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India-Norway River Kinetic Energy: A Damless Power Pilot in Arunachal

17 July 2026

ENVIRONMENT

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India-Norway River Kinetic Energy: A Damless Power Pilot in Arunachal

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On , the Arunachal Pradesh government's **Centre for Earth Sciences and Himalayan Studies (CES&HS)** signed a Memorandum of Understanding with Norway's **Tidal Sail AS** to build India's first **500 kW River Kinetic Energy Demonstration Project**. The pilot will generate electricity purely from the natural flow of river current, **without dams or reservoirs**, under the **India-Norway Green Partnership**.

WHAT IS RIVER KINETIC ENERGY

Conventional hydropower depends on **head**, the vertical drop of water created by a dam or barrage that spins turbines as water falls. **River kinetic energy**, also called **hydrokinetic energy**, works on a completely different principle. It harvests the **kinetic energy of moving water**, the energy of the current itself, using submerged turbines placed directly in the flowing river. There is no dam, no reservoir and no large civil structure holding back water.

This distinction matters. Because there is no impoundment, the technology avoids the submergence of land, displacement of communities and disruption of river ecology that large dams typically cause.

How the Pilot Works

The project uses turbine technology supplied by **Tidal Sail AS**, a Norwegian firm specialising in current-driven power. The turbines sit in the river and convert the steady movement of water into electricity that can serve nearby settlements. At **500 kW**, this is a demonstration-scale unit meant to prove technical and economic viability in Himalayan river conditions before any wider rollout.

PARTNERSHIP AND SUPPORT

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The pilot is anchored in the broader **India-Norway Green Partnership**, a **bilateral** (<https://ujjyari.com/vocab/bilateral/>) framework for cooperation on clean energy, oceans and climate action.

ELEMENT	DETAIL
Indian partner	Centre for Earth Sciences and Himalayan Studies (CES&HS), Arunachal Pradesh
Norwegian partner	Tidal Sail AS
Capacity	500 kW demonstration project
Central support	Ministry of New and Renewable Energy (MNRE)
Norway support	Innovation Norway
Framework	India-Norway Green Partnership

The **Ministry of New and Renewable Energy (MNRE)** provides the domestic policy backing, while **Innovation Norway** supports the technology transfer from the Norwegian side.

WHY IT MATTERS FOR THE NORTHEAST

Arunachal Pradesh and the wider Northeast sit in a **seismically active and ecologically sensitive Himalayan zone**. Large hydropower projects here have long drawn controversy over submergence, downstream flow, biodiversity loss and safety in an earthquake-prone landscape. A **damless, decentralised** technology offers a lower-footprint alternative.

Key Benefits

- **Decentralised and off-grid power** for remote hamlets that are hard to connect to the main grid.
- **Low civil-infrastructure cost** compared with dam construction, tunnels and long transmission lines.
- **Low environmental footprint**, with no submergence, no reservoir and minimal disruption to river continuity and fish migration.
- **Energy diversification** that adds a new renewable stream beyond solar, wind and conventional hydro.

STRATEGIC FRAME

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The pilot supports India's pathway to **net zero by 2070** and its target of expanding non-fossil generation capacity. For border and hill districts, reliable local electricity also carries strategic value, reducing dependence on fragile long-distance supply. If the demonstration succeeds, river kinetic systems could be replicated across the many perennial rivers of the Northeast without repeating the social and ecological costs of mega-dams.

UPSC RELEVANCE

GS Paper 3: Infrastructure and energy; conservation, environmental pollution and degradation; science and technology in the field of renewable energy.

Prelims pointers:

- India's first **River Kinetic Energy Demonstration Project: 500 kW**, in **Arunachal Pradesh**.
- Indian partner: **CES&HS**; Norwegian partner: **Tidal Sail AS**.
- **Hydrokinetic energy** uses the current's kinetic energy, not the head of a dam.
- Supported by **MNRE** and **Innovation Norway** under the **India-Norway Green Partnership**.
- Relevant to India's **net zero by 2070** goal.

★ FACTS CORNER, KNOWLEDGE PEDIA

Hydrokinetic energy captures energy from flowing water without impoundment; tidal, wave and river-current systems all fall under this family.

Conventional hydropower relies on potential energy stored by height (head); kinetic systems rely on velocity of flow.

Arunachal Pradesh has among the highest untapped hydropower potential in India, but projects face ecological and seismic scrutiny.

India and Norway cooperate on oceans and clean energy, including through the earlier India-Norway Integrated Ocean Initiative.

Decentralised renewable energy directly supports Sustainable Development (<https://ujjayi.com/terms/sustainable-development/>) Goal 7 (affordable and clean energy).

Sources: Arunachal Pradesh CES&HS and Tidal Sail AS MoU (July 16, 2026); Ministry of New and Renewable Energy; India-Norway Green Partnership statements; Innovation Norway.

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