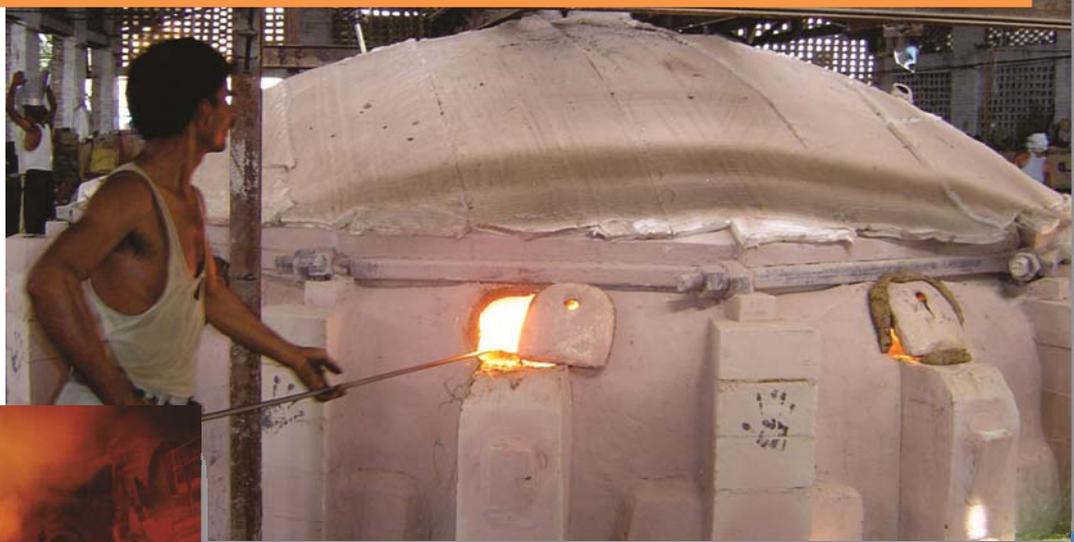


## Promoting Energy Efficiency in Small and Medium Sized Enterprises (SMEs) and Waste Heat Recovery Measures in India



*6<sup>th</sup> workshop for  
Energy Management Action  
Network (EMAK)*



*Promoting Energy Efficiency in Small and Medium Sized Enterprises (SMEs) and Waste Heat Recovery Measures in India*

**Report on a the 6<sup>th</sup> Energy Management Action Network Workshop held on Wednesday, 25 February 2015 at the Taj Palace Hotel, New Delhi, India**

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## List of Acronyms

|           |   |
|-----------|---|
| BEE       | Bureau of Energy Efficiency, India  |
| DESL      | Development Environergy Services Ltd  |
| ECCJ      | The Energy Conservation Center of Japan   |
| ESCO      | Energy Service Company  |
| GEDA      | Gujarat Energy Development Agency   |
| IEA       | International Energy Agency   |
| IEEJ      | Institute of Energy Economics, Japan  |
| IIF       | The Institute of Indian Foundrymen  |
| METI      | Ministry of Economy, Trade and Industry, Japan  |
| MSME      | Micro, Small and Medium enterprises   |
| NGO       | Non Governmental Organisations  |
| RDD&D     | Research, Development, Demonstration and Dissemination  |
| SAMEEKSHA | Small and medium enterprises energy efficiency knowledge sharing platform for promoting energy efficiency in SMEs |
| SIDBI     | Small Industries Development Bank of India  |
| SME       | Small and medium enterprises  |
| TERI      | The Energy and Resources Institute  |

## Executive Summary

The Institute of Energy Economics, Japan (IEEJ) on behalf of the Government of Japan and in cooperation with The Energy and Resources Institute (TERI), hosted the 6th Energy Management Action NetworK (EMAK) workshop on Wednesday, 25 February 2015 at the Taj Palace Hotel, New Delhi, India.

The workshop explored the challenges and opportunities of promoting energy efficiency in Small and Medium Sized Enterprises (SMEs) and through the implementation of waste heat recovery measures in India.

The workshop provided participants with an opportunity to:

- Learn about and share experiences on designing and implementing energy efficiency policies and programmes for SMEs
- Identify innovative ways of financing energy efficiency projects
- Better understand the technical opportunities to reuse waste heat in industrial organisations
- Initiate and develop networks within and across SMEs, the finance sector, industry associations and government policy-makers at both national and international levels
- Contribute towards domestic and international dialogue and capacity building on energy efficiency measures.

Over 80 people attended the workshop. Participants represented governments, industry associations, SMEs in the industrial sector, financial institutions, NGOs and researchers. Participants from India, Japan and Australia contributed local, national and international perspectives.

Thirteen presentations from highly respected Indian and International speakers were delivered. Participant perspectives on the challenges and opportunities for progressing energy efficiency in SMEs were also encouraged through interactive small group discussions. In the final session, a distinguished panel shared their

perspectives on the issues raised throughout the workshop and future priorities for progressing energy efficiency improvement in SMEs.

The main themes that emerged from the workshop are:

1. SMEs play a **central role in the economy** of India, Japan and other countries around the world. Energy efficiency improves the productivity and competitiveness of SMEs which, in turn, contributes to employment opportunities, innovation and economic growth.
2. Energy efficiency **policies and programmes should be designed to provide assistance across the energy efficiency project lifecycle** from project identification, through the development of specifications, selection of vendors, access to finance and implementation. This is important because information alone is often not sufficient to motivate SMEs to progress energy efficiency even when projects present a strong financial return.
3. **Research, Development, Demonstration and Dissemination (RDD&D) activities are essential** to ensure that locally relevant technologies are accessible to SMEs. Due to the small scale and financial challenges faced by SMEs, energy efficient technologies that have a high capital cost are often not feasible and therefore alternatives need to be developed locally.
4. The large number of SMEs and their diverse business activities and energy consumption patterns present a challenge for the development of SME programmes. Focusing on **geographic clusters of particular industries** is an approach that has been effectively utilised in India.
5. Energy efficiency in SMEs requires **sustained efforts** from governments, technical experts, banks and other stakeholders over a number of years. This is due to the large number and diversity of SMEs.
6. **Waste heat recovery has significant potential in India.** To meet this potential, policies can be improved by establishing a framework and incentives to support the uptake of such projects. Policy frameworks that have been developed in Japan provide a useful indication of the kinds of policies that might be developed in India and other countries.

This report and video recordings of the presentations will be made available on the International Energy Agency's website to ensure that the workshop outcomes are

widely shared with policy makers and practitioners around the world.

## 1. Introduction

This report provides a summary and analysis of the presentations and discussions that were conducted at the *6th Energy Management Action Network Workshop* held on Wednesday, 25 February 2015 at the Taj Palace Hotel, New Delhi, India

The Institute of Energy Economics, Japan (IEEJ)<sup>i</sup> on behalf of the Government of Japan and in cooperation with The Energy and Resources Institute (TERI)<sup>ii</sup> hosted the workshop on Wednesday, 25 February 2015 at the Taj Palace Hotel, New Delhi, India. EMAK aims to improve energy efficiency in industry through information-sharing and the development of policy and practitioner networks.<sup>iii</sup>

Previous EMAK workshops have been held in the following locations (click on links to view the agenda and presentations for each workshop):

- [Paris, France – January 26-27, 2010](#)
- [Washington, USA – May 10, 2010](#)
- [Guilin, China - November 15, 2011](#)
- [Tokyo, Japan – January 1, 2013](#)
- [Sydney, Australia – February 27, 2014](#)

The workshop aims were to:

1. Learn about and share experiences on designing and implementing energy efficiency policies and programmes for SMEs
2. Identify innovative ways of financing energy efficiency projects
3. Better understand the technical opportunities to reuse waste heat in industrial organisations
4. Initiate and develop networks within and across SMEs, the finance sector, industry associations and government policy-makers at both national and

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<sup>i</sup> For more information about IEEJ see: <http://eneken.ieej.or.jp/en/>

<sup>ii</sup> For more information about TERI see: <http://www.teriin.org/>

<sup>iii</sup> For more information about EMAK see <http://www.ipeec.org/EMAK.html>

international levels

5. Contribute towards domestic and international dialogue and capacity building on energy efficiency measures.

Over 80 people attended the workshop. Participants represented governments, industry associations, SMEs in the industrial sector, financial institutions, NGOs and researchers. Participants from India, Japan and Australia contributed local, national and international perspectives. The workshop was moderated by Dr. Patrick Crittenden, Director, Sustainable Business Pty Ltd, Australia.

This report and video recordings of the presentations will be made available on the International Energy Agency's website to ensure that the workshop outcomes are widely shared with policy makers and practitioners.

## **2. Session summaries**

### **1. Inaugural session**

In the inaugural session, a welcome address was delivered by the workshop organisers and the Secretary of the Bureau of Energy Efficiency (BEE) delivered the inaugural speech.

**Mr. Girish Sethi**, Director, IEED, TERI:

- Acknowledged the support provided by Ministry of Economy, Trade and Industry (METI) in Japan, and BEE in India for promoting energy efficiency in Indian industry
- Noted that the present Indian government's thrust to promote clean, efficient production technologies in industry (captured in the slogan '*zero defect, zero effect*'), provides a very conducive environment for more such initiatives to be undertaken.
- Encouraged workshop participants to share their experiences and perspectives throughout the workshop.

**Ms. Junko Ogawa**, Senior Researcher, IEEJ:

- Provided an historical context for energy efficiency in Japan by explaining developments under the Energy Conservation Law, which was first established in 1979.
- Highlighted that the effectiveness of energy efficiency measures in Japan (including regulations, taxes, programmes and incentives) is evidenced by the fact that the economic growth has increased in the past few decades while energy intensity has decreased.
- Explained that EMAK was established in 2009 to promote energy efficiency by encouraging information sharing between policy makers and practitioners through workshops, internet based seminars and its portal <http://www.iea.org/topics/energyefficiency/industry/emak/>.

**Mr. Bhaskar Jyoti Sarma**, Secretary, BEE:

- Highlighted the importance of energy conservation in the Indian context.
- Noted that in the past decade, the Indian economy has grown by around 8% overall, while specific energy consumption has dropped by about 25% while many large companies (e.g. in the cement and fertilizer sectors) have improved their energy performances to global standards.
- Described the challenge of progressing energy conservation in the SME sector, which is largely unorganized and hence difficult to influence through regulatory measures.
- Invited participants to share their perspectives on progressing energy efficiency in SMEs and improving the uptake of waste heat recovery projects.

**Dr. Patrick Crittenden**, Director, Sustainable Business Pty Ltd, Australia set out the aims of the workshop and presented the agenda (See Appendix A).

## 2. **Session 1: Energy Efficiency in SMEs**

The aim of this session was to present global, regional and local perspectives on the challenges and opportunities of progressing energy efficiency in SMEs.

### **Speakers and topics for session**

| <b>Session 1: Energy Efficiency in SMEs</b>   |  |
|---|--|
| <b>Topic</b>  | <b>Speaker</b>   |
| Energy efficiency in SMEs – a Global Perspective  | Dr Patrick Crittenden, Director, Sustainable Business Pty Ltd, Australia |
| Understanding the SME sector in Asia, with a focus on India, and challenges in terms of improving energy efficiency   | Mr Prosanto Pal, Senior Fellow, TERI                                     |
| A case study of foundry and steel rolling SMEs in India   | Mr Gaurav Sharma, Institute for Industrial Productivity Office in India  |
| Enabling Finance for Scaling up Energy Efficiency in MSMEs  | Mr Upinder Singh Dhingra, Associate Fellow, TERI                         |
| Table Discussion<br>What challenges do you face in progressing energy efficiency?<br>What kind of policies and programme measures are needed to progress energy efficiency in SMEs? |  |

### **1. The International Energy Agency’s Policy Pathway on Energy Efficiency in SMEs – a Global Perspective**

**Dr. Patrick Crittenden, Director, Sustainable Business Pty Ltd, Australia**

Key points:

- The IEA has recognised the importance of energy efficiency improvement in SMEs. It is currently developing a *Policy Pathway* publication to assist policy makers and practitioners to develop SME energy efficiency programmes.
- Energy efficiency can deliver energy savings, productivity and competitiveness benefits to SMEs. These benefits flow to the wider economy as a more resilient SME sector creates job opportunities and economic growth while reducing greenhouse gas emissions.
- Six key strategies for successfully developing energy efficiency programmes for SMEs are: (1) understand the particular barriers and needs of each SME

target group; (2) focus on multiple benefits (not just on energy savings); (3) build stakeholder partnerships; (4) make it easy for SMEs to access assistance; (5) leverage existing policies and programs; and (6) combine programme measures to address the information, skills and financing needs of SMEs.

## **2. Understanding the SME sector in Asia, with a focus on India, and challenges in terms of improving energy efficiency**

**Mr. Prosanto Pal, Senior Fellow, TERI**

Key points:

- The importance of SMEs is evidenced by the fact that they are major providers of employment and account for 40–70% of GDP in most Asian countries, e.g., Bangladesh and Nepal.
- The Indian SME sector is characterized by: a high proportion of micro and small scale units and their geographical clustering; variations in energy intensity (i.e. where energy cost makes up a major portion of operating cost); limited support institutions and local service providers; low awareness levels among entrepreneurs and workers; and, the uniqueness of technologies and practices deployed, which are often decades old, low in energy efficiency and high on pollution.
- R&D efforts, backed by extensive training and capacity building of unit-level personnel and LSPs, are hence required to evolve, introduce and help sustain energy efficient technological solutions that are adapted to local conditions and needs. TERI's experience in working with small-scale foundries has shown the effectiveness of the RDD&D (research, development, demonstration and dissemination) approach to promoting clean, energy efficient technology in the SME sector.

### **3. A case study of foundry and steel rolling SMEs in India**

**Mr. Gaurav Sharma, Institute for Industrial Productivity (IIP) Office in India**

Key points:

- The cluster-based approach works well in promoting energy efficiency in the Indian SME sector. However, a major challenge is to address the diverse kinds of entrepreneurs often encountered within the same cluster, in terms of their education, awareness levels and willingness to consider/adopt new ideas.
- IIP's experience in two Indian SME sub-sectors—foundry and steel re-rolling—has shown that the demonstration of 'co-benefits' brought by energy efficient technology (i.e. benefits in addition to energy savings) can help in motivating entrepreneurs to adopt the improved technology. For instance, in steel re-rolling, improved technology not only brings direct savings in energy costs (reducing coal consumption by about 30 kg/t product), but also reduces metal losses on account of scaling/oxidation, thereby improving productivity.

### **4. Enabling Finance for Scaling up Energy Efficiency in MSMEs**

**Mr. Upinder S. Dhingra, Associate Fellow, TERI**

Key points:

- Financing energy efficient technologies presents special challenges, as the low awareness and capacity levels among MSMEs is compounded by the lack of capacity among financiers in understanding and assessing energy efficiency projects.
- It is important to distinguish between an investment made for modernization or expansion, and an investment based on energy efficiency criteria. Typically, the former is marked by high capital cost and long payback period while the latter is marked by a relatively low capital cost but short payback period (e.g. an air compressor) based purely on energy savings.
- Financing of energy efficient technologies at different stages of commercialization could be modeled as follows:
  - Pre-commercial. Funds are needed for the entire RDD&D cycle. The funds could take the form of grants or venture capital, and come from

government financing schemes and/or low-cost funds from multilateral/bilateral agencies.

- Semi-commercial. Here, upfront costs are high, as are the perceived risks. Funds could take the form of capital subsidies and concessional interest rates for new technologies (making them more attractive for MSMEs compared to the existing low efficiency technologies).
- Commercial. Funds could be routed through Energy Services Companies (ESCOs) and concessional lines of credit. Financiers should be provided with guidelines to assess energy efficient technologies.

## 5. Discussion

Following the formal presentations, workshop participants were invited to share their perspectives on challenges to progressing energy efficiency and the kinds of policies and programme measures they think are needed. Some of the important points that emerged from the table and large group discussions include:

- Governments should consider providing tax rebate schemes to SMEs to encourage them to adopt energy efficient technologies. A Value-Added Tax holiday could be provided during the duration of the payback period.
- A major challenge is that energy efficient solutions are not readily available for the scale of operation in Indian MSMEs, and/or they require customization to suit specific needs
- Loans required for many energy efficiency measures are usually small, and carry almost the same transaction costs as large loans; hence, bankers find them unattractive
- It was suggested that a special agency could be established to bridge the gap between MSMEs, technology providers and banks.
- The ESCO mechanism, with specific focus on the MSME sector, should be promoted particularly for the energy efficiency products.
- BEE could validate and provide accreditation to various energy efficient technologies and their respective vendors. The SAMEEEKSHA platform<sup>iv</sup>

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<sup>iv</sup> SAMEEEKSHA ([www.sameeksha.org](http://www.sameeksha.org)) is a collaborative platform aimed at pooling the knowledge and synergizing the efforts of various organizations and institutions – Indian and international, public

can be used to spread awareness on these accredited energy efficient technologies and vendors.

- Entrepreneurs suggested that subsidies for energy efficient technologies should be released at the time of investment itself.
- The focus on energy intensive clusters should be maintained as an approach to formulating and implementing supportive policies.

### 3. **Session 2: Waste Heat Recovery**

There are significant opportunities to increase the uptake of waste heat recovery measures in Indian industry. The aim of this session was to better understand the technical opportunities in India and to explore opportunities to increase the uptake of waste heat recovery measures. Speakers from India and Japan shared perspectives on practical initiatives and policies.

#### **Speakers and topics for session 2**

| <b>Session 2: Waste Heat Recovery</b>                           |   |
|---|---|
| <b>Topic</b>  | <b>Speaker</b>  |
| 'Waste Heat Recovery': Opportunities in Indian Industry Sector  | Mr Srikant Kasturi, Assoc. Consultant Development Environergy Services Limited (DESL) |
| 'Waste Heat Recovery': Case Study of the Glass Industry Sector  | Mr. Sachin Kumar, Fellow, TERI  |
| Waste heat recovery power generation for cement plants in India | Mr. K.V. Perumal, Manager, Kawasaki Heavy Industries, Ltd., Delhi                     |
| Waste heat recovery policy and practices in Japan               | Mr. Niro Kitagawa, Energy Conservation Center, Japan                                  |
| Waste to Energy - Heat recovery from waste                      | Mr. Makoto Takano, Deputy Head of BU India, Hitachi Zosen India Private Limited       |

#### **1. Waste Heat Recovery': Opportunities in the Indian Industrial Sector**

##### **Mr. Srikant Kasturi, Development Environergy Services Ltd (DESL)**

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and private – that are working towards the common goal of facilitating the development of the SME sector in India through the promotion and adoption of clean, energy efficient technologies and practices.

Key points:

- Significant opportunities for waste heat recovery have been identified in the Indian Faridabad cluster of SMEs - particularly in the forging process.
- Technical barriers include space limitations, seasonal operations and the added cost and complexity of integrating waste heat recovery system controls with existing process controls.
- Business barriers include negative perceptions about the impact of waste heat recovery measures on production and the risk of financing projects dependent on uncertain future energy prices.
- Suggestions for progressing waste heat recover measures in India include: sharing the success from past SME programmes; providing vendor and manufacturer incentives for energy efficient design; and, influencing MSME owners to adopt a life cycle costing perspective for investment in furnaces.

## **2. 'Waste Heat Recovery': Case Study of the Glass Industry Sector**

**Mr. Sachin Kumar, Fellow, TERI**

Key points:

- Over 1 million tonnes/ year of glass is manufactured in the Firozabad cluster which uses around 0.2 million tonnes of oil equivalent energy/ year.
- 12% annual growth is expected due to increasing demand in the packaging, construction and the automobile sector
- Glass manufacturing is well suited to waste heat recovery due to high furnace and exhaust gas temperatures
- An example of a successful project is a counter flow metallic recuperator made up of 5 stainless steel modules which can save 25-30% energy per year for a payback period of 0.5 years. This has been adopted by almost all cluster units.

### **3. Waste heat recovery power generation for cement plants in India**

**Mr. K.V. Perumal, Manager, Kawasaki Heavy Industries, Ltd., Delhi**

Key points:

- There are many successful examples of waste heat recovery in cement plants around the world such as Taiheiyo Cement / Kumagaya Plant (Japan) which has been operating for 30 years.
- The first plant in India with waste heat recovery commenced operation was the Indian Cement/ Vishunupuram Plant (India) which was commissioned in 2004.
- The project by Siddhi Vinayak Cement (P) Ltd / Nimbol, Pali, Rajasthan is expected to commence operation in June 2015.
- There is substantial opportunity for further applications in the cement industry.

### **4. Waste heat recovery policy and practices in Japan**

**Mr. Niro Kitagawa, Energy Conservation Center, Japan**

Key points:

- Waste heat recovery is encouraged through the Energy Conservation Act of Japan.
- ‘Standards of judgement’ (standard values) in the Act have been established for waste gas temperatures for boilers, rates of waste heat recovery for industrial furnaces and furnace wall outer surfaces. Enterprises are also required to comply with the Energy Conservation Guideline and develop an Energy Management Manual.
- Mr. Kitagawa described a number of case studies that explored: 1) preheating of the combustion air, 2) Renewal to regenerative burners, 3) Steam drain-off recovery, 4) Heat retention of steam valves, 5) Air and gas preheating systems for a boiler plant, 6) Process flow involving the use of a heat-pipe- type air pre-heater, 7) Heat recovery of tunnel dryer exhaust gas, and 8) Waste heat recovery in tunnel kiln.

## **5. Waste to Energy - Heat recovery from waste**

**Mr. Makoto Takano / Deputy head of BU India, Hitachi Zosen India Private Limited**

Key points:

- Mr. Takano provided an overview of the technology that allows for the recovery of heat from waste sources.
- Successful examples include the Riverside project in London (UK) and the Osaka Hitashiyodo project in Japan.
- The LoCal Plus technology developed by Hitachi Zosen India has significant potential in the Indian market.

## **4. Session 3: Panel Discussion**

Five distinguished speakers were invited to participate in the panel discussion. Each speaker provided a perspective on the key themes that had been discussed throughout the workshop.

### **Speakers and topics for session 3**

| <b>Session 3: Panel Discussion &amp; Wrap up</b>  |  |
|---|--|
| <b>Moderator :</b><br>Dr. Patrick Crittenden, Director, Sustainable Business Pty Ltd, Australia |  |
| <b>Panelists</b>  |  |
| 1   | Mr Rajiv Kumar, DGM, Energy Efficiency Centre, Small Industries Development Bank of India                            |
| 2   | Mr M A Patil, Director, Resource Conservation and Management, Federation of Indian Chambers of Commerce and Industry |
| 3   | Shri R N Pandya., Sr. Project. Executive, Energy Conservation, Gujarat Energy Development Agency (GEDA)              |
| 4   | Mr. Girish Sethi, Director, TERI   |
| 5   | Mr A Pari, Chairman, The Institute of Indian Foundrymen (IIF) Chennai Chapter  |

**1. Mr. Rajiv Kumar, DGM, Energy Efficiency Centre, Small Industries Development Bank of India (SIDBI)**

Mr. Kumar began by reiterating the importance of the SME sector in India. He then:

- Highlighted the challenges that SMEs face with regard to investing in the latest energy efficiency technologies due to high capital costs and their business structure.
- Described the way in which SIDBI has partnered with the World Bank, Global Environment Facility (GEF), industry associations and others to assist MSMEs with energy efficiency through a focus on industry clusters.
- Explained the importance of going beyond energy audit reports towards an ‘end to end energy efficiency’ (4E) approach. 4E is the name of a new programme which SIDBI is currently piloting. It will support SMEs with audits, selection of vendors, implementation and finance.
- SIDBI have also trained more than 1500 bankers and professionals to improve their understanding of how to assess loans for energy efficient products.

**2. Mr. M A Patil, Director, Resource Conservation and Management, Federation of Indian Chambers of Commerce and Industry**

Mr. Patil:

- emphasized the importance of adopting an integrated approach to energy efficiency in SMEs.
- He presented an example of a project that led to dust being collected from the manufacturing process. The project led to a reduction in pollution, the recovery of a valuable resource and the recovery of heat which reduced the energy intensity of the operation. Mr. Patil encouraged this wider focus to be applied to energy efficiency improvement initiatives.

### **3. Shri R N Pandya, Sr. Project. Executive, Energy Conservation, Gujarat Energy Development Agency (GEDA)**

Mr. Pandya highlighted that there is significant potential to improve energy efficiency. He suggested that programmes could be more effective when they:

- Are developed with input from SMEs themselves.
- Integrate the message of energy efficiency with the concerns of SMEs – which are productivity and profitability.
- Balance general information to many businesses with more direct interventions such as ‘walk through energy audits’. Mr Pandya highlighted that although audits are more expensive his experience had been that they delivered results when they were combined with direct contact with an SME and where they provide specific information on the actions that can be taken and the benefits that will result.

### **4. Mr. Girish Sethi, Director, TERI**

Mr. Sethi acknowledged the considerable achievements that had been presented throughout the workshop and chose to focus his talk on some areas for future efforts.

Key points made are:

- The need to develop more ‘demand management’ programmes with utilities. It was noted that this stakeholder group did not attend the workshop but should be invited to future such events.
- The importance of educational institutions to build capability in order to support a flourishing local service providers.
- The importance of investment in research and development to ensure that technology solutions are appropriate for SMEs. For many SMEs the technologies that have been created for large scale operations are not feasible for SMEs due to their high capital cost.

## **5. Mr. A. Pari, Chairman, The Institute of Indian Foundrymen (IIF) Chennai Chapter**

Mr. Pari shared his own experience in reducing energy consumption by 30% in an aluminium foundry following a reduction in the availability of energy in 2008. He explained how the IIF is working with TERI to examine further opportunities. Mr Pari also encouraged the organisers to influence Hotels like the Taj Palace to improve their own energy efficiency.

### **5. Closing remarks and networking dinner**

Mr. Tomoyoshi Hisamori, Deputy Director, International Affairs Office, Energy Conservation and Renewable Energy Department, The Ministry of Economy, Trade and Industry of Japan (METI) provided the closing remarks for the workshop. Mr. Hisamori thanked the organisers, presenters and participants. He reiterated the importance of continuing to share perspectives on ways to advance energy efficiency in SMEs. Mr. Hisamori invited speakers and participants to the reception and networking dinner.

Following Mr. Hisamori's remarks, workshop participants attended a reception and networking dinner at the hotel. This provided an opportunity for networks to be further developed and perspectives to be shared across governments, industry associations, SMEs in the industrial sector, financial institutions, NGOs and researchers.

## **3. Summary of workshop themes**

The workshop aimed to create a discussion around the challenges and opportunities of progressing energy efficiency in SMEs in general and through waste heat recovery measures in particular. The main themes that emerged from the workshop are:

1. SMEs play a **central role in the economy** of India, Japan and other countries

around the world. Energy efficiency improves the productivity and competitiveness of SMEs which, in turn, contributes to employment opportunities, innovation and economic growth.

2. Energy efficiency **policies and programmes should be designed to provide assistance across the energy efficiency project lifecycle** from project identification, through the development of specifications, selection of vendors, access to finance and implementation. This is important because information alone is often not sufficient to motivate SMEs to progress energy efficiency even when projects present a strong financial return.
3. **Research, Development, Demonstration and Dissemination (RDD&D) activities are essential** to ensure that locally relevant technologies are accessible to SMEs. Due to the small scale and financial challenges faced by SMEs, energy efficient technologies that have a high capital cost are often not feasible and therefore alternatives need to be developed locally.
4. The large number of SMEs and their diverse business activities and energy consumption patterns present a challenge for the development of SME programmes. Focusing on **geographic clusters of particular industries** is an approach that has been effectively utilised in India.
5. Energy efficiency in SMEs requires **sustained efforts** from governments, technical experts, banks and other stakeholders over a number of years. This is due to the large number and diversity of SMEs.
6. **Waste heat recovery has significant potential in India.** To meet this potential, policies can be improved by establishing a framework and incentives to support the uptake of such projects. Policy frameworks that have been developed in Japan provide a useful indication of the kinds of policies that might be developed in India and other countries.

## 4. Appendices

### 1. Workshop agenda

### *6<sup>th</sup> EMAK Workshop*

#### Promoting Energy Efficiency in Small and Medium Sized Enterprises (SMEs) and Waste Heat Recovery Measures in India

25 February 2015

Mumtaz Hall, Taj Palace Hotel, Sardar Patel Marg, Diplomatic Enclave, New Delhi

| 10:00 – 10:30 hrs.                          | Registration  |  |
|---|---|--|
| 10:30 – 11:15 hrs.                          | <b>Inaugural session</b> <ul style="list-style-type: none"><li>- <b>Welcome address</b><ul style="list-style-type: none"><li>- Mr. Girish Sethi, Director, TERI</li></ul></li><li>- <b>Introductory remarks</b><ul style="list-style-type: none"><li>- Ms. Junko Ogawa, Senior Researcher, IEEJ</li></ul></li><li>- <b>Inaugural address</b><ul style="list-style-type: none"><li>- Shri Bhaskar Jyoti Sarma, Secretary/DG, Bureau of Energy Efficiency, Government of India</li></ul></li><li>- <b>Background and workshop objectives</b><ul style="list-style-type: none"><li>- Dr. Patrick Crittenden, Director, Sustainable Business Pty Ltd, Australia</li></ul></li></ul> |  |
| 11:15 – 11:30 hrs.                          | Tea/Coffee  |  |
| <b>Session 1: Energy Efficiency in SMEs</b> |   |  |
| Time  | Topic   | Speaker  |
| 11.30 -12.00                                | Energy efficiency in SMEs – a Global Perspective  | Dr Patrick Crittenden, Director, Sustainable Business Pty Ltd, Australia |
| 12.00 -12.20                                | Understanding the SME sector in Asia, with a focus on India, and challenges in terms of improving energy efficiency   | Mr Prosanto Pal, Senior Fellow, TERI                                     |
| 12.20 – 12.40                               | A case study of foundry and steel rolling SMEs in India   | Mr Gaurav Sharrma, Institute for Industrial Productivity Office in India |
| 12.40 – 13.10                               | Enabling Finance for Scaling up Energy Efficiency in MSMEs  | Mr Upinder Singh Dhingra, Associate Fellow, TERI                         |
| 13.10 – 13.30                               | Table Discussion<br>What challenges do you face in progressing energy efficiency?<br>What kind of policies and programme measures are needed to progress energy efficiency in SMEs?   |  |

| 13:30 – 14:30 hrs.                               | Lunch   |   |
|--|---|---|
| <b>Session 2: Waste Heat Recovery</b>            |   |   |
| Time   | Topic   | Speaker   |
| 14.30 -14.50                                     | 'Waste Heat Recovery': Opportunities in Indian Industry Sector  | Mr Srikant Kasturi, Assoc. Consultant<br>Development Environenergy Services<br>Limited (DESL) |
| 14.50 -15.05                                     | 'Waste Heat Recovery': Case Study of the Glass Industry Sector  | Mr. Sachin Kumar, Fellow, TERI  |
| 15.05 -15.30                                     | Waste heat recovery power generation for cement plants in India   | Mr. K.V. Perumal, Manager, Kawasaki<br>Heavy Industries, Ltd., Delhi                          |
| 15.30-16.00                                      | Waste heat recovery policy and practices in Japan   | Mr. Niro Kitagawa, Energy<br>Conservation Center, Japan                                       |
| 16.00 -16.30                                     | Waste to Energy - Heat recovery from waste  | Mr. Makoto Takano, Deputy Head of<br>BU India, Hitachi Zosen India Private<br>Limited         |
| 16:30 – 17:00 hrs.                               | Tea/Coffee  |   |
| <b>Session 3: Panel Discussion &amp; Wrap up</b> |   |   |
| 17:00 – 18:00 hrs.                               | <p><b>Moderator :</b><br/>Dr. Patrick Crittenden, Director, Sustainable Business Pty Ltd, Australia</p> <p><b>Panelists</b></p> <ol style="list-style-type: none"> <li>1 Mr Rajiv Kumar, DGM, Energy Efficiency Centre, Small Industries Development Bank of India</li> <li>2 Mr M A Patil, Director, Resource Conservation and Management, Federation of Indian Chambers of Commerce and Industry</li> <li>3 Shri R N Pandya., Sr. Project. Executive, Energy Conservation, Gujarat Energy Development Agency (GEDA)</li> <li>4 Mr. Girish Sethi, Director, TERI</li> <li>5 Mr A. Pari, Chairman, The Institute of Indian Foundrymen (IIF), Chennai Chapter</li> </ol> |   |
| <b>Closing Remarks</b>                           |   |   |
| 18:00 –  | Mr. Tomoyoshi Hisamori, Deputy Director, International Affairs Office, Energy Conservation and Renewable Energy Department, The Ministry of Economy, Trade and Industry of Japan (METI)   |   |
| 18:30 hrs. onwards                               | <p><b>Reception and Networking Dinner</b></p> <p>Raja Bagh Lawns, Taj Palace Hotel, Sardar Patel Marg, Diplomatic Enclave, New Delhi</p>  |   |

## **2. Evaluation against the workshop aims**

### **Aim 1: Learn about and share experiences on designing and implementing energy efficiency policies and programmes for SMEs**

Outcomes achieved:

- Thirteen presentations from highly respected Indian and International speakers were delivered.
- Participant perspectives on the challenges and opportunities for progressing energy efficiency in SMEs were explored through interactive small group discussions.
- In the final session a distinguished panel shared their perspectives on the issues raised throughout the workshop.

### **Aim 2: Identify innovative ways of financing energy efficiency projects**

Outcomes achieved:

- A presentation and discussion was led by the TERI co-author of the recently published report *Enabling Finance for Scaling up Energy Efficiency in MSMEs*.
- The Deputy General Manager of the Energy Efficiency Centre of Small Industries Development Bank of India (SIDBI) presented and participated in the panel session.
- Participants shared their perspectives on the challenges and opportunities to improve access to finance for energy efficiency projects.
- Follow up meetings have been arranged between bank representatives, researchers and SMEs to further explore appropriate financing initiatives.

### **Aim 3: Better understand the technical opportunities to reuse waste heat in industrial organisations**

Outcomes achieved:

- Five presentations were made. These covered waste heat recovery options in India and the approach being adopted in Japan to establish a policy framework to support the uptake of waste heat recovery projects.

- A number of follow up meetings have been established. For example, between a regional industry association and Hitachi Zosen India to explore a potential waste to energy project.
- Further dialogue is anticipated regarding the policy framework that India might adopt to support the uptake of waste heat recovery projects.

**Aim 4: Initiate and develop networks within and across SMEs, the finance sector, industry associations and government policy-makers at both national and international levels**

Outcomes achieved:

- Workshop participants represented governments, industry associations, SMEs in the industrial sector, financial institutions, NGOs and researchers.
- Participants from India, Japan and Australia contributed local, national and international perspectives.
- Lessons learned about SME energy efficiency programmes around the world were shared in a presentation based on research for the forthcoming IEA publication *Policy Pathway on Energy Management Programmes for SMEs*.

**Aim 5: Contribute towards domestic and international dialogue and capacity building on energy efficiency measures.**

Outcomes achieved:

- The workshop was video recorded and a workshop report is being prepared. These will be made available on the International Energy Agency’s website to ensure that the workshop outcomes are widely shared with policy makers and practitioners.
- Insights from the workshop will inform the IEA’s *Policy Pathway on Energy Management Programmes for SMEs* which is currently under development.
- Insights on energy efficiency policy and practice that emerged at the workshop will be presented to the Indian government nodal agency for energy efficiency—Bureau of Energy Efficiency (BEE), as requested by the Secretary of BEE, Mr. Bhaskar Sarma, in his opening address.