

Japan-India Partnership towards Net Zero Society - Outcomes, Lessons Learned and Way forward of the Japan-India Technology Matchmaking Platform (JITMAP)

February 8, 2022 | Webinar

The Energy and Resources Institute (TERI), and Institute for Global Environmental Strategies (IGES), Japan organized a Webinar on Japan-India Partnership towards Net Zero Society - Outcomes, Lessons Learned and Way forward of The Japan-India Technology Matchmaking Platform (JITMAP) on 8th February 2022.

Opening Session

Mr. Girish Sethi, Senior Director, Energy, The Energy and Resources Institute (TERI), welcomed participants and thanked experts from India and Japan for joining the discussion. The webinar has been organized as part of the India-Japan co-operation agreement signed in October 2018 between the Ministry of Environment, Forest and Climate Change (MoEFCC) and Ministry of the Environment, Japan (MOEJ). India and Japan have made bold commitments on decarbonization – India at COP26 to achieve net-zero by 2070 and Japan to achieve net-zero by 2050. In this context, Japan-India Technology Matchmaking Platform (JITMAP), could serve as an important tool to achieve these ‘net-zero’ targets.

Welcome address and brief introduction of JITMAP

Mr. Nobutoshi Miyoshi, Managing Director, Institute for Global Environmental Strategies (IGES), thanked all the participants and the representatives from MOEJ, MoEFCC and the Bureau of Energy Efficiency (BEE) for their support. JITMAP is a collaborative initiative between IGES and TERI to promote Japanese Low-carbon and energy efficient technologies in India. The initiative was launched in 2016 with the support of the MOEJ. Through JITMAP, Indian stakeholders have adopted Japanese technologies, which has led to improved Energy Efficiency (EE) and reduced GHG emissions. The first Japan – India dialogue, was held in September 2021, where the two countries discussed areas for future collaboration. The scope of JITMAP is to be expanded to host more technologies. The webinar will include a discussion on the past activities of JITMAP and future direction of the platform with stakeholders and implementation partners. He hoped that the discussions would help strengthen cooperation between India and Japan and to further the reach of the JITMAP platform.

Opening remarks

Speaking on the occasion **Mr. Subrata Bose, Scientist-F, Ministry of Environment, Forest and Climate Change, India (MoEFCC)**, emphasized the strong relations between India and Japan in environment and climate. Both countries are vulnerable to climate change and are aligned on several areas in climate negotiation. The views of both India and Japan were aligned during the discussion at COP26 including views on Article 6. JITMAP can serve as a forum to understand how Japanese technologies can be introduced in India. He conveyed his hopes that the webinar would lead the way to a better understanding of the role that JITMAP can play in the future.

Mr. Milind Deore, Director, Bureau of Energy Efficiency (BEE), Ministry of Power, India, spoke on India's strong relationship with Japan particularly in the energy domain, with cooperation of more than 20 years. The Japan-India energy dialogue is led by BEE from India and Energy Conservation Center, Japan (ECCJ) from Japan. It has resulted in many joint activities across areas of energy transition, energy generation, energy efficiency and clean energy systems. In collaboration with ECCJ, BEE has prepared Energy Conservation guidelines for large industries, such as steel, refineries, fertilizer, etc., and MSMEs. Under the JITMAP program, several Indian State authorities have been involved, including Gujarat Energy Development Agency (GEDA) in Gujarat, Maharashtra Energy Development Agency (MEDA) in Maharashtra, and the State Energy Conservation Mission in Andhra Pradesh (APSECM). Through JITMAP EE and LCTs are being introduced in these States. BEE is also working with United Nations Industrial Development Organization (UNIDO) to promote and identify innovative technologies in areas such as pumping, Waste Heat Recovery, Steam, etc. More than 60 innovations have been identified, and are being deployed at the pilot level. Mr. Deore also shared information on BEE and TERI's knowledge sharing platform in the MSME sector – SAMEEKSHA. It includes information on EE technologies, and best practices. India's commitment at COP26 highlights the need for initiatives like JITMAP to meet these targets. BEE is a partner to the initiative and can support the JITMAP initiative.

Mr. Ryuzo Sugimoto, Director, International Cooperation and Sustainable Infrastructure Office, Ministry of the Environment, Japan (MOEJ), mentioned the MoC signed between India and Japan in 2018 for co-operation in the environment. Japan welcomes Prime Minister Modi's announcement in COP26 to achieve carbon neutrality by 2070. Renewable Energy in India has a 40% share in the energy mix. India has several initiatives on clean energy, including the National Hydrogen Energy Mission, International Solar Alliance and many others. Co-operation on climate change is vital for both countries. Technological innovation and public-private partnerships in R&D will be important aspects of these Japan-India collaborations. Business opportunities and mutual economic benefits are now major driving forces in promoting LCTs. JITMAP is expected to play a key role in this regard. The event held today is part of the three-part series. Today's webinar is the 1st and focuses on technology, current and past learnings from JITMAP and co-operation with the private sector. The 2nd webinar will focus on research areas and will be held on 15th February 2022. The 3rd webinar will focus on JCM and project implementation and is proposed to be held in March.

Technical Session – JITMAP Initiatives, Outcomes, and Lessons Learned

Mr. Prosanto Pal, Associate Director, Industrial Energy Efficiency, TERI and Ms. Mika Tachibana, Policy Researcher, IGES Kansai Research Centre, outlined the structure of JITMAP - a multi-stakeholder platform that aims to 'matchmake' Japanese manufacturers of LCTs with potential Indian end-users. Under this initiative, activities such as awareness generation (seminars, workshops), feasibility studies, strengthening the expertise of energy auditors through training-of-trainer (TOT), and meetings with policy-level stakeholders are organized. Mr. Pal shared a summary of activities held between 2016 and 2021. Through the platform 13 seminars/workshops, 54 feasibility studies, 5 TOTs and 5 policy-level meetings, were organized. LCTs covered compressed air (CA) system; electric heat pump (EHP); refrigeration system; steam management system; and energy-efficient belt. The platform has had a large

number of stakeholders and partners and is associated with several Government agencies. The partner agencies include several state and national-level agencies (such as GEDA, GITCO, MEDA, APSECM, APSEEDCO) and prominent industry associations.

Ms. Tachibana presented two case studies on JITMAP initiatives, including i) generating awareness on EHPs & refrigeration systems (Mayekawa Mfg. Co., Ltd.) among seafood processing companies in Vijayawada; and ii) EE transmission belts (Bando Chemical Industries, Ltd.) among chemical and pharmaceutical units in Ankleshwar. These initiatives have resulted in implementation by 6 MSMEs and 5 large-scale enterprises. She also shared the key lessons and way forward for JITMAP.

Key lesson and way forward:

- A **key lesson** from the initiatives is that continuity of engagement by both Japanese and Indian stakeholders is vital for successful LCT implementations.
- Looking ahead, the organization of JITMAP is being strengthened and its ambit increased through the following measures:
 - Widening the scope of target technologies to include environment technologies (ETs)
 - Exploring collaborations with more agencies/organizations such as Japan Platform for Redesign: Sustainable Infrastructure (JPRSI); Blue Sky Initiatives; Japan Environmental Technology Association (JETA); and The Energy Conservation Center, Japan (ECCJ)
 - Undertaking Technology Needs Assessments to identify new target technologies and implementing partners in the textile and foundry industries (on-going)

Mr. Tsukasa Saito, Former Hitachi Industrial Equipment Systems, IGES Fellow, outlined initiatives to promote CA systems through on-site missions, feasibility studies, TOTs for energy auditors and managers, awareness workshops, and multi-stakeholder meetings. He presented examples of the benefits in the form of energy and cost savings and reductions in CO₂ emissions obtained from introducing best operating practices (BOP) in CA systems. Annual energy savings were estimated at 11–14% in two textile units and over 36% in a forging unit. Initiatives under JITMAP led to significant reductions in CO₂ emissions and resulted in co-benefits such as the reduction of NO_x and SO_x emissions. Further, the feasibility studies and training were also appreciated by the clients.

- A **key lesson** from these initiatives: Greater awareness of Japanese technologies in the Indian industrial sector is needed.
- **Suggestions** for policy-level measures in India to facilitate smooth LCT transfers from Japan include:
 - A gradual reduction in import tariffs, particularly for high-efficiency products like LCTs.
 - A scheme akin to Japan's 'Top Runner' program for establishing EE standards in industrial equipment, which will help in the large-scale production and adoption of high-efficiency products like IE3 motors.
 - Strong and sustained interactions between stakeholders from industry, local government, ministries and other relevant policy-level entities.

Activities undertaken through JITMAP

Mr. Peush Jaitly, General Manager-Country Head (India Operations), TLV PTE LTD. India Liaison Office, provided an overview of the activities undertaken by TLV for promoting high-efficiency steam

management systems. These systems have been implemented in collaboration with JITMAP and independently. TLV has been conducting seminars, plant surveys, training program, and sharing findings with industry stakeholders to spread awareness. In all, over 100 Indian companies have received TLV's plant survey for steam systems. Besides being energy efficient, these systems lower carbon emissions (by reducing the consumption of boiler fuel), avoid plant shutdowns, and more importantly, conserve water. Comprehensive steam system analyses were conducted on condensate discharge locations in about 100 MSMEs. This analysis showed a failure rate of about 17% in condensate discharge recovery (CDR), of which leakages accounted for over 40%. Besides significant energy losses, CDR failures resulted in annual water wastage of about 27,000 m³ and monetary loss of about Rs 100 crores (Rs 1 billion).

A similar analysis on a large-scale refinery showed the potential to save about Rs 154 crores (Rs 1.54 billion) and avoid about 97,000 tons of CO₂ emissions annually. There is a large potential for saving energy and costs and reducing carbon emissions through high-efficiency steam management systems. He highlighted some of the main challenges and the way forward for implementing LCTs:

Challenges

- Low awareness regarding the superior technologies (LCTs) that are available and their benefits.
- IBR Rules & Regulations, which make the manufacture of EE boilers unnecessarily expensive and consequently discourage industries from adopting such boilers.
- Challenging procurement process makes it difficult for industries to understand the future high costs of using low-quality technology.

Way forward:

- Mechanism to allow sustained engagement by IGES and TERI with industry to oversee implementation of the technologies and review results.
- Adoption by India of internationally accepted standards for EE equipment, such as the American Society of Mechanical Engineers (ASME) standards for boilers.
- Procurement policies that consider the quality and co-benefits of technologies, rather than be focused only on the lowest price.

Energy efficiency improvements through JITMAP activities

Mr. Arun Ghugri, Director; Mr. Dinesh Raskar, Assistant Manager Maintenance; Mr. Pravin Narsale, Senior Engineer Maintenance, Trinity Engineers Pvt. Ltd., Pune, focused on significant energy and cost savings achieved by the plant in CA systems, due to the ongoing implementation of EE measures such as BOP. These measures are being implemented based on recommendations by the JITMAP (IGES–TERI) team with Japanese expert. The plant has already taken steps to control air leakages and adopted air guns. Through these measures, the plant is saving an estimated 810,000 kWh annually - equivalent to a cost saving of Rs 72.9 lakhs, and avoiding CO₂ emissions of about 656 tons each year. Other EE measures will also be implemented.

Moderated Discussion - How should JITMAP be strengthened to promote the application of Japanese

environmental technologies and contribute to energy efficiency and environmental improvement in India?

Background presentations on way forward of JITMAP activities

Mr. Ryosuke Horikawa, Researcher, Office of the Market Mechanisms, Climate Change Policy Division, Global Environment Bureau, MOEJ, elaborated on the role of Article 6 in paving the way for utilizing market mechanisms to reduce global emissions. He described the role Japan's Joint Crediting Mechanism (JCM) can play in facilitating the diffusion of ETs and LCTs to developing countries, bringing mutual benefits and reducing emissions at the global level. He outlined JCM financing programs by MOEJ during 2013–21 in 205 projects in 17 partner countries. Projects include renewable energy; EE in industry, consumer, and urban sectors; waste-to-energy plants; and EE in the transport sector. The JCM provides significant scope for supporting the implementation of LCTs.

Financial scheme: Dr. Abdessalem Rabhi, Senior Programme Coordinator, Finance Taskforce, IGES, underlined finance as one of the biggest barriers faced by MSMEs in adopting new/improved technology. Only 5% of all MSMEs have access to formal finance, and while banks are reluctant to extend loans below a threshold limit of Rs 10 lakhs (JY 1.5 million), an estimated 94% of all MSMEs require credit below Rs 10 lakhs. He suggested that JITMAP could focus its initiatives on medium-scale enterprises within the Indian MSME sector. Regarding technology suppliers, half of all the Japanese companies in India are in the manufacturing sector; 60% of these companies are considering setting up new plants in Gujarat. MSMEs generally consider the upfront cost of technology (rather than life-cycle costs) when deciding if they wish to adopt the technology. However, not all LCTs require financial support. JITMAP could focus on low-cost technologies like transmission belts and EE blowers, where the end-user industries may not require loans. Regarding other (higher-cost) LCTs, Dr. Rabhi suggested that JITMAP leverage support schemes offered for clean energy financing by entities such as public-private consortiums (e.g., JICA - SMBC - TCCL), NBFCs (e.g., Credit Season - Capital Float), Japanese banks in India (e.g., MUFG Bank Ltd, Mizuho Bank Ltd, SMBC), Indian banks (e.g., SIDBI), and government (e.g., interest and capital subsidies, incentives for clean and green production).

Key recommendations:

- JITMAP should narrow its focus on to medium-sized enterprises in specific sub-sectors/clusters.
- Expand ET/LCT basket to include niche technologies.
- Evolve a flexible marketing & sales strategy that can be tailored to suit individual technologies.
- In cases where finance is required for technology adoption, options to get the technology at discounted price.
- Engage with providers of supportive finance schemes, technical support should also be provided. Possibilities for turning JITMAP 'feasibility reports' into bankable proposals for green/sustainability-linked loans should also be explored.

Discussion

Mr. Yuki Yoshida, Second Secretary, Embassy of Japan in India, highlighted the need for finance to take initiatives under JITMAP forward. He emphasized the need for engaging with international organizations such as the World Bank and Asian Development Bank, and private sector organizations. JITMAP can play a role in bridging the knowledge gaps between various stakeholders in both countries and providing the end-users with access to the required finance.

Mr. A Chandrasekhara Reddy, Chief Executive Officer, AP State Energy Conservation Mission (APSECM), commended TERI and IGES for JITMAP and highlighted the important role the platform can play in the context of India's targets announced during COP26. Andhra Pradesh has achieved top rank for energy efficiency in the State Energy Efficiency index-2020 released by Ministry of Power, Government of India. APSECM has undertaken detailed energy audits and identified significant energy saving potential among fisheries (Bhimavaram); foundries (Vijayawada); and refractory units (East Godavari). Recently, APSECM and TERI have also conducted situation analyses and energy audits among MSMEs in other sub-sectors such as dal processing, spinning mills and cold storage. Adoption of the LCTs being promoted under JITMAP—namely, CA systems, steam management systems, high-efficiency refrigeration systems, and EE transmission belts, can bring significant benefits to MSMEs in these and other clusters/sub-sectors. Andhra Pradesh has over 100,000 MSMEs, and APSECM looks forward to collaborating with JITMAP partners to make these MSMEs energy efficient.

Mr. Akio Yoshizaki, Manager, Digital Solution Development Office, Management Planning Gr., Hitachi Industrial Equipment System Co., Ltd., Japan, spoke on the impact of high costs for industry when making decisions on purchasing energy efficient equipment from Japanese companies. He reiterated that the high up-front costs of technology are a barrier to adoption, not only in India but also in Japan. However, Japan was able to overcome this barrier through initiatives like 'Top Runner' and subsidy schemes. It is noteworthy that these schemes require strict monitoring and reporting protocols, along with suitably trained energy auditors.

Mr. Sudhir Kumar, Vice President, Frick India Limited (partner of MAYEKAWA MFG. CO., LTD., Japan), The firm provides LCTs such as heat pump technologies and ammonia CO₂ refrigeration systems, which offer huge energy and cost savings for end-users like dairies, cold storage units, etc. However, these LCTs carry relatively high capital costs, and hence adoption is slow. He expressed keenness to collaborate with JITMAP in this regard. The firm is currently working with TERI to introduce EE motors and CA systems.

Session 4: Closing Session

Closing remarks

Dr. Satoshi Kojima, IGES, thanked participants for joining the webinar. IGES is working in collaboration with TERI on technology transfers. He looked forward to strengthening IGES' partnership with TERI to facilitate the transfer and adoption of Japanese ETs and LCTs for adoption by Indian end-users, particularly MSMEs.

Mr. Girish Sethi, Senior Director, TERI, highlighted the huge opportunities for collaboration with Japanese stakeholders given India's targets for becoming net-zero. TERI and IGES have a strong collaboration in spreading awareness on emerging technologies and moving forward, TERI would like to continue this association. Reiterated that India offers huge opportunities for the promotion and adoption of ETs/LCTs, including new technologies that could be added to the existing basket. With Japan–India ties at their strongest, this is an opportune time for the two countries to scale up their mutually beneficial cooperation in clean energy technologies under JITMAP.