

energy

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The Impact of Crude Oil Deficit on the Energy Industry



As the global energy landscape evolves, the crude oil deficit has emerged as a critical concern for the energy industry. This issue not only affects oil prices but also shapes investment strategies and energy policies worldwide. Recent developments indicate that the crude oil market is facing significant supply constraints, driven by a combination of geopolitical tensions, production cuts by OPEC+, and increasing demand from emerging economies.

One of the primary factors contributing to the crude oil deficit is the ongoing geopolitical instability in key oil-producing regions. Tensions in the Middle East, particularly surrounding Iran and Iraq, have raised concerns about potential disruptions in oil supply. These uncertainties have prompted OPEC+ to implement production cuts in an attempt to stabilize prices, inadvertently exacerbating the crude oil deficit. As major producers limit output, the balance between supply and demand shifts, often resulting in higher prices and increased volatility in the market.

Additionally, the resurgence of demand as economies recover from the COVID-19 pandemic has put further pressure on crude oil supplies. Countries like China and India are ramping up their energy consumption, driving the need for more crude oil. This rebound in demand, coupled with supply constraints, has led to predictions of a prolonged period of tight markets and elevated prices. Analysts project that if the trend continues, it could push energy costs higher across various sectors, influencing everything from transportation to manufacturing.

Moreover, the crude oil deficit is prompting companies to reconsider their investment strategies. With uncertainties in supply, there is a growing interest in diversifying energy portfolios. Many firms are investing in renewable energy sources and alternative fuels to mitigate risks associated with fluctuating crude oil prices. This shift not only aligns with global sustainability goals but also positions companies to adapt to the changing energy landscape.

The crude oil deficit is a pivotal issue for the energy industry, influencing market dynamics and shaping strategic decisions. As geopolitical tensions persist and demand continues to rise, industry stakeholders must navigate this complex environment with agility and foresight. The balance between crude oil supply and demand will remain a key determinant of energy prices and overall market stability in the coming years.

In This Issue!

energyHQ's July 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 Community Renewable Energy
- Article on page 16 focuses on Nuclear Fusion
- Article on page 22 sheds the light on Crude Deficit

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
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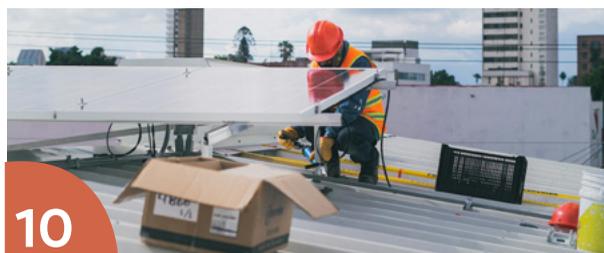
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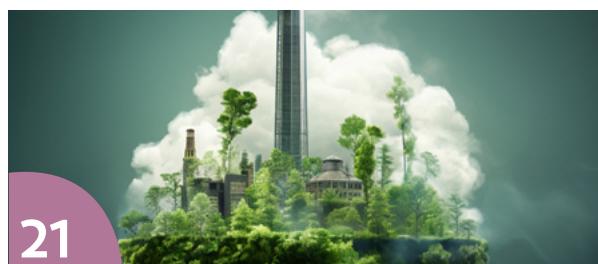
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World Digest



Argentina

Canada



Canada's Oil and Gas Industry Soars to New Heights

As Canada's oil and natural gas production hit record high levels, the country is taking pains to amplify its status as a global oil and natural gas superpower. One part of this greater initiative includes an ongoing effort to transform the sector to be less reliant on U.S. markets and infrastructure through strategic expansion of its own industry at a time when the United States is taking a step back.

Canada took a major step in that direction on May first when the Trans Mountain pipeline expansion project (TMX) finally became commercially operational after 12 years and 12 years and C\$34 billion (USD\$25 billion). Years of insufficient pipeline infrastructure have forced Albertan oil producers to sell their oil at a discount, resulting in tens of billions of dollars of revenue loss each year. The new TMX is set to change all of that by tripling the nation's flow of crude.

In anticipation of a boom year for Canadian oil and gas, producers are already ramping up output, and as a result Canadian oil production is expected to break records this year, reaching a high of around 5.3 million barrels per day. Not only is this a massive boon to the Canadian economy, it's also a huge step toward self-sufficiency for the Canadian energy industry that will enable the country to ease its reliance on U.S. markets.

Argentina's Renewable Energy Sector Thrives with Solar Power Surge

In a recent report released by the Administrative Company of the Wholesale Electricity Market Sociedad Anónima (Cammesa), Argentina's renewable energy landscape shines brightly with the burgeoning prominence of solar power. The Variable Renewable Generation Report for March reveals significant milestones and trends within the nation's renewable energy sector.

According to Cammesa's data, March witnessed a remarkable upsurge in photovoltaic power, reaching an impressive 1,454.5 MW. This surge is attributed primarily to the authorization received by 360Energy for the 20 MW La Rioja II plant in the province of La Rioja.

Moreover, the report forecasts the addition of 8 MW of solar energy between March and April, with notable contributions from the 7.20 MW Victorica plant in La Pampa and the 1.5 MW Algarrobo plant in Caucete, San Juan, both under the RenovaAr 3 program.

Renewables accounted for a notable 16.4% of the energy mix during the reported period, with solar power contributing 2.8% and wind power reaching 11.5%.

A detailed breakdown of solar infrastructure reveals the operation of 54 solar parks across the country, boasting a staggering 4,341,461 panels. Among these, 99.39% are single-axis, demonstrating a clear preference in solar panel orientation. Further insights from the report shed light on the prevalence of specific solar panel brands, with Jinko leading the pack at 31%, followed by Trina at 18%, and Canadian at 8%, among others.



Sudan

Developing Oil Industry Set to Ignite South Sudan's Economy

Boasting an estimated 3.5 billion barrels of oil and producing an average of approximately 149,000 barrels per day (bpd) in 2023, South Sudan's oil sector plays a vital role in the country's economy. During the forecast period 2022-2027, South Sudan's oil market is poised to grow at a compound annual rate of 1.5% – rising from 134,000 in 2021 to approximately 160,500 bpd by 2027.

Serving as the sole oil producing nation in East Africa, South Sudan is well-positioned to serve as a facilitator of investment, technology and expertise across the broader regional energy landscape. As such, the country will leverage this year's South Sudan Oil & Power (SSOP) 2024 conference and exhibition to invite investors to explore and engage with opportunities across the upstream, refining, power generation and mining industries to drive projects and maximize oil production.

Driving Upstream Investment

According to the Ministry of Petroleum – the regulatory body in charge of the country's oil sector – nearly 90% of South Sudan's oil and gas reserves remain untapped. As such, through the country's parastatal Nile Petroleum Corporation (Nilepet), South Sudan aims to attract investment through ongoing or upcoming upstream licensing rounds to boost liquid fuels production for export and for domestic use.



Turkey

Turkey sees growth in renewable energy and hydrogen

Renewables and hydrogen energy are a big part of newly added energy capacity in Turkey, according to a study from global strategy consulting firm Kearney.

Turkey's power generation capacity increased in 2023 by around 3% from the previous year. The vast majority of that 2.9 GW of new capacity came from renewable sources. Currently, renewables make up 53% of the total installed capacity in Turkey, a higher percentage than some Western European countries.

By all accounts, Turkey is on a roll when it comes to boosting power. In the past 15 years, total power generation capacity (GW generated per year) more than doubled, in fact. And since the outbreak of war in Ukraine crippled many European energy markets, Turkey managed to actually improve its position.

When it comes to electricity generation (the amount of electricity in TW that can be produced in an hour), Turkey has its capacity grow by 1.5 times over the past 15 years.

Of that increased generation, the share of geothermal, solar, and wind energy has nearly doubled in the past five years. The combined share of those renewables increased from 1% to 20% in the past 15 years.

The Kearney study shows that natural gas as a source of power has steadily declined over the past 15 years in Turkey.



Lebanon

Chinese solar energy solutions gain popularity in Lebanon

More than 15 Chinese companies showcased their solar technology at the Lebanon International Solar Week 2024, highlighting China's growing interest in Lebanon's burgeoning solar market.

Companies displayed everything from solar panels to batteries and inverters, eager to establish connections with potential clients. Belinda Huang from Ates Power Technology cited Lebanon's electricity shortages and high power demand as reasons for the market's appeal.

"The economic crisis and foreign currency shortage force Lebanese factories to turn to local production, causing a rise in demand for our power solutions," said Huang, adding that her company's revenues from businesses in Lebanon amounted to 150 million U.S. dollars last year.

Adam Ho from Minghong Technology spoke of the decade-long presence of his company in Lebanon, highlighting an increase of 20 percent annually in local demand for the company's solar solution.

Will Zhang with Chisage New Energy Technology, a solar inverter manufacturer, pointed to Lebanon's power outages and expensive generators as drivers of the increasing demand. He added that China's massive production capacity makes it a global leader in solar solutions.



Cyprus

Cyprus Unveils New Strategic Plan To Drive Green Energy And Economic Growth

The Ministry of Energy, Commerce and Industry (MECI) of Cyprus has released its Strategic Plan for 2024-2026, outlining a roadmap to accelerate the nation's transition to a green economy and bolster its competitiveness on the global stage.

Building on the foundation laid out in the previous plan (2021-2023), the new strategy prioritizes the continued development of renewable energy sources and energy efficiency measures. This aligns with the European Union's Green Deal goals of achieving climate neutrality by 2050.

The MECI emphasizes its commitment to fostering a robust entrepreneurial ecosystem and promoting Cypriot exports. The plan highlights initiatives to improve the business environment, attract foreign investment, and empower domestic industries.

The announcement comes amidst a global push for sustainable development and a growing focus on energy security. Cyprus, with its abundant sunshine and wind resources, is well-positioned to capitalize on these trends.

This strategic plan is expected to serve as a blueprint for the MECI's actions over the next three years, guiding its policies and programs in the critical areas of energy, trade, and industry.

Renewable Energy

07 Community Renewable Energy



Network of French local communities for renewable energy production wins 2024 European Sustainable Energy Award



The Association des Centrales Villageoises, a network of French local cooperatives that unites citizens, municipalities, and local businesses to develop renewable energy and energy efficiency projects, has been honored with the 2024 European Sustainable Energy Award in the Local Energy Action category. This accolade was decided through an online public vote and presented at the European Sustainable Energy Week (EUSEW) awards ceremony on June 11 in Brussels. The Centrales Villageoises facilitate collaboration among citizens, municipalities, and local businesses to initiate projects on a local scale, offering crucial technical, economic, and legal assistance.

“The model is implemented in over 70 territories, which have expedited the energy transition by establishing over 500 photovoltaic power plants on private and public rooftops (totaling more than 11 MWp installed, equivalent to powering 3,500 homes),” says Juliette Rasse,

development officer of the Association des Centrales Villageoises.

The initiative has designed a step-by-step approach that empowers anyone interested to spearhead a community-driven energy initiative. The association supports volunteers, while experienced local companies provide expertise to assist emerging citizen collectives. This structured guidance ensures that new projects can be initiated and managed effectively, maximizing their impact on local energy transition efforts.

The Association des Centrales Villageoises was one of three finalists shortlisted for the European Sustainable Energy Awards 2024 in the Local Energy Action category. This award recognizes sustainable energy actions driven by groups of citizens or consumers that contribute significantly to the clean energy transition at the community or local level.

The other finalists in this category included the AUSL Romagna Energy Action Plan in Italy, which implements a comprehensive approach to energy efficiency across 13 hospitals, and De Energiecentrale, a one-stop-shop for advice and support on improving home energy efficiency in the Belgian city of Ghent.

The recognition of the Association des Centrales Villageoises underscores the substantial impact of community-driven initiatives in advancing renewable energy adoption. This accolade not only celebrates their achievements but also inspires other communities across Europe to engage in similar efforts, fostering a collaborative approach to sustainable energy solutions. By empowering local actors, the Centrales Villageoises model demonstrates the power of collective action in addressing climate change and promoting energy independence.

Moreover, the award highlights the importance of local engagement and innovation in achieving broader energy and environmental goals. It proves that grassroots initiatives can lead to substantial progress and serve as a model for others to follow. The Centrales Villageoises have created a replicable blueprint for local energy action, enabling communities to take control of their energy future.

The success of the Centrales Villageoises initiative is a testament to the effectiveness of local cooperation in tackling global challenges. By pooling resources and expertise, these communities have not only improved their energy efficiency but have also contributed to the broader goals of sustainability and climate resilience. This collaborative approach ensures that the benefits of renewable energy projects are distributed widely, fostering a sense of ownership and responsibility among local stakeholders.

In addition to their technical achievements, the Centrales Villageoises have also had a

profound social impact. By involving a diverse range of participants, including citizens, local businesses, and municipal authorities, the initiative has strengthened community bonds and encouraged a shared commitment to sustainable development. This inclusive model ensures that the transition to renewable energy is equitable and benefits all members of the community.

The European Sustainable Energy Award for the Association des Centrales Villageoises not only recognizes their past accomplishments but also sets a precedent for future community-led energy initiatives. It highlights the potential for small-scale, local actions to drive significant change and underscores the importance of empowering communities to take an active role in the energy transition.

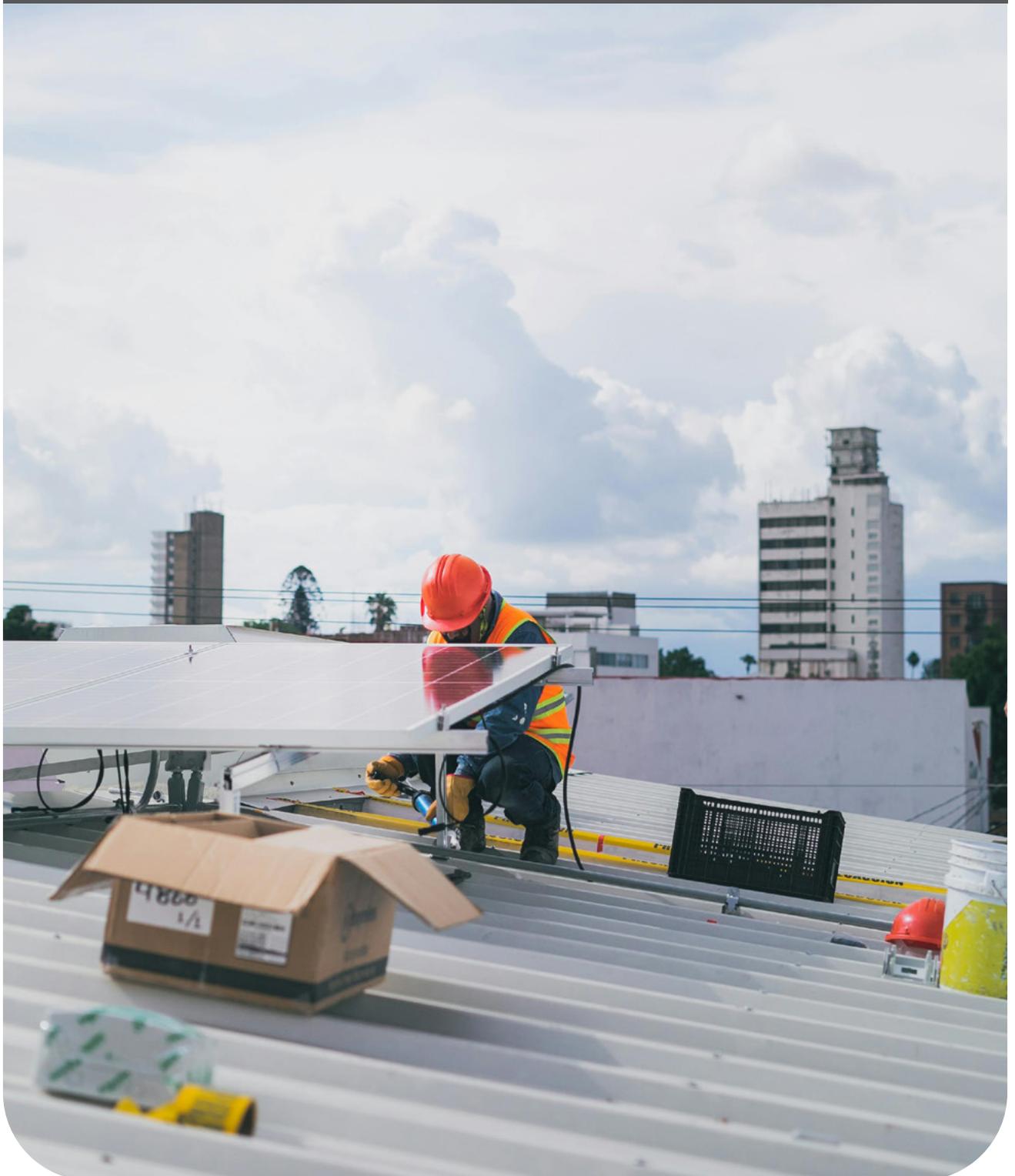
As Europe continues to strive towards its climate and energy goals, the success of the Centrales Villageoises serves as an inspiring example of what can be achieved through grassroots innovation and collaboration. By continuing to support and expand these local initiatives, Europe can accelerate its progress towards a sustainable, resilient, and energy-independent future.

The 2024 European Sustainable Energy Award for the Association des Centrales Villageoises is a well-deserved recognition of their pioneering work in renewable energy. Their model of local cooperation and collective action provides a valuable framework for other communities to follow, demonstrating that with the right support and collaboration, significant strides can be made in the pursuit of sustainable energy solutions. This recognition serves as a beacon of hope and motivation for communities aiming to make a positive impact on the environment.

Edited by Hassan Mourtada
<https://sustainable-energy-week.ec.europa.eu/>

Sustainability & Decarbonization

10 Behavioral Change & Consumer Engagement



UBITECH's Katerina Drivakou Talks About Customer Engagement in Energy Flexibility at EUSEW 2024



At the European Sustainable Energy Week (EUSEW) 2024, Katerina Drivakou of UBITECH delivered an insightful discussion on customer engagement in energy flexibility. The event, which brings together industry leaders, policymakers, and innovators, focused on sustainable energy solutions and the future of energy systems in Europe. Drivakou's presentation was a highlight, addressing critical issues and proposing innovative solutions to enhance customer engagement and promote energy flexibility.

Drivakou emphasized the need to revisit the basics of how energy flexibility can be promoted. She pointed out that a fundamental reevaluation of competition and pricing is necessary to create a more efficient and responsive energy market. The traditional models of energy distribution and consumption are becoming obsolete, and there's a pressing need to adopt

new strategies that encourage active participation from consumers. This shift not only involves technological advancements but also requires a change in consumer behavior and market dynamics.

One of the key areas of focus during the discussions was the concept of demand response and its scalability across Europe. Demand response refers to the adjustment of electricity consumption by end-users in response to supply conditions, such as price signals or incentives. While Europe has established a strong framework for demand response, several technical barriers remain. These include interoperability issues, data management challenges, and the need for advanced communication infrastructure. Overcoming these obstacles is crucial for the widespread adoption and success of demand response initiatives.

Drivakou highlighted that demand

response is not just a future concept but a present reality. She advocated for starting with non-core processes in industries to build familiarity and confidence before scaling up to more critical operations. This approach allows businesses to gradually adapt to new practices without risking major disruptions. By focusing on non-core processes, industries can test and refine demand response strategies, ensuring smoother integration into the overall energy management system. This incremental approach can help in identifying potential issues early and refining the strategies accordingly.

A significant point raised during the panel was the importance of avoiding past mistakes in new markets. Historical issues, such as billing inaccuracies and data protection concerns, must be addressed proactively to build trust and reliability in the system. Drivakou stressed the need for robust regulatory frameworks that protect consumer rights and ensure transparency in billing and data handling. These measures are crucial for gaining consumer trust and promoting widespread adoption of demand response initiatives. Clear and consistent regulations will help in creating a stable and predictable market environment.

Raising consumer awareness is another critical aspect of enhancing customer engagement in energy flexibility. Many consumers are still unaware of the benefits and opportunities associated with demand response. Effective communication strategies are needed to educate consumers about how they can actively participate in energy markets and benefit from doing so. Drivakou suggested leveraging digital platforms, social media, and targeted marketing campaigns to reach a broader audience and inform them about the advantages of energy flexibility. Consumer education programs can also play a vital role in this regard.

Regulatory policies also play a vital role in protecting consumers and facilitating market growth. Drivakou called for the development of business models that

turn energy flexibility markets into profitable ventures. This involves creating diverse offerings that cater to different consumer needs and preferences. By providing consumers with a range of choices, energy providers can enhance customer satisfaction and drive market participation. Innovative business models can include dynamic pricing, incentive programs, and subscription-based services that provide consumers with flexibility and control over their energy usage.

The discussions at EUSEW 2024 underscored the need for collaboration between various stakeholders, including government agencies, private companies, and research institutions. Drivakou emphasized the importance of public-private partnerships in overcoming technical and regulatory challenges. These collaborations can lead to the development of innovative solutions and the implementation of best practices across the industry. Joint efforts can also help in pooling resources and expertise, accelerating the deployment of demand response technologies and strategies.

Katerina Drivakou's insights at EUSEW 2024 highlighted the critical need for revisiting the fundamentals of energy flexibility and promoting customer engagement. By addressing technical barriers, avoiding past mistakes, and raising consumer awareness, Europe can create a more resilient and efficient energy system. The development of robust regulatory policies and profitable business models will further support the growth of energy flexibility markets. Through collaboration and innovation, the energy industry can pave the way for a sustainable and flexible energy future. This comprehensive approach will ensure that the benefits of energy flexibility are realized across the board, contributing to a more sustainable and energy-efficient Europe.

<https://ubitech.eu/>

Oil & Gas

13 Environmental Concerns & Regulations



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



The energy industry, encompassing oil, gas, coal, nuclear, and renewables, is pivotal to global economic stability and growth. However, its environmental footprint has been a topic of significant concern. In response, governments and international bodies have implemented a range of regulations aimed at mitigating the adverse effects of energy production and consumption. This article explores the primary environmental concerns associated with the energy industry and the evolving regulatory landscape designed to address them.

Environmental Concerns in the Energy Sector

1. Greenhouse Gas Emissions

One of the most pressing environmental concerns is the emission of greenhouse gases (GHGs), particularly carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). These emissions primarily result from the burning of fossil fuels such as coal, oil, and natural gas. GHGs are major contributors to climate change, leading to global warming, sea level rise, and extreme weather events.

2. Air and Water Pollution

The energy sector is a significant

source of air pollutants, including sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM), and volatile organic compounds (VOCs). These pollutants can cause respiratory and cardiovascular diseases, acid rain, and smog. Additionally, energy production and extraction processes, especially fracking and oil spills, can contaminate water sources, harming aquatic life and threatening human health.

3. Land Habitat Degradation and Destruction

The extraction and processing of fossil fuels often lead to land degradation, deforestation, and habitat destruction. Open-pit mining, oil sands extraction, and the construction of energy infrastructure disrupt ecosystems, displace wildlife, and contribute to biodiversity loss.

Waste Management

The energy industry generates substantial amounts of waste, including radioactive waste from nuclear power plants, coal ash from power stations, and industrial waste from refineries. Proper management and disposal of these wastes are crucial to prevent environmental contamination

and ensure public safety.

Regulatory Responses to Environmental Concerns

Governments and international organizations have developed a comprehensive framework of regulations to address these environmental challenges. These regulations aim to reduce emissions, promote cleaner technologies, and ensure sustainable practices across the energy sector.

1. Emission Reduction Targets

Many countries have established national emission reduction targets in line with international agreements such as the Paris Agreement. These targets often include specific goals for reducing CO₂ and other GHG emissions. Regulatory measures include carbon pricing mechanisms like carbon taxes and cap-and-trade systems, which incentivize companies to reduce their carbon footprint.

2. Renewable Energy Mandates

To decrease reliance on fossil fuels, numerous jurisdictions have implemented renewable energy mandates. These mandates require a certain percentage of energy to be generated from renewable sources such as wind, solar, and hydroelectric power. Incentives like feed-in tariffs, tax credits, and subsidies support the development and adoption of renewable technologies.

3. Air Quality Standard

Regulatory bodies have established stringent air quality standards to limit the emission of harmful pollutants. The Clean Air Act in the United States, for example, sets limits on the amount of SO₂, NO_x, and PM that power plants and industrial facilities can emit. Compliance with these standards often necessitates the installation of pollution control technologies such as scrubbers and filters.

4. Water Protection Regulations

To safeguard water resources, regulations like the Clean Water Act in the U.S. impose restrictions on discharges of pollutants into water bodies. These regulations require energy companies to obtain permits for wastewater discharge, adhere to effluent limitations, and implement best management practices to prevent contamination.

5. Land Use and Habitat Protection

Environmental impact assessments (EIAs) and land use regulations help mitigate the effects of energy projects on land and biodiversity. These assessments evaluate the potential environmental impacts of proposed projects and outline measures to minimize harm. Protected areas and wildlife corridors are also designated to preserve critical habitats and prevent habitat fragmentation.

6. Waste Management and Disposal

Regulations governing waste management ensure the safe handling, treatment, and disposal of hazardous and non-hazardous waste generated by the energy industry. The Resource Conservation and Recovery Act (RCRA) in the U.S. sets standards for waste management practices, including the disposal of coal ash and the storage of radioactive waste.

Challenges and Future Directions

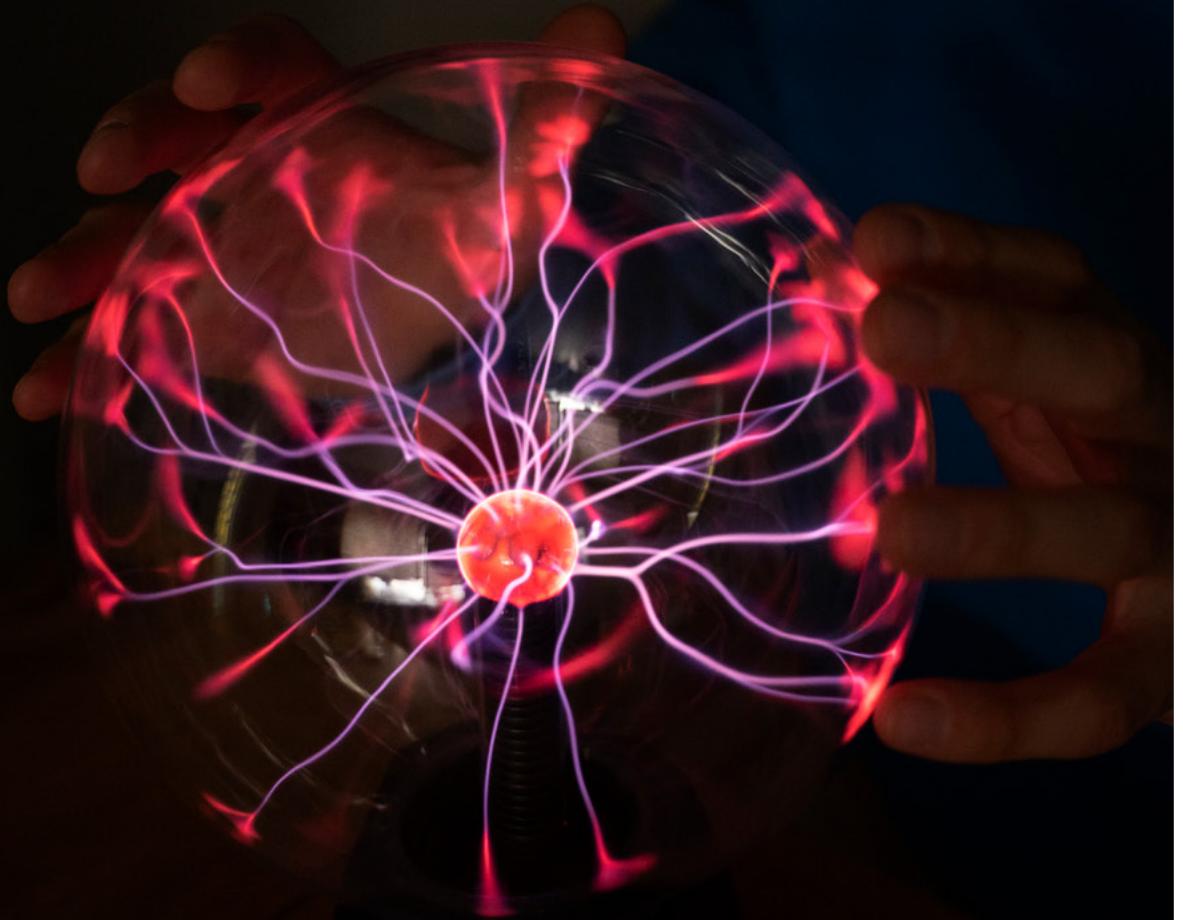
While existing regulations have made significant strides in addressing environmental concerns, several challenges remain. The global nature of the energy industry requires international cooperation and harmonization of standards to effectively tackle transboundary pollution and climate change. Moreover, the rapid pace of technological advancement necessitates continuous updates to regulatory frameworks to accommodate emerging technologies and practices.

The transition to a sustainable energy future also demands significant investment in research and development, infrastructure, and workforce training. Policymakers, industry stakeholders, and environmental organizations must collaborate to create an enabling environment for innovation and sustainable development.

The energy industry faces substantial environmental challenges, but robust regulatory frameworks provide a pathway to mitigate these impacts. By adhering to these regulations and embracing sustainable practices, the energy sector can contribute to a cleaner, healthier planet while continuing to fuel economic growth and development.

Nuclear

16 Nuclear Fusion



World's Largest Nuclear Fusion Reactor is Finally Completed



ITER, a \$28 billion fusion reactor in France, has finally had its last magnetic coil installed. But the reactor itself won't fire up fully until 2039 at the earliest.

The world's largest fusion reactor has finally been assembled, but it won't run for another 15 years, project scientists have announced.

The International Fusion Energy Project (ITER) fusion reactor, consisting of 19 massive coils looped into multiple toroidal magnets, was originally slated to begin its first full test in 2020. Now scientists say it will fire in 2039 at the earliest.

This means that fusion power, of which ITER's tokamak is at the forefront, is very unlikely to arrive in time to be a solution for the climate crisis.

«Certainly, the delay of ITER is not going in the right direction,» Pietro Barabaschi, ITER's director general, said at a news conference on Wednesday (July 3). «In terms of the impact of nuclear fusion on the problems humanity faces now, we should not wait for nuclear fusion to resolve them. This is not prudent.»

The world's largest nuclear fusion reactor is the product of collaboration between

35 countries — including every state in the European Union, Russia, China, India and the U.S. — ITER contains the world's most powerful magnet, making it capable of producing a magnetic field 280,000 times as strong as the one shielding Earth.

The reactor's impressive design comes with an equally hefty price-tag. Originally slated to cost around \$5 billion and fire up in 2020, it has now suffered multiple delays and its budget swelled beyond \$22 billion, with an additional \$5 billion proposed to cover additional costs. These unforeseen expenses and delays are behind the most recent, 15-year delay.

Scientists have been trying to harness the power of nuclear fusion — the process by which stars burn — for more than 70 years. By fusing hydrogen atoms to make helium under extremely high pressures and temperatures, main-sequence stars convert matter into light and heat, generating enormous amounts of energy without producing greenhouse gases or long-lasting radioactive waste.

But replicating the conditions found inside the hearts of stars is no simple task. The most common design for fusion reactors,

the tokamak, works by superheating plasma (one of the four states of matter, consisting of positive ions and negatively charged free electrons) before trapping it inside a donut-shaped reactor chamber with powerful magnetic fields.

Keeping the turbulent and superheated coils of plasma in place long enough for nuclear fusion to happen, however, has been challenging. Soviet scientist Natan Yavlinsky designed the first tokamak in 1958, but no one has since managed to create a reactor that is able to put out more energy than it takes in.

One of the main stumbling blocks is handling a plasma that's hot enough to fuse. Fusion reactors require very high temperatures (many times hotter than the sun) because they have to operate at much lower pressures than is found inside the cores of stars.

The core of the actual sun, for example, reaches temperatures of around 27 million Fahrenheit (15 million Celsius) but has pressures roughly equal to 340 billion times the air pressure at sea level on Earth.

Cooking plasma to these temperatures is the relatively easy part, but finding a way to corral it so that it doesn't burn through the reactor or derail the fusion reaction is technically tricky. This is usually done either with lasers or magnetic fields.

The promise of nuclear fusion has long tantalized scientists and policymakers alike, offering the vision of an almost limitless and clean energy source. Unlike nuclear fission, which splits heavy atoms like uranium to release energy and produce long-lived radioactive waste, fusion merges light atoms such as hydrogen into helium, releasing vast amounts of energy with minimal radioactive by-products. If successfully harnessed, fusion could provide a major breakthrough in the quest for sustainable energy, especially given the mounting urgency of climate change.

Despite the formidable challenges and setbacks, the potential of fusion power remains a driving force behind projects like ITER. The reactor's completion marks a significant milestone, demonstrating the capability of international collaboration to tackle one of the most complex engineering projects ever conceived. The

fact that 35 countries have contributed resources and expertise underscores the global commitment to advancing fusion technology.

The economic and logistical implications of ITER are equally significant. The project's ballooning budget and extended timeline reflect the immense complexity and pioneering nature of the endeavor. Managing the project's financial and technical risks while maintaining international cooperation is a formidable task. Yet, these investments are considered necessary steps toward a future where fusion energy can be a viable part of the global energy mix.

Beyond ITER, other approaches to fusion are also being explored. Advances in materials science, computational modeling, and magnetic confinement techniques are contributing to the broader fusion research landscape. Private companies and national laboratories are pursuing alternative reactor designs and novel methods to achieve stable fusion conditions. These parallel efforts highlight the importance of diversified strategies in overcoming the obstacles inherent to fusion energy development.

In the context of the global energy crisis and environmental challenges, the delays in ITER's timeline are a reminder of the urgent need for interim solutions. Renewable energy sources like wind, solar, and hydroelectric power, along with advancements in energy storage and efficiency, must be accelerated to mitigate climate change impacts. Fusion, while promising, is not a near-term solution and must be seen as a complementary part of a diverse energy portfolio.

As ITER progresses toward its operational phase, it serves as a beacon of scientific ambition and international cooperation. The lessons learned and the technological advancements made during its construction will inform future projects and potentially shorten the path to practical fusion energy. The journey toward harnessing the power of the stars is fraught with challenges, but the potential rewards—sustainable, clean, and abundant energy—make it a pursuit worth undertaking.

By Ben Turner

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

“

SGLM 510™ Steam Generator Leakage Monitor

The SGLM 510 monitor is part of the proTK / 260 series product line. It has been designed to detect leakages between the primary and the secondary circuits in a nuclear power plant.

It operates on the principle that radioactive isotopes like N-16 that are only present in the primary circuit during normal operation cross the boundary into the secondary circuit due to a leak in a steam generator tube.



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Hydrogen

21 Economic Potential & Job Creation



Bridging Skills Gap Key to Job Creation and Economic Development in Chittagong-Cox's Bazar Region



The ILO and the Cox's Bazar Chamber of Commerce and Industry undertook a study to better understand the skills demand and supply in the Chattogram-Cox's Bazar economic corridor, which has the potential of becoming a hub for decent jobs.

Economic growth in the Chattogram – Cox's Bazar region is facing significant challenges due to pervasive skills gaps and systemic issues within the workforce development framework, a study by ILO has found.

The study titled “Skills demand and supply Assessment in the Chattogram-Cox's Bazar region” highlights several critical factors contributing to the region's economic stagnation, including a notable deficiency in skilled workers as per employers' requirements for improving their productivity, efficiency, and innovation in order to remain competitive.

Launching the study, chief guest, Dr. Gazi Md. Saifuzzaman, Director General (Grade I), Department of Youth Development

(DYPD), Ministry of Youth & Sports stated: “It is a commendable step towards bridging the skills gap for job creation in the Chittagong-Cox's Bazar economic corridor.»

«I am certain that the outcomes of the study will guide the Government, private sector, development partners and other stakeholders to design and deliver harmonized market-driven skills development programmes for youth not in education, training or employment, and women, that are aligned to the National Skills Development Framework.»

Lack of collaboration

The study highlighted the lack of collaboration between public and private training institutions, which undermines development of a workforce ready for the job market. Lack of collaboration also hinders development of effective work-based learning programs such as apprentices, and employment support services.

As a result of this disconnection, employers are reluctant to hire graduates from technical education and vocational training institutes, worsening unemployment rates among trained individuals and discouraging new students from enrolling in the programs, the report says.

“The Cox’s Bazar and Chattogram Economic Corridor has significant economic potential with its comparative advantages, government mega-projects, and increasing private investments in high-potential sectors,” said ILO Country Director for Bangladesh, Tuomo Poutiainen.

“However, we must jointly build human and institutional capabilities, enhance private sector connectivity, and promote partnerships for decent work opportunities. The skills anticipation study is a major step in the right direction. It has identified systemic and sector-specific skills needs, and 49 hard-to-fill occupations that have high growth and employment potential in the region.”

Shortage of female trainers

The study also revealed that the region faces a critical shortage of qualified and certified trainers, especially female trainers, which limits the quality, reach and inclusivity of the training programs.

Enrolment of women in training programs across five key employment sectors - construction, tourism and hospitality, transport, manufacturing and agri-food, remains significantly low, stunting overall economic growth.

Reiterating the need for collaboration, UN Resident Coordinator for Bangladesh, Gwyn Lewis said: “The private sector, Government, UN agencies and NGOs all have a role to play in training young people. Through this new report, forty-nine hard to fill professions have been identified and we need to work together

to prepare young people for them. The inclusion of women and youth is a high priority, particularly to advance women’s participation in skills development and the job market.”

By improving collaboration and aligning training programs with industry needs, Chattogram-Cox’s Bazar can unlock its full economic potential and drive sustainable growth. It is also necessary to raise community awareness to increase female enrolment in technical training programmes, and to provide gender-sensitive career guidance. Strategies for recruiting female trainers and make learning environments more inclusive are also crucial.

Modern jobs

The study also calls for educating employers and TVET trainers about the impact of harassment and discrimination against women and their critical role in increasing women’s participation in male-dominated jobs.

Vivek Prakash, Counsellor and Head of Cooperation, Rohingya and Host Communities Program, Global Affairs Canada said: “When I speak with young people in the Cox’s Bazar region, they tell me they dream of building their skills for modern jobs such as graphic design. That’s why we are proud to support this comprehensive evaluation of required skills and accessible training. Using regional economic investments as our driving force, we can forge a path to inclusive employment, spanning soft skills to industry-specific expertise, so that we leave no one behind.”

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

Cover Story

24 Crude Deficit



EIA Predicts Global Crude Supply Deficit In 2025 Amid Opec+ Cuts



Storage tanks at a refinery in Los Angeles, US. Crude production worldwide is projected to reach 104.6 million bpd, according to the EIA. Reuters

Global oil stocks will drop by 700,000 barrels per day in the second half of 2024

Global demand for crude is projected to exceed supply next year as Opec+ extends some of its deep production cuts into 2025, according to the US Energy Information Administration (EIA).

The statistical arm of the US Department of Energy, on Tuesday raised its forecast for global oil consumption for next year to 104.7 million barrels per day from an earlier estimate of 104.5 million bpd.

Crude production worldwide is now projected to reach 104.6 million bpd, down from a previous forecast of 104.7 million bpd, the agency said in its Short-Term Energy Outlook.

Global oil stocks, or the total inventory of oil stored worldwide, will drop by 700,000 bpd in the second half of 2024 following a decrease of 500,000 bpd in the first half,

the EIA said.

“Inventory withdrawals stem in part from Opec+ production cuts, which the group announced in early June would remain at current levels until at least the end of September,” it added.

Last month, Opec+ agreed to extend output cuts of 3.66 million bpd, which were initially planned to end this year, until the end of 2025.

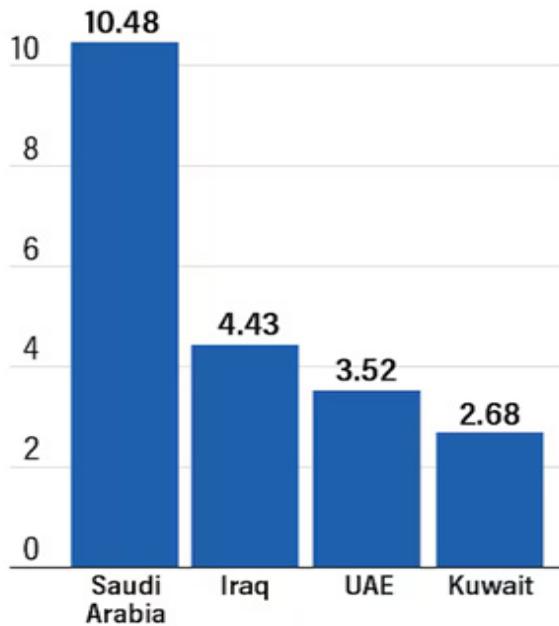
At the same time, the additional 2.2 million bpd voluntary production cuts of eight Opec+ member states were extended by three months until the end of September.

The group also released a plan for gradually unwinding the voluntary curbs on a monthly basis from October 2024 until September 2025, but said that “the monthly increases can be paused or reversed subject to market conditions”.

OPEC+ REQUIRED PRODUCTION LEVEL FOR 2025

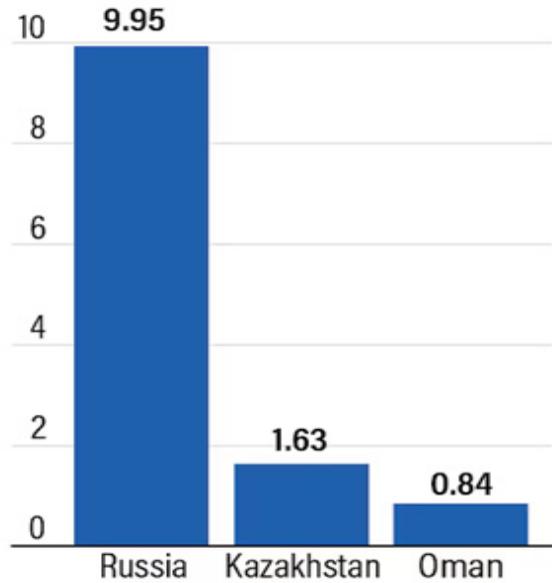
(million bpd)

12 Opec



(million bpd)

12 Non-Opec



Footnote: The required production level is before applying any additional production adjustments

Source: Opec

For this year, the EIA expects crude oil demand to be 102.9 million bpd, compared to a supply of 102.4 million bpd.

Brent, the benchmark for two thirds of the world's oil, will average \$89 a barrel in the second half of 2024, up from \$84 a barrel in the first half of the year, the agency said.

"Higher prices in the second half of the year result from our forecast of persistent withdrawals from global oil inventories," it added.

The international benchmark was trading 0.64 per cent lower at \$84.12 a barrel at 10.09am UAE time on Wednesday.

Last week, oil prices marked their fourth consecutive week of gains, driven by strong fuel demand and tightening supply.

Opec crude exports fell to 18.1 million bpd in June, a decrease of more than 1.6 million bpd month-over-month, marking the

lowest crude export level since June 2021, UBS said last week, citing estimates from tanker tracking company Petro-Logistics.

Nearly all Opec members recorded a drop in exports last month, with large declines in Saudi Arabia, Iran, the UAE and Kuwait, the Swiss lender said.

Meanwhile, geopolitical tensions in the Middle East, driven by Israel-Hamas war, Hezbollah's escalating military skirmishes with Israel, as well as the actions of the Houthis in the Red Sea, are causing an increase in oil prices due to added risk, analysts said.

Recent escalations in the Middle East are reintroducing a risk premium to oil prices, which we "had not seen for a few weeks," Rystad Energy said in a research note.

By John Benny

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

Energy Storage & Grids

27 Regulatory Frameworks & Market Design



Grid-Forming Technology and Its Role in The Energy Transition



Zenobē Energy's Blackhilllock BESS, pictured under construction in April 2024. Image: Zenobē Energy

In the quest for stable power systems, ensuring grid stability is paramount, particularly with the increasing integration of volatile renewable generators such as PV and wind. Grid stability relies on the dependable provision of essential grid services such as frequency response (FRT), voltage stability, and inertia.

Traditionally, synchronous generators provided these reserves at the transmission system level. However, the emergence of large-scale battery storage technology presents an alternative solution.

Battery storage offers rapid delivery of stored power and energy, outperforming conventional synchronous power plants in terms of response time and efficiency. With its impressive technical performance and increasing commercial competitiveness, battery storage is poised to play a pivotal role in future power systems with 100% renewable penetration.

Global solar inverter manufacturer SMA has utilised advanced power conversion

systems (PCS) and control technologies that have significantly contributed to grid stability by encompassing inverters, medium voltage solutions, plant control and engineering services.

The provision of grid-following inverters proved instrumental in maintaining operational continuity and ensuring an uninterrupted power supply during severe grid disturbances in Odessa in 2021 and 2022.

Additionally, advanced grid-following controls have proven effective even in weak grid environments, as demonstrated in the West Murray region of Australia.

This article explores the pivotal role of advanced inverter and control technology, especially concerning grid stability.

Understanding grid-forming technology and its evolution

Developing the grid-forming solution was not merely about replicating a

synchronous generator; instead, the focus was on preserving relevant features and emphasising beneficial capabilities. This approach diverged from the conventional term “virtual synchronous machine,” as the goal was to enhance functionality beyond traditional methods.

In the initial stages of discussions, there were doubts about the feasibility of grid-forming technology. Demonstrators, such as the one on the island of St. Eustatius in the Caribbean Sea, played a crucial role in dispelling these concerns.

Software (SW) plays a pivotal role in grid-forming operation, where grid parameters are stabilised in response to deviations. This involves adapting island grid SW to react to frequency gradients instead of frequencies for grid-tied operation, resulting in a unique combination of droop and inertia control. This approach ensures stability and resilience, allowing inverters to emulate the behaviour of synchronous machines effectively.

Hardware (HW) enhancements are also integral to grid-forming solutions. Given that grid-following inverters typically offer limited short-circuit level (SCL) contributions compared to synchronous condensers, SMA's Large Scale Hardware incorporates a short-term boost capability. This involves improving thermal management and providing design headroom for short-term overload, ensuring grid-friendly behaviour across various operational conditions.

By harnessing the stability and flexibility of battery energy storage systems, grid-forming solutions offer a pathway to a more sustainable and reliable energy future.

These solutions for grid-forming on-grid applications ensure seamless integration of renewable energy sources while maintaining grid stability. The emergence of additional stability services like inertia, system strength, and islanding capabilities underscores the necessity for grid-forming (GFM) controls at both inverter and plant levels.

Grid-forming projects in Australia: A key use case

Australia's ambitious federal goal of achieving 82% renewable energy generation by 2030 has propelled the nation to the forefront of renewable energy adoption. With a vast potential for wind and solar energy, Australia faces the challenge of integrating these intermittent energy sources into its grid seamlessly. Battery energy storage systems (BESS) equipped with grid-forming technology have emerged as essential components to enable the required grid-hosting capacity for renewable energy.

Australia's unique energy landscape offers valuable insights into the future of energy supply and grid stability. As an islanded power system with extensive distances for power transmission and high renewable energy penetration, Australia encounters challenges that other regions may face in the future.

Recognising the importance of grid-forming technology in enhancing grid stability and resilience, the Australian Renewable Energy Agency (ARENA) has allocated substantial funding to support grid-connected BESS projects with GFM capabilities.

The deployment of robust GFM technology is crucial for the Australian grid's progression, as outlined in the Integrated System Plan released by the Australian Energy Market Operator (AEMO).

With a shift towards renewable energy sources connected to the grid through inverter-based resources (IBR), traditional IBR without grid-forming technology fall short in providing adequate grid support services. Grid-forming functionality is essential to address this gap, enabling IBR coupled with BESS to contribute to network strength and stability.

By Aaron Philipp Gerdemann
Senior Business Development Manager, SMA
<https://www.energy-storage.news/>

Country Reports

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Kuwait Says Breakthrough Oil and Gas Discovery Set to Boost Crude Production



Preliminary estimates suggest the latest discovery at the Al-Nokhatha field could yield approximately 3.2 billion barrels of oil equivalent

Kuwait, Opec's fifth-largest crude producer, said it has discovered "huge commercial quantities" of oil and gas, which is a breakthrough in the Gulf state's push to boost its hydrocarbons reserves. The announcement comes as the country reported a multibillion deficit for the upcoming fiscal year.

Preliminary estimates suggest the latest discovery at the Al-Nokhatha field east of the Kuwaiti island of Failaka, could yield about 2.1 billion barrels of light oil and 5.1 trillion standard cubic feet of gas, which corresponds to approximately 3.2 billion barrels of oil equivalent, according to the Kuwait Oil Company.

"These initial findings indicate huge potential to further enhance and increase hydrocarbons resource quantities in various layers and reservoirs within the discovered field," KOC said in a statement on Sunday carried by state news agency Kuna.

The initial estimated area of the newly discovered oil well is around 96 square kilometres and the reserves are equivalent to the country's entire production in three

years, chief executive of KOC parent, Kuwait Petroleum Corporation, Sheikh Nawaf Al-Sabah said in a video posted on the company's account on X.

The daily production of from Al-Nokhatha well is about currently 2,800 barrels of light oil and 7 million cubic meters of associated gas.

"Based on initial test results, a development plans will be established to commence actual production from the field at the earliest opportunity, boosting KOC's production capacity," the company said.

Government expenditure

Kuwait, which relies heavily on sale of hydrocarbons to fuel its economy has benefited from a rise in oil prices this year, but the government still needs to control spending to cut its budget deficit.

Kuwait's budget is projected to show a deficit of 5.6 billion dinars (\$18.33 billion) for the 2024-2025 fiscal year, with expenses estimated at 24.5 billion dinars and revenue at 18.9 billion dinars, Reuters cited Kuwait's Ministry of Finance as saying on Sunday.

Government spending must be fixed at 24.5 billion dinars in the 2027-2028 budget to control budget growth, it added.

The liquidity of the General Reserve Fund, from which the budget deficit is financed, decreased to 2 billion dinars last March from 33.6 billion ten years ago due to increasing withdrawals, the ministry said.

Matthew Davies

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

Iraq Plans to Ramp Up Oil Output By 2027

Iraq has outlined an ambitious plan to raise its crude oil output to 7 million barrels per day (bpd) by 2027, according to the country's oil minister, Ihsan Abdul Jabbar. Speaking at the virtual Iraq Petroleum Conference, Jabbar emphasized that this goal remains firm despite challenges such as OPEC production cuts and fluctuating oil prices.

«Iraq's master plan is aligned to achieve our target,» Jabbar asserted, underlining the nation's strategic commitment to boosting its production capacity. Currently, Iraq is the second-largest crude oil producer within the Organization of Petroleum Exporting Countries (OPEC), trailing only Saudi Arabia. Moreover, Iraq holds the world's fifth-largest proved crude oil reserves, positioning it as a critical player in the global energy market.

By 2027, Iraq aims to increase its oil production capacity by an additional 2 million bpd, reaching a total output of 7 million bpd. This ambitious target underscores Iraq's determination to enhance its oil sector, which has faced significant delays and challenges, particularly due to OPEC's production cuts implemented to counteract the demand crisis triggered by the COVID-19 pandemic. Despite these setbacks, Jabbar reiterated Iraq's unwavering commitment to its long-term production goals.

The implications of Iraq's plans are significant for the global energy sector. An increase in Iraq's oil production could potentially alter the dynamics within OPEC, influencing production quotas and pricing strategies. Furthermore, the anticipated rise in output could impact global oil supply, potentially affecting prices and market stability. For stakeholders within the energy industry, understanding and preparing for these potential shifts is crucial.

Iraq's strategy also involves leveraging its vast oil reserves to secure a more prominent position in the global energy market. With proved reserves ranking fifth globally, the country has substantial



untapped potential. Developing these resources efficiently will require significant investments in infrastructure, technology, and human capital. This presents opportunities for international energy companies, service providers, and investors looking to engage with Iraq's burgeoning oil sector.

Jabbar expressed optimism about the future, anticipating a more favorable oil market in the second quarter of 2021. This positive outlook is essential for driving investments and partnerships necessary to realize Iraq's production targets. However, the journey towards achieving 7 million bpd will not be without challenges. Geopolitical tensions, regulatory hurdles, and market volatility are factors that could influence the pace and success of Iraq's oil production expansion.

Iraq's plan to ramp up its oil production capacity to 7 million bpd by 2027 is a bold and strategic move with far-reaching implications for the global energy market. As the country navigates the complexities of production increases and market dynamics, stakeholders in the energy sector must stay informed and adaptive to capitalize on emerging opportunities. Iraq's determination to enhance its oil production underscores the nation's pivotal role in shaping the future of the global energy landscape.

Edited by Hassan Mourtada

www.energyHQ.world

The UK Sets a Path for Clean, Affordable Energy- And Renewed Climate Leadership



The new United Kingdom administration is one that is passionate about clean energy and the energy transition. But first, to understand its approach to energy policy, it is important to understand how this new government will operate.

Prime Minister Keir Starmer's pitch is that the government will be focused on "mission delivery" with mission delivery boards chaired by Starmer personally. He has said that his approach to all issues will be "country first—party second."

Almost all members of the Shadow Cabinet have been appointed to those same portfolios in government and, in addition, Starmer has also brought back some former ministers from the Tony Blair/Gordon Brown years. They are all therefore familiar with their portfolios, widely respected, and able to hit the ground running. It is also clear that the prime minister wants to work closely with the private sector in order to make early progress on the government's priorities.

Ed Miliband has been appointed as secretary of state for energy security and net zero. This is broadly the role he held when Labour was last in government before 2010, so he knows the issues well and is a genuinely passionate advocate for tackling climate change and delivering net zero.

With the UK government now one of the most secure among the large western nations (with a five-year mandate and a very large majority), the United Kingdom is expected to reassume a leading role in the international discussions on climate change. As the only country to have reduced its carbon emissions by over 50 percent since 1990, many will welcome that leadership once again.

In most areas, there will not be a huge difference in UK government energy policy under the new administration, but there will be a few distinct changes.

Labour has set a very challenging target to decarbonize the electricity grid by 2030. Until there is much more detail about how this can be done, industry will understandably be skeptical about the feasibility of such a goal, the costs involved, and how local communities will be brought on board. This will involve a significant further commitment to renewables, including a welcome early announcement to end the ban on onshore wind. The United Kingdom's success in developing offshore wind will be continued.

By Charles Hendry
<https://www.atlanticcouncil.org/>

Services

34 Coming Events



Coming Events

The Energy Expo 2024

Miami Airport Convention Center, Miami, USA
20 - 22 Aug 2024

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

The Energy Expo (6th edition) in Miami, Florida, comes as an in-person physical tradeshow to serve your energy-clean needs, in the proper place, at the proper time...

India Process Expo and Conference 2024

Hitex Exhibition Center, Hyderabad, India
16 - 18 Aug 2024

<https://ipeexpo.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

Solid-State Battery Summit 2024

Chicago, USA
13 - 15 Aug 2024
Event website

Join us for an exciting in-person and virtual summit that delves into the global solid-state battery ecosystem from every perspective. This unique event will explore significant advances...

International Conference on Electronics and Power Engineering 2024

Montreal, Canada - Virtual Event
05 - 06 Aug 2024
Event website

The Electronics and Power Engineering conference in Montreal aims to bring together researchers, scientists, scholars, and engineers to share their research and discuss innovations in the field...

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...

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.

Solar PV & Energy Storage World Expo 2024

Guangzhou, China
08 - 10 Aug 2024

<https://en.pvguangzhou.com/>

Solar PV & Energy Storage World Expo will showcase products like silicon rod silicon block silicon ingot production equipment, silicon wafer production equipment...

ASEAN Clean Energy Week

Manila, Philippines
21 - 22 November 2024

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

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

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Middle East Heat Takes Toll on Energy Supply in Summer



The world has just experienced the hottest May on record, and record temperatures are expected throughout the northern hemisphere summer. This extreme heat poses a significant threat to the energy supply in the Middle East, where high temperatures can be deadly. The region faces a triple challenge: electricity shortages, intense heat, and the need to reduce carbon emissions.

Egypt: Despite financial support from Gulf allies and international institutions, Egypt faces power cuts lasting two to three hours, which are likely to worsen in the peak of summer. Restrictions on shop hours aim to conserve energy, but they frustrate locals.

Lebanon's struggle with electricity continues, as offshore gas exploration remains unsuccessful. The country relies on temporary solutions to mitigate frequent power outages.

Iraq's demand for electricity has surged to 48 gigawatts, but the state can only supply 25 gigawatts. Last summer, it managed 26 gigawatts. Some regions receive only 10 hours of power daily, prompting the government to reduce working hours to save energy.

Political gridlock has hindered the construction of new power plants. With heavily subsidized electricity prices, Kuwait faced rolling power cuts last month due to a technical issue and high air-conditioning use.

The UAE's challenge lies in meeting growing electricity demand while reducing greenhouse gas emissions. Dubai's peak electricity load reached 10.4 gigawatts last summer and is expected to rise. Despite quadrupling solar output, gas generation has also increased, raising carbon emissions.

Saudi Arabia's Economic growth and new developments have led to rising electricity demand after a period of stagnation. Saudi Arabia is working to balance this demand with its environmental goals.

Solutions and Challenges

The technical solutions to these energy challenges are well-known. Upgrading or replacing inefficient gas- or oil-fired plants with modern, efficient ones is essential. Building new power stations, particularly solar and wind, is crucial, alongside using cheap batteries to store energy for hot nights.

Efforts are underway in the UAE, where Taqa plans to replace older gas plants with solar power, aiming to reduce emissions by 25% by 2030. Rooftop solar panels should be more accessible, and new homes should come equipped with solar from the start.

However, simply adding more power generation isn't enough. Lebanon and Iraq have long struggled with this approach due to bureaucratic inertia and vested interests. Rapid demand growth in Iraq suggests it may never catch up. Economically, it's also wasteful, diverting funds from other critical areas. For instance, Egypt doesn't have enough gas to fuel new stations.

Alternative Approaches

Electricity trade between countries needs expansion, as regional connectivity remains insufficient. Efficiency improvements, particularly in cooling buildings, are crucial. Better insulation, district cooling, efficient air-conditioners, and thoughtful urban planning with green spaces and reflective surfaces can significantly reduce energy consumption.

Eliminating remaining energy and water subsidies and converting them to compensatory payments for lower-income residents can also drive efficiency. Tackling the "generator mafia," which thrives on the current gridlock, is essential. International pressure and a two-track approach of dismantling corrupt networks while integrating responsible generators into formal electricity provision can help break the deadlock.

Addressing the Middle East's energy challenges requires a multifaceted approach, balancing immediate needs with long-term sustainability goals.

Robin Mills

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