UK Government

iDeeksha

Bureau of Energy Efficiency
Ministry of Power, Government of India

# Accelerating Smart Power and Renewable Energy in India (ASPIRE)

## IE01 – REJUVENATION OF KNOWLEDGE EXCHANGE PLATFORM

## IE02 – INDUSTRIAL EE AND DECARBONISATION KNOWLEDGE AND TECHNOLOGY PARTNERSHIPS

## IE01a – TECHNICAL ASSISTANCE FOR OPERATIONS AND MAINTENANCE OF IDEEKSHA PLATFORM

## IE03 – ENERGY EFFICIENCY AND DECARBONISATION STRATEGY FOR INDIAN ALUMINIUM INDUSTRY


**Presented by:**
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**Managing Director**
**Idam Infrastructure Advisory (ASPIRE Team)**

# Programme Introduction & Architecture

**2 Projects**
*Smart Power & Renewable Energy*

**7 Themes**
*Spread across two projects*

**£15.4 Mn**
*including GoI contribution of £7.7 Mn in kind & capital*

**2-year project**
*extension possibility of 1 year*

**Multiple Work Packages**
*Initiatives focused on center & in select states*

| | Smart Power Project Architecture | | | Renewable Energy Project Architecture | | |
|---|---|---|---|---|---|---|
| **Project Themes** | **Electricity Distribution** | **Industrial Energy Efficiency** | **E-mobility Charging Infrastructure** | **Solar Energy** | **Off-Shore Wind Energy** | **Energy Storage & Green Hydrogen** |

**Work Packages with Central & select states (chosen among Andhra Pradesh, Himachal Pradesh, Telangana, Karnataka, Gujarat, Tamil Nadu, Delhi & Maharashtra)**

| | | | | |
|---|---|---|---|---|
| **Cross Cutting Activities** | **Green Financing** | | | |
| | **UK India Knowledge Forum / Investment Promotion** | | | |
| | **Gender and Social Inclusion** | | | |
| **Intermediate Outcomes** | **Policy Products and Tools** | **Robust project pipeline** | **Commercial & Knowledge Partnership** | **Innovation** |
| **Outcome** | **Improved investment environment through policy adoption, investment mobilisation & enhanced knowledge and skills** | | **New partnerships between India and international institutions** | |

**Impact**

**Increased investment to support energy security & economic growth that is inclusive, low carbon, supports poverty reduction & climate action**
**Increased trade, investment & relationships between India and UK**

# IE01- Rejuvenation of Knowledge Exchange Platform

# Activities carried out under IE01 work package of ASPIRE

## 1 REJUVENATION OF KEP (IDEEKSHA Platform)

- Preparation of technical documents for IDEEKSHA (BRD & Webhosting Requirement Document)
- Development of beta version of KEP and Preparation of Help Manuals
- **Organised Launch Event** for IDEEKSHA Platform (rejuvenated KEP) and Event Summary Report
- Database/Repository of IEED Technology/Solutions Providers

## 2 ORGANISING SECTORAL WORKSHOPS AND POLICY ROUNDTABLE

- Organised sectoral workshop for **Aluminium Sector** (November 2022)
- Organised sectoral workshop for **Textile Sector** (December 2022)
- Organised sectoral workshop for **Cement Sector** (March 2023)
- Organised sectoral workshop for **Iron & Steel Sector** (April 2033)
- Organised national-level cross-sectoral workshop & launch of IDEEKSHA during BEE's 21st Foundation Day Event
- Organised **Policy Roundtable** and prepared 2 policy recommendations

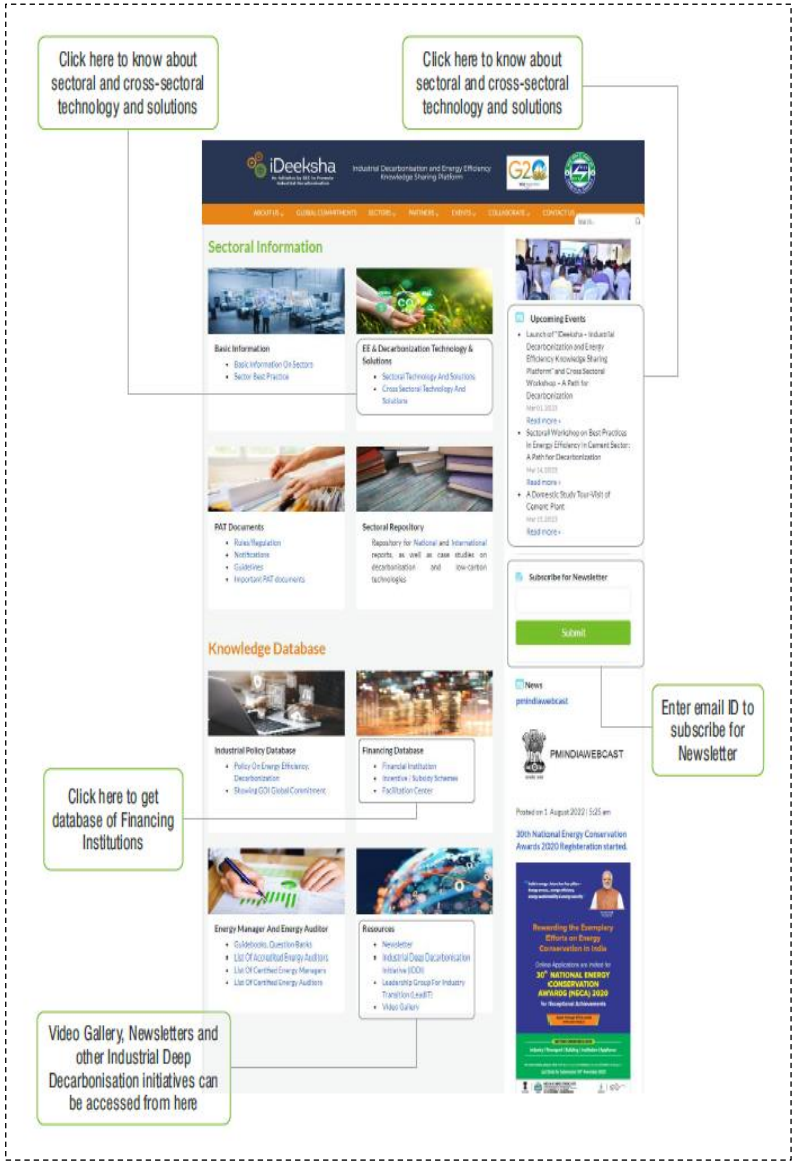
## 3 ORGANISING SECTORAL LEARNING STUDY TOURS

- Organised sectoral learning study tour for **Aluminium Sector** (November 2022)
- Organised sectoral learning study tour for **Textile Sector** (December 2022)
- Organised sectoral learning study tour for **Cement Sector** (March 2023)
- Organised sectoral learning study tour for **Iron & Steel Sector** (April 2033)

## 4 IEED NEWSLETTERS

- Newsletter 1 (IDEEKSHA Launch Event)
- Newsletter 2 (March 2023)
- Newsletter 3 (June 2023)
- Newsletter 4 (October 2023)

# Rejuvenation of KEP – IDEEKSHA Platform


https://www.ideeksha.in/

# Features of IDEEKSHA

## 10 Energy Intensive Sectors Covered

- Aluminium
- Pulp & Paper
- Textile
- Refinery
- Cement
- Chlor Alkali
- Iron & Steel
- Fertiliser
- Sugar
- Tyre Manufacturers


## Features of IDEEKSHA Platform

| | |
|---|---|
| 1 | One-stop shop for all IIED needs |
| 2 | Access to tools, technologies, and technology providers in India & globally |
| 3 | Dedicated tab on Govt. of India's Global Commitments |
| 4 | Collaboration facility – Technology, Discussion Forums and Blogs |
| 5 | Secure and quick user registration |
| 6 | Dedicated tab for Gender Equality and Social Inclusion in hard to abate sectors |
| 7 | Access to IEED Newsletters, Events, Workshops, Study Tours, Webinars |
| 8 | Robust system to ensure quality content |

# Four Sectoral Workshops (1/2)

| | Aluminium Workshop | Textile Workshop |
|---|---|---|
| **Venue & Date** | Aditya Aluminium, Lapanga, Odisha<br>November 21, 2022 | Raymond Ltd., Chhindwara, Madhya Pradesh<br>December 08, 2022 |
| **No. of Participants** | **100+** | **70+** |
| **IEED Initiatives identified in Workshop** | • Decarbonize electricity use (60% emissions)<br>• Decarbonize aluminum processing emissions (25% emissions)<br>• Recycle aluminum scrap efficiently to reduce 15% of sector emissions | • Use renewable energy for most electricity<br>• AI-based management for water, energy, and steam<br>• Recover waste heat in various processes<br>• Use waterless/chemical-free dyeing tech |
| **IEED technologies/ solutions – interest expressed by industries** | • Techniques and technologies for enhanced waste heat recovery, especially from Kilns<br>• Future of power plants including hydrogen fuel based<br>• Advanced energy management systems | • **Alchemie's 'Endeavour'** and '**Novera**' technologies for waterless low-energy textile dyeing and energy-saving non-contact finishing<br>• **Centrica's IoT** 4.0 energy management system, driven by wireless sensors and advanced analytics, improves operating margins and sustainability |

Group Photograph from Aluminum Workshop


Group Photograph from Textile Workshop

# Four Sectoral Workshops (2/2)

| | Cement Workshop | Iron & Steel Workshop |
|---|---|---|
| **Venue & Date** | Udaipur, Rajasthan<br>March 14, 2023 | Raipur, Chhattisgarh<br>April 19, 2023 |
| **No. of Participants** | **80+** | **100+** |
| **IEED Initiatives identified in Workshop** | • CCU technology applications<br>• Low-energy drying for cement/mineral products<br>• Next-gen circular materials, incl. supplementary cementing materials<br>• Delta zero cement, AI-based platform for production<br>• New carbon sequestration tech in concrete | • AI and IoT-based decarbonization<br>• Convert waste into circular value chain links<br>• Achieve zero emissions with Electric Arc Furnace while creating revenue<br>• Use sustainable refractory solutions<br>• Reduce process fluctuations for EE optimization |
| **IEED technologies/ solutions – interest expressed by industries** | • Techniques and technologies for enhanced waste heat recovery<br>• CCUS Technology<br>• Advanced energy management systems<br>• Recycling technologies and processes | • Enhanced techniques for recovering waste heat<br>• Advanced electrolysis processes and technology<br>• Advanced systems for managing energy<br>• Recycling technologies and processes |

Group Photograph from Cement Workshop

Group Photograph from Iron & Steel Workshop

# Four Sectoral Learning Study Trips (1/2)

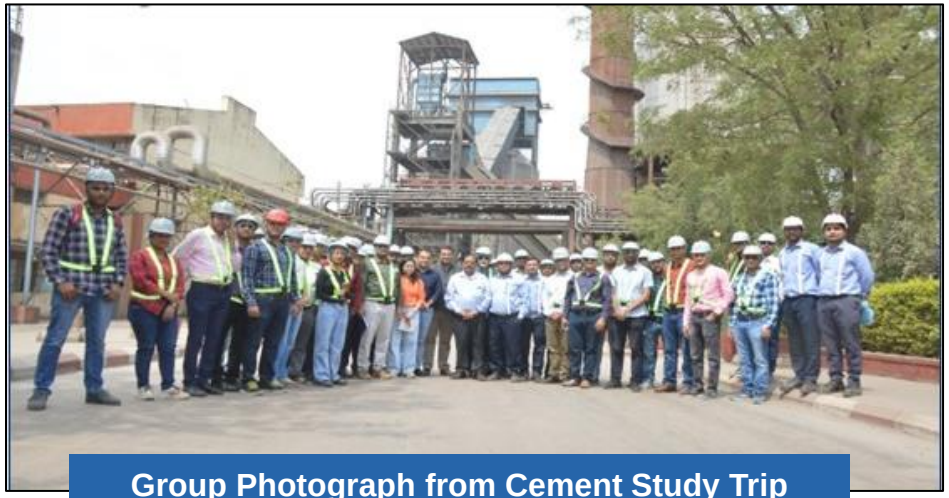
| | Study Tour of Aluminium Plant | Study Tour of Textile Plant |
|---|---|---|
| **Venue & Date** | Aditya Aluminium, Lapanga, Odisha<br>November 22, 2022 | Raymond Ltd., Chhindwara, Madhya Pradesh<br>December 09, 2022 |
| **No. of Participants** | **50+** | **50+** |
| **IEED measures adopted by the plant** | • Leveraging the power of Energy Analytics Platform, integrated with Power BI with AI, to harness the full potential of their data and drive meaningful insights.<br>• Use of Copper Insert Collector Bar / Cathode (CuCB)<br>• Upcoming 10 MW floating solar plant by 2023 | • IoT for machine monitoring and energy analytics, with auto WhatsApp reports to officials.<br>• Efficient fans and Harmonic Filters installed.<br>• Waste Heat Recovery systems in use.<br>• Advanced Compressed Air System with Air Pressure Band Separation.<br>• Rice Husk used in boilers and thermopacs, with the upgraded fuel system |

Group Photograph from Aluminium Study Trip

Group Photograph from Textile Study Trip

# Four Sectoral Learning Study Trips (2/2)

| | Study Tour of Cement Plant | Study Tour of Iron & Steel Plant |
|---|---|---|
| **Venue & Date** | Udaipur Cement Works Ltd., Udaipur, Rajasthan<br>March 15, 2023 | Godawari Power & Ispat Ltd., Raipur, Chhattisgarh<br>April 20, 2023 |
| **No. of Participants** | **40+** | **40+** |
| **IEED measures adopted by the plant** | • IoT sensors for real-time condition monitoring of equipments.<br>• AI-based "Advanced Process Control Suite" for kiln & mills optimization<br>• Tracking of Vehicles by Ultra High Frequency<br>• Online Particle Size Distribution system for mills | • Operating a 70 MW solar power plant near Rajnandgaon (Chhattisgarh) since July 2022.<br>• Commissioning a 30 MW solar power plant near Bemetara (Chhattisgarh) to further increase their reliance on renewable energy sources.<br>• In the process of generating power using biomass and wind |



Group Photograph from Cement Study Trip

Group Photograph from Iron & Steel Study Trip

# National Level Cross-Sectoral Workshop & Launch of IDEEKSHA Platform


- **Launch of IDEEKSHA Platform** and Newsletter by Shri. R.K. Singh, Hon'ble Cabinet Minister on 1st March' 23 during BEE's 21st Foundation Day
- Database of **34** UK based IEED technologies hosted on IDEEKSHA platform

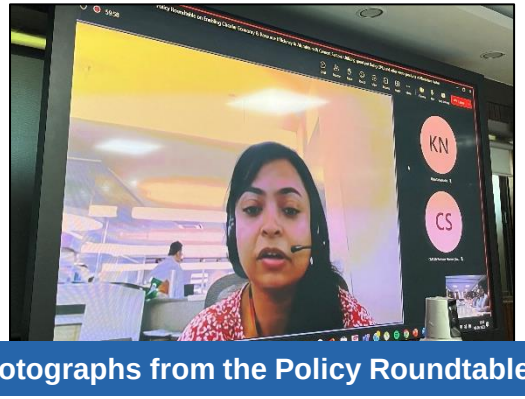

**5 UK companies presented their IEED technologies/ solution during IDEEKSHA Launch Event/ BEE Foundation Day:**

- **Innovate UK:** Transforming Foundation Industries (India Collaboration)
- **Alchemie:** Waterless Dyeing Technology
- **LAT Water:** Wastewater Treatment and the Water Energy Nexus
- **Carbon Clean:** Technology to Achieve Net Zero
- **Centrica:** Improving Operating Margins and Drive Sustainability with IOT 4 Real Time Machine level EMS

# Policy Roundtable

| Policy Roundtable | |
|---|---|
| **Venue & Date** | Conference Room, Bureau of Energy Efficiency, 4th Floor, Sewa Bhawan, New Delhi<br>June 09, 2023 |
| **Topic of Policy Roundtable** | Enabling circular economy and resource efficiency in Aluminium & Cement sectors: Utilising spent pot lining and other waste products of Aluminium Sector |
| **No. of Participants** | **30+** |
| **Key Aspects of Policy Roundtable** | The policy roundtable focused on the following key aspects:<br>• Discussions on key interventions required in policies to accelerate SPL utilisation in Cement Industries.<br>• Discussions on key challenges faced by the Aluminium and Cement sectors for enabling circular economy.<br>• SPL utilization was discussed, emphasizing the need for pilot studies to assess its impact on kiln operations and clinker formation.<br>• The aluminium industry expressed commitment to SPL utilization, while the cement industry had concerns. Both sectors explored ways to incorporate SPL as a raw material replacement.<br>• The collaborative atmosphere between the aluminium and cement sectors showcased a willingness to find mutually beneficial solutions.<br>• A successful national case study demonstrated the effective implementation of SPL utilization. |
| **Policy Recommendations** | **Two major** national-level policy interventions have emerged which will enable Cement Industries to enhance the utilization of SPL: |

| S.No | Suggested Policy Intervention | Issuing Department/ Ministry |
|---|---|---|
| 1 | Establish clear regulations and guidelines for SPL management and utilization in Cement Industries. | CPCB/ MOEFCC |
| 2 | Mandate Cement plants for Percentage Utilisation of SPL in Kiln. | MOEFCC |




Photographs from the Policy Roundtable

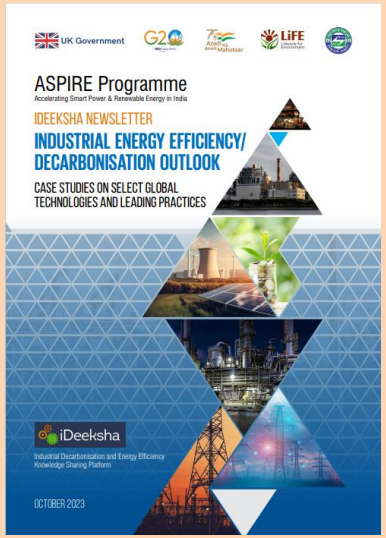
# 4 IDEEKSHA Newsletters (1/2)


- Case Studies on Global IEED Technologies
  - Textile Sector: UK's Waterless Smart Dyeing Technology
  - Cement Sector: Low carbon multi-component cement for UK concrete applications
  - Industry 4.0 Wireless Energy Solutions for Net Zero and Energy Productivity from UK
  - Pulp & Paper Sector: Novel dewatering solutions within corrugated case medium manufacture
- International Best Practices – UK Aluminium Sector
- Expert View on Emerging Low Carbon Technologies - Importance of Inert Anode technology for the Aluminium Sector
- Initiatives by industries to promote GESI (Gender Equality & Social Inclusion)


- Case Studies on Global IEED Technologies
  - Waste heat powered treatment of industrial wastewaters
  - Simulation aided/digital twin control of drying process in paper production
  - Total dissolved solids detection and control in industrial steam boilers
  - Carbon Clean's technology to become net-zero
- International Best Practices in Waste Heat Recovery
- National Best Practices
  - Energy Analytic Platform using Power BI with AI – Aditya Aluminium (Hindalco Industries Limited)
- From the Archives (IDEEKSHA Portal, First Newsletter, Sectoral Workshops of Aluminium, Textile and Cement Sectors, and Study Tours of Aluminium, Textile and Cement Sectors )

# 4 IDEEKSHA Newsletters (2/2)


- Case Studies on Global IEED Technologies
  - Carbon8 - Carbon Capture Technology Decarbonising the Cement Industry
  - Cambridge Electric Cement: A Zero-Emissions Breakthrough
  - Carbon Re's AI-based Delta Zero Cement Platform - Decarbonising Cement Production
- National Case Studies
  - Dalmia Cement (Bharat) Limited: Co-processing of Spent Pot Lining (SPL) Mixed Fines in Cement Plants
  - Raymond Limited, Vapi Plant: Energy Savings & Greenhouse Gases Mitigation to Manage Climate Change
- From the Archives (Sectoral Workshop and Study Tour of Iron & Steel Sector)




- Case Studies on Global IEED Technologies
  - Smartia – Unlocking Energy Efficiency Through Industrial Intelligence
  - CCm Technology – Improving Energy Efficiency in Fertiliser Production through Wastewater Treatment Resource Recovery
- International Best Practices in Driving Sustainability across UK Aluminium Sector
- National Best Practices
  - Superlative Utilisation of Green Energy in Cement Production
  - Copper Insert Collector Bar for Energy Reduction in Hindalco Smelter
- From the Archives (Policy Roundtable on Enabling Circular Economy and Resource Efficiency in Aluminium and Cement Sectors: Utilising Spent Pot Lining and other waste products of Aluminium Sector )

# Major Outcomes of IE01 Work Package

| | |
|---|---|
| 34 | Launch of IDEEKSHA Platform by Shri. R.K. Singh, Hon'ble Cabinet Minister. IDEEKSHA includes database of 34 global IEED technology/ solution providers. |
| 16 | International IEED companies showcased their technology/ solution during sectoral workshops in 4 hard to abate industrial sectors. |
| 500+ | Capacity building of 500+ stakeholders (including 30 women) from various energy intensive industrial sectors. |
| 4 | Newsletters covering international case studies and best practices in IEED technologies/ solutions developed and disseminated. |
| 4 | Facilitating B2B partnerships for pilot projects between Centrica (UK) and Indian textile firms – Raymond Ltd., DCM Shriram Rayons, Loyal Textile Mills, Vardhman Fabrics |

# IE02 - Industrial Energy Efficiency and Decarbonisation Knowledge and Technology Partnerships

# IE02 - Major Activities

With multiple PAT Cycles, many low-hanging EE opportunities have been exploited.

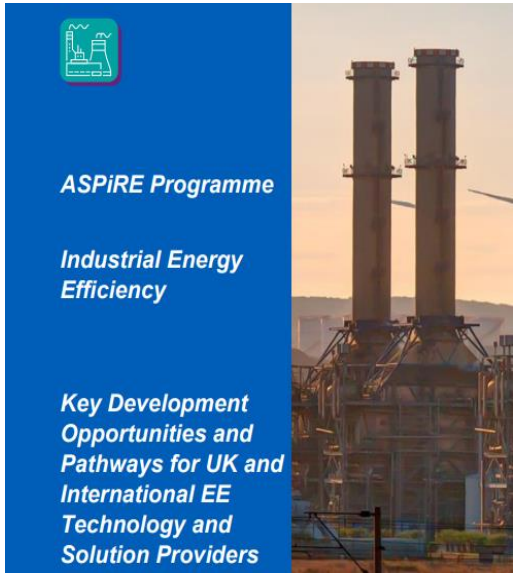
The **next set of opportunities** requires the **deployment of new technologies, through new approaches, investment and partnerships.**

Over the past decade, experience from the UK has found that further progress on IEED requires targeted handholding and deployment-focused interventions supporting the increased deployment of established and proven solutions.

Under this work package, the activities will **catalyse the partnerships, investments and collaborations needed to accelerate this next phase of IEED solutions within key Indian industries**, which would improve new technology acceptance, build confidence, supply chain development and de-risk investment.

- Report on key technology deployment opportunities and pathways for UK and international EE technology and solution providers
- Deployment toolkit for UK/international technology providers
- Preparation of customised industrial EE solution longlist of pre-screened providers
- Development of pipelines of partnership opportunities and provide deployment support

# IE02 Deliverables (1/2)



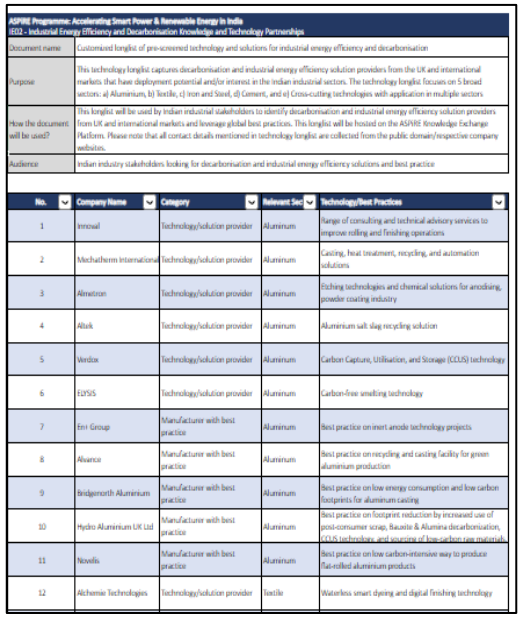

## Summary Report

- **Purpose: To provide a summary of key technology development opportunities and pathways for UK and International energy efficiency technology and solution providers.**
- **Provide Indian industry overview for Aluminum, Textile, Cement and Iron and Steel sector**
  - **Sector-wise production and capacity**
  - **Key market characteristics**
  - **Government programmes and policies**
  - **Key IEE initiative and financing opportunities**
  - **State of technology deployment**
  - **Potential opportunities for international companies**
  - **Way forward including enabling factors and potential barriers**


## Deployment Toolkit

- **Purpose: To provide step-wise guidance and highlight key considerations for international technology and solution companies for planning market entry into Indian industrial sectors.**
- **Key considerations for market entry: Policy landscape; Legal and tax considerations; State of existing technology solutions**
- **Step-wise guidance for market entry**
  - **Prioritizing market segments**
  - **Understanding the consumer**
  - **Positioning product and services**
  - **Building team**
  - **Identifying and partnering with industry collaborators**
  - **Potential modes of engagement**
  - **Managing legal and tax compliance**

# IE02 Deliverables (2/2)



ASPIRE Programme: Accelerating Smart Power & Renewable Energy in India
IE02 – Industrial Energy Efficiency and Decarbonisation Knowledge and Technology Partnerships

| | |
|---|---|
| Document name | Customised longlist of pre-screened technology and solutions for industrial energy efficiency and decarbonisation |
| Purpose | This technology longlist captures decarbonisation and industrial energy efficiency solution providers from the UK and international markets that have deployment potential and/or interest in the Indian industrial sectors. The technology longlist focuses on 5 broad sectors: a) Aluminium, b) Textile, c) Iron and Steel, d) Cement, and e) Cross-cutting technologies with application in multiple sectors |
| How the document will be used? | This longlist will be used by Indian industrial stakeholders to identify decarbonisation and industrial energy efficiency solution providers from UK and international markets and leverage global best practices. This longlist will be hosted on the ASPIRE Knowledge Exchange Platform. Please note that all contact details mentioned in technology longlist are collected from the public domain/respective company websites. |
| Audience | Indian industry stakeholders looking for decarbonisation and industrial energy efficiency solutions and best practice |

| No. | Company Name | Category | Relevant Sec | Technology/Best Practices |
|---|---|---|---|---|
| 1 | Innoval | Technology/solution provider | Aluminum | Range of consulting and technical advisory services to improve rolling and finishing operations |
| 2 | Mechatherm International | Technology/solution provider | Aluminum | Casting, heat treatment, recycling, and automation solutions |
| 3 | Almetron | Technology/solution provider | Aluminum | Etching technologies and chemical solutions for anodising, powder coating industry |
| 4 | Altek | Technology/solution provider | Aluminum | Aluminium salt slag recycling solution |
| 5 | Verdox | Technology/solution provider | Aluminum | Carbon Capture, Utilisation, and Storage (CCUS) technology |
| 6 | EOSIS | Technology/solution provider | Aluminum | Carbon-free smelting technology |
| 7 | Rio Tinto Group | Manufacturer with best practice | Aluminum | Best practice on inert anode technology projects |
| 8 | Alvance | Manufacturer with best practice | Aluminum | Best practice on recycling and casting facility for green aluminium production |
| 9 | Bridgenorth Aluminium | Manufacturer with best practice | Aluminum | Best practice on low energy consumption and low carbon footprints for aluminum casting |
| 10 | Hydro Aluminium UK Ltd | Manufacturer with best practice | Aluminum | Best practice on footprint reduction by increased use of post-consumer scrap, Bauxite & Alumina decarbonisation, CCUS technology, and sourcing of low-carbon raw materials |
| 11 | Novelis | Manufacturer with best practice | Aluminum | Best practice on low carbon-intensive way to produce flat-rolled aluminium products |
| 12 | Alchemie Technologies | Technology/solution provider | Textile | Waterless smart dyeing and digital finishing technology |

## Technology Longlist

- Purpose: This technology longlist captures decarbonisation and industrial energy efficiency solution providers* (50+) from the UK and international markets that have deployment potential and/or interest in the Indian industrial sectors.
- The technology longlist focuses on 5 broad areas: a) Aluminium, b) Textile, c) Iron and Steel, d) Cement, and e) Cross-cutting technologies with information on solution providers, their value proposition, geographic focus, suitability for the Indian market, and technology maturity level etc.
- Following are a few key examples of technology and solutions
  - Aluminum - Casting, heat treatment, recycling, and automation solutions - Mechatherm International
  - Textile - Waterless smart dyeing and digital finishing technology - Alchemie Technologies
  - Iron and Steel - Decarbonisation of Integrated and EAF Steelmaking Plants – Sustain Steel
  - Cement – Modular kinetic drying technology for drying and upgrading bulk-solid materials – Coomtech
  - Cross Sector - Carbon Capture, Utilisation, and Storage (CCUS) technology – Carbon Clean, Carbon Re

## Deployment Discussions

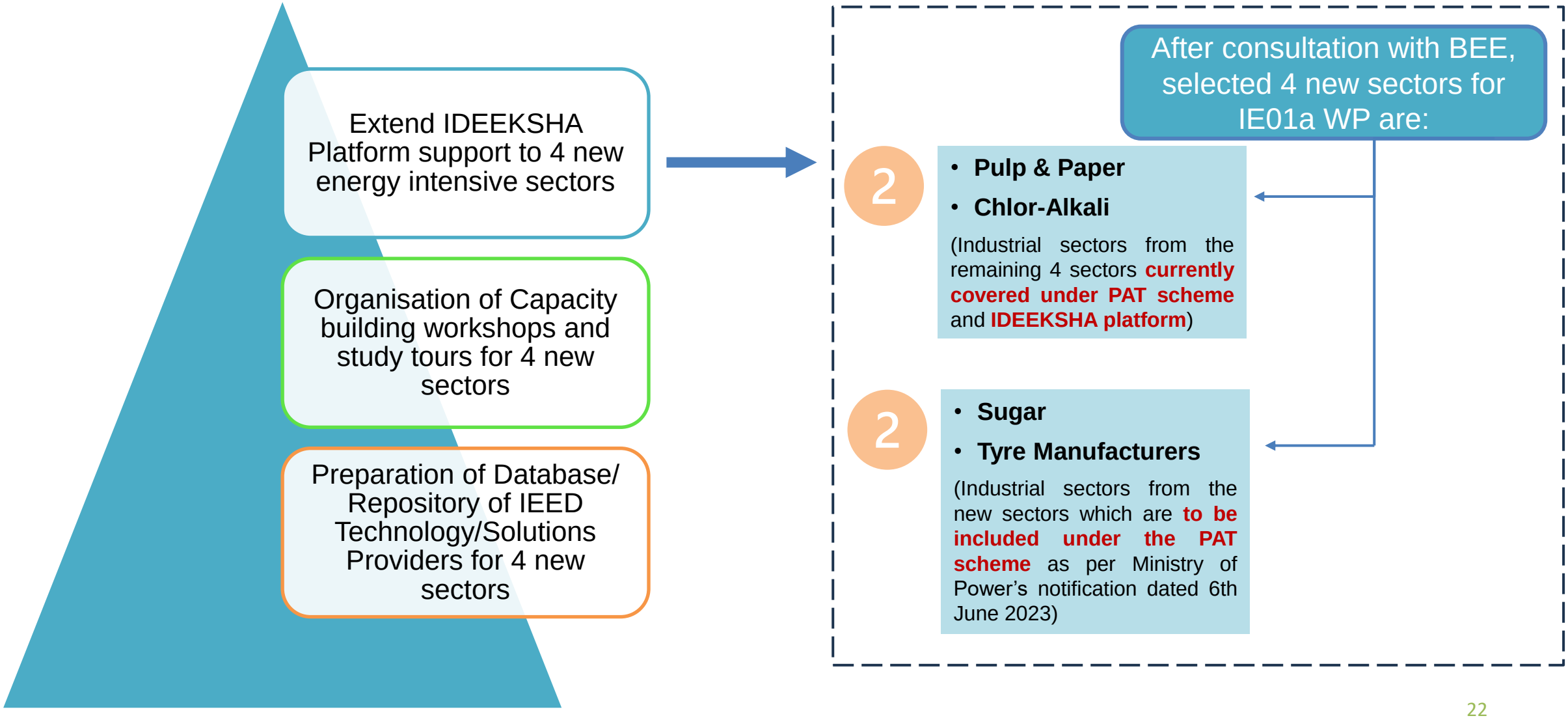
- Webinar/ virtual deployment session on waterless smart dyeing and finishing technology offered by Alchemie for sustainable textile dyeing process. 32+ participants from various textile industries
- Webinar/ virtual deployment session on opportunities for deployment of AI-based solution to reduce energy consumption and carbon emissions in the Cement sector carbon Re. 64+ Participants from the cement sector
- Facilitated in-person one-to-one partnership discussions between discussion between senior officials of Alchemie and Arvind Ltd. Partnership and follow-up discussions in process.
- Facilitated a deployment discussion between senior officials of Arvind Ltd. India and LAT Water – Partnership discussions in process. Additionally, LAT Water discussions with DCM Shriram Rayons and the Aditya Birla group to explore potential partnerships for technology deployment.
- Facilitated deployment support to UK companies – Innoval, Pilio, MRI eSight, Carbon Upcycling, Carbon Clean, Carbon8, Centrica, Coomtech, Smartia etc.

# Major Outcomes of IE02 Work Package

| | |
|---|---|
| 1 | Deployment toolkit for UK/international technology and solution providers interested in entering Indian Industrial sectors |
| 50+ | Technology longlist of 50+ UK/ International companies that have deployment potential and/or interest in the Indian industrial sectors. |
| 2 | Follow-up webinars/ virtual deployment sessions for the Textile (Alchemie's waterless smart dyeing and finishing) & Cement sectors (Carbon Re AI-based solution) with 96+ participants and follow-up discussions |

# IE01a- Technical Assistance for Operations And Maintenance of IDEEKSHA Platform

# Objectives of IE01a WP under ASPIRE Programme



# One Sectoral Workshop & Study Trip under IE01a

| | Pulp & Paper Workshop | Pulp & Paper Study Trip |
|---|---|---|
| **Venue & Date** | Amritsar, Punjab<br>February 13, 2024 | Khanna Paper Mills Limited, Amritsar, Punjab<br>February 14, 2024 |
| **No. of Participants** | **40+** | **30+** |
| **IEED Initiatives identified in Workshop** | • Utilising Biomass residues for energy (fuel switch)<br>• Emission reduction through logistic optimization – Raw material, vendor selection, digitalisation, etc.<br>• Use of renewable energy (biogas, solar, wind, hydrogen)<br>• Implementing process integration systems | |
| **IEED technologies/ solutions – interest expressed by industries** | • Waste heat recovery and utilisation output<br>• Low carbon technologies<br>• Advanced electrolysis technology and process<br>• Recycling technology | |
| **IEED measures adopted by the plant** | | • Efficiency Improvement of 14 MW Turbine by overhauling<br>• Replacement of 17.5 MW Steam Turbine Generator (STG) with 23.3 MW<br>• Generate energy by using sludge as a fuel for boilers after mixing it with coal.<br>• Increase the dryness of paper waste sludge from 50% to 75% to consume in the boilers as a fuel.<br>• Safely disposing the plastic waste and getting gains from it by producing energy |


Group Photograph from Pulp & Paper Workshop


Group Photograph from Pulp & Paper Study Trip

# IE03- Energy Efficiency and Decarbonisation Strategy for Indian Aluminium Industry

# Objective and activities of IE03 WP

## Objective

**To develop an energy efficiency and decarbonisation strategy for Indian Aluminium sector with key focus on alumina refining, smelting and integrated plants.**

## Major Activities

### 01 Assessment of energy consumption & emissions in Indian Aluminium sector

- Data collection & analysis of energy consumption in the Indian Aluminium sector
- Analyse emission patterns in different stages of the Aluminium production (scope 1)

### 02 Stakeholder Consultations

- Develop a questionnaire to gather inputs and insights from stakeholders
- Conduct stakeholder consultations with representatives from aluminum industry

### 03 Benchmarking of Indian Aluminium industries

- Identify key metrics for benchmarking of Indian Aluminium companies and 5 global peers
- Comparative assessment of industries in Indian Aluminium sector with global peers (incl. from UK) to identify leading practices and technologies

### 04 Assessment of expected energy consumption in Aluminium sector in medium to long term basis

- Identify measures/ interventions required to improve energy intensity and enable decarbonisation of Indian aluminum industry

### 05 Identification of decarbonisation technologies and cost benefit assessment

- Identify decarbonisation technologies for Indian Aluminum industry to enable competitiveness in view of the CBAM
- Conduct preliminary CBA of 2-3 such decarbonisation technologies

### 06 Preparation of EE & Decarbonisation Strategy

- Preparation of the draft and final report on EE & decarbonisation strategy
- Organise workshop for dissemination of the report

# Thank You