# UK Study Tour Report

**19 to 21st April, 2016**

## 1. BACKGROUND

A Study tour comprising of senior industry representatives from three of India's largest industry sectors viz. Cement, Aluminium and Textile was organised to UK from 19 to 21 April, 2016. The Study tour also comprised of representatives from Bureau of Energy Efficiency (BEE) and Knowledge Exchange Platform/ Institute for Industrial Productivity (IIP). The composition of the delegation is provided at Annex-1.

The study tour was organised under the Knowledge Exchange Platform (KEP) initiative, which is a Joint initiative of BEE and IIP. British High Commission (BHC) is supporting IIP in this initiative under their Prosperity Fund program. The core mandate of KEP initiative is to help the industry in meeting its energy efficiency targets by facilitating peer to peer learning and exchange of best practices within and across the targeted industry sectors of PAT. It also proposes to support the industry by bringing in knowledge on innovative approaches on energy management and international best practices/ technologies for promoting energy efficiency and Energy Management System (EnMS), as a means of achieving continuous improvement in energy efficiency in the industry sector. The study tour to UK was organised to support this objective of KEP.

## 2. OBJECTIVES OF THE STUDY TOUR

The purpose of the Study tour was to facilitate knowledge sharing and technology partnership between UK and India in the area of Industrial energy efficiency and provide practical exposure to industry, BEE and KEP officials through direct interaction with their counterparts in UK with a view to assess the viability and applicability of UK technologies and approaches in India, with the following objectives:

- **Interactions with policy makers** in UK, focussing on how industrial energy efficiency issues and challenges were handled, what policy and regulatory measures and technologies were adopted and what has been the experience so far.
- **Interactions with technology experts and technology developers** to get an understanding whether these technologies are replicable in India and what provisions are needed to ensure their adoption in India.
- **Interactions with Industry representatives, industry associations and knowledge exchange bodies** in UK, to understand the drivers for promoting energy efficiency and the strategies and approaches being adopted by them to achieve policy and regulatory mandate for energy conservation.
- **Field visits** to the chosen industrial units and centres of excellence, to assess their performance in operational condition and get a first-hand feedback on energy performance, investment, pay back and other issues relevant for their success and scale up in India.

## 3. DETAILS OF THE DISCUSSIONS AND MEETINGS ORGANIZED DURING STUDY TOUR

To cover the above objectives, the delegation met representatives of industry, industry association, knowledge bodies and policy makers in UK and also visited selected industrial units, exhibitions and centers of excellence. The detailed program of the study tour is provided at Annex-2. The key issues discussed in the meetings organized during the study tour are highlighted below:

### (i) Meeting with Emissions Trading Group

The meeting of Emissions Trading Group (ETG) was organized with the study tour delegates. ETG is an industry/ business led initiative that offers a forum for discussion and resolution of important aspects of emissions trading and facilitates communication between commerce and industry, and the UK Government. ETG membership represents a major share of UK carbon emissions covered under the EU Emissions Trading System (EU ETS).

The strategy and approach of ETG resonate well with the Knowledge Exchange Platform (KEP) initiative and as KEP moves in to the next phase of its implementation, there is a significant scope to drawn a lot of learning's from ETG.

The following representatives of ETG met the delegation:

- Mr. John Craven, Head of ETG Secretariat
- Ms. Anne-Marie Ferguson, the ETG Secretariat Executive.
- Mr. Matthew Croucher, ETG Director (from the motor industry trade association, SMMT)
- Ms. Lucy Candlin, ETG Director (independent consultant and co-chair of the ETG EU ETS working group specialising in monitoring, reporting and verification)

The ETG Secretariat representatives explained the delegation about the ETG process, covering the membership structure and the manner in which they engage with the policy makers and EU on policies and resources for the activities of the ETG. While providing the background about ETG, Mr Carven mentioned that ETG was created in 1999 under the auspices of ACBE and CBI with just 30 founder-members as an informal body, put together to prepare and submit outline proposals to the UK Government as the basis for the UK GHG Emissions Trading Scheme that began in April 2002. Since then they have been working closely with the UK Government on various issues related to implementation of emissions trading.

**Figure 1: Delegates interacting with ETG Representatives**

Mr. Carven explained that ETG transformed from an informal body to a registered entity in 2004 when members of ETG agreed to establish the ETG as a non for profit company (ETG Ltd). ETG currently has a multi-disciplinary membership of 60 organizations involved in the emissions trading sector extending to industrial companies, trade associations and service providers.

The ETG Secretariat is responsible for day-to-day administration of the Group's affairs, including arrangements for the various Working Group meetings and co-ordination of ETG's work programme. Currently, ETG operation is funded substantially from Member's annual subscription fee, while the ETG working group meetings are hosted by industry/ working Group Chairman/ members. ETG now has a secure operational and financial base from which they continue to support the UK business involvement, expertise and investment in emissions trading.

Matthew Croucher and Lucy Candlin provided Director's and Member's perspective on how ETG platform helped them in policy advocacy and in addressing various policy issues/ challenges. They explained that the affairs of ETG are managed by the ETG Board which meets three times a year for review purposes. Directors are required to seek re-election - in rotation every two years. All Directors of ETG Board are appointed in a personal capacity. Currently, ETG operates through two main Working Groups viz. EU ETS Working Group and UK Domestic measures (including CCAs, CRC and ESOS) Working Group. These Working Groups are supported by a series of sub-groups dealing with, e.g. the technical aspects of monitoring, reporting, verification and accreditation; data issues; competition issues; and aviation issues.

The delegation members asked ETG representatives about any policy area where they have been able to actively pursue policy advocacy role through ETG. They mentioned that ETG played a very important role in providing inputs in drafting EU-ETS guidelines and in framing the MRV rules. While explaining their strategy on how they are able to effectively provide input into policy development, ETG representatives explained that they support open discussion with Government and respect any confidentiality of information

**Figure 2: Delegates and ETG representatives**

provided to the ETG by Government. ETG is positioned as a non-lobbying organisation to present consensus views to Government wherever possible and where this is not the case, they try to identify possible pros and cons of different approaches and present it to government. ETG also provides timely input to Government through papers agreed and signed off at Working Group level. The delegation members felt that ETG had a very effective strategy for policy influencing, which could be adopted by KEP.

Mr. Carven mentioned that they would be interested in sustaining the engagement with KEP and partner to exchange their learning's to support the mandate of energy efficiency and GHG mitigation.

### (ii) Participation in Texfusion

'Texfusion' was a 2 day event that was organised from 18th April to the 19th April 2016 in the Lindley hall, London. The delegate members attended the Texfusion on 19th April.

The trade show had participation from high-quality international companies and textile suppliers and provided the delegation members an opportunity to interact with them and explore the range of fabrics and products offered by them. The wide selection of products at display included lycra, wool, viscose, denim, women/men dress fabrics, where delegation members could interact and review their competence and experience in both design and production capability.

**Figure 3: Delegates at Texfusion**

The participants of the trade fair also included members of the British Textile Machinery Association, who explained the delegate members on how they help their member companies improve their export performance and provide latest information on market opportunities to them. They are open to partnership with KEP and collaborate on similar actions for Indian companies.

The Organisers of Texfusion invited Indian delegate members to join the exhibition in their next trade show.

### (iii) Meeting with Mineral Product Association

Mineral Product Association (MPA) is cement manufacturers association in UK, similar to Cement Manufacturers Association (CMA) in India. But unlike CMA, they also represent concrete and aggregate industry. The delegate members met the following representatives of MPA:

- Dr Richard Leese- Director, Energy and Climate Change, Mineral Product Association
- Mr Iain Walpole - Senior Environment Manager – Hanson UK , Heidelberg Group

Dr. Leese made a presentation before the delegation, where he provided an introduction to MPA, discussed fuel use, energy efficiency, resource efficiency and the Circular Economy strategy followed by their members. They also discussed various policy measures like UK Cement Industry de-carbonisation, EU ETS Current Scheme, Carbon Leakage, Policy Costs and EU ETS Phase IV.


**Figure 4: Delegates during meeting with MPA**

Providing a background, Dr Leese mentioned that MPA was formed in 2009 after the merger of the British Cement Association, Quarry Products Association and the Concrete Centreis. With the recent addition of The British Precast Concrete Federation (BPCF), the membership has now grown to 405 companies and is the sectoral voice for mineral products. MPA membership is made up of the vast majority of independent SME companies throughout the UK, as well as the 9 major international and global companies. It covers 100% of GB cement production, 90% of aggregates production and 95% of asphalt and ready-mixed concrete production and 70% of precast concrete production. Each year, the industry supplies in excess of £5 billion of materials to the £110 billion

construction and other sectors. Industry production represents the largest materials flow in the UK economy and is also one of the largest manufacturing sectors.

Explaining their fuel use and energy/ resource efficiency strategy, MPA explained, that they are actively pursuing the circular economy strategy. The use of alternative waste derived fuels in cement manufacturing has increased from 6% in 1998 to almost 44% in 2014. A major share of this alternative fuel comes from Residue Derived Fuel (RDF) from MSW and used tyre. Besides Alternative waste fuel, cement industry is also promoting the use of biomass. In 2014, nearly 20% of fuel use was biomass or part biomass in UK cement. The key driver to promoting the use of RDF in Cement industry has been the policy push under which Municipal landfill tax has been levied on MSW, which makes cement co-processing a cheaper/better alternative. The cement industry has to pay for Tyre chips but they are still economical as compared to coal. Another important driver for promoting use of Alternative fuel (AF) is the simplified process for obtaining permit for use of AF, which takes about 2 to 3 months' time. The cement industry is only required to carry out emission trials for only new Hazardous waste streams, which cost about GBP 100,000 and time taken for permit process is about 6 months. Regulatory barrier is a major concern that has been impeding the use of AF in Indian cement industry and the delegation members felt that there is a lot of scope for sharing some of these processes an approaches with Indian counterparts through KEP.

MPA mentioned that UK produces about 10 MTY cement with about 80 % as OPC and 20 % PLC and follow EN 197-1 standards. Lafarge –Holcim, Cemex, Hiedelberg and CRH are some of the prominent cement manufacturers in UK. MPA mentioned that their members are very aggressively pursuing CO2 reduction targets. According to their emission Cap and Trade scheme, they get free allowance for CO2 emissions at the beginning of year and have to surrender one allowance for one ton of CO2 emitted. If there is a shortfall they have to buy emission allowance. Surplus can be sold in market. The emissions allowance are based on clinker production and the present baseline is 766kgCO2/t of clinker produced which is average of top 10 % production in 2007-08. The allowance for emissions is gradually being reduced to encourage shift to low carbon technologies. The Cement Industry in UK is looking forward to do more work on CCS and CCU to mitigate its carbon footprint as the allowance for CO2 emissions is likely to be reduced every year.

All these issues are extremely relevant for the Indian cement industry. The AFR issue, for example, could serve as a good model for India which is trying very hard to increase their thermal substitution rate, which is less than even 1%.

### (iv) Meeting with Mechatherm International Limited

Mechatherm International Limited, based in the West Midlands, England have been designing and supplying energy efficiency equipments since its formation in 1973. They are already supplying technology solutions to Indian Aluminium industry through an Indian Licensee, Associated Industrial Furnaces Ltd (www.associated-furnaces.com). The delegation members met Mr. Andrew Riley, Chairman, Mechatherm International Limited

Mr. Riley explained the technology options offered by Mechatherm Ltd in the area of cast house technology, recycling & secondary scrap processing, heat treatment & reheat technology and furnace control & automation

**Figure 5: Delegates during meeting with Andrew Riley**

Under cast house technology, Mechatherm specialises in all types of holding & casting furnaces, degassing & filtration, launder systems, vertical direct chill casting machines, water cooling plants and general melting furnace design features. They also provide air recirculation heat treatment and re-heating furnaces for flat, rolled, forged, extruded and cast products for the Aluminium industry.

Mechatherm have experience in customizing the furnace designs to suit specific locations, local standards, regulations and internal standards. It utilizes many different local contractors for the fabrication, component supply and labour usually locally to where the equipment has to be installed and in this regard they already have tie up with Associated Industrial Furnaces Ltd. to cater to the Indian market.

In the area of heat treatment and re-heating technology, Mechatherm designs integrate many features and practical solutions to give a very operator friendly and easily maintainable operation. Their equipment is very robustly engineered to meet the arduous and aggressive conditions in foundries. Their designs are generated and verified by the use of 3D modelling software with Finite Element Analysis.

In his presentation, Mr. Riley however clarified that in many of their Indian installations so far, their technology offerings are not customised to deliver maximum energy saving potential as they have to cut down on many of the technology features to minimise cost as per the demand of their client. The Indian delegation members were aware of some of these installations of Mechatherm in Aluminium Industry and its performance and assured Mr. Riley that if the viable case for investment is made with all the benefits and cost savings in the long run, the Indian Industry would be interested in fully optimized technological solutions.

### (v) Meeting with GSH

GSH is a leading ESCO and provider of facilities services. The company has a strong reputation and diverse capability and experience to deliver facilities services to large, multi-faceted portfolios located across the globe. The delegation members met the following representatives of GSH:

- Mr. Jacob Pannell, Group Global Development, GSH
- Mr. Robert Greenfield, Safety, Health, Environment and Quality Director, GSH

Mr. Pannell and Mr. Greenfield provided an overview of their experience, along with their best practices in the area of energy management, energy efficiency and GSH Dashboard technology.

**Figure 6: Delegates during meeting with representatives of GSH**

GSH support their partners in implementing Energy Management Systems Approach by analyzing consumption data, conducting audits, implementing asset management checks, real time BMS, cloud based consumption monitors and energy efficient monitors and so on. GSH explained their capabilities and range of services offered by them with the example of UK textile mill engineering. They explained about measures like sub-metering in all departments, heat recovery from drying process, use of low temperature colour fix chemicals, use of infrared drying process for heat recovery and use of efficient plant, pumps and motors.

GSH also explained about their capability in on site power generation, which is of relevance to almost all PAT sectors. The delegation members also enquired whether they had capability in Fuel Cell based power generation for industry about which GSH mentioned that they would provide separate literature to concerned members.

Mr. Pannell mentioned that in 2012, GSH expanded into India with a registered office in New Delhi, and Indian headquarters in Chennai. GSH Group in India began by delivering services to the manufacturing industry, with JK Tyre being one of their major partners.

Providing an overview of their experience in India they presented the case study of steam supply for an Indian partner through an ESCO model for which they have a seven year contract in place. They have put in place robust efficiency and maintenance mechanism to drive efficiency and sustain it leading to 8 % direct saving in steam costs. This has helped the client in reduction of operating costs, availability of on-site technical, energy and environmental expertise, comply with regulatory provisions and innovate with carbon capture program.

The Indian Delegation members mentioned that although the ESCO model did not work quite efficiently in India in the past, but in the recent time many of the earlier bottlenecks and barriers have been addressed and there is scope for services of entities like GSH. The delegation members however requested GSH to provide more information on their capacity (size of the project that can be managed by them in different sectors) and experience in the manufacturing sector. GSH mentioned that they would coordinate the required information from the concerned members in their organization and provide it to the concerned delegation members.

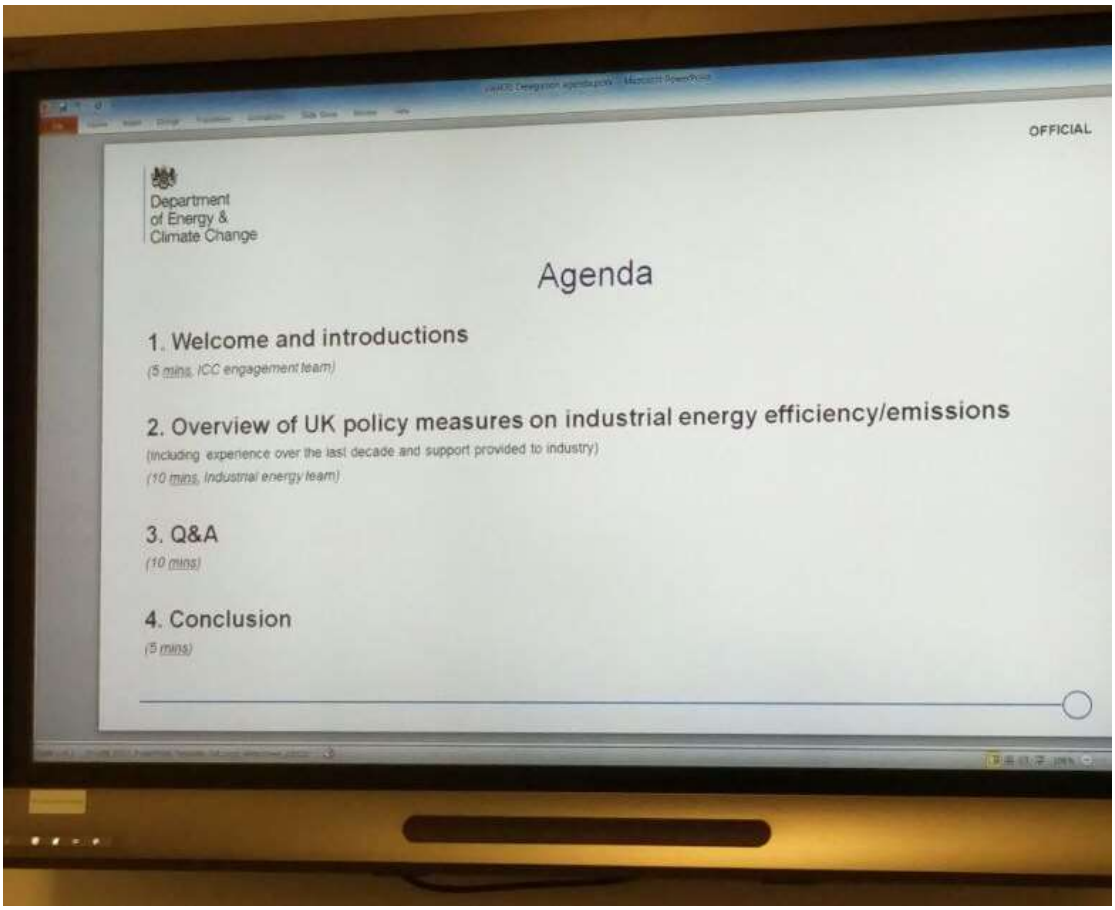

**Figure 7: Delegates with GSH Representatives**

### (vi) Meeting with Department for Energy and Climate Change (DECC)

The UK Department of Energy & Climate Change (DECC) works with the policy objective of promoting energy security (secure, clean, affordable energy supplies) and international action to mitigate climate change. The delegation members met the following DECC representatives.

- Ms. Harriet Dalrymple, Head of EU ETS, Aviation and Delivery, DECC
- Ms. Ritchie Conor, International Climate Change, DECC
- Ms. Lovejoy Afriqnmun, Clean Electricity, DECC
- Ms. Maria Suttle, Country Engagement Team, International Climate Change, DECC

The delegation members provided a brief about Knowledge Exchange Platform initiative and the Perform Achieve and Trade (PAT) scheme, and discussed how these initiatives compare to the regimes in the UK.




The meeting particularly discussed the EU ETS scheme, Climate Change Agreements and other policy initiatives in UK like the Carbon Plan and the 2013 Heat Strategy. Ms. Harriet explained how UK first initiated voluntary UK's GHG Emissions Trading Scheme (UK ETS) in April 2002, which later became part of the EU-ETS scheme. Drawing comparisons with the PAT initiative, Ms. Harriet explained that the EU ETS is a cap and trade scheme that aims to establish a price for carbon emissions. The EU ETS affects 11,000 energy-intensive industrial installations throughout Europe, such as power stations, refineries and large manufacturing plants. There are over 1000 participants, each with an individual cap on the carbon emissions they are able to emit. The defaulters which exceed their limit have to purchase additional allowances in the market to cover their emissions, whereas those that emits less than their cap can sell their surplus allowances into the market.

In the meeting it clearly emerged that there is a lot of scope for learning from existing UK policies in the area of energy efficiency and carbon mitigation and KEP could provide an effective media to facilitate such knowledge transfer.

## FIELD VISIT

The delegation members undertook field visit to selected industrial units and centers of excellence showcasing energy efficiency technologies and practices.

### (i) Siemens plc- The Crystal London

The Crystal London is one of the world's most sustainable buildings with platinum Leeds accreditation. The Crystal is a 100% electric building, around 20% of which is generated by the 1580 $m^2$ of solar photovoltaic panel, that cover two-thirds of the roof. Energy use in the Crystal is monitored so extensively that every kilowatt of electricity used can be measured. CO2 emissions for the Siemens offices in the Crystal are around 70% lower than incomparable office buildings in the UK.

The delegation members visited the Siemens- The Crystal London and met the following Siemens officials, who briefed the team about the features of the building and organized a visit to the building:

- Mr Joachim Kiauk, Manager System Solutions Buildings, Siemens
- Mr Peter Daw, Cities Project Developer, Urban development, Siemens

A short Video film was also shown on smart cities and sustainable development. The Crystal hosts the world's largest exhibition on the future of cities and is the first building in the world to reach both BREEAM® Outstanding and LEED® Platinum status. The Crystal also serves as an exhibition for sustainable smart cities and venue for green companies' events. The exhibits are interactive and designed as games to make it easier to understand.

The Crystal Building Energy Management System is produced by Siemens and controls all electrical and mechanical systems in the building. Information from an outdoor weather station supplements over 3,500 data points within the Crystal.

Ground source heat pumps supply virtually all of the building's heating and most of its cooling. The system works by pumping water through a pipe that loops deep into the ground. There are 199 pipes at the Crystal totaling 17km in length and reaching as deep as 150m.Two ground source heat pumps then create hot and chilled water and pump it to under floor pipes for heating or cooling. Cold water is passed through a ceiling mounted beam so when the rising hot air reaches the chilled beam, it cools and sinks, bringing chilled air to those below.

Energy is recovered by thermal wheels. Outgoing air passes over a heat-absorbing disc which then rotates into the incoming air stream, warming the fresh air. Around 60% of

outgoing heat or cooling energy is recovered. By using 100% natural heat sources, the Crystal receives no heating bill. The Crystal's self-shading facades use high performance solar glass which allows around 70% of visible light through each window but only about 30% of the solar energy. The glass has three layers and an Argon cavity. Almost every space in the building has access to natural daylight, meaning minimal artificial light is needed.

The lighting system in the Crystal uses a combination of 65% fluorescent lights and 35% LED lights along with an advanced control system produced by Siemens which automatically adjusts every individual lamp to provide comfortable brightness levels without wasting electricity. Daylight and presence detectors dim the electric lighting or turn it off when it is not needed.

The Crystal Building Energy Management System senses indoor and outdoor conditions and then controls the most suitable, energy efficient ventilation mode for each part of the building. At moderate temperatures, natural ventilation is used and the windows open automatically. At low or high temperatures the windows close and a mechanical ventilation system takes over. Natural ventilation can also be used during night time, reducing the cooling demand during the following day.

The delegation members found many features of the Crystal building useful and felt that many of them could be adopted for energy and water conservation in office spaces and industrial unit.

### (ii) Visit to Lafarge Cement Industry

Delegation member visited Lafarge Tarmac Cauldon unit, which was the first modern energy-efficient plant to be commissioned in Britain and Ireland. The Cauldon plant has a

capacity to manufacture up to one million tonnes of cement per annum and contributes over £11 million to the local economy per annum.

Cauldon Plant is considered to be Lafarge Tarmac's flagship Plant in the drive for increased use of Waste Derived Fuels as a substitute for fossil fuels in the cement making process. Couldon was the first cement plant in the UK to use tyres as an alternative fuel. In 2012, Cauldon replaced almost 58 per cent of fossil fuels with waste derived fuels such as tyre chips, Processed Sewage Pellets (PSP) and Solid Recovered Fuel (SRF). SRF for example, is a specially prepared blend of non-hazardous materials, which would normally be land-filled, used as a fuel for the cement making process. Currently Cauldon Plant replaces approximately 8,000 tonnes of coal with SRF per year. In the last 15 years, Cauldon has made significant progress on emission reductions from the Plant including; Dust down by 91%, CO2 down by 19% (Since 1990), NOX down by 32% and SO2 down by 61%.

As already mentioned, such examples of cement co-processing could be extremely relevant for the Indian cement industry in its effort to enhance use of alternate fuels and raw materials in cement manufacture.

**Annex-1**

# List of Delegates

**1. Mr. Harishkumar Hariprasad Chatterjee,**
Vice President (Manufacturing),
Raymond Limited, Textile Division,
P.O. Jekegram, Thane 400606, India

**2. Mr. Dayanidhi Behera,**
Senior Vice President,
Head Aluminium Operations,
Vedanta Limited
Village-Bhurkamunda, Jharsuguda-768202, Odisha

**3. Mr. Kapilavai Narayana Rao,**
Director (Energy & Environment),
ACC Limited, Thane Complex,
LBS Marg, Thane-400 604.

**4. Mr. Sanjay Jain**
Asst. Executive Director- Technical Services
Dalmia Bharat Ltd.
11th & 12th Floor, Hansalaya Building,
15 Barakhamba Road,
New Delhi-110001

**5. Mr. Kishan Kumar Chakarvarti,**
Expert Consultant,
Bureau of Energy Efficiency, West Block 2,
R.K. Puram Sector 1, New Delhi -110066

6. **Ms. Ritu Bharadwaj**
Senior Program Manager
Institute for Industrial Productivity
S-212 Panchsheel Park
Second Floor, New Delhi - 110017

**Annex-2**

# UK Study Tour

# PROGRAM

**19 April, 2016**

## 10:30 am – 12:30 am- Meeting with the Emissions Trading Group (ETG) (John Craven Head of ETG Secretariat) and other senior Industry members of ETG

ETG supports, represents and informs UK businesses and installations covered by the UK and EU Schemes, and the CRC Energy Efficiency Scheme. The business-led ETG offers a forum for discussion and resolution of all aspects of emissions trading and enables communication to take place between commerce and industry, and the UK Government. The Knowledge Exchange Platform has drawn a lot of learnings from ETG in designing its strategy and approach.

**Delegate member joining the meeting**

1. Mr. Harishkumar Hariprasad Chatterjee, Vice President (Manufacturing), Raymond Ltd.
2. Mr Dayanidhi Behera, Senior Vice President, Head Aluminium Operations Vedanta Ltd.
3. Mr. Kapilavai Narayana Rao, Director (Energy & Environment), ACC Limited
4. Mr. Sanjay Jain, Asst. Executive Director- Technical Services, Dalmia Bharat Ltd.
5. Mr. Kishan Kumar Chakarvarti, Expert Consultant, Bureau of Energy Efficiency
6. Ms. Ritu Bharadwaj, Senior Program Manager, Institute for Industrial Productivity

**Meeting Venue:**

Hotel Holiday Inn, Kensignton, London

**Contact Details:**

Mobile: +44 (0) 20 7484 5274

## 12:30 am – 5:00 pm- Visit to Texfusion

The show will present a carefully-selected group of high-quality international companies. The exhibitors are selected by Textile Events team, among the finest World fabrics and accessories manufacturers.

**Delegate member joining the meeting**

1. Mr. Harishkumar Hariprasad Chatterjee, Vice President (Manufacturing), Raymond Ltd.
2. Mr Dayanidhi Behera, Senior Vice President, Head Aluminium Operations Vedanta Ltd.
3. Mr. Kapilavai Narayana Rao, Director (Energy & Environment), ACC Limited
4. Mr. Sanjay Jain, Asst. Executive Director- Technical Services, Dalmia Bharat Ltd.
5. Mr. Kishan Kumar Chakarvarti, Expert Consultant, Bureau of Energy Efficiency
6. Ms. Ritu Bharadwaj, Senior Program Manager, Institute for Industrial Productivity

**Meeting Venue:**

The Lindley Hall, Elverton Street,
London, SW1P 2QW

**20 April, 2016**

## 09:30 am- 10:30 am- Meeting with Mineral Product Association

**Delegate member joining the meeting**

1. Mr. Kapilavai Narayana Rao, Director (Energy & Environment), ACC Limited
2. Mr. Sanjay Jain, Asst. Executive Director- Technical Services, Dalmia Bharat Ltd.

**Meeting Venue:**

Mineral Product Association
Gillingham House,
38-44 Gillingham Street, London SW1V 1HU

## 10: 00 – 11:30 am- Meeting with Andrew Riley, Chairman, Mechatherm International Ltd

Mechatherm provide solutions to alunimium industry on

- Casthouse technology
- Furnace control and automation
- Heat treatment and reheat technology
- Recycling and secondary scrap processing

They have an Indian Licensee, Associated Industrial Furnaces Ltd (www.associated-furnaces.com) and would briefly go through what they are and what they do.

**Delegate member joining the meeting**

1. Mr Dayanidhi Behera, Senior Vice President, Head Aluminium Operations Vedanta Ltd.
2. Mr. Kishan Kumar Chakarvarti, Expert Consultant, Bureau of Energy Efficiency
3. Mr. Harishkumar Hariprasad Chatterjee, Vice President (Manufacturing), Raymond Limited
4. Ms. Ritu Bharadwaj, Senior Program Manager, Institute for Industrial Productivity

**Meeting Venue:**

Hotel Holiday Inn, Kensignton, London

**Contact Details:**

Office: +44 (0) 1384 279132
Mobile: +44 (0) 7718 523688

## 11: 30 – 03:00 pm- Meeting with Clare Perry/ Robert and Jacob, Global Managed Services, GSH

GSH Group is an expert in facilities management services and specialist in mechanical services and energy management.

**Delegate member joining the meeting**

1. Mr. Harishkumar Hariprasad Chatterjee, Vice President (Manufacturing), Raymond Ltd.
2. Mr Dayanidhi Behera, Senior Vice President, Head Aluminium Operations Vedanta Ltd.
3. Mr. Kapilavai Narayana Rao, Director (Energy & Environment), ACC Limited
4. Mr. Sanjay Jain, Asst. Executive Director- Technical Services, Dalmia Bharat Ltd.
5. Mr. Kishan Kumar Chakarvarti, Expert Consultant, Bureau of Energy Efficiency
6. Ms. Ritu Bharadwaj, Senior Program Manager, Institute for Industrial Productivity

**Meeting Venue:**
GSH Office. They will pick us up from the Hotel and drop at DECC after the meeting

**Contact Details:**
Mobile: +44 *07803469709*

**03: 30 – 05:00 pm- Meeting with UK Department for Energy and Climate Change (DECC)**

**Delegate member joining the meeting**

1. Mr. Harishkumar Hariprasad Chatterjee, Vice President (Manufacturing), Raymond Ltd.
2. Mr Dayanidhi Behera, Senior Vice President, Head Aluminium Operations Vedanta Ltd.
3. Mr. Kapilavai Narayana Rao, Director (Energy & Environment), ACC Limited
4. Mr. Sanjay Jain, Asst. Executive Director- Technical Services, Dalmia Bharat Ltd.
5. Mr. Kishan Kumar Chakarvarti, Expert Consultant, Bureau of Energy Efficiency
6. Ms. Ritu Bharadwaj, Senior Program Manager, Institute for Industrial Productivity

**Meeting Venue:**
Department of Energy and Climate Change,
3 Whitehall Place,
London SW1A 2AW, UK

**Contact Details:**
Tbc by BHC

**21 April, 2016**

**9:00 am – 05:00 pm- Field Visit to**
**(i) Cement Plant- Lafarge Tarmac, Cauldon cement Plant– Showcasing use of waste derived fuel**

**(ii) Siemens plc- The Crystal London, which is one of the world's most sustainable buildings with platinum Leeds accreditation.**

**Delegate member joining the field Visit**

1. Mr. Harishkumar Hariprasad Chatterjee, Vice President (Manufacturing), Raymond Ltd.
2. Mr Dayanidhi Behera, Senior Vice President, Head Aluminium Operations Vedanta Ltd.
3. Mr. Kapilavai Narayana Rao, Director (Energy & Environment), ACC Limited
4. Mr. Sanjay Jain, Asst. Executive Director- Technical Services, Dalmia Bharat Ltd.
5. Mr. Kishan Kumar Chakarvarti, Expert Consultant, Bureau of Energy Efficiency
6. Ms. Ritu Bharadwaj, Senior Program Manager, Institute for Industrial Productivity