WORLD POWER SYSTEMS REVIEW

1 April 2025

15 March 2025

World's most powerful underwater tide-riding turbines to power 15,000 homes annually

One of the most powerful underwater tide-riding turbine projects has secured funding from the European Union's Innovation Fund.

NH1 project by tidal energy developer Normandie Hydroliennes in France has been granted €31.3 million in funding from the European Union's 2023 Innovation Fund. The grant will fast-track NH1, one of France's first commercial tidal energy pilots, boosting marine renewables. The project aims to install four horizontal-axis turbines in Normandy, delivering 34 GWh annually to the French grid by 2028.

According to the firm, the NH1 farm aligns with France's 2030 renewable energy targets and broader energy transition strategy. "This funding will enable us to take decisive steps in the implementation of our innovative and competitive solution, to accelerate our development and to realize our vision," said Katia Gautier, director of Normandie Hydroliennes, in a statement.

EU has selected the NH1 tidal energy pilot farm for funding under the "Innovation Fund," a program supporting low-carbon technologies. NH1 is among 85 "Zero-Net" projects awarded a share of €4.8 billion, chosen based on greenhouse gas reduction potential, innovation, maturity, scalability, and economic viability. "The grants range from €1.4 million to €262 million for projects with the potential to reduce emissions by some 397.6 million tonnes of CO2 equivalent over their first ten years of operation," said European Climate, Infrastructure and Environment Executive Agency, in a statement.

Located in the Alderney Race, NH1 will feature four 3MW AR3000 turbines, generating 33.9 GWh annually—enough to power 15,000 homes. The project, set to begin operations in late 2027, highlights tidal energy as a reliable and competitive renewable source. According to Normandie Hydroliennes, with Alderney Race offering up to 5 GW of tidal potential, NH1 represents a key step in France's clean energy transition. Developed by Proteus Marine Renewables, the AR3000 turbines are the world's most powerful tidal units and are cost-competitive in electricity generation. Normandie Hydroliennes claims with it being manufactured in France and assembled at Efinor workshops in Cherbourg, the project emphasizes local expertise, with 80 percent of its value sourced from French suppliers. The NH1 development is expected to create approximately 400 direct and indirect jobs.

According to the firm, the recognition from the EU reinforces tidal energy's viability and investment appeal, strengthening France's renewable energy sector and its 2030 sustainability goals. Climate change remains the greatest global challenge of this generation. To combat it, Europe and France have set ambitious 2030 mandates aimed at accelerating the ecological and energy transition while significantly cutting carbon emissions.

In this change, renewable energy is essential. Although solar and wind have lessened dependency on fossil fuels, their erratic nature emphasizes the need for more reliable renewable energy sources. By using the Moon's gravitational pull to generate predictable ocean currents, tidal energy provides a dependable source of electricity. With up to 5 GW of unrealized potential, tidal power is a crucial component of France's renewable energy transition, according to Ocean Energy Europe. By 2030, its production costs are expected to be comparable to those of floating wind energy, making it a competitive part of the energy mix of the future. Tidal turbines are environmentally benign, have little effect on marine environments, and are simple to recycle when their useful lives are up.

Tidal farms are completely submerged, removing any visual, acoustic, and marine disruptions, in contrast to other renewable energy sources. In addition to helping the environment, the industry strengthens local economies, which assists SMEs and mid-sized

businesses the most. By 2030, it is anticipated that France's tidal energy industry will create 6,000 new jobs, bolstering the local economy and promoting the nation's energy independence.

Interesting Engineering
http://interestingengineering.com/

16 March 2025

Blackout in Panama after massive fire at power plant, water supply hit too

A massive power outage has plunged Panama into darkness following an explosion and fire at the La Chorrera Thermoelectric Power Plant. The incident, which authorities believe was caused by a "technical fault" within one of the plant's generators, has disrupted electricity across the country.

Firefighters are currently working to extinguish the blaze, while officials assure the public that power will be gradually restored in the coming hours. Panama's President, Jose Raul Mulino, addressed the nation via social media, saying, "The Director of ETESA informs me that the damage was caused by a private power generator that triggered the system's protection. Service will be restored little by little. Stay calm."

The blackout has also severely impacted water services, as the operation of water treatment plants and wells nationwide depends on the electrical system. As a result, the supply of drinking water has been suspended until power is restored. Authorities have confirmed that staff remain on-site at each facility to resume operations as soon as possible. Residents have been urged to remain patient as emergency crews work to address the crisis and restore essential services across the country.

Hindustan Times
http://www.hindustantimes.com/

16 March 2025

Electricity gradually returns to Cuba after substation failure left millions in the dark

Electricity service in Cuba was gradually restored Sunday, more than 36 hours after a substation failure left the entire island in the dark. Union Electrica, the state agency responsible for the electric grid, reported that most of the capital, Havana, and eastern parts of the country had power. It expected service to return to western areas on Sunday, too.

The massive blackout that began Friday night was the fourth in the last six months as a severe economic crisis plagues the Caribbean country. The Ministry of Energy and Mines attributed it to a failure at a substation in the suburbs of Havana.

Cuba suffered similar blackouts in October, November and December. The latest was the first of 2025 but in mid-February authorities suspended classes and work activities for two days due to a shortage of electricity generation that exceeded 50% in the country. The outages come as Cubans are experiencing a severe economic crisis that analysts have blamed on the effects of the COVID-19 pandemic, a program of domestic measures that triggered inflation and, above all, the tightening of sanctions by the United States.

Experts have said the electricity disruptions are a result of fuel shortages at power plants and aging infrastructure. Most plants have been in operation for more than 30 years. The government has contracted floating power generating plants from Turkey in recent months to meet peak demand, especially during the sweltering tropical summer. The government has also promised that dozens of solar power parks would begin operating in 2025.

CityNews
http://citynews.ca/

17 March 2025

Mangla Dam hits dead level; power production halted

Pakistan's water reservoirs have reached critical levels, with the Mangla Dam water level dropping to the "dead level," leading to the suspension of hydroelectric power production.

According to a WAPDA spokesperson, the Mangla Dam is now at its minimum operating level. Tarbela Dam stands just two feet above its dead level, while Chashma Barrage is only one foot above. Consequently, Mangla Dam has ceased power production due to the lack of water.

Current Reservoir Levels:

- Tarbela Dam: Water level at 1404.93 feet (minimum operating level: 1402 feet, maximum storage level: 1550 feet). Current water storage is 14,000 acre-feet.
- Mangla Dam: Water level at 1050 feet (minimum operating level: 1050 feet, maximum storage level: 1242 feet). Current water storage is 72,000 acre-feet.
- Chashma Barrage: Water level at 639.30 feet (minimum operating level: 638.15 feet, maximum storage level: 649 feet). Current water storage is 17,000 acre-feet.

River Flows: At Tarbela, the Indus River inflow is 19,600 cusecs, while outflow is 20,000 cusecs; At Nowshera, Kabul River inflow and outflow are both 14,600 cusecs; At Mangla, the Jhelum River inflow is 19,800 cusecs and outflow is 19,900 cusecs; and At Marala, the Chenab River inflow is 16,600 cusecs, while outflow is 11,900 cusecs.

Other barrages such as Jinnah, Chashma, Taunsa, Guddu, Sukkur, and Kotri are also witnessing varying inflow and outflow levels, further reflecting the declining water availability. The severe water shortage highlights Pakistan's ongoing struggles with water management and climate change impacts. The reduction in water levels not only affects power production but also has significant implications for agriculture and drinking water supply.

Business Recorder
http://www.brecorder.com/

18 March 2025

China issues guideline on promoting high-quality development of renewable energy, green electricity certificate market

China issued a guideline on promoting the high-quality development of renewable energy and the green electricity certificate (GEC) market on Tuesday. The guideline specifies that China's green certificate market trading system will be basically complete by 2027, and the market will be further improved by 2030, operating in an efficient and orderly manner.

Industry observers said that the guideline will improve the market competitiveness of China's clean energy and significantly expand the relevant market's trading scale, which is conducive for the country's long-term green energy consumption and development. Also, the guideline is expected to further align China's green energy certificates with international standards, providing an important basis for the expansion of Chinese manufacturers into markets where carbon taxes are high, analysts noted.

According to the guideline, by 2027, China will basically establish a GEC market trading system, and the green electricity consumption mechanism - which combines mandatory and voluntary consumption - will be further improved. The market potential of green certificates will be rapidly unlocked, and their international application will be steadily advanced, achieving the smooth nationwide circulation of green certificates.

By 2030, the GEC system will be further improved, with a significant increase in society's demand for independent consumption of green electricity, according to the guideline. The international application of GECs will be effectively realized, and the environmental value of green electricity will be reasonably reflected, which will strongly support the high-quality development of renewable energy and contribute to the comprehensive green transformation of economic and social development.

The guideline has been published on the website of the National Development and Reform Commission (NDRC), China's top economic planner. It was jointly issued by the NDRC, along with other four government departments, including the National Energy Administration as well as the Ministry of Industry and Information Technology. Industry analysts said that the core of the new policy is to accelerate China's green energy transition, both in terms of production and consumption. China has announced the "dual carbon" goals of peaking carbon emissions before 2030 and achieving carbon neutrality before 2060.

Liu Yong, secretary-general of the Energy Storage Application Branch at the China Industrial Association of Power Sources, told the Global Times on Tuesday that the guideline is expected to drive clean energy adoption and investment, significantly advancing China's green transition and the global renewable energy landscape. Lin Boqiang, director of the China Center for Energy Economics Research at Xiamen University, told the Global Times on Tuesday that an improvement in the GEC mechanism will offset certain disadvantages associated with renewable energy consumption, such as intermittent supply and prices with low market competitiveness.

"Green electricity producing companies can sell green electricity at lower prices, which are comparable to those of traditional energy, while supplementing their income through GEC trading, ensuring economic viability," Lin explained, noting that it is also part of the broad national effort to make the trading of clean energy more market-oriented. The guideline also contains detailed measures that aim to boost the GEC market: stabilizing supply, stimulating demand for consumption, improving trading mechanisms, expanding application and promoting international adoption.

For example, the proportion of green electricity consumption in newly built data centers at national hub nodes should be further increased on the basis of 80 percent of the total consumption, the guideline noted. Also, a number of electricity-powered factories, green electricity parks, and other facilities with a high proportion of green electricity consumption will be developed in regions with favorable conditions in a categorized and tiered manner, encouraging them to achieve 100-percent green electricity consumption, read the guideline.

According to Lin, those policies also seek to align China's green certificate standards with international frameworks, promoting mutual recognition and helping Chinese manufacturing enterprises navigate in overseas markets such as the EU, where high carbon emissions could inflict extra taxes and GEC trading could offset certain taxes. As of the end of 2024, China had issued 4.955 billion GECs, a year-on-year increase of 21.42 times, according to a report by China Central Television. A total of 553 million GECs were traded, a year-on-year increase of 4.19 times, equivalent to 553 billion kilowatt-hours of electricity.

Global Times
http://www.globaltimes.cn/

18 March 2025

China's Jan-Feb power consumption up 1.3% on the year, energy administration says

China's power consumption ticked up by a sluggish 1.3% in the first two months of the year because of an unseasonably warm winter, although the growth rate recovered to some 9% in February, National Energy Administration (NEA) data showed on Tuesday.

February power consumption was 743.7 billion kWh while that for the two months was 1.56 trillion kWh, according to the NEA data. Data from China's National Bureau of Statistics (NBS) on Monday had reported that China's power generation fell 1.3% for the first two months of the year - only the third dip for power generation during the January-February period since the 1990s.

Power generation and power demand tend to grow at a similar rate, although there can be discrepancies because of transmission loss, curtailment and other issues, analysts say. The NBS and NEA data samples also vary because the NBS reports omit a portion of generation from China's small-scale renewables, such as distributed solar. For example, NBS data showed power generation grew 6.4% in the first half of 2024, but London-based think tank Ember, using data from the National Energy Administration, said that electricity output rose 7.3% in the same period.

The slower power consumption growth at the beginning of 2025 was partly down to China's warmer than usual winter, which cut into power demand for heating, said S&P Global Commodities senior research analyst Bing Han, speaking in an online seminar on Tuesday, adding that base effects also played a role. That was backed up by the Tuesday NEA data showing that residential power consumption fell 4.2% in February, while primary industry such as agriculture and mining used 10% more power and secondary industry - which encompasses manufacturing - used 12% more.

Weaker demand for heating this winter weighed on coal-fired generation in particular, Han said, because of its use in the heating system. That led China's thermal power generation to fall 6% in the two months, according to the NBS data, which it did not break out by month. "As we enter the second and third quarter we believe power demand will rebound strongly," Han said.

Reuters
http://www.reuters.com/

20 March 2025

Britain on fast track to net zero with early access to £4 billion infrastructure investment

British renewable energy projects will be connected quicker thanks to new Ofgem rules granting early access to almost £4 billion of investment for crucial transmission equipment and services.

The regulator’s new Advanced Procurement Mechanism (APM) will unblock supply chains by allowing Britain’s electricity transmission owners (TOs) to buy essential equipment – such as switchgear, cables and steel – years in advance of when it is needed. This streamlined process will ensure green-lit projects are ready to break ground as soon as planning approval is granted, allowing TOs to avoid delays, control costs and attract international investment in the drive to net zero.

This first-of-its kind mechanism reflects Ofgem's commitment to the government’s Growth Duty compelling regulators to tear down barriers to promote growth and innovation – and the concept could be extended in the future to support other areas of infrastructure development. The APM balances acceleration with accountability to ensure that companies operating within Ofgem’s strict financial framework are delivering projects on time and at the best value to customers.

Advantages to this first-of-its-kind framework include:

- Reduced risk of costly supply chain delays as global demand for vital infrastructure materials increases
- Lowering or controlling build costs by purchasing materials in advance, as supply and demand steadily raises prices year on year

- Supporting growth in domestic manufacturing and attracting international investment to British projects
- Accelerated project delivery which will help government achieve clean power by 2030, and subsequent net zero targets after that

The introduction of this 'use it or lose it' allowance chimes with independent advice provided to government last November by the National Energy System Operator (NESO), which called for a step change across the energy sector to achieve clean power by 2030.

However, conscious of the significant impact that the transition to net zero has on customer bills, the regulator is clear in its governance rules to ensure that the APM is used only for the intended purposes and any unused funding will be returned to consumers.

To minimise the risk of stranded procurement – pre-ordered equipment for projects that do not progress – Ofgem will ensure that only equipment that is transferable between many different projects is eligible for APM funding. More bespoke procurement will be considered on a case-by-case basis to assess the benefit and risk.

Ofgem
http://www.ofgem.gov.uk/

21 March 2025

Mexico's Federal Executive Publishes the Secondary Legislation on Energy Matters

Mexican President Claudia Sheinbaum signed and published in the Federal Official Gazette (Diario Oficial de la Federación or DOF) on March 18, 2025, the "Decree issuing the Law of the State Public Enterprise, Federal Electricity Commission; the Law of the State Public Enterprise, Petróleos Mexicanos; the Electricity Sector Law; the Hydrocarbons Sector Law; the Energy Planning and Transition Law; the Biofuels Law; the Geothermal Law and the Law of the National Energy Commission; it also amends various provisions of the Law on the Mexican Petroleum Fund for Stabilization and Development and amends, adds and repeals various provisions of the Organic Law of the Federal Public Administration," essentially establishing a new framework for the energy sector in Mexico. It is important to note that the decree came into force on March 19, 2025. In addition, on the same day, a decree that reforms, adds and repeals various provisions of the Hydrocarbons Revenue Law, was published in the DOF, but in a separate act.

These reforms aim to establish new regulations for the electricity, hydrocarbons and renewable energy sectors, to modernize and strengthen the country's energy industry. It will be interesting to closely follow the reaction of investors and energy industry participants in the country as a result of these reforms, which substantially alter the national energy sector.

From a general analysis of the new legal framework published, it is important to highlight the following main points:

- The Mexican State assumes strategic control over the energy sector.
- The Ministry of Energy (Secretaría de Energía) is granted most of the powers and prerogatives for planning, regulation and supervision of the energy sector, which were previously assigned to the regulatory bodies that have now been dissolved.
- The National Energy Commission (Comisión Nacional de Energía or CNE) replaces, in its administrative role, the functions of the now-defunct Energy Regulatory Commission (Comisión Reguladora de Energía or CRE).
- The CNE will be composed of a general director, a technical committee and administrative units to handle the procedures under its responsibility.
- The Federal Electricity Commission (Comisión Federal de Electricidad or CFE) will dominate the total annual electricity generation injected into the National Electricity System, with at least 54 percent of its shares.

- PEMEX (Petróleos Mexicanos) will continue to have preference in project assignments involving the exploration and extraction of hydrocarbons in the country.
- The planning of the electricity sector will be binding, ensuring the State's preference in sector activities, aiming to promote electricity generation and supply at the lowest possible price.
- In the electricity sector, joint development projects between private investors and the State will be carried out under the so-called "Mixed Development scheme," which still needs further definition.
- For the hydrocarbons sector, a new system for assigning fields and reserves is established, along with the implementation of new mixed contracts.

It is important to mention that the aforementioned decree repealed the Federal Electricity Commission Law, the Petróleos Mexicanos Law, the Power Industry Law, the Hydrocarbons Law, the Energy Transition Law, the Bioenergy Promotion and Development Law, the Geothermal Energy Law and the Coordinated Regulatory Bodies in Energy Matters Law.

Regarding the information available at the time of the publication of the secondary legislation, please note the following key dates:

- Appointment of the director general of the CNE: The Federal Executive, within 30 calendar days following the implementation, must directly appoint the person to head the CNE as general director without requiring ratification by the Senate. The maximum date for this appointment is April 18, 2025.
- Suspension of deadlines for the CRE and National Hydrocarbons Commission (CNH): To ensure legal certainty regarding the transfer and continuity of actions, requests, matters, procedures, administrative proceedings, or any acts in progress or subject to deadline calculations at the CRE and the CNH, which fall under the jurisdiction of the Ministry of Energy or the CNE, a suspension of deadlines is declared for a period of 90 calendar days, starting from the commencement of the law. That is, restarting terms from June 17, 2025.
- Issuance of the Regulation of the Hydrocarbons Sector Law: The Federal Executive will issue the regulation of this law within 180 calendar days following its implementation. The maximum date for this issuance will be Sept. 15, 2025.
- Issuance of the Regulation of the Energy Planning and Transition Law: The Federal Executive must issue the regulation of this law within 180 calendar days following its entry into force. The maximum date for this issuance will be Sept. 15, 2025.
- Issuance of the Regulation of the Biofuels Law: The Federal Executive must issue the regulation of this law within 180 days following its commencement. The maximum date for this issuance will be Sept. 15, 2025.
- Issuance of the Regulation of the Geothermal Law: The Federal Executive must issue the regulation of this law within 180 business days, starting from the implementation.

Holland & Knight has experienced attorneys in energy matters available to assist clients in understanding the impact of the new regulations on their businesses and projects, as well as to explore the legal alternatives available to address needs in this area.

Holland & Knight
http://www.hklaw.com/

21 March 2025

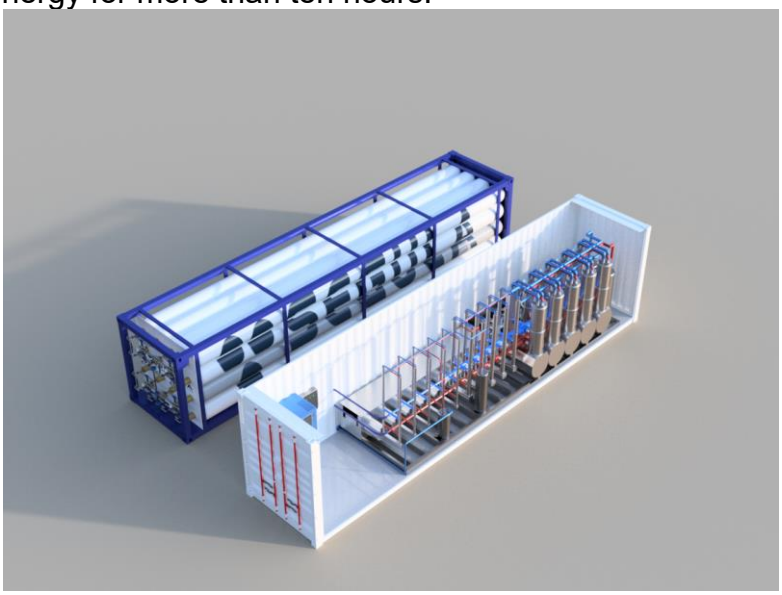
French compressed air energy storage system for homes and businesses

French multinational Segula Technologies has unveiled the Remora Stack, a sustainable renewable energy storage solution for industry, residential eco-districts,

shopping centers, power plants, and public infrastructure. The Remora Stack is a standard, 12 m-container installed system which its manufacturer says has a process efficiency of 70%.

"The entire system has a useful life of at least 30 years, generates no polluting emissions and, unlike batteries, uses robust and durable materials," said the engineering firm, adding the product does not feature lithium or rare earth elements. The new product uses a patented isothermal air compression method developed by Segula and builds on the engineer's Remora technology, which was designed to store renewable energy underwater.

The Remora Stack system is for large energy users and the Remora Home product is for residential energy storage. The former system's storage capacity depends on the size of compressor and its compressed air storage capacity, and can be tailored to the needs of clients. "We've been working on Remora technology and its potential applications for about ten years," said David Guyomarc'h, Segula's head of R&D. "Eventually, the Remora Stack will be able to store energy for more than ten hours."



Remora Stack is part of the EU-funded Air4NRG collaborative project. Segula is piloting the development of test facilities to evaluate the Remora Stack under real-world conditions. Prototypes will validate performance and fine-tune the technology before industrialization. Two industrial-scale prototypes, with a power output of 200 kW each, will be built in Spain, in Eibar and Bilbao. Those sites will be installed in collaboration with project partners the Belgian consultancy Zabala, Spain's ABC Compressors, Portuguese utility EDP, French technological university IMT Atlantique, Spanish engineer Lomartov, communications agency Icons, French electricity transmission system operator RTE, and Portuguese company R&D Nester.

The first industrial-scale pilot project is planned for 2026, and the first Remora Stack production units for the 2028/29 fiscal year.

ESS News
http://www.ess-news.com/

22 March 2025

China unveils a powerful deep-sea cable cutter that could reset the world order

In a move that could disrupt crucial undersea communication networks and energy infrastructure worldwide, a Chinese scientific body has unveiled a compact device that can cut cables and power lines located deep in the ocean.

Developed by the China Ship Scientific Research Centre (CSSRC) and its State Key Laboratory of Deep-sea Manned Vehicles, the device targets armoured cables—made of steel, rubber, and polymer—that carry 95% of global data transmission. Capable of cutting lines at depths of up to 4,000 meters (13,123 feet), twice the depth of existing subsea communication infrastructure, the tool is designed for integration with China's advanced crewed and uncrewed submersibles, including the Fendouzhe (Striver) and Haidou series.

Originally developed for civilian salvage and seabed mining, the tool's dual-use potential raises concerns for other nations. For instance, cutting cables near strategic chokepoints like Guam—vital to the US military's second island chain defense strategy—could disrupt global communications signalling a geopolitical crisis.

The cutting tool's design has successfully addressed several significant technical challenges posed by deep-sea conditions, according to the team, led by engineer Hu Haolong, in a peer-reviewed paper published in the Chinese-language journal Mechanical Engineer on February 24.

At 4,000 meters, where water pressure exceeds 400 atmospheres, the device's titanium alloy shell and oil-compensated seals prevent implosion, even during prolonged use. Conventional blades are ineffective against steel-reinforced cables. To solve this, Hu and his team created a 150mm (six-inch) diamond-coated grinding wheel spinning at 1,600 rpm, generating enough force to shatter steel while minimizing marine sediment disturbance.

Designed for submersibles with limited power resources, the tool features a one-kilowatt motor and 8:1 gear reducer, balancing torque (six Newton-meters) with efficiency, though prolonged use may cause overheating. Operated by robotic arms in near-zero visibility, the device also incorporates advanced positioning technology to ensure precise alignment. The launch of the device marks a significant step as China expands its presence in undersea infrastructure. Beijing now operates the world's largest fleet of crewed and uncrewed submersibles, with the capability to access all parts of the world's oceans.

China's new cable cutting device, which can be operated from stealthy unmanned platforms, has the potential to exploit strategic bottlenecks without the need to surface. This capability has sparked growing discussions within military research communities, particularly following the destruction of Russia's seabed natural gas pipeline by unidentified actors during the war with Ukraine.

However, Chinese scientists insist that the tool, which has successfully sliced through 60mm-thick cables in ground trials, is designed to support "marine resource development," with nations increasingly compelled to shift their focus towards exploiting resources from the seas. Notwithstanding its intended uses, the new breakthrough will further enable China to enhance its marine resource development capabilities, advance the blue economy, and solidify its status as a maritime powerhouse, all of which are crucial to achieving the nation's long-term objectives, the scientists noted. Last month, construction began on a 2,000-meter-deep 'space station' on the floor of the South China Sea, designed to accommodate at least six people for month-long stays.

China Morning Post
http://www.scmp.com/

23 March 2025

Eskom adds 800MW of new capacity to the grid for the first time with the addition of Kusile Power Station's final unit to the national grid

Eskom is pleased to announce the successful addition of Kusile Power Station's final unit, Unit 6, to the national grid today at 16:45. This achievement marks a crucial step toward completing one of South Africa's largest infrastructure projects and is a key milestone in Eskom's strategic objective of adding 2 500MW of new capacity to the grid by March 2025.

Kusile Power Station will contribute a total of 4 800MW to the national grid once all units are fully operational, making it South Africa's largest infrastructure project. Its sister project, Medupi, will see its Unit 4 return 800MW by the end of April 2025 from an extended outage following a generator stator failure and the completion of the project. Both South Africa's new build power station projects will then be essentially completed once Kusile Unit 6 is in commercial operation.

Additionally, Kusile is the first power station in South Africa and Africa to implement Wet Flue Gas Desulphurisation (WFGD) technology, ensuring compliance with air quality standards and aligning with global best practices to reduce sulphur dioxide emissions.

"Eskom is at a critical point returning megawatts to the grid as we are currently in a constrained state. This milestone is a testament to the unwavering dedication and resilience of Eskom's employees and contractors. Their commitment has driven us forward despite numerous challenges. As we celebrate this progress, our focus is now on ensuring that Unit 6 achieves commercial operation in the second half of 2025, further strengthening South Africa's energy security," said Eskom Group Executive for Generation, Bheki Nxumalo.

"Kusile Unit 6's addition is proof that we are making continued progress in stabilising and strengthening South Africa's electricity supply. Meeting the targets we set in the Generation Recovery Plan and our strategic roadmap underscores our determination to deliver new capacity, enhance generation performance, support economic growth, and ultimately deliver a more sustainable energy future. We reiterate our commitment to ensuring that South Africa is in no way returning to the levels of loadshedding that we experienced in 2023 and, our focus remains on delivering a more reliable, resilient, and sustainable power system for the country." said Eskom Group Chief Executive, Dan Marokane.

Over the next six months, the unit will undergo extensive testing and optimisation before reaching commercial operation, when its 800MW capacity will be officially added to the Eskom generation fleet.

With this latest milestone, Eskom remains committed to implementing the Generation Operational Recovery Plan, strengthening governance, and future-proofing the organisation. This is to ensure energy security, growth, and long-term sustainability for the benefit of South Africa and sub-Saharan Africa.

Eskom
http://www.eskom.co.za/

24 March 2025

Growth in global energy demand surged in 2024 to almost twice its recent average

Global energy demand grew at a faster-than-average pace in 2024 as the consumption of electricity rose around the world – with increased supply of renewables and natural gas covering the majority of additional energy needs, according to a new IEA report.

The latest edition of the IEA's Global Energy Review, published today, is the first global assessment of 2024 trends across the energy sector. Based on the most recent data, it covers energy demand, supply, the uptake of new energy technologies and energy-related carbon dioxide (CO2) emissions.

The report finds that global energy demand rose by 2.2% last year – lower than GDP growth of 3.2% but considerably faster than the average annual demand increase of 1.3% between 2013 and 2023. Emerging and developing economies accounted for over 80% of the increase in global energy demand in 2024. This was despite slower growth in China, where energy consumption rose by less than 3%, half its 2023 rate and well below the country's recent annual average. After several years of declines, advanced economies saw a return to growth, with their energy demand increasing by almost 1% in aggregate.

The acceleration in global energy demand growth in 2024 was led by the power sector, with global electricity consumption surging by nearly 1,100 terawatt-hours, or 4.3%. This was nearly double the annual average over the past decade. The sharp increase in the world's electricity use last year was driven by record global temperatures, which boosted demand for cooling in many countries, as well as by rising consumption from industry, the electrification of transport, and the growth of data centres and artificial intelligence.

The expanding supply of low-emissions sources covered most of the increase in global electricity demand in 2024. The amount of new renewable power capacity installed worldwide rose to around 700 gigawatts, setting a new annual record for the 22nd consecutive year. Nuclear power capacity additions reached their fifth highest level in the past three decades. As a result, 80% of the increase in global electricity generation in 2024 was provided by renewable sources and nuclear, which together contributed 40% of total generation for the first time. The supply of natural gas-fired generation also increased steadily to cover rising electricity demand.

As a result of higher power consumption, natural gas saw the strongest increase in demand among fossil fuels in 2024. Gas demand rose by 115 billion cubic metres (bcm), or 2.7%, compared with an average of around 75 bcm annually over the past decade.

Meanwhile, oil demand grew more slowly, rising by 0.8% in 2024. Oil's share of total energy demand fell below 30% for the first time ever, 50 years after it peaked at 46%. Sales of electric cars rose by over 25% last year, with electric models accounting for one in five cars sold globally. This contributed considerably to the decline in oil demand for road transport, which offset a significant proportion of the rise in oil consumption for aviation and petrochemicals.

Global coal demand rose by 1% in 2024, half the rate of increase seen the previous year. According to the report, intense heatwaves in China and India – which pushed up cooling needs – contributed more than 90% of the total annual increase in coal consumption globally, highlighting the major impacts extreme weather can have on energy demand patterns.

The continued rapid adoption of clean energy technologies limited the annual rise in energy-related carbon dioxide (CO2) emissions, which are increasingly decoupling from economic growth, according to the report. Record temperatures contributed significantly to the annual 0.8% rise in global CO2 emissions to 37.8 billion tonnes. But the deployment of solar PV, wind, nuclear, electric cars and heat pumps since 2019 now prevents 2.6 billion tonnes of CO2 annually, the equivalent of 7% of global emissions.

CO2 emissions in advanced economies fell by 1.1% to 10.9 billion tonnes in 2024 – a level last seen 50 years ago, even though the cumulative GDP of these countries is now three times as large. The majority of emissions growth in 2024 came from emerging and developing economies other than China. Though emissions growth in China slowed in 2024, the country's per-capita emissions are now 16% above those of advanced economies and nearly twice the global average.

IEA
http://www.iea.org/

25 March 2025

Power outage hits southern Mexican state, including Cancun

A power outage left different towns in the southern Mexican state of Quintana Roo, including the popular tourist destination Cancun, without electricity, local media reported on Monday evening.

It was not immediately clear what caused the latest outage and state-owned utility CFE, a near-monopoly that produces around 99% of the country's electricity, could not

immediately be reached for comment. Mexico sometimes consumes more electricity than its utility infrastructure can generate and transmit, raising the likelihood of outages, especially during heat waves.

Reuters
http://www.reuters.com/

25 March 2025

ASCE Infrastructure Report Card on Energy: A D+ is Really Failing in Era of Electrification and AI

The imperiled state of U.S. energy infrastructure, already losing luster as the new decade dawned, is now even more in need than it was four years ago.

In fact, energy generation and delivery will require at least $1.89 trillion of near-term future investment to reach a healthy state of repair and keep up with the era of expanding electrification.

The dire and potentially costly warning comes from the latest America's Infrastructure Report Card by the American Society of Civil Engineers (ASCE). The report card, released Tuesday morning by the ASCE, is published once every four years. The demand for electrification is elevating in nearly every way, from data centers to reshoring of manufacturing and vehicle electrification. However, the U.S. grade for energy infrastructure to meet that growing connection is faltering, dropping to a D+ in 2025 from the C- assessed by the ASCE in 2021.

"Energy demand is growing faster than it has in two decades," Otto Lynch, an electric transmission engineer and CEO of Power Line Systems who helped craft the report card as part of the ASCE Committee on America's Infrastructure, said in the Monday press conference announcing the findings.

Energy wasn't alone among U.S. sectors getting the proverbial dunce cap grading by many of the nation's top civil engineers, but it was one of only two which dropped a grade compared with the 2021 ASCE Infrastructure Report Card. Other infrastructural sectors receiving D grades, which ASCE classified as "poor, at risk," include aviation, dams, levees, roads, schools, transit, stormwater and wastewater sectors. Only rails and ports earned B-level plaudits from the ASCE. The remaining sectors--bridges, broadband, drinking water, hazardous waste, inland waterways, public parks and solid waste--graded at "mediocre" Cs.

Previously some industry experts, noting the need for massive upgrades in an era of climate change, have told EnergyTech that U.S. infrastructure is at risk of downgrading into a "second world country." The ASCE report says no such thing verbatim but does stress that lack of investment imperils the nation's critical facilities and services to its people.

"With the 2025 Report Card for America's Infrastructure, ASCE estimates investment needs total $9.1 trillion for 18 categories to reach a state of good repair," reads the executive summary, which does note that public and private investments so far are forecast at about $5.4 trillion, which "leaves a gap of $3.7 trillion in investments for America's infrastructure if we keep investing at current funding levels." The funding gap for the U.S. energy sector—what is being spent compared with what's needed—stands at about $578 billion, according to the ASCE. "An increase in electric vehicles and a rise in data centers will demand 35 GW of electricity by 2030 alone, up from 17 GW in 2022," reads the energy snapshot of the ASCE Infrastructure Report Card. "This rapid acceleration, compounded by federal and state net zero greenhouse gas emission goals, means utilities will need to double existing transmission capacity to connect new renewable generation sources."

Presumably, a substantial portion of these renewables could be distributed energy resources and microgrid assets, which can provide resiliency at the edge of the grid. The Biden Administration-era Infrastructure, Investment and Jobs Act in 2021 and Inflation

Reduction Act (IRA) one year later dedicated hundreds of billions toward domestic energy infrastructure improvement, as well as the addition of the IRA's funding and incentives for low and no-carbon projects such as microgrids and distributed energy projects.

Even so, the demand curve is rising dramatically beyond most previous expectations. Other forecasts, such as Bloom Energy and Goldman Sachs, have predicted as much as 50 GW in new data center capacity over the coming decade. During the press conference, the ASCE's Lynch acknowledged the role for distributed energy resources, including battery storage, to strengthen electricity delivery, but repeated that the ultimate need is for more investment in delivery infrastructure such as "poles and wires." The arrival of the Trump Administration has resulted in the potential undoing of many Biden initiatives. President Trump has frozen some funding from the IRA, which along with the Infrastructure Investment and Jobs Act have incentivized greater spending on renewable and grid hardening technologies, the ASCE wrote. "It is critical for the current administration and Congress to maintain that investment," said Darren Olson, chair of the ASCE's Committee on America's Infrastructure, the group of about 52 civil engineers who worked on the reports.

The weather also is getting nastier in recent years, accounting for 80% of electricity outages since 2000, most of those in the past decade. The ASCE estimated that weather events cost close to $182 billion in property damage in 2024. Time can also be an enemy of progress in the energy sector. The nation's interconnection queue, the process by which new projects are approved by several regulatory jurisdictions, can take several years to complete a clean energy project from design to construction to commissioning. "Interregional connections accelerated by streamlined regulatory review, rigorous design standards and resilient technologies must be implemented to ensure reliability in the years ahead," reads the ASCE's review of energy investment needs.Some of the nation's biggest economic entities are so worried about utility grid resiliency that they are moving forward with alternate plans to build both natural gas-fired and perhaps off-grid power systems. Most of the major data technology firms, including Microsoft and Google, are exploring future energy deals with nuclear technology firms to expand access to GWs of capacity.

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Record-Breaking Annual Growth in Renewable Power Capacity

With 585 GW of capacity additions, renewables accounted for over 90% of total power expansion globally in 2024.

Renewable Capacity Statistics 2025 released by the International Renewable Energy Agency (IRENA) today shows a massive increase in renewable power capacity during 2024, reaching 4 448 gigawatts (GW). The 585 GW addition last year indicates a 92.5% share of the total capacity expansion, and a record rate of annual growth (15.1%).

Although 2024 marks yet another benchmark in renewable energy capacity and growth, progress still falls short of the 11.2 terawatts needed to align with the global goal to triple installed renewable energy capacity by 2030. To reach this goal, renewable capacity must now expand by 16.6 % annually until 2030. In addition, progress yet again reflects significant geographic disparities. As in previous years, most of the increase occurred in Asia, with the greatest share being contributed by China – almost 64% of the global added capacity – while Central America and the Caribbean contributed the least at only 3.2%. The G7 and G20 countries respectively accounted for 14.3% and 90.3% of new capacity in 2024.

IRENA Director-General, Francesco La Camera said: "The continuous growth of renewables we witness each year is evidence that renewables are economically viable and readily deployable. Each year they keep breaking their own expansion records, but we also

face the same challenges of great regional disparities and the ticking clock as the 2030 deadline is imminent."

Commenting on the remarkable progress, the United Nations Secretary-General, António Guterres, said: "Renewable energy is powering down the fossil fuel age. Record-breaking growth is creating jobs, lowering energy bills and cleaning our air. Renewables renew economies. But the shift to clean energy must be faster and fairer – with all countries given the chance to fully benefit from cheap, clean renewable power."

Solar and wind energy continued to expand the most, jointly accounting for 96.6% of all net renewable additions in 2024. Over three-quarters of the capacity expansion was in solar energy which increased by 32.2%, reaching 1 865 GW, followed by wind energy which grew by 11.1%.

The large net decommissioning of non-renewable power in some regions has contributed to the upward trend of renewables capacity. However, more needs to be done to reach the goal of tripling renewables capacity by 2030 and the Paris Agreement. Over the past few years, IRENA has been pressing for clear, quantifiable renewable capacity targets in NDCs 3.0. To this end, the Agency has been assisting in the enhancement and implementation of its members' NDCs with a focus on the energy sector through its country engagement.

Technology highlights:

- Solar: solar photovoltaics increased by 451.9 GW last year. China alone added 278 GW to the total expansion, followed by India (24.5 GW).
- Hydropower (excluding pumped storage hydropower): capacity reached 1 283 GW, demonstrating a notable rebound from 2023, driven by China. Ethiopia, Indonesia, Nepal Pakistan, Tanzania, and Viet Nam added more than 0.5 GW each.
- Wind: wind energy expansion declined slightly, to a total of 1 133 GW capacity by the end of 2024. Expansion was once again dominated by China and the United States (US).
- Bioenergy: expansion rebounded in 2024, with an increase of 4.6 GW of capacity compared to an increase of 3.0 GW in 2023. The growth was driven by China and France with 1.3 GW of additions each.
- Geothermal: geothermal energy increased by 0.4 GW overall, led by New Zealand, followed by Indonesia, Türkiye, and the US.
- Off-grid electricity (excluding Eurasia, Europe and North America): capacity expansion nearly tripled, growing by 1.7 GW to reach 14.3 GW. Growth was dominated by off-grid solar energy which reached 6.3 GW by 2024.

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In Germany, a coal-fired power plant was blown up for three billion: Demolition did not go according to plan

In Hamburg, Germany, they tried to blow up the modern Moorburg coal-fired power plant, the construction of which cost 3 billion euros. However, the demolition did not go according to plan — the explosives worked only in one of the two boiler rooms.

The Moorburg coal-fired power plant with a capacity of almost 1.5 GW was the most modern and efficient in Germany and cost 3 billion euros. However, she worked for only six years. Due to the government's green policy on the development of renewable energy sources, the thermal power plant was closed in 2021. And in March it was decided to demolish it. However, the work did not go according to plan.

At the site of the coal-fired power plant, it is planned to produce "green" hydrogen using electrolysis. For this purpose, a plant will be built, the cost of which is estimated at 300 million euros. More than half of the funds will be provided by the federal government.

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