مدينة الملك عبد الله للطاقة
الذرية والمتجددة K•A•CARE

Energy Observatory
JOURNAL

January 2026

المقدمة

تُـــعد نشرة مـــرصد الطاقة منصة معرفية دورية تقدم لمحات شامـــــلة حول المستجدات في مـــجال الـطاقة عـــالميًا ومحليـــاً

تهدف النشرة إلى تسليط الضوء على :

- أحدث التطورات في مجالات الطاقة المتجددة والذرية.
- استعـــراض التـــقنيات الحديثة والـــتحولات العالمية.
- مـــــقالات خـــــبـــراء
- ملخصات أوراق علمية بارزة
- تقـــــارير مـــــتخصصة

تسعى النشرة إلى توفير محتوى غني ومتنوع يلبي احتياجات صناع القرار والباحثين والمهتمين بمجال الطاقة، مما يساهم في تعزيز المعرفة ودعم الابتكار في القطاع.

Renewable Energy News

Saudi Arabia, Morocco sign renewable energy cooperation program.

Image: SaudiGazette

Saudi Arabia and Morocco have signed an executive program to enhance cooperation in renewable energy and energy efficiency. The agreement, stemming from a 2022 memorandum of understanding, was formalized following talks in Riyadh between Saudi Energy Minister Prince Abdulaziz bin Salman and Morocco's Minister Leila Benali. It aims to promote joint renewable energy projects and expand mutual investments between both nations.

The program focuses on enabling companies to collaborate on initiatives such as energy storage systems, grid integration, and electricity transmission. It also covers the development of research centers, technology advancement, and training programs to support sustainability and knowledge transfer in both countries and abroad.

Source

Renewable Energy News

Scientists achieve 25.4% efficiency in perovskite solar cells with enhanced stability using multivalent ligands.

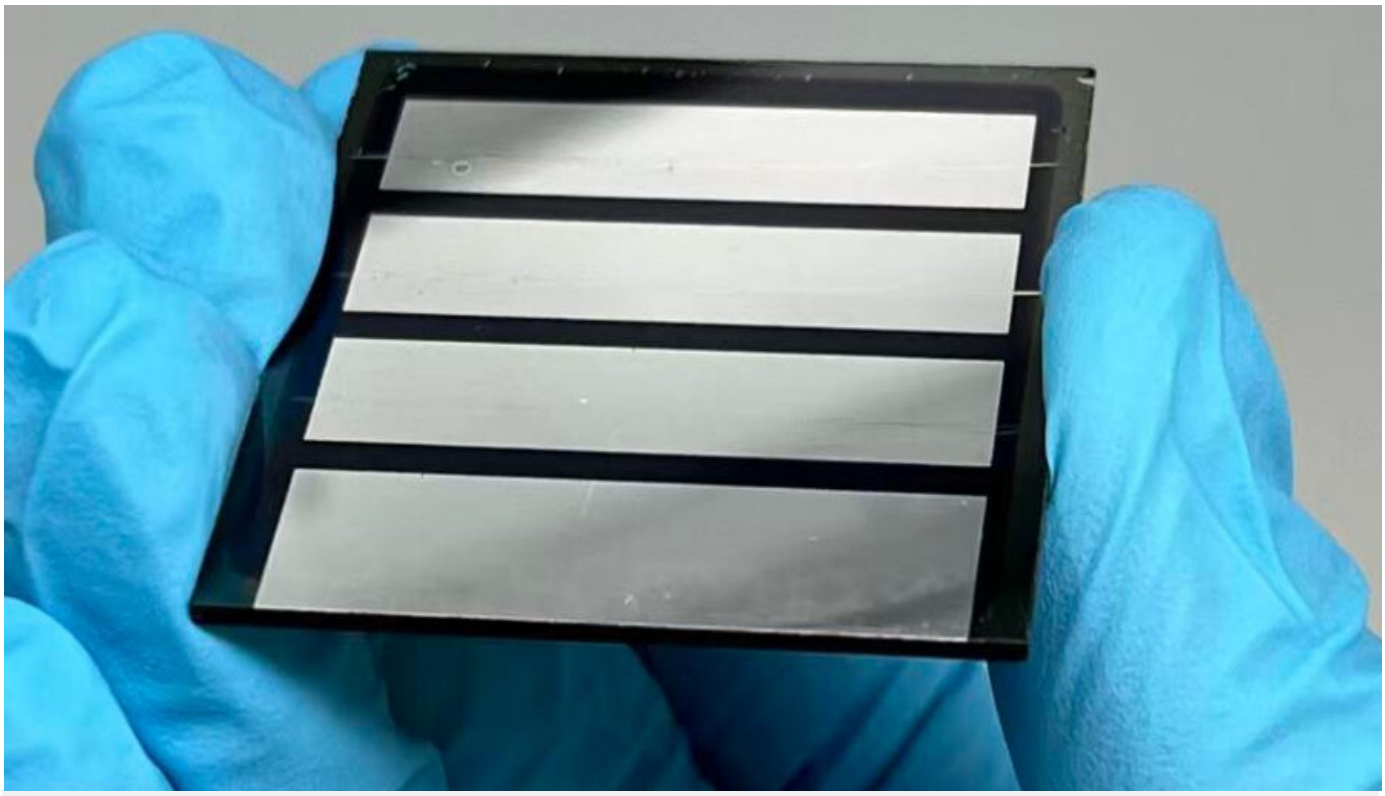

Image: The 4-cell minimodule. Xiaoming Chang – PV Magazine

An international research team has demonstrated perovskite solar cells with a certified efficiency of 25.4% and over 95% performance retention after 1,100 hours at 85 °C under 1-sun illumination, using multivalent amidinium ligands for controlled low-dimensional passivation. The approach enables precise 1D-to-2D structural tuning at the perovskite interface, forming uniform and stable heterojunctions that suppress defects and enhance long-term operation.

The method was validated on 1.1 cm² cells and 4 cm × 4 cm mini-modules, reaching 24.2% efficiency. The collaboration involved researchers from the University of Manchester, Chinese University of Hong Kong Shenzhen, and King Abdullah University of Science and Technology (KAUST), alongside partners in Korea, Singapore, Greece, and China, highlighting its relevance for scalable and durable perovskite technologies.

Source

Renewable Energy News

Mirai Solar develops lightweight solar panel for agrivoltaics.

Image: Mirai Solar - PV Magazine

Mirai Solar, a KAUST spinoff based in the U.S., has developed and certified a novel lightweight photovoltaic module tailored for agrivoltaics, especially greenhouse applications. The 115 W foldable panel is glass-free, vacuum-laminated on flexible polymer sheets, and delivers 60% shading with 40% light transmission. It uses crystalline silicon back-contact solar cells and meets IEC certification standards.

With pilot installations in the U.S., Europe, and Saudi Arabia, Mirai Solar has deployed over 150 kW across leafy greenhouses, vineyards, and algae systems. The technology has also been adapted for lightweight carport canopies at KAUST and is supported by several global clean-tech startup accelerators.

Source

Renewable Energy News

IRENA Assembly Addresses Global Renewable Energy Developments.

Image: https://www.irena.org/

The Sixteenth Session of the International Renewable Energy Agency (IRENA) Assembly (IRENA 16A) convened in Abu Dhabi, bringing together government representatives, international organizations, and energy stakeholders to discuss developments in the global renewable energy landscape.

The assembly was hold under the theme “Powering Humanity: Renewable Energy for Shared Prosperity” and was focused on progress toward global targets, including increasing renewable energy capacity and improving energy efficiency by 2030. Discussions during the event addressed recent trends in renewable deployment, the role of renewables in energy systems, and the importance of policy frameworks, investment, and international cooperation in supporting the energy transition.

Source

Renewable Energy News

Azerbaijan Opens Khizi-Absheron Wind Farm Developed by Saudi ACWA Power.

Image: https://www.spa.gov.sa/en/N2484600

In the presence of President Ilham Aliyev, ACWA Power officially inaugurated the Khizi-Absheron Wind Power Plant in Azerbaijan. Represented by Chairman Mohammed Abunayyan, the project has a total capacity of 240 MW and aims to increase renewable energy in Azerbaijan's power mix, reduce carbon emissions, and support national energy goals.

The ceremony was attended by Assistant Minister Eng. Nasser Al-Qahtani, Azerbaijani officials, and energy sector representatives. The project highlights Saudi Arabia and Azerbaijan cooperation in renewable energy and forms part of ACWA Power's international investment portfolio, reaffirming the Kingdom's leadership in the global energy transition through its national companies.

Source

Renewable Energy News

CATL Opens Middle East's Largest New Energy Aftermarket Facility in Riyadh.

Image: https://www.catl.com/en/news/6661.html

CATL opened the NING SERVICE Experience Center in Riyadh, marking the company's first new energy aftermarket facility in the Middle East and currently the largest of its kind outside China. Covering more than 7,000 square meters, the center provides full-lifecycle after-sales services for electric mobility and energy storage systems, including diagnostics, maintenance, refurbishment, training, and recycling.

The facility supports Saudi Arabia's electrification and decarbonization objectives under Vision 2030 and serves as a regional hub for technical services, talent development, and localized operations, reinforcing CATL's long-term commitment to the Middle East's energy transition.

Source

Renewable Energy News

Interface nanostructuring raises perovskite–silicon tandem cell efficiency to 32.6%.

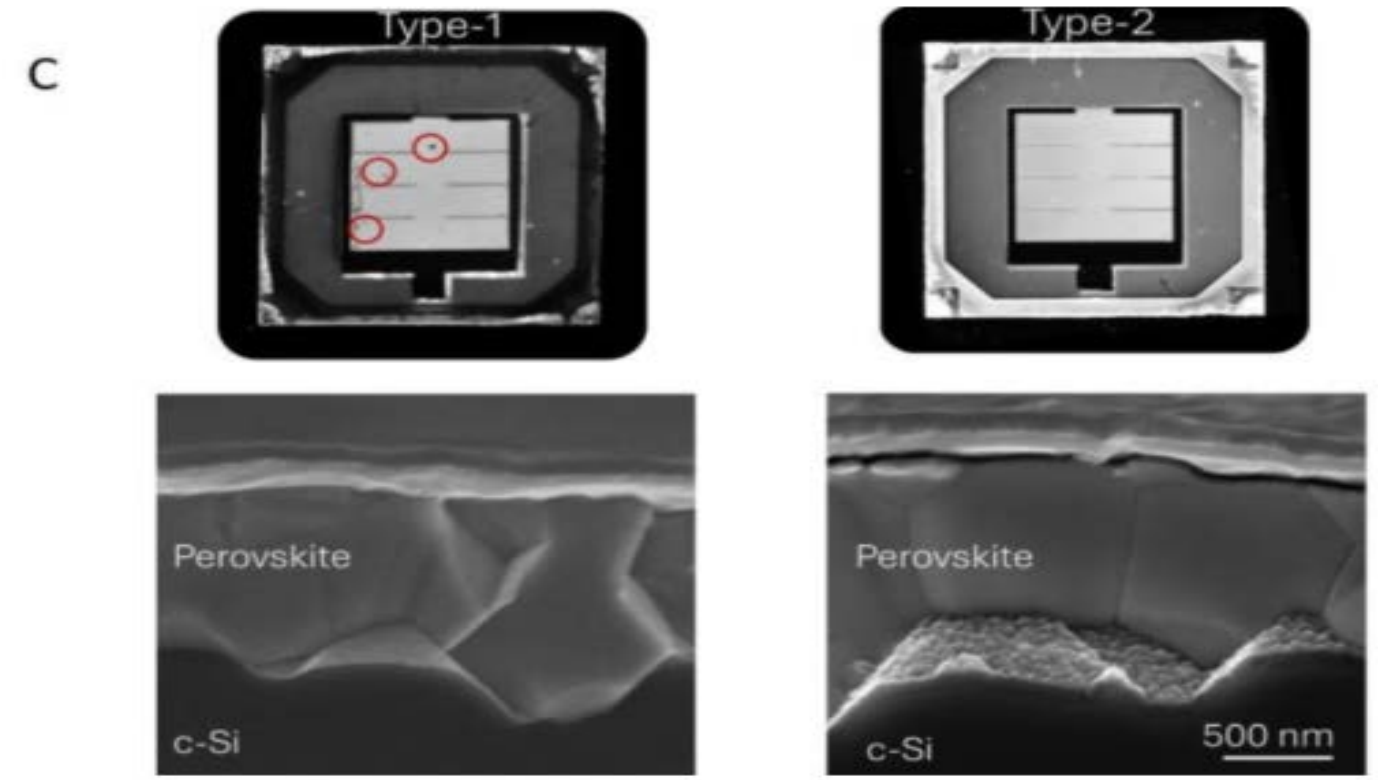

Image: Yifeng Zhao, et al. Delft University of Technology, EES Solar CC by 3.0

Researchers from TU Delft, KAUST, and LMU Munich reported a perovskite–silicon tandem solar cell efficiency of 32.6% by engineering nanoscale roughness at the recombination junction. Instead of modifying material composition, the team adjusted the thickness and plasma treatment of n-type nanocrystalline silicon layers to control surface morphology. This increased conductivity, crystallinity, and improved the quality of ITO, hole transport layer, and perovskite interfaces. The modified nano roughness enhanced self-assembled monolayer anchoring and reduced recombination losses, leading mainly to higher fill factors without introducing new materials or complex fabrication steps.4.

Source

Renewable Energy News

Sodium-ion battery developed using low-cost cathode and plant-based hard carbon anode.

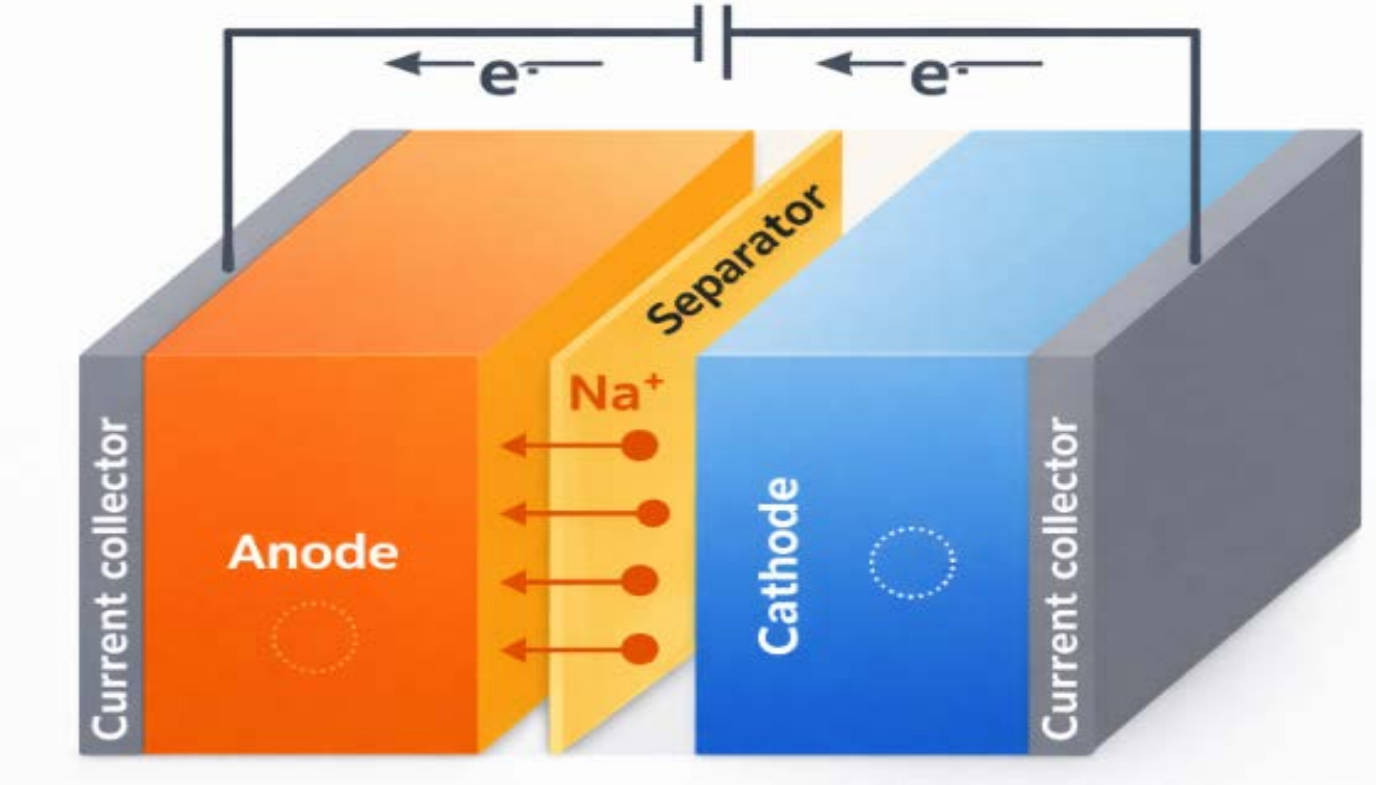

Image: Schematic of the SIB system by pv magazine

Researchers developed a sodium-ion battery using a P2-type $Na_{0.67}Mn_{0.9}Ni_{0.1}O_2$ cathode and a hard carbon anode derived from lavender flower waste. The plant-based carbon preserved porous microstructures that enhanced electrolyte penetration and sodium diffusion. Structural analysis using XRD, SEM, TEM, XPS, FTIR, and Raman spectroscopy showed a hexagonal cathode phase and amorphous carbon anode morphology. Nickel doping improved cathode conductivity and electrochemical stability. The system delivered initial capacities of 200 mAh/g for the cathode and 360 mAh/g for the anode, with capacity retentions of 42% and 67.4% after 100 cycles, highlighting a low-cost and scalable electrode strategy.

Source

Nuclear Energy News

Cooling system tests at RA-10 multipurpose reactor.

Image: (CNEA)

Argentina has reached a key milestone in commissioning the RA-10 multipurpose research reactor with the successful start-up of the first pump in its primary cooling circuit, enabling coolant circulation for the first time. According to National Atomic Energy Commission, the test allows verification of hydraulic performance and compliance with design and safety requirements ahead of reactor commissioning.

Over the next two months, further cold tests will validate the full cooling system using dummy fuel elements that replicate the operational core configuration. The 30 MWt open-pool RA-10 reactor, under construction since 2016 with Invap as main contractor, will replace the RA-3 reactor and support radioisotope production, materials research, silicon doping, training, and exports covering up to 20% of global medical isotope demand.

Source

Nuclear Energy News

Joint study validates SMR use for chemical plants.

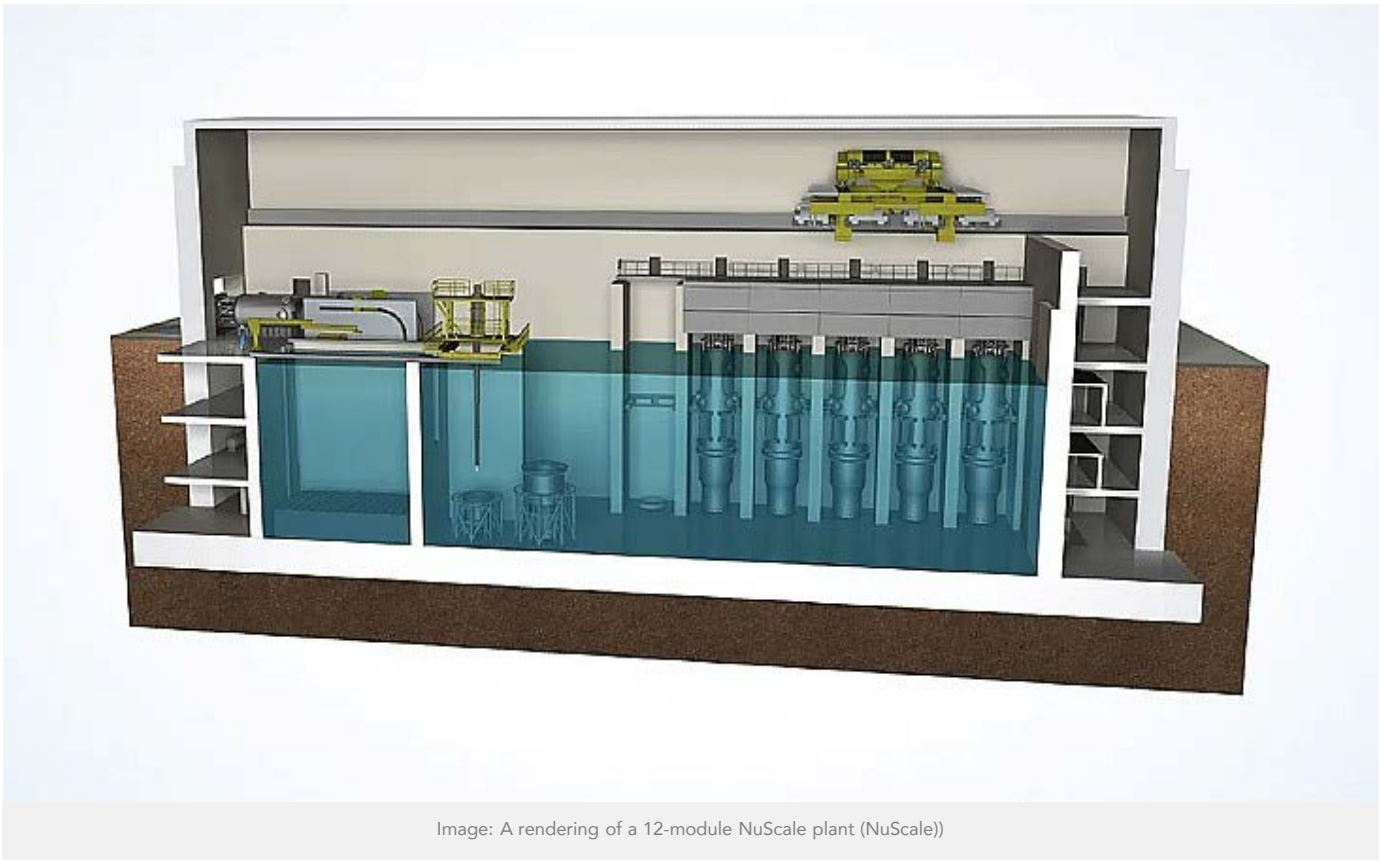

Image: A rendering of a 12-module NuScale plant (NuScale))

A two-year study by Oak Ridge National Laboratory and NuScale Power has validated the technical and economic case for supplying a large US chemical plant with nuclear-generated steam and electricity using NuScale's uprated 77 MWe small modular reactor design. Funded by the US Department of Energy through its GAIN programme, the analysis used real industrial operating data to compare nuclear and natural gas options.

The results show that coupling NuScale Power Modules with a high-temperature steam heat-augmentation system can reliably meet demanding process steam and power needs while remaining profitable. A 12-module configuration offered the strongest performance and flexibility, with excess electricity available for export to the grid.

Source

Nuclear Energy News

NASA, DOE aim for nuclear reactor on moon by 2030.

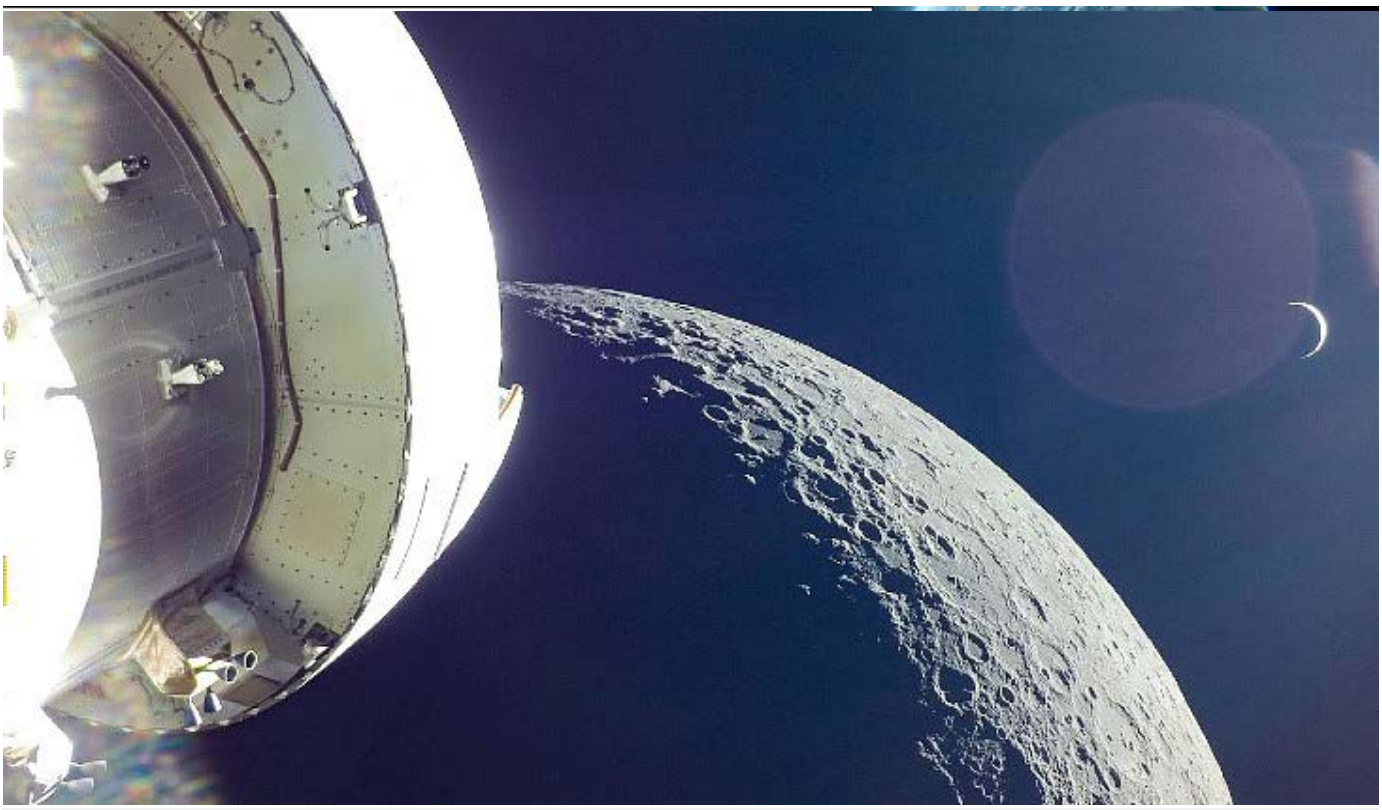

Image: The Earth rises behind the Moon in this image captured by Orion, part of the Artemis I mission, during a flyby in 2022 (NASA)

NASA and the US Department of Energy have renewed their collaboration to develop a nuclear fission power system for the Moon and future Mars missions, targeting deployment of a lunar surface reactor by 2030. The renewed memorandum of understanding aligns with a December executive order prioritising US space leadership, sustained lunar presence under the Artemis programme, and the use of nuclear reactors on the Moon and in orbit.

The agencies aim to deploy a long-lived fission surface power system capable of providing continuous, reliable electricity regardless of sunlight or extreme temperatures, enabling long-duration lunar operations. Nuclear fission is a core option in NASA's Moon-to-Mars architecture, complementing solar power, and is seen as essential for sustained human exploration beyond Earth.

Source

Nuclear Energy News

COMPASS in 2025: Cameroon and Ghana Strengthen their Safeguards Regulatory Frameworks .

Image: (COMPASS)

In 2025, Cameroon and Ghana advanced their national legal and regulatory frameworks related to nuclear material, reinforcing their commitments to international nuclear non-proliferation. These commitments enable the IAEA to verify that nuclear material and technology are used exclusively for peaceful purposes through safeguards activities. Both countries are part of the current COMPASS programme, an IAEA initiative designed to enhance national capacities in meeting safeguards obligations.

Established in 2020 by IAEA Director General Rafael Mariano Grossi, COMPASS assists States in strengthening nuclear material accounting and control systems, as well as the effectiveness of national or regional authorities responsible for safeguards implementation.

Source

1) Report title: Sodium-ion batteries: A technology brief

The International Renewable Energy Agency (IRENA) published a technology-brief report on sodium-ion batteries in November 2025, emphasizing the critical role of battery storage in the energy transition and outlining the potential of sodium-ion batteries, their key advantages, and their future market outlook.

The key points from the report are as follows:

- Battery storage is essential for the energy transition, enabling grid stability, renewable integration, and transport electrification.
- Sodium-ion batteries (SIBs) are a promising alternative to lithium-ion batteries due to abundant sodium and fewer critical materials.
- SIBs have similar construction to LIBs, allowing use of existing manufacturing know-how and infrastructure.

Prepared by: Omer Al Owain

Source

2 REPORT HIGHLIGHT

- Cathode materials for SIB technologies are usually categorized into layered oxides, polyanions and framework materials. Anode materials are usually categorized into carbonaceous materials, transition metal oxides, and intermetallic and organic compounds
- Key advantages of SIBs include strong performance, improved safety, wider operating temperature range, and sustainability.
- Although SIBs have lower energy density than LIBs, ongoing innovation is steadily closing the performance gap.
- SIBs are particularly well suited for stationary energy storage, where size and weight are less critical, and are also being adopted in transport for short-range urban EVs as well as two- and three-wheelers
- The LIB leads today's battery markets because of their high energy density and broad applicability
- The SIB market is currently in its nascent stage but may see significant growth in the coming years, with production capacity projected to reach 70 GWh by 2025 and up to 400 GWh by 2030.

For more detailed insights, please visit the IRENA website to explore the full report, including in-depth analysis, data tables, and figures, by clicking the link below.

Prepared by: Omer Al Owain

Source

1) Overview of the Global Renewable Energy Capacity Trend

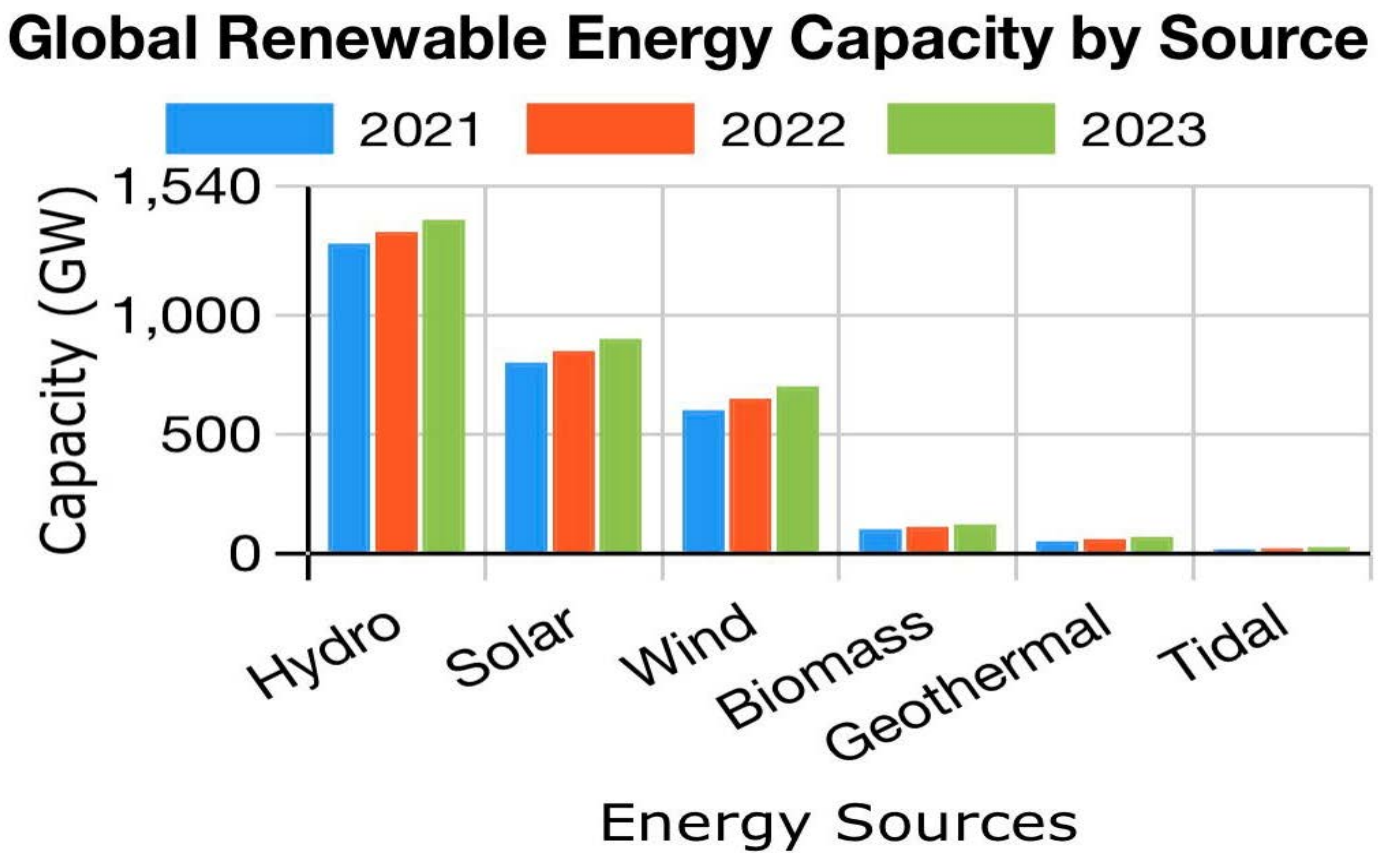

Figure 1 illustrates the global installed capacity of major renewable energy sources—hydropower, solar, wind, biomass, geothermal, and tidal energy—over the period from 2021 to 2023. The chart provides a comparative overview of how different renewable technologies have evolved in terms of capacity deployment, reflecting broader trends in the global energy transition.

Hydropower continues to dominate the renewable energy mix, maintaining the highest installed capacity across all three years. Its steady growth indicates that hydropower remains a foundational pillar of renewable electricity generation worldwide, largely due to its reliability, long operational lifetimes, and established infrastructure in many regions. However, the relatively moderate growth rate compared to other technologies suggests that hydropower expansion is increasingly constrained by geographical, environmental, and regulatory limitations.

Prepared by: Aseel Zamzami

Source

In contrast, **solar energy** demonstrates one of the most pronounced growth trajectories between 2021 and 2023. The continuous rise in installed solar capacity reflects rapid technological advancements, declining costs of photovoltaic systems, and strong policy support in both developed and emerging economies. Solar energy's scalability and suitability for decentralized generation have made it a preferred option for expanding renewable capacity, particularly in regions with high solar irradiance and growing electricity demand.

Wind energy also shows a consistent and significant increase over the analyzed period. The growth in wind capacity highlights sustained investments in both onshore and offshore wind projects. Improvements in turbine efficiency, larger rotor diameters, and enhanced grid integration have contributed to wind energy becoming a competitive and reliable source of power. Together, solar and wind energy represent the fastest-growing segments of the renewable energy sector, signaling a structural shift toward variable but low-carbon energy sources.

Biomass energy exhibits moderate growth, indicating its continued role as a supplementary renewable source. While biomass contributes to energy diversification and can support waste management and rural development, its expansion is often limited by sustainability concerns, feedstock availability, and emissions considerations. As a result, biomass growth remains more restrained compared to solar and wind technologies.

Geothermal and tidal energy capacities remain relatively small in comparison to other renewable sources. Despite their low contribution in absolute terms, these technologies offer important strategic value. Geothermal energy provides stable baseload power with minimal emissions, while tidal energy represents an emerging technology with long-term potential in coastal regions. Their slower growth reflects high upfront costs, site-specific requirements, and technological maturity challenges rather than a lack of long-term relevance.

Overall, the trends depicted in Figure 1 highlight a clear global movement toward diversifying renewable energy portfolios while accelerating the deployment of solar and wind technologies. The data underscores the role of renewables in supporting climate goals, enhancing energy security, and reducing reliance on fossil fuels. As countries continue to implement decarbonization strategies, the observed capacity growth patterns are expected to persist, with innovation, policy frameworks, and investment playing critical roles in shaping the future global energy mix.

Prepared by: Aseel Zamzami

Source

1) Paper Title: **Advances in solar-powered hydrogen energy generation, storage.** Deepthi Jayan K, Praveen Kumar Kanti

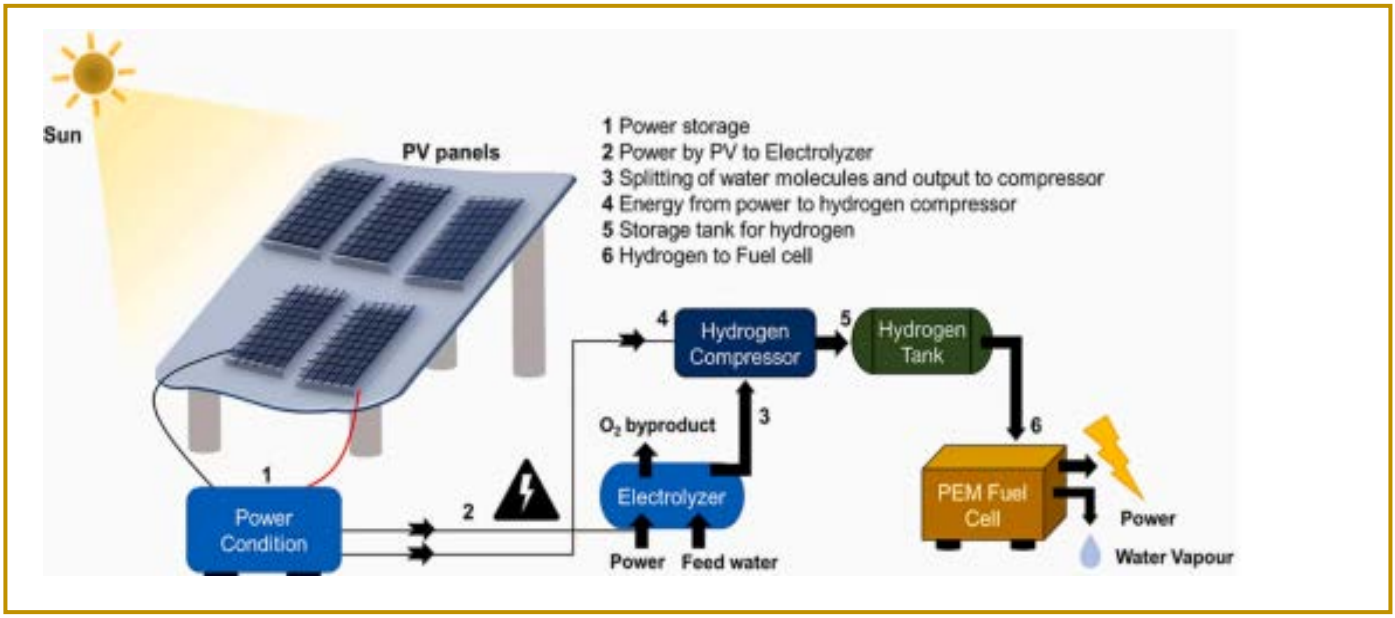

Fig.1, Representation of the integration of solar powered hydrogen production for PEMFCs

The paper reviews recent progress in solar-powered hydrogen energy as a clean and sustainable alternative to fossil fuels. It highlights hydrogen's role as a flexible energy carrier and the importance of integrating solar technologies to achieve carbon-free hydrogen production.

Background & Motivation:

Growing climate concerns, fossil-fuel dependence, and energy security issues motivate research into hydrogen produced from renewable sources. Solar-driven hydrogen offers a way to store renewable energy and decarbonize sectors such as transportation and industry.

Scope and Approach:

The study reviews literature from 2018–2025 (especially 2022–2025), focusing on:

- Solar-to-hydrogen production methods (PV-electrolysis, photoelectrochemical, thermochemical)
- Hydrogen storage and transport technologies
- System integration and techno-economic analysis. It compares performance, efficiency, and cost trends across these technologies.

Major Findings and Insights:

- PV-powered electrolysis is currently the most mature and scalable method.
- Photoelectrochemical and thermochemical systems show high potential but remain at low technology readiness levels.
- Advances in materials (perovskites, catalysts) and thermal storage improve efficiency.
- Hydrogen can support multi-generation systems (electricity, heat, water, and fuel).

Prepared by: Bandar Bahattab

Source

Challenges and Caveats

Key challenges include:

- High capital cost of electrolysers and storage systems
- Low overall system efficiency
- Material degradation and limited durability
- Safety, storage, and transportation difficulties
- Gap between laboratory results and large-scale deployment

Implications and Future Directions

The study suggests future work should focus on:

- Developing cheaper and more stable catalysts and materials
- Improving system integration (solar + hydrogen + storage)
- Scaling up emerging technologies
- Policy support and industry collaboration to reduce hydrogen cost and enable commercialization

Solar-powered hydrogen could play a major role in a low-carbon energy system if these challenges are addressed.

Prepared by: Bandar Bahattab

Source

Dr. Raed Sherif,

Sr. Expert Renewable Energy

January 2026

Economies of scale vs. innovation: what led to the great cost reduction of solar PV panels and how it can be sustained

Anyone observing the progression of solar photovoltaic (PV) panels over the last few decades cannot ignore the incredible cost reduction that was achieved. Just 25 years ago in the beginning of this century, the cost of a solar panel was around $4-5 per Watt; today it is under $0.15 per Watt. How did this happen? Was it simply a matter of increased demand that led to larger volumes and subsequently cost reduction was achieved via economies of scale? How did innovation play a role in this transition? To really understand this, we need to go back in time, specifically to the year 2004 to see how the story unfolded.

Looking at the module cost vs. volume (see Fig. 1), one may be tempted to attribute the incredible journey of solar PV panels cost reduction to the economies of scale, driven primarily by Chinese manufacturers setting up large-scale PV cell and panel factories and doing what they do best. But how did Chinese companies get into this business in such a big capacity in the first place? Going back to 2004, the total installed cumulative PV capacity reached 1 GW, which was a celebrated milestone during that time. But then in the same year Germany issued an amendment to its Renewable Energy Resources Act (known as EEG) which stated that the electricity generated from rooftop or agriculture PV systems are guaranteed to be sold at tariffs between 40-60 euro cents per kWh (depending on the system size) for a period of 20 years. These very generous tariffs were to be paid for from the added surcharge the German government would impose on its electricity consumers. This inspired an unprecedented wave of installations of PV panels in the country, which was later joined by other countries such as Spain that also introduced similar though less generous tariffs. Ultimately, Chinese manufacturers seized on the opportunity of a guaranteed market for 20 years, and through receiving low-cost debt financing from their government, they installed large-scale factories in China. Ironically, this German program led to the unfortunate demise of some German solar cell companies. Take for example Q-Cells, a major German solar company at the time which enjoyed an initial boost when the feed-in tariffs were introduced; however, they were forced into bankruptcy in 2012 as they were unable to compete on price against Chinese manufacturers.

But to attribute the cost reduction of solar panels only to economies of scale would greatly undermine the role of innovation. One of the big success stories in the PV industry has been the great reduction of material usage of poly silicon wafers. Today, poly silicon wafer thickness is under 150 microns, which is about 3X less than the 400 microns thick wafers back in the 1990's. Those thinner wafers were enabled by moving away from traditional mechanical saw dicing using abrasive, diamond impregnated wires to laser dicing. This allowed not only the use of thinner wafers but also the creation of cells with less defects. It also enabled manufacturing of smaller, half-cut cells which reduced current and hence electric losses, enabling higher cell efficiency. Figure 2 shows how the poly silicon wafer's thickness changed over time and the corresponding reduction in the poly silicon usage from 16 g/W in 2004 down to 2 g/W in 2025, taking into account not just the reduction in material but also the corresponding increase in cell efficiency.

So, the answer to our original question of what drove the great cost reduction is a combination of both economies of scale and innovation. But now we are at a point where the solar panel costs have become a smaller part of the overall cost of a PV plant; hence, reducing the solar panel cost any further is not the focus of innovations as it will have no big impact on the levelized cost of electricity. As such, the focus has shifted from reducing the cost of PV panels to increasing cell efficiency and panel power output. And here innovation is taking the lead in a big way. Here is how:

Right now, mono crystalline silicon cells have achieved world record efficiency of 27.8%, which is very close to the 29.3% maximum theoretical efficiency limit of silicon cells. So how can efficiency be pushed any further? By borrowing ideas used in space PV power generation. For many decades, the space industry has been using multijunction cells made from III-V semiconductors, not from silicon. In a multijunction cell, different subcells are grown on top of each other, with the top cell absorbing short wavelength, high energy photons then passing the remaining light to the subcells underneath. In the end, each subcell is building voltage with the current being dictated by the lowest producing subcell. When these cells are used under concentration, their efficiency surpasses 47% in the terrestrial spectrum. These multijunction III-V cells, however, are too expensive to be used in terrestrial power generation despite their high efficiency; hence their use has been limited to space power generation.

5 EXPERT'S COMMENTARY

The idea of a multijunction solar cell for terrestrial application is now being pursued aggressively using silicon with perovskites. Perovskites represent a class of material that is very efficient light absorber and have tunable bandgap. On their own as a single cell, they have demonstrated world record efficiencies of 26.9% which is impressive but still far from their maximum theoretical efficiency limit of 33%. When used with silicon as a tandem, multijunction structure, world record efficiencies of 34.9% have been demonstrated. This 2-junction structure is now considered the new holy grail of solar PV cells, and efforts to develop a commercial product using this structure are pursued aggressively with the main challenges being in achieving a stable device on a large area cell. Not surprisingly, the big silicon manufacturers are pushing for a next generation technology that can still take advantage of their existing infrastructure. Because in the end, the worldwide solar PV market is in the tens of gigawatts per year, and the only challenge now is to develop the right commercial product that can be built in large volumes to meet the market expectations.

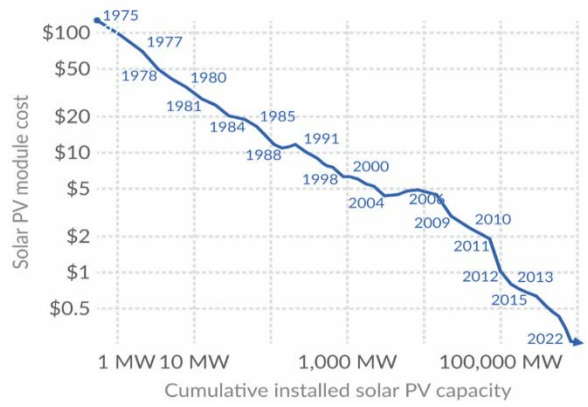

Figure 1- Solar PV module cost vs. volume and years (notice the increase in module price around 2004 when demand exceeded supply)

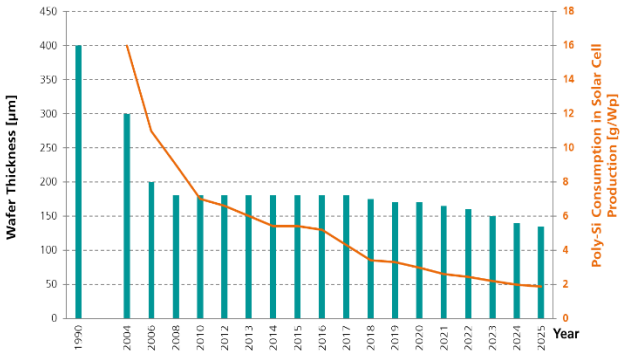

Figure 2- Reduction of silicon material usage per W over the years

Saudi Arabia Green Energy Week 2026
Hosted by Prince Sultan University, this conference focuses on sustainability challenges and interdisciplinary solutions across engineering, policy, urban design, and education.

8–12 February 2026 | Riyadh, Saudi Arabia

Source

International Conference on Renewable Energy Systems and Applications (ICRESA)
Technical and research conference focused on theory and applications in renewable energy systems, suitable for academics, engineers, and industry researchers.

16 February 2026 | Jeddah, Saudi Arabia

Source

International Training Course on Nuclear Material Accounting and Control
Hands-on training for facility-level nuclear material control and safeguards implementation.

2–13 March 2026 | Vienna, Austria

Source

2nd Global Conference on Renewable Energy & Sustainable Development (GCRESD 2026)
A global forum focusing on clean energy policies, innovative renewable technologies, and the integration of sustainability principles into long-term development strategies.

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23–25 March 2026 | Rome, Italy

Source

International Conference on Safe and Secure Transport of Nuclear Material
Global event addressing regulatory frameworks, physical protection, logistics, and emergency response during transport.

23–27 March 2026 | Vienna, Austria

Source

World Conference on Renewable & Sustainable Energy (WCRESE-2026)
A global conference focusing on innovation, research, and the practical implementation of renewable and sustainable energy technologies.

6–8 April 2026 | Tokyo, Japan

Source

National Workshop on Nuclear Security for Major Public Events
Designed for host nations to develop nuclear security strategies and inter-agency coordination for high-profile gatherings.

6–10 April 2026 | Arusha, Tanzania

Source

Middle East Energy 2026
One of the region's largest energy exhibitions, featuring renewable energy segments and co-located events such as Intersolar Middle East, The Battery Show Middle East, and Energy Storage Middle East.

7–9 April 2026 | Dubai, UAE

Source

6 EVENTS

LEAP 2026 – Global Tech & Innovation Festival
A premier global technology conference featuring breakthroughs in AI, sustainability, robotics, and energy tech.

12–16 April 2026 | RECC Malham, Riyadh, Saudi Arabia

Source

25th World Petroleum Congress – WPC Energy 2026
The world's flagship oil & gas event returns with a focus on energy transition, hydrogen, digitalization, and future fuels.

26–30 April 2026 | Riyadh, Saudi Arabia

Source

11th International Conference on Sustainable and Renewable Energy Engineering (ICSREE 2026)
A technical conference showcasing advancements in solar, wind, storage, microgrids, and sustainable energy systems.

20–23 May 2026 | San Sebastián, Spain

Source

Intersolar Europe 2026
Europe's leading solar industry exhibition and conference, featuring innovation in photovoltaics, storage, hydrogen, and solar manufacturing.

22–25 June 2026 | Munich, Germany

Source

43rd European Photovoltaic Solar Energy Conference and Exhibition (EU PVSEC 2026)
The world's largest scientific conference on solar photovoltaics.

14–18 September 2026 | Rotterdam, Netherlands

Source

32nd Solar PACES Conference 2026
The premier global conference on concentrating solar power (CSP), thermal storage, and dispatchable solar systems.

15–18 September 2026 | Bad Neuenahr, Germany

Source

8th RD20 Conference 2026 – Clean Energy R&D Forum
An international dialogue among leading research institutions under the G20 framework.

19–23 October 2026 | Pretoria, South Africa

Source

Solar & Storage Live Riyadh 2026
A regional showcase of solar PV, battery storage, EV infrastructure, and smart energy innovation.

23–25 November 2026 | Riyadh Front, Saudi Arabia

Source