

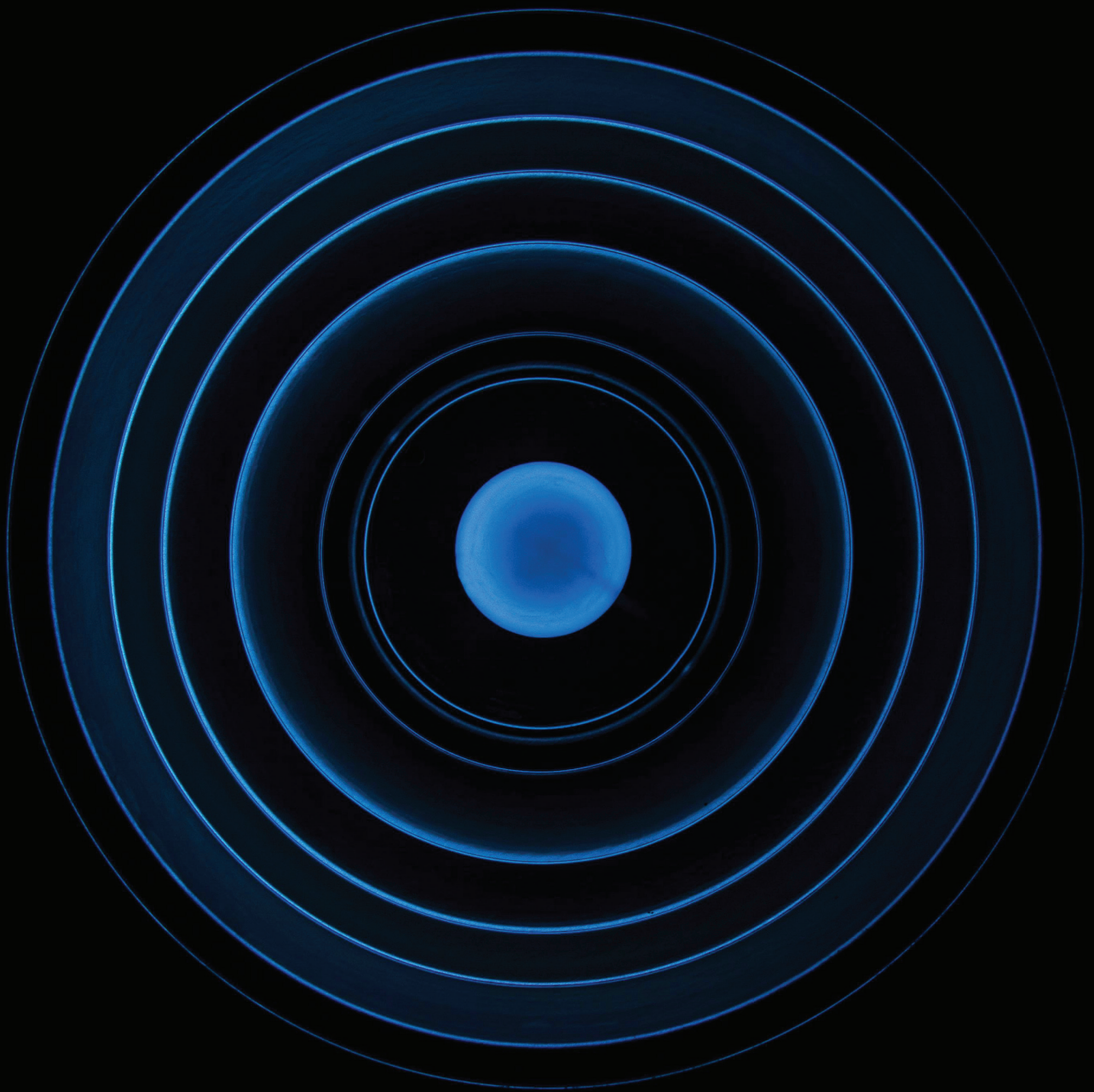
MAY/JUN
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Journal

Close that door...





ENERGY IS POWER

MOVING TOWARDS SUSTAINA- BILITY

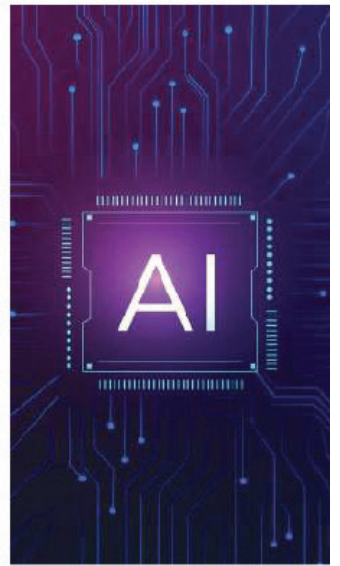


Moving towards sustainable living is not just an ecological obligation; it's a compassionate choice that benefits both us and our planet. Sustainability ensures that we leave a healthier, more harmonious world for future generations. By reducing our environmental footprint through responsible consumption, 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



EDITOR'S NOTE	01
LOCAL SCOOP	02
Regional developments in the industry	
GLOBAL SCOOP	18
Learn about the latest industry news around the world	
HAPPENINGS	26
Current affairs about clean energy and more	

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EDITOR'S NOTE

As I welcome you to this latest edition, I am filled with optimism about the future of Pakistan's solar industry. The momentum we are witnessing today is unlike anything before. Across our cities, industries, farms, and homes, solar energy is no longer viewed as an alternative—it has become an essential part of Pakistan's energy landscape. This remarkable shift reflects not only the growing demand for reliable and affordable electricity but also the resilience and innovation of an industry determined to power the nation's future.

This edition celebrates the people and organizations leading that transformation. From manufacturers, EPC companies, and technology providers to policymakers, investors, and renewable energy advocates, every stakeholder has a role in shaping a cleaner, more sustainable Pakistan. Through exclusive interviews, market insights, project features, and expert analysis, we strive to provide a trusted platform that keeps our readers informed and connected to the latest developments across the sector.

While challenges remain—from policy consistency and grid modernization to financing and infrastructure—they also present opportunities for innovation, collaboration, and long-term growth. I firmly believe that with the collective efforts of industry leaders and policymakers, Pakistan can unlock its tremendous solar potential and strengthen its energy security for generations to come.

With that I hope we see a brighter future ahead.

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.



ESTONIAN POWER GRID OPERATORS ANNOUNCE NEW DEVELOPMENT PLAN

The Estonian national transmission system operator Elering and the distribution network operator Elektrilevi have unveiled a joint development plan through 2040. This is the first integrated long-term vision for the country's electricity infrastructure.

The collaborative strategy aims to modernise the grid by addressing consumption shifts, urban circumstances, suburbanisation and the integration of new energy technologies. The companies expect to generate a social cost saving of at least 54 million euros with coordinating the efforts between the main transmission system and the distribution network.

The plan outlines significant infrastructure upgrades over the next five years. These

investments are projected to increase the consumption and production capacity of the networks by 400 megawatts. Key focus areas include high-density regions such as Tallinn, Tartu, and Pärnu, where peak loads are rising most rapidly. The project will also free up approximately 260 kilometres of land currently occupied by overhead power lines.

"I believe that through the cooperation of the two companies, we will find the best solutions for Estonia," Mihkel Härm, the Chairman of the Board at Elektrilevi. "There are plans to update the development strategy every two years. I highly praise the strong project team who developed this plan."



Pakistan, Canada Discuss Concerns Over Canadian Investments

Canadian High Commissioner to Pakistan, Tarik Ali Khan, has voiced serious concerns over the treatment of Canadian investments in Pakistan's renewable energy sector during a meeting with Federal Minister for Commerce Jam Kamal Khan.

The discussion centered on strengthening bilateral cooperation across a wide range of areas, including trade, investment, mining, agriculture, energy and emerging sectors. Coordinator to the Prime Minister for Commerce, Rana Ihsaan Afzal Khan, was also in attendance.

Both sides reviewed the changing global economic environment and emphasized the importance of flexible and forward-looking trade strategies in response to shifting supply chains and ongoing geopolitical developments.

The Federal Minister reiterated Pakistan's commitment to broadening its international partnerships and attracting high-quality foreign investment, particularly in value-added industries and export-driven sectors.

Collaboration in mining and minerals emerged as a key area of focus. Jam Kamal Khan highlighted Pakistan's growing interest in developing small- and medium-scale mining projects and underscored the need for advanced exploration methods, technical surveying expertise and strong governance frameworks. In response, the Canadian High Commissioner pointed to Canada's global standing in mining services and exploration technologies, expressing readiness to support Pakistan through capacity-building efforts, technical cooperation and business-to-business linkages.

In this regard, both sides discussed Pakistan's participation in the Prospectors & Developers Association of Canada (PDAC) conference in Toronto, with an emphasis on connecting Pakistani mining stakeholders with reputable Canadian exploration firms and service providers.

Agricultural cooperation was also reviewed, particularly following the resumption of Canadian canola exports to Pakistan. The two sides welcomed the successful arrival of initial shipments and agreed to work jointly to resolve regulatory and procedural hurdles to ensure timely and efficient imports. The Federal Minister noted the strategic importance of canola for Pakistan's edible oil and livestock feed industries and expressed interest in expanding collaboration in agriculture, agribusiness and food security.

The talks further explored potential cooperation in the dairy and livestock sectors, including animal genetics, modern dairy farming practices and disease-control systems aimed at improving productivity and quality standards.

On the energy front, the Canadian High Commissioner raised concerns regarding Canadian investments in renewable energy projects in Pakistan, stressing the need for regulatory certainty and timely approvals to maintain investor confidence. Progress on the Pakistan–Canada Bilateral Investment Treaty (BIT) was also reviewed, with both sides agreeing on the importance of sustaining momentum in negotiations to facilitate increased Canadian investment.

Under the proposed Prosumer Regulations 2025, Nepra plans to repeal the Alternative and Renewable Energy Distributed Generation and Net Metering Regulations of 2015. The revised framework aims to strike what the regulator describes as a “balance” between consumer relief and utility sustainability — allowing households to shield themselves from unaffordable tariffs without turning net metering into a profit-making venture.

A key proposal would restrict prosumers from installing solar systems exceeding their sanctioned load, effectively cutting allowable capacity by up to 50 per cent. For example, a consumer with a sanctioned load of 10 kilowatts would be limited to installing a 10kW solar system. Currently, prosumers are permitted to install up to 150 per cent of their sanctioned load, enabling a 10kW consumer to deploy a 15kW system. Existing net-metering consumers would remain unaffected until the expiry of their current seven-year agreements, after which the new rules would apply.

The revised regulations would cover installations ranging from one kilowatt to one megawatt, bringing all such systems under Nepra’s direct regulatory and licensing authority. At present, systems below 25kW are licensed by distribution companies.

Another proposed change would shorten the duration of net-metering contracts from seven years to five, with any renewal for an additional five-year term subject to mutual consent between the consumer and the distribution company, without any binding obligation.

Significant revisions are also planned for compensation of surplus electricity supplied to the

grid. Instead of the current rate of approximately Rs26 per kilowatt-hour, prosumers would be paid the national average energy purchase price — estimated at around Rs13 per unit.

Additionally, the billing mechanism would transition from net metering to net billing. Electricity imported from the grid would be charged at the applicable consumer tariff, while exported electricity would be credited at the national average energy purchase price. Any excess credits could be carried forward or settled on a quarterly basis.

These proposals come despite Nepra’s own acknowledgment that the quality of service provided by distribution companies remains below acceptable standards. The regulator has noted that heavy taxes, levies and surcharges have inflated electricity prices, driving consumers towards decentralised and off-grid energy solutions and weakening demand for grid-supplied power. According to Nepra, on-grid solar installations have surpassed 6,000 megawatts, while total solar capacity — including off-grid systems — has crossed 13,000MW.

The draft regulations also seek to introduce clearer procedures, stricter technical standards and a revised billing methodology to better integrate small-scale renewable generation into the national grid while maintaining overall system stability.





PAKISTAN IMPOSES BROAD AUSTERITY CURBS AS IRAN CONFLICT SPARKS OIL SUPPLY CRISIS

Pakistan has rolled out wide-ranging emergency austerity and fuel-saving measures following disruptions in oil and gas supplies triggered by the ongoing US–Israel conflict with Iran and rising tensions across the Middle East.

In a televised address, Prime Minister Shehbaz Sharif warned that interruptions to shipping through the Strait of Hormuz—a critical artery for global energy trade—pose a serious threat to Pakistan’s economy.

Describing the region as being “effectively at war,” the prime minister unveiled a series of measures aimed at cutting fuel consumption. These include a temporary four-day workweek for government offices and extended spring holidays for schools through the second half of March.

Half of all government employees will work remotely on a rotating basis, with the private sector encouraged to adopt similar arrangements. Key industries such as banking, however, have been exempted.

Educational institutions will remain closed for two weeks, though exams will proceed as scheduled. Universities have been instructed to shift to online classes to further reduce fuel use.

Additional austerity steps include federal and provincial cabinet members giving up their salaries and perks for two months, while lawmakers will face a 25% pay cut during the same period. Officials have also been directed to limit foreign travel to essential trips only, and strictly in economy class.

All in-person government meetings have been suspended in favour of virtual sessions, and fuel allocations for official use have been reduced. The public has also been urged to limit gatherings, with weddings and events capped at 200 guests and restricted to a single main dish.

Pakistan’s heavy reliance on imported energy—over 80% of its oil needs—has intensified the impact of the crisis. The recent supply shock has driven a sharp surge in fuel prices, marking one of the steepest increases in the country’s history.

Experts note that transport accounts for the bulk of petroleum consumption, meaning structural changes—such as shifting freight from road to rail—are essential for long-term relief. Others warn that currency depreciation could further amplify the economic strain by driving up inflation.

The crisis also extends to natural gas. Pakistan has depended on imported liquefied natural gas (LNG) since 2015, with a significant portion of its electricity generation tied to these imports. Much of this supply passes through the Strait of Hormuz, where ongoing hostilities have disrupted energy flows.

The timing has compounded difficulties for households, as the fuel crunch coincides with the final days of Ramadan and the lead-up to Eid al-Fitr. Rising transport and food costs are placing added pressure on families during a period typically marked by increased spending. For many workers, especially those reliant on daily mobility, the surge in fuel prices is directly affecting livelihoods—forcing difficult choices and scaling back plans for the upcoming holiday.

KSTAR SHOWCASES HIGH-PERFORMANCE BLUESPARK RESIDENTIAL ESS AT SOLAR PAKISTAN 2026

As an exhibitor at Solar Pakistan, KSTAR proudly presents its latest advancement in residential energy storage: the BlueSpark Residential ESS (IP66 series). Designed for reliability, scalability, and modern energy demands, this project showcases a high-performance installation tailored for real-world applications.

The system features two parallel towers, each equipped with a 12kW three-phase hybrid inverter and four 5kWh lithium battery packs, delivering 20kWh capacity per tower. Combined, the configuration achieves a total output of 24kW power and 40kWh energy storage. The installation reflects a clean, structured layout that prioritizes accessibility, efficient wireless commissioning, and robust system protection. Its IP66-rated design ensures safe outdoor deployment, offering strong resistance against dust and water—ideal for Pakistan's diverse environmental conditions.

From a technical standpoint, the BlueSpark ESS delivers up to 97% efficiency and supports both on-grid and off-grid operations. It enables multiple intelligent working modes, including self-consumption, peak shaving, time-

of-use optimization, and battery priority. With full support for parallel expansion and 100% three-phase unbalanced output, the system ensures stable performance even under uneven load conditions.

Powered by EVE A-Grade lithium cells and an advanced Battery Management System (BMS), the solution guarantees safety, longevity, and operational reliability. Backed by over 30 years of expertise, KSTAR continues to drive innovation in energy storage, offering future-ready solutions for residential, commercial, and industrial needs.





PAKISTAN TARGETS 90% CLEAN ENERGY BY 2034

Pakistan is set to become a 90 percent clean energy country in power generation by 2034, announced Minister for Power Sardar Awaiz Ahmad Khan Leghari in the National Assembly. He highlighted that 55 percent of the electricity produced in 2024–25 already came from renewable and clean energy sources.

Leghari clarified that under international commitments, Pakistan is expected to reach 60 percent clean energy by 2030, and the government is on track to meet this target this year. He emphasized that recent changes to the net metering regulations—now replaced with net billing—fall within the regulator's legal authority and do not affect the majority of solar energy users.

The minister explained that Pakistan's distributed solar generation currently ranges from 20,000 to 22,000 MW, with only 6,000–7,000 MW linked to net metering. The remaining capacity includes off-grid and self-consumption systems for households, farms, and businesses. He noted that regulatory changes apply solely to the net metering segment and will not disproportionately affect low-income households.



Stakeholders slam Neptra, Power Division over proposed net-metering changes

ISLAMABAD: The National Electric Power Regulatory Authority (Neptra) and the Power Division faced strong criticism from stakeholders over proposed changes to net-metering regulations, with critics warning the move could slow Pakistan's solar energy growth and make the power system more expensive and unreliable.

The objections were raised during a public hearing convened by Neptra to seek feedback on its proposed Prosumers Regulations 2025, which aim to reduce incentives for solar consumers using net-metering. While Neptra drafted the proposals, they were largely defended during the hearing by the Power Division and its affiliated utilities, including distribution companies and K-Electric. Participants — including think tanks, politicians, chambers of commerce, solar installers, industrialists and domestic consumers — argued that the changes could undermine Pakistan's transition to clean energy and weaken consumer rights.

Under the draft rules, existing registered prosumers would be shifted from net-metering to net-billing, with exported electricity units credited for one month instead of the current three-month adjustment period. Other contract terms would remain unchanged until the expiry of existing seven-year agreements.

For new consumers, the proposed regulations

suggest five-year contracts with surplus electricity purchased at Rs11 per unit, significantly lower than the current rate of around Rs26 per unit.

Stakeholders also criticised procedural limitations during the hearing, saying they were barred from presenting alternative proposals. Neptra's former Member (Law) Amina Ahmed, who assumed charge as Member Finance and Technical on Friday, directed participants to confine their comments strictly to the draft regulations.

Pakistan Peoples Party leader Nadeem Afzal Chan opposed the proposals and announced his party would challenge them. He alleged the country's power system was corrupt, inefficient and unaffordable, while solar energy had enabled farmers and small rural businesses to reduce electricity costs. He also claimed consumers were often forced to pay unofficial fees and finance repairs of faulty transformers.

Mr Chan also requested that the hearing be broadcast live to allow broader public participation, but Neptra declined the request. Business groups and industry representatives demanded similar consultations in provincial capitals, arguing that an issue of national importance should not be restricted to a single hearing in Islamabad. The regulator did not respond to the demand.

Some participants alleged that distribution companies had already begun discouraging new solar applications and were not properly accounting for electricity supplied by existing prosumers. Nepra Chairman Waseem Mukhtar and Member (Development) Maqsood Anwar termed such actions illegal and assured participants that regulatory action would be taken. The chairman also sought a detailed report from distribution companies.

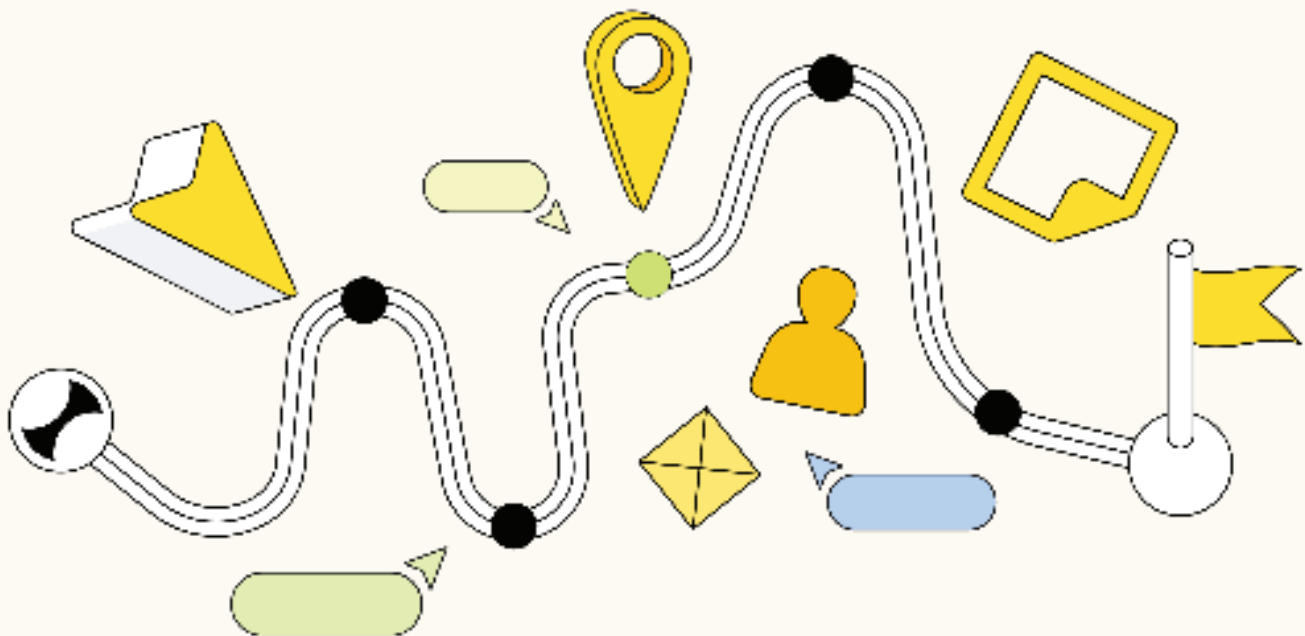
While the Power Division and its entities were given about 90 minutes to present their case, other participants were limited to three minutes each. The hearing continued for more than three hours.

Think tanks warned that the proposed regulations could conflict with Pakistan's commitments under the Paris Agreement and the UN Sustainable Development Goals. They argued that encouraging surplus solar power purchases could

help Pakistan earn carbon credits estimated at \$40 million annually.

The Power Division, however, said the government was not discouraging solar adoption but aiming to ensure sustainable growth while addressing system misuse. Officials said Pakistan's clean energy share had increased from 40 per cent in 2015 to 55 per cent in 2025, with grid-connected solar capacity reaching 7,000 megawatts and off-grid systems exceeding 13,000MW.

Officials maintained that rapid solar expansion had created grid stability challenges, including sharp demand fluctuations, voltage management problems and backfeed issues, necessitating regulatory intervention.



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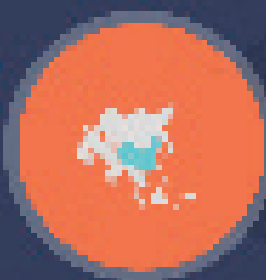
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ASIA IS KEY



35%

of global greenhouse gas and energy-related emissions are produced by Asia's manufacturing and construction sectors. **17% to 44%**



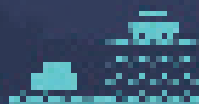
75%

of global greenhouse gas emissions must be cut to meet the Paris Agreement. **Three** of the world's top 10 largest economies are in Asia, and **67%** of all developed economies.

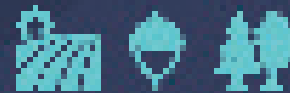
IMPACTS TO THE REGION



Low-lying coastal areas and islands are at greatest risk of being submerged. The impact of sea level rise will be most severe in Asia and Pacific, with some areas by 2100 rising **1 to 6m**.



400 million people live in coastal cities, and **400 million** live in areas that are at least **100m** from the coast.



More than **400** million of the region's population is living in **highly** vulnerable areas, and **1 billion** people will be at risk of climate change.

DISASTER RISK MANAGEMENT

100 billion USD in disaster recovery, reconstruction and relief is needed annually to meet the needs of the world's poor.



50 to 100 billion USD in annual investment is needed to help a world of poor people manage natural disasters and climate change impacts.

PAKISTAN CUTS GAS FOR SOME INDUSTRIAL BUYERS AS CONFLICT DISRUPTS SUPPLY

Pakistan's largest gas distributor is preparing to cut supplies to certain industrial customers, highlighting mounting pressure on an economy heavily reliant on energy imports from Qatar. An escalating conflict in the Middle East has triggered the most significant disruption to global energy trade since Russia's invasion of Ukraine in 2022. The turmoil has blocked the Strait of Hormuz and forced the shutdown of major energy facilities, including Qatar's Ras Laffan liquefied natural gas export plant.

During the previous energy crisis four years ago, Pakistan faced severe economic stress and struggled to afford soaring fuel prices, leading to widespread power shortages and hours of daily blackouts.

In the near term, however, the crisis may offer a limited upside for the strained economy. Analysts say it could allow Pakistan to avoid expensive LNG purchase agreements with Qatar that it increasingly finds difficult to sustain. Samiullah Tariq, head of research at Pakistan Kuwait Investment, said shifting toward cheaper alternatives such as imported coal "could prove to be a blessing in disguise."

Despite this, Sui Northern Gas Pipelines Ltd. has informed customers that it cannot supply regasified LNG to fertilizer plants from midnight Wednesday after receiving notice of disruptions from Pakistan State Oil just five days into the

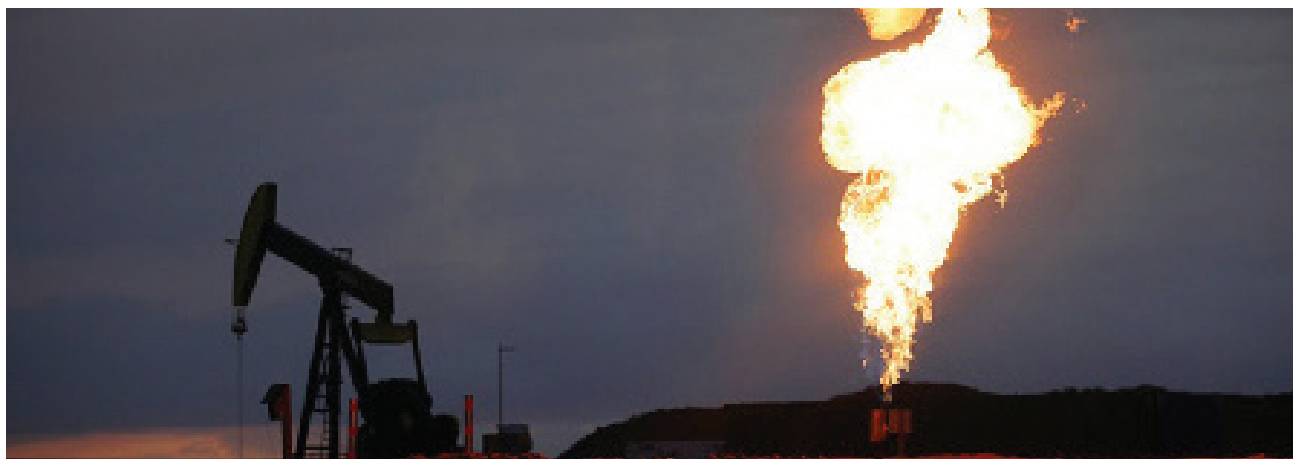
Gulf tensions. Analysts warn that prolonged interruptions could quickly become both painful and costly for the country.

Masanori Odaka, an analyst at Rystad Energy, said the situation "could become serious" if five or more LNG shipments are affected. "Current spot prices are well beyond what Pakistan is likely willing to pay," he noted, adding that alternatives for sourcing LNG cargoes remain limited.

For March, Pakistan has received two LNG cargoes, meaning any shortfall may be temporarily managed through domestic production and coal imports. However, analysts expect supply gaps to widen in April and May.

Bound by expensive long-term LNG contracts with Qatar, Pakistan had already been reducing domestic production to manage costs. Last year the country received an average of nine LNG shipments per month, according to shipping data. To address potential oil shortages, Pakistan has also requested supplies through alternative routes, including via Saudi Arabia's Yanbu port. Riyadh has assured full support, the petroleum ministry said in a statement citing Minister Ali Pervaiz Malik.

The emerging energy crunch comes as Pakistan grapples with a sluggish economy and rising regional tensions, including clashes with neighboring Afghanistan.



PAKISTAN IMPORTS 12.7GW SOLAR MODULES IN NINE MONTHS

Pakistan's solar energy drive is gathering unprecedented momentum, with imports of solar photovoltaic modules soaring to 12.7 gigawatts between July 2024 and March 2025. The surge — nearly one-fourth of the country's total power generation capacity of 46.6 gigawatts — reflects a major structural shift in the national energy mix away from expensive imported fuels. From residential rooftops to industrial estates, solar panels are rapidly reshaping Pakistan's energy landscape.

The trend is being fuelled by a combination of record-high electricity costs, frequent grid disruptions, and growing awareness of renewable alternatives. Energy experts believe the country is entering a decisive phase of solar adoption that could permanently alter its power dynamics. In parallel, the inclusion of Trina Solar among the world's Tier 1 clean energy firms by S&P Global Commodity Insights has further strengthened investor confidence in the sector.

Recognized for excellence in both solar modules and energy storage systems, Trina's standing underscores the importance of quality and innovation in meeting Pakistan's rising energy demands. Analysts say such international recognition of Trina Solar also benefits Pakistan by ensuring access to reliable technology and attracting long-term investment.

As solar adoption widens and global leaders expand their footprint in the local market, Pakistan's renewable energy transition is expected to gain deeper roots — reducing fuel import dependence, easing pressure on foreign reserves, and paving the way for a more sustainable power future.

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.





UKRAINE'S EX-ENERGY MINISTER ARRESTED WHILE TRYING TO CROSS BORDER

Ukraine's National Anti-Corruption Bureau (NABU) says it has arrested the country's former energy minister, German Galushchenko, who resigned in November amid a massive corruption scandal, as he tried to cross Ukraine's border.

"Today, while crossing the state border, NABU detectives have detained the former Minister of Energy as part of the 'Midas' case," the NABU said in a statement.

It did not name Galushchenko in its statement, but he served as the country's energy minister last year and resigned in November. "Initial investigative proceedings are ongoing, carried out in accordance with the requirements of the law and court sanctions. Details to follow," the NABU added.

Galushchenko was one of several ministers who resigned in 2025 as the NABU unveiled an alleged money-laundering conspiracy in the country's

energy sector that investigators believe was orchestrated by an ally of President Volodymyr Zelenskyy.

According to Ukraine's Specialised Anti-Corruption Prosecutor's Office (SAPO), the alleged \$100m scheme was orchestrated by businessman Timur Mindich.

SAPO's investigators say Galushchenko helped Mindich manage illicit financial flows in the energy sector, while contractors working with Energoatom were forced to pay bribes of 10 to 15 percent to avoid losing contracts or facing payment delays.

Ukraine's previous two energy ministers had resigned amid the fallout from the scandal, which also claimed the job of Zelenskyy's chief of staff. The two ministers and the chief of staff have all denied wrongdoing.

SARDAR OWAIS AHMED KHAN LEGHARI DEFENDS SOLAR NET-METERING CHANGES AS SHEHBAZ SHARIF ORDERS POLICY REVIEW

Pakistan's power minister on Thursday defended recently introduced changes to rooftop solar net-metering regulations, stating that high financial returns for a relatively small group of consumers were placing an unfair burden on millions of other electricity users. The remarks came a day after Prime Minister Shehbaz Sharif directed authorities to review the revised rules.

The controversy stems from amendments to the country's net-metering framework, which allows households and businesses with rooftop solar systems to export surplus electricity to the national grid. Under the updated compensation structure introduced by the National Electric Power Regulatory Authority, consumers must pay full tariffs for electricity drawn from the grid while receiving reduced, market-linked rates for electricity supplied back to the system.

Government Defends Pricing Reforms

Addressing the National Assembly, Leghari said only 6,000 to 7,000 megawatts of Pakistan's estimated 22,000 megawatts of installed solar capacity falls under the net-metering regime, benefitting approximately 466,000 consumers out of nearly 35.5 million electricity users nationwide.

He argued that existing incentives allowed solar users to achieve disproportionately high returns compared with other investment options. According to the minister, some net-metering users were earning returns of around 50% due to savings generated through electricity credits, significantly higher than the roughly 17% returns earned by independent power producers and about 8% returns on bank deposits.

Leghari also questioned the pricing structure under the earlier system, stating that while solar electricity could be generated at approximately Rs5 per unit, it was being exported to the grid at rates close to Rs27 per unit. He noted that the national grid's average electricity procurement cost stood at roughly Rs8.31 per unit, raising concerns about pricing sustainability.

Returns to Remain Attractive Despite Changes

The minister said the revised framework is expected to reduce returns for solar consumers to around 37%, maintaining that rooftop solar installations would remain financially viable even after the adjustment.

He added that the regulatory changes were intended to introduce fairer pricing and reduce cross-subsidies borne by the wider consumer base. According to Leghari, lowering electricity costs for the broader population — potentially by up to Rs1.50 per unit — would justify the policy shift.

Prime Minister Seeks Safeguards for Existing Consumers

Leghari's defence follows directives from Prime Minister Shehbaz Sharif instructing the government to file a review petition against the revised regulations. The prime minister emphasised the need to safeguard existing consumer agreements while ensuring that the updated policy does not transfer financial pressure onto non-solar electricity users.

The ongoing review highlights the government's effort to balance renewable energy expansion with grid stability and equitable tariff structures as solar adoption continues to grow across the country.





ROOFTOP SOLAR BOOM SAVES PAKISTAN \$12BN IN LNG IMPORTS

Pakistan's rapid rooftop solar adoption has saved the country an estimated \$12 billion in liquefied natural gas (LNG) imports, according to a study by UK-based energy think tank Ember.

The report said solar generation in Pakistan has surged sharply in recent years, placing it alongside hydropower and gas as one of the country's largest sources of electricity.

As a result, gas-based power generation declined, while demand for other fossil fuels also dropped significantly. The study noted that if fossil fuels had met the same increase in demand instead of solar, gas usage would have risen substantially, increasing import costs.

Ember said Pakistan's solar boom has been driven by rising electricity tariffs linked to reforms backed by the International Monetary Fund, prompting consumers to shift to rooftop solar systems.

The expansion has also been supported by net metering policies and the availability of low-cost solar panels, particularly from China. The shift has reduced reliance on imported fuels at a time of global price volatility, though the report warned that declining grid demand could increase electricity tariffs as fixed system costs are spread across fewer users.

It urged authorities to maintain a financially stable power grid to support continued solar growth, especially in the absence of large-scale battery storage.

Separately, Pakistan's Power Minister Awaiz Leghari said around 55% of the country's electricity generation currently comes from clean sources, with a target to exceed 90% by 2034. He added that about 74% of electricity generation is now based on local resources, with plans to increase this share to over 96% in the coming years.

ARGENTINA'S GENNEIA OPENS \$180 MILLION SOLAR PARK IN MENDOZA

Argentine renewable energy company Genneia has officially brought the San Rafael Solar Park online in the western province of Mendoza, marking a major milestone in the country's clean energy expansion. The project represents an investment of around \$180 million and further strengthens Genneia's position as one of Argentina's leading renewable power producers, the company said in a statement on Tuesday.

San Rafael is Genneia's third solar park in Mendoza, a province that has emerged as a key hub for renewable energy development due to its strong solar resources. The facility is equipped with approximately 400,000 solar panels and has an installed capacity of 180 megawatts, making it one of the largest solar power plants currently operating in the country.

According to the company, the park will generate enough electricity to meet the annual needs of roughly 135,000 households, helping to reduce reliance on fossil fuels and lower carbon emissions. The project is expected to play an important role in improving energy security while supporting Argentina's transition towards a more sustainable and diversified energy matrix.

"This level of capacity makes the San Rafael Solar Park a benchmark for large-scale solar power generation," Genneia said, adding that the project will contribute significantly to improving the overall efficiency and resilience of the national energy system. With the launch of San Rafael, Genneia continues to expand its renewable portfolio and reinforce its long-term commitment to clean energy development in Argentina.

MALAYSIA TO DEVELOP \$6 BILLION RENEWABLE ENERGY CORRIDOR

Malaysia has signed a collaboration agreement with the World Bank Group to develop the Southern Johor Renewable Energy Corridor (SJREC), a landmark project valued at 6 billion USD.

The agreement—finalized on Monday—brings together the International Finance Corporation (IFC), Permodalan Darul Ta'zim (the Johor state government's strategic investment arm), and Ditrolic Energy. According to a joint statement, the 2,000 sq km hybrid solar and battery energy storage zone in Johor is designed to supply clean power for the state's industrial expansion and support the ASEAN Power Grid through future cross-border electricity trade.

Signed alongside the launch of the Johor Renewable Energy Policy 2030, the collaboration outlines cooperation on project development, technical expertise, and potential financing. As a central pillar of the Johor-Singapore Special Economic Zone master plan, the first phase of SJREC will feature up to 4 GWp of solar capacity and 5.12 GWh of energy storage across a 10,000-acre site.

Judith Green, the World Bank Group's country manager for Malaysia, said the project will advance Johor's sustainable development goals, generate employment, attract foreign investment, and enable clean energy exchange between Malaysia and Singapore.

WHAT IS RENEWABLE ENERGY?

The Answer is Blowing in the Wind

We hear a lot about renewable energy, but what is it, exactly?

It is an energy source that is perpetual ... inexhaustible... "to infinity and beyond!" Renewable energy has storage limitations, however, and some types are not available 24/7.

A FEW FACTS

- According to the University of Michigan (U-M) Center for Sustainable Systems, about 80% of the nation's energy comes from fossil fuels, 8.4% from nuclear and 11.4% from renewable sources.
- In 2019, renewable energy sources accounted for about 17% of energy generation, according to the U.S. Energy Information Administration (EIA).
- The EIA projects that the share of renewables used for U.S. electricity generation will increase from 21% in 2020 to 42% in 2050.
- Wind and solar are the fastest-growing renewable sources, but they provide just 3.8% of total energy used in the U.S., according to the U-M center.

THE MAJOR TYPES OF RENEWABLE ENERGY SOURCES ARE:



**BIOMASS,
INCLUDING
BIOFUELS**
(comes from plants
and animals)

WATER OR HYDROPOWER



GEOHERMAL
(comes from the heat
of the earth)

WIND



SOLAR

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.





IRAQ RANKS FIFTH IN ARAB SOLAR PANEL IMPORTS FROM CHINA

Iraq emerged as the fifth-largest among Arab countries importing Chinese solar panels in 2025, the Washington-based ATTAQA, an energy research group, reported on Sunday, adding that Iraq recorded a substantial growth in imports, jumping from 0.43 gigawatts (GW) in 2024 to 1.89 GW in 2025.

The top 10 Arab importers of Chinese solar panels collectively raised their capacity to 29.07 gigawatts (GW) in 2025, up from 27.34 GW in 2024, marking a year-on-year increase of 1.73 GW, according to the Washington-based energy research group ATTAQA.

Leading the region, the United Arab Emirates imported 9.54 GW of Chinese solar panels last year, followed by Saudi Arabia with 8.82 GW and Egypt with 2.28 GW. Other countries included Algeria at 2.10 GW, Iraq at 1.89 GW, Morocco at 1 GW, Yemen at 0.97 GW, Oman at 0.95 GW, Jordan at 0.94 GW,

and Lebanon at 0.58 GW.

Meanwhile, the Iraqi Economic Observatory, Eco Iraq, reported on December 13, 2025, that the country's electricity production cost reached 5.6 trillion Iraqi dinars, while renewable energy contributes only around 2% of total generation.

The Central Bank of Iraq has supported growth in the sector by offering households loans of up to 30 million dinars (approximately \$20,400) at low or zero interest, with minimal administrative fees.

Last year, caretaker Prime Minister Mohammed Shia' Al-Sudani directed the allocation of land for solar energy projects in Baghdad during a meeting focused on smart solutions for renewable energy management, in preparation for summer 2026.

KUWAIT PETROLEUM CORPORATION TO FACILITATE DIESEL, JET FUEL SUPPLIES AMID REGIONAL DISRUPTIONS

Kuwait's state-owned oil company, Kuwait Petroleum Corporation, has assured it would facilitate Pakistani-flagged vessels with diesel and jet fuel supplies, Pakistan's petroleum ministry said, amid widespread energy and cargo disruptions linked to the United States-Israeli war on Iran.

The move follows Pakistan's announcement of a Jet A-1 fuel supply disruption, after which authorities urged foreign airlines to carry return fuel and limit refueling as a precaution due to concerns about availability.

Iran's chokehold of the Strait of Hormuz in response to US-Israeli attacks has upended tanker traffic along a route that once carried around 20 percent of global oil, driving up energy prices worldwide.

Pakistan's Petroleum Minister Ali Parvez Malik met Kuwaiti Ambassador Nasser Abdulrahman Jasim Al-Mutairi to discuss Kuwait's facilitation of Pakistani-flagged ships.

"Kuwait Petroleum Corporation has assured of fully facilitating possible supply of diesel and jet fuel to Pakistani flagged ships from Kuwait," the petroleum ministry said in a statement, expressing gratitude for the support.

Ambassador Al-Mutairi said Kuwait would continue to support Pakistan, while Minister Malik appreciated the assistance despite global and regional challenges.

Separately, Deputy Prime Minister Ishaq Dar said Iran had allowed additional ships to pass through the Strait of Hormuz. Pakistan has also finalized arrangements to import petrol for April as it works to conserve fuel stocks amid global supply disruptions.

The government recently raised petrol and diesel prices by Rs55 per liter, reflecting concerns that a prolonged Middle East conflict could trigger shortages or push global oil prices higher, affecting Pakistan's balance of payments.

Meanwhile, the Cabinet Committee to Monitor Petrol Prices met under Finance Minister Muhammad Aurangzeb to review petroleum stocks and developments in the energy sector.

Officials said the current supply position remains stable, with diesel stocks covering approximately 23–24 days and petrol availability described as comfortable. Crude oil stocks were reported to provide around 11 days of cover, with additional cargoes in transit expected to sustain refinery operations and product availability through April.

Authorities added that import plans are being actively managed, with significant volumes already secured through commercial and government-to-government arrangements, while refinery operations continue at optimal levels to meet domestic demand.





MOL Pakistan announces gas discovery in Tal Block

MOL Pakistan has announced the successful appraisal of a major natural gas and condensate discovery at the Bilitang-1 ST-1 exploratory well in Khyber Pakhtunkhwa, as reported by the Daily Times.

Located in Kohat District, the well produced 26.5 million standard cubic feet of gas per day—equivalent to around 5,065 barrels of oil equivalent per day (BOEPD). This is the second significant discovery by the MOL-led joint venture in Pakistan over the past 18 months, following the Razgir-1 find in August 2024.

Drilled to a total depth of 4,004 metres, the well

employed sidetrack drilling to access higher-quality reservoir rock within the Lumshiwal Formation.

MOL Pakistan, a wholly owned subsidiary of the Budapest-based MOL Group, operates the Tal Block and holds an 8.4% production share, contributing approximately 400 BOEPD to its global output.

Commenting on the development, CEO Ádám Zsolt László stated that the second major discovery within 18 months highlights the team's commitment and adaptability in delivering strong results, even in a mature area that has been under exploration for 27 years.



SEEKING AUSTRIAN INVESTMENT IN CITRUS PROCESSING, MINING AND RENEWABLE ENERGY DURING PM VIENNA VISIT

Pakistan has invited Austrian companies to collaborate with local firms in citrus value addition, mining, and renewable energy, with Prime Minister Shehbaz Sharif saying Austria's global expertise could help fast-track the country's economic growth. He made the remarks at the Pakistan-Austria Business Forum in Vienna during his two-day official visit — the first by a Pakistani premier to Austria in more than three decades, according to the foreign office. The trip is centered on expanding trade, investment, and economic ties, and includes engagements with the International Atomic Energy Agency, the United Nations Office on Drugs and Crime, and the United Nations Industrial Development Organization.

Addressing business leaders, Sharif noted that Pakistan is largely agrarian, with nearly 60 percent of its population living in rural areas. He said Austria could support Pakistan with modern

technology to enhance citrus processing — producing marmalade and juices for export to Austria, the Middle East, and other global markets. He also highlighted opportunities in mining, pointing to Pakistan's extensive reserves, including rare minerals in Khyber Pakhtunkhwa, Gilgit-Baltistan, Balochistan, and Azad Kashmir.

The visit comes as Pakistan works toward economic stabilization under a \$7 billion bailout program from the International Monetary Fund and seeks to strengthen trade and attract foreign investment to sustain recent economic gains. Beyond agriculture and mining, Sharif encouraged Austrian participation in renewable energy and grid modernization initiatives, saying Austria's strengths in engineering, environmental technology, and advanced manufacturing align well with Pakistan's development goals.

Illegal immigration and skilled workforce
Sharif also addressed concerns over illegal migration from Pakistan and other countries to Europe, stating that his government is committed to curbing the practice while offering certified, skilled workers to meet European labor demands. Each year, thousands from Pakistan, Afghanistan, Bangladesh, and elsewhere attempt dangerous journeys to Europe in search of better opportunities.

In December, Pakistan's interior ministry reported a 47 percent decline in illegal migration to Europe in 2025, alongside the arrest of over 1,700 human smugglers in a nationwide crackdown.

Sharif said Pakistan is working with European partners — including Austria, Germany, and France — to end illegal migration and instead provide internationally certified skilled labor tailored to European requirements. He also expressed hope that Austrian firms would participate in the upcoming European Union-Pakistan Business Forum scheduled for late April

in Islamabad.

Earlier, Sharif met Austrian Chancellor Christian Stocker and co-chaired a CEOs' forum featuring leading Austrian and Pakistani companies from sectors such as renewable energy, manufacturing, construction, IT, textiles, surgical instruments, leather, sports goods, healthcare, tourism, hospitality, and agro-industries.

In a post on X, Sharif described the meeting as warm and productive, saying both sides reaffirmed their commitment to deepen cooperation in trade, investment, tourism, education, IT, healthcare, and human resource mobility.

The visit marks 70 years of diplomatic relations between Islamabad and Vienna and is the first by a Pakistani prime minister since 1992, when then-premier Nawaz Sharif visited Austria. Officials say the trip is expected to open new avenues in Pakistan-Austria relations, building on existing cooperation in trade, culture, and education.





PAKISTAN-KOREA SOLAR TESTING LAB MOVES TOWARD ISO ACCREDITATION TO STRENGTHEN QUALITY STANDARDS

The Pakistan-Korea PV Module Testing Laboratory is preparing to officially launch its commercial operations as it pursues ISO/IEC 17025 accreditation from the Pakistan National Accreditation Council — a step expected to reinforce quality assurance across Pakistan's rapidly expanding solar sector.

Official documents reviewed by Wealth Pakistan state that the facility is now fully operational after the installation and commissioning of advanced equipment capable of conducting up to 40 different tests on solar panels. The lab has been set up to carry out technical assessments of photovoltaic (PV) modules in accordance with internationally recognized standards.

The laboratory plans to apply for accreditation in May 2026, following the completion of its final round of specialized training in Korea scheduled for March–April 2026. The accreditation process is projected to conclude by mid-2026.

Once accredited, the facility will be authorized to issue internationally recognized test reports, allowing regulators to more effectively enforce quality standards in the solar market.

Meanwhile, the Pakistan Standards and Quality Control Authority is expected to move toward including solar panels in its mandatory certification regime to curb the entry of substandard products into the domestic market. The Pakistan-Korea lab will support this effort by providing accredited testing services, strengthening regulatory compliance and enhancing consumer protection. Industry experts say the initiative is likely to improve investor confidence, support domestic manufacturing, and expand export opportunities for Pakistan's solar equipment industry.

Overall, the lab's operational launch and upcoming accreditation are viewed as significant milestones in enhancing transparency, ensuring product reliability, and aligning Pakistan's renewable energy framework with global quality standards.

FROM OIL TO OPPORTUNITY: UAE AND MIDDLE EAST POWER AHEAD TOWARD A CLEAN ENERGY FUTURE

This shift forms part of a wider economic plan aimed at reducing long-standing dependence on oil and gas revenues, which historically financed major infrastructure projects and significantly improved living standards across the region. With a global transition toward cleaner energy underway, these nations are seeking to secure long-term economic stability by avoiding reliance on a single income source.

Strong public-sector investment is driving rapid expansion of clean energy capacity throughout the Middle East and North Africa. Solar photovoltaic capacity is projected to increase tenfold by 2035, while renewables are expected to account for about 25 percent of total electricity generation. Nuclear energy capacity is also forecast to triple during the same period.

The United Arab Emirates has committed to achieving net-zero carbon emissions by 2050. Its strategy focuses on reducing emissions from fossil fuel operations while significantly expanding renewable energy. By mid-century, the UAE aims for an energy mix of 44 percent alternative energy, 38 percent gas, 12 percent clean coal, and 6 percent nuclear power. The plan also includes generating

50,000 new jobs, tripling renewable capacity to 14 GW by 2030, and increasing the share of alternative energy to 30 percent by 2031.

The UAE is home to three of the world's largest solar power plants, including a major facility in Dubai expected to supply electricity to around 800,000 homes by 2030. In 2023, the country launched its first wind energy program, a 104 MW project spanning four locations. It is also expanding its nuclear sector with ambitions to become the first Arab country to operate a nuclear power plant and plans to scale up green hydrogen production to rank among the world's leading producers by 2031.

Alongside renewable expansion, the UAE continues investing heavily in carbon capture technology as part of efforts to decarbonize fossil fuel operations, even while increasing oil production. Its state-owned oil company is developing what could become the largest carbon capture project in the region, with the capacity to capture up to 1.5 million tonnes of carbon dioxide annually.



SHRINKING THE CARBON FOOTPRINT OF CHEMICAL MANUFACTURING WITH LASERS, SOLAR RADIATION

Scientists have developed a new method that uses solar energy to power a key chemical reaction widely used in manufacturing. The breakthrough could significantly reduce the energy required for industrial processes, eliminate harmful oxidizing byproducts, and cut carbon emissions.

The process involved is known as olefin epoxidation. While unfamiliar to many people, the epoxide chemicals produced through this reaction are essential for industries such as textiles, plastics, chemicals, and pharmaceuticals. Currently, the standard industrial method relies on strong peroxide-based oxidants to drive the reaction. These chemicals are difficult to dispose of safely and generate carbon dioxide during production, contributing to environmental pollution.

Water could theoretically serve as a cleaner oxidant, but breaking the strong bonds between hydrogen and oxygen atoms in water requires extremely high temperatures. This makes the process energy-intensive and increases carbon emissions. As a result, researchers have been searching for greener alternatives that could reduce the environmental footprint of chemical manufacturing.

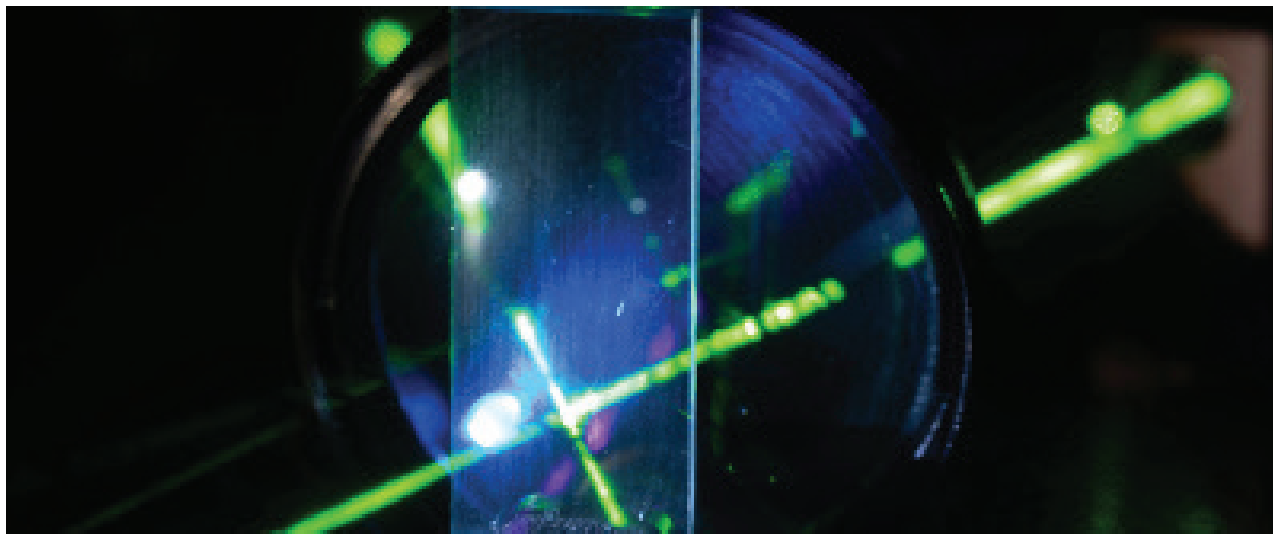
A research team led by Professor Prashant Jain from the University of Illinois Urbana-Champaign has been exploring

ways to use solar energy in industrial chemistry through a technique known as plasmonic chemistry. This approach uses light energy to activate chemical reactions, potentially replacing energy-heavy industrial methods.

In the new study, conducted in collaboration with scientists from the Universidade de São Paulo and Northwestern University, researchers developed a system that combines electricity with visible light to drive the epoxidation reaction. The system uses specialized “antenna” catalysts made from gold nanoparticles and manganese oxide nanowire electrodes. These materials absorb light and generate energetic charge carriers that weaken the bonds in water molecules.

By weakening these bonds, oxygen atoms can be extracted from water and added to other molecules to produce epoxides, effectively turning water into a clean oxidant without the need for high temperatures.

Although the laboratory results are promising, researchers say further work is needed to scale the technology for industrial use and develop more efficient light sources to power the process.



Earlier this year, Pakistan's Power Minister, Awaiz Leghari, said that it is a "misconception that solar tube wells are depleting groundwater." Some experts disagree, while the water department in Punjab continues to study whether tube wells are depleting groundwater. Pakistan needs measures to map the tube wells and monitor groundwater levels and withdrawals, to avoid what could be a major water crisis, analysts say.

Pakistan is a water-stressed country, and its water supply situation may further worsen. Earlier this year, rising tensions with India led to New Delhi threatening to suspend the 1960 Indus Waters Treaty (IWT), a vital water treaty between the two rivals mediated by the World Bank, to share water resources from the Indus River basin downstream to Pakistan.

Climate change and population growth are also stressing water resources in Pakistan. Many people do not have access to clean water. Depletion of groundwater would be devastating to a country with a rapidly growing population, as potentially falling crop yields due to water shortages could also lead to food scarcity.

Solar-powered irrigation could also contribute to the water stress of Pakistan, according to a study published in the *Journal of Agriculture and Food Research* earlier this year.

The paper by researchers from the Pakistan Agricultural Research Council and the Wageningen University in the Netherlands studied the effect of the ongoing transition from diesel to solar power for irrigation. The authors noted that farmers using solar pumps typically extract more groundwater compared to farmers using diesel pumps under similar conditions. While solar-powered tube well pumps have environmental and economic benefits, they could cause over-extraction of groundwater, the study found.

The authors of the paper conducted one-to-one comparisons of solar vs diesel pumps in 30 pairs of farmers working in similar circumstances. The researchers found that in 77% of the cases, farms using solar pumps extracted more water than their diesel counterparts under comparable conditions. The up-scaling of solar pumps could deplete groundwater aquifers and have drastic implications for future sustainable food production in Pakistan, the authors of the study wrote.





2040 CLIMATE TARGET: COUNCIL GIVES FINAL GREEN LIGHT

The Council has formally adopted the amended European Climate Law, setting a new binding intermediate climate target for 2040. Under the updated framework, the European Union will aim to reduce net greenhouse gas (GHG) emissions by 90% compared to 1990 levels, strengthening its pathway toward achieving full climate neutrality by 2050 across all sectors of the economy.

The revised law also introduces a limited role for international carbon credits. From 2036 onwards, high-quality international credits may account for up to 5% of the EU's 1990 net emissions to help meet the 2040 target in a cost-effective manner. However, the regulation ensures that at least 85% of emissions reductions must occur within the EU itself. Any credits used must come from credible greenhouse gas reduction activities in partner countries and remain fully aligned with the Paris Agreement.

According to Maria Panayiotou, the EU remains determined to lead global climate action while safeguarding economic competitiveness and ensuring an inclusive transition. She said the adoption of the 2040 climate target will provide industries, citizens and investors with greater certainty as Europe accelerates its shift toward a cleaner economy over the coming decade.

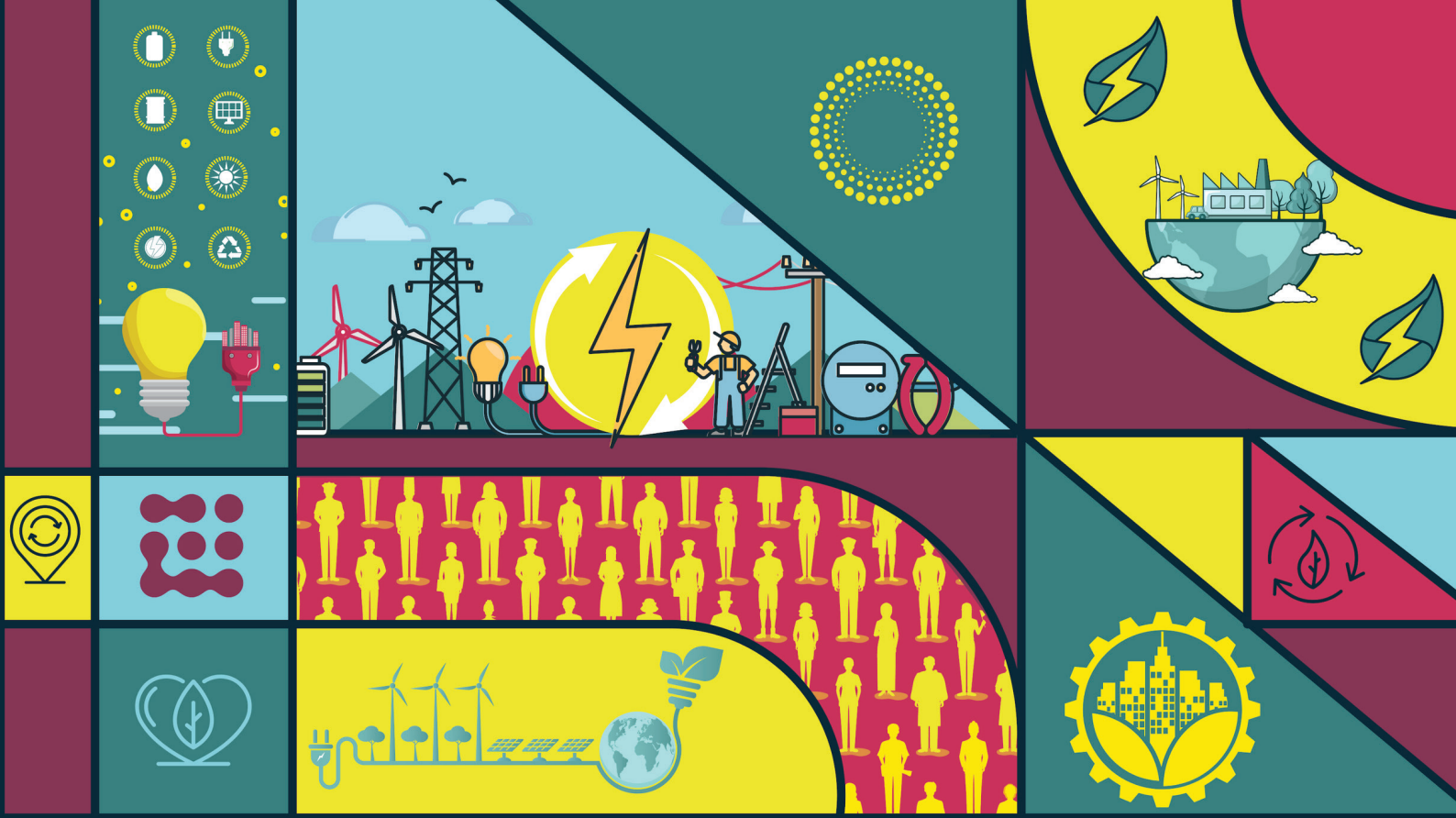
The amended law also outlines key factors the European Commission must consider when preparing climate legislation for the post-2030 period. These include maintaining competitiveness, simplifying regulatory frameworks, ensuring social fairness, improving energy security, and keeping energy affordable.

Among the additional measures included in the revision are provisions for EU-based permanent carbon removals, which involve capturing carbon dioxide from the atmosphere and storing it long-term to offset hard-to-abate emissions under the EU emissions trading system. The law also introduces greater flexibility across sectors and policy instruments to help countries meet targets in a more efficient and cost-effective way.

Additionally, the timeline for the EU's emissions trading system for road transport, buildings and other sectors (ETS2) has been pushed back by one year, meaning it will become fully operational in 2028 instead of 2027.

The amended regulation will enter into force 20 days after its publication in the Official Journal of the European Union and will apply directly across all EU member states. The European Commission will now prepare legislative proposals to implement the new 2040 climate target.

The regulation also mandates a biennial review of the European Climate Law, allowing policymakers to assess progress based on scientific developments, technological advances, EU competitiveness, energy prices, and the role of carbon removals and international credits in meeting future climate goals. If necessary, the Commission may propose further revisions or additional measures to support Europe's long-term prosperity while advancing its climate ambitions.



WHY YOUNG PEOPLE SHOULD CARE ABOUT INVESTING IN CLEAN ENERGY

For younger generations, investing in clean energy is one of the most impactful ways to shape a better future—both for the planet and for their own financial well-being. As the climate crisis intensifies, clean energy offers a practical and forward-thinking investment option that supports innovation, job creation, and global sustainability.

Renewable energy sources like solar, wind, and hydropower are no longer niche technologies—they are rapidly becoming the backbone of modern energy systems. The clean energy sector is one of the fastest-growing industries in the world, offering vast opportunities in technology, engineering, finance, and entrepreneurship. For young people entering the workforce or beginning their investment journey, this sector represents growth, resilience, and long-term returns.

Investing in clean energy also reflects values that matter to many young people. Climate change, environmental justice, and sustainability are priorities for this generation. By choosing green investments—such as sustainability-focused

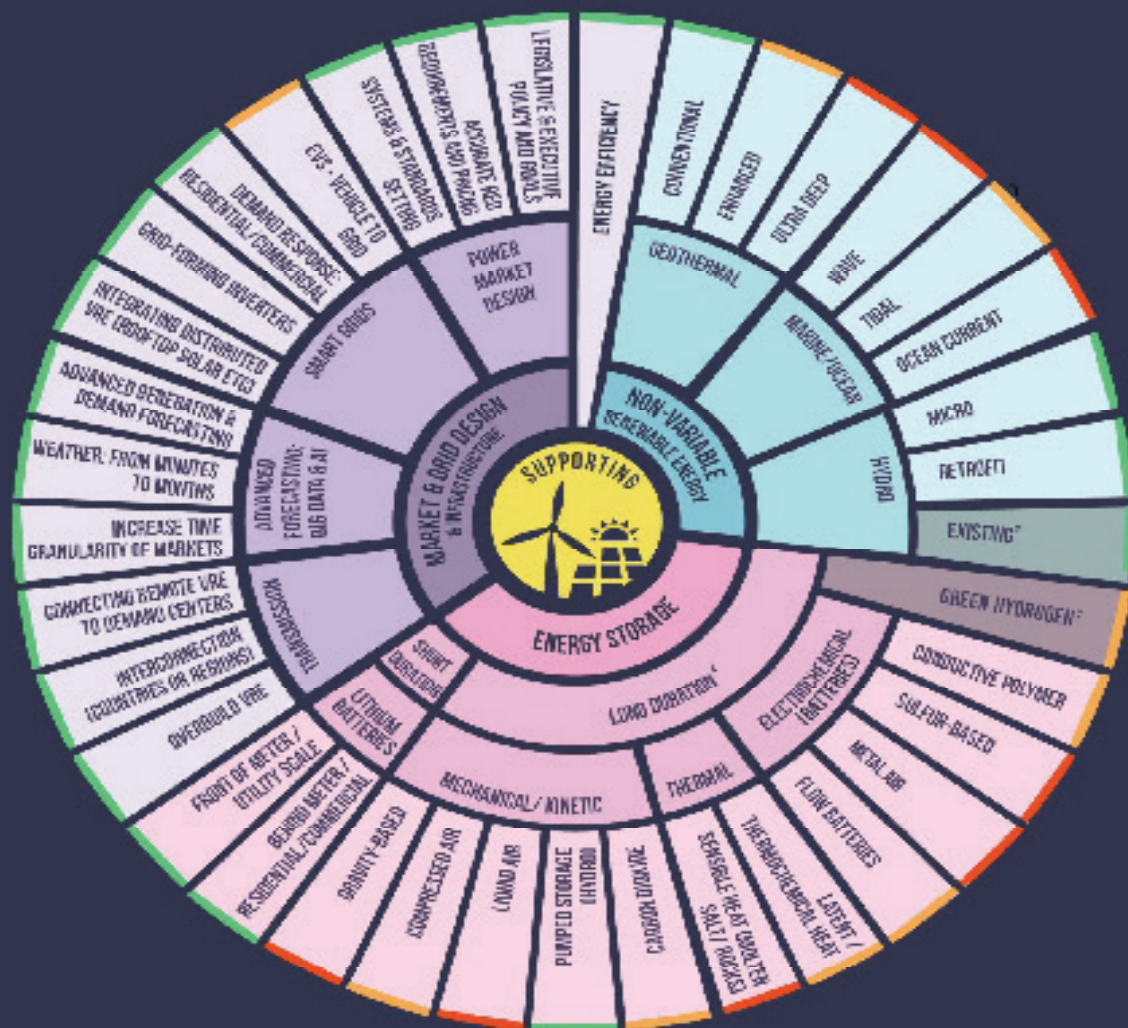
mutual funds, green bonds, or shares in renewable energy companies—young investors can align their financial choices with their personal beliefs, contributing to positive environmental and social impact.

Moreover, clean energy is a more stable and secure alternative to fossil fuels, which are prone to price volatility and geopolitical risks. Renewable technologies offer decentralized, low-cost, and increasingly reliable energy solutions. As demand for electric vehicles, energy storage, and smart grids grows, so does the potential for clean energy to deliver strong financial performance.

Thanks to digital investment platforms, getting started is easier than ever—even with small amounts. For young people looking to build wealth while supporting the planet, clean energy offers a powerful and accessible opportunity. It's more than an investment—it's a step toward a cleaner, smarter, and more sustainable world they'll inherit.

Achieving Fossil-Free Electricity¹

Policies, Tools and Technologies for Supporting Wind and Solar



Key: Market Readiness

■	Commercial
■	Newly Commercial
■	Demo/Pilot

Footnotes:

1. Infographic shows the many choices available for supporting wind & solar to achieve reliable, dispatchable fossil-free energy. There is no one silver bullet. Not all are necessary, although most Market & Grid Design reforms are. List is not exhaustive.
2. No new large hydropower dams should be built. Existing projects should be operated in a way that minimizes impact on vulnerable communities.
3. Converting electricity to hydrogen and back again is inherently inefficient but may make sense in some contexts. Hydrogen should be manufactured, stored, and converted back to electricity, all at the same location, in order to limit inefficiencies and leakage risks.
4. Long Duration storage is mostly not needed until over 50% VPP penetration.

“SOLAR BATTERY” SUPPLIES HYDROGEN FROM SOLAR ENERGY AT THE TOUCH OF A BUTTON

A newly developed “solar battery” can store sunlight and release it later as hydrogen at the push of a button — even in the dark. The breakthrough material, created by researchers from Ulm University and Friedrich Schiller University Jena, allows solar energy to be captured, stored for days, and converted into hydrogen on demand. The findings were published in Nature Communications.

Green hydrogen is a key pillar of the global energy transition, typically produced directly from sunlight through photocatalysis. While many technologies can convert and store solar energy as chemical energy, this is the first material capable of holding that energy for several days before releasing it as hydrogen when triggered. Professor Sven Rau of Ulm University describes it as “a combination of a solar cell and a battery at the molecular level.”

At the core of the system is a water-soluble, redox-active copolymer — a macromolecule built from different organic components and engineered with enhanced electron-storage capability. The material achieves a charging efficiency of more than 80 percent and can retain the stored energy for days. When hydrogen is needed, adding acid and a hydrogen evolution catalyst releases the stored electrons, which combine with protons to generate hydrogen with an impressive efficiency of 72 percent. Notably, this discharge

process works even without sunlight.

The system can be reset using a simple pH switch. Once neutralised, it can absorb light and recharge again. Because the polymer’s redox reactions are reversible, the material supports multiple cycles of charging, storage, and hydrogen production without needing to be isolated or replaced. The process also produces a visible colour change: violet when charged, yellow when discharged, and back to violet once reactivated by light.

Beyond its technical innovation, the project bridges two rarely connected areas of chemistry — macromolecular polymer science and photocatalysis. Researchers believe the technology could support industrial applications requiring reliable green hydrogen supplies, such as climate-neutral steel production. By enabling cost-effective and scalable solar energy storage, the development marks an important step toward a sustainable, hydrogen-based energy economy.







GAME-CHANGING PROJECT PAIRING SOLAR PANELS WITH CROPS — HERE'S HOW IT WORKS

A pioneering project that combines solar power generation with crop cultivation is set to reshape the future of solar farming. Germany's largest solar farm is expected to come online later this year, featuring an innovative agrivoltaic design that delivers multiple benefits. According to SolarQuarter, the project is being developed by the Greenbuddies Group in the Bavarian town of Oberndorf am Lech. Spanning 69 acres with an installed capacity of nearly 17 megawatts peak, it will be the largest agrivoltaic installation in Germany.

The solar panels will be mounted on tracking systems that follow the sun throughout the day, enabling up to 30% higher electricity generation compared to fixed installations. However, the most distinctive feature lies beneath the panels. Wheat will be cultivated under the solar arrays, demonstrating that large-scale solar power and agriculture can coexist on the same land. Appropriately named Triticum — the Latin word for wheat — the project aims to prove the viability of dual land use.

Solar energy is among the cleanest and most cost-effective power sources globally. When paired with other renewables like wind, it can significantly cut fossil fuel use and reduce heat-trapping emissions. Yet, the extensive land requirements of solar farms have long been a challenge.

Agrivoltaic projects like Triticum address this issue by allowing crops to grow beneath solar panels, creating dual-purpose land use. This approach not only makes solar installations more appealing to farmers but also offers additional revenue streams.

Similar models have already shown success worldwide. Farmers in Puerto Rico and western Colorado have integrated solar panels into coffee and peach farms, respectively. Meanwhile, the Czech Republic recently updated its farming regulations to permit solar installations above crops such as cabbage and tomatoes.

The Triticum project is expected to be completed by the end of the year.

GLOBAL EVENTS



SOLAR PAKISTAN
Date: 17 - 19 April, 2026
Venue: Lahore Expo Centre



SNEC
Date: 3 - 5 June, 2026
Venue: Shanghai, China



Intersolar Europe Exhibition
Date: 23 - 25 June, 2026
Venue: Messe, München



SOLAR PAKISTAN
Date: 09-11 Oct, 2026
Venue: Karachi Expo Centre

Global Events



RE+
Date: 16 - 19 Nov 2026
Venue: Las Vegas, NV



WETEX & DSS
Date: 20 - 22 Oct, 2026
Venue: Dubai World Trade Centre (DWTC)



WORLD BATTERY & ENERGY STORAGE INDUSTRY EXPO
世界电池、储能产业博览会

WBE
Date: 16 - 18 Sep, 2026
Venue: Guangzhou, China

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