

## Press Release

### **iFOREST latest study reveals Heat Pumps can cut India's industrial heating costs by 34% and eliminate 24.4 million tonnes of CO<sub>2</sub> annually.**

- Heat pumps deliver two to six units of heat per unit of electricity consumed — making them among the most energy-efficient solutions for decarbonising India's thermal energy use across residential, commercial, and industrial sectors.
- Thermal energy for water heating, and process heat accounts for a major share of India's energy use and emissions yet remains a largely overlooked in the country's clean energy transition.
- The report draws on manufacturer surveys, 13 real-world case studies, sector-level demand analysis, and extensive stakeholder consultations to present a technology suitability, market potential and policy roadmap.

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The International Forum for Environment, Sustainability and Technology (iFOREST) has published India's first comprehensive policy report, "Policy Roadmap for Enhanced Adoption of Heat Pumps in India," providing the most detailed techno-economic analysis of the Indian heat pump market to date. The report makes the case that heat pumps are a commercially viable and climate-aligned solution ready for large-scale deployment.

The findings of the report launched at the Indian Habitat Centre, have major implications for policymakers, investors, ESG practitioners, food and industrial sector businesses, and climate strategists working on India's decarbonisation agenda.

The first- of-its-kind study reveals that the Heat pumps can potentially unleash one of the largest untapped decarbonisation and cost-saving opportunities in the country.

Unlike conventional boilers or electric heaters that burn fuel or convert electricity directly into heat, heat pumps move heat from ambient air, water, or industrial waste streams — and amplify it using a small amount of electricity. The result: two to six units of useful heat for every unit of electricity consumed, compared to one unit for a conventional electric heater or less than one for a gas or diesel boiler.

At the launch Chandra Bhushan, CEO, iFOREST said, "Heat pumps can play a transformative role in India's industrial decarbonization by replacing oil and gas boilers in applications below 120°C. They can potentially replace 450 PJ of thermal energy demand annually, reduce heat costs from ₹3,000 to ₹1,900 per MWhth, and avoid nearly 54 million tonnes of CO<sub>2</sub> emissions by 2040. While the commercial sector offers the fastest payback, high upfront costs remain a challenge. Targeted measures such as GST reduction, PLI support, and MSME financing can significantly accelerate adoption."

India currently has approximately 830 MW of heat pump capacity installed across residential, commercial, and industrial applications. The report estimates that the fully deployable potential approaches 48 GW-th across all sectors by 2040.

The report studied eleven industrial sectors, including dairy, edible oils, sugar, bakery, fruits & vegetables, beverages, textiles, pulp & paper, pharmaceuticals, consumer durables, and automotive, including from reputed companies such as Royal Enfield, Mercedes-Benz India, Manali Petrochemicals, Biocon, Samsung India and Saint-Gobain India.

The study finds that across eleven industrial sectors, the overall payback period for heat pump adoption is around 5 years, below the 7-year feasibility threshold. Four sectors, dairy, beverages, automotive, and consumer durables, are already commercially self-sustaining without subsidy, with payback periods of 1–2 years, and a further three sectors are viable with moderate MSME support.

Full heat pump adoption across India's industrial sector would cut emissions by 24.4 MtCO<sub>2</sub>/yr today — a 67% reduction. By 2040, as India's grid decarbonises, the same transition would deliver 54 MtCO<sub>2</sub>/yr in abatement, more than double the current impact with no additional investment required.

In the commercial sector, where 88% of water heating currently runs on near-unity-efficiency electric resistance heaters, hospitals alone represent the single largest heat pump opportunity at 0.91–1.36 GW-th by 2040. At the household level, a family in a cold-climate zone switching from an electric geyser to a heat pump water heater avoids around 622 kg of CO<sub>2</sub> per year at today's grid.

The report identifies dairy, beverages, bakery, and fruits & vegetables as among the most immediately viable targets for heat pump adoption. For dairy specifically, the economics are exceptional; all eight unit operations analysed, including HTST pasteurisation, CIP hot water rinse, raw milk pre-heating, cheese vat heating, and whey membrane filtration, are technically compatible with heat pumps, with a weighted average heat cost 53.5% lower than the baseline.

A distinctive feature of this report is its focus on micro, small, and medium enterprises (MSMEs). India's MSME sector accounts for a large share of industrial energy use, and the majority of this energy goes toward low-temperature heating — precisely the range where heat pumps perform best.

The main barriers are not technical. They are financial access (upfront cost), awareness, electricity tariff structures that penalise industrial users, and limited availability of financing products designed for MSME scale. These are policy-solvable problems.

The fastest near-term wins come from embedding HPs in instruments that already regulate energy use. In the residential sector, HPWHs should be recognised as equivalent to solar SWHs under the Eco – Niwas Samhita 2024 and added to GRIHA's energy-optimisation credits.

India already has a credible heat pump manufacturing ecosystem — spanning air-source, water-source, waste heat recovery, CO<sub>2</sub>-based, absorption, and steam-generating systems — supplying automotive, pharmaceutical, and commercial sectors across the country. Heat pumps are a proven, commercially available technology already delivering energy savings.

and emission reductions at scale. The gap holding back wider deployment is not a technology gap; it is a financing and policy gap that well-designed interventions can close.

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