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EDITORIAL ANALYSIS

Green Molecules, Global Markets: India's Hydrogen Export Bet

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THE LIFT LINE

The next commodity India ships to the world may not be dug out of the ground but split out of water. Green molecules could do for the coast what software did for the city.

WHY THIS EDITORIAL MATTERS FOR YOUR EXAM

The ACME-Japan deals of early July 2026 are a live case study that ties together energy transition, industrial policy, trade and climate diplomacy, making them examinable across several GS3 sub-themes at once.

GS Paper 3: Energy security (https://ujiyari.com/terms/energy-security/), renewable energy, infrastructure, and the growth of new export industries, along with the decarbonisation of hard-to-abate sectors.

Prelims relevance: The National Green Hydrogen Mission (2023, MNRE), the SIGHT scheme, green ammonia versus green methanol, the IMO's net-zero shipping framework and the EU's RFNBO rules. These specific terms are exactly what Prelims probes.

Mains relevance: Green hydrogen is a rising Mains theme. A strong answer links India's cheap renewable power to an export strategy, explains the global demand drivers (shipping and EU norms), and weighs the cost competitiveness honestly.

BACKGROUND AND CONTEXT

In early July 2026, ACME Group signed two landmark deals with Japanese buyers, both anchored in Odisha. ACME agreed to supply 405,000 tonnes a year of green ammonia to IHI Corporation, structured through a joint venture at Gopalpur, supported by Japan's contract-for-difference scheme for low-carbon ammonia.

Separately, ACME signed a 10-year agreement to supply about 100,000 tonnes a year of green methanol to Mitsubishi Gas Chemical from its Paradip facility, valued at roughly one billion US dollars and billed as India's first RFNBO-compliant green marine-fuel collaboration.

These deals sit inside the National Green Hydrogen Mission, approved in January 2023 with an outlay of about Rs 19,744 crore and a target of producing at least 5 million tonnes of green hydrogen a year by 2030, adding about 125 GW of renewable capacity and abating around 50 million tonnes of carbon dioxide. The mission's main instrument is the SIGHT scheme, which incentivises both electrolyser manufacturing and green hydrogen production.

The global pull comes from two directions. The International Maritime Organization's 2023 strategy targets net-zero shipping by around 2050, and its net-zero framework (approved in 2025) will price the carbon intensity of marine fuels, creating demand for green ammonia and methanol as bunker fuels. The European Union's RFNBO rules under RED III, defined by delegated acts in June 2023, require hydrogen made from renewable electricity with at least 70 per cent lower emissions than the fossil comparator, setting the compliance bar for exportable green molecules.

THE CORE ARGUMENT / ISSUE

The central argument is that India can convert an abundance of cheap renewable electricity into a high-value export industry, moving from importing energy to exporting decarbonised fuels. This is export-led green industrialisation, and the coast is its factory floor.

Why the molecule, not the electron

Electricity is hard to export across oceans; molecules are not. By using renewable power to split water into hydrogen and then converting it into ammonia or methanol, India can ship its clean energy in liquid form to Japan and Europe. Coastal Odisha, with ports and renewable potential, becomes the natural production and export hub.

The demand is being created by regulation

Green ammonia and methanol are expensive today, so demand depends on rules that penalise dirty fuels. The IMO framework and the EU RFNBO norms are exactly such rules: they make green molecules commercially viable by putting a cost on carbon-intensive alternatives. India's export bet is therefore a bet that this regulation holds.

DEAL / POLICY	KEY FIGURE	SIGNIFICANCE
ACME green ammonia to IHI	405,000 tonnes/year	Japan CfD-backed offtake, Gopalpur JV
ACME green methanol to MGC	100,000 tonnes/year, ~USD 1 bn	India's first RFNBO green marine fuel deal
National Green Hydrogen Mission	5 MMT/year by 2030	The national anchor, Rs 19,744 cr outlay
EU RED III RFNBO norm	70% GHG saving	Sets the export compliance bar

The honest caveat on cost

India's green hydrogen currently costs about USD 3.5 to 5 per kg against grey hydrogen at about USD 2.3 to 2.5 per kg. The government's aspiration of USD 1 per kg by 2030 is widely seen as optimistic; independent estimates put a realistic 2030 cost at roughly USD 2.4 to 3.6 per kg. Competitiveness will depend on cheaper electrolysers, low-cost renewable power and continued policy support.

HOW TO THINK ABOUT THIS (ANALYTICAL FRAME)

Use the **comparative-advantage-plus-policy frame**: an export industry is born where a country's natural endowment (here, cheap renewable power and a long coastline) meets a global market that policy is actively creating (here, IMO and EU carbon rules). Ask two questions: does India have the underlying cost advantage, and is external demand durable or dependent on a single regulation. This frame separates a genuine industrial opportunity from a subsidy-dependent bubble.

THE DIAGRAM IN WORDS

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Cheap renewable power plus coastline -> split water into green hydrogen -> convert to ammonia and methanol -> ship from Odisha ports -> sold to Japan (CfD) and EU (RFNBO) shipping and industry -> export-led green industrialisation
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WAY FORWARD

1. **Drive down the cost curve.** Scale domestic electrolyser manufacturing under SIGHT and secure low-cost round-the-clock renewable power to close the gap with grey hydrogen.
2. **Lock in offtake and certification.** Sign more long-term export contracts and build a robust green-certification regime that meets EU RFNBO and IMO standards.
3. **Build the export backbone.** Invest in port infrastructure, storage and pipelines at hubs like Paradip and Gopalpur.

4. **Anchor domestic demand too.** Use green ammonia in fertiliser and green hydrogen in refining and steel so the industry is not solely export-dependent.

5. **Deepen green diplomacy.** Coordinate with buyer governments (Japan, the EU) on standards and financing so demand remains durable.

PYQ LINKAGE AND PRACTICE

UPSC has asked about India's energy needs and renewable energy (questions on solar and energy security appear across recent years) and about the challenges of climate change and India's commitments. This editorial links the energy transition to a concrete export-industry strategy.

Practice question (Mains, GS3, 15 marks): "India's green hydrogen ambition is as much a trade strategy as a climate strategy." Examine India's move toward export-led green industrialisation, its demand drivers and the cost challenges it must overcome. (250 words)

Sources: *The Indian Express* *(https://indianexpress.com/section/opinion/)*

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