



Environmental Science & Other Innovations:

Environmental Science & Clean Energy

India's Green Initiatives: India has made significant strides in clean energy. The government has reduced the Goods and Services Tax (GST) on renewable energy components from 12% to 5%. This change, which came into effect on September 22, 2025, aims to reduce the nation's reliance on imported solar modules and boost domestic production. Additionally, India's first dedicated vulture conservation portal, "The Vulture Network," has been launched in Assam. This portal will serve as a comprehensive platform for raising awareness and sharing information on vulture conservation in local languages.

AI in Energy Systems: The energy sector is being revolutionized by AI. New AI-powered systems are creating self-learning, predictive, and adaptive power grids. These systems analyze real-time data from weather forecasts and energy demand to manage supply and prevent blackouts. This enables the grid to efficiently redirect renewable energy from one region to another and pre-charge energy storage systems in anticipation of demand surges.

Advancements in Solar Technology: Global solar installations have surged, with a 64% increase in the first half of 2025 compared to the same period in 2024. This growth is making solar power the fastest-growing source of new electricity generation. Researchers have also made a "crucial step" toward the industrialization of perovskite silicon tandem

solar cells, a new technology that promises to improve the efficiency of solar panels.

Critical Mineral Recycling: India's Union Cabinet has approved a ₹1,500 crore incentive scheme to promote the recycling of e-waste and battery waste. The goal is to recover critical minerals and reduce import dependency. This initiative is a near-term solution to meet mineral needs until new mining and exploration projects are fully operational.

Other Scientific Discoveries & Innovations

Earth Science Discovery: A new study has revealed a groundbreaking insight into our planet's history: Earth's solid inner core exists because of carbon. Without the presence of this element, the molten core would not have been able to freeze, which would have prevented the stabilization of the magnetic field that protects our planet.

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Neurological Research: Scientists are studying a protein that has been shown to reverse brain aging. In a separate development, a new compound is being researched that could treat lung and liver fibrosis, offering hope for patients with these conditions.

Evolutionary Insights: A 310-million-year-old fossil of a fish with a hidden second jaw has been discovered, revealing a unique adaptation previously unknown in such ancient species. Additionally, fossilized bones from Brazil show that deadly infections plagued sauropods (dinosaurs) 80 million years ago, indicating that these ancient creatures were susceptible to diseases like osteomyelitis.





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MCQS

1. According to the provided text, what is the primary purpose of the GST reduction on renewable energy components in India?

- a) To increase reliance on imported solar modules
- b) To reduce dependence on imported solar modules and boost domestic production
- c) To promote the use of fossil fuels
- d) To make solar power less affordable for households

Answer: b) To reduce dependence on imported solar modules and boost domestic production
The text states, "The government has reduced the Goods and Services Tax (GST) on renewable energy components from 12% to 5%. This change, which came into effect on September 22, 2025, aims to reduce the nation's reliance on imported solar modules and boost domestic production."

2. What specific function does AI perform in modern energy grids to address the intermittency of renewable sources?

- a) Manually turning off power plants during periods of high supply
- b) Creating new types of solar panels
- c) Analyzing data to predict supply and demand, and manage energy flow
- d) Directly controlling the weather to ensure consistent sun and wind

Answer: c) Analyzing data to predict supply and demand, and manage energy flow
The text explains that AI systems "analyze real-time data from weather forecasts and energy demand to manage supply and prevent blackouts," which directly addresses the issue of intermittency.





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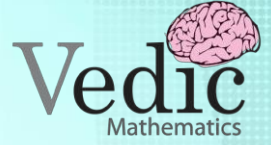
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3.What is the key innovation related to perovskite silicon tandem solar cells mentioned in the text?

- a) A new method for cleaning the cells
- b) A crucial step toward their industrialization, making them more compatible with existing technology
- c) A design that makes them resistant to extreme temperatures
- d) A way to make them glow in the dark

Answer: b) A crucial step toward their industrialization, making them more compatible with existing technology

The text mentions that "Researchers have also made a 'crucial step' toward the industrialization of perovskite silicon tandem solar cells, a new technology that promises to improve the efficiency of solar panels."

4.What is the primary purpose of the ₹1,500 crore incentive scheme approved by India's Union Cabinet?

- a) To fund new solar panel manufacturing plants
- b) To promote the recycling of e-waste and battery waste for critical minerals
- c) To provide subsidies for households to install solar panels
- d) To establish new mining operations for critical minerals

Answer: b) To promote the recycling of e-waste and battery waste for critical minerals

The text clearly states, "India's Union Cabinet has approved a ₹1,500 crore incentive scheme to promote the recycling of e-waste and battery waste. The goal is to recover critical minerals and reduce import dependency."

5.According to the text, what element is essential for the existence of Earth's solid inner core and its magnetic field?

- a) Iron
- b) Oxygen
- c) Silicon
- d) Carbon

Answer: d) Carbon

The text states, "Earth's solid inner core exists because of carbon. Without the presence of this element, the molten core would not have been able to freeze, which would have prevented the stabilization of the magnetic field that protects our planet."

6.What has a new study on ancient fossils from Brazil revealed about sauropods (dinosaurs)?

- a) They were not as large as previously thought.
- b) They were plagued by deadly infections like osteomyelitis.
- c) They lived much longer than modern animals.
- d) They had hidden second jaws.

Answer: b) They were plagued by deadly infections like osteomyelitis.

The text states, "Additionally, fossilized bones from Brazil show that deadly infections plagued sauropods (dinosaurs) 80 million years ago, indicating that these ancient creatures were susceptible to diseases like osteomyelitis."

7.What is the purpose of "The Vulture Network" portal launched in Assam, India?

- a) To promote hunting and conservation of wild animals
- b) To raise awareness and share information on vulture conservation
- c) To track the migration patterns of vultures
- d) To provide a platform for trading exotic birds

Answer: b) To raise awareness and share information on vulture conservation

The text states, "India's first dedicated vulture conservation portal, 'The Vulture Network,' has been launched in Assam. This portal will serve





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as a comprehensive platform for raising awareness and sharing information on vulture conservation in local languages."

8.A new compound is being researched to treat which of the following conditions, according to the text?

- a) Skin cancer and diabetes
- b) Heart disease and high cholesterol
- c) Lung and liver fibrosis
- d) Alzheimer's and Parkinson's disease

Answer: c) Lung and liver fibrosis

The text mentions, "In a separate development, a new compound is being researched that could treat lung and liver fibrosis, offering hope for patients with these conditions."

9.What is one major effect of spaceflight on human blood, as mentioned in the previous document?

- a) It strengthens the immune system.
- b) It accelerates the aging of blood stem cells.
- c) It increases the production of red blood cells.
- d) It reduces the body's need for iron.

Answer: b) It accelerates the aging of blood stem cells.

The previous text on biotechnology mentioned, "Researchers have found that spaceflight accelerates the aging of human blood stem cells, which are crucial for the immune system."

10.What unique anatomical feature was found in a 310-million-year-old fish fossil?

- a) Bioluminescence
- b) A hidden second jaw
- c) An extra fin on its back
- d) The ability to walk on land

Answer: b) A hidden second jaw

The text states, "A 310-million-year-old fossil of a fish with a hidden second jaw has been

discovered, revealing a unique adaptation previously unknown in such ancient species."

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