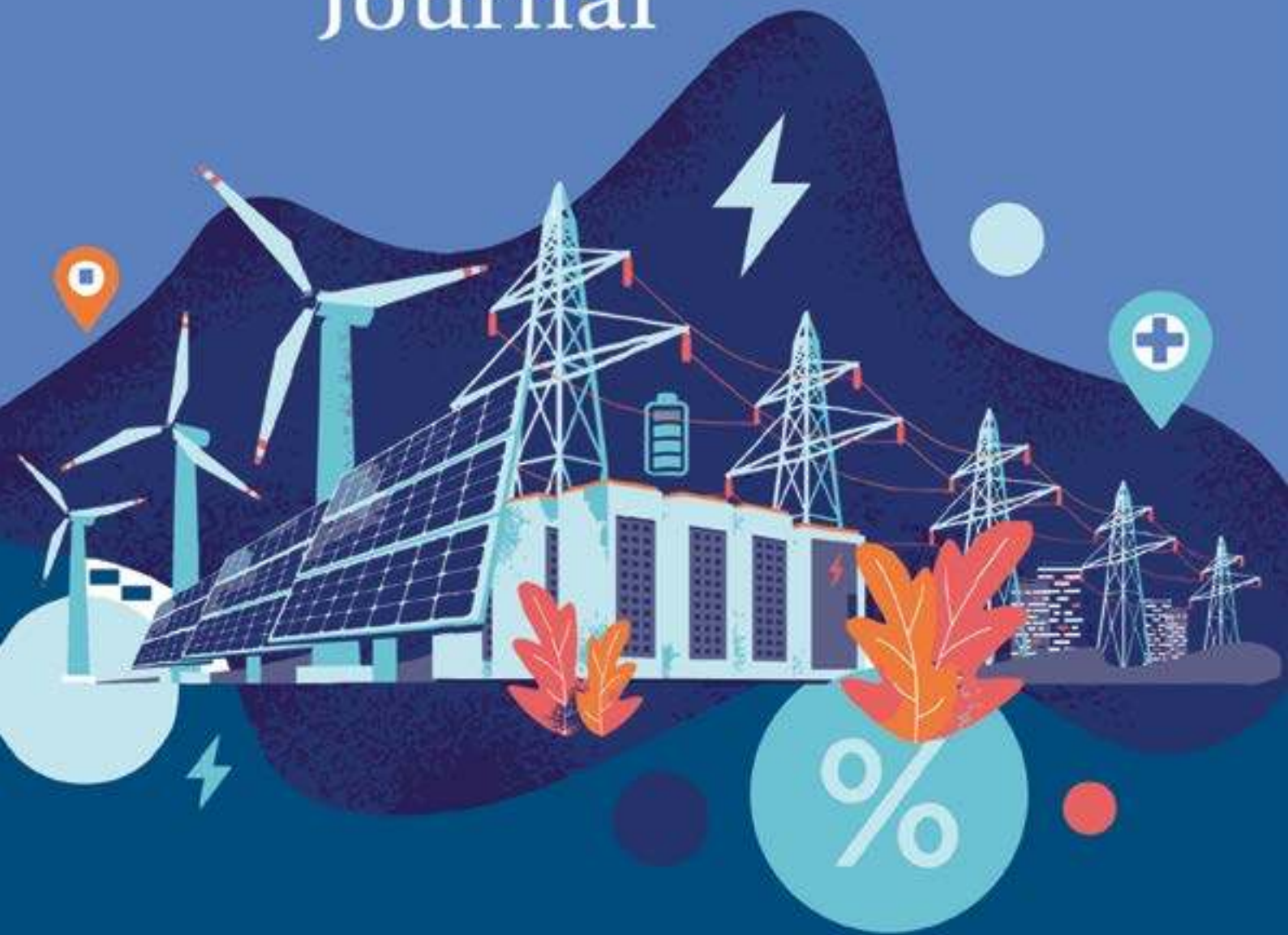
SEP/OCT
2023

PV+ Journal



ALTERNATIVE ENERGY DRIVEN FUTURE

TECHNOLOGY, POLICIES, SUSTAINABILITY AND MORE!

PAKISTAN SUSTAINABILITY WEEK | A GREENER FUTURE AWAITS

MOVING TOWARDS SUSTAINA-BILITY

Moving towards sustainable living is not just an ecological obligation; it's a compassionate choice that benefits both us and our planet. Sustainability ensures that we leave a healthier, more harmonious world for future generations. By reducing our environmental footprint through responsible consumption, renewable energy, and mindful resource management, we can mitigate climate change, protect biodiversity, and foster resilient ecosystems.

Sustainable living also brings personal advantages. It promotes a healthier lifestyle, as it encourages fresh, locally sourced foods and active transportation. It fosters community connections and reduces stress, making us happier and more fulfilled. Moreover, it bolsters economic stability, as green industries create jobs and lower our energy bills.

#cleanenergy

CONTENTS

ADDRESS

304, 3rd Floor, Clifton Center, Block - 5,
Clifton,Karachi 75600, Pakistan.
Phone: (+92) 21 35810637 - 39
Email: pv@pvjournal.com

EDITOR'S NOTE

The recent success of Pakistan Sustainability Week has been a remarkable milestone in the country's journey toward a more sustainable and environmentally conscious future. This event served as a testament to the nation's growing commitment to addressing critical environmental issues and embracing renewable energy solutions.

One noteworthy shift in this year's event was the spotlight on individuals from academia. Pakistan Sustainability Week successfully shifted the narrative towards academia, emphasizing the crucial role that research, education, and innovation play in advancing sustainability. By providing a platform for academics to share their expertise, the event bridged the gap between theory and practical implementation. We are proud to report that PV+ Journal was prominently featured at Pakistan Sustainability Week, where it received an overwhelming response from industry professionals. This recognition reinforces our commitment to delivering high-quality content and insights in the renewable energy sector.

Looking ahead, we are excited to announce that PV+ Journal is gearing up for bigger and better things. We have added seasoned experts to our panel who will provide firsthand insights into the world of renewable energy in Pakistan and beyond. Their expertise will help us bring you in-depth analysis and valuable perspectives on the latest developments and trends in the field.
As we continue to evolve and expand, we remain dedicated to delivering informative and relevant content to our readers. We look forward to being your trusted source for renewable energy news and insights in the coming months and years.
Thank you for your continued support.

God Bless!

Local Scoop.

Here we bring you the latest updates on the green revolution happening in your region. Read about how your community is harnessing the power of renewables to shape a sustainable future and create positive environmental impact, one innovation at a time. We talk about breakthrough technologies, and local initiatives driving the renewable energy movement forward.

JAMSHORO TRANSITION

Pakistani firm plans to transition the Jamshoro power plant from using imported coal to locally-sourced coal in order to achieve more cost-effective power generation.

AsiaPak Investments, a private investment firm with operations in Pakistan and Hong Kong, plans to convert the Jamshoro Power Plant from using imported coal to locally-sourced Thar coal for cost-effective power generation. The project, located in Sindh province, Pakistan, is financed by the Asian Development Bank (ADB) and is 95% complete, costing around $545 million. The plant, originally designed for imported coal, remains non-operational due to rising energy import costs.

AsiaPak Investments, in collaboration with the government and K-Electric, aims to convert the plant to run on Thar coal, ensuring its long-term sustainability. The project, supported by the ADB, consists of two 660-megawatt units, with one unit near completion. The company estimates a conversion cost of approximately $50 million and plans to supply 3.1 million tons of coal annually from its Thar coal mining investment.

Pakistan possesses vast coal reserves, primarily in the Thar region, equivalent to 50 billion tons of oil and capable of generating 100,000 MW of power for 350 years. At full capacity, the power plant will produce about 5 billion kilowatt hours per year, meeting 25% of Karachi's power needs.

AsiaPak Investments aims to complete the conversion within 10 months, contributing locally generated electricity to the national grid and potentially reducing Pakistan's energy import expenses, which stood at $17 billion in FY23, a 27% decrease from the previous year according to the Pakistan Bureau of Statistics.

KUWAIT'S ENERTECH HOLDING EXPLORES COLLABORATION WITH K-ELECTRIC

Kuwait's EnerTech Holding, specializing in renewable energy and clean technology investments, held discussions with K-Electric regarding potential collaboration in Pakistan's energy sector. The meeting, attended by CEOs Abdallah Al-Mutairi (EnerTech Holding) and Moonis Alvi (K-Electric), explored opportunities to support K-Electric's renewable energy initiatives in alignment with Pakistan's sustainable energy goals.

EnerTech Holding expressed enthusiasm for partnering with K-Electric, whose plans include substantial investments in transmission, distribution, and integrating up to 1,200 MW of renewable energy by 2030. K-Electric aims to serve 5 million customers with a 5,000 MW demand by 2030, with ambitions to meet 30% of this demand through renewable sources, reducing reliance on imported fuels.

K-Electric emphasized the importance of addressing the energy trilemma (reliability, affordability, and sustainability) for the country's 40 million electricity users. Both companies look forward to collaborating to enhance energy efficiency and meet customer needs effectively.

EnerTech Holding, operating in 65 countries, recently signed a $750 million agreement with the Pak Kuwait Investment Company (PKIC) to explore investment opportunities in Pakistan. It is a subsidiary of the Kuwait Investment Authority, the world's oldest sovereign fund.

WASA LAHORE INTENDS TO PURSUE ISO 500001 CERTIFICATION.

With support from the German development agency GIZ, the Water and Sanitation Authority (Wasa) Lahore is set to pursue ISO 500001 certification, an internationally recognized standard for effective energy management in both public and private sector organizations.

A delegation from GIZ, including Stephen Betterling and Detlef Borst, recently met with Wasa Lahore's MD, Ghafran Ahmed, alongside Wasa Lahore Director of Electricity, Muhammad Amjad, Mudassar Javed, and Deputy Director Amar Arshad.

During the meeting, the MD of Wasa Lahore emphasized their intention to seek certification from the German development agency. He highlighted that Wasa's energy management system would undergo auditing, emphasizing that no department in Pakistan has obtained this certificate before, making Wasa Lahore a pioneer in this regard. Additionally, he mentioned their adoption of renewable energy practices and the efficient utilization of existing resources to save energy, noting ongoing improvements in the energy management system.

PAKISTAN RAILWAYS INITIATES TRANSITION TO SOLAR POWER FOR ENTIRE STATION NETWORK

Pakistan Railways is embarking on a phased transition to solar power for its entire network, encompassing major railway stations, offices, workshops, and factories. This strategic move is expected to yield substantial cost savings amounting to billions of rupees.

"In the first phase, an estimated Rs1.8 billion in savings is anticipated, with subsequent phases incorporating additional stations, offices, and facilities," revealed an official from the Ministry of Railways.

Initially, the plan for the first phase involves converting approximately 99 formations, including major railway stations, nine divisional headquarters, and other crucial offices, to solar power. The Pakistan Railways has engaged the services of the National Engineering Services Pakistan (NESPAK) to facilitate the transition.

The decision to shift the railway network to solar energy is driven by the aim to alleviate the financial burden associated with conventional power sources.

Simultaneously, due to the ongoing energy crisis and rising utility costs, Pakistan Railways management has enforced a policy prohibiting officers from using air-conditioning units before 11 am.

INTERIM PM SEEKS CHINESE INVESTMENT FOR PAKISTAN'S SOLAR PARKS

Caretaker Prime Minister Anwaar-ul-Haq Kakar, in a meeting with representatives from prominent Chinese think tanks and scholars on Tuesday, extended an invitation to Chinese businesses to invest in Pakistan's solar parks. This initiative aligns with Pakistan's goals of reducing its energy import expenses and meeting climate change objectives.

Kakar expressed, "In our commitment to promoting sustainable energy, we extend a warm invitation to Chinese companies to participate in the development of solar parks within Pakistan." He highlighted the twofold benefits of such investments, stating, "These investments will not only bolster Pakistan's efforts in addressing climate change but also contribute to the reduction of our substantial energy import costs."

The caretaker PM also shared that Pakistan is actively working to increase the proportion of renewable energy sources in its energy mix, with the aim of reaching up to 65% by 2030. He stated, "Despite the challenges, we are optimistic about achieving this target, including through investments from the China-Pakistan Economic Corridor (CPEC) in the clean energy sector."

DIPLOMATS IN JIANGSU: ADVANCING THE ECONOMY THROUGH GREEN ENERGY DEVELOPMENT

The Chinese Ministry of Foreign Affairs invited over 20 diplomats from 15 countries to explore Jiangsu Province's journey towards achieving carbon neutrality. This exclusive three-part series by CGTN begins by focusing on the development of green energy in the region.

Historically known for its abundance of fish and rice, Jiangsu has modernized by integrating fishery with photovoltaics. Photovoltaic panels are used to adjust water temperature by altering their angle to control the light on the water surface while also serving as emergency power sources for fish ponds. This innovative project generates 170 million KWH of electricity annually and reduces greenhouse gas emissions by 200,000 tons.

MOIN UI HAQUE, the Ambassador of Pakistan to China, praised the initiative as an essential part of Jiangsu Province's green development and energy promotion. He highlighted its significance for promoting clean energy and ecological projects, echoing Pakistan's efforts in developing solar energy, particularly as part of the China-Pakistan Economic Corridor.

The diplomats also explored an energy storage project in Changzhou that repurposes old salt mines to store compressed air during off-peak periods, releasing it to generate electricity when needed. This unique storage solution piqued the interest of JESS BROWN, the Counselor at the Australian Embassy in China, who found it efficient and environmentally friendly.

The diplomats visited various companies in Jiangsu Province engaged in wind, solar, and hydrogen energy production. GRAHAME MORTON, the Ambassador of New Zealand to China, expressed interest in learning about innovations in clean energy, even though New Zealand already has a significant renewable energy capacity.

XUE CHI, President of Zhongtian Technology, discussed future plans to combine offshore wind and hydrogen pipelines to enhance the convenience and efficiency of green energy.

Jiangsu Province aims to install more than 66 million KW of renewable energy by 2025, accounting for over 34% of the total installed capacity, ensuring a sustainable and clean energy supply for modern development.

SSGC REPRESENTS PAKISTAN AT GASTECH 2023

Gastech 2023, a prominent global platform focusing on natural gas, LNG, hydrogen, low-carbon solutions, and climate technologies, commenced in Singapore on September 5, 2023, attracting a substantial number of exhibitors and delegates.

Representing Pakistan at this event, SSGC joined other energy sector companies from the country. Imran Maniar, Managing Director of SSGC, engaged with delegates to discuss the vital role of both renewable and non-renewable energy in shaping future energy security and transitions in Pakistan and across Asia.

> LNG is crucial for Pakistan, where natural gas accounts for over a third of power generation and local gas reserves are insufficient to address growing electricity demand in a country of over 230 million, leading to frequent power cuts.

During his interactions, MD, SSGC elaborated on the sustainability challenges faced by SSGC and shed light on various initiatives the company is undertaking, particularly in the realm of alternative energy and LNG. He also explored opportunities for collaboration on diverse projects

LUCKY CEMENT'S 37.6MW INITIATIVE

The company's Board of Directors (BoD) has approved a 28.8 MW captive wind power project at its Karachi plant, expected to conclude by FY 2024-end. Additionally, BoD sanctioned solar power projects, 6.3 MW in Karachi and 2.5 MW in Pezu, targeted for completion by Q3 FY2024.

These projects complement the recent 25 MW and 34 MW solar power projects at the Karachi and Pezu facilities, respectively, with a total estimated cost of Rs11 billion.These initiatives reinforce our commitment to sustainability and reduce reliance on imported fuel, potentially improving earnings per share by Rs2 and Rs0.46 due to wind and solar power plants, respectively.

Lucky may save up to Rs1.261 billion annually. Furthermore, BoD has authorized evaluation of equity participation in Lucky Core Ventures, a subsidiary, and potential acquisition of Lotte Chemical Pakistan Limited, pending due diligence and regulatory approvals.

CHINA HAS THE CAPABILITY
TO CRAFT A SUSTAINABLE PLAN FOR PAKISTAN

At the heart of this transformative journey lies the China-Pakistan Economic Corridor (CPEC), which not only symbolizes an enduring friendship but also has the potential to become a global exemplar of environmental stewardship. Renewables First (RF), in partnership with People of Asia for Climate Solutions (PACS), has released a report emphasizing China's unparalleled ability to spearhead the shift toward green energy. The report asserts that "China's global leadership in the Renewable Energy sector can craft a sustainable roadmap for Pakistan, setting a precedent for other nations along the BRI corridor."

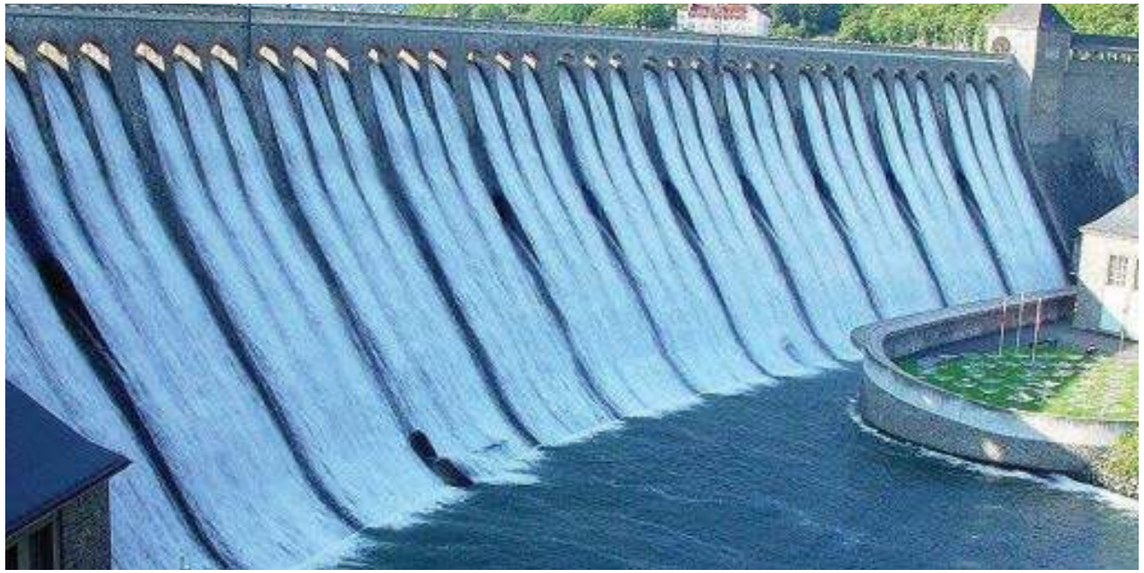
Historically, CPEC's infrastructure development, largely financed by Chinese investments, heavily favored coal projects. It is now imperative to transition towards renewable energy deployment to mitigate the environmental impact of previous ventures. The report underlines this necessity, emphasizing that "in a rapidly changing world where climate vulnerabilities threaten geopolitical and socioeconomic landscapes, projects like CPEC must align with global sustainability objectives."

Tom Xiaojun Wang, Executive Director of PACS, commented on this transformation, highlighting the vital corridors like CPEC under the BRI that link countries with China through mutually agreed, designed, and executed sustainable projects. Pakistan, among the most vulnerable countries to climate change, faces challenges such as reduced river flow, accelerating glacier melt rates, and frequent catastrophic flooding. Therefore, embarking on greener and sustainable development initiatives has become an existential imperative. China's decision in 2021 to curtail overseas coal plant projects, coupled with its steadfast commitment to harness renewable energy sources, signifies a fresh vision for CPEC. This strategic alignment is reinforced by Pakistan's ambitious target of raising the solar and wind energy share to 30% of its total electricity mix by 2030.

Furthermore, there are ample opportunities for comprehensive collaborations. Beyond the power sector, Pakistan's endeavors to electrify transportation, industry, and households enhance the synergy between the two nations, delivering benefits that extend beyond their borders.
Economic challenges, such as Pakistan's issues in managing power payments, underscore the urgent need for environmentally responsible and fiscally strategic collaborations. Companies like Goldwind are already making significant strides in Pakistan's renewable energy sector.

The landscape holds the promise of further expansion, with the solar and wind energy sectors projected to surge dramatically in the next decade, further solidifying CPEC as a symbolic hub for green investments. Muhammad Basit Ghauri, Senior Associate at RF, noted that "China and Pakistan find themselves at a unique intersection of economic growth and environmental responsibility. Blending economic ambitions with environmental principles can redefine CPEC, transforming it from a mere infrastructure marvel into a global benchmark for sustainable international development."

AZAD PATTAN HYDROPOWER PROJECT OF 700MW IS READY FOR CONSTRUCTION



Wang Huihua, Managing Director of China Energy International Group's Pakistan Branch, said that Energy China's 700-megawatt Azad Pattan hydropower project is ready for development following the completion of a feasibility study and site acquisition.

Wang spoke at the 'Pakistan Energy Sector Landscape: Challenges & Opportunities' conference at NUST University in Islamabad.

He added that the initiative will offer Pakistan with affordable, clean electricity. "We've been working on this project for six years." We expect that the government would prioritize it in the China-Pakistan Economic Corridor (CPEC) programme to speed up financial closure," he added.

He went on to say that Energy China thought investing in renewable energy in Pakistan was financially feasible. "We are committed to establishing a long-term presence in Pakistan and investing more," he added.

He emphasized the presence of China Energy Engineering Corp. (Energy China) in Pakistan over the past 20 years. "China Energy considers Pakistan to be its preferred investment destination," he added. N Wang also highlighted some of the problems that international investors experience in Pakistan, emphasizing the significance of addressing them rapidly in order to encourage a win-win collaboration.

The Azad Pattan Project is a 700.7 MW hydroelectric power station on the Jhelum River roughly 7 km upstream of Azad Pattan Bridge in the Sudhanoti District, Azad Jammu and Kashmir, Pakistan and 90 km from Islamabad, the capital city of Pakistan. The project is scheduled for completion by 2026.

DISCOs ABANDON 8,000MW PROJECTS

Power distribution companies (DISCOs) have taken an unexpected turn by abandoning 8,000 megawatts of renewable energy projects due to critical flaws in their electricity procurement plan. This five-year strategy aimed to source power from clean energy facilities but raised concerns among stakeholders and the National Electric Power Regulatory Authority (Nepra).

During a recent public hearing, Nepra and stakeholders highlighted significant plan shortcomings. Notably, the plan lacked consideration for its impact on consumer electricity tariffs, perplexing regulators. Nepra's representatives had difficulty grasping the plan's key elements, revealing its unclear presentation. The previously approved Indicative Generation Capacity Expansion Plan (IGCEP) had approved 8,000 megawatts of renewable energy projects. However, these projects were surprisingly absent from DISCOs' power acquisition plan for the years 2022-23 to 2026-27.

The plan also overlooked critical aspects like electricity evacuation and system constraints, raising concerns about power system reliability and stability. DISCOs stated the plan covered only electricity from contracted power plants, excluding electricity from the Kapco power plant. However, they later acknowledged including Kapco's power.

Nepra emphasized that DISCOs significantly deviated from the approved IGCEP, potentially causing gaps in the plan and neglecting consultation with the system operator, responsible for ensuring power system reliability and stability. Nepra warned that misalignment with system reliability could lead to chronic power system constraints and shortages. Some cities were resorting to furnace oil-based power plants to stabilize the system, highlighting systemic issues.

PAKISTAN: 282 MW CLEAN, GREEN ENERGY TO BE ADDED TO NATIONAL GRID BY 2024

A total of 282 megawatts (MW) of environmentally friendly energy, derived from solar, wind, and biomass sources, is set to be integrated into the national grid system by the year 2024. Providing insights into these projects, official sources indicated that among the 282 MW, solar installations would contribute 150 MW, wind energy would account for 100 MW, and biomass would generate the remaining 32 MW.

They further explained that three solar projects, including Meridian Energy (Pvt) Ltd (50 MW), HND Energy (Pvt) Ltd, and Helios Power (Pvt) Ltd, are expected to commence supplying electricity in the coming month, contributing to the initial 150 MW. Meanwhile, two Independent Power Producers (IPPs) wind projects, Western Energy (Pvt) Ltd and Transatlantic Energy (Pvt) Ltd, are at various stages of development, with each set to deliver 50 MW.

Additionally, the 32 MW biomass project, Shah Taj Sugar Mills Ltd, is scheduled to begin power generation by January 2024. All these initiatives are being facilitated by the Private Power Infrastructure Board (PPIB).

Global Scoop.

Here we dive into the latest developments in the industry as we explore the remarkable strides countries are making towards sustainable power sources, highlighting groundbreaking innovations and initiatives that promise a greener future for our planet. From cutting-edge solar technologies to revolutionary wind farms, this is your gateway to staying informed on the global transition to clean energy.

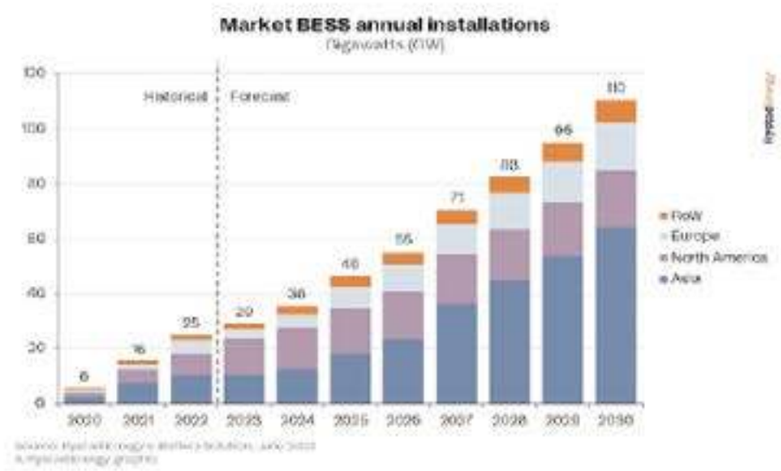
RYSTAD ENERGY PREDICTS THAT ENERGY OUTPUT IN SPAIN WILL SURPASS 50% BY 2023

According to Rystad Energy estimates, Spain is on course to generate more than half of its electricity from renewable sources this year, making it the first of the top five European nations by power consumption to do so. Spain will achieve this key decarbonisation milestone this year, with renewable-sourced power exceeding the 50% average by 2023, overtaking France, Germany, Italy, and the United Kingdom. “Spain’s achievements in renewable energy are unsurprising given its history of strategic investments and early adoption.” Its development should serve as a clear bar for competitors and a monument to the viability of a cleaner energy future,” said Fabian Rnningen, Senior Analyst on Rystad Energy’s Renewables & Power team.

However, it has not been easy, and Spain has encountered significant difficulties in its renewables path. The use of fossil fuels increased significantly last year, owing to market intervention measures and huge pricing discrepancies with France. As the influence of these market interventions fades, Spain’s power generation returns to normal levels, resulting in a drop in both exports and domestic power consumption in 2023. This fall will be largely driven by a reduction in gas-fired power, increasing the importance of renewables in the energy mix.

While official data from Spain’s transmission system operator reveals that more than 50% of electricity generated is renewable, power exports to France might stymie further development in 2023. The discrepancy in market fundamentals between Spain and France has resulted in a rise in exports from the Iberian country to its northern neighbour. This year, France has suffered with low nuclear power output, requiring it to rely on electricity imports from Spain. Spain’s progressive transformation from net importer to net exporter of electricity not only reflects the country’s rising significance in the European energy scene, but also highlights the country’s road towards becoming a vital participant in the global energy market.

Lower consumer costs are a direct effect of Spain’s renewable energy performance, a vital victory following the sky-high prices of 2022. The increased percentage of intermittent renewables has cut average spot costs, and despite limited interconnection capacity with the rest of Europe, Spain’s rates have been much lower this year than France’s. Because of many variables, including Spain’s move from one of Europe’s highest-priced spot markets to one of its lowest, average power costs in France have been 34% higher than those in Spain. Even after accounting for the consequences of market intervention measures in 2022, the pricing gap between Spain and France remains significant.



THE ENERGY ISLAND PROJECT HAS REACHED A SIGNIFICANT MILESTONE.

The intergovernmental agreement on the German-Danish Bornholm Energy Island project has been welcomed by transmission system operators (TSOs) 50Hertz and Energinet. At the EU Energy Ministers' Meeting in Luxembourg, Robert Habeck, Minister for Economic Affairs and Climate Action, and Lars Aagaard, Minister for Climate, Energy, and Utilities, publicly announced the agreement.

The intergovernmental agreement establishes the conditions for 50Hertz and Energinet to collaborate and equitably share duties in order to construct the unique power hub on the Baltic Sea island, as well as hundreds of km of 525kV direct current undersea and land cables.

"Bornholm Energy Island paves the way to a future in which offshore wind energy is no longer used exclusively by individual countries via point-to-point connections," stated Stefan Kapferer, CEO of 50Hertzm. "In the future, a portion of offshore electricity production will be able to flow to areas of greatest need via direct current grids at sea."

"In the case of the Bornholm Energy Island project, the lines will also be available for inter-country electricity trading." "This makes economic sense, and it also increases supply security in light of the new geopolitical conditions."
"For Denmark and Energinet, the construction of large offshore wind farms and interconnectors is an important part of the political ambitions and plans to export not only 'green' electricity, but also 'green' molecules via a future hydrogen backbone in Denmark," said Thoma Egebo, CEO of Energinet. Last but not least, this will help to decarbonize German industry. "This joint project in the Baltic Sea, as well as our projects in the North Sea, will thus have a significant impact on the EU's energy transition."

With Bornholm Energy Island, 50Hertz and Energinet are not just breaking new ground in terms of technology. According to the agreement, each grid operator will pay 50% of the project's expenditure, and half of the power generated will be credited towards the European renewable energy objectives. In addition, 50Hertz and Energinet will split congestion earnings from their separate lines to Germany and Denmark equally.

RECORD ROOFTOP SOLAR CAPACITY: AUSTRALIAN HOUSEHOLDS ON TRACK TO CONTRIBUTE TO THE ELECTRICITY GRID

Households are set to contribute three gigawatts of rooftop solar capacity to the grid this year, while investment in large-scale wind and solar projects remains stagnant, as reported by the Clean Energy Regulator. In the first half of 2023, nearly 160,000 rooftop systems added 1.4GW of capacity to the grid, demonstrating a desire among consumers to reduce energy costs and their carbon footprint. Despite Australia's abundant solar resources and the rapid adoption of rooftop solar, large-scale renewable projects are struggling due to increasing costs for components, engineering, and construction.
The regulator's quarterly report shows that renewable electricity now accounts for over 36% of national electricity demand, with an expected increase to 40% by December. However, large-scale renewable energy investments have been lackluster, with the regulator lowering its 2023 expectations to possibly not reaching three gigawatts.

Experts have voiced concerns that Australia is not moving quickly enough to achieve its 82% renewable energy target by 2030. The Australian Energy Market Operator and Green Energy Markets emphasize the need to streamline grid connections and expedite new transmission projects to meet these goals.
In its recent quarterly report, the Clean Energy Council highlighted numerous barriers facing solar and windfarm developers in Australia, despite political support. The first half of 2023 witnessed the slowest pace of final investment approvals in six years of data tracking.

MOZAMBIQUE UNVEILS TETEREANE SOLAR POWER PLANT, PROVIDING ENERGY TO THOUSANDS

The Tetereane Solar Power Plant, which was inaugurated by Mozambican President Filipe Nyusi, is poised to deliver renewable electricity to around 21,000 inhabitants residing in Cuamba, a city located in the northern Mozambican Province of Niassa.

During the inauguration of the facility, President Nyusi underscored its capacity to provide a steady supply of electricity to approximately 21,000 residents. As part of an economic decentralization initiative, there are plans to allocate one percent of the plant's annual earnings, estimated at around 10.5 million meticais (equivalent to about $164,000 USD), to support the development of the Cuamba municipality.
With a total worth of $36.2 million, this project seeks to meet the increasing electricity demand in Niassa by boosting power generation. It stands as the third-largest solar power plant in the country and is expected to generate more than 500 jobs while supplying electricity to northern Mozambique, producing 15 megawatts and incorporating a six-megawatt per hour energy storage system.

Furthermore, a portion of its revenue, approximately $164,000 per annum, will contribute to the advancement of Cuamba's municipal development. This collaborative initiative involves the Mozambican government, Norway, and the United Kingdom. President Nyusi encouraged local residents to utilize this electricity for the creation of job opportunities and the promotion of economic growth.

PRIVATE EQUITY'S QUEST FOR ENERGY TRANSITION OPPORTUNITIES IN AFRICA

Private equity investors are actively exploring investment opportunities in Africa's energy transition, with a particular focus on small-scale projects that are not integrated into national power grids, according to Saad Ul Islam, the infrastructure equity investment director at British International Investment, as reported by Private Equity International. Africa still has over 600 million people without access to electricity, nearly half of its population, and even those with access often experience unreliable power supply, as noted by the International Energy Agency (IEA).

Private equity firms are increasingly playing a significant role in supporting the development of energy services and technology in response to this growing need, as highlighted by Ul Islam. Ben Hughes, an investment director at Camco, shares the perspective that the energy transition in Africa will primarily be decentralized, with a focus on these cost-effective projects that are easier to implement and finance.

The unreliability of national power grids, marked by frequent blackouts and erratic power supply, has prompted more households and businesses in Africa to shift away from traditional energy supply models and embrace solutions offered by the private sector.

ØRSTED SECURES CONTRACTS FOR 124.2 MW OF RENEWABLE ENERGY IN IRISH RESS 3 AUCTION

Kieran White, the Senior Vice President of Onshore in Region Europe at Ørsted, shared insights on the preliminary results of the RESS 3 auction. He expressed that these results, which encompass two projects with a combined capacity of 124 MW, are poised to play a significant role in reducing electricity costs when compared to fossil fuel generation. Moreover, they are expected to contribute to Ireland's energy self-sufficiency and align with their value creation objectives. Mr. White further emphasized their commitment to delivering these projects within the RESS 3 timeline, aiming for completion before 2030.

In the RESS 3 auction, a total of 24 projects, encompassing both onshore wind and solar initiatives, received clearance, with Ørsted's two projects included in the mix. These projects were secured at an average strike price of EUR 100.47 per MWh.

Ørsted's presence in Ireland is centered in Cork City, where they employ more than 100 individuals. Currently, Ørsted operates onshore wind facilities with a total capacity of 378 MW across the island, generating enough electricity to power over 230,000 households. Additionally, Ørsted has recently announced two notable partnerships: one with ESB to jointly develop an offshore wind portfolio in Ireland and another with Terra Solar to advance 400 MW of solar energy initiatives.

Recognized as one of the world's leading sustainable energy companies, Ørsted boasts a portfolio encompassing over 5.7 GW of onshore renewables that are either operational, under construction, or have received consent across both the United States and Europe.

SOUTH AFRICAN ENERGY FIRM SECURES R3 BILLION FUNDING FOR RENEWABLE POWER VENTURES

Red Rocket, a renewable energy developer based in Cape Town, South Africa, has secured $160 million (equivalent to R3.07 billion) in funding from a consortium of management and investment partners. This financial injection will support the company's expansion efforts throughout the region.

Red Rocket has a track record of constructing hydro, solar, and wind projects and recently achieved financial close on a project involving 364MW of wind turbines in February. While the majority of Red Rocket's project pipeline is in South Africa, the company has ambitious plans to extend its operations into other markets, primarily within southern Africa.

Matteo Brambilla, the CEO of Red Rocket, emphasized the importance of the new investment partners in advancing the development of utility-scale power projects across the continent. This expansion is particularly crucial in light of the challenges faced by South Africa's Eskom Holdings SOC Ltd., which has struggled to meet electricity demand, leading to significant power outages that have negatively impacted the economy. To address this issue, the government has turned to independent power producers to bolster capacity and stabilize the power grid, albeit with some delays in the program's implementation.

The funding for Red Rocket was secured from several key backers, including Bill Kilgore Investments, a vehicle operated by management shareholders, and Inspired Evolution, a climate-focused investor. Additionally, Dutch entrepreneurial development bank FMO and French infrastructure and energy investor STOA have joined the initiative as partners to support Red Rocket's expansion efforts.

STATKRAFT SECURES APPROVAL FOR 126MW WIND FARM IN SHETLAND

Statkraft has received the green light for the development of its 126MW Energy Isles wind farm in Shetland. On the island of Yell, up to 18 turbines have been approved for installation. The company intends to commence construction in 2025. In addition to this project, Statkraft is advancing two other wind farms in Shetland, having acquired the 72MW Beaw Field and 48MW Mossy Hill projects from Peel NRE earlier this year.

Rebecca Todd, the Principal Project Manager for Energy Isles, stated, "This project holds significant importance for Statkraft, as it will generate a substantial amount of renewable electricity and enhance energy security. Furthermore, Energy Isles will contribute a minimum of £18.9 million through a Community Benefit Fund for the local community. This achievement would not have been possible without the forward-thinking Shetland residents who initiated this ambitious project in 2012 and have consistently supported it. We express our gratitude to the people of Shetland and the Energy Isles Consortium for their dedication and determination in decarbonizing the North Isles and their unwavering support for this endeavor."

TÜRKIYE: TOTALENERGIES PARTNERS WITH RÖNESANS HOLDING

Rönesans Enerji currently operates a portfolio of 166 MW in hydro assets. Additionally, the company has secured a pipeline of over 700 MW in wind, photovoltaic, and battery storage assets. Relying on TotalEnergies' expertise in onshore wind and solar development, as well as electricity trading, combined with Rönesans' extensive knowledge of the local electricity market, Rönesans Enerji aspires to generate 2 GW of renewable energy by 2028.

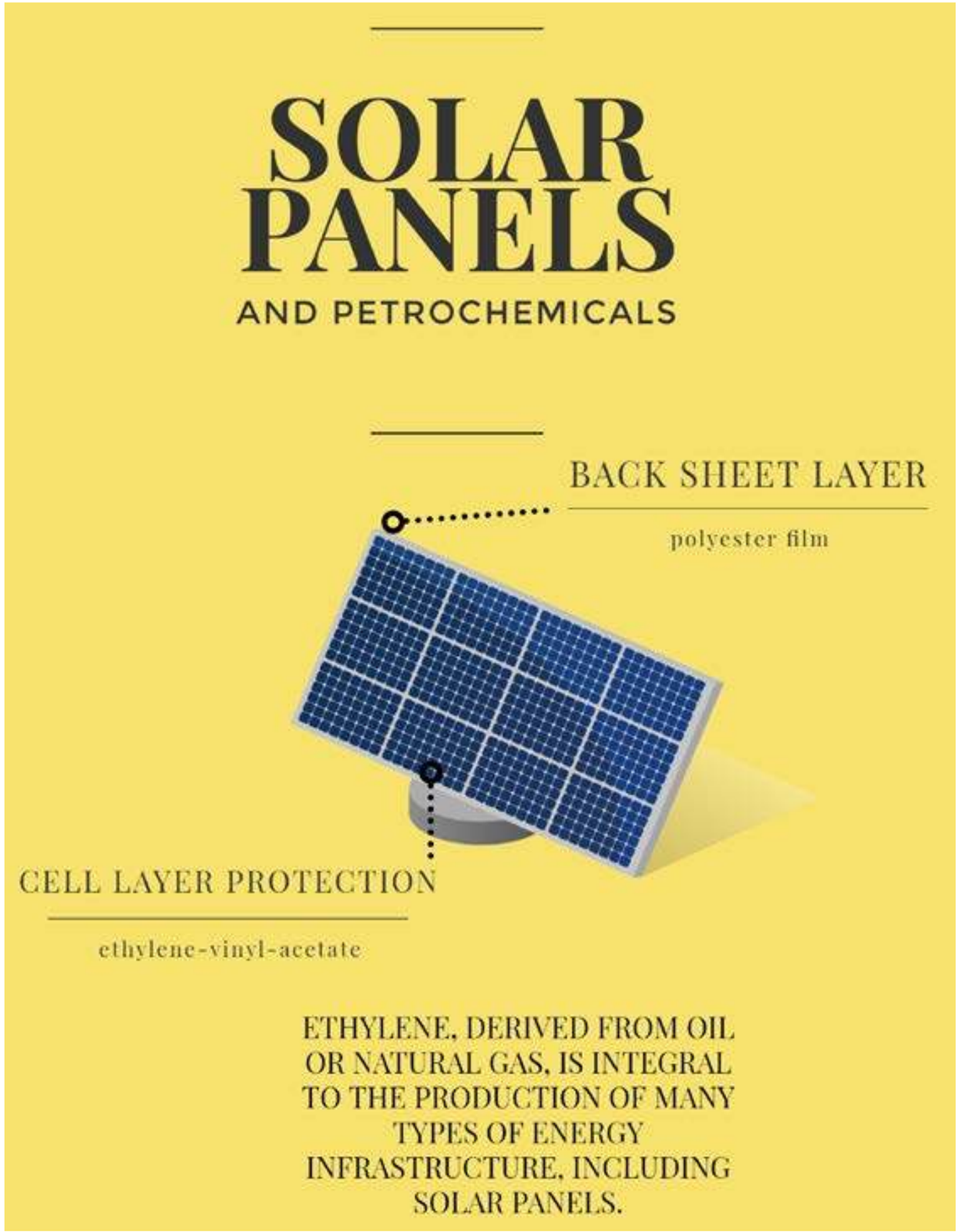
The energy produced by these facilities will be marketed, including direct sales on the electricity market and the establishment of power purchase agreements (PPAs) with end-buyers. These projects, which are competitively priced due to Turkey's favorable renewable energy potential, align with the company's strategy to become an integrated player in electricity markets. They will harness price fluctuations and contribute to achieving double-digit profitability targets for the Integrated Power Business Unit.
"We are pleased to collaborate with Rönesans, which has developed a diverse portfolio of assets encompassing wind, hydro, and solar power. Considering Turkey's market outlook and the quality of renewable sites in the country, we are confident that this new partnership will advance our goal of profitable growth in the Integrated Power sector. It will also support the growth of Turkey's renewable energy industry," noted Stéphane Michel, President of Gas, Renewables & Power at TotalEnergies.

SINGAPORE AIMS TO POSITION ITSELF AS THE EPICENTER OF RENEWABLE ENERGY IN ASIA

Despite its lack of natural resources, Singapore has effectively transformed challenges into economic prosperity, establishing itself as a pivotal trade and financial center in the region. Now, faced with the dual imperatives of achieving carbon neutrality and ensuring energy security, the city-state seems determined to emerge as Asia's renewable energy hub. If this endeavor succeeds, Singapore could serve as a guiding light for other ASEAN nations grappling with formidable carbon reduction targets.

Lawrence Wong, the deputy prime minister and finance minister, who is widely regarded as Singapore's upcoming leader, disclosed last October the nation's ambitious commitment to attain "net zero carbon dioxide emissions by 2050." A substantial portion of Singapore's greenhouse gas emissions, currently responsible for 40% of the total, emanates from electricity generation, primarily fueled by natural gas. If Singapore aspires to align with the United States and Europe in achieving carbon neutrality within the same time frame, the crux of this transformation lies in decarbonizing the power sector.

Singapore has charted a multifaceted course toward decarbonization, intending to replace 70% of its power supply with hydrogen, ammonia, and CCUS (carbon dioxide capture, utilization, and storage) technology. However, in this compact nation, smaller in size than New York City, the available options are constrained.



Happen-ings.

Get ready to immerse yourself in a comprehensive exploration of the dynamic world of renewable energy and beyond. Here we will uncover the latest trends, breakthroughs, and impactful events shaping the global transition to sustainable practices, empowering you with the knowledge and inspiration to be at the forefront of the green revolution.

AMAZON INCORPORATES 39 NEW RENEWABLE ENERGY INITIATIVES IN EUROPE

In 2022
Amazon's renewable energy projects in Europe contributed

€2.4Billion
in economic investment and created over

3,900 Jobs

Today, Amazon disclosed the addition of 39 new renewable energy initiatives in Europe, delivering over one gigawatt of clean energy capacity to European grids. Across 13 European countries, Amazon has facilitated over 160 wind and solar projects. When all these projects are fully operational, they are anticipated to yield a total of 5.8 gigawatts of clean energy capacity, sufficient to power more than 4.7 million European households annually.

These new projects encompass 15 rooftop solar installations on Amazon facilities and 24 large-scale wind and solar ventures, which include Amazon's inaugural solar farm in Greece. The project in Greece follows the introduction of Amazon's first large-scale solar farm in Poland the previous year. Amazon's investments in these nations play a pivotal role in expediting the transition of their energy grids from fossil fuels, contributing to decarbonization efforts.

Lindsay McQuade, Director of Energy, EMEA at Amazon, emphasized the company's commitment to environmental sustainability, stating, "With over 160 wind and solar projects in Europe, Amazon is actively contributing to the integration of clean energy into local power grids, fostering job creation, and bolstering regional businesses as we make strides toward achieving our goal of powering our operations with 100% renewable energy by 2025.

Corporate investments play a pivotal role in driving the transition to a cleaner energy future, and we eagerly anticipate our ongoing collaboration with governments, local communities, and energy providers across Europe to facilitate the infusion of more renewable energy into local grids."

Amazon's renewable energy investments stimulate local economies

Amazon's investments in renewable energy projects have significant economic implications for local economies. According to a newly developed economic model by Amazon, spanning from 2014 to 2022, the company's European wind and solar farms have contributed an estimated €2.4 billion in investment in Europe and have added more than €723 million to the region's gross domestic product (GDP). In 2022 alone, these projects supported the equivalent of over 3,900 full-time jobs.

The positive impact of Amazon's renewable energy investments is underscored by data generated through this economic model. The model adheres to guidelines from the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) and has been verified by the global independent economic advisory firm, Oxford Economics. It encompasses utility-scale renewable energy projects that have commenced construction, become operational between 2014 and 2022, or are anticipated to go live in 2023, all stemming from Amazon's investments in Power Purchase Agreements.

New investments span nine European countries

Amazon's investments in solar and wind initiatives have solidified its position as Europe's foremost corporate procurer of renewable energy, a distinction the company has maintained since 2021. Our most recent projects encompass rooftop solar ventures situated in Belgium, France, Italy, Spain, and the UK, as well as fresh large-scale solar and wind ventures located in Finland, Germany, Greece, Spain, Sweden, and the UK.

Amazon is committed to achieving full renewable energy utilization for our operations, encompassing Amazon Web Services (AWS) data centers, fulfillment centers, and physical stores, by 2025, a goal we're advancing by five years compared to our initial target of 2030. In 2022, a noteworthy 90% of Amazon's global electricity consumption was met through renewable energy sources.

90%

of Amazon's global electricity consumption was met through renewable energy sources.

WETEX & DSS: The Region's Largest Sustainability & Clean Energy Technology Exhibition

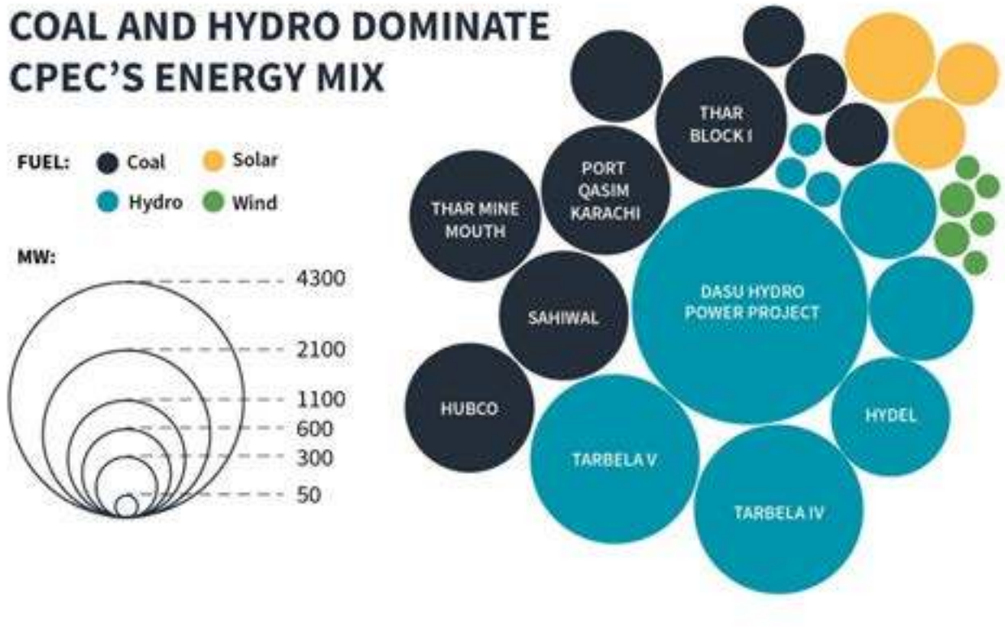
15th - 17th November 2023

WETEX and the Dubai Solar Show, organized by the Dubai Electricity and Water Authority (DEWA), align with Dubai's commitment to creating a sustainable future for the Emirate. These events occur annually under the guidance of HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai.

The exhibition serves as a prominent platform for global organizations to showcase their latest solutions and products. It also facilitates the exploration of cutting-edge technologies from around the world in various domains, including energy, water, sustainability, green technologies, renewable and clean energy, green transportation solutions, sustainable development, eco-friendly architecture, water desalination technologies, smart cities, and more. In addition to these offerings, specialized seminars and panel discussions held alongside the exhibition create opportunities for engaging with international experts and specialists, fostering the exchange of ideas and knowledge.

وينتيكس WETEX 2023 معرض دبي للطاقة الشمسية DUBAI SOLAR SHOW

PAKISTAN'S COMPETITIVE ENERGY SECTOR IS YET TO TAKE OFF



KARACHI: According to a research conducted by the International Institute for Energy Economics and Financial Analysis (IEEFA), Pakistan's plan to transition to a competitive electricity system has not been welcomed with excitement by the renewable energy development community.

Although competitive bidding was stipulated under the Renewable Energy Development Policy of 2006, the study revealed that the unexpected termination of the upfront tariff scheme left project developers confused of how to continue. According to Haneea Isaac's report "Choosing the Right Incentives for Pakistan's Renewable Industry," the categorization of these projects or the establishment of a new policy that formalised auctions could not be published until 2019. Despite the fact that the tariff requests to NEPRA corresponded to some of the lowest renewable energy prices: about 3.2 cents/KWh for solar and 3.6 cents/KWh for wind, no new projects were initiated during this time.

These were some of the lowest regional rates and could only be overcome by auction results in India. It noted that with tariffs this low, price discovery seemed to have already occurred. Why did the government want to press through with auctions?

"There was a lot of interest in renewable energy projects in Pakistan in 2015-2016." Seeing this, the federal authorities prohibited the issue of LOIs, although there was still almost 6-7 GW of capacity in the pipeline. "A large portion of this capacity was contingent on NTDC (National Transmission and Despatch Company) providing adequate evacuation capacity and interconnectivity," the report stated.

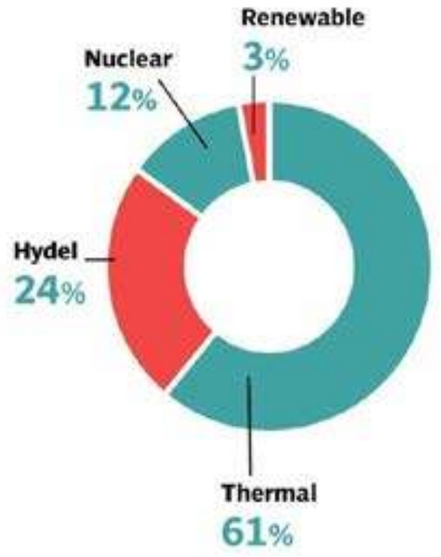
The current grid network would not be able to absorb such a large infusion of fluctuating renewable energy into the system. The government desired more control over the amount of renewable energy supplied into the system so that grid upgrades could be completed on schedule.

Auctions might make this possible. There were also hopes for more price cuts. While challenges like as inadequate grid connectivity and the risk of curtailment are true and have been acknowledged by renewable energy developers, the research stated that what has impacted developers the most is the extraordinary delay in the conduct of these auctions.

When the competition policy was first announced in 2017, the government assuaged developers' concerns by stating that framework guidelines and a mechanism for disposing of existing LOIs would be developed within 10-12 months, but nearly five years later, that framework has yet to be made public. Request for proposal (RFP) packages for Category III solar and wind projects were produced and shared with NEPRA for approval in 2020, but they have yet to be approved due to a slew of issues expressed by the regulator. The fact that the RFP did not specify the amount of capacity to be sought through these packages was at the forefront of these difficulties, according to the research.

It would, however, be incorrect to throw all of the blame on AEDB. When it comes to determining the volumes of solar and wind energy to be auctioned, AEDB must follow the lead of the NTDC, which has been instrumental in preventing AEDB from arriving at an ideal quantum of electricity that could be auctioned. The Indicative Generation Capacity Expansion Plan (IGCEP) is an annual generation planning exercise in which NTDC optimises additional generating capacity on a least-cost basis.

The first IGCEP was approved in September 2021, therefore any further auctions would take place at a later date. Other reasons for the auction delays include the country's lack of experience with competitive bidding in the electricity industry and a disagreement among provinces on finishing the auction design. Pakistan has typically used the thermal IPP model, with projects coming online on a cost-plus or upfront tariff basis. According to the report, transitioning to a more liberal system has presented design issues and necessitates careful planning.



$12.9Billion

Estimated investment required to expedite the hydropower potential for the next 10 years

Exploring EU'S CARBON BORDER ADJUSTMENT MECHANISM (CBAM)

A CHALLENGE?

The impending introduction of the Carbon Border Adjustment Mechanism (CBAM) by the European Union (EU) presents a substantial challenge for Pakistani businesses. This mechanism, which connects the competitiveness of Pakistan's exports to the transition to sustainable and renewable energy sources, will have a considerable impact on the country's crucial exports. Specifically, products manufactured using electricity generated from coal-based power plants will progressively become more expensive, posing a significant threat to the Pakistani export sector, particularly in its textile industries.

The consequences of this transition are profound and should not be underestimated. Pakistani businesses must acknowledge that investing in renewable energy is not merely an option but an absolute necessity to safeguard our exports. Failing to embrace this shift will inevitably jeopardize the future of our export-oriented economy, while the EU's CBAM will evolve into a formidable trade barrier. The textile industry, a pivotal component of Pakistan's exports, is particularly susceptible to these changes, making it imperative for Pakistani businesses to adapt swiftly.

Our primary focus should center around the energy sources that underpin our industries. The impending CBAM necessitates a rapid transition away from coal-based power generation toward cleaner and more sustainable alternatives. Renewable energy sources, including solar, wind, and hydroelectric power, provide a viable path forward. The competitive advantage of Pakistani products in the global market will depend on their energy footprint. Therefore, embracing renewable energy is not only an environmentally responsible decision but also a strategic business necessity. The use of coal, often considered as a potential solution, should be reevaluated in this evolving landscape. With CBAM on the horizon, it may be prudent to leave Thar coal reserves untapped until carbon capture technologies mature. This approach minimizes carbon emissions and ensures that Pakistani exports remain competitive in a rapidly changing global market.

The current energy mix in Pakistan's electricity generation reveals a significant reliance on coal, ranking as the third-largest source of electricity. However, a shift toward renewable energy is imperative to meet the evolving demands of global trade. As CBAM is set to encompass all industries, including textiles, by 2030, Pakistan's dependence on coal should be promptly reassessed.

UAE SECURED $36 BILLION IN FOREIGN DIRECT INVESTMENT (FDI)

The United Arab Emirates (UAE) has effectively drawn in approximately AED 132.5 billion (equivalent to $36 billion) in Foreign Direct Investment (FDI) for its renewable energy initiatives. According to a top official cited by Wam, the Emirates now ranks as the world's fourth-largest recipient of greenfield projects. Ahmed Jasim Al Zaabi, the Chairman of the Abu Dhabi Department of Economic Development (ADDED), highlighted that over the past decade, investors from more than 170 countries have chosen the UAE as their destination for investment, growth, and expansion. This reinforces the global investment community's confidence in the country's strong economic fundamentals and optimistic outlook.

Addressing attendees at the 8th World Investment Forum (WIF), organized by the United Nations Conference on Trade and Development (UNCTAD) and commencing in Abu Dhabi on October 16, Al Zaabi reaffirmed Abu Dhabi and the UAE's commitment to fostering collaboration, reinforcing economic partnerships, and addressing contemporary global challenges.

He stated, "The UAE's commitment to facilitating international relations and economic cooperation is poised to unlock a wealth of opportunities. As a global center for business and finance, the UAE has also established bilateral trade agreements, solidifying our reputation as a dependable partner for international trade and cooperation."

Al Zaabi noted that in the previous year, the UAE had successfully attracted a substantial $23 billion in FDI, representing a 10% increase over the figures from 2021, and this accomplishment positioned the UAE as the 16th largest recipient of FDI globally.

He also emphasized that the UAE had become the world's fourth-largest recipient of greenfield projects, with nearly a thousand ambitious ventures announced during the previous year. Furthermore, Al Zaabi pointed out that the UAE had been one of the world's most active nations in terms of investing abroad, contributing to growth across 122 countries and spanning 35 diverse sectors over the past five years. Al Zaabi concluded by highlighting the UAE's commitment to sustainable development, underscoring substantial investments of nearly $45 billion in renewable energy. In 2022, UAE FDI outflows dedicated nearly $36 billion to renewable energy projects.

CROATIA CAUGHT BETWEEN LNG AMBITIONS AND ABUNDANT UNTAPPED POTENTIAL

As Croatia gears up for the anticipated "super election year" in 2024, featuring three significant elections, it is anticipated that energy-related matters will take center stage in political campaigns. However, the cost of energy usage continues to take precedence over environmental and climate considerations. The present government is endorsing the expansion of the LNG terminal on Krk Island, envisioning the nation as a pivotal regional hub for importing fossil gas from the United States. This initiative consistently triggers protests from environmental organizations and energy specialists.

Croatia boasts a substantial proportion of renewable energy in its electricity generation, primarily owing to its extensive hydropower facilities. The persistent rainy conditions in the first five months of 2023 resulted in a renewable energy share of 75.9 percent. However, due to the highly variable nature of hydropower, the country also relies on its thermal power plants and energy imports. In 2022, when rainfall was considerably lower, the hydropower contribution to energy production was just 25 percent. Croatia presently imports a significant portion of its energy needs, including 100 percent of coal, 40 percent of gas, and 80 percent of oil. This dependency has left the nation vulnerable to escalating fossil fuel prices.

In 2021, Croatia's estimated domestic greenhouse gas emissions amounted to 23.3 million metric tons of CO2-equivalents, reflecting a 2.1 percent reduction compared to 2020 and a 5.6 percent decrease from pre-pandemic levels. When considering the land use, land use change, and forestry (LULUCF) sector, the overall domestic emissions, dating back to 1990, were substantially lower by 41.9 percent.

Croatia's 2030 National Energy and Climate Plan sets ambitious targets, aiming for a 36.4 percent share of renewable energy by 2030 and a 45 percent reduction in emissions. This plan is presently under revision with new objectives in the pipeline.

Croatia is among the EU member states highly susceptible to climate-related risks, with a significant portion of its economy reliant on sectors vulnerable to climate change and extreme weather, including agriculture and tourism. The country is making substantial investments in gas infrastructure with the goal of becoming a regional hub for U.S. gas imports. A significant 180 million euros investment is earmarked for expanding the capacity of the LNG terminal on Krk Island, alongside the construction of a new gas pipeline.

Looking ahead, 2024 is being hyped as a "super-election" year in Croatia, with European Parliament elections in May followed by parliamentary and presidential votes later in the year. While economic issues are expected to dominate the political landscape, some parties, such as the left-wing green party Možemo, have declared their intent to place the green energy transition at the forefront of their campaigns.

Hydrogen Initiatives

Croatia is a participant in the North Adriatic Hydrogen Valley project, in collaboration with Slovenia and Italy. Launched in September 2023, the project encompasses 17 pilot initiatives for the production of over 5,000 tonnes of renewable hydrogen annually, derived from sustainable energy sources. These initiatives also focus on the storage, distribution, and utilization of hydrogen.

Harnessing Geothermal Energy

Northern Croatia is endowed with abundant geothermal energy resources, yet their utilization has been limited. However, the energy crisis has spurred many local communities to embark on localized projects, primarily in the research phase. For instance, Bjelovar is planning to heat the entire town using geothermal energy.

Solar Energy Potential

Croatia enjoys one of the highest levels of solar insolation in the EU, receiving between 2,000 and 2,700 hours of sunshine annually. According to SolarPower Europe analysts, Croatia has the capacity to install up to 7 GW of solar power by 2030 (with only a few hundred MW currently installed). In 2022, solar power facilities generated 79 GWh of electricity, accounting for a mere 0.43 percent of the total energy production, making Croatia the least advanced in solar energy utilization across Europe. As of February 2023, the cumulative capacity of installed solar power plants, according to HEP (Croatian public energy production and distribution company), reached 30.9 MW. One of the contributing factors to this slow progress is Croatia's position as the least efficient among the 12 European Union member states in permitting onshore wind and solar projects, as per Ember's recent report.

Advancements in Energy Storage

Croatia is poised to construct its first large-scale battery energy storage system by 2024 in Šibenik, thanks to EU funding support. This project is anticipated to become the largest of its kind in South-East Europe.

Island Energy Independence

- In 2020, Croatia initiated the endorsement of the Split Memorandum (implementing the Valletta Political Declaration on Clean Energy for European Union Islands), with the primary objective of advancing the energy transition on its islands. This memorandum guarantees comprehensive assistance to the islands in crafting strategies for their shift towards clean energy and encourages collaboration among energy communities located on these islands. Croatia's largest island, Krk, is actively striving to become one of the initial energy-independent and carbon-neutral islands in the Mediterranean.

Electrifying Maritime Transportation

Croatia, historically known for its shipbuilding industry, is now venturing into the construction of electric marine vessels. Notable initiatives include the development of a zero-emission passenger sailing ship in Split, the production of solar electric catamarans by the iCat company, and the creation of Croatia's inaugural electric speedboat by Pearlsea Yachts. Jadroplov company has also conceptualized one of the largest ferries in the Adriatic, capable of transporting a thousand passengers and 400 vehicles using electric power, subject to resolving funding challenges.

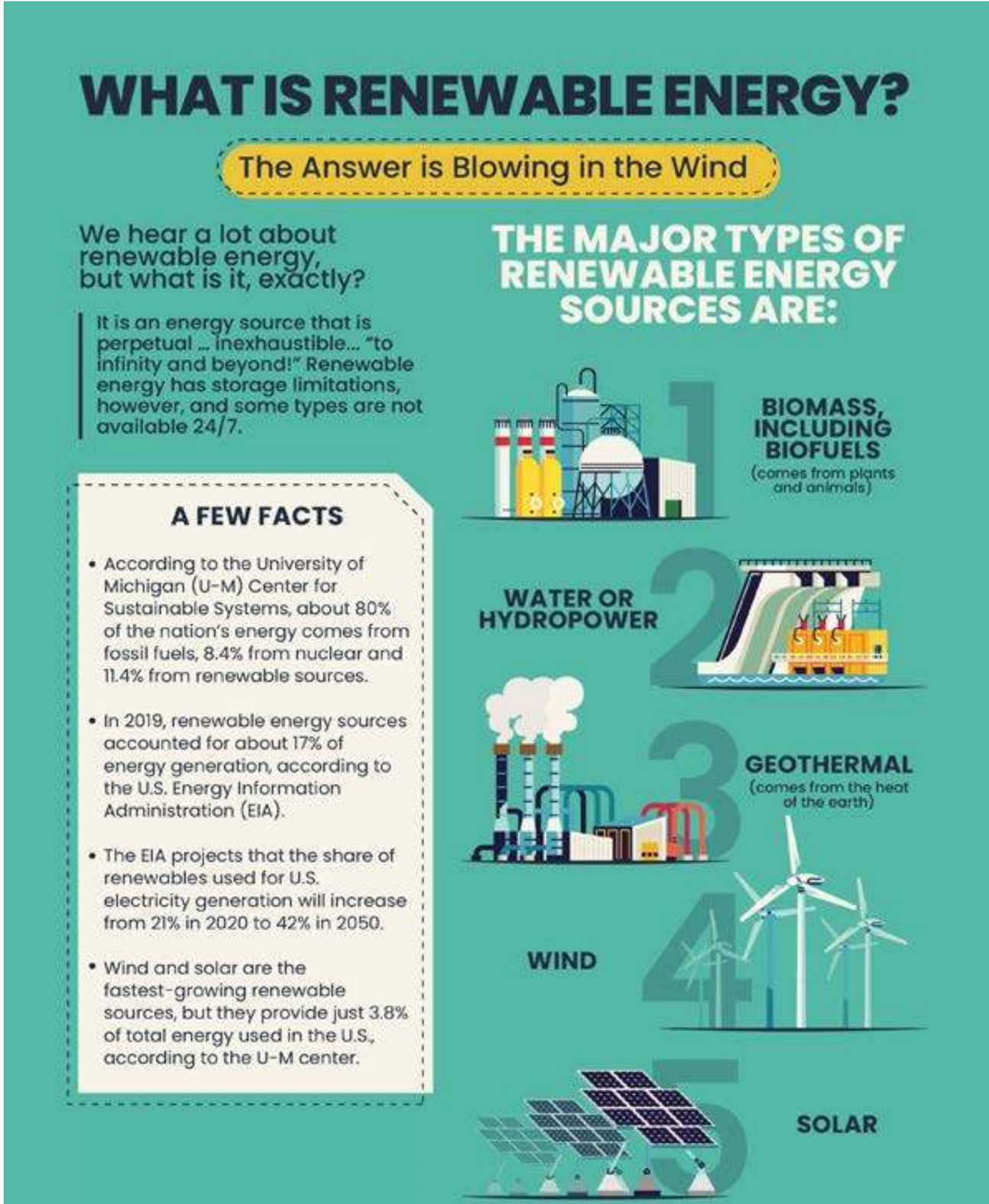
PAKISTAN'S INAUGURAL SOLAR SCHOOL PROJECT LAUNCHED AT BENCHMARK SCHOOL

The Pakistan-German Renewable Energy Forum (PGREF) and Benchmark School, in partnership with the Goethe Institut, celebrated the inauguration of Benchmark School as a Solar School. This event marked the official launch of the project, showcasing the successful installation of a solar system for teaching purposes and highlighting the significance of renewable energy and climate change awareness among Pakistani youth. The event brought together school management, dignitaries from Pakistan and Germany, students, teachers, and organizations from the public and private sectors involved in renewable energy.

Benchmark School's Principal, Ms. Kulsoom Tanvir, expressed pride in being Pakistan's first solar school and emphasized the project's goal of engaging youth in climate change and renewable energy topics. The solar school initiative aims to inspire young generations in countries with low renewable energy awareness, with specially designed solar systems integrated into school lessons. The project, funded by the German Federal Foreign Office since 2021, had already involved four schools in Uzbekistan and Kazakhstan before Benchmark School.

The event began with Benchmark School students welcoming guests and showcasing renewable energy projects, cultural products, and food. Ms. Kulsoom Tanvir led a tour of the rooftop solar system, followed by a ribbon-cutting ceremony by the chief guest, Mr. Shah Jahan Mirza, Managing Director. Project Manager Mr. Julian Scheider emphasized the project's role in integrating renewable energy into the school's curriculum.

Benchmark School students presented engaging performances, including songs, dances, and speeches in multiple languages. A panel discussion allowed students to interact with dignitaries, and Mr. Shah Jahan Mirza commended the German-Pakistan partnership and Benchmark School's role in this initiative. Ms. Amanda from the British Council congratulated Benchmark School for its pioneering role, while Ms. Maha from the Goethe Institut praised the collaborative efforts between Germany and Pakistan. The event concluded with a closing ceremony, honoring all participants. Students received certificates, and guests and project partners received souvenirs prepared by the students. Benchmark School expressed gratitude to all partners, supporters, and attendees for their contributions to sustainable education and clean energy, advancing towards a greener future.



IS YOUR SUSTAINABILITY-THEMED CAMPAIGN PUB-TEST APPROVED?

at the PUB

Politicians frequently apply the “pub test” to assess policies. However, can your sustainability campaign withstand this scrutiny? Will an average person at a local pub grasp its purpose and rationale? Do they believe you have the expertise to support it, or do they simply not care?

Brands are increasingly looking for ways to gain more exposure through sustainability initiatives in response to heightened customer expectations for sustainable products and services. Utilizing sustainability to distinguish your brand is a wise move. However, as we know, authenticity is not always ensured, which presents risks.

Today, most companies are delving into fundamental sustainability practices, and the looming threat of stricter regulations means more businesses will need to deepen their involvement.

Amidst a sea of environmental claims, standing out is challenging, and staying in the middle is costly.

It’s important to emphasize that standing out should be challenging. The climate crisis is no longer a distant concern; we are experiencing its effects now. The measures taken to mitigate global warming thus far, and the future plans, fall short.

The days when announcing a net-zero target would earn praise or win over customers are gone. Brands must think and act on a grander scale.

So, before you join the sustainability marketing trend with a “green” campaign, consider these three questions:

Asking yourself these questions and providing honest answers will prevent potential issues. We all appreciate campaigns that resonate with consumers on a deeper level, touching on subjects they care about. However, it’s crucial to ensure that such emotions do not turn into outrage when your sustainability proposition fails to meet public expectations.

RELATIONSHIPS

AN EXAMPLE: THE ‘PUB TEST’ HELPS YOU HAVE BETTER BUSINESS CONVERSATIONS

PUB QUIZ

WILL YOUR CAMPAIGN DRIVE CHANGE?

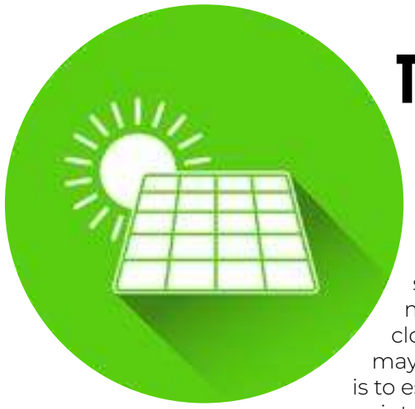
When your campaign launches, will it challenge the current state of affairs? Does it address a problem or behavior, offer solutions or education, and provoke thought? If it merely exploits a weak link to boost sales, it will likely fail or face criticism.

WHAT IMPACT WILL YOUR BRAND’S VOICE HAVE IN THE CONVERSATION?

If you have a robust, sustainability-focused campaign idea, assess whether your brand should be its face. With consumers increasingly skeptical of corporate sustainability claims, authenticity is paramount. Consider how your brand’s voice contributes to the broader dialogue and builds consumer trust. Are your actions aligned with your sustainability rhetoric?

HOW SUSTAINABLE IS YOUR PRODUCT OR SERVICE?

Are there tangible evidence and credibility behind the claims made in your campaign? While your company may operate on a circular business model or enable consumers to be more sustainable, true sustainability cannot exist within an unsustainable system. Do your communication and claims acknowledge the long road ahead?



THE MOST EFFICIENT SOLAR PANELS OF SEPTEMBER 2023

Tied for the top spot in overall performance are Canadian Solar and SunPower. These two companies offer the most efficient solar panels currently accessible to residential customers, boasting maximum efficiency ratings of 22.8%. While other companies are in close pursuit, focusing on efficiency during your solar panel shopping may not be the top priority for most individuals. However, if your goal is to establish the most efficient solar system possible, here's a starting point.

UNDERSTANDING SOLAR PANEL EFFICIENCY:

Solar panels may initially appear uniform, but they exhibit distinctions in several aspects. One significant aspect is their efficiency rating, which gauges the extent to which a panel's solar cells convert sunlight into usable electricity. Higher-efficiency solar panels outperform their less efficient counterparts, generating more electricity when exposed to the same amount of sunlight.

As Daniel Ciolkosz, a professor of agricultural and biological engineering at Pennsylvania State University, explains, "If something is 20% efficient, that means that 20% of the energy in the sunlight reaching the solar panel is converted into electrons in motion." This underscores the importance of efficiency when assessing solar panel options.

BALANCING FACTORS IN SOLAR PANEL SELECTION:

When choosing the most suitable solar panels for your residence, it necessitates a careful equilibrium among various factors. These considerations encompass the cost of the panels, their efficiency, and even their visual appeal. Additionally, your choices may be contingent on the offerings provided by your selected solar installer.

SUNPOWER M SERIES 440-WATT

SunPower, renowned for its leadership in solar panel efficiency, introduces the M Series 440-watt panel.

SunPower's suite of panels maintains an overall higher efficiency rating than any other manufacturer.

CANADIAN SOLAR HIHERO 445-WATT

Canadian Solar's HiHero 445-watt panel matches SunPower's efficiency benchmark, marking a significant achievement in solar panel technology.

Notably, this panel boasts a temperature coefficient of -0.26%, ensuring consistent high-level performance even in elevated temperatures.

REC ALPHA PURE 430-WATT

REC's Alpha Pure panel stands out with the best temperature coefficient for panel power at -0.24%.

This feature enables the panel to retain more production efficiency when exposed to higher temperatures compared to its counterparts.

JINKO SOLAR TIGER NEO 445-WATT

The Tiger Neo panel by Jinko Solar impresses with an efficiency rating of 22.27%.

It maintains a temperature coefficient of -0.29%, further enhancing its appeal for high-performance solar installations.

LONGI HI-MO 6 565-WATT

The Hi-MO 6 Longi 560 watt to 580 watt LR5-72HTH. 560~575M is a 565W monocrystalline Dual Glass module and 144 (6*24) cells from Longi Solar, one of the world's leading manufacturers of the photovoltaic industry. Longi Hi-mo 6 solar panels come with a 15-year product warranty and a 25-year Extra linear power warranty.

Longi Solar Panel Hi-Mo 6 565 watt Ideal for both off-grid and grid-connected photovoltaic solar energy installations.

THE EVOLVING LANDSCAPE OF SOLAR EFFICIENCY

Determining the highest solar panel efficiency has become more accessible through manufacturer-provided data sheets and efficiency ratings.

The efficiency of solar panels has witnessed a steady increase over the years, as highlighted by the Lawrence Berkeley National Laboratory's Tracking the Sun report.

In 2021, more than half of residential solar panels installed in the US had efficiency ratings above 20%, reflecting the growing prevalence of high-efficiency solar panels.

EVALUATION OF OTHER SOLAR PANELS

For those seeking the most efficient solar panel for their residential or commercial roofs, it is essential to compare the leading brands in the market.

A detailed assessment of various solar panel options is necessary to make an informed decision regarding efficiency, performance, and suitability for specific installation requirements.

STRATEGIC PARTNERSHIP

LONGI SOLAR AND ENERCITY JOIN FORCES TO SUPPLY HI-O 6 MODULES TO END CUSTOMERS

The objective of this partnership is to ensure a consistent provision of top-tier solar modules tailored for photovoltaic needs within the residential customer segment, catering to both new installations and existing systems. The exceptional efficiency, reliability, and cost-effectiveness of the Hi-MO 6 modules are attributed to the innovative back contact technology (HPBC), marking a significant milestone in LONGi's expansion of the Hi-MO 6 module within the European market

Nick Wang, Vice President of LONGi Europe Distributed Generation (DG), expresses, "Through our collaboration with enercity, we've found a determined partner with whom we can propel the energy transition across multiple fronts. Together, we are charting a clear path in the PV end-customer applications market, delivering solar technologies that offer tangible economic benefits to consumers." The Hi-MO 6 module, designed specifically for rooftop installations, is a testament to this commitment. Enercity, headquartered in Hanover, expands its product portfolio for solar power generation with high-quality components, a direct outcome of its partnership with LONGi. Dr. Susanna Zapreva, enercity's CEO, emphasizes the importance of quality, efficiency, and aesthetics as key differentiators. She notes, "Our customers gain access to a stream of reliable and highly efficient solar technology. With an annual energy yield that's five percent higher and an extended product warranty of 10 years, we offer an unmatched product to our customers." Furthermore, customers will now benefit from 25 years of high technical performance, a significant increase from the standard 15-year warranty prevalent in the end-customer sector. SchwörerHaus, enercity's partner, plays a crucial role in this success story. Customers of SchwörerHaus, a provider of top-tier prefabricated houses, now have the opportunity to customize their photovoltaic systems through enercity, tailoring them to their homes. Going forward, both new and existing customers of SchwörerHaus can exclusively purchase cutting-edge solar energy systems for new and existing buildings through enercity.

HI-MO 6 MODULES MAKE THEIR DEBUT IN THE EUROPEAN MARKET

LONGi's partnership with enercity represents a significant milestone in the introduction of the Hi-MO 6 module to the European market. Gerald Müller, Sales Director of LONGi for the DACH region, notes, "The demand for modules with back contact technology is increasing significantly. This means that LONGi is now making a new premium technology for solar cells suitable for mass production. Until now, manufacturing back contact technology cells has been very cost-intensive and complex." He further explains, "The increased demand can be attributed, firstly, to the higher efficiency and reliability compared with other modules and, secondly, to the aesthetic appeal."
The design of the Hi-MO 6 module is defined by its technology. Notably, it features a busbar-free front view, giving it a sleek and minimalist appearance, addressing the rising aesthetic preferences of end users for solar modules. The obsidian-black variant of the Hi-MO 6, in particular, stands out for its elegance and popularity among end customers.

HI-MO 6: CUTTING-EDGE SOLAR MODULES OFFERING HIGH PERFORMANCE AND LONGEVITY

Within the framework of their strategic partnership, enercity will have guaranteed access to LONGi's top-performing PV modules from the Hi-MO 6 series. The Hi-MO 6 relies on advanced back contact technology known as HPBC (Hybrid Passivated Back Contact), a manufacturing process adopted by only a select few solar energy companies due to its intricacy and costliness. This technology boasts exceptional efficiency, delivering impressive performance even under low light conditions. Its absence of busbars and connections on the front side not only enhances efficiency but also augments the module's reliability and visual appeal. With a module efficiency rating of up to 23.3% and a remarkable module output of 88.9% after 25 years, the Hi-MO 6 stands as the epitome of next-generation solar modules.

RENEWABLE ENERGY

The facts, figures and statistics you need to know about our growing renewable energy sources.

2017 WAS THE GREENEST YEAR ON RECORD

21 APRIL

The first day since 1882 that the UK was **coal free**

Greenest summer ever!

52%

of electricity generated came from low carbon sources

19.2 GW

The **largest amount of electricity produced** from renewable sources (21 March)

40 HOURS 35 MINS

The **longest period without coal generation** in 2017 (October)

RENEWABLES ACCOUNTED FOR **30%** OF ELECTRICITY GENERATED IN 2017

WIND POWER

60 MINUTES

CHINA INSTALLS **one wind turbine every hour**

ONE WIND TURBINE can generate enough electricity to power up to **1,400 HOMES**

Wind speed needs to be **14mph** to convert wind

How do wind turbines work?

Wind turns the long blades on the turbine. **The movement of the blades spins a generator and it produces electricity**

Wind turbines can generate electricity **for 20-25 years**

Turbines can run continuously for **120,000 HOURS**

(a car has a lifetime of up to 6,000 hours)

The largest wind turbine is in **HAWAII**

It is **20 stories tall**, with blades as long as a **football pitch**

SOLAR POWER

The **cost of solar** power has dropped **90%** globally since 2009

The first solar cells were available to to buy in **1956**

How does solar power work?

Solar panels have photovoltaic (PV) cells, which **convert the suns energy into electricity**

Currently, in the UK **1.5 MILLION HOMES** have solar panels installed

709,000 new solar panels were installed in homes, workplaces and solar farms in 2017

The United Kingdom is installing solar panels **faster than any other European country**

Solar panels can last up to **20 years**

HYDRO POWER

IN NORWAY 20 hydro power stations produce 99% of the nation's total energy

Hydro power stations have a lifetime of over **100 YEARS**

How does hydro power work?

It uses **the movement of water to create electricity**. For example, it will release the water collected in a dam, as it flows, **the water will turn turbines that are connected to a generator, which then generates electricity**

The amount of power generated, depends on the amount of rainfall

THE MORE RAIN = THE MORE POWER

There are **838** Hydroelectric power schemes across the UK

over 65% of hydro power stations in the UK can be found in mountains and hills **IN SCOTLAND**

WORLDS LARGEST RENEWABLE SITES

OFFSHORE WIND

London Array in the United Kingdom is the largest offshore wind farm in the world, at **630 MW**

ONSHORE WIND

Gansu Wind Farm in China is the largest onshore wind farm at **7,965 MW**

SOLAR FARMS

Tengger Desert Solar Park in China is the largest solar farm at **1,547 MW**

HYDRO POWER STATIONS

Three Gorges Dam in China has the largest generating capacity at **22,500 MW**

Cover Story.

PSW 2023 A SUCESS!

The Pakistan Sustainability event garnered international acclaim by engaging solar industry professionals. This significant conference revolved around the core theme of sustainability and took a unique approach by hosting a competition where students hailing from diverse universities displayed their innovative projects. The event not only provided a platform for knowledge sharing and collaboration among industry experts but also offered an opportunity for budding talents to demonstrate their creative solutions and commitment to sustainability. The fusion of industry expertise and academic enthusiasm made the Pakistan Sustainability event a remarkable gathering that contributed to the promotion of sustainable practices and solutions in the field.

PAKISTAN SUSTAINABILITY WEEK

THE RENEWABLE ENERGY INDUSTRY TRIUMPHS AT PSW 2023

From the 7th to the 9th of September, the Expo Center in Karachi was abuzz with innovation and enthusiasm as it played host to the much-anticipated Pakistan Sustainability Week Exhibition. This three-day event brought together industry leaders, government representatives, researchers, and the public to celebrate and promote sustainable practices in the domains of energy and environmental conservation.

The event was marked by two main events, Solar Pakistan and Electricity Pakistan, which were designed to showcase the latest advancements and breakthroughs in the fields of solar energy, electricity generation, and conservation methods. The amalgamation of these two key events created a dynamic platform that explored the synergies between renewable energy and efficient electricity management.

A significant highlight of the Pakistan Sustainability Week was the impressive turnout of participants and visitors. The event drew attention from various sectors, including businesses, academics, and environmental enthusiasts, reflecting a growing awareness and interest in sustainability and green technologies in Pakistan.

One of the standout features of the exhibition was the SOLECT competition, which provided a unique opportunity for the youth to showcase their innovative and sustainable projects. Teams from over 10 universities across the country enthusiastically participated in this competition, displaying their independent projects that aimed to address various energy and environmental challenges.

The SOLECT competition was not merely a demonstration of cutting-edge technology but also a testament to the passion and commitment of the young generation in Pakistan towards creating a more sustainable future. These projects ranged from solar-powered water purification systems to smart grids for efficient electricity distribution. The competition fostered an environment of healthy competition and collaboration, enabling students to exchange ideas and experiences in the pursuit of sustainable solutions.

The Exhibition served as a valuable platform for networking, knowledge exchange, and collaboration. It brought together experts, policymakers, industry leaders, and the youth to discuss and address the pressing sustainability issues facing Pakistan today. The event highlighted the potential of renewable energy, efficient electricity generation, and sustainable practices in meeting the country's energy demands while reducing its carbon footprint.


PAKISTAN
SUSTAINAB
WEEK


PAEA
SOLAR
SUSTAINABILITY INNOVATION SUMMIT

SOLECT

A BRIDGE FOR THE YOUTH TO EXCEL

STUDENTS AT NUST TURN HEADS WITH PROJECT ENVISION

Established in 2009, Team Envision is comprised of undergraduate students driven by a passion for engineering and a resolute commitment to addressing pressing energy and climate challenges. Each year, the team undertakes the design and construction of vehicles in two categories: electric and internal combustion engines, with a keen focus on optimizing fuel efficiency and environmental sustainability, thereby contributing to pollution reduction and the preservation of natural resources. Team Envision actively participates in prestigious international competitions, including the Shell Eco-Marathon and Teknofest.

Remarkably, Team Envision has consistently distinguished itself in the Shell Eco-Marathon arena, earning the coveted Communications Award three times (2014, 2017, 2022) in recognition of their exceptional outreach initiatives. Their unwavering dedication extends to technical innovation, exemplified by their pioneering introduction of piezoelectric tires in 2015, and their noteworthy runner-up placements in 2018 and 2019. Furthermore, they have garnered acclaim for their vehicle design prowess, achieving significant milestones such as a 2nd-place finish in the 2016 SEM Dream Car competition and securing the Telenor Internet of Things Award in the same year. Their illustrious track record spans a commendable range, with positions ranging from 6th to 12th in both urban and prototype concept categories.

In October 2022, Team Envision unveiled their latest groundbreaking prototype vehicle, the Evo-X, as a testament to their ongoing commitment to developing highly efficient and environmentally friendly vehicles. Operating at a nominal voltage of 48 volts, the Evo-X boasts a capacious 10.4 ampere-hours (Ah) battery, equivalent to 0.5 kilowatt-hours (kWh) of stored energy. This innovative battery configuration, comprising 13 series and 4 parallel cells, empowers the Evo-X with an extraordinary minimum mileage of 200 km/kWh and an impressive range extending to 100 kilometers on a single charge. The vehicle's robust yet lightweight spaceframe chassis, meticulously crafted from mild steel, establishes a solid foundation. Complementing this chassis is an avant-garde and aerodynamically designed body, painstakingly fashioned from glass-fiber material, yielding an exceptional low drag coefficient of 0.21, thus markedly augmenting overall efficiency.

The Evo-X is all set to compete in the prototype battery electric category at the Shell Eco-Marathon, continuing Team Envision's legacy of innovation and dedication to sustainability. Their unwavering commitment to pushing the boundaries of eco-friendly vehicle design not only serves as an exemplar but also actively contributes to the advancement of positive change, both within Pakistan and on the global environmental stage.

ZIAUDDIN: RENEWABLE ENERGY GENERATION USING VERTICAL AXIS WIND TURBINE

Renewable energy sources are essential for addressing the global climate crisis and achieving sustainable development. Wind energy is a promising renewable energy source with significant potential, particularly in urban and remote areas. Vertical axis wind turbines (VAWTs) have garnered attention due to their ability to harness wind from any direction and operate at low wind speeds. This project was motivated by the increasing demand for decentralized and environmentally friendly energy solutions and has been successfully completed in the Department of Electrical Engineering, primarily focusing on United Nations Sustainable Development Goals SDG-7: Affordable and Clean Energy and SDG-9: Industry, Innovation, and Infrastructure. VAWTs offer several advantages over conventional horizontal axis wind turbines (HAWTs), including their suitability for urban environments and low wind speeds.

The research methodology adopted a multidisciplinary approach, combining theoretical analysis, computational simulations, and practical experimentation. Initial design parameters were established using aerodynamic principles and computational fluid dynamics (CFD) simulations. Subsequently, a small-scale prototype underwent rigorous testing, generating performance data at various wind speeds and angles. The study provided valuable insights into the performance of the small-scale VAWT prototype, demonstrating improved efficiency and power generation capabilities compared to conventional designs. These findings were supported by simulations, offering a deeper understanding of flow patterns and forces affecting the turbine blades. The research unveils a novel small-scale VAWT design with potential applications in urban and low-wind-speed environments, emphasizing

enhanced efficiency and cost-effectiveness. These findings contribute significantly to the scientific community's comprehension of VAWT technology, providing a sustainable energy solution for regions with limited access to traditional power sources.

The study effectively bridges the gap between theoretical design and practical VAWT implementation, offering invaluable insights into their potential as a renewable energy source. These findings hold implications for urban planning, rural electrification, and the global development of sustainable energy solutions, underscoring the significance of continued wind energy research. This research project has made significant contributions to the advancement of VAWT technology, unveiling a novel design with enhanced efficiency and cost-effectiveness for urban and low-wind-speed environments. These findings offer valuable insights for the development of sustainable energy solutions, highlighting the potential of VAWTs to meet the growing demand for decentralized and environmentally friendly energy.
The "Renewable Energy Generation using Vertical Axis Wind Turbine" project won second prize in the Alternative Energy Project at Pakistan Sustainability Week, held from September 7 to 9, 2023 at the Karachi Expo Centre.

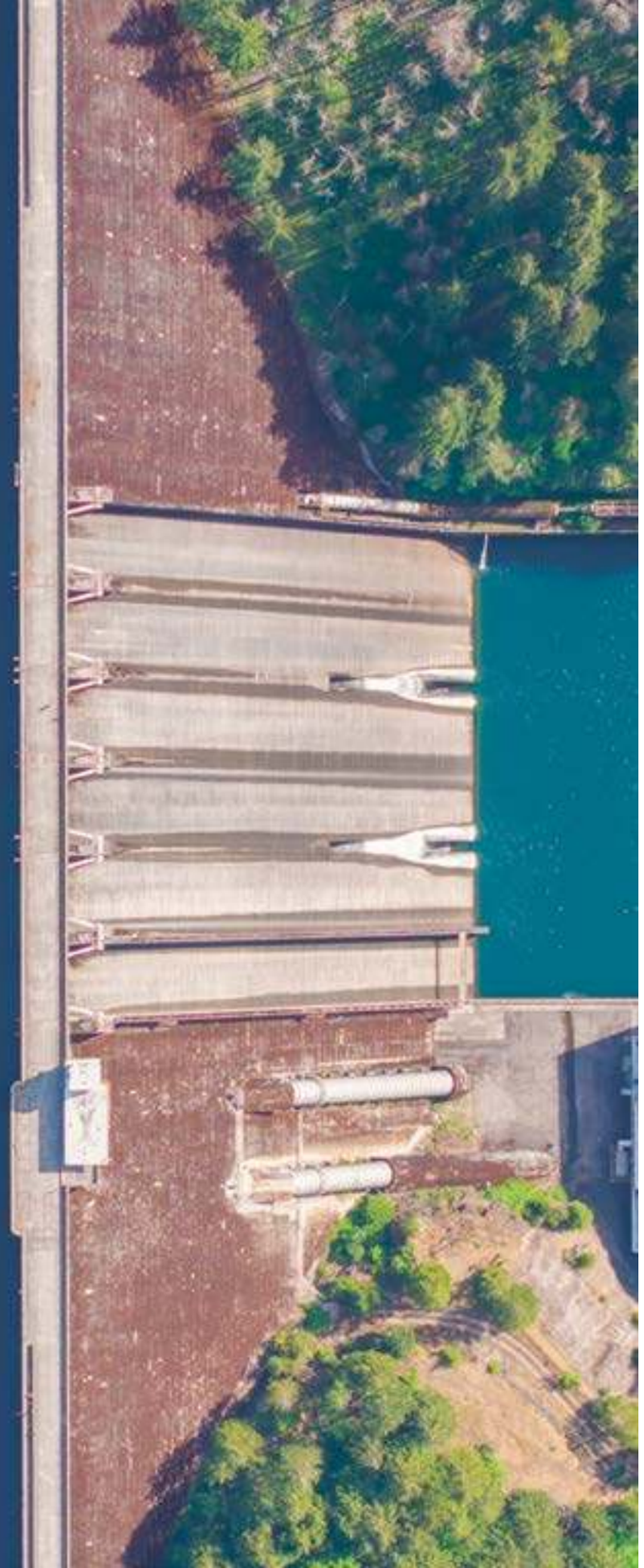
UIT UNVEILS HYDRO POWER GENERATION BASED ON ARCHIMEDES SCREW

Archimedes Screw Generators (ASGs) are a highly efficient and environmentally friendly method of generating hydroelectricity, particularly suitable for sites with low head and moderate flow. This paper explores their potential for rural electrification in developing regions with reliable low head water resources. Archimedes, renowned for his innovative work in 250 BC, introduced the concept of the screw. Initially used as a water system conveyor to elevate water to higher levels, the Archimedes screw consists of a helical arrangement of blades around a central barrel, resembling a wood screw. When adapted as a hydroelectric turbine, it operates in reverse, primarily serving low head/high flow sites efficiently, sometimes even with as low as a 1-meter head. ASGs are hailed as one of the most environmentally friendly hydropower turbine options, offering a unique operational range for low head situations and favorable capital and operational costs. In contrast to wind turbines, which typically reach efficiencies of up to 40%, Archimedes turbines boast at least 70% efficiency in hydroelectric generation.

Recent years have witnessed significant research and development in the sustainable energy sector, driven by the imperative to reduce emissions and establish a carbon-friendly environment. Archimedes Screws have gained prominence globally, finding applications in countries such as the United States, the United Kingdom, Germany, Australia, among others. In the United States,

Archimedes Screws are employed in various settings, including hydroelectric power plants and fish passage systems. These turbines consist of a cylindrical structure encased with helical screws, as depicted in Figure 1 and Figure 2. (Figures 1 and 2 are provided for visual reference of an Archimedes Screw Turbine)
The primary objective of this project is to facilitate the transition of Pakistan towards sustainable and environmentally friendly energy solutions. Pakistan faces a severe energy crisis, and embracing green energy is a promising way to address this challenge. The global effort to combat climate change necessitates prioritizing renewable energy sources. Furthermore, this project aims to address the energy deficit in northern Pakistan, where inadequate transmission systems hinder energy access. The region is abundant in rivers, presenting an opportunity to harness energy from these resources.

WE ARE LIKE TENANT FARMERS
CHOPPING DOWN
THE FENCE AROUND OUR
HOUSE FOR FUEL WHEN WE
SHOULD BE USING NATURE'S
INEXHAUSTIBLE
SOURCE OF ENERGY
SUN, WIND AND TIDE
WHAT A SOURCE OF POWER! I HOPE
WE DON'T HAVE TO WAIT UNTIL
OIL AND COAL RUN OUT BEFORE
WE TACKLE THAT



The Intergovernmental Panel on Climate Change (IPCC) does not mince its words when describing the disastrous effect that humans are having on the planet. "It is unequivocal that human influence has warmed the atmosphere, ocean, and land," reads its latest report.

From heat waves and wildfires to downpours and flooding, 2023 has given us a taste of the impacts we can expect over the coming decades and centuries. In short, it's not good news. Without very significant reductions in greenhouse gases—beginning immediately—it is very likely that global surface temperatures will exceed the 1.5 degrees Celsius threshold set in the 2015 Paris climate agreement.

Even if we do curtail emissions, sea levels will almost certainly continue to rise throughout this century and may continue to rise for centuries or millennia beyond that. Extreme weather events have become more frequent since 1950 and will become more frequent and more severe as global temperatures increase.

The message could not be clearer: We need to do everything we can to reduce our greenhouse gas emissions right now. Unless we take major action to stop emissions, we're facing an Earth that is hotter, plagued by more extreme weather, and less hospitable than the already-warmed planet we have today.

Dialogue.

In this edition, we interviewed Prof. Vali Uddin from UIT to gain insights into the academic landscape of Pakistan, particularly in the realm of renewable energy. His expertise shed light on the developments and challenges in the field of academics and sustainability in Pakistan

INTERVIEW WITH PROF. DR. VALI UDDIN

VICE CHANCELLOR,
SIR SYED UNIVERSITY OF ENGINEERING & TECHNOLOGY, KARACHI

What strategies and initiatives are universities around the world and in Pakistan implementing to embed sustainability principles into their curricula, research, and campus operations, and what evidence exists to support the effectiveness of these efforts?

Universities globally, including those in Pakistan, are actively integrating sustainability principles into their academic, research, and operational realms to address critical environmental and social challenges. This collective endeavor underscores the significance of sustainability. Universities have embraced a multifaceted approach, encompassing sustainability-focused courses, interdisciplinary education, and the establishment of dedicated research centers. Empirical evidence reveals that students exposed to sustainability education tend to develop heightened environmental awareness, incorporating sustainable practices into their personal and professional lives. Notably, university-based research has contributed groundbreaking innovations in renewable energy, environmental conservation, and agriculture. Moreover, campuses are evolving to meet green building standards, reducing energy consumption and waste, yielding cost savings and enhanced environmental stewardship.

Collaborative initiatives with local communities, businesses, and NGOs, alongside awareness

events, extend the influence of these sustainability practices. Transparency is ensured through sustainability reporting, aiding in progress monitoring, target setting, and stakeholder engagement. Encouraging student-led sustainability initiatives and formalizing sustainability within governance structures reinforce a sense of ownership and

How can academic institutions collaborate with local communities, governments, and industry partners to advance sustainability goals and address regional environmental and social challenges, and what are some successful examples of such partnerships?

Academic institutions can foster regional sustainability and tackle environmental and social challenges through collaboration with local communities, government bodies,

Innovative Solutions and Best Practices

Universities create on-campus living laboratories where students and researchers can develop and test sustainable solutions in real-world settings, allowing for hands-on learning and impactful research.

Establish funds or endowments dedicated to sustainability initiatives, using a portion of the investment returns to finance projects, ensuring ongoing funding for sustainability efforts.

How can universities measure and assess their progress toward sustainability goals, and what role does academic research play in developing metrics and evaluation frameworks to ensure universities' ongoing commitment to sustainability?

Universities gauge sustainability progress through established reporting frameworks like STARS and GRI, while academic research continually enhances these tools with emerging sustainability insights. Key Performance Indicators (KPIs) are tailored to the university's sustainability targets, informed by research. Benchmarking against peers identifies areas for growth, supported by academic research

provide a structured framework for decision-making and resource allocation. However, the effectiveness of these strategies depends on individual university commitment, available resources, and specific local contexts. Ongoing assessment and improvement are vital for sustaining these initiatives in higher education.

and industry partners. Successful examples of such partnerships include joint research projects addressing regional environmental issues, educational programs for community engagement, internships focusing on sustainability-related projects, contributions to regional policies, technology transfer support, sustainable campus practices, community-driven research, and advisory boards to ensure alignment with regional priorities. These partnerships empower universities to play a pivotal role in promoting sustainability within their regions and equipping graduates for sustainable careers.

Universities adopt sustainability certification programs (e.g., AASHE STARS) to benchmark their sustainability efforts, set goals, and track progress, providing a structured framework for improvement.

Develop online platforms or apps that facilitate collaboration between the university and the community, enabling citizens to contribute to sustainability efforts, provide input on projects, and access resources.

data. Surveys collect qualitative feedback from stakeholders, and academic research aids in survey design and analysis.

Researchers evaluate the effectiveness of sustainability initiatives and identify emerging trends. Collaborative assessment engages diverse perspectives, with research contributing insights into effective stakeholder engagement. Longitudinal studies track progress over time, drawing from academic research for in-depth analysis and recommendations. In sum, academic research underpins universities' ability to measure and improve sustainability efforts, promoting data-driven strategies and a steadfast commitment to sustainability.

IGEM
Date: 2 - 5 November, 2023
Venue: Kuala lumpur Convention Center Malaysia

WETEX & DSS
Date: 15 - 17 November, 2023
Venue: Dubai World Trade Centre (DWTC)

Pakistan Sustainability Week
Date: 27 - 29 February 2024
Venue: Expo Center, Lahore Pakistan

Intersolar South America
Date: 19 – 21 June, 2024
Venue: Messe, München

Solar Pakistan
Date: 27 - 29 February 2024
Venue: Expo Center, Lahore Pakistan

ASEAN Sustainable Energy Week
Date: 5 – 3 July, 2024
Venue: Bangkok, Thailand

Electricity Pakistan
Date: 27 - 29 February 2024
Venue: Expo Center, Lahore Pakistan

RE+
Date: 9 – 12 September, 2024
Venue: ANAHEIM, CA

PAKISTAN SUSTAINABILITY WEEK

AN EVENT ON ALTERNATIVE ENERGY

27 | 28 | 29	09 | 10 | 11	26 | 27 | 28
FEB 2024	**MAY 2024**	**SEP 2024**
LAHORE EXPO CENTRE	ISLAMABAD PAK CHINA FRIENDSHIP CENTRE	KARACHI EXPO CENTRE

The Largest Sustainability & Clean Energy Technology Exhibition & Conference

fakt

Phone: (+92) 21 35810637 - 39
Email: enquiry@pakistansustainabilityweek.com
Web: www.pakistansustainabilityweek.com

ALONGSIDE

SOLAR® PAKISTAN

ELECTRICITY® PAKISTAN
ENERGY | STORAGE | POWER