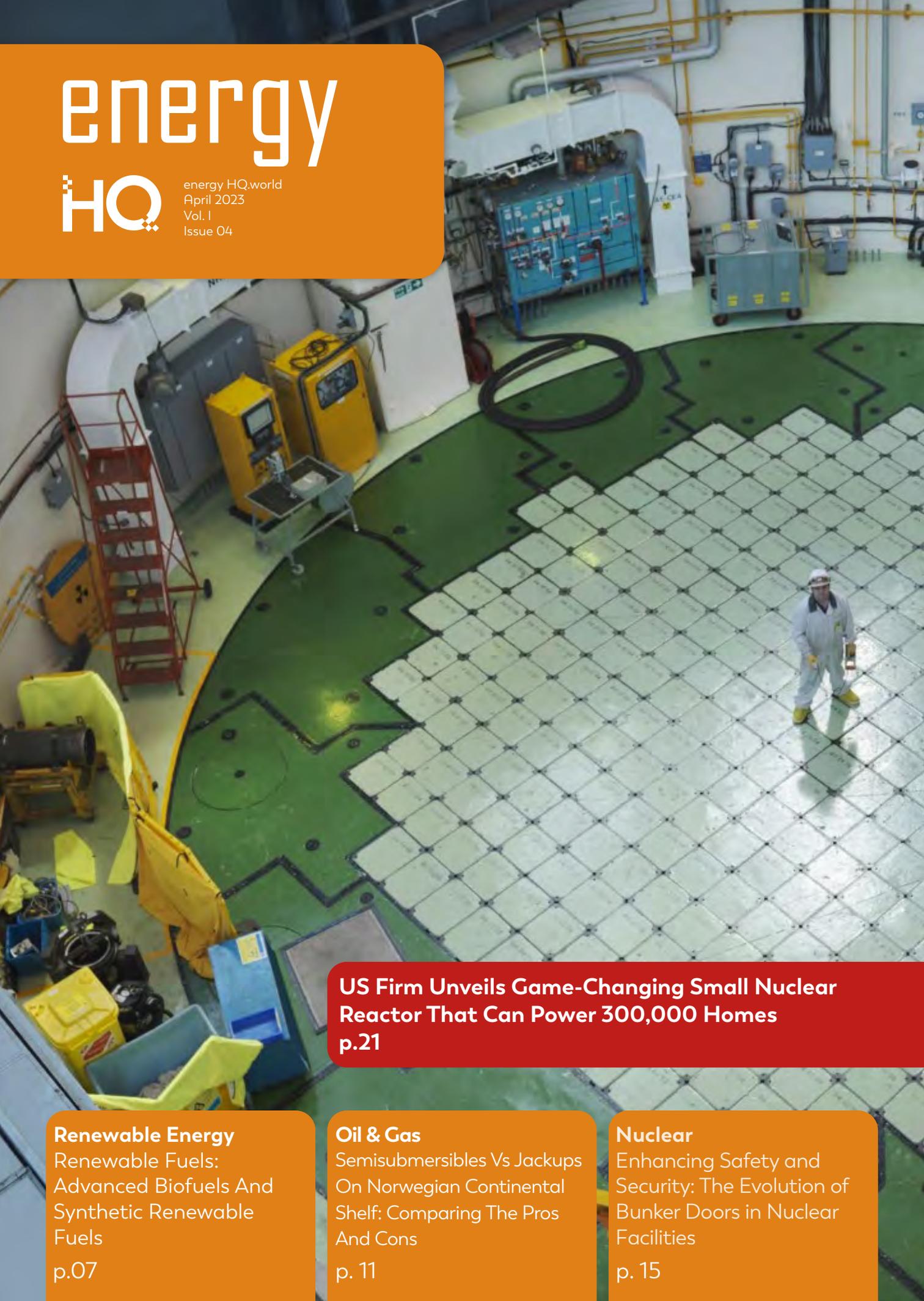


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energy HQ.world
April 2023
Vol. 1
Issue 04



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Advancements in the Energy Industry: A Spotlight on Nuclear Reactors



The energy industry has witnessed remarkable advancements over the years, with innovative technologies driving the transition to cleaner and more sustainable energy sources. Among these developments, nuclear reactors have emerged as a significant player, offering immense potential for meeting the world's growing energy demands while minimizing carbon emissions.

Nuclear reactors are renowned for their ability to generate large amounts of electricity without emitting greenhouse gases. Unlike traditional fossil fuel-based power plants, nuclear reactors harness the energy from nuclear fission, a process where the nucleus of an atom is split into smaller parts, releasing an enormous amount of energy. This energy is then converted into electricity through turbines and generators. By relying on nuclear power, countries can reduce their dependence on fossil fuels and make significant strides towards mitigating climate change.

In recent years, there have been notable advancements in nuclear reactor technology, focusing on safety, efficiency, and waste management. One breakthrough is the development of small modular reactors (SMRs). These compact reactors offer several advantages, such as simplified construction, enhanced safety features, and the ability to provide power to remote areas. SMRs are scalable and can be manufactured in a factory setting, significantly reducing costs and construction time.

Another noteworthy innovation is the Generation IV reactors. These reactors aim to further enhance safety, reduce waste, and improve efficiency. Generation IV reactors employ advanced cooling mechanisms, such as liquid metal or gas, to optimize heat transfer and minimize the risk of meltdowns. Moreover, they have the potential to recycle spent nuclear fuel, thereby reducing long-term waste management challenges.

As the global energy landscape evolves, nuclear reactors play a vital role in providing a clean and reliable source of electricity. With ongoing research and development, nuclear power continues to improve its safety measures, efficiency, and waste management capabilities. The advent of small modular reactors and Generation IV reactors exemplifies the industry's commitment to innovation, allowing for safer and more sustainable nuclear power generation.

While challenges remain, such as public perception and waste disposal, nuclear reactors offer immense potential in meeting the world's energy demands while minimizing environmental impact. With continued advancements and a commitment to safety, nuclear power can contribute significantly to a more sustainable and resilient future for the energy industry and our planet as a whole.

In This Issue!

energyHQ's April 2023 issue covers the most recent developments and events pertaining to the energy industry, as well as including valuable insights, details and spec sheets / peer reviews related to latest technologies, innovations, products, services, and projects of relevance to the industry and its audience. The article on page 11 talks about Marine Riser System, the article on page 15 Sheds the light on Bunker Doors, and the article on page 21 focuses on Nuclear Reactors. Additional content is also available covering the latest activities of manufacturers, importers, and exporters – worldwide!

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

Best wishes,
Hassan Mourtada
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Energy Digest



Qatar

Advantages in Adversity

Qatar's oil and gas industry has had a significant impact on the nation since oil was discovered in the mid-20th century. In 1985, Qatar's North field was declared the largest non-associated gasfield in the world with recoverable reserves amounting to 10% of all recoverable reserves worldwide. Hydrocarbons activities and affiliated operations form the majority of the peninsular nation's economic backbone and make up around 70% of government revenues. Gas operations have propelled the country's GDP per capita into the top 50 globally. QatarEnergy is the state-owned entity involved in managing all oil and gas activity in the country. The country has made considerable investments in producing LNG since it began in the 1990s, with the country now one of the leading LNG exporters worldwide along with the US and Australia. LNG export from Qatar has traditionally been done through long-term oil-indexed contracts, though short-term contracts are being made as the LNG customers diversify import sources. The traditional target market for the country's product is Asia, although interest in Qatari LNG from Europe has grown. While the nation's power generation capacity has traditionally come from fossil fuels, the government has made ambitious strides to develop renewable capacity, particularly solar. The state has set ambitious targets to have its electricity derived from non-gas sources by 2030 under the Qatar National Vision 2030 initiative.



Malaysia

Malaysia Opens Its Renewable Energy Market To Ppas, Cross-Border Trade

The Malaysian government is developing a new strategy to expand renewable energy use in the country and also boost the domestic renewable energy industry. Malaysia's Ministry of Natural Resources, Environment and Climate Change and Ministry of Economy are working together to establish plans and determine new renewable energy initiatives and programs to drive the development of the country's renewable energy industry. The ministries earlier this month presented their proposals to the cabinet, which approved a number of measures:

- Renewable energy generation capacity will be increased to create new economic opportunities through the enhanced growth of the country's renewable energy industry while ensuring a secure electricity supply;
- Based on the concept of self-contained systems, renewable energy development will be expanded to spur investment along the renewable energy value chain and to diversify renewable energy programs according to a "willing buyer-willing seller" approach to encourage corporate involvement via power purchase agreements (PPAs);
- The government will directly allocate funds from its development budget for the installation of solar systems on government buildings, enabling government ministries and agencies to benefit from electricity cost savings;
- The government will develop and establish an electricity exchange system to allow the implementation of policy on cross-border renewable energy trading.

Colombia

Colombia Oil Regulator To Invest \$135 Million In Renewable Energy

Colombia's National Hydrocarbons Agency (ANH) will invest more than \$135 million in growing its knowledge of renewable energy options, the agency's new president Clara Guatame said at an industry event in the Caribbean city of Barranquilla on Wednesday. The government of leftist President Gustavo Petro has set its sights on weaning Colombia from its dependence on oil exports, a major source of income for the Andean country, as it moves to transition to cleaner energy sources. "Recently, the ministry of mines and energy has delegated some functions to the National Hydrocarbons Agency, that will allow us to grow our knowledge mainly in wind energy, geothermal energy and hydrogen," Guatame said at an oil and gas conference organized by the Colombian Petroleum Association (ACP). The ANH will invest 640 billion pesos (\$135.8 million) in projects over the next four years geared toward the energy transition, she said. The sum forms part of the Colombian government's four-year development plan being debated in congress. As part of its energy policy, Colombia's government has pledged not to grant any more hydrocarbon exploration and production contracts, urging companies to make the most of licenses they have already been granted. Last year, Minister of Mines and Energy Irene Velez told Reuters the government was targeting a 15% increase in oil output using enhanced recovery methods.

Canada

Canada Must Remove Hurdles To Attract Capital, Grow Energy Industry And Economy

Why is capital critical to Canadians' well-being? Because capital fuels our economy, performing as a hand up versus a taxpayer handout. Yet, being mobile, it also seeks the highest adjusted investor returns. Countries compete for investment dollars as an imperative for building a strong economy. Investors into Canada expect an efficient, consistent and transparent regulatory policy. Underlying these key tenets to investor confidence is government support of the sector. A strong investment environment requires stability alongside mutual trust. As co-founder of FirstEnergy Capital, for more than 25 years we had global exposure to diverse energy investment opportunities and helped 1,200 companies raise more than \$160 billion. Leadership teams were foremost to our investment assessments because, regardless of the asset being developed, their intellect drove investment strategy. These innovative teams deployed capital globally, advancing the energy sector through technical and environmental enhancement, exploring and producing reliable energy through the most efficient and effective means possible. Their ability to access capital allowed them to choose when and where to do business. In Canada, when economic opportunity lacks capital, it shortchanges opportunity. Decreased capital investment stifles innovation, productivity and ultimately our standard of living. Unrealized global demand for products we could supply will be pursued by others.

Germany

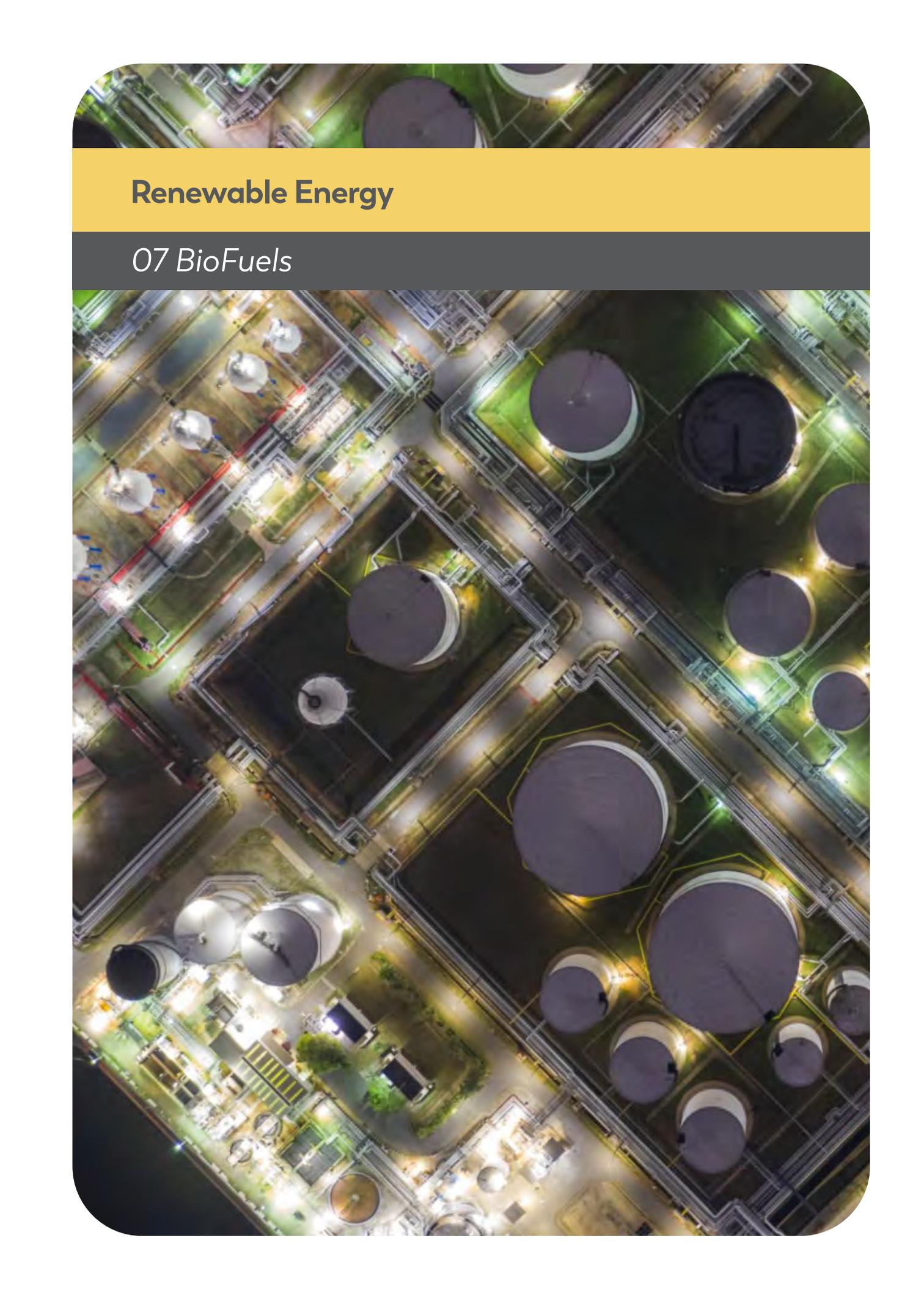
Renewables Cover Half Of Germany's Electricity Demand In First Quarter Of 2023

Renewable energy covered about half of electricity consumption in Germany during the first three months of 2023, according to preliminary calculations by energy industry association BDEW and the centre for solar research Baden-Württemberg (ZSW). In total, around 138 billion kilowatt hours (kWh) were consumed – roughly a six percent drop compared to the first quarter of the year before – of which around 69 billion kWh came from renewable sources. The largest renewable electricity source was onshore wind (38 billion kWh), followed by biomass (11 billion kWh), solar PV (8 billion kWh), offshore wind (7 billion kWh) and hydropower (4 billion kWh). "Regardless of whether it is for the energy transition, the heat transition, the transport transition or the hydrogen ramp-up: in order to achieve the climate targets, we need much more green electricity than we have today," said BDEW head Kerstin Andreae. The government has presented a wealth of amendments to existing laws and funding schemes – mainly geared towards boosting the country's renewable capacity, especially onshore wind – but also to accelerate grid planning and the development of offshore wind connections, and to make the building stock more efficient. Germany aims to cover 80 percent of power demand with renewables by 2030 and a climate neutral supply once the coal exit is finalised.

VIETNAM

Vietnam's Renewable Energy Future

Vietnam's electricity demand has increased at a rapid pace—an average of 10 percent per year over the past five years. To keep up with demand, the country will need a significant amount of new capacity, requiring \$150 billion in capital investments for generation and grid upgrades, according to Electricity of Vietnam (EVN's) estimates. Given the country's natural hydro endowments and lower-cost solar and wind power, Vietnam may be wise to pursue renewables as it decides a future power plan. In our recent review of Vietnam's power sector, we determined that a renewable-led plan would present the country with the best opportunity for capital formation while posing the lowest risk and impact on public budgets. Vietnam has tremendous natural endowments: four to five kilowatt-hours per square meter for solar and 3,000 kilometers of coastlines with consistent winds in the range of 5.5 to 7.3 meters per second. Yet, the country's own market for renewables remains in its infancy, with only about 200 megawatts of grid-scale, renewable solar and wind capacity online, primarily through wind projects. Most of Vietnam's renewable energy generation capacity, some 3.4 gigawatts annually, is intended for export to Europe and the U.S. A successful renewables-led pathway includes building out the country's wind and solar generation capabilities (39 gigawatts and 61 gigawatts by 2030, respectively). This is five times more than what is called for in Vietnam's current energy plan—which aims by 2030 to increase coal by 45 gigawatts—and would need to be supplemented by natural gas and battery storage to help firm renewables generation.



Renewable Energy

07 BioFuels

Renewable Fuels: Advanced Biofuels And Synthetic Renewable Fuels



Transportation fuels are among the largest sources of greenhouse gas (GHG) emissions in the EU. In line with the European Green Deal's goal of achieving climate neutrality by 2050, 15 EU-funded projects are introducing renewable fuel technologies that will support the clean energy transition in the transport sector and help EU's energy independence.

Transportation accounts for a large share of the total energy consumption in Europe and contributes to approximately one fourth of global direct CO₂ emissions from fuel combustion. Advanced biofuels are a promising alternative that could significantly reduce the carbon footprint of the sector fast.

Europe has taken significant steps towards transport decarbonisation with initiatives such as

the European Green Deal "Fit for 55" package. For the uptake of sustainable fuels, special provisions are proposed for the aviation and shipping sectors, which are among the most difficult to decarbonise and rely on renewable fuels in the long-term: ambitious targets on sustainable aviation fuels have been set (a share of at least 5 % in 2030 and 63 % in 2050), and guidelines for reduction in the GHG content of the energy supplied to ships have been laid down (at least 6 % in 2030 and 75 % in 2050 from the 2020 average).

Specific transport targets are foreseen in the proposal for the Renewable Energy Directive revision for advanced biofuels and biogas (a share of at least 2.2 % in 2030) and renewable fuels of non-biological origin (a share of at least 2.6 % in

2030), as well as for GHG intensity reduction (at least 13 % in 2030). This will help in the short term to decarbonize all transport sectors, including heavy road transport, through renewable fuels.

In order to rapidly reduce the EU's dependence on fossil fuel imports, the REPowerEU Plan proposes to increase the target of renewable energy in the EU final energy consumption in transport by an additional 4 % in 2030 through increasing also the shares of renewable fuels of non-biological origin to 5.7 % and of GHG savings to 16 %. This also implies that the demand for the supply of renewable fuels will be further increased. This expectation is confirmed by the recent provisional agreement on specific transport targets for advanced biofuels and renewable fuels of non-biological origin in the Renewable Energy Directive revision trilogues.

Moreover, the Net Zero Industry Act establishes the framework of measures for innovating and scaling up the manufacturing capacity of net-zero technologies in the EU. It names renewable fuel from non-biological origin and sustainable alternative fuel technologies among the net-zero technologies.

The SET Plan Conference in Barcelona planned for 13-14 November 2023 will further strengthen Europe's plans towards the development of low-carbon, cost-competitive technologies that will also accelerate the transition towards green transportation.

Decisive Steps Towards Carbon Neutrality In The Transport Sector

This Results Pack on Renewable Fuels aims to showcase the contribution of novel technologies in replacing fossil fuels in line with "Fit for 55" and REPowerEU.

The 15 Horizon 2020 projects featured in the Pack will show how advanced biofuels and synthetic renewable fuel technologies can help pave the way towards energy security and autonomy, placing Europe in the lead of the net-zero industrial revolution. Driving change in renewable energy for transport – 15 ways.

Producing advanced biofuels from various organic sources is a significant step towards decarbonising the transport sector while relieving the environmental burden of depositing "unused" materials. The HyFlexFuel team successfully turned a wide variety of feedstock into advanced biofuels, while COMSYN set out to increase the adoption of biomass-to-biofuel technologies by introducing a cost-effective blended biodiesel and biogasoline production process from biocrude.

ABC-SALT validated a novel concept whereby sustainable biofuels are obtained from waste biomass cost-effectively in a process based on

molten salts, while CONVERGE introduced a process for green methanol production from residual biomass, allowing for cost-effective green biodiesel production in biodiesel facilities.

TO-SYN-FUEL introduced advanced biofuels made from waste and biogenic residual materials. Instead of being landfilled or incinerated, sewage waste can now power up the transport sector, including aviation.

4REFINERY demonstrated that advanced biofuel production in existing refineries is achievable without the need to build new units. The methods proposed will lead to improved efficiency and significantly reduced costs. With the aim to use existing infrastructure, the scope of BIOFIT was to identify best bioenergy retrofitting practices by working in close collaboration with companies and industry partners. The expected result was increased fuel efficiency in line with the transport sector's needs.

Marginal, underutilised and contaminated (MUC) lands across Europe are no longer suitable for food production, and for that reason little thought has been put into their utilisation. BIOPLAT-EU is changing this paradigm by exploiting MUC lands for biomass production to enlarge the sustainable feedstock potential for bioenergy.

Heat-To_Fuel set out to develop advanced biofuel production technologies delivering high-quality fuels at competitive prices, while REDIFUEL's core achievement was the development of a drop-in fuel that can replace up to 100 % of petroleum-derived diesel.

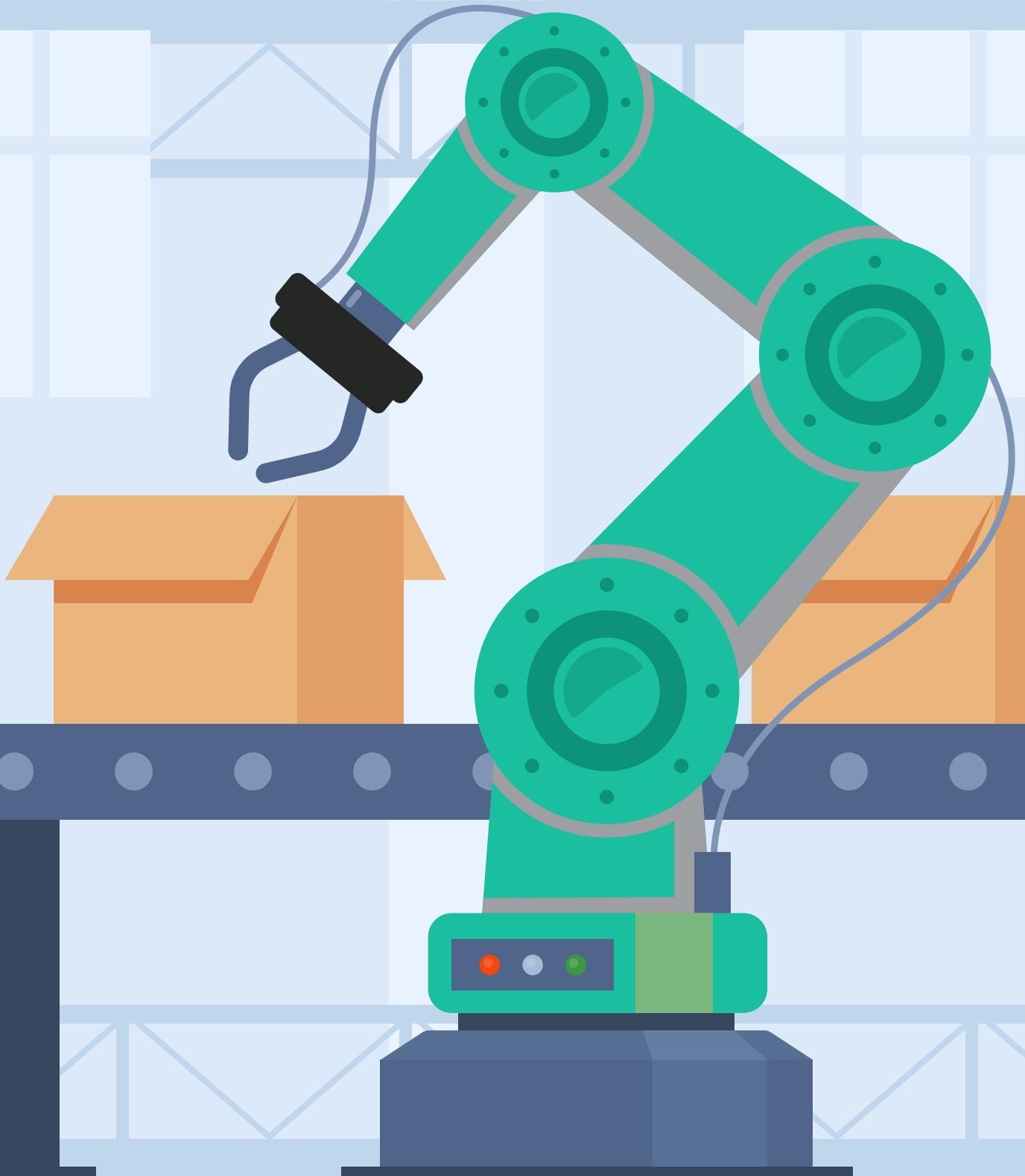
The transition to green aviation was the scope of KEROGREEN; the project offered a sustainable route towards CO₂ conversion into aviation fuel by combining high-temperature electrolysis and plasmolysis.

The steel industry and the shipping sector are among the most energy intensive. FReSME introduced an innovative way to decarbonise both, at the same time creating marine fuels.

Microbes play a central role in renewable fuel production. eForFuel focused on producing valuable ready-to-use biofuels via a sustainable production chain involving renewable electricity and engineered microbial strains, whereas STEELANOL introduced a process whereby waste streams are turned into ethanol, a green transportation fuel, via gas fermentation. Torero, on the other hand, introduced a novel technology that converts wood waste into biocoal, utilising products that have thus far been considered "unrecyclable."

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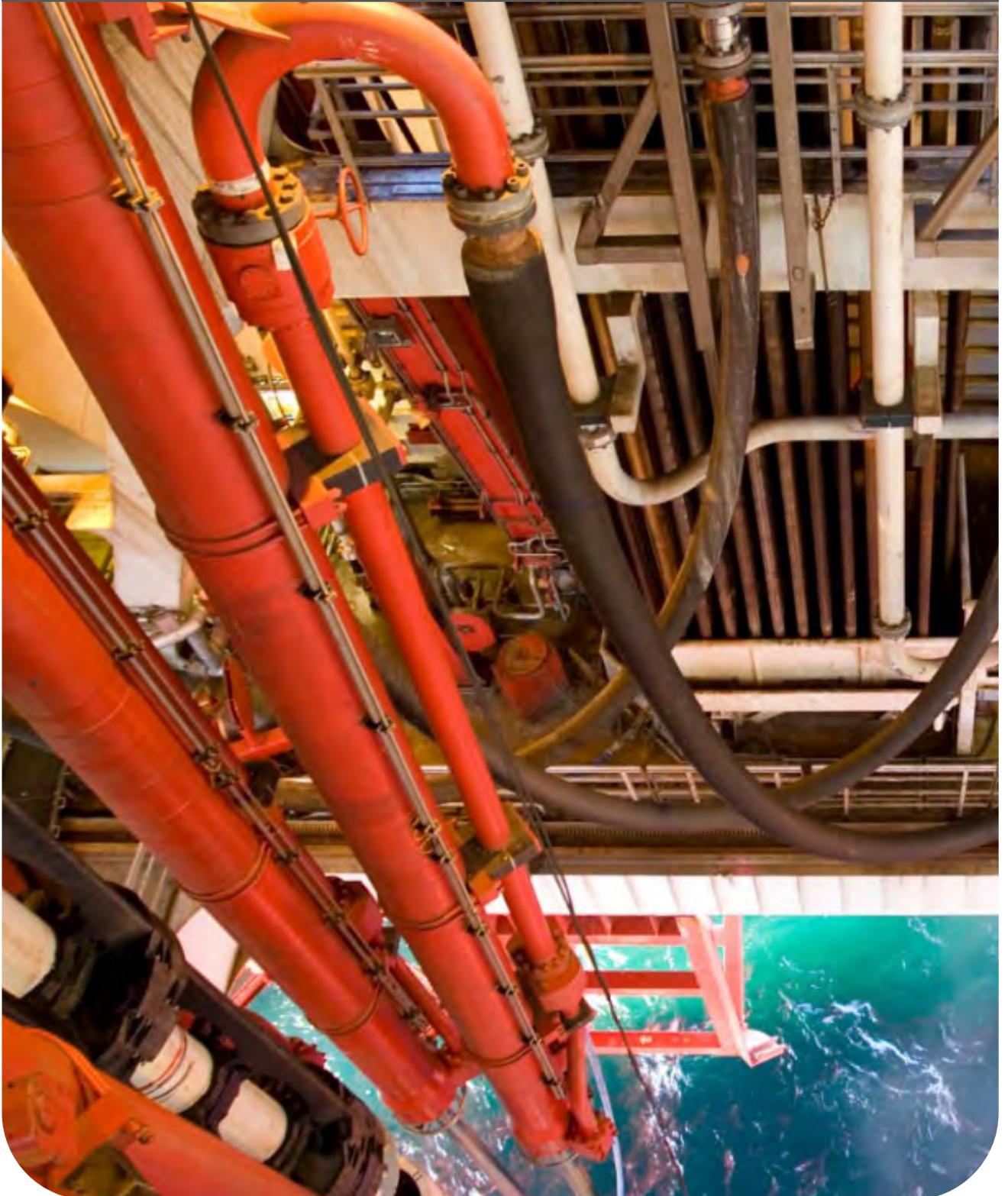
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Oil & Gas

10 Marine Riser System



Semisubmersibles Vs Jackups On Norwegian Continental Shelf: Comparing The Pros And Cons



Jackups of the CJ70 design, like the Noble Intrepid (pictured), typically have a higher variable deck load than semisubmersibles. However, the jackup's VDL may be negatively affected in some weather conditions if it's deployed close to the 150-m water depth boundary.

Noble undertakes review based on factors like NPT, waiting on weather, emissions and applicability of new drilling technologies

By Konstantin Puskarskij, Helge Talleraas, Bjarne Bertelsen, Ben Pomford, Michael Olsen, Kristian Engelbrecht Hansen, Per Frederiksen, Ida Maria Welhaven Winther, Adebowale Solarin and Robert Van Kuilenburg, Noble Corp

Approximately 30 of 73 offshore fields on the Norwegian Continental Shelf are located at a water depth between 100 and 150 m. Historically, two types of mobile offshore drilling units (MODUs) have been utilized to drill these prospects: column-stabilized MODUs (semisubmersibles) and self-elevated MODUs (jackups) of GustoMSC/NOV CJ70 design, which can operate at a water depth of up to 150 m.

Over the years, most of the advantages and disadvantages associated with using these types of MODUs have been identified. However, a

periodic review of well-established conclusions can help operators to determine if adjustments are needed to reflect changing external factors. Noble Corp recently completed a comprehensive review comparing both MODU types based on nonproductive time, waiting on the weather (WoW), emissions footprint, drilling schedule predictability, drilling efficiency, the applicability of new drilling techniques and technologies such as managed pressure drilling (MPD) and riserless drilling, offshore logistics, and other essential criteria.

The review didn't identify a clear "winner," as both MODU types have strengths and weaknesses depending on the requirements applied; however, the assessment highlights some points that could be used for campaign-specific evaluations where a wider gap can be observed between both MODU types on a case-by-case basis. This article presents selected points from the assessment.

Specific site assessment (SSA)

Seabed soil condition information is required to complete an SSA for jackups, and the timeline depends on the availability and accuracy of soil data. On some occasions, the SSA may require geotechnical and seabed surveys, including performing a cone penetration test or drilling a borehole under each future spud to position center. The SSA defines preloading conditions for the jackup arriving at the location, as well as limitations to the rig variable deck load (VDL) for various weather scenarios.

Mooring analysis

The mooring analysis for a semisubmersible depends on the soil condition, mooring spread design, inventory availability, decision on potential dynamic positioning (DP) assistance, subsea infrastructure at the location, and rig mooring capabilities. For shallow waters, the mooring (along with the riser) analysis significantly impacts the rig's operability window. The rig offset, triggered by the environmental loads, may exceed the capacity of one or more weak points determined as a part of the weak point analysis. This could lead to a situation where the MODU may need to be disconnected from the well. The most common mitigation is utilizing DP assistance under certain adverse weather conditions in a disconnected drilling mode, which allows for handling higher environmental loads.

Wellhead analysis

The upper well components and soil supporting the wellhead are exposed to external loads. Those loads are transmitted to the wellhead by the riser system, either by a marine riser for a semisubmersible operation or typically by a high-pressure (HP) or low-pressure (LP) riser system for a jackup operation.

The semisubmersible wave response, as well as VIV load effects on any type of riser from vortex shedding, is capable of inducing significant dynamic loads onto the wellhead and potentially reducing the fatigue life of critical components to a level that is below acceptable. Conditions are further exacerbated in shallow water due to the short riser length. Adverse metocean conditions at the location may aggravate the situation even further.

Mooring a semisubmersible on a shallow location

(and using DP assistance when required) may mitigate the situation, to some extent, by dampening vessel motions. However, in some cases, more barriers could be required, such as a subsea BOP tethering system, wellhead and riser-mounted sensors for monitoring of motions and stress, a mooring system with a quick disconnect function, and, ultimately, planned emergency disconnect (EDS) from the well.

Marine riser analysis for semisubmersibles

Marine riser analysis includes a set of assessments that highlight limitations to be considered during subsea BOP and riser deployment while staying connected on the well, when conducting drilling operations and also for control of emergency disconnect events, as well as hard/soft hang-off during wells hopping or storms.

For shallow-water prospects, the weak point analysis is the most crucial component of the riser analysis. It sets requirements for the mooring spread (and DP assistance where relevant) to secure the rig within the structural boundaries, where none of the weak point limits will be exceeded considering capacity criteria and methodologies for verification of extreme loads as outlined in API, ISO and DNV standards. For shallow-water drilling, the weak points usually are also associated with the upper part of the well and wellhead.

Riser analysis for jackups

HP or LP riser analysis for jackups with surface or subsea BOP is performed to verify that maximum loads for operating and survival conditions stay within predefined criteria. Fatigue loads need to be assessed as well, considering both the drilling riser stack-up and riser interfaces. For a number of load cases, it should be verified that the allowable component utilization will not be exceeded for the connected condition, which could potentially drive a decision to either suspend drilling and WoW or for a planned disconnect in case of extreme weather. Other verifications look at maximum loads on the horizontal guiding system top-side, loads on the diverter and overshot, and VIV adverse effects for the areas where a strong current is present or the riser is exposed to wind.

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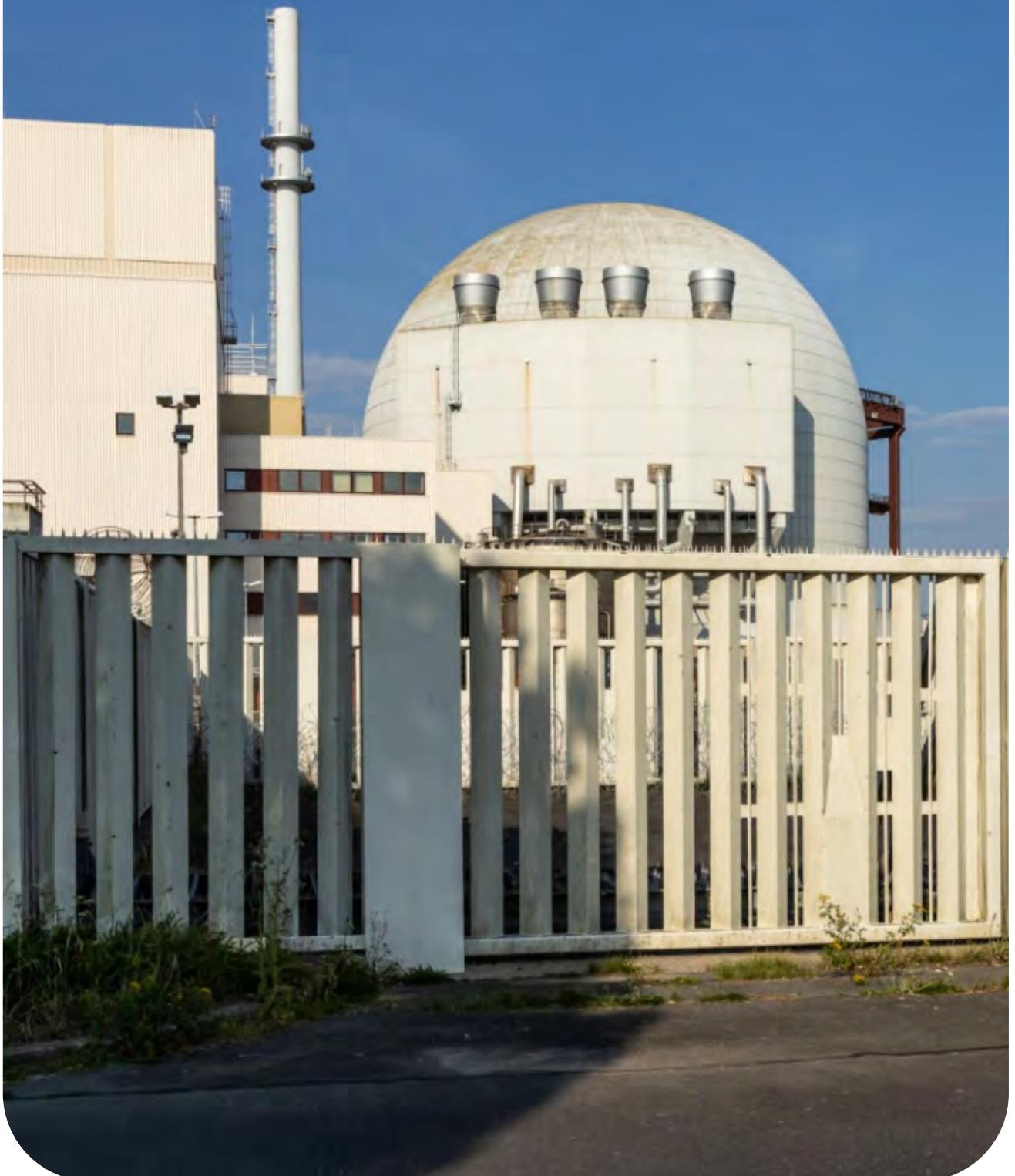
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Nuclear

Bunker Doors



Enhancing Safety and Security: The Evolution of Bunker Doors in Nuclear Facilities



In the realm of nuclear facilities, safety and security are paramount concerns. These high-stakes environments require robust measures to ensure the protection of personnel, prevent unauthorized access, and mitigate potential risks. Among the critical components of these facilities are bunker doors, which have undergone a significant evolution over the years to enhance safety and security measures. This article explores the advancements in bunker door technology, highlighting their crucial role in safeguarding nuclear facilities.

Nuclear facilities, such as power plants, research laboratories, and storage sites, house sensitive materials and equipment that necessitate strict access control. Bunker doors act as the first line of defense, fortifying these facilities against potential threats. Traditionally, bunker doors were made from thick steel and relied primarily on mechanical locks. While effective to some extent, these early designs had limitations and were susceptible to unauthorized entry.

Advancements in technology have revolutionized the concept of bunker doors, introducing innovative features to bolster safety and security. Modern bunker doors are now constructed using composite materials that offer enhanced strength and resistance to physical attacks, including extreme

temperatures and impact forces. Composite materials, such as reinforced steel and advanced alloys, provide superior durability and make breaching the door significantly more challenging. One of the key advancements in bunker door technology is the incorporation of advanced locking systems. Mechanical locks have been largely replaced with electronic access control systems, combining biometric identification, keycards, and passcodes to regulate entry. These sophisticated systems not only ensure authorized access but also allow for precise monitoring and tracking of individuals entering and exiting the facility.

Moreover, bunker doors now come equipped with state-of-the-art surveillance systems and sensors. Integrated CCTV cameras and motion detectors provide real-time monitoring, enabling security personnel to detect any suspicious activities promptly. In the event of an unauthorized breach or attempted tampering, the system can trigger alarms, alerting security teams and initiating appropriate responses.

Another critical aspect of bunker door evolution is the development of emergency response mechanisms. Nuclear facilities must have contingency plans in place to deal with emergencies, including natural disasters or security breaches. Modern bunker doors

are designed to withstand extreme environmental conditions and can be equipped with automated locking mechanisms triggered by seismic sensors or emergency alerts. These mechanisms ensure the integrity of the facility and protect personnel during crises.

Furthermore, the evolution of bunker doors has brought about improvements in fire resistance. In the event of a fire outbreak, bunker doors with fire-resistant properties can act as a barrier, preventing the spread of flames and smoke to other parts of the facility. This feature plays a crucial role in minimizing potential damage and allowing sufficient time for evacuation and firefighting measures.

Additionally, accessibility and ease of use have been taken into consideration in the development of modern bunker doors. While maintaining robust security measures, these doors now incorporate user-friendly features such as touchpad interfaces, intuitive controls, and automated opening and closing mechanisms. These enhancements facilitate efficient operations and reduce response times during routine activities and emergency situations.

It is worth noting that the evolution of bunker doors in nuclear facilities is an ongoing process. As technology continues to advance, so will the capabilities of these crucial components. Researchers and engineers are constantly exploring new materials, refining access control systems, and incorporating artificial intelligence to further enhance safety and security measures. The aim is to create bunker doors that are not only impenetrable but also adaptable to evolving threats and capable of providing real-time threat assessments.

The evolution of bunker doors in nuclear facilities has significantly contributed to enhancing safety and security measures. The incorporation of composite materials, advanced locking systems, surveillance technologies, and emergency response mechanisms has fortified these crucial entry points. Furthermore, improvements in fire resistance, accessibility, and ease of use have further bolstered the protective capabilities of modern bunker doors. The ongoing research and development in this field demonstrate a commitment to continuous improvement and the pursuit of excellence in

safeguarding nuclear facilities. As new threats and challenges arise, the evolution of bunker doors will continue to address them head-on.

The advancements in bunker door technology not only enhance the physical security of nuclear facilities but also contribute to the overall safety of personnel and the surrounding environment. By implementing sophisticated access control systems, surveillance measures, and emergency response mechanisms, the risk of unauthorized entry, tampering, or accidents can be significantly reduced.

Additionally, the evolution of bunker doors aligns with the broader goal of the nuclear industry to prioritize safety and security. Regulatory bodies and industry stakeholders recognize the importance of investing in cutting-edge technologies and continuously improving infrastructure to ensure the protection of nuclear facilities and the communities they serve.

However, it is crucial to acknowledge that no security measure is foolproof. While bunker doors play a crucial role in safeguarding nuclear facilities, they are part of a comprehensive security framework that includes perimeter defenses, surveillance systems, trained personnel, and robust emergency response plans. Regular maintenance, testing, and training are essential to ensure the proper functioning of bunker doors and the overall security infrastructure.

In conclusion, the evolution of bunker doors in nuclear facilities is a testament to the unwavering commitment to safety and security. Through the integration of advanced materials, access control systems, surveillance technologies, and emergency response mechanisms, bunker doors have become more resilient, effective, and adaptable to evolving threats. As the nuclear industry continues to advance, it will remain imperative to stay at the forefront of technological advancements and leverage innovation to enhance safety and security measures in nuclear facilities worldwide. By doing so, we can ensure the continued safe and responsible utilization of nuclear energy for the benefit of society while minimizing risks and protecting the well-being of all.

Hassan Mourtada
Editor in Chief
<https://www.energyhq.world/>

Electric

Temporary Solar Power



SKipp Panels: Innovating Portable Solar Power with Stability and Flexibility



The German solar company Sinn Power has introduced a new innovation in the form of tiltable, portable solar panels called SKipp. While the company primarily focuses on floating solar power plants, these panels are designed specifically for applications such as camping or mobile work sites that require frequent location changes.

Sinn Power has an impressive track record, with 750 megawatts of installed floating solar power and an additional 100 megawatts of installed land-based solar. The introduction of these tiltable, portable solar panels expands their range of solutions even further. One of the key advantages of these panels is that they don't require anchoring into the ground, making them suitable for off-grid areas where restrictions on ground-mounted installations exist.

But the question arises: Won't these panels blow over in strong winds? Surprisingly, the company claims that they will remain standing even in adverse weather conditions. While it may sound like magic, the explanation lies in the incorporation of a pendulum mechanism based on basic scientific principles. Sinn Power is confident in the stability of these panels, stating that tipping over is highly unlikely—even without anchoring them to the ground.

Philipp Sinn, the founder and managing director of Sinn Power, highlights the significance of this innovation. He explains, «With SKipp, we have

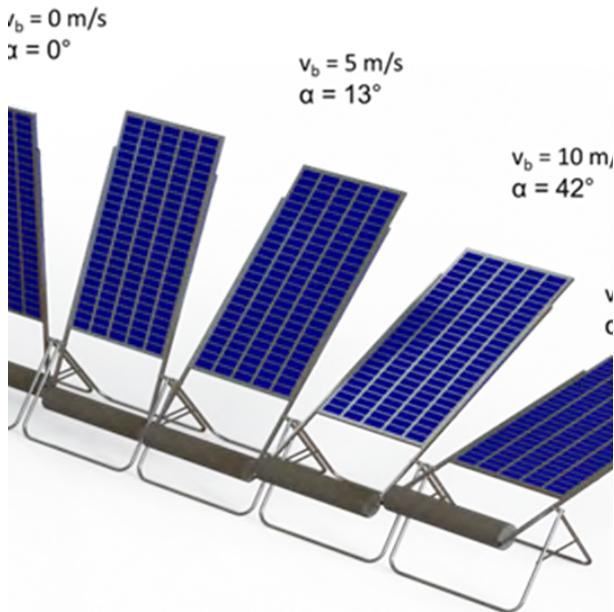
redesigned open ground-mounted and agrivoltaic systems. This photovoltaic solution not only meets the highest technical requirements but also offers our customers maximum flexibility and optimal electricity generation in terms of location and duration of use.» The adaptability of these panels suggests that they could also be an excellent option for agrivoltaic installations, where solar energy generation complements agricultural activities.

The versatility of SKipp panels is further enhanced by their compatibility with both conventional solar PV modules and bifacial solar modules. Conventional modules can be used for various applications, while bifacial modules maximize energy generation by harnessing sunlight from both sides. This flexibility ensures that the panels can be utilized in diverse installations and locations, making them an attractive option for a range of solar projects.

The introduction of tiltable, portable solar panels opens up new possibilities for power generation in areas where ground-mounted installations are not feasible or desired. Whether it's for camping enthusiasts seeking a reliable and portable power source or for off-grid communities with strict regulations, these panels offer a solution that combines convenience, stability, and efficiency.

As the demand for renewable energy continues to grow, innovations like the SKipp panels demonstrate the ongoing efforts of companies

like Sinn Power to provide sustainable solutions. By combining advanced technology with practical design, these panels contribute to the expansion and accessibility of solar power in various contexts. With their proven stability and adaptability, tiltable, portable solar panels represent a promising step forward in the evolution of solar energy systems.



The potential applications of SKipp panels extend beyond camping and mobile work sites. Their unique design and features make them a viable option for agrivoltaic installations, where solar panels are integrated into agricultural fields. This approach allows for the efficient use of land by simultaneously harnessing solar energy and supporting agricultural activities. The flexibility and optimal electricity yield provided by SKipp panels make them well-suited for such combined applications.

Moreover, the compatibility of these panels with bifacial solar modules enhances their energy generation capabilities. Bifacial modules have the advantage of capturing sunlight from both the front and back surfaces, increasing overall electricity production. This feature is particularly valuable in installations with varying sunlight angles or environments with high reflectivity, such as snowy landscapes or areas surrounded by water. By incorporating bifacial modules into the SKipp panels, Sinn Power ensures that customers can maximize solar energy generation in a wide range of installations and locations.

The introduction of tiltable, portable solar panels also addresses the need for power solutions in

sensitive off-grid areas. In some locations, strict regulations prohibit anchoring equipment into the ground, making traditional ground-mounted solar installations impossible. SKipp panels provide an alternative solution by eliminating the need for ground anchoring. This opens up opportunities for renewable energy deployment in previously inaccessible areas, contributing to the transition towards sustainable power generation.

The innovative design of SKipp panels, with their built-in pendulum mechanism, ensures stability even in strong winds. This feature sets them apart from conventional solar panels and enhances their suitability for various environments. Whether it's a windy camping site or a remote off-grid location prone to gusty conditions, users can have confidence in the panels' ability to withstand such challenges. Sinn Power's assurance that tipping over is highly unlikely without ground anchoring adds to the reliability and safety of these portable solar panels.

As the renewable energy sector continues to evolve, advancements like the SKipp panels exemplify the ongoing commitment to improving the efficiency, accessibility, and versatility of solar power. The ability to easily transport and set up these panels in different locations without the need for extensive groundwork expands the potential for solar energy deployment. Furthermore, the inclusion of innovative features such as the tiltable design and compatibility with bifacial modules demonstrates the industry's continuous efforts to optimize solar energy generation.

In conclusion, Sinn Power's introduction of tiltable, portable solar panels presents a novel solution for portable power generation. These panels offer flexibility, stability, and efficiency, making them suitable for various applications, including camping, mobile work sites, agrivoltaic installations, and off-grid areas with restrictions on ground-mounted installations. By incorporating basic scientific principles and innovative design features, Sinn Power has created a reliable and versatile solar solution that contributes to the growth of renewable energy adoption. The SKipp panels represent a significant step forward in the development of solar energy systems, providing an accessible and sustainable power generation option in diverse settings.

Cover Story

Nuclear Reactors



Westinghouse Announces A New Small Nuclear Reactor — A Notable Step In The Industry’s Efforts To Remake Itself



Westinghouse unveils AP300, a small modular reactor for mid-sized nuclear technology.

Westinghouse is offering a smaller-scale nuclear reactor in an effort to expand access to nuclear power as demand for clean energy soars.

The company announced the launch of a small version of its flagship AP1000 nuclear reactor on Thursday. The new reactor, called the AP300, aims to be available in 2027, and will generate about a third of the power of the flagship AP1000 reactor.

Westinghouse’s move is a notable inflection point in the nuclear industry’s effort to remake itself as a way to address climate change. Electricity generated from a nuclear fission reactor produces no greenhouse gas emissions.

The AP300 will generate approximately 300 megawatts of energy, which will power approximately 300,000 homes, versus 1,200 megawatts for the AP1000, according to David Durham, president of energy systems at Westinghouse.

Smaller nuclear reactors are less expensive to build, which is a major selling point. The AP300 is estimated to cost approximately \$1 billion per unit, Durham told CNBC. A 2022 study from MIT, which Durham cited to CNBC, estimates that it should cost around \$6.8 billion to stand up an AP1000.

The Vogtle power plant in Georgia is adding two AP1000s, and that project has been widely criticized for budget

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1,320 Gallon Heated Double Wall DEF Cube (Flow Meter)

1,320 Gallon Premium Heated DEF Double Walled Cube Tank, Includes 400W Heater, TD10-115V Diaphragm Pump, Flow Meter, 25' Hose Reel, Stainless Steel Auto Nozzle, and Lockable Hinged Lid.



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Vol. 1
Issue 04



and schedule overruns. But Durham says publicized cost estimates, which have reached past \$30 billion, include things like interest on money borrowed to pay for the project.

Because the small modular reactors are smaller and less expensive, they are also more versatile.

“Unlike the previous generation of nuclear power plants, which were only used by large integrated utilities, the sizes of the advanced reactors which range from microreactors of a half-megawatt to 300 megawatts or more, means that there is a significantly larger number of utilities that can utilize these technologies,” Jeffrey S. Merrifield, a nuclear energy lawyer and former commissioner of the U.S. Nuclear Regulatory Commission, told CNBC. (News of Westinghouse’s AP300 was not public before Thursday morning, so Merrifield was speaking with CNBC about general trends in the nuclear industry.)

Small nuclear reactors are also being eyed by industrial producers as carbon-free sources of heat, Merrifield told CNBC.

“One aspect of many of the advanced reactor technologies, including high-temperature gas, molten-salt and sodium fast reactors, is they can produce industrial grade heat for non-power purposes or combined heat and power applications for industries such as steel making, chemical production, cement production, and milling and mining among many others,” Merrifield said.

It’s also easier to connect small reactors to the power grid. In the U.S., transmission lines are virtually tapped out. It can take years to get new sources of power connected because they often require an upgrade in transmission capacity. But an AP300 nuclear reactor will produce roughly the same amount of electricity as what a typical coal plant produces, so replacing one coal plant with a small nuclear reactor would be simpler. For the AP300 to be available to customers at the end of 2027 in the U.S., the Nuclear Regulatory Commission will have to offer approval, but Durham said he’s confident that will happen.

“We have absolute confidence, because the NRC has already licensed every bit of this technology,” Durham told CNBC. “This is all the same exact thing.”

The AP300 also has the same safety features of the AP1000, Durham said. The passive cooling system is especially critical in both models.

Water keeps the fuel rods cool, preventing them from overheating. When a nuclear reactor shuts down, the fuel rods still need to be kept cool, which requires backup sources of electricity.

“And if you don’t have backup sources of electricity, or

backup sources of water, then you can have a situation where the fuel overheats, like it did at Fukushima,” Durham said. “Passive safety systems keep the fuel cool all by themselves with no human action, no backup source of electricity, no backup source of water, because everything you need to keep the fuel cool is inside the reactor.”

In a passive cooling system, a large pool of water sits above the reactor. If the reactor needs to shut down, the water is released and falls onto the fuel rods. As the water heats up, it produces steam, which rises, condenses back into water and then keeps cycling for about three days, Durham said. At the end of three days, if the reactor still isn’t operating, more water needs to be added in the tank at the top of the reactor.

“This is a game changer technology,” he said. “If the AP1000 had been in operation at Fukushima, it would have been a total non-event.”

Demand for large nuclear reactors strong overseas

While small nuclear reactors are a new area of interest for the industry, demand for large reactors is still robust outside the U.S.

“In most countries, utilities are state owned,” Durham said. “If the country makes a commitment to decarbonize, then the utility is the vehicle to implement that decarbonization.”

In much of the U.S., the lowest-cost energy wins, and nuclear energy is not usually the cheapest.

There are two AP1000 reactors in the U.S. at the Vogtle power plant — one will be online later this year, the second by early 2024. But four are operating in China, and another six are under construction.

Westinghouse has an agreement to build nine AP1000s in Ukraine, has been selected to build three AP1000s in Poland, and is in the running for another 11 AP1000s throughout Europe, Durham told CNBC.

There’s also interest in large nuclear reactors from several more countries in Africa and Asia, including Egypt, Indonesia, Nigeria, the Philippines, Saudi Arabia and the United Arab Emirates, among others, according to Merrifield.

Larger reactors, while more expensive to build, will produce electricity at a cheaper price.

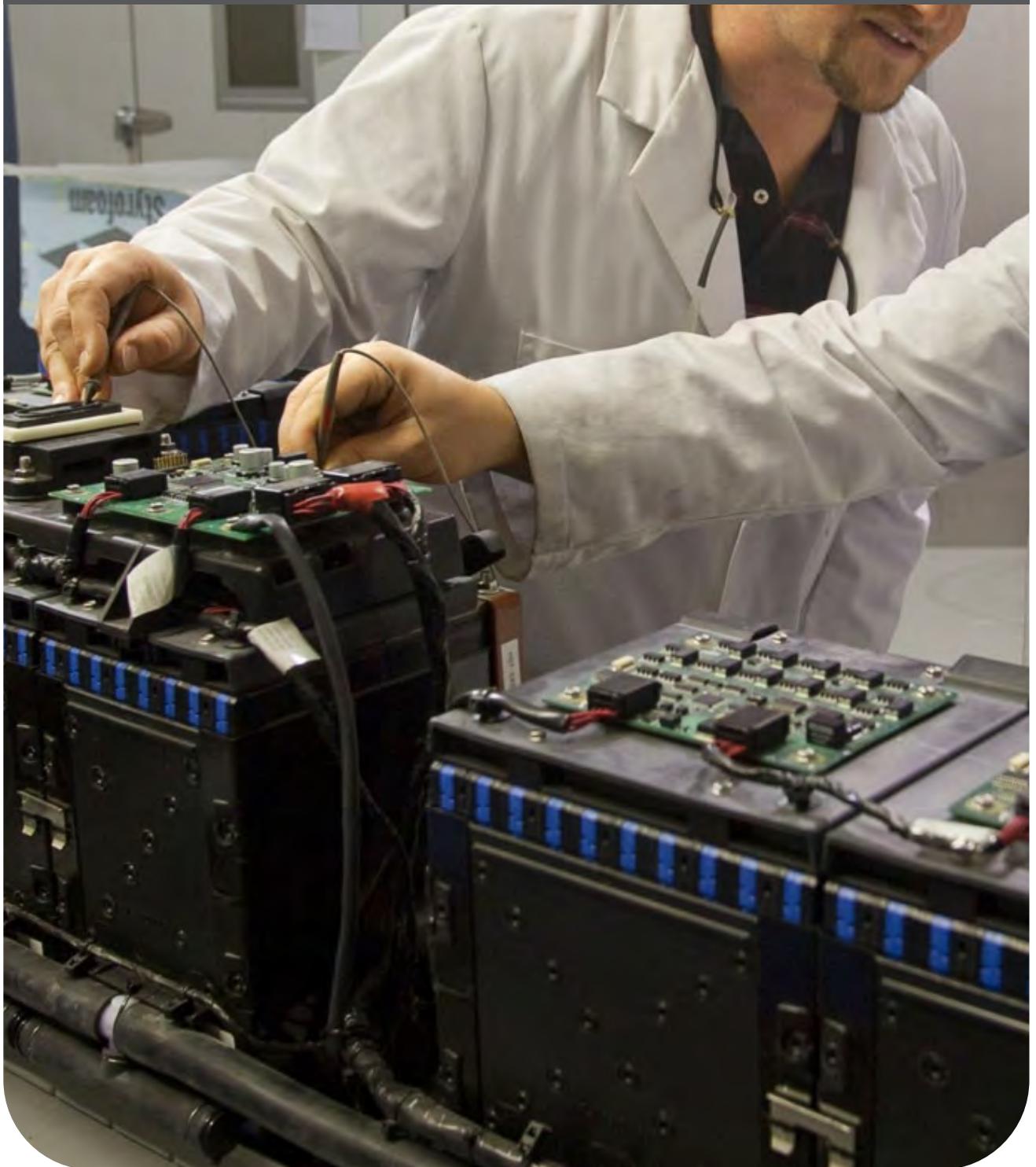
“SMRs will be very valuable, they will play an important role in many areas,” Durham said. “Their electricity will be slightly more expensive than larger units. And so if a country is looking for large baseload electricity generation carbon free, they typically will look at those larger units.”

Catherine Clifford

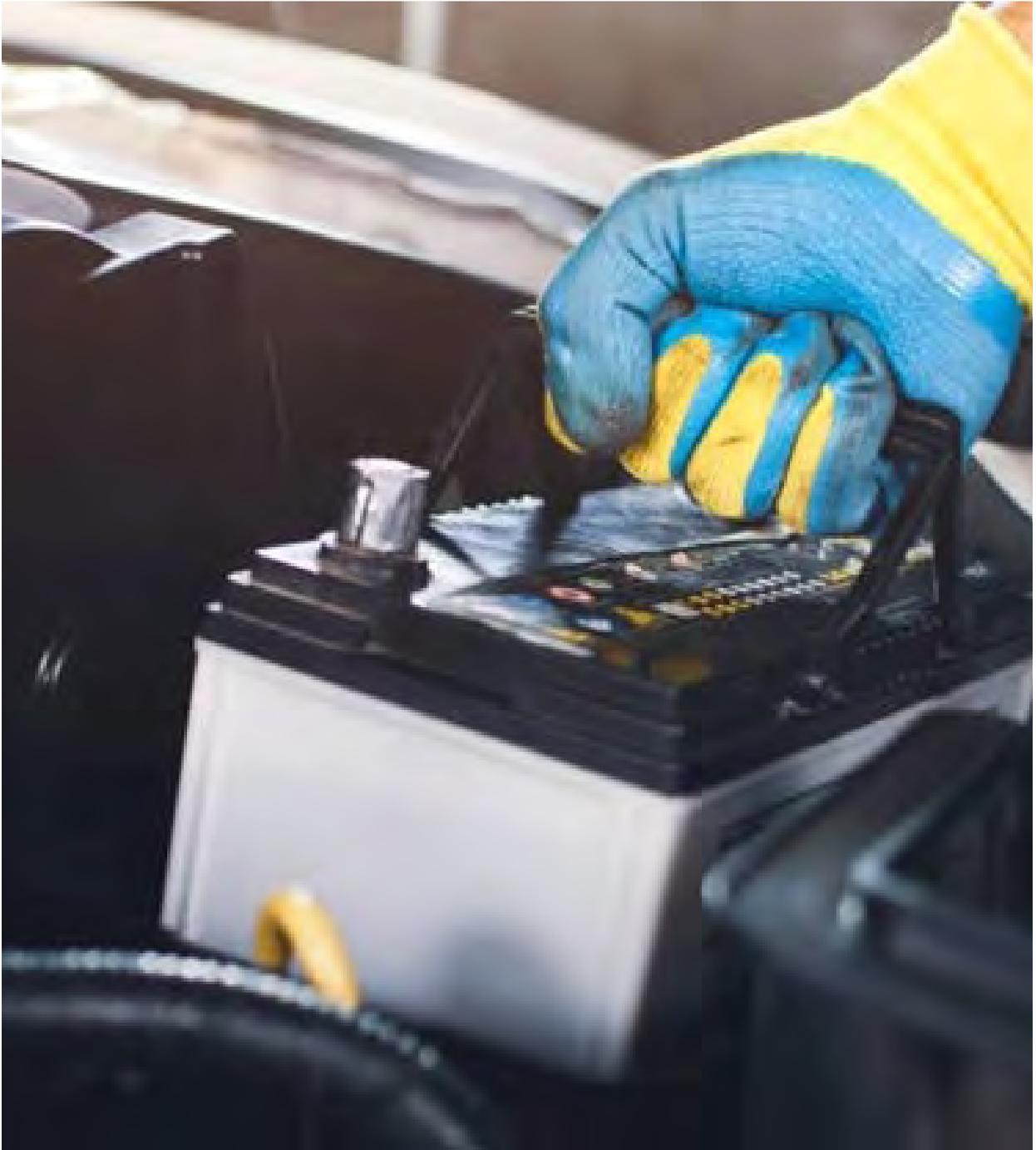
<https://www.cnbc.com/>

Products

Industrial Batteries & Chargers



Stay Powered Up: The Game-Changing -24Volt Battery Chargers for Crown Forklift Batteries



When it comes to operating Crown forklifts, reliable battery charging is of utmost importance. Ensuring that your Crown forklift batteries are charged efficiently and effectively is vital for maintaining productivity and reducing operational costs. In this blog, we will explore the game-changing 24-volt battery chargers specifically designed for Crown forklift batteries and their numerous benefits. Lets dive in!

Understanding Crown Forklift Batteries

Crown forklift batteries are known for their exceptional quality and performance. These batteries are designed to withstand the demanding industrial environments they operate in. They come equipped with key features such as high energy density, excellent cycle life, and reliable power output. Common battery types used in

Crown forklifts include lead-acid and lithium-ion, each with its own advantages and considerations. Factors like proper maintenance, temperature control, and charging methods greatly influence battery performance and lifespan.

The Need for Efficient Battery Charging

Traditional charging methods for forklift batteries often present challenges such as slow charging times, overcharging risks, and inadequate monitoring capabilities. This is where 24-volt battery chargers step in and revolutionise the charging process. These chargers offer significant advantages over conventional options, ensuring efficient and safe charging for Crown forklift batteries. By adopting 24-volt battery chargers, businesses can experience improved productivity and reduced operational costs.

Benefits of 24-Volt Battery Chargers for Crown Forklift Batteries

- **Enhanced Battery Performance and Lifespan:** 24-volt battery chargers employ advanced charging algorithms tailored for Crown forklift batteries. This results in optimised charging cycles that improve battery performance and extend battery life.
- **Improved Charging Efficiency and Reduced Downtime:** These chargers provide faster charging rates, minimising downtime and maximising forklift availability. With shorter charge times, operators can get back to work more quickly, ensuring smooth warehouse operations.
- **Intelligent Charging Algorithms for Optimal Results:** 24-volt battery chargers incorporate intelligent algorithms that adapt to battery conditions, delivering the right amount of charge at the right time. This prevents overcharging, undercharging, and the associated battery performance issues.
- **Safety Features and Battery Maintenance Capabilities:** These chargers offer safety features such as temperature monitoring, voltage regulation, and automatic shut-off to prevent battery damage and ensure operator safety. Some models even provide battery maintenance functionalities like equalisation charging and desulfation, prolonging battery life further.

Best Practices for Charging Crown Forklift Batteries

To maximise the benefits of 24-volt battery chargers and ensure optimal battery performance, it is essential to follow best practices:

- **Proper battery handling and maintenance:** Regularly inspect and clean the batteries, ensuring proper connections and adequate ventilation. Monitor fluid levels and perform necessary watering and equalisation as per the manufacturer's guidelines.
- **Charging protocols and guidelines:** Follow the

recommended charging protocols provided by the charger and battery manufacturers. Avoid rapid charging and extreme temperature conditions that can adversely affect battery life.

- **Maximising battery life through effective charging practices:** Implement efficient charging schedules based on your operational requirements. Avoid unnecessary partial charges and aim for complete charge cycles whenever possible.

Tips for Maximising the Performance of Crown Forklift Batteries

To ensure the optimal performance and longevity of Crown forklift batteries, consider the following tips:

- **Battery watering and maintenance practices:** Regularly check the water levels in lead-acid batteries and top them up with distilled water as needed. Follow the manufacturer's recommendations for proper watering techniques and intervals. Additionally, keep the battery terminals clean and free from corrosion.
- **Monitoring and tracking battery performance:** Implement a battery monitoring system to track important metrics such as charge levels, voltage, and temperature. This data can help identify any anomalies or issues early on, allowing for timely maintenance and intervention.

- **Implementing efficient charging schedules:** Create a charging schedule that aligns with your operational needs. Avoid frequent partial charges and strive for complete charge cycles whenever possible. Consider utilising opportunity charging during breaks to keep batteries topped up without interrupting workflow.

24-volt battery chargers have emerged as game-changers in the realm of Crown forklift battery charging. Industrial Batteries offer you chargers specifically designed for Crown forklift batteries, businesses can unlock a range of benefits. Enhanced battery performance, improved charging efficiency, intelligent algorithms, and safety features all contribute to increased productivity and reduced operational costs.

Investing in high-quality 24-volt battery chargers for Crown forklift batteries is an investment in the long-term success of your business. By prioritising reliable battery charging, you can enjoy the benefits of improved productivity, reduced downtime, and extended battery lifespan. So, stay powered up and maximise the performance of your Crown forklift batteries for a more efficient and cost-effective operation. Contact us now to know more.

<https://www.industrialbatteries.com.au>

Services

Transport



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Nurturing Healthier world!

Vitamins and minerals
make up essential parts of
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Vitamins and minerals
work together to support
the cellular metabolism



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



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



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



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



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Clean Energy Transition: Transport

Is the global transport industry on a highway to climate hell?



According to the International Energy Agency (IEA), transport has the highest reliance on fossil fuels of any sector. Although its contribution to global emissions dropped sharply when the world hit pause during the pandemic, this has risen rapidly since borders reopened and lockdowns ended. The greatest increases have been recorded in developing markets: transport-related emissions in developing countries have increased more rapidly than in Europe or North America and this is a trend that is likely to continue in coming decades.

Transitioning to clean energy is not cheap. Cost will be a significant challenge for the sector moving forward. However, as Gido van Graas, Head of ING's Energy Project Advisory Team noted in the Atradius Clean Energy Transition: A New Way Forward for Global Trade? event: "We see that there are huge investments required to support the energy transition. I believe that the liquidity is there to support that".

What can our underwriters tell us about clean energy transitions in the transport sector?

Our underwriters note the transport industry cannot be viewed as a homogenous whole. The industry's subsectors face different challenges, with varying outlooks across developing and developed markets. For example, the passenger electric vehicles (EV) sector in developed economies is enjoying growth. According to the IEA, one in seven passenger cars bought globally in 2022 was an EV, compared to one in 70 in 2017. Decarbonising

shipping and aviation is more complex and still requires more research and development.

Challenges: What are the most urgent challenges for the sector in the next three years?

1. Development of infrastructure is insufficient

Every Atradius underwriter we spoke to, representing a geographical spread across the world's developed markets, pointed to insufficient infrastructure as one of the greatest risks to emissions reduction in the transport industry. In particular, a primary challenge for the transport industry is the need to expand EV charging networks to support growing consumer demand for electrification.

2. High costs are a barrier to adoption

Although our underwriters noted subsidies and tax incentives are available in some markets, this doesn't detract from the fact that energy transition is costly. EVs remain unaffordable for many consumers and the electrification of entire fleets can put too deep a dent in many business balance sheets. Investment in other alternative energy sources, such as hydrogen, is also costly. The current economic conditions with high inflation and increasing interest rates, also makes for a challenging investment environment.

3. Some sectors are difficult to decarbonise

Aviation remains a heavily carbon-intensive mode



of transport. There is a long-term need for further investment in technology and alternative fuels for the sector. Although the shipping industry can reduce emissions through the use of low-sulfur-compliant bunker oil or cleaner alternative fuels, the cost of these are still higher than heavy bunker fuels. Smaller players are more vulnerable to the increased costs and their survival may depend on their ability to pass on costs to customers.

Opportunities: What are greatest opportunities for the sector in the next three years?

1. Access to financing and government incentives

Several of our underwriters pointed to the availability of financing and subsidies as a clear opportunity for growth, particularly in the US and Europe. Our underwriters in Germany and the Netherlands noted that government stimulation programmes and tax advantages were widely available.

2. Development of alternative fuel sources

New energy such as clean hydrogen and bio-fuel is becoming an increasingly important element in supporting energy transition in the transport industry and presents great opportunities for growth. Our underwriting team in Japan explained how this extends to the aviation sector. They said: "Japan Airlines (TYO: 9201) has already set a goal to become the leading airline in the use of SAF (sustainable aviation fuel) and plans to replace 10% of fuel on board by 2030."

3. Growth of the EV sector

The EV sector is enjoying growth with global demand presenting opportunities along the entire value chain from chip producers to materials manufacturers and OEMs. Our underwriters in China said: "China accounts for about half of global EV sales and will benefit from the global transition towards EVs as well growth in the domestic market which is currently dominated by local brands."

Where next?

Lowering greenhouse gas emissions in the transport industry is not just about transitioning to clean energy sources. Reshoring industries, bringing them closer to their markets, can help to reduce freight miles. Digitalisation may also bring about freight transport efficiencies and help to reduce statistics such as reported by the US Bureau of Transportation Statistics that revealed one in four trucks that ran empty in the US in 2019. Applying the concept of the circular economy could also help decarbonise the transport industry, reducing the volume of tyres that end up in landfill each year for example, although this still has a way to go.

<https://group.atradius.com>

An aerial photograph of a multi-story brick building with a grey roof. The building features several long, narrow solar panel arrays mounted on the roof. The panels are blue and arranged in rows. The building is surrounded by a green lawn and a wooden fence. The image is presented with rounded corners.

Technology

Solar Energy System

Qualifying 106 companies to implement solar energy projects in homes and facilities in Saudi Arabia

The regulatory framework for energy systems for solar photovoltaic systems is that they should be Small, and their capacity should not exceed 2 megawatts for self-consumption.



Engineer Majid Al-Rifai: Qualifying 106 companies to implement solar energy projects in homes and facilities in Saudi Arabia is an important step that enhances Saudi Arabia's quest to become a global center for solar energy.

The Saudi Electricity and Water Regulatory Authority recently revealed a list of contractors and consultants qualified by the Saudi Ministry of Energy to design, inspect, install, and maintain small solar PV systems in the small solar PV system for homes and establishments. In their statement, the authority announced the qualification of more than 106 companies To implement small photovoltaic solar energy systems projects for homes and facilities inside Saudi Arabia, after the approval of the Board of Directors of the Water and Electricity Regulatory Authority headed by Prince Abdulaziz Salman Abdulaziz, Minister of Energy and Chairman of the Board of Directors of the Water and Electricity Regulatory Authority, last November. The regulatory framework for energy systems for solar photovoltaic systems is that they should be Small, and their capacity should not exceed 2 megawatts for self-consumption.

Since the announcement of its national program for renewable energy and its plan to achieve carbon neutrality in 2060, Saudi Arabia sought to generate 50% of its energy from renewable sources by 2030. Its efforts to localize this vital sector and become a global center for solar energy and its technologies during the coming years align with Vision 2030 adopted by Prince Mohammed Salman, Crown Prince and Prime Minister,

and the initiatives that fall under it. This includes the promotion of local content and the manufacture of components for the production of alternative energy locally, as Saudi Arabia possesses raw materials, sunlight, land and will, which are the ingredients that qualify it to be in the forefront. According to experts and specialists, this step also represents a new stage to promote solar energy production locally, and support and encourage localization in all fields and specializations as solar energy takes the lead in renewable projects across the Kingdom.

The Authority stated: "Since the approval of the regulatory framework for small PV solar energy systems, the necessary arrangements have been completed to achieve the stipulated requirements and follow up with the concerned authorities and service providers in order to effectively and safely the install small solar PV systems in facilities and to expand the segment of beneficiaries of renewable energy technologies, which will contribute to the diversification of energy sources and achieving the optimal mix for the production of electric energy."

The Regulatory Authority held many workshops and participated in conferences and exhibitions to raise awareness of the regulatory framework, in addition to publishing awareness and introductory messages

on the websites of service providers. This provides information on how to apply for connecting small solar PV systems to the distribution system and answering all inquiries from consumers wishing to install small PV solar energy systems in their facilities.

According to the authority, those wishing to install small solar PV energy systems in their homes and facilities can visit the “Shamsi” portal provided to the consumer to find out the economic feasibility and estimated costs of installing a solar energy system in a home or facility, before connecting it to the public electrical network, through an easy electronic calculator. The portal helps its users to estimate the expected electrical energy to be generated, based on the size of the system and the location, in addition to helping the consumer calculate the energy saved, the average cost and return, and the amount of savings monthly and annually. The efforts of all government agencies led by the Ministry of Energy are integrated in this project including the Ministry of Municipal, Rural Affairs and Housing, the Ministry of Commerce, the Water and Electricity Regulatory Authority, King Abdullah City for Atomic and Renewable Energy, and the Saudi Standards, Metrology and Quality Organization.

Commenting on this step, Eng. Majid Al-Rifaie, CEO of Desert Technologies Industries said: “The qualification of Saudi companies confirms the development of the Saudi private sector in the field of solar energy.” He added that this decision will raise the demand from individual consumers to establish these stations, especially since the housing sector accounts for more than 50 percent of the market size, in addition to new cities such as “Neom, Qiddiya, the Red Sea, and Sandala”. Desert Technologies is the first Saudi company to manufacture and export solar panels and one of the companies qualified to implement small PV solar energy systems projects for homes and facilities.

He explained that the buildings sector in the Kingdom consumes about 80% of the total electrical energy produced, in addition to that 70% of buildings in Saudi Arabia are not thermally insulated, which contributes to the high volume of consumption. The use of solar energy in homes and commercial buildings is a practical way to reduce electricity bills, help reduce carbon emissions and raise the market value of real estate.

Al-Rifaie stressed: “The future of renewable energy in the Kingdom is promising, and this isn’t new for Saudi Arabia because it possesses the elements of leadership in the field of renewable energy, especially solar energy, whether in terms of production, consumption or purchasing power, or the advanced contracting sector that strengthens its infrastructure.”

Al-Rifaie pointed out that Desert Technologies is

ready, with its experience and capabilities, to strongly implement the country’s strategy aimed at expanding the use of solar energy in homes and facilities. In this context, Desert Technologies signed many agreements and partnerships with leading local companies to implement many projects in the Kingdom. As well as to build solar power plants on the roofs of residential, commercial, and industrial buildings at competitive prices and global performance in terms of quality and safety, using solar panels that are manufactured according to a fully automated manufacturing process supported by the latest technological equipment in the field of solar panel manufacturing and energy storage solutions from Germany, Austria and America.

Eng. Majed emphasized: “The contribution of Desert Technologies at the level of its industrial and investment arms (Desert Technologies Industries, Desert Technologies Investment, Nurun Digital Energy) will not be limited to investing its knowledge and capabilities in building and managing solar power plants but will also employ its expertise in the field of manufacturing solar panels and solar energy solutions. We are committed to harnessing the expertise and capabilities of Desert Technologies to provide clean energy at competitive prices and reliable services to consumers» With more than 12 years of experience, Desert Technologies has a strong experience in playing its role as a manufacturer, exporter, developer, operator, and investor to implement projects. Whether at the residential, commercial, or industrial level, or large stations at the level of service facilities, small projects outside the network, and large-scale projects, to lead the solar photovoltaic industry to new horizons.

Regarding the benefits of a rooftop solar energy system, Eng. Majed Al-Rifaie said: “The rooftop solar market has witnessed a major shift recently, as it became one of the most sustainable and reliable solar energy generation models, due to the low cost of production when compared to industrial and commercial electricity, and the optimal use of space on the roof. The building, which reduces the need to invest in additional lands in addition to protecting the roof of the building and raising the financial value of residential buildings.

Al-Rifaie expects that the solar panel market in Saudi Arabia will witness a growth at a compound annual rate of 30 percent within the next two years, through the growth of international investments, the transfer of technology to local companies, and the creation of more job opportunities.

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Country Report

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Kuwait To Deliver \$19bln Mega Energy Projects By 2030

Kuwait's national oil company has always had an impressive roster of oil sector projects to deliver



Kuwait Oil Tanker employees oversee the loading of crude oil into the new Kazimah III Oil Tanker at Ahmadi North Pier in Kuwait

Kuwait Petroleum Corporation (KPC) is focused on completing 10 major projects by 2030, with the aim of increasing upstream capacity and expanding into the petrochemical sector. However, according to MEES, a regional oil and gas weekly publication, the outlook for these projects is clouded by soaring costs, delays, and political challenges in Kuwait.

Despite having an impressive portfolio of oil sector projects, Kuwait's national oil company has struggled with delays and cost overruns, resulting in a decline in oil production capacity in recent years. The target of reaching a production capacity of 4 million barrels per day (b/d), originally set for 2020, has been pushed back to 2035, which is five years earlier than the previously communicated target of 2040, as reported by MEES in March.

Insider plans obtained by local daily Al-Anbaa indicate that KPC is eager to expedite ongoing projects and revive long-planned projects that have experienced significant delays. These mega oil projects are scheduled to be completed between 2024 and 2030, with some projects having been in the planning phase for over a decade or falling behind schedule for years.

The challenges faced by KPC include rising costs, which can strain project budgets and lead to financial difficulties. Additionally, project delays can result in missed production targets and revenue losses. The political landscape in Kuwait has also played a disruptive role, creating uncertainty

and potentially impacting the progress of these projects.

Despite these challenges, KPC remains determined to achieve its goals and enhance the country's oil and petrochemical sectors. The successful completion of these projects would not only boost Kuwait's oil production capacity but also enable the expansion into downstream activities, particularly in the petrochemical industry. However, careful management of costs, adherence to project timelines, and political stability will be crucial in ensuring the successful execution of these initiatives.

In conclusion, Kuwait Petroleum Corporation aims to complete 10 major projects by 2030, focusing on increasing upstream capacity and expanding into the petrochemical sector. However, the outlook for these projects is overshadowed by rising costs, project delays, and political challenges in Kuwait. Despite the setbacks, KPC is determined to expedite ongoing projects and revive long-delayed ones to achieve its goals. The successful completion of these projects would significantly impact Kuwait's oil and petrochemical sectors, but careful management and political stability are essential for their success.

Staff Writer, *trade Arabia*
 Edited by *hassan Mourtada*
<https://www.zawya.com/>

Renewable Energy's Share Of German Power Use Tops 50% In Q1



Wind turbines, including some from RWE's new Kaskasi offshore wind farm, are pictured during the opening of the RWE-Offshore-Windpark Kaskasi, north of Helgoland, Germany, March 23, 2023.

Renewable energy sources accounted for 50.3% of Germany's power consumption in the first quarter of the year, as highlighted by data from utility group BDEW and the Centre for Solar Energy and Hydrogen Research (ZSW) released on Friday. Germany has set an ambitious target to have 80% of its energy mix derived from solar, wind, biomass, and hydroelectric generation by 2030. This goal aligns with the country's decision to phase out nuclear power and reduce its reliance on coal, with natural gas plants serving as backup for the grid.

The preliminary figures were influenced in part by a decrease in electricity usage during the first three months of 2023. BDEW noted a 6.4% year-on-year decline to 138.1 terawatt hours (TWh). In the same period of 2022, renewable energy accounted for 49.2% of Germany's energy mix.

Notably, the data was calculated in accordance with European Union requirements, which determine the share of renewables based on usage rather than production. The Berlin government has also adopted this methodology for defining its climate targets. BDEW explained that the relative share of renewable energy appears higher when overall electricity consumption is lower, and vice versa.

When examining domestic electricity production, the two research bodies recorded an 8.3% decline to 147.5 TWh during the three-month period, including production volumes intended for export. Within the

total output, renewables accounted for 69.5 TWh, representing a share of 47.1%. This figure marked an increase from 45.1% in the first quarter of 2022, despite a 4.3% drop in green power production volumes.

Conventional energy sources, encompassing nuclear, coal, natural gas, and oil, contributed 78 TWh to the overall generation total. This figure marked a decline from the previous year when these sources accounted for 88.3 TWh.

Germany's commitment to renewable energy transition has gained momentum, with significant strides made in reducing carbon emissions and fostering a sustainable energy sector. The country's emphasis on expanding solar, wind, biomass, and hydroelectric power generation demonstrates its determination to address climate change and build a more resilient and environmentally friendly energy system.

While challenges remain in achieving the 80% renewable energy target by 2030, Germany's progress in the first quarter of this year indicates that the transition is underway. Continued investments in renewable infrastructure, advancements in technology, and supportive policies will play crucial roles in driving the country's energy transformation and paving the way for a greener future.

Reporting by Vera Eckert, editing by
Miranda Murray, Kirsten Donova
Edited by Hassan Mourtada
<https://www.reuters.com>

Nigeria: Energy Sector Growth Faces Multitude Of Challenges – WEF



Green Village Electricity project in Nigeria

The biggest challenges facing Nigeria in scaling its energy sector include complications with currency convertibility and financing structures.

Other challenges are technology supply and technical know-how in operating the equipment.

These are some of the conclusions drawn from a “deep five” roundtable that brought together over 40 stakeholders from Nigeria’s energy and finance sectors. The gathering in Abuja this week was convened by the World Economic Forum (WEF) and the Renewable Energy & Energy Efficiency Associations (REEEA-A). The aim of the gathering was to develop energy and power priority areas, and “showcase viable solutions to address the financing challenges faced by each priority area.”

According to the International Energy Agency (IEA), more than 140 million people do not have access to energy in Nigeria – about 71% of the country’s population.

“When we talk about energy access, we refer to people’s ability to access modern energy services, including electricity, clean cooking facilities, and modern fuels. Energy inaccessibility has significant negative impacts on health, education, and economic development,” said the WEF.

Solar, mini-grids and off-grid technology could help address energy sector challenges in Nigeria

The Nigerian government has set a goal to achieve universal energy access by 2030.

“The working group carried out a country context risk analysis that shows Nigeria’s biggest risks in scaling the sector.”

“These risks negatively affect the growth of the sector. As such, developing financial and technical assistance solutions are key to stimulating the sector’s growth,” said the WEF.

The Forum said scaling rural electrification through

distributed solar generation, mini-grids, and off-grid technology alternatives has the potential to generate \$9.2 billion in annual market investments for solar mini-grids.

“This can also save Nigerian households and companies \$4.4 billion annually. However, certain barriers persist in the broader adoption of solar generation.”

Barbara Izilein, Senior Advisor to the CEO, Rural Electrification Agency, said: “We cannot tell people to adopt renewable energy without educating on the social, economic and environmental benefits.

“Africa needs a mind shift and this cannot happen without multi-stakeholder collaboration. There are major opportunities in green energy, but government must de-risk these opportunities to attract investments.”

Nigeria and Africa must use opportunities to address poverty

Nigeria is the largest consumer of oil-fired backup generators in Africa, with more than 80% of power generation coming from gas reserves.

“Natural gas thus remains the primary source of power in future short-term plans, despite the shift to other renewable sources.

“The recent attractiveness of natural gas lies in the low-carbon features that make it relatively “clean” and less expensive in comparison to oil and coal,” said WEF.

It said that using natural gas as a transitional fuel with a viable pathway to greener future solutions has potential to foster some \$18.3bn in gross value added to the local economy. This potential, coupled with the global difficulties the gas sector is facing, can create exponential growth in the nation’s domestic value chain.

“The global renewable energy sector is massive and growing at a fast pace. Africa must do what it takes to leverage these opportunities and close the energy gap to avoid falling into deeper poverty,” said Ademola Agunbanjo, Executive Vice President of Oando Clean Energy.

The WEF said Africa possesses substantial natural gas, hydro and solar resources, with the ability to generate significant electric power from existing plants.

“Despite this capacity, lack of transmission and distribution infrastructure hinders the growth of large and small-scale businesses and has created a mass of unserved households that do not have access to the national grid.”

By Yunus Kemp

<https://www.esi-africa.com/>

Services

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Career Center

AECOM

Position Title:	Principal Civil Engineer – Renewable Energy
Location:	London, United Kingdom
ReqID	J10065775
Requirements	<ul style="list-style-type: none"> • Previous experience of working on National Grid, SSE or other UK utility projects would be advantageous. • Ideally you will have a background in civil infrastructure and the energy sector and in particular renewable energy systems. • The role is a technical role, and you will be expected to demonstrate a high degree of technical competency in the design of civil and structural elements. • BEng (Hons) degree in Civil Engineering Chartered status or actively working towards chartership with either the Institution of Civil or Structural Engineers. https://www.energyjobline.com/

Holaluz

Position Title:	Head of Energy Management
Application Deadline:	N/A
Location:	Barcelona, Spain
Requirements	<ul style="list-style-type: none"> • Bachelor's degree required, MBA or advanced degree strongly preferred. • At least 7 years of experience in a Portfolio analysis position or alike. • Deep understanding of the energy sector. • Extensive knowledge of hedging financial derivatives. • Outstanding critical thinking, analytical and quantitative abilities. https://www.euroclimatejobs.com/

MET Group

Position Title:	Renewables Project Manager
Application Deadline:	N/A
Location:	Milan, Italy
Requirements	<ul style="list-style-type: none"> • At least 3 years of project management experience in solar PV project development and construction management in Italy. • Deep knowledge of the renewables permitting and regulatory background in Italy is a must. • Fluent in Italian (native) and English. • Engineering degree. • Excellent stakeholder management, interpersonal and project management skills. https://www.euroclimatejobs.com/

Qair

Position Title:	Wind and PV Project Manager
Application Deadline:	N/A
Location:	Constanta or Bucharest, Romania
Requirements	<ul style="list-style-type: none"> • He/she has a 4/5-year degree (Engineer/Master Environment, Economics), with 3 to 6 years of experience in the development of large infrastructure projects in rural areas, ideally in development and/or construction of renewable energy. • He/she has good interpersonal and writing skills. He/she has a solid knowledge of renewable energy and administrative authorization procedures. • He/she is comfortable with standard computer tools and planning software. • In addition, he/she is rigorous, methodical and likes to work in a team, but can work with a large autonomy. • English or French is required. https://www.euroclimatejobs.com/

Tender Notice

TenderID	62219927
Tender Brief	Procurement Plan For Development Of The National Strategy And Actions To Enhance Biomass-Energy
Competition Type	ICB/NCB
Funded By	Self-Funded
Country	Benin
Tender Value	-EUR 16,949,153
Tender Value In USD	-18,210,278
Last Date of Bid Submission	22 Aug 2023
TenderID	62157751
Tender Brief	Procurement Plan For Acquisition And Installation Of A Photovoltaic Solar Energy System
Competition Type	ICB/NCB
Funded By	Self-Funded
Country	Benin
Tender Value	EUR 25,423,728
Tender Value In USD	26,989,497
Last Date of Bid Submission	25 Aug 2023
TenderID	22730780
Tender Brief	Tenders Are Invited for Services Related to The Oil And Gas Industry
Competition Type	ICB/NCB
Funded By	Self-Funded
Country	France
Tender Value	-
Tender Value In USD	-
Last Date of Bid Submission	09 Sep 2023
TenderID	62157716
Tender Brief	Procurement Plan For Supply And Installation Of Solar Equipment For Energy Access Of Certain Sensitive Services
Competition Type	ICB/NCB
Funded By	Self-Funded
Country	Benin
Tender Value	EUR 605,755,000
Tender Value In USD	643,061,573
Last Date of Bid Submission	28 Jun 2023

Coming Events

Energy and Mines Australia Summit

Optus Stadium, Perth, Australia
14 - 15 Jun 2023

<https://australia.energyandmines.com/>

Now in its 7th year, the Energy and Mines Australia Summit is the annual event for miners to get the latest updates on the strategies and technologies for realizing net-zero targets and to network with mining peers and global decarbonization experts...

BlueSky-Incorep Conference

Hilton Sorrento Palace, Sorrento, Italy
12 - 16 Jun 2023

<https://www.bluesky-incorep.org/>

The first BlueSky/Incorep Polyolefin Conference will be held on 12-16 June 2023 in Sorrento (Italy), at the Hilton Sorrento Palace Conference Center. The scientific program from Monday June 12 until Friday June 16 will focus on the latest...

HRSG Forum

Renaissance Atlanta Waverly Hotel & Convention Center, Atlanta, USA
12 - 15 Jun 2023

<https://hrsgforum.com/>

Owner/Operators, Vendors, and Consultants present and discuss HRSG case studies, field trials, and best practices to ensure reliable and effective operation of your CCGT plants...

Sabah Oil, Gas & Energy Conference & Exhibition

Sabah International Convention Centre, Kota Kinabalu, Sabah, Kota Kinabalu, Malaysia
08 - 09 Jun 2023

<https://www.sabahoilandgas.com.my/>

SOGCE is the only oil, gas & energy conference and exhibition aimed at providing an industry platform for oil, gas & energy companies meet and discuss pivotal industry issues to help grow and explore...

Electrical Energy Storage South America

Expo Center Norte, São Paulo, Brazil
29 - 31 Aug 2023

<https://www.ees-southamerica.com/home>

With the well-known trade fair and conference Intersolar South America, and two new energy trade fairs, such as the ees South America, Eletrotec+EM- Power South America and the Special Exhibition Power2Drive, The smarter...

Annual International Hydrogen & Fuel Cell Event

Vancouver, Canada
05 - 07 Jun 2023

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

The Annual International Hydrogen and Fuel Cell Event is Canada's premier platform for professionals to meet, discuss and promote the latest developments in technology, policy and applications of for both hydrogen and fuel cells. The intriguing...

Renewable Energy Cyber Security Forum

Schönefeld, Germany
06 - 07 Jun 2023

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

The Renewable Energy Cyber Security Forum aims to prepare utilities and other energy providers for coping with cyber security risks in the real world. Critical precautions and supporting technology are thoroughly studied in order to better prepare energy...

Solar Energy Systems Conference

University of Texas A & M at Qatar, Doha, Qatar
22 - 24 May 2023

<https://www.aiche.org/cei/conferences/>

AICHE invites representatives from academia, industry, and policy making and government organizations to participate. The conference will provide a forum for the exposure & exchange of ideas and methods & results in solar energy...

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energyHQ magazine, established since 1983, is published monthly by **One Media (1M) – a One World (1W) Division**

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Recycling ‘End-Of-Life’ Solar Panels, Wind Turbines, Is About To Be Climate Tech’s Big Waste Business



The United States is increasingly recognizing the significance of wind and solar energy for its power grid, as well as the growing adoption of electric vehicles. These developments are crucial in the nation's efforts to reduce reliance on fossil fuels, lower carbon emissions, and combat climate change. However, as these renewable energy industries continue to expand, they will inevitably generate a substantial amount of waste when millions of photovoltaic (PV) solar panels, wind turbines, and lithium-ion EV batteries reach the end of their lifecycles.

Fortunately, innovative startups are taking proactive measures to address this impending issue and avoid repeating past mistakes of irresponsibly handling decommissioned coal mines, oil wells, and power plants. These companies aim to establish a sustainable and profitable circular economy that focuses on recovering, recycling, and reusing the core components of climate tech innovation.

According to the U.S. Energy Information Administration (EIA), wind and solar energy collectively accounted for 13.6% of utility-scale electricity generation last year. As renewable energy continues to scale up, these numbers are expected to increase. Some leading utilities across the nation are already well ahead of this pace.

Additionally, the sales of all-electric vehicles have seen significant growth, representing 5.8% of the total 13.8 million vehicles purchased by Americans in 2022, up from 3.2% in the previous year. With the Environmental Protection Agency's proposed tailpipe emissions limits and power plant rules, electric vehicle sales could capture a 67% market share by 2032, prompting more utilities to accelerate their transition to clean power generation.

One notable company striving to tackle the future waste challenge in climate tech is Solarcycle. Established in Oakland, California, last year, Solarcycle has constructed a recycling facility in Odessa, Texas. At this facility, the company extracts 95% of materials from end-of-life solar panels and reintroduces them back into the supply chain. It then sells the recovered silver and copper on commodity markets, while glass, silicon, and aluminum are sold to panel manufacturers and solar farm operators.

Solarcycle's CEO, Suvi Sharma, highlights that solar power is becoming the dominant form of electricity generation, with an EIA report projecting that 54% of new utility-scale electric-generating capacity in the U.S. this year will come from solar. However, with this growth comes a new set of challenges and opportunities. While significant progress has been made in making solar energy efficient and cost-effective, little has been done to address the end-of-life management of solar panels.

By focusing on circular practices and finding ways to deal with the disposal and recycling of solar panels, companies like Solarcycle are positioning themselves to contribute to a sustainable future. The recovery and reuse of valuable materials not only reduce waste but also provide economic benefits. Furthermore, initiatives like these help mitigate environmental risks associated with the improper disposal of clean-energy components, ensuring that the progress made in renewable energy does not come at the cost of environmental harm.

As the U.S. continues its transition towards a cleaner and more sustainable energy landscape, the development of a circular economy for renewable technologies becomes increasingly crucial. By embracing innovative solutions and proactive approaches to waste management, the nation can effectively address the challenges posed by the growing demand for wind, solar, and electric vehicles while simultaneously mitigating the environmental impacts and maximizing the economic potential of climate tech innovation.

Bob Woods
<https://www.cnn.com>

water HQ

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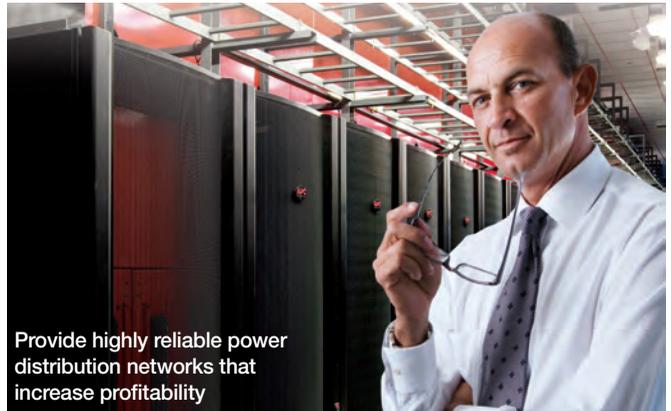
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