

India-Japan Green Cooperation: Clean Energy, JCM and UPSC Relevance

India and Japan are strengthening cooperation on **clean energy, climate action and green technologies**. A major recent development was the launch of the **Operational Manual for the India-Japan Joint Crediting Mechanism (JCM)** on **30 September 2026**.

The manual provides the framework for implementing projects that use advanced low-carbon technologies, mobilise climate finance and generate high-integrity emission reductions. The cooperation operates under **Article 6.2 of the Paris Agreement**.

The development is part of the broader **India-Japan Special Strategic and Global Partnership**, which increasingly includes clean energy, energy security, critical minerals, batteries and green technologies.

What is the Joint Crediting Mechanism?

The **Joint Crediting Mechanism (JCM)** is a bilateral framework through which participating countries cooperate on projects that reduce or remove greenhouse-gas emissions.

Under the India-Japan JCM:

- Japanese and Indian entities can collaborate on low-carbon projects.
- Advanced Japanese technologies can be deployed in India.
- Emission reductions can be quantified and verified.
- Credits can be issued and transferred according to agreed rules.
- Projects are expected to contribute to sustainable development.

India and Japan signed the **JCM Memorandum of Cooperation in August 2025**, followed by the **Rules of Implementation in June 2026** and the Operational Manual in September 2026.

India-Japan Cooperation in Green Energy

The partnership covers several important areas.

1. Green Hydrogen and Green Ammonia

India aims to become a major producer and exporter of **green hydrogen and its derivatives**, while Japan is developing clean-hydrogen and ammonia supply chains.

India's **National Green Hydrogen Mission** provides the domestic policy framework for this cooperation.

In 2026, an Indian company entered into long-term agreements with Japanese companies for the supply of **green ammonia and green methanol**, creating an emerging India-Japan clean-fuel supply chain.

2. Clean Energy Technologies

The two countries are exploring cooperation in:

- Solar photovoltaic technology
- Green hydrogen
- Clean ammonia
- Nuclear energy
- Batteries
- Energy-efficient technologies

At the 16th India-Japan Annual Summit in July 2026, both countries reaffirmed their commitment to expanding cooperation in these areas.

3. Cooperative Biogas for Growth

India and Japan launched the **India-Japan Cooperative Biogas for Growth Initiative**.

The initiative aims to support India's objective of establishing **1,000 biogas and organic-fertiliser plants**, leveraging India's dairy cooperative network.

It links **waste management, renewable energy, agriculture and rural development**.

4. Batteries and Energy Storage

India and Japan have also agreed to cooperate on **battery-related projects**, with the objective of developing trusted and sustainable battery supply chains.

This is particularly important for:

- Electric vehicles
- Renewable-energy storage
- Grid stability
- Clean mobility

Why is India-Japan Green Cooperation Important?

Energy Security

India and Japan are both major energy-consuming economies. Cooperation in hydrogen, ammonia, renewables and resilient supply chains can reduce dependence on vulnerable energy sources.

Technology Transfer

Japan possesses advanced technologies in areas such as energy efficiency, batteries, hydrogen and low-carbon industrial processes. Collaboration can accelerate India's green transition.

Climate Finance

The JCM can help mobilise investment for low-carbon projects while creating a transparent framework for emission reductions.

Green Industrialisation

Clean-energy cooperation can support new industries, jobs, manufacturing capabilities and export opportunities.

Indo-Pacific Cooperation

The partnership also complements broader cooperation between India and Japan on economic security, resilient supply chains and a sustainable Indo-Pacific.

JCM and Article 6.2: UPSC Concept

Article 6 of the Paris Agreement provides mechanisms for international cooperation in achieving climate goals.

Article 6.2 deals with cooperative approaches involving **Internationally Transferred Mitigation Outcomes (ITMOs)**.

The India-Japan JCM is therefore important as a practical example of how countries can cooperate through **carbon markets and internationally transferred emission reductions**.

Challenges

India-Japan green cooperation must address:

- High cost of emerging green technologies
- Technology and financing gaps
- Ensuring genuine emission reductions
- Avoiding double counting of carbon credits
- Developing reliable hydrogen and ammonia infrastructure
- Building domestic manufacturing capabilities

Strong monitoring, reporting and verification mechanisms are therefore essential.

UPSC Relevance Prelims

Remember:

- **JCM:** Joint Crediting Mechanism
- India-Japan JCM MoC: **2025**
- Rules of Implementation: **2026**
- Operational Manual: **September 2026**
- JCM operates under **Article 6.2 of the Paris Agreement**
- Key areas: low-carbon technology, climate finance and emission reductions

Mains – GS Paper III

The topic can be linked with:

- Climate change and carbon markets
- Renewable energy
- Green hydrogen
- Energy security
- Technology transfer
- Sustainable development
- International environmental cooperation

Possible UPSC Mains Question

“The India-Japan Joint Crediting Mechanism represents the growing importance of bilateral cooperation in achieving climate goals. Discuss its potential for India’s clean-energy transition.”

Conclusion

India-Japan green cooperation is evolving from traditional development assistance towards a broader partnership involving **clean energy, green hydrogen, carbon markets, batteries, biogas and climate technology**.

The Joint Crediting Mechanism provides an important institutional framework for translating climate cooperation into actual projects. For UPSC aspirants, the topic connects **Paris Agreement mechanisms, carbon markets, energy security, technology transfer and India’s sustainable-development goals**.

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