

Promoting clean, high-efficiency Japanese technologies and practices in Indian industries

Success Stories and Scope for Scaling Up



IGES
Institute for Global
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Opportunity

India aims to become a net-zero economy by 2070, as announced at the 26th UN Climate Change Conference (COP-26) held in Glasgow, 2021. Toward achieving this goal, India is striving to improve energy efficiency and reduce carbon emissions in different economic sectors— particularly in the industrial sector, which accounts for about 50% of the nation's total commercial energy consumption and contributes over 45% of the total energy-related emissions.

Japan is among the most advanced economies in the world, renowned for its expertise in manufacturing highly efficient environment-friendly technologies (ETs) for global markets. Japan, too, has declared its aim of becoming net-zero by 2050.

Clearly, both Japan and India stand to gain huge economic and environmental benefits by promoting Japanese ETs among Indian industries on a large scale.

Solution

The **Japan-India Technology Matchmaking Platform (JITMAP)** was set up in 2016 by IGES and TERI with the support of Ministry of the Environment, Japan (MOEJ) to facilitate the transfer of ETs from Japan for adoption by Indian industrial end-users. JITMAP provides the necessary framework for the Japanese ET suppliers and Indian end-users to interface, synergize knowledge and expertise, study and assess end-user needs, and pinpoint the ET solution that best meets those needs. Thus, JITMAP catalyses and supports the technology transfer process from initiation to implementation.

Each Japanese technology is a package of 'hard' elements (equipment/machinery) and 'soft' elements (knowledge, training in best operating practices, etc.)





IGES–TERI: strong partnership

IGES and TERI have over a decade's experience in jointly promoting Japanese low carbon technologies (LCTs) in India. During 2010–14, in an R&D project supported by Japan International Cooperation Agency (JICA) and Japan Science and Technology Agency (JST), the partners successfully implemented Japanese electric heat pump (EHP) and gas heat pump (GHP) technologies for the first time in four large-scale industrial plants in India, and also introduced better operating practices in compressed air systems and induction furnaces among a number of other industrial units. These LCTs have yielded significant energy and cost savings with attractive payback periods, and also brought about 30–40% reduction in CO₂ emissions. With the launching of JITMAP in 2016, IGES and TERI have continued to promote and scale up the adoption of Japanese ETs.

Key Technologies

- Compressed air systems
- Once-through boilers and steam management systems
- High-efficiency refrigeration systems including electric heat pump (EHP)
- Energy-efficient transmission belts.

Activities

Seminars & Workshops

- Conducted for energy managers, industry associations, and energy auditors to deepen their understanding on ETs
- Japanese companies present their ET products at these events

Walk-through audits

- Carried out at the Indian end-user plants to identify the most suitable Japanese ETs and to confirm their economic viability

Training-of-trainer (TOT) programs

- Conducted for energy auditors, technical consultants and other primary promoters of the ETs, to deepen their knowledge and widen the variety of solutions that they can provide

Follow-up site visits

- Carried out among industrial clusters across India to strengthen earlier awareness initiatives and encourage ET implementations
- Support ET implementations as required, and assess the results

Policy-level meetings

- Held with senior officials from the relevant policy and regulatory agencies & institutions to discuss barriers to the transfer/ adoption of ETs
- Focus on possible modifications in the existing policies and regulations to help overcome the barriers



Partners and collaborators

JITMAP conducts its activities in close coordination with a number of relevant public and private sector agencies and organizations in both India and Japan. They include:

- Bureau of Energy Efficiency, Government of India
- Ministry of Power, Government of India
- Ministry of MSME, Government of India
- Ministry of Environment, Forest and Climate Change, Government of India
- Ministry of the Environment, Japan
- Hyogo Prefectural Government, Japan, which supports JITMAP activities specifically in Gujarat under a memorandum of understanding on mutual cooperation in the economic and environmental fields with the state government of Gujarat.
- State designated agencies of the Bureau of Energy Efficiency (BEE) such as Gujarat Energy Development Agency (GEDA), Maharashtra Energy Development Agency (MEDA), and Andhra Pradesh State Energy Conservation Mission (APSECM)
- Technical consultancy organizations such as Gujarat Industrial and Technical Consultancy Organization Limited (GITCO), Maharashtra Chamber of Commerce, Industries and Agriculture (MCCIA) and Andhra Pradesh State Energy Efficiency Development Corporation (APSEEDCO)
- Local industry associations

An energy expert who participated in JITMAP's TOT programs says:

"We have implemented Variable Frequency Drive (VFD) for air compressor in a plastic moulding plant; this has brought 20% saving in energy consumption. Likewise, we have implemented VFD in a large dye manufacturing plant to bring down power consumption by 10%."

From participants at an awareness workshop on steam management systems:

*"Learnt many practical tips on steam traps..." [Energy Auditor]
"Such programs should be organized frequently..." [Energy Expert]*



Achievements

Through its campaign of awareness generation initiatives, on-site feasibility studies, TOT workshops, and policy-level engagements, JITMAP has made sure progress in enabling the adoption of Japanese ETs by a number of Indian industrial end-users.

Success stories: compressed air system optimization

End-user industry: forging

Energy efficiency measures implemented

- Optimizing the layout of the compressed air pipelines in the plant
- Detecting and arresting air leakages in the entire compressed air network
- Replacing underground air pipes with overhead pipes to help inspection, detection and sealing of leakages

Benefits

- Annual electricity saving: 810,000 kWh
- Annual monetary saving: INR 7.3 million
- Avoided CO2 emissions: 664 tonnes/year



End-user industry: textile

Energy efficiency measures implemented

- Regular monitoring of compressed air network; arresting leakages
- Ensuring that ambient air in compressor rooms is fresh, clean and dry

Benefits

- Annual electricity saving: 502,500 kWh
- Annual monetary saving: INR 4.5 million
- Avoided CO2 emissions: 412 tonnes/year



End-user industry: automobile plant

Energy efficiency measures under implementation

- Regular compressed air leakage inspections being conducted; 893 leakage points identified, representing a total annual leakage of 32.1 million Nm³ compressed air.
- Started using Vacuum Ejectors in assembly shops (in glass fitment line) to reduce compressed air consumption in suction cups.
- Installation of Intelligent Flow Controller is planned for individual shop

Benefits

- Annual electricity saving: 125 million kWh
- Annual monetary saving: INR 1125 million
- Avoided CO2 emissions: 102,500 tonnes/year



Steam system improvements: huge opportunities

End-user industries: various

Energy-efficient steam management systems not only save energy costs but also lower carbon emissions, avoid plant shutdowns, and most importantly, conserve water.

A leading Japanese supplier of steam management systems studied condensate discharge locations in about 100 Indian MSMEs, and found failure rate of about 17% in condensate discharge recovery (CDR) of which leakages accounted for 40%. The CDR failures result in huge wastages of energy and water; annual monetary losses are estimated at INR one billion!

Looking ahead

In September 2021, the First India–Japan High Level Policy Dialogue saw both Japan and India reaffirm their intent to strengthen bilateral cooperation in climate change, environment and energy. Reflecting this intent, JITMAP will identify and include more Japanese technologies to include in its 'basket of ETs', and simultaneously expand its activities to cover new industrial sub-sectors/clusters in India. The focus will be sharpened on the MSME sector, which offers vast scope for implementing ETs.

Collaborative activities will be continued and expanded with existing partners as well as new stakeholders from both public and private sectors. In order to maximize their impacts, the activities will be synergized with other initiatives aimed at bringing about clean, energy efficient production in the Indian MSME sector—such as those being conducted under the SAMEEESHKA platform.





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