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INDIA

- **India's First Hydrogen Train Set to Revolutionize Rail Travel with Impressive Speed and Eco-Friendly Performance**

Times bull, 27 March, 2025

India's first hydrogen fuel cell train is expected to begin operations not until June due to technical issues discovered during testing. This state-of-the-art train, set to operate on the historic Kalka-Shimla route, is equipped with a 1,200 HP hydrogen engine, making it the world's most powerful hydrogen-powered train. It uses hydrogen and oxygen to generate electricity, emitting only steam as a by-product, reinforcing India's push for eco-friendly transportation. Designed for short-distance travel, the train will first run between Jind and Sonipat in Haryana, accommodating up to 2,638 passengers across eight coaches. However, operational challenges in extreme weather conditions are being addressed, with adjustments being made to ensure smooth operation on the Shimla-Kalka route, where temperatures can range from below 5°C to above 35°C. Indian Railways is also upgrading tracks to ensure the train reaches speeds of 100 km/h while maintaining safety and comfort for passengers.

- **India Strengthens Energy Security with Key Agreements at India Energy Week (IEW) 2025**

The Energy World, 13 February 2025

At the India Energy Week (IEW) 2025, a series of landmark agreements were signed by major Indian energy companies, marking a pivotal moment for India's energy security and its growing influence in global energy markets. Indian Oil Corporation Limited (IOCL) signed a sales agreement with Yogya Holdings Nepal for the export of approximately 1,000 metric tons of Liquefied Natural Gas (LNG). The LNG will be transported via cryogenic trucks from the Dhamra Terminal in Odisha, marking India's entry into the LNG export market. In addition, Bharat Petroleum Corporation Limited (BPCL) signed a significant optional term contract with Brazil's Petrobras for the import of up to six million barrels of Brazilian crude grades. This agreement also helps mitigate the risks posed by geopolitical tensions and supply chain disruptions, ensuring that India can meet its growing energy demands without heavy reliance on any single source.

IOCL also took another major step by signing a long-term Sale and Purchase Agreement with ADNOC, the UAE's state-owned oil company, for sourcing up to 1.2 million metric tons per annum (MMTPA) of LNG starting in 2026. ONGC Videsh Ltd. also made a notable move by signing a Memorandum of Understanding (MoU) with Petrobras for joint collaboration in upstream oil and gas projects in Brazil, India, and third countries. This collaboration will focus on developing low-carbon solutions and enhancing digitalization in energy production. Oil India Limited entered into a MoU with Petrobras to explore offshore hydrocarbon opportunities in deep and ultra-deep water regions,

including the Mahanadi and Andaman basins. Reliance Industries also made a substantial commitment to green energy with a ₹65,000 crores investment in establishing 500 Compressed Biogas (CBG) plants in Andhra Pradesh. Once fully operational, these plants are expected to generate 4 million tons of green CBG and 1.1 million metric tons of organic fertilizer annually.

WORLD

- **Japan Unveils Breakthrough in Solar Technology by creating Super Panels Capable of Generating Power Equivalent to 20 Nuclear Reactors**

Unión Rayo, 01 April 2025

Japan has unveiled a game-changing solar panel technology that could significantly reduce the country's dependence on traditional power sources. With the development of perovskite solar panels, Japan is poised to take a giant leap forward in renewable energy. **Pervoskite** is a synthetic mineral with a unique crystalline structure which has proven to be a lightweight, flexible, and cost-effective alternative to the traditional silicon used in solar panels. With an impressive efficiency rate of 43% – far surpassing silicon's maximum efficiency of 29% – **perovskite** panels offer significantly better energy generation potential. Furthermore, their foldable design makes them ideal for non-flat surfaces, broadening their application possibilities, from rooftops to more unconventional spaces. The production of **perovskite** solar panels is also far less expensive than silicon-based ones, making them an attractive option for mass production. As the world's largest producer of iodine, Japan is in a prime position to dominate the global market for **perovskite** solar technology, potentially shifting the dynamics of energy production worldwide.

- **Clean Energy Powers 40 percent of Global Electricity in 2024, Solar Leads Growth but Hydro Power Dominates**

The Guardian, 08 April 2025

For the first time since the 1940s, clean energy sources accounted for over 40% of global electricity demand in 2024. Solar capacity has doubled in the past three years, now making up nearly 7% of global electricity, while wind contributes just over 8%. However, both remain dwarfed by hydro power, which provided 14% of global electricity last year. Despite this, solar's rapid expansion is a key factor in shifting the global energy landscape.

While solar and wind are on the rise, hydro power, one of the oldest renewable technologies, has maintained a steady share in the power system. Nonetheless, the growing share of clean power is expected to outpace overall electricity demand, signaling that fossil fuels will increasingly be squeezed out of the energy mix. Despite the growth of renewables, last year's extreme heat waves drove a surge in electricity demand, pushing emissions from the global power sector to an all-time high. The demand for electricity to power air conditioning, refrigeration, and other systems led to a 1.6% increase in emissions. Looking ahead, the rise of electric vehicles, data centers, and AI is expected to continue driving electricity demand, though solar and wind are projected to meet these needs.

- **Launch of a Key Section of CASA-1000 Project: A Milestone in Regional Energy Connectivity**

Tolo News, 02 April 2025

Tajikistan and Kyrgyzstan have marked a significant milestone with the inauguration of the 500 kilovolt transmission line in Tajikistan, a crucial component of the CASA-1000 project. As part of this ambitious initiative, Afghanistan will receive approximately 300 megawatts of electricity annually, generating nearly $50 million in transit fees. The CASA-1000 project is designed to bring 1,300 megawatts of surplus electricity from Central Asia to high-demand markets in South Asia, addressing the growing energy needs of these regions. Officially launched in May 2016, the project is supported by major international organizations, including the World Bank Group, the Islamic Development Bank, the European Bank for Reconstruction and Development, and the European Investment Bank, alongside several donor organizations. The CASA-1000 project is expected to be fully completed by 2027, promising to bring long-term benefits to the region through improved energy infrastructure and cross-border cooperation.

The Energy Forum, a New Delhi based Independent think tank, conducts intensive research and consults on a wide range of issues related to the global energy sector, with focus on energy space. It aims to put collective knowledge and experience in making the planet a better place to live in by formulating new paradigms for sustainable transitions and engendering robust developmental narratives. TEF is supported by a network of scientists, economists, policy makers, diplomats, researchers and academics considered experts in their respective fields.

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