, globally the market remains in its very early stages and progress has been – with a few exceptions – quite slow.

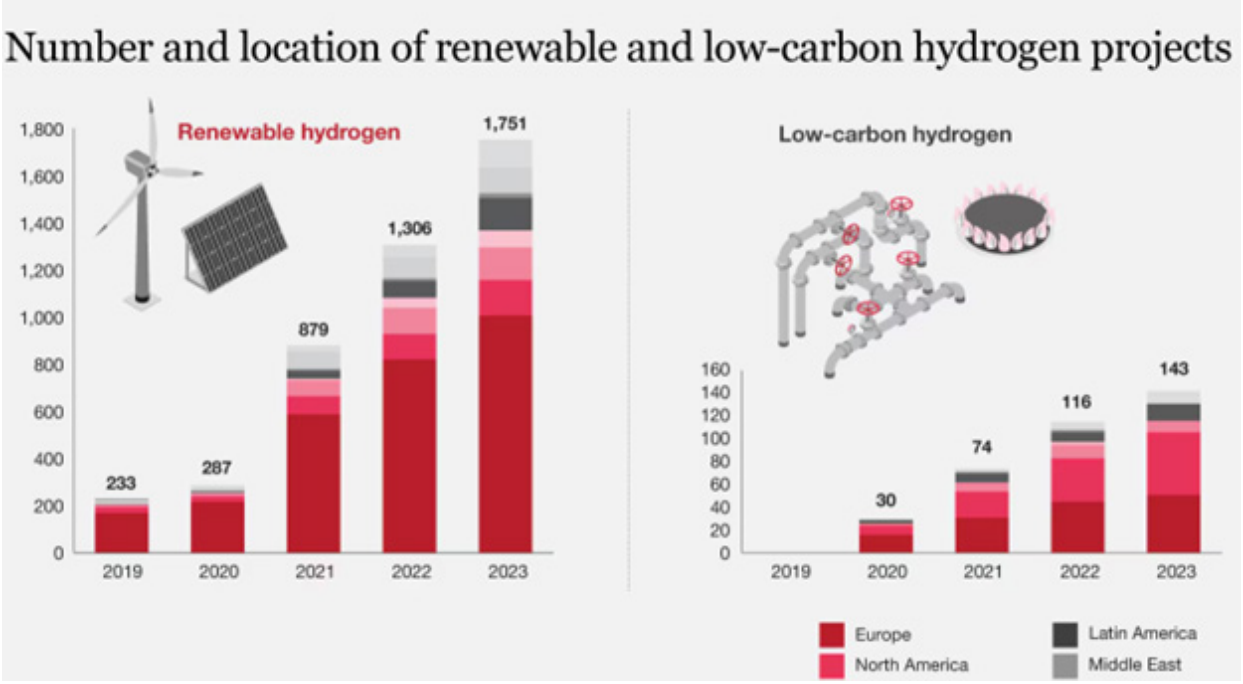
Global clean hydrogen market dynamics

The number of low-carbon and renewable hydrogen projects announced worldwide is rising steadily, with more than 1,400 new production projects announced between 2020 and 2023. When it comes to renewable hydrogen, produced using renewable electricity to split water into oxygen and clean hydrogen, Europe continues to dominate – with more than half of the world's known renewable hydrogen projects located there.

Looking at low-carbon hydrogen – produced using methods including carbon capture and storage (CCS) technology to reduce emissions created in the process of producing clean hydrogen from natural gas – North America took the lead by the number of projects announced in 2023. When looking at renewable hydrogen capacity rather than numbers of projects alone, Europe leads with the largest announced capacity until 2023 (200 GW) followed by Africa (170 GW) and Oceania (130 GW). However, it is important to note that 'announced' is not the same as built, and risks remain that these projects will never be completed.

In the future, around 100 million tons of clean hydrogen will be needed globally by 2030 to meet the Paris climate targets. By 2050, the global economy will need 500 million tons of hydrogen every year to meet these targets. This will likely involve using some low-carbon hydrogen because of its reliability and cost-effectiveness.

Currently, only around 1 GW of electrolyzer capacity is operational globally. This is only enough to produce around 80,000 tons of renewable hydrogen if enough renewable power is accessible. To increase this towards 500 million tons by 2050, there is no time to lose in building up production capacity worldwide.



Challenges in Scaling Up Clean Hydrogen Production

However, scaling up clean hydrogen production to meet future demands poses significant challenges. Infrastructure development, such as establishing hydrogen transport networks and storage facilities, requires substantial investment and international cooperation. Additionally, technological advancements are needed to enhance the efficiency and reduce the costs of both electrolyzers and carbon capture and storage systems. Governments and private sectors must also address regulatory barriers and create favorable market conditions to stimulate investment and innovation.

The transition to a hydrogen-based economy will depend heavily on policies that support research and development, incentivize green energy adoption, and ensure a just transition for industries and workers affected by the shift. Global collaboration will be key, as countries with abundant renewable energy resources can export clean hydrogen to regions lacking such capacities, creating a balanced and resilient global hydrogen supply chain.

Public awareness and acceptance of hydrogen as a clean energy carrier will also play a crucial role in driving demand and supporting policy measures. Public campaigns and educational initiatives can help demystify hydrogen technologies and build trust among consumers and stakeholders. Moreover, strategic partnerships between governments, private companies, and research institutions will be essential in fostering innovation and accelerating the deployment of hydrogen solutions.

The Path Forward: A Coordinated Effort

Ultimately, achieving the ambitious hydrogen production targets by 2050 will require a coordinated effort that integrates technological, economic, and social dimensions to create a sustainable and inclusive global hydrogen ecosystem. Stakeholders across the board need to commit to long-term investments in hydrogen infrastructure, technological innovation, and workforce development. By aligning efforts and resources, the global community can overcome current obstacles and unlock the full potential of clean hydrogen, paving the way for a decarbonized future.

While the path to a robust global hydrogen economy is fraught with challenges, it also offers unparalleled opportunities for reducing carbon emissions and achieving climate goals. Through concerted action and sustained commitment, the vision of a hydrogen-powered world can become a reality, driving economic growth and environmental sustainability for generations to come.

https://www.strategyand.pwc.com/

Cover Story

24 Monitoring Transformers

Monitoring Transformers To Guard Against The Impact Of Solar Flares

Elimpus Ltd has installed several of Vaisala's online transformer monitoring solutions on behalf of Scottish Power, a leading British energy provider, to provide real-time condition updates.

In one application, the Optimus DGA Monitor OPT100 will provide continuous updates on Scottish Power's 1000MVA auto transformer and monitor for the impact of geomagnetically induced currents on the asset.

Scottish Power is a British energy provider and distribution network operator for central and southern Scotland, and parts of northern England and Wales. It is also the transmission grid owner for the south of Scotland. At a key site in Scotland's central belt, Scottish Power wanted to protect a 1000MVA autotransformer from the effects of solar flares - periods when intense high-energy radiation is emitted from the sun's surface, causing radio and magnetic disturbances on Earth. Coupled with local geology, these have the potential to disrupt power the magnetic circuit of transformers, leading to inefficient power transmission and significant damage to the transformers.

Accurate transformer monitoring with the Optimus DGA Monitor OPT100

In order to accurately and continuously monitor the condition of its transformer, detect the effects of geomagnetically induced currents, and take proactive maintenance if required, Scottish Power commissioned the installation of an Optimus DGA Monitor OPT100 by Elimpus Ltd.

The OPT100 is Vaisala's most advanced monitoring solution and assesses a transformer's condition by measuring for the presence seven key fault gases and moisture in transformer oil.

"Scottish Power has a number of strategic transformers on the transmission

network that require advanced condition monitoring, and we have been increasingly wary of the effects of solar flares and geomagnetically induced currents to disrupt their efficient performance," said Keith Black, System Performance Senior Engineer at Scottish Power. "The Vaisala unit was installed because it met our current specification of online DGA devices with the addition of being maintenance free."

Employing advanced technology for the best outcomes

The OPT100 draws on Vaisala's long heritage in industrial measurement technologies. Its infrared (IR) sensors are based on Vaisala's core technology. The highest engineering quality is maintained by manufacturing all of the unit's optical measurement components in-house in the company's own cleanrooms, including the infrared light sources, detectors and innovative tuneable optical filters using MEMS technology, which ensure optimal condition monitoring performance regardless of operational conditions. To maximize reliability, there are no moving parts in the optical measurement module.

Long-term measurement stability is supported by a patented autocalibration facility and IR reference measurement, always ensuring the provision of reliable gas trending data. Vacuum extraction results in more complete gas separation from the oil than with the traditional headspace method. Hermetically sealed oil and gas handling eliminates potential contamination from ambient air, such as humidity or possibly the exhaust gases that may exist at a power facility.

Moisture and hydrogen are measured directly in the insulation oil with Vaisala's capacitive thin-film polymer HUMICAP® sensor and a solid-state sensor.

The OPT100 has been designed for durability in all climates, with stainless steel pipes, an IP66-rated housing, and a magnetic drive gear pump. The system does not require consumables, so no regular maintenance is necessary.

In combination, the design features of the OPT100 deliver reliable data so that users are able to make critical operational decisions for their power transformers.

Removing the requirement for additional software, a web-based user interface is available with the OPT100. The device can be connected to an existing monitoring and control system using digital communication protocols and relays, or used as a standalone monitoring system. In the event of an issue such as a power outage, self-diagnostics enable automatic self-recovery.

An additional and key benefit of Vaisala's OPT100 over other transformer monitoring equipment is its simple installation process, which enabled Elimpus and Scottish Power to quickly and independently bring the unit online.

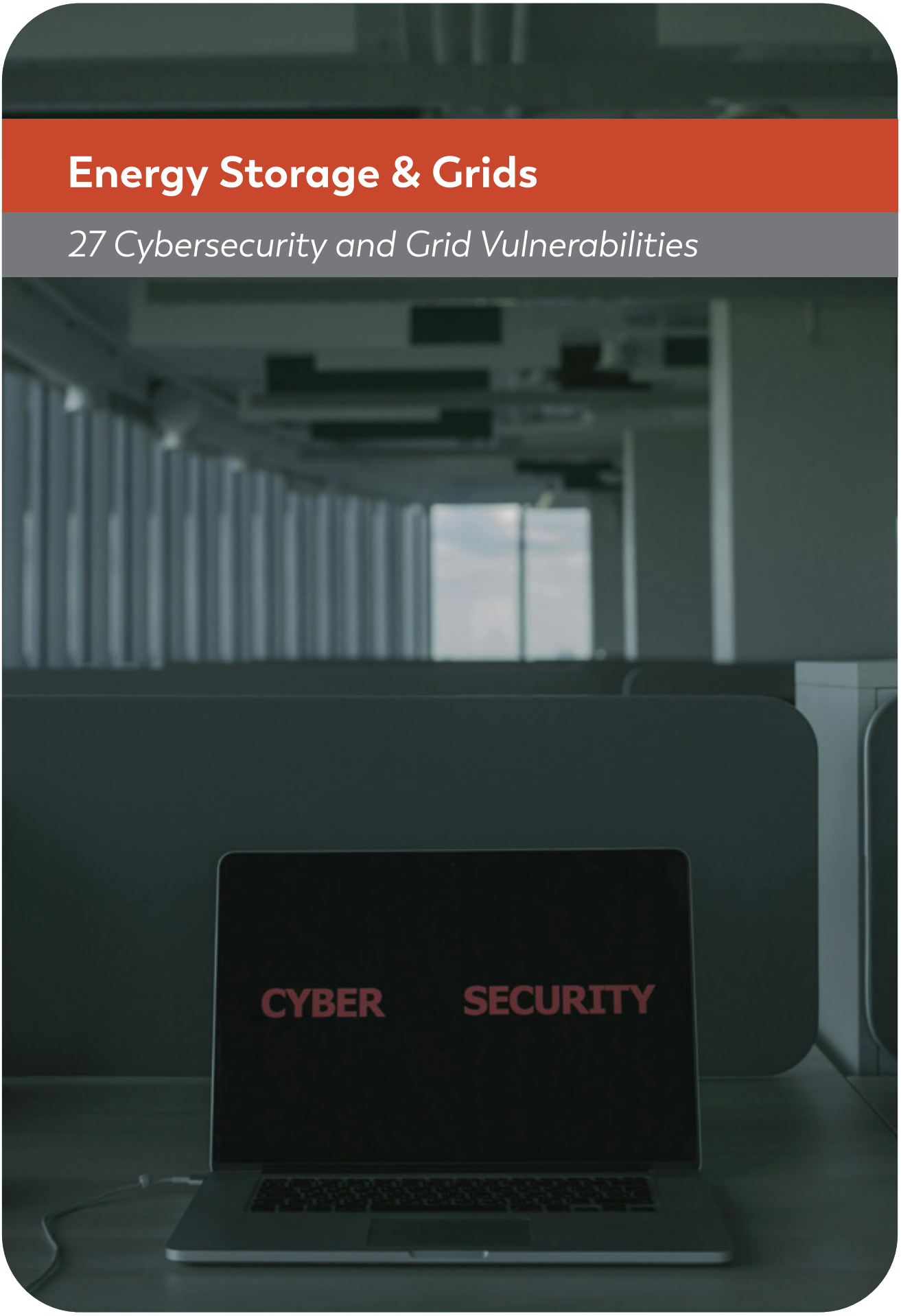
Scottish Power has been using the OPT100 since November 2017, and has benefited from greater oversight of its asset's condition. "The OPT100 gives us the ability to track any disturbance that may occur and extend the lifetime of our transformer, as well as reducing the possibility of any unplanned outages," added Keith Black.

With online transformer monitoring set to become increasingly important, Scottish Power are installing more OPT100 units across their fleet of power transformers.

Edited By Hassan Mourtada
www.energyHQ.world

Energy Storage & Grids

27 Cybersecurity and Grid Vulnerabilities



Guarding the Grid: Cyber Barriers to Grid Digitalization

Cyberattacks on a digitalized and interconnected power grid can have devastating effects. Preventing them will require technical innovation. This is the first part in a series examining technical challenges to grid digitalization in depth.

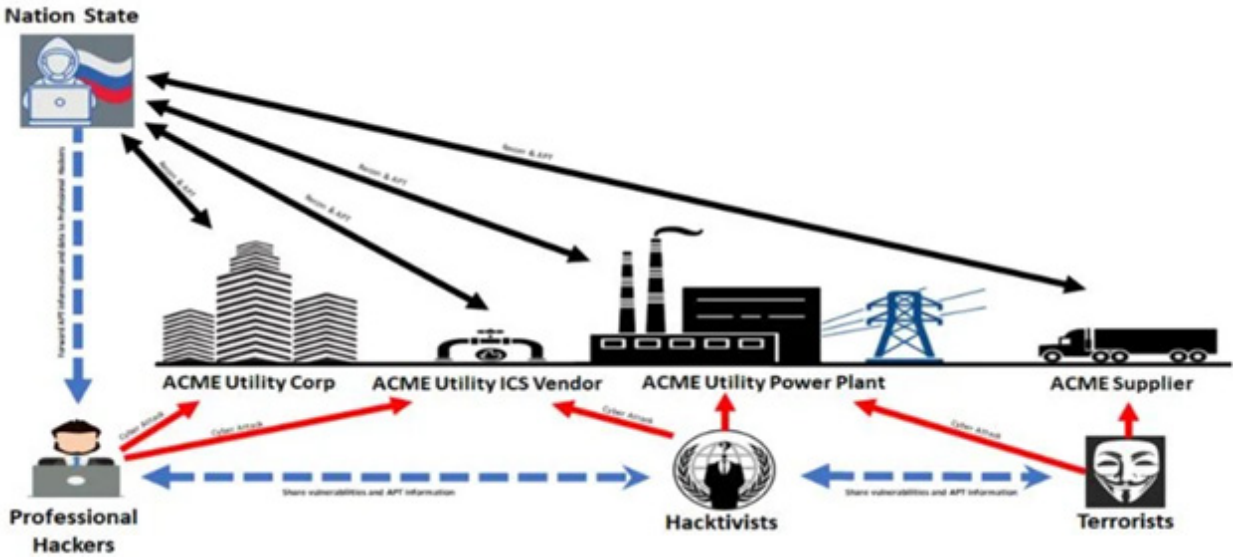
The World Economic Forum lists cyberattack risk in the top 10 regarding likelihood and impact worldwide. Cyberattacks are becoming increasingly sophisticated, targeting automated smart devices as a gateway into larger computing networks.

While grid digitization offers many benefits, the rapid growth of connected devices like electric vehicles in a digitalized grid could create more gateways for cyberattacks. To combat this, systems to protect against cyberattacks must progress at the same rate as digitalization developments. Cybersecurity is a significant technical barrier to overcome before a larger digitalized rollout can happen across the grid.

Smart Grids and Cyberattacks

Grid digitalization aims to bring the physical and digital worlds together to improve operational efficiencies, optimize grid performance, manage the integration of renewable energy sources, and meet the ever-changing consumer demands.

Many moving parts must come together, and numerous technical barriers hamper efforts to create a decentralized system. As more systems, devices, and networks become intertwined and better connected, the chances increase that these digital networks become targets for cyberattacks—especially when new technologies are being leveraged in areas



Cyberattack threats on a connected grid. Image used courtesy of Public Utility Council of Pennsylvania

where legacy equipment has existed for decades. Often, no robust IT security protocols are in place.

Why Cybersecurity Threatens the Power Grid

As infrastructure shifts toward automation, systems are moving online and becoming digitally connected. This presents cybersecurity risks, creating more potential openings for hackers to exploit, gaining access to the wider IT network. Cloud computing and open-protocol standards exacerbate this risk. A hacker or anyone who gains access to a decentralized data center can harvest and use this data.

Increasing the power grid's connectivity and automation levels will naturally

make the grid more vulnerable to cyberattacks. However, the main problem is the connectivity the energy industry shares with the wider society. The power grid is interconnected with many other critical infrastructures and services, so cyberattacks using the grid as a gateway could potentially threaten many aspects of society.

Bringing Together Multiple Players Against Cyber Threats

Cybersecurity barriers are multifaceted, and technical, human, and economic factors must work together to remove them. Cyberattacks are a particular concern for distribution system operators (DSOs), so keeping up with the system's evolution and mitigating threats will be critical. This task will be particularly difficult because many DSOs do not share data, so trying to build a united front against different attacks without sharing data about each attack presents some challenges.

Few cyberattacks have disrupted power systems. To date, cyberattacks have been smaller than other disruptions in the energy sector, such as power outages from storms, equipment failure, or operational errors. The first cyberattack came in 2015 when Ukraine's grid was targeted, and 30 substations were offline, leaving 225,000 people without power.

Different frameworks within the industry have been developed. Still, many strategies have limited real-world impacts toward mitigating risk because they rely on voluntary initiatives from active organizations within the power sector. Combating grid cyberattacks will depend on policymakers, regulators, system operators, and organizations across the electricity value chain coming together to tackle challenges as one.

The Potential Impact of Cybersecurity Attacks

Power grids operate in real time, and electricity availability and grid reliability are two major priorities for operators. If cyberattacks happen, the industrial control systems must react within a fraction of a second, so robust and authenticated cybersecurity procedures are required to support the underlying industrial control system functions.

Cyberattacks pose many risks if security systems don't react quickly enough to a threat. The real-time nature of electricity means common cyber-prevention methods, such as installing patches and rebooting, are much more complex than other system networks. Unlike other industries, it's not possible to temporarily take out grid operations because of the impacts shutting down would have on the electricity supply.

Electricity systems also have the potential to cascade if a cyberattack occurs. Since systems from individual parties are interconnected to the wider grid for sharing operational and planning information, any cyberattack could affect the targeted company or party and cascade across digital networks, causing outages in multiple IT systems. A single attack on something digitally connected to the grid could cause large-scale outages.

However, a grid outage doesn't just affect the electricity companies but also other critical services relying on electricity, such as hospitals. Cyberattack outages could directly damage assets and infrastructure, causing a decline in revenue for electricity supply companies and many businesses and potentially resulting in billions of dollars in damage. The costs of dealing with cyberattacks— detection, investigation, containment, and recovery—further compound economic damages.

Most electrical infrastructure—such as power plants and transmission and distribution systems—are legacy equipment. These systems have operational lifetimes beyond 50 years, so modern-day electrical systems contain a mixture of old technology and new digitalized technologies. Legacy equipment was never connected digitally, but retrofitting approaches enable old equipment to come online. However, if robust security measures and cyber resilience protocols are not implemented alongside these digital connections, they will become an easy and vulnerable target for hackers.

By Liam Critchley
https://eepower.com/

Country Reports

UK Energy Sector's Ticking Time-Bomb To Hit Net-Zero Targets

Wind turbines on Eaglesham Moor, south-west of Glasgow. Britain needs far more investment to help it hit net-zero targets. AFP

Call for more investment as uncertainty surrounding interest rates and government policy are a major concern, according to the Resolution Foundation

The UK›s road to net zero needs to be paved with a fourfold increase in investment in electricity generation and infrastructure, a leading think tank has said.

In a new report called Electric Dreams, the Resolution Foundation calculated that by 2035, about 40 per cent of the energy consumed in both our homes and in road transport will need to be electricity (up from 22 and 4 per cent today, respectively), before rising to almost 100 per cent by 2050.

«At the same time, spending on power networks needs to increase by a factor of four to cope with this surge in the volume of electricity,» the report said.

There has been mounting uncertainty over the cost of capital, as interest rates have gone from 0.25 per cent to 5.25 per cent over the past two and a half years in response to rising inflation.

Such conditions mean the cost of building a wind farm in the UK has risen by about 31 per cent in recent times.

As such, for the UK economy to decarbonise and meet rising demand, «quite a bit of money» will be needed, Resolution Foundation›s senior economist Jonathan Marshall said.

«We have been able to ramp up investment before. In the 2010s, we managed to double what we were investing in electricity in the previous decade.»

However, the foundation points out in its report that green energy is more capital intensive in its initial phases, because many of the costs are «front-loaded», which means fluctuating interest rates can throw in an added element of uncertainty.

"Cleaner energy could be cheaper energy, if interest rates return to the low levels seen during the 2010s," Mr Marshall said.

"But we can't count on that being the case. If interest rates stay high, energy costs will rise rather than fall in the years ahead."

The report says when borrowing costs for the private sector are high, up to £29 billion ($35.8 billion) could be added to energy bills, creating "severe financial strain for low-income households».

The foundation also said higher interest rates mean nearly half of the total cost of a new offshore wind project is now due to the cost of capital.

Nevertheless, Neil Kenward, director of strategy, economics, research and net zero at the UK regulator Ofgem believes the costs of decarbonisation will eventually pay dividends.

«Whatever the cost due to these capital pressures of renewables, increasingly they will start to drive down the wholesale prices,» he said.

«It›s currently set by gas the whole time. Increasingly it will be set by renewables as we generate the renewable surplus.»

Although the cost of capital-intensive infrastructure required in the electricity sector on the road to net zero will be higher if interest rates go up, Mr Kenward said Ofgem can keep some of the costs, particularly in critical parts such as networks, «as low as possible, by providing a very investable framework, which gives investors the clarity and certainty they need to make long-term investments».

Matthew Davies
https://www.thenationalnews.com/

Ireland's Energy-Related Emissions Hit Lowest Levels In 30 Years

While the result sounds promising, the SEAI warned that Ireland is highly reliant on both fossil fuels and imported energy, and transport emissions continued to rise last year

Ireland's energy-related emissions fell by more than 7pc in 2023, but the country is still not on track to remain within its 2021-2025 carbon budget .

That's according to a new report from the Sustainable Energy Authority of Ireland (SEAI), which estimates that energy-related emissions reached their lowest point in 30 years. This Interim National Energy Balance report estimates that emissions from electricity generation went down by 21pc last year.

The SEAI attributed the decline to a new record in Ireland for importing electricity through interconnectors – 12 times more last year than in 2022. These imports meant Ireland used less fossil fuel generation.

Ireland's demand for electricity increased by 3pc in 2023, but the generation of electricity in Ireland fell by 6.7pc due to this increased use of imported electricity.

The report also notes that Ireland set "new highs" for renewable energy generation such as wind, solar and heat-pump installations. For example, solar electricity generation increased by more than 300pc in 2023 – though it still only accounted for 1.9pc of Ireland's electricity supply according to the SEAI.

Despite the new records, the SEAI warned that more action is needed and that the only way for Ireland to hit its overall emissions targets is to meet annual energy-related and industry emission reductions of more than 11pc for 2024 and 2025.

The report also noted that Ireland is heavily dependent on both fossil fuels and imported energy, as more than 80pc of the country's energy comes from fossil fuels.

"The reduction in energy-related emissions in 2023 is encouraging, it shows movement in the right direction in some sectors," said Margie McCarthy, SEAI director of research and policy insights. "It is clear from the data that pace is critical. We have no time to wait.

"We must redouble our collective efforts to reduce our reliance on fossil fuels. This must be driven by increased Government supports, full and timely realisation of our climate action plans, and importantly support from wider society through citizen and community action."

Meanwhile, the report warns that collective action is "urgently" needed in Ireland's transport sector, as there was increased demand and emissions from transport last year. The report suggests there has been an almost full return to pre-COVID levels of petrol and diesel demand in Ireland

By Leigh Mc Gowran

https://www.siliconrepublic.com/

Egypt to Create Ministry of Energy, Details Shared at Invest in African Energy (IAE) 2024 Forum

Egypt is looking at the possibility of merging its petroleum and renewable energy ministries, creating an integrated Ministry of Energy to streamline industry operations and regulations. Mohamed Fouad, CEO of Egypt Oil & Gas, Secretary General of the Egyptian Gas Association and Marketing & Communications Committee Chairman of the International Gas Union, told an audience

Egypt is looking at the possibility of merging its petroleum and renewable energy ministries, creating an integrated Ministry of Energy to streamline industry operations and regulations.

Mohamed Fouad, CEO of Egypt Oil & Gas, Secretary General of the Egyptian Gas Association and Marketing & Communications Committee Chairman of the International Gas Union, told an audience at the Invest in African Energy (IAE) Forum in Paris that the merger will "make discussions and open dialogue with international companies much more efficient."

The merger comes in response to changing dynamics within Egypt's energy industry, as the country aims to increase the penetration of renewable energy in its gas-dominated energy mix. Oil and gas companies are also turning to renewable energy systems to support sustainable operations in the country, highlighting a need to enhance certainty regarding regulatory approvals in the industry.

According to Fouad, "We are increasing and putting a lot of investments in renewable energy and clean energy, while investing a lot within nuclear energy. We see the dynamics of creating a balance in our energy mix to be in favor of the country and the region."

Various North African countries are prioritizing an integrated energy mix – one that comprises a balance of hydrocarbon and renewable energy resources. In Morocco – a major gas and renewable energy producer – incorporating both renewables and gas in the energy mix is critical for developing baseload power while supporting a transition to a more sustainable future.

Adonis Pouroulis, CEO of Chariot Energy Group, stated that, "Morocco is the leader in Africa in renewable energy, but to support baseload power, you need gas and you need hydrocarbons. With hydrocarbons as your baseload, you can be more relentless in new technologies going forward because we will need all forms of energy to not only power Africa but the rest of the world."

To support multi-faceted energy development, both Egypt and Morocco are prioritizing investments in infrastructure. According to Fouad, "You will not have more energy investments if you do not have infrastructure. Reliable, sustainable and cost-efficient infrastructure adds value."

Morocco is spearheading cross-border infrastructure development with the construction of the Nigeria-Morocco Gas Pipeline. The northern section survey of the pipeline has begun, serving as a critical step forward in the development of the $25 billion project. The 5,600km pipeline will link Nigeria's gas fields to international markets via Morocco, traversing 11 West African countries. Pouroulis believes that "the Nigeria-Morocco Pipeline is very important," as it showcases the success of cross-border collaboration and infrastructure development in Africa.

Meanwhile, Libya aims to increase production to two million barrels per day within the next three years, with 45 greenfield and brownfield projects currently in the pipeline. As the market grows, the demand for insurance services has also increased. Delivering a presentation ahead of the North African panel discussion at IAE 2024, Zakaria Albarouni, General Manager at Al Baraka Insurance, stated that "Our energy offerings are tailored to the needs of both onshore and offshore projects. We provide a comprehensive coverage of onshore facilities and offshore platforms. Our comprehensive engineering policies ensure every phase from groundwork to completion is covered against unforeseen events."

https://african.business/

Services

34 Coming Events

Coming Events

Indonesia Critical Minerals Conference & Expo 2024
Hotel Mulia Senayan Jakarta, Jakarta, Indonesia
11 - 13 Jun 2024
https://ni-co-ev-indonesia.metal.com/home

As part of the Indonesia Critical Minerals Conference 2024, SMM continues this grand nickel and cobalt event that connects industry experts and related practitioners. This year, the sector specifically discussing NEV (new energy vehicle)

India Process Expo and Conference 2024
Hitex Exhibition Center, Hyderabad, India
16 - 18 Aug 2024
https://ipecexpo.in/

India Process Expo and Conference is the country finest platform for the machinery and equipment manufacturers as well as service providers to showcase their technological superiority/latest innovations to the Pan India audience

Northwest Renewable Hydrogen Conference 2024
Spokane, USA
04 Jun 2024
https://renewableh2.org/

The Renewable Hydrogen Alliance promotes the use of renewable hydrogen as a clean energy alternative to fossil fuels. The organization advocates for policy changes and educates stakeholders on the benefits of renewable power for various sectors

International Exhibition on Environmental
Technology & Green Energy 2024
COEX Convention Center, Seoul, South Korea
03 - 05 Jun 2024
https://www.envex.or.kr/kor/main/index.asp

The ENVEX exhibition showcases various environmental products and technologies, encompassing water treatment, air pollution control, measurement and analysis, recycling, carbon-neutral solutions like CCUS, hydrogen...

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).

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.

General Queries & Contact Info

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Media Kit 2024

Everything about energyHQ ~ Here!

https://www.energyhq.world/energyHQ_Media%20Kit_2024.pdf

Holistic Promotional Packages (HPP)

From Bronze to Platinum Package ~One GPO To Rule Them All!

https://www.energyhq.world/GPO%20-%20Copy.html

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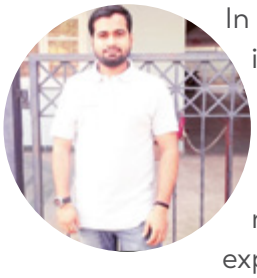
Navigating Taxation Turmoil: Legal Battle Surrounding A 250 MW Solar Power Project In Rajasthan



In a recent turn of events, a renewable energy firm has found itself entangled in a legal battle following a substantial change in taxation that has significantly impacted the cost of its ambitious solar power project. The company, known for its expertise in sustainable energy solutions, is facing unforeseen financial strains after a government directive altered the tax rate on solar equipment, causing a notable escalation in the project's capital expenditure.

The crux of the matter revolves around a 250 MW solar power plant slated for development in Rajasthan, with the company having inked agreements with a governmental entity for the supply of power. However, the foundation of these agreements was shaken when the tax landscape shifted unexpectedly, throwing the project's financial projections into disarray.

In response to this abrupt turn of events, the renewable energy company took decisive action by filing a petition, arguing that the sudden tax hike should be classified as a 'Change in Law' under the terms of their power purchase agreement. Such a classification would render them eligible for compensation to mitigate the escalated costs incurred due to the tax amendment.

The legal proceedings that ensued were intricate and involved presentations from a multitude of stakeholders, including representatives from the renewable energy firm, the concerned governmental entity, and various other parties with vested interests in the outcome.

Central to the arguments presented during the hearings were the substantial financial ramifications that the tax revision had inflicted upon the project. Both sides presented meticulously crafted analyses and relied on expert testimonies to bolster their respective positions.

The company's representatives fervently contended that the tax adjustment, which materialized after the project's financial planning and bidding phase, had unfairly burdened them with unforeseen financial strains. Their plea sought not only the acknowledgment of the tax alteration as a 'Change in Law' but also restitution in the form of financial compensation to restore them to the economic equilibrium they would have enjoyed had the tax amendment not materialized.

The resolution of this legal conundrum is poised to set a precedent for how the energy sector navigates sudden regulatory or legal changes impacting project economics. Moreover, it underscores the intricate complexities and inherent risks associated with large-scale renewable energy initiatives, where the financial viability of such endeavors is intricately interwoven with the stability of regulatory and tax frameworks.

As stakeholders eagerly await the conclusion of this legal saga, the outcome is poised to reverberate across the renewable energy landscape, potentially reshaping how such ventures navigate the turbulent waters of regulatory uncertainties and taxation dynamics.

By Mohan Gupta
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