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Transforming Energy Efficiency: Innovations in Protection and Power Management



The energy sector is undergoing rapid changes, driven by technological advancements and the push towards sustainability. Companies across the industry are exploring new ways to enhance efficiency, reduce costs, and improve the resilience of power systems. Among these developments, optimizing transformer protection with Transformer Guarding Protocol (TGP) has gained notable attention, representing a critical aspect of modern energy infrastructure.

Efficient and reliable transformers are vital to the smooth transmission and distribution of electricity. However, without proper protection mechanisms, they can be vulnerable to operational failures that lead to costly disruptions. TGP systems address this challenge by providing real-time monitoring of key parameters like temperature, voltage, and load conditions. By continuously assessing these factors, TGP solutions can detect irregularities early, allowing operators to perform preventative maintenance and avoid potential breakdowns. This not only reduces maintenance costs but also extends the lifespan of transformers, ensuring a more stable and reliable power supply.

In addition to safeguarding equipment, TGP systems contribute to the seamless integration of renewable energy sources. As more wind, solar, and other green technologies feed into the grid, maintaining transformer stability becomes crucial. By optimizing transformer performance under variable load conditions, TGP helps utilities adapt to fluctuations and maintain consistent energy flow, making it an essential tool for modern power management.

Beyond transformer protection, the broader energy industry is experiencing significant transformations. One of the key trends is the widespread adoption of digital technologies, such as artificial intelligence (AI) and the Internet of Things (IoT), to improve grid management. Smart grid systems leverage these tools to monitor energy usage patterns, predict peak demand, and optimize power distribution. These advancements enhance efficiency, reduce energy wastage, and contribute to a more reliable power grid.

Another noteworthy development is the increased focus on energy storage solutions. With the rise of renewable energy, the ability to store and manage surplus power has become a priority. Advances in battery technology, including innovations in lithium-ion and flow batteries, are providing new opportunities for balancing supply and demand. Efficient storage systems are critical for ensuring that energy generated during periods of high production, such as sunny or windy days, can be saved and used when needed.

The energy industry's path forward is marked by a commitment to innovation and sustainability. While optimizing transformer protection with TGP plays a vital role in improving reliability, other advancements, like smart grids and enhanced storage solutions, are reshaping how energy is produced, stored, and consumed. Together, these innovations are paving the way for a more efficient, resilient, and sustainable energy future.

In This Issue!

energyHQ's September 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 Grid Integration of Renewables
- Article on page 16 focuses on Economic Considerations & Nuclear Power Costs
- Article on page 24 sheds the light on Optimizing Transformer Protection with TGP

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,
Hassan Mourtada
Editor-in-Chief
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World Digest



Qatar

QatarEnergy unveils plan to build 2GW solar power in Qatar

The new solar power plant is expected to double Qatar's solar capacity by 2030.

Qatari state-owned petroleum company QatarEnergy has unveiled plans to build a new 2GW solar power project in Qatar's Dukhan area.

The initiative is expected to more than double Qatar's solar energy production capacity, while significantly contributing to the nation's lower carbon emissions.

The project will elevate Qatar's photovoltaic (PV) solar power production capacity to 4GW.

Dukhan solar power plant, along with the existing Al-Kharsaah solar power plant, was inaugurated in 2022 with an 800MW capacity. Two further upcoming projects in the Ras Laffan and Mesaieed industrial cities will bolster QatarEnergy's solar power portfolio.

The Ras Laffan and Mesaieed projects, with a combined capacity of 875MW, are anticipated to commence production before the end of 2024.

With the Dukhan plant's completion, QatarEnergy's solar power projects within Qatar will have a total capacity of 4GW by 2030, representing almost 30% of the nation's total electrical power production capacity.

Germany



Reform to German industrial grid fees overdue

Reforming Germany's grids fees for industrial electricity consumers as a way to incentivise flexible power consumption and boost the use of renewables is overdue, according to a report by energy industry consultancy Neon Neue Energieökonomik. Currently, large industrial consumers receive discounts for maintaining a constant demand for electricity to keep flows in the grid stable and predictable. However, this has been criticised for making it virtually impossible for companies to respond to electricity price signals.

"The flexibilisation of industrial electricity consumption and thus the use of cheap green surplus electricity is an essential building block for the affordability of the energy transition and Germany's industrial competitiveness," report author Lion Hirth said, adding that this is "why a reform is right, important and overdue." The report, commissioned by transmission system operator (TSO) TenneT, comes on the back of the country's Federal Network Agency's (BNetzA) proposal to adapt grid fees to incentivise energy-intensive industries to adapt their electricity demand based on current supply.



Iran

Future energy perspective & investment opportunities in Iran's petroleum industry

Population growth, increasing urbanization, and the need for countries to fulfill the “Right to Development” all point in the inexorable direction of significant increase in energy demand in the foreseeable future. Even the most optimistic energy outlooks indicate that by 2050, at least half of the world's energy needs will be met by oil and gas.

At the same time, increase in demand in the post-COVID era, coupled with geopolitical developments and the imposition of cross-border sanctions on oil and gas exports in recent years, especially after the Russia-Ukraine War, has drawn global attention to the state of fragility of the global economy as regards energy security.

The world now appears to look for a reliable increase in energy supply more than ever before. History has shown that the process of energy transition usually takes decades, if not longer. Moreover, history has also come to bear out the pattern that energy transition has seldom led to the complete elimination of an energy source from the global energy mix. Instead, a new emerging source has tended to enrich the existing energy mix.



Thailand

Thailand Clean Energy Direct Purchase

The National Energy Policy Council (NEPC) has approved a pilot project for a Direct Power Purchase Agreement (Direct PPA), allowing businesses to directly purchase clean energy from renewable sources, including solar, wind, hydropower, and biogas not exceeding 2,000 megawatts through the Third-Party Access (TPA) systems. This project follows a discussion with U.S. Secretary of Commerce Gina Raimondo regarding a PPA during her recent visit to Thailand in March. The initiative is designed in part to meet the electricity demands of data centers, which are required to utilize 100 percent renewable energy for their operations.

Thailand's power generation is structured under an enhanced single-buyer model, and the Electricity Generating Authority of Thailand (EGAT) monopolizes high-voltage transmission and the wholesale electricity market. Currently, if power companies want to sell electricity produced by renewable sources, they are required to sell it to EGAT under the feed-in-tariff system and state distribution agencies.

The project is a significant development for Thailand's electricity market, promising better management of energy costs, reductions in carbon dioxide emissions, and additional opportunities for renewable energy developers.

Mexico



Energy Stability Key to Nearshoring Growth

The nearshoring trend can help Mexico to remain a key investment destination and a strong economy. However, development in the oil and gas industry, as well as energy infrastructure modernization, are paramount to ensure nearshoring success, according to experts.

Ernesto Bravo, Researcher at the Institute of Economic Research (IIEc), UNAM, emphasizes the need to ensure stability in Mexico's electricity supply to attract and retain investments. This stability is crucial to successfully address nearshoring, which positions Mexico as a key destination for foreign investment. To leverage on this trend, Mexico must ensure reliable energy from both renewable and non-renewable sources.

Arturo Ortiz, a Researcher, IIEc, notes that Mexico's fuel self-sufficiency in oil production can prove advantageous in attracting investments. By the end of 2024, Mexico is expected to achieve self-sufficiency in diesel and jet fuel, while reducing gasoline imports to 10%. Ortiz explained that Mexico's self-sufficiency places it in a favorable position, potentially leading to a new phase of industrialization in the country. Additionally, this sufficiency could be key to securing Mexico's position in USMCA negotiations.

Indonesia

Indonesia Relaxes Local Content Rules to Spur Green Energy Investments

The country's local content requirements are one reason for the slow progress of the \$20 billion Just Energy Transition Partnership.

Indonesia's government says that it has relaxed its local content requirements in the energy sector, in a bit to attract concessional funding for renewable energy investments from international development banks, Reuters reported yesterday.

The news agency quoted Rachmat Kaimuddin, the deputy minister of maritime affairs and investment, as saying that the government had passed a new regulation, under which it will exempt projects that receive at least 50 percent funding from foreign multilateral or bilateral lenders from the local content rules.

“If we're using funds from development financing agencies that have different procurement rules, in which we are a member, we can follow an agreement that we set,” Rachmat told a briefing for the electrical industry.

Under Indonesia's current rules, all electricity for public consumption infrastructure must use domestically produced goods and services. Under Industry Ministerial Regulation No. 54/2012, solar power projects are subject to a local content requirement of 40 percent; hydropower plants must have at least 50 percent local, and geothermal plants a minimum of 30 percent.

Renewable Energy

07 Grid Integration of Renewables



Jinzhai Pumped-Storage Hydro Facility Helps Integrate Renewable Energy and Solve Grid Stability Challenges



Pumped-storage hydropower is seen as a key technology in China to balance the grid and store excess energy from intermittent sources like wind and solar. The 1.2-GW Jinzhai pumped-storage project is a model for the industry and winner of a 2024 POWER Top Plant award.

The global energy storage market almost tripled in 2023, according to BloombergNEF. Last year's record global additions of 45 GW and 97 GWh is expected to be followed by even larger growth this year. Globally, energy storage is set to add more than 100 GWh of energy capacity for the first time ever. The uptick is expected to largely be driven by growth in China, which is forecast to once again be the biggest energy storage market in the world.

When it comes to energy storage technology, batteries garner most of the attention. That's not without good cause. The International

Energy Agency (IEA) predicts grid-scale batteries will account for the majority of energy storage growth worldwide for many years to come.

Yet, even as battery installations grow, pumped-storage hydropower (Figure 1) continues to account for the vast majority of current utility-scale energy storage capacity and capability—more than three-quarters of the world's total at the end of 2023. According to the IEA, pumped-storage hydro had a total installed capacity of about 181 GW in 2023. Furthermore, the agency says there remains “significant additional potential” for pumped-storage hydro in many regions of the world.

Investments are being made in new pumped-storage facilities, albeit, mostly in China. The U.S. Energy Information Administration (EIA) reported that, as of May 2023, China had 50 GW of operational pumped-storage capacity—more than any other country—and it also

had 89 GW of capacity under construction. Furthermore, the EIA said developers were “seeking governmental approvals, land rights, or financing for an additional 276 GW of pumped-storage projects.”

Collaboration Leads to Success

In Jinzhai County, Anhui Province, China, a new 1.2-GW pumped-storage hydro facility officially began commercial operation in December 2022. GE Vernova supplied the plant’s four 300-MW pumped-storage turbines and generator-motors, as well as the balance-of-plant equipment for the site. The facility is owned by Anhui Jinzhai Pumped Storage Power Co. Ltd., a division of State Grid XinYuan.

Power China was in charge of all civil work, grid, installation, and commissioning activities. In addition to engineering and manufacturing the plant equipment, GE Vernova’s scope of work also included supervising the installation and commissioning activities at the site.

“There has been an open, transparent, and strong collaboration amongst all stakeholders involved in the project, which greatly enabled the successful execution of the project to help meet the goals of Anhui Jinzhai Pumped Storage Power Co. Ltd. and State Grid Xin Yuan,” Zhiyong Liang, project manager with GE Vernova, told POWER.

The contract between GE Vernova and Anhui Jinzhai Pumped Storage Power Co. Ltd. was signed in December 2017. The four 300-MW pumped-storage units were commissioned between July 2022 and December 2022.

“The Anhui province was expecting one of the hottest summers ever,” Liang recollected. “State Grid XinYuan needed the Jinzhai pumped-storage plant to come to life before the heat waves to help increase the capacity of the grid system and get the population through this heated summer,” he added.

Safety First

Liang reported that all project stakeholders did everything they could to enable project execution in record time. While commissioning four units of this type might typically require a full year to complete, the project team

was able to accomplish the feat in only 180 days, an exceptional record that could only be possible with the open, transparent, and strong collaboration amongst all stakeholders. The project was also executed without any significant safety incidents.

“Safety is paramount and protecting people is the most important thing to do in everything GE Vernova does,” stressed Liang. “All stakeholders involved in these projects shared the same beliefs, standard, and processes to help deliver this project safely.”

The accelerated project schedule was the biggest challenge faced by the team, according to Liang, but it was not the only one. There were about 300 workers involved in construction. For civil works, and mechanical and electrical component installation, the workers were from the state-owned enterprises: Power China and Energy China. A systematic staff training process was implemented to ensure every worker was properly trained.

Like so many projects executed during this particular timeframe, the pandemic presented another obstacle. “COVID-19 just broke out at the beginning of year 2020 and ended at the end of year 2022,” noted Liang. “Throughout the pandemic, project execution was at its peak, from delivery to site installation and commissioning, and the execution has been affected. However, all participating parties did best to meet the challenges for the common purpose.”

Today, there are about 100 fulltime staff working at site—about half of them involved in daily operation of the units. GE Vernova said the Jinzhai plant was the world’s first application of a 13-blade runner in a pumped-storage hydropower project. Since the first unit started commercial operation in July 2022, all units have operated very stably and have fully achieved annual operating targets. The general efficiency of units reached almost 82%, Liang reported, which was higher than expected, creating additional value.

By Aaron Larson

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Sustainability & Decarbonization

10 *The Role of Cities in Decarbonization*



NEOM and Energy & Water Academy partner to train Saudi Arabia's green workforce

NEOM Green Hydrogen Company and Energy & Water Academy partner to train Saudi Arabia's future green energy workforce

The partnership directly addresses the growing demand for skilled professionals in the green hydrogen sector.

NEOM Green Hydrogen Company (NGHC) and the Energy & Water Academy (EWA) today announced a strategic collaboration to deliver a specialised vocational training programme equipping Saudi nationals with the skills and experience needed to support the operation, maintenance, and optimisation of the green hydrogen plant, and excel in the rapidly growing green hydrogen sector. This is the first green hydrogen training programme of its kind available in the Kingdom.

NGHC is set to become the world's largest green hydrogen producer when full operations begin by the end of 2026. As a first mover in this industry, NGHC is investing significantly in the training and upskilling of its workforce in the Kingdom, ensuring they are equipped with the necessary skills, knowledge and on-site experience to lead this ground-breaking project. The partnership between NGHC and EWA aligns both organisations to Saudi Arabia's Vision 2030 goal of becoming a global leader in renewable energy and sustainable development, and a leading producer of

clean hydrogen by 2030.

The comprehensive training programme, supported by the Saudi Human Resources Development Fund,

programme will offer:

2 Year Technician Training Programme in Renewable Energy Technology & Green Hydrogen: This programme



The comprehensive training programme commenced in August at EWA in the city of Rabigh

commenced in August at EWA in the city of Rabigh in Saudi Arabia, and is tailored for aspiring male and female technicians and engineers. The programme offers a unique opportunity to gain practical knowledge and hands-on experience on-site in renewable energy technology and green hydrogen production. The

targets recent graduates of Industrial Technical Colleges with Diploma Certificates or a Bachelor's Degree in Science and provides specialised training in Renewable Energy technology and green hydrogen.

1 Year Engineers Training Programme: Designed for individuals holding

a Bachelor's degree in engineering, this programme provides specialised training in Renewable Energy technologies.

Trainees will also receive a stipend while on the programme, combining academic rigour with practical

centre.

Comprehensive Support: Accommodation and meals will be provided to ensure a seamless learning experience.

On-the-job training: Trainees will be able to apply their new skills and knowledge while taking part in the day-to-day

and supporting the broader clean hydrogen revolution in Saudi Arabia. This programme in partnership with EWA will empower a new generation of skilled professionals to lead this exciting nascent industry into the future.

“This programme goes beyond traditional training, providing hands-on experience with cutting-edge technology and a comprehensive understanding of green hydrogen production, and we are confident that graduates will be highly sought-after by industry leaders.”

Tariq Al Shamrani, CEO of the Energy & Water Academy, said: “Our mission at EWA is to cultivate a generation of innovators and leaders equipped to drive Saudi Arabia’s vision for a sustainable future. This partnership with NGHC reflects our dedication to advancing education that not only meets but exceeds industry demands, ensuring our trainees are at the forefront of the global energy transition.”

The programme serves as a model for industry-academic collaboration in tackling the challenges of climate change and building a more sustainable future. Aspiring technicians and engineers are encouraged to explore these unique training opportunities and join the movement towards Saudi Arabia’s economic diversification goals while supporting the global transition to clean energy solutions.



high in Saudi Arabia. Image Courtesy: NGHC

application. Trainees will benefit from:

World-class Instruction: EWA’s expert faculty will deliver a curriculum aligned with industry best practices.

State-of-the-art Facilities: Access to cutting-edge equipment and technology at EWA’s dedicated training

operations of the plant.

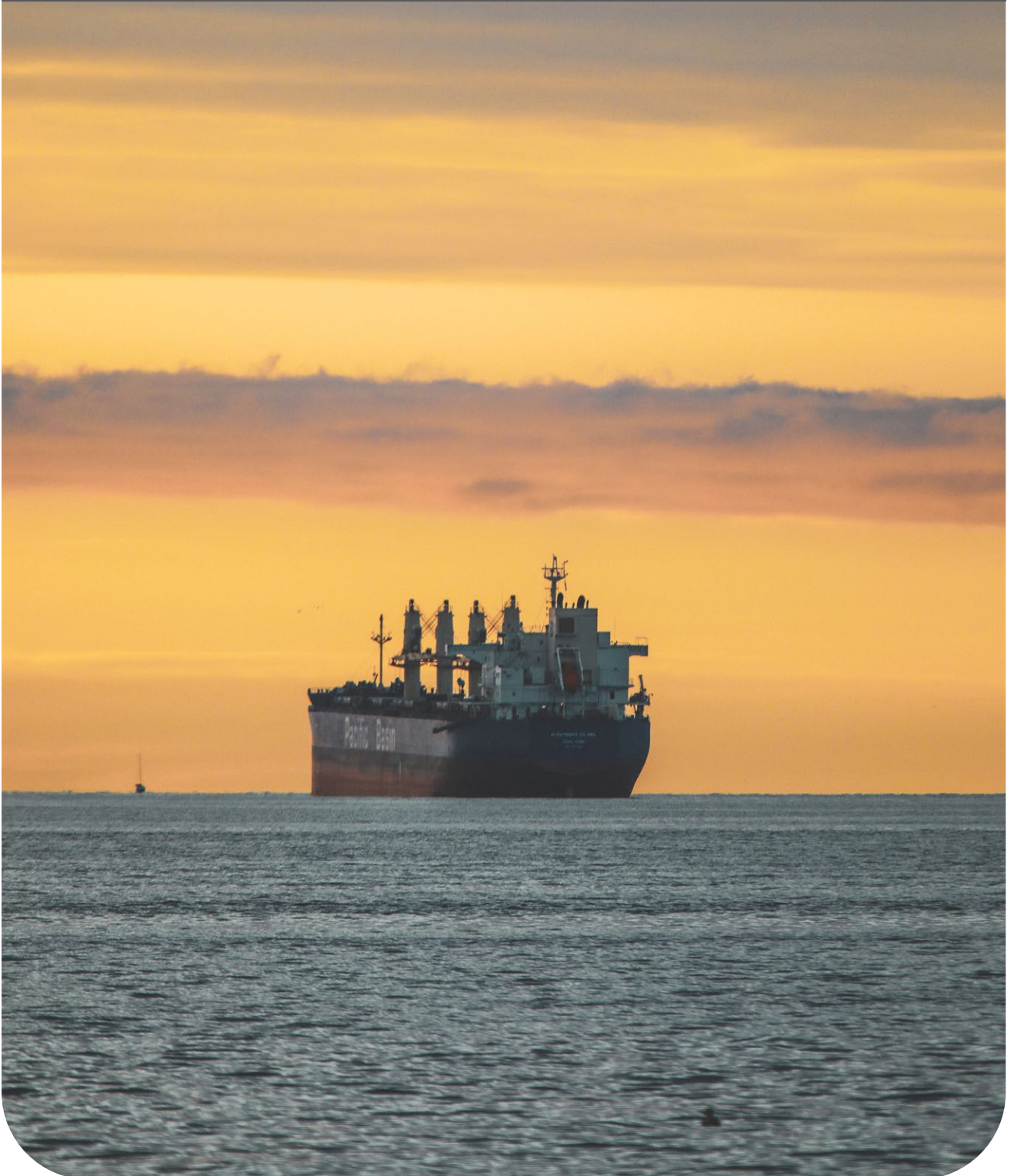
Wesam Y. Alghamdi, CEO of NEOM Green Hydrogen Company, said:

“Investing in education and training is crucial for the success of NEOM Green Hydrogen Company as we start preparing to operate the renewable energy facilities and the green hydrogen production plant

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

Oil & Gas

13 Community Engagement & Social Responsibility



Will Senegal Leverage Oil to Transform Its Economy?



Will Senegal Leverage Oil to Transform Its Economy?

Senegal, a country rich in cultural heritage and natural beauty, is embarking on a new chapter in its economic journey with the discovery and extraction of oil. The first barrels were extracted from the Sangomar field off the coast of Dakar on June 10, marking a momentous milestone in the country's economic aspirations. As a new oil-producing nation, Senegal has the opportunity to harness the potential of this natural resource to transform its economy, but the path ahead is laden with both promise and challenges. The question on everyone's mind is: Will Senegal be able to leverage its newfound oil wealth to drive sustainable economic growth and development?

Oil: Economic Rebirth in Senegal?

The Sangomar project is seen by many as a beacon of hope for Senegal's economy. With a substantial investment of \$5 billion, the project is set to produce 100,000 barrels of oil per day. Ameth Guisse, the CEO of Maak Petroleum Company, views this as an opportunity to reduce energy costs and boost the country's competitiveness in global markets. Lower energy costs could help Senegalese industries become more competitive, potentially spurring industrial growth and increasing exports. Additionally, the oil sector could create thousands of jobs, from exploration

and extraction to refining and distribution. However, the benefits of oil production do not come without concerns. One of the major issues raised by economists and industry experts is the terms of the contracts for oil exploitation. Currently, Australian company Woodside holds an 82% stake in the Sangomar field, leaving only 18% to Senegal. While this arrangement will bring revenue to the country, many argue that the share of profits allocated to Senegal—ranging between 15% and 40%—is insufficient for a nation looking to maximize the benefits of its natural resources.

Balancing Growth and Governance

Senegalese economist Ousmane Dieng has been vocal about the financial potential that oil production could bring. He highlights that the oil revenue could be a catalyst for double-digit economic growth and could provide significant funding for local infrastructure projects, social services, and the development of other sectors. However, Dieng also stresses that strategic public policy priorities will be crucial in ensuring that the wealth generated from oil does not lead to economic inequality or corruption. He argues that without proper governance, the oil boom could become a missed opportunity for Senegal, as has been the case in other oil-rich African countries.

The Senegalese government, led by President Bassirou Diomaye Faye, has pledged to

maintain transparency in the oil and gas sectors. Faye has promised regular audits of the contracts and revenue generated from oil production, emphasizing that the government will work to ensure that the country's oil wealth benefits the Senegalese people. Prime Minister Ousmane Sonko has also assured the public that his administration will fight for equitable terms in agreements with multinational corporations, ensuring that Senegal is not left shortchanged by powerful foreign interests.

The Path Forward: To truly benefit from its oil reserves, Senegal needs to quickly build its refining and production capacity. Ousmane Dieng has urged the government to prioritize local refining, as relying on foreign refineries could reduce the potential economic impact of oil production. Currently, much of Africa's oil is exported in crude form and then re-imported as refined products, which significantly reduces the profitability of the oil sector for local economies. By investing in refining capabilities, Senegal could retain more value from its oil production, potentially reducing energy costs for local consumers and industries alike.

The Sangomar field is expected to generate over \$1 billion annually for Senegal over the next 30 years. This influx of revenue could have a transformative effect on the country's economy, but only if it is managed wisely. Concurrently, Senegal is also investing in liquefied natural gas (LNG) production through the Greater Tortue Ahmeyim project, which is expected to produce 2.5 million tons of LNG annually from the Mauritania border. Together, these projects represent a significant shift in Senegal's economic landscape and hold the potential to propel the country into a new era of prosperity.

Challenges in Intra-African Connectivity

While Senegal is poised for growth in the energy sector, other areas of the economy still face significant challenges. One of these is air travel, a critical sector for business and tourism development. Traveling across Africa remains notoriously complex and expensive, in part due to the lack of direct flights between African countries. Intra-African travel often requires passengers to transit through Europe or the Gulf, significantly increasing both the

time and cost of travel.

In 2021, African passengers faced taxes of around \$50 per flight, compared to \$30 in Europe and the Middle East. Moreover, only 19% of the 1,431 potential routes between the 54 countries in the African Union had weekly direct flights, according to the International Air Transport Association (IATA). Efforts to address this issue, such as the Single African Air Transport Market (SAATM), launched in 2018, aim to boost connectivity and reduce costs. IATA estimates that improved intra-African connectivity could increase air traffic by 81%, generate €1.3 billion in revenue, and create 155,000 jobs across the continent.

The Agricultural Sector: Zimbabwe's Resilience: While Senegal navigates its oil boom, other African countries are finding success in different sectors. In Zimbabwe, for instance, the horticulture industry is experiencing growth, despite the severe droughts caused by the El Niño weather phenomenon. Small-scale farmers like Clarence Mwale are helping to boost the country's agricultural output, with Mwale's company, Kuminda, assisting 2,500 farmers with export opportunities and training programs. The growth of the horticulture sector has been acknowledged by Zimbabwe's Ministry of Agriculture as a bright spot in an otherwise challenging agricultural landscape.

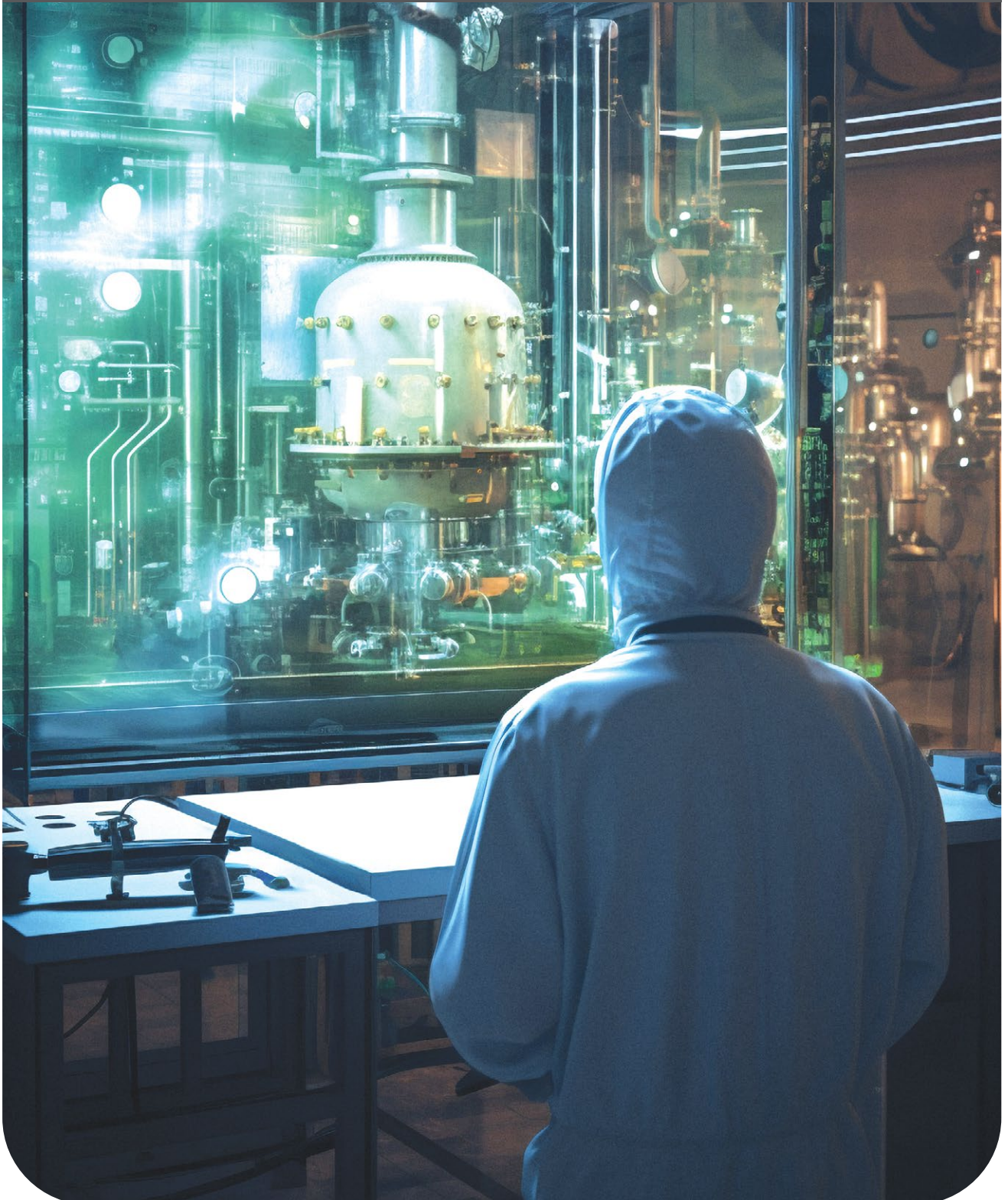
Senegal's emergence as an oil-producing nation presents a unique opportunity for economic transformation. If managed well, the oil revenues from Sangomar and Greater Tortue Ahmeyim could finance significant improvements in infrastructure, healthcare, education, and local industries. However, the road to sustained economic growth is fraught with challenges, from ensuring fair contracts to building local refining capacity. At the same time, other sectors, such as agriculture and air travel, will need to continue evolving to support broader economic growth across the continent. For Senegal, this is a moment of potential—one that could redefine its future for generations to come.

By Ndea Yoka

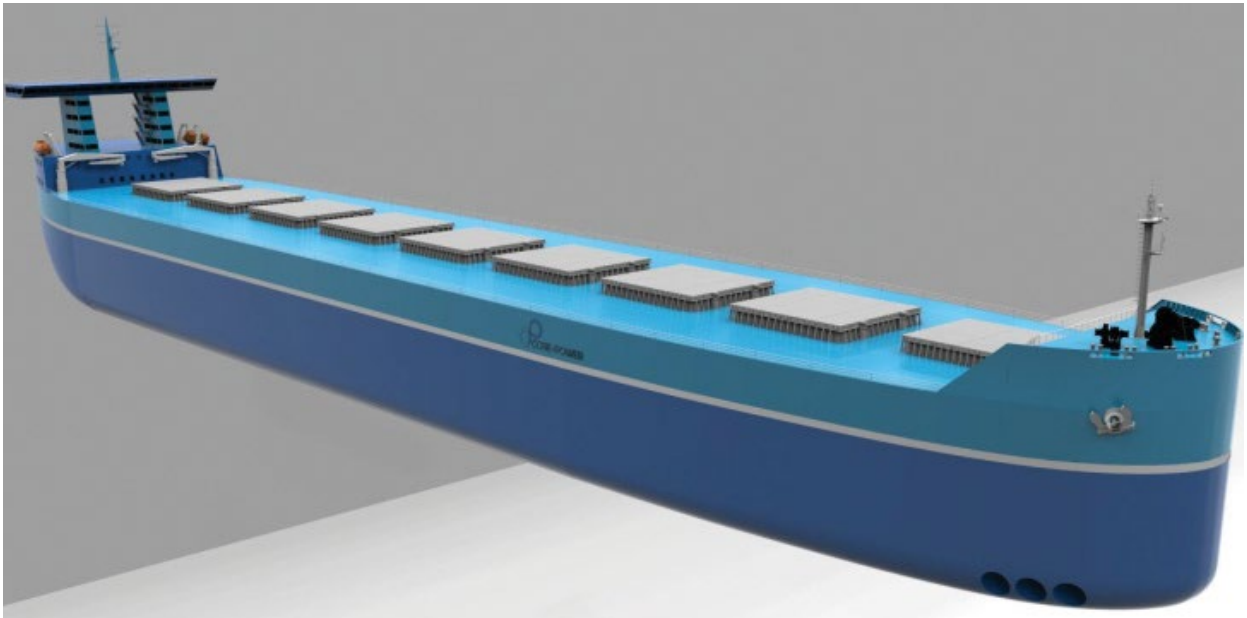
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Nuclear

16 Thorium-Based Nuclear Energy



Regulatory Assessment of Nuclear-Powered Cargo Ships



A concept for a nuclear-powered cargo ship (Image: Core Power)

A joint development project agreement has been signed between Lloyd's Register, Core Power and AP Moller - Maersk to conduct a regulatory assessment study to determine the safety and regulatory considerations for a potential nuclear-propelled containership to undertake cargo operations at a port in Europe.

The joint study will investigate the requirements for updated safety rules along with the improved operational and regulatory understanding that is needed for the application of nuclear power in container shipping. In addition, the study will provide insight for members of the maritime value chain who are exploring the business case for nuclear power to help shape their fleet strategy towards achieving net-zero greenhouse gas emissions.

The study will bring together the expertise of technical and professional services organisation and maritime classification society Lloyd's Register, Core Power's experience of developing advanced nuclear energy technology for maritime applications, a leading Port Authority and Maersk's extensive experience in shipping and logistics.

The shipping industry consumes some 350 million tonnes of fossil fuel annually and accounts for about 3% of total worldwide carbon emissions. In July last year, the shipping industry, via the International Maritime Organization (IMO), approved new targets for greenhouse gas emission reductions, aiming to reach net-zero emissions by, or around, 2050.

"The initiation of this joint study marks the beginning of an exciting journey towards unlocking the potential of nuclear power in the maritime industry, paving the way for emissions-free operations, more agile service networks and greater efficiency through the supply chain," said Lloyd's Register CEO Nick Brown. "A multi-fuel pathway to decarbonising the maritime industry is crucial to ensuring we as an industry meet the IMO's emission reduction targets and nuclear propulsion shows signs of playing a key role in this energy transition."

Last month, Lloyd's Register released a report that concluded nuclear power could transform the maritime industry with emissions-free shipping, whilst extending the life cycle of vessels and removing the uncertainty of fuel

and refuelling infrastructure development. However, it said regulation and safety considerations must be addressed for its widespread commercial adoption.

According to the report, the commercial relationships between shipowners and energy producers will be altered as power is likely to be leased from reactor owners, separating the shipowner from the complexities of licensing and operating nuclear technology.

“There’s no net-zero without nuclear,” Core Power CEO Mikal Bøe said. “A critical key to unlocking the vast potential for nuclear energy to transform how the maritime sector is powered, is the standards framework for commercial insurability of floating nuclear power plants and nuclear-powered ships that would operate in nearshore environments, ports, and waterways. We’re immensely pleased to be working with some of Europe’s most respected industry participants to set out the conditions for how this can be achieved.”

Ole Graa Jakobsen, Head of Fleet Technology at Maersk, added: “Since Maersk launched its energy transition strategy in 2018, we have continuously explored diverse low-emission energy options for our assets. Nuclear power holds a number of challenges related to, for example, safety, waste management, and regulatory acceptance across regions, and so far, the downsides have clearly outweighed the benefits of the technology.

“If these challenges can be addressed by development of the new so-called fourth-generation reactor designs, nuclear power could potentially mature into another possible decarbonisation pathway for the logistics industry 10 to 15 years in the future. Therefore, we continue to monitor and assess this technology, along with all other low-emission solutions.”

In December last year, Maersk CEO Vincent Clerc was one of five heads of leading global shipping lines to sign a joint declaration during COP28 in Dubai calling for an end date for fossil-only powered new-builds and urging the IMO to accelerate the transition to green fuels.

At the time, Clerc said the company “wants to accelerate the green transition in shipping and

logistics and a crucial next step is to introduce regulatory conditions which ensure that we create the most greenhouse gas emission reductions per invested dollar”.

The potential introduction of nuclear-powered cargo ships presents a significant shift in the maritime industry, with the promise of emissions-free operations. However, the challenges extend beyond technology to encompass regulatory, operational, and safety concerns that need to be addressed before widespread adoption. One of the major hurdles is the perception and management of nuclear risks, especially in port cities where the proximity of nuclear-powered vessels raises concerns about accidents, waste disposal, and emergency response capabilities. This necessitates the development of robust international regulatory frameworks to ensure the safety of crew, port workers, and surrounding communities.

Additionally, public acceptance will play a crucial role in the success of nuclear propulsion. There is a need for transparent communication about the safety measures and technological advancements of next-generation reactors, which promise lower risks and more efficient waste management. The shipping industry, along with regulatory bodies, must engage with stakeholders, including governments, environmental groups, and the public, to build trust and address any misconceptions about the use of nuclear energy in maritime transport.

Another key consideration is the economic feasibility of nuclear-powered vessels. While nuclear propulsion offers a solution to decarbonization, the initial investment and long-term operational costs must be weighed against other green energy alternatives, such as biofuels, ammonia, and hydrogen. The industry must also consider the development of supporting infrastructure, including ports equipped to handle nuclear-powered vessels and the creation of new insurance models to cover the unique risks posed by nuclear technology.

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Hydrogen

21 Hydrogen in Developing Countries



Latin America: A Future Clean Hydrogen Exporter?



Latin American countries can become exporters, local decarbonizers or focused players of clean hydrogen.

In the global decarbonization landscape, clean hydrogen has become a crucial element for the energy transition. Its potential to reduce greenhouse gas (GHG) emissions in hard-to-abate sectors makes it a vital component in achieving a sustainable future. “Latin America, with its abundant renewable resources, has the potential to become a key player in the global clean hydrogen economy. In addition, investment in clean hydrogen infrastructure could help address energy security concerns and drive economic growth across the region,” says Andrés Rebolledo, Executive Director of the Latin American Energy Organization (OLADE). Through targeted strategies and embracing collaboration, the region can harness its potential to produce clean hydrogen at competitive costs, driving both local decarbonization and global exports.

Latin American countries are uniquely positioned to leverage their vast renewable energy resources to produce clean hydrogen. Depending on their regional-specific characteristics and short- and medium-term clean hydrogen strategies, countries in the region may follow one of three potential

pathways: net exporters, decarbonizers, and purpose-driven players.

Net exporters, such as Argentina and Chile, prioritize the production of clean hydrogen for trading it on international markets, aiming to become globally competitive through cost-effective production, robust trade infrastructure and transparent certification schemes.

Clean hydrogen economy challenges

Despite its great future potential, the clean hydrogen economy in Latin America currently faces several challenges:

- Low demand. Demand for both local consumption and exports of clean hydrogen remains limited. There are only a small number of offtake agreements in place, and few projects are reaching final investment decision.
- Low progress on dedicated infrastructure. Though several clean hydrogen hubs have been announced, few are under construction. These clusters integrate various aspects of the hydrogen supply chain to facilitate its efficient

production, storage, transportation and use.

- Technology adaptation and workforce development. The region is still highly dependent on international manufacturers for key components. Technology adaptation to local requirements is needed, as well as development of local skilled talent to support the clean hydrogen economy.

Enabling measures to advance the clean hydrogen economy

To address these challenges, enabling measures across six key areas have been identified. These measures, while primarily aimed at governments and policy-makers, also require the involvement of players in infrastructure, technology and finance, as well as offtakers.

Technology and talent. A primary objective across the region is to focus innovation and research and development (R&D) efforts on scaling up the technology needed in the clean hydrogen value chain, such as electrolyzers and hydrogen pipelines. In parallel, increased funding for research centres and training programmes to upskill local talent is essential.

Cost. Targeted government support through balanced incentives for clean hydrogen projects across the value chain is needed. In addition, collaboration between nearby industries – for instance, in industrial clusters – can help reduce costs by sharing resources, developing shared infrastructure and leveraging economies of scale.

Standards and certifications. Regional agreements and partnerships are needed to standardize regulations and certifications. For example, defining technical, safety and carbon intensity standards.

Demand. International demand can be stimulated through long-term trade agreements and by defining operational rules for international trade. For domestic use, demand aggregation in hard-to-abate industrial clusters can play a key role in reducing offtake risks by pooling together demand from multiple industries with public procurement, to develop and ensure a more diversified – and thus less risky – “market”.

Collaborating to unlock the clean hydrogen

opportunity

Collaboration at local, regional and global levels is pivotal in accelerating the clean hydrogen economy. This can distribute required investments and risks, create market stability by aggregating regional supply and demand and accelerate technology and infrastructure R&D. Collaboration across the clean hydrogen ecosystem can help identify common challenges, share best practices and provide a platform to advocate for regional needs and support. In addition, aligning regional regulations with international standards can enable efficiencies and synergies. Pursuing an inclusive clean hydrogen economy approach by convening all relevant stakeholders, including policy-makers, industries, financial institutions, academic organizations, local communities and non-governmental organizations (NGOs) can foster a sustainable transition that benefits all players.

The Accelerating the Clean Hydrogen Economy in Latin America report, developed by the World Economic Forum in collaboration with Accenture, analyzes the clean hydrogen economy development journey of selected countries, deep-dives into the ambitions and challenges in the region, and provides perspective on key enabling measures for the region. Latin America’s potential is significant and, by leveraging each country’s characteristics and ambitions, the region can collectively accelerate its journey toward becoming a key player in the global clean hydrogen future. Collaboration among companies and governments located in proximity in industrial clusters together with public and government stakeholders is critical for accelerating clean hydrogen by sharing risk and resources, developing shared infrastructure, aggregating demand, enabling economies of scale and facilitating access to funding. In light of this, the World Economic Forum’s Transitioning Industrial Clusters initiative, in collaboration with Accenture and EPRI, will continue to advance cooperation and shared vision in industrial clusters to drive economic growth, employment and the energy transition.

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

Cover Story

24 *Optimizing Transformer Protection with TGP*



Finding The Right Measures For Transformer Protection



Transformers with cellulose-based solid insulation typically have a lifespan of several decades under optimal conditions. However, various factors—such as design, materials, insulation system contaminants, and operating conditions—affect their aging. The presence of water, oxygen, and acids accelerates the degradation of cellulose, reducing the transformer’s mechanical strength and operational life. Detecting early signs of premature aging is crucial for timely intervention.

While ideal conditions for transformers would involve operating at normal temperatures without water or oxygen, achieving such conditions is neither practical nor economical. Research indicates that if oxygen levels in the oil are kept below 2000 ppm, the insulation system ages more than five times slower compared to a transformer exposed to air. However, both cellulose and insulation oil age over time. Insulation oil primarily undergoes oxidation, producing carboxylic acids that further accelerate paper aging.

Challenges with Oxygen and Moisture

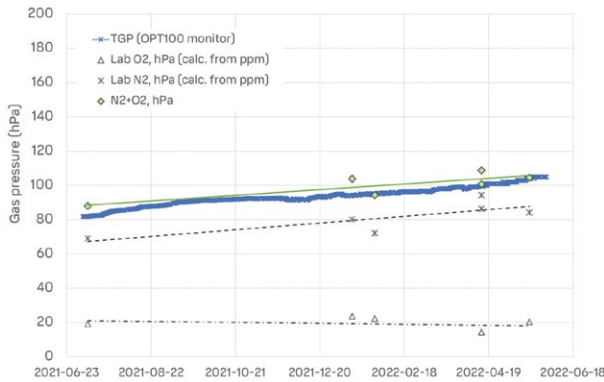
Ambient air is the main source of oxygen

and moisture in transformers. Preservation systems, such as rubber bags or nitrogen blanketing, protect the insulation oil from the environment. Modern transformers are generally sealed, and older models are often upgraded to prevent moisture and oxygen ingress. Air leaks, typically caused by deteriorating gaskets or rubber bags, are more common in transformers operating under higher loads. Ensuring airtight transformer tanks is crucial for effective protection.

Limitations of Older Monitoring Methods

Traditional air leak detection methods involve measuring oxygen and nitrogen levels in oil samples. However, sample contamination by air during handling and transport complicates accurate data interpretation. Recent advancements include online oxygen measurement, but this may not detect slow air leaks if active oxidation processes are consuming oxygen. Despite over sixty years of dissolved gas analysis (DGA) use, there is no standard practice for interpreting oxygen concentrations, necessitating expert analysis.

Some DGA monitors estimate nitrogen levels from oxygen measurements, but this assumes



constant oxygen/nitrogen ratios in air-saturated oil, making it unsuitable for sealed transformers.

Essential Considerations for Asset Maintenance Teams

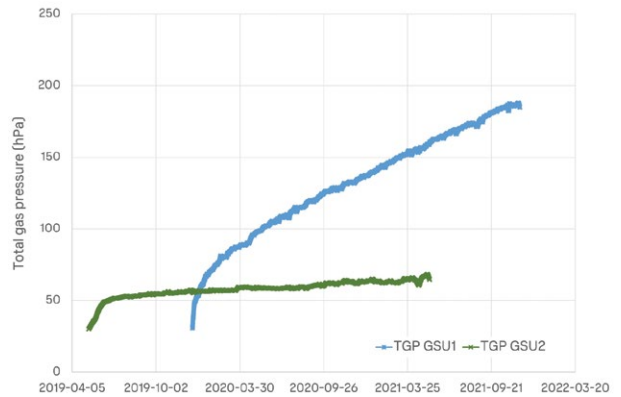
Understanding the aging process involves measuring oil quality parameters such as acidity, and aging markers like furans or methanol, alongside gas concentrations including oxygen, carbon dioxide, and carbon monoxide. Assessing solid insulation life expectancy requires expertise because oxidation is a slow process, often taking years to manifest significantly. Real-time gas monitoring is better suited for detecting rapidly evolving faults rather than tracking oxidation.

Maintenance teams do not need exact oxygen or nitrogen concentrations but should determine if the insulation system is exposed to air. This information guides decisions on oil degassing, drying, or sealing system repairs.

Total Gas Pressure (TGP) – A Step Forward in Air Leak Detection

TGP offers a simpler method for detecting air entry by measuring the total pressure of all dissolved gases. This parameter, which includes partial pressures of gases like carbon monoxide, carbon dioxide, hydrogen, methane, acetylene, ethylene, and ethane, is easier to interpret than individual gas measurements. An increase in TGP indicates an air leak in a sealed transformer, simplifying detection without requiring specialized expertise.

During commissioning, oil degassing should ensure low dissolved gas pressure in sealed transformers. An increase in TGP signals potential problems and shows TGP's advantage over oxygen measurement, which



may remain stable despite ongoing oxidation.

A properly sealed transformer should maintain low gas pressure levels throughout its life, well below atmospheric pressure (1000 hPa or 14.5 psia). A rise in TGP indicates air entry, allowing maintenance teams to address sealing issues during service breaks to prevent further insulation paper degradation.

Practical Use of TGP Measurement

Operational membrane-sealed transformers typically have TGP values between 100 to 300 hPa (1.45-4.4 psia). For example, TGP readings from the Vaisala OPT100 online DGA monitor showed an increase of 23 hPa (0.33 psi) over 11 months, with a corresponding nitrogen increase and stable oxygen levels. This suggests active aging consuming oxygen, demonstrating TGP's sensitivity to minor air ingress. TGP measurement is also free from contamination risks associated with oil samples.

For instance, the GSU1 transformer exhibited a low and stable TGP level after an initial rise due to air from the transportation phase. The average annual increase post-stabilization was only 7 hPa (0.1 psi), indicating minimal risk and no need for further investigation. Conversely, the GSU2 transformer showed a rapid TGP increase of 30 hPa (0.43 psi) after degassing, with a subsequent rise of about 60 hPa/year (0.87 psi/a), suggesting continuous air and moisture ingress.

TGP monitoring enables decision-making about the transformer's lifespan versus repair costs, making it an ideal technology for reliable transformer protection.

Author: Senja Leivo
Senior Industry Expert, Vaisala

Energy Storage & Grids

27 Environmental & Social Impacts of Energy Storage



Investments in Rural Clean Energy Are Putting People to Work

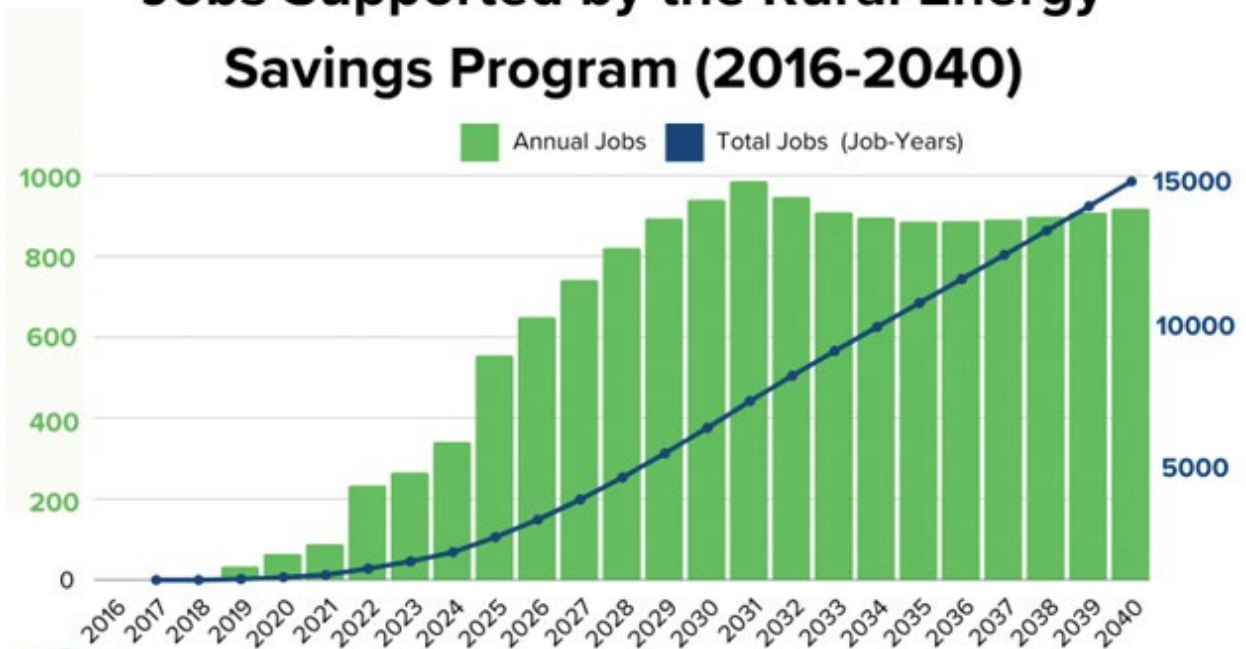
More than 1,000 rural South Carolina households save on energy costs annually through the Help My House program, an on-bill financing initiative run by KW Savings and the Electric Cooperatives of South Carolina. By reducing energy costs, the program makes other necessities more affordable. Launched in 2011 as a pilot, Help My House has since inspired the creation of the Rural Energy Savings Program (RESP), authorized by Congress and administered by the USDA. RESP offers no-interest loans to rural electric cooperatives to fund similar programs nationwide.

Since RESP's establishment in the 2014 Farm Bill, 43 rural electric cooperatives, green banks, and other borrowers have secured over \$500 million for on-bill financing programs. These programs help households and small businesses implement cost-effective energy efficiency measures, resulting in significant

savings. For instance, participants in Help My House saw utility bills drop by about 35% annually (roughly \$1,100) in the program's early years, with more recent figures showing a sustained 23% reduction in energy costs.

In addition to saving money, RESP has created jobs in rural areas. According to economist John A. "Skip" Laitner, RESP has generated nearly 700 net jobs through 2023, with projections estimating about 15,000 jobs by 2040. In 2023 alone, RESP programs resulted in 265 net direct, indirect, and induced jobs, with another 340 expected in 2024 and 555 in 2025. Laitner's analysis, based on RESP loan data and national economic inputs, suggests that greater investment in energy efficiency could lead to even more job creation—potentially supporting 330,000 net new jobs across the U.S. if energy costs are reduced by 10%.

Jobs Supported by the Rural Energy Savings Program (2016-2040)



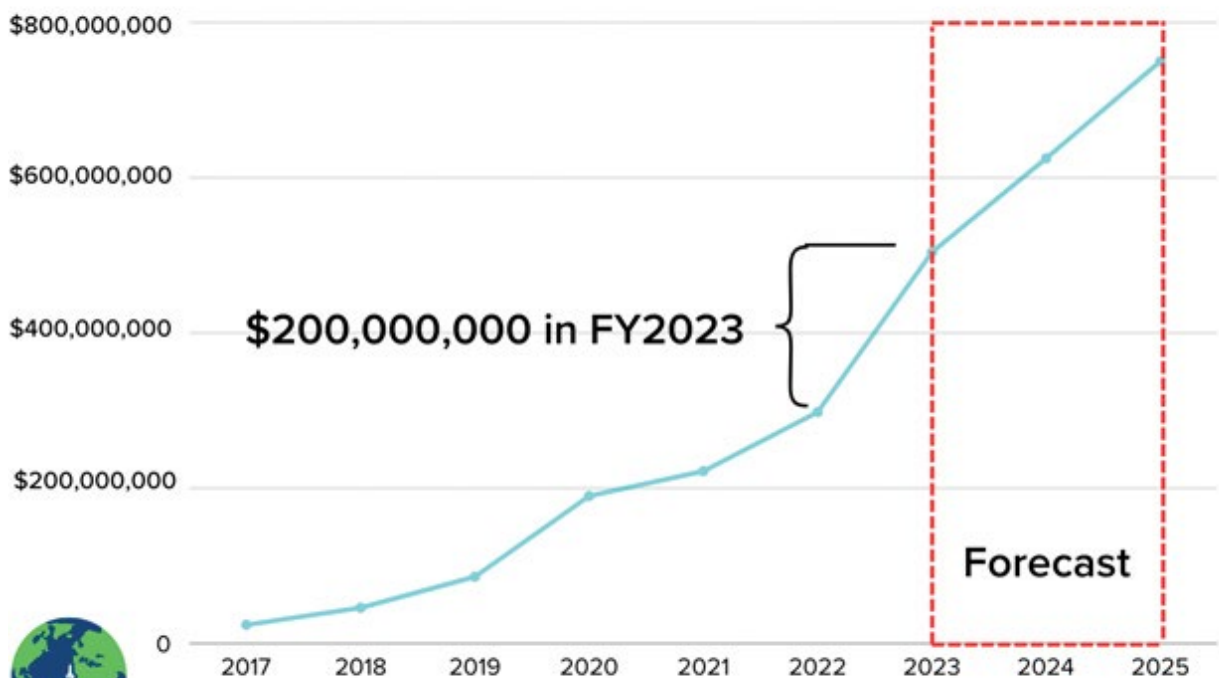
Graphic By: Aaron Vincent Facundo

The benefits of RESP extend beyond energy savings. In South Carolina, program administrators like Mike Couick, CEO of the Electric Cooperatives of South Carolina, have observed how RESP improves quality of life by reducing energy consumption and lowering power bills. Foster Hildreth, general manager of Washington's Orcas Power and Light Cooperative (OPALCO), which received \$47 million in RESP loans, highlights how RESP helps members combat rising energy costs by financing energy-efficient home upgrades,

such as ductless heat pumps and insulation, without the need for additional mortgages.

Though RESP's impact may seem modest compared to larger renewable energy projects, it plays a crucial role in rural areas where access to low-cost loans is limited. For many homeowners and renters, RESP is the only way to afford energy-efficient upgrades. Without RESP, many of these communities would face high energy bills, and the jobs created by the program would not exist.

Total RESP Loans Obligated (by Fiscal Year)



Graphic By: Aaron Vincent Facundo

Looking ahead, the demand for RESP loans is expected to grow. In 2023, nearly half of RESP's total awards were approved, and the application pipeline could support over \$100 million in loans annually. However, USDA's ability to meet this demand depends on annual appropriations from Congress. Each dollar of federal funding leveraged by RESP can provide loans worth ten times more, amplifying the program's impact. For example, USDA's \$5 million funding in FY 2024 can support \$50 million in RESP loans, though this falls short of the current demand.

RESP also delivers broader benefits. Homes

financed through RESP not only see energy savings but also become more comfortable and resilient. For utilities, on-bill financing reduces peak demand, easing pressure on the electric grid. Overall, RESP's contributions to rural economies demonstrate how programs like Help My House can drive job creation and meaningful energy savings, offering a model for other regions.

Authors: Daniel Bresette and Miguel Yañez-Barnuevo

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

Country Reports

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King's College Hospital London Improves EHR Performance and Security with Oracle Cloud Infrastructure



Cuts time to access critical patient information in half and significantly reduces time spent on administrative tasks

AUSTIN, TEXAS – July 31, 2024 — King's College Hospital London, in Dubai (KCH Dubai), has become one of the first UAE-based health systems to migrate its Oracle Health Electronic Health Record (EHR) to Oracle Cloud Infrastructure (OCI). With OCI, KCH Dubai is improving the security, performance, and usability of the EHR resulting in a better experience for its patients and providers. KCH Dubai is now providing more than 1,000 concurrent users across its facilities with access to more efficient workflows and improved system performance. Moving to the cloud has also provided the hospital network with the scalable foundation it needs to simplify integrations and meet its goal of innovating in critical areas such as population health.

Following its rapid migration to OCI, KCH Dubai is seeing positive results across the hospital including cutting the time it takes to access patient information by 50%, a 20% reduction in reviewing each patient's medical chart, and a 25% overall reduction in time spent in the EHR due to faster screen loads and transaction response times. The overall increased speed and responsiveness of the system is helping to streamline processes so clinicians can complete tasks more quickly and free up more time to spend with patients. The performance gains also enable more comprehensive and real-time updates to the patient record, which strengthens communication and care coordination across all caregivers to enhance patient care.

"With Oracle Health, we've seen substantial improvements in our clinical processes, including an increase in the system's speed and responsiveness and a noticeable deduction in the time spent reviewing patient charts across various specialties," said Kimberly Pierce, chief executive officer, KCH Dubai. "Oracle's cloud offering has the technological infrastructure we need to fully embrace future advancements

in areas such as generative AI that will benefit our patients and how we deliver care while better supporting our practitioners."

With OCI, KCH Dubai can also now rely on Oracle's real-time threat detection and monitoring, autonomous systems, and team of experts to help protect its networks against the constantly changing cybercrime landscape. In addition, OCI will support scalability of healthcare technology as KCH Dubai expands with new facilities and specialties, ultimately growing its overall operation and capacity to care for its community.

"The combined power of OCI and our EHR is enabling KCH Dubai physicians to be more productive, waste less time in medical records, and refocus more time on patient care," said Seema Verma, executive vice president and general manager, Oracle Health and Life Sciences. "Moreover, they have the comprehensive platform to continually be able to plug-in the technologies they need to solve their toughest challenges and be more adaptable, predictive, and responsive to evolving healthcare needs."

Learn more about the benefits of OCI for healthcare customers at <https://www.oracle.com/health/cloud/oci/>.

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Petrobras And TGS Join Forces to Drive Innovation And Sustainability In Brazil's Energy Sector



Norwegian seismic company TGS has signed a memorandum of understanding (MoU) with Brazilian state-owned energy giant Petrobras to collaborate on scientific research and technological development activities in Brazil.

According to TGS, this MoU establishes a strategic partnership between the companies to advance innovation in the energy sector. The collaboration will focus on developing technologies, conducting research to improve oil and gas exploration efficiency, and advancing renewable energy technologies and carbon capture solutions.

Petrobras and TGS will collaborate on developing technological solutions to improve the efficiency of exploration and production operations, as well as on conducting scientific research on Brazil's sedimentary basins and analyzing geological and geophysical data.

The partnership will also focus on creating technologies that enhance sustainability in energy production, aligning with global efforts to reduce carbon emissions.

"We are honored to work alongside Petrobras on such important technical initiatives. The combination of our expertise in data acquisition and processing combined with Petrobras's

operational capabilities promises to deliver significant results for the Brazilian energy industry," said Kristian Johansen, CEO of TGS.

"This partnership with TGS Brazil reflects our ongoing commitment to innovation and sustainability. We are excited to collaborate with a company that shares our vision of a more efficient and sustainable energy future," added Jonilton Pessoa, Executive Exploration Manager of Petrobras.

Petrobras has big plans for Brazil, which entail the start-up of 14 FPSOs from 2024 to 2028 in line with its 'Strategic Plan 2024-2028' demonstrating the firm's intent to spend \$102 billion over the next five years, with \$11.5 billion earmarked for projects propelling its decarbonization journey forward, focusing on biorefining wind, solar, carbon capture, utilization and storage (CCUS) and hydrogen.

The strategic plan aims to strengthen and prepare the company for the future by pursuing a diversified mix of energy sources, which Petrobras perceives to be essential for "a fair and responsible energy transition."

By Zerina Maksumic

<https://www.offshore-energy.biz/>

Unlocking Africa's Renewable Energy Potential: Overcoming High Costs and Political Risks



Solar and wind have become cheaper than electricity from oil, gas and even coal in many parts of the world, as their cost falls while performance improves, and storage systems such as batteries also become more effective.

Africa, despite its vast renewable energy potential, significantly lags behind other regions in solar and wind capacity. For instance, the entire continent has less than two-thirds the solar and wind capacity of the Netherlands, a relatively small country. Around 600 million Africans, primarily in sub-Saharan Africa, lack access to electricity. With average electricity usage per person extremely low, modern economic progress remains out of reach without substantial increases in power availability.

Africa holds immense potential for renewable energy. The International Energy Agency (IEA) highlights that Africa has 60% of the world's best solar resources, massive wind potential, and the largest untapped hydropower capacity globally. However, many large Western renewable companies have overlooked Africa, with Gulf entities such as the UAE's Masdar stepping in to fill part of the gap.

A significant hurdle for renewable energy investment in Africa is the high cost of capital, which stems from perceived business risks. This makes renewable projects far more expensive compared to other regions, further exacerbated by challenges in payment collection and unstable government policies. Projects funded in foreign currencies face additional risks from local currency fluctuations.

International oil companies, such as Shell and BP, which have traditionally focused on fossil fuels, have begun exploring renewable investments in regions like Iraq, Oman, and Algeria. However, these efforts have yet to extend to Africa on a large scale. With their expertise in managing high-risk environments, oil companies could leverage their experience to develop renewable energy projects in Africa. By bundling these projects with traditional energy ventures, they may mitigate some risks while contributing to low-carbon development across the continent.

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Services

34 Coming Events



Coming Events

Canadian Crude Oil Conference 2024

Lake Louise, Canada

18 - 20 Sep 2024

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

The Canadian Crude Oil Conference is an important event for industry executives to discuss critical issues. The conference will highlight how WCSB production can provide...

COMEXPO Kenya 2024

Nairobi, Kenya

03 - 05 Oct 2024

<https://smartexpos.in/comexpo/kenya>

COMEXPO Kenya is a trade exhibition that focuses on the general manufacturing and light engineering industries. The event brings together manufacturers, suppliers, distributors...

Li-ion Battery Europe 2024

The Egg, Brussels, Belgium

08 - 10 Oct 2024

<https://li-ion-battery-europe.metal.com/>

LiBE 2024, a leading global platform that unites the full Li-ion Battery value chain, gathering 1000+ leading Scientists, Investors, Project Developers, Financiers, Technology...

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...

Oil and Gas Automation and Digitalisation Congress 2024

Neuss, Germany

14 - 16 Oct 2024

<https://automacongress.com/>

The Oil and Gas Automation and Digitalisation Congress (AUTOMA 2024) brings together key players from across the oil and gas value chain in Dusseldorf, Germany...

Laser World of Photonics South China 2024

Shenzhen, China

14 - 16 Oct 2024

<https://world-of-photonics.com/de/>

Laser World of Photonics South China focuses on the laser application market in South China and aims to provide personalized products and industry solutions to potential users of laser technology in South China to meet users' stringent...

International Conference on Power and Energy Applications 2024

Taiyuan University League, Taiyuan, China

18 - 20 Oct 2024

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

The field of Power and Energy Applications is undergoing rapid and significant changes in response to the growing demand for sustainable, efficient, and reliable energy solutions worldwide...

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...

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Is the world on track to meet its renewable energy goals?



Almost 200 countries pledged to triple global renewable energy capacity by 2030 at the Cop28 climate conference

The global fight against climate change stands at a critical juncture. Despite bold pledges, such as the commitment made at the Cop28 climate conference to triple global renewable energy capacity by 2030, the world remains off-track in its efforts to limit global warming to 1.5 degrees Celsius.

The effects of global warming have become more evident than ever, with record-high temperatures sweeping across Europe, Asia, and North America this summer, endangering lives, livelihoods, and industries. But where are we truly at in this fight, and what does the data tell us about our progress and the challenges ahead?

A mixed picture

Renewable energy has gained momentum, fuelled by decreasing costs and the urgent need for cleaner alternatives to fossil fuels. However, fossil fuels still made up 81.5 per cent of primary energy – or directly used sources – of consumption in 2023. This is a stark reminder of the world's continued dependence on coal, oil and gas, according to the Statistical Review published by UK's Energy Institute.

Despite significant investments and political commitments, renewables' share of total primary energy consumption increased only marginally, reaching 14.6 per cent last year. This slow progress was underscored by a June report from the International Energy Agency (IEA), which warned that the world is on course to only roughly double – rather than triple – global renewable energy capacity by 2030 under current policies and trends.

Several of the world's largest economies have introduced regulations and programmes to promote the use of clean energy. The EU's REPowerEU plan, introduced two years ago, aims to increase the share of renewable energy in the bloc's gross final consumption to 45 per cent by 2030, up from a previous target of 40 per cent. It also includes boosting renewable hydrogen production to 10 million tonnes per year by the end of the decade.

The US has enacted the Inflation Reduction Act, which offers a series of tax incentives on wind, solar, hydropower and other renewables, as well as a push towards electric vehicle ownership. In Asia, China aims to increase renewable energy generation by 50 per cent by 2025, while India plans to have half of its power-generating capacity come from non-fossil fuel sources by 2030.

Headwinds curbing wind power growth

Wind power, viewed as a key pillar in reducing global carbon emissions, has in recent years been plagued by high inflation and supply chain issues. These obstacles include delayed permits, postponed auctions and slow supply chain development.

Siemens Energy, the world's top manufacturer of offshore wind turbines, anticipates a 2024 loss of about €2 billion euros (\$2.2 billion) at its Siemens Gamesa subsidiary, excluding one-time charges. Siemens Gamesa has experienced problems with components in its onshore wind turbines, resulting in substantial financial losses and delays in project execution.

The sector staved off challenges in 2023, recording a 7 per cent increase in new capacity additions compared to the previous year, the Norway-based consultancy said. This momentum is expected to accelerate this year, with new capacity additions expected to grow by 9 per cent to over 11 gigawatts.

Europe is set to play a key role in the growth of floating wind energy, heavily relying on it to meet ambitious national targets and tap into offshore resources.

By John Benny

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