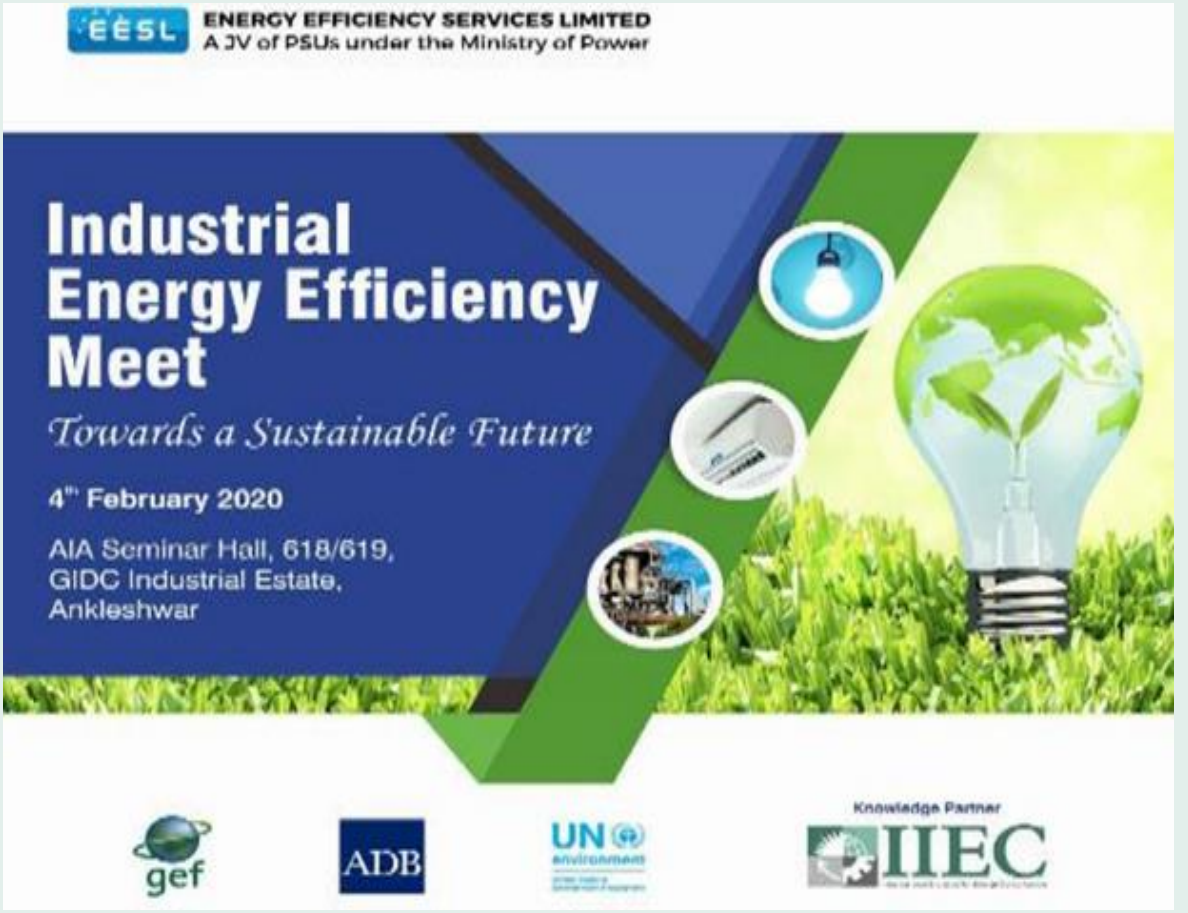


# Industrial Energy Efficiency Meet - Towards a Sustainable Future in Ankleshwar, Gujarat

## Workshop Report

Prepared for

## Energy Efficiency Services Limited (EESL)

*By*

**International Institute for Energy Conservation (IIEC)**
D-1, First Floor, Shopping Centre, D-Block, Paschimi Marg, Vasant Vihar,
New Delhi – 110057 INDIA

**March 2020**

# Contents

1 EXECUTIVE SUMMARY ..... 1

2 PURPOSE OF THE ROUNDTABLE ..... 2

3 PROCEEDINGS OF ROUNDTABLE & EESL SERVICES ..... 3

4 KEY TAKEAWAYS & HIGHLIGHT OF THE ROUNDTABLE ..... 6

5 ANNEXURE ..... 1

# 1 EXECUTIVE SUMMARY

An **"Industrial Energy Efficiency Meet – Towards a Sustainable Future"** program was held in Ankleshwar, Gujarat on 4th February 2020 for the senior management i.e. CEO/CFO's and Engineers of industries and hotels with an intent to share and discuss the success stories & innovative EE mechanisms and provide support in overcoming the technical and financial barriers in the implementation of energy efficiency. Energy Efficiency Services Limited (EESL) along with their knowledge partner International Institute for Energy Conservation (IIEC) conducted this round table.

The roundtable was attended by approximately 40 participants from various industries such as Surya Life Sciences, Deccan Fine Chemicals, Sanofi, Ion Exchange, DyStar, Detox, etc. The outcomes of the roundtable discussions have been listed below:

- The participants were encouraged to improve the EE of their establishments to mainstream the EE across industrial and commercial processes.
- Awareness was created about the different programs and schemes that EESL can offer for implementation.
- The participants got an opportunity to establish the contact with EESL and get support in the design and implementation of customized EE programs. Some of these contacts are expected to lead towards partnerships with EESL.
- The roundtable program also provided the opportunity for peer to peer discussions and an open environment to share knowledge, learnings, and challenges and to advocate change.

EESL has designed an innovative business model that is scalable, flexible, embraces different and emerging technologies, is independent of public funding, and incentivises all stakeholders. Capable of delivering outcomes in a time-bound manner to enable more, it has the power to unlock demand in sectors where none existed. EESL can therefore drive large-scale initiatives to create markets for disruptive solutions. Thus, a need was felt for EESL services to reach remote areas/districts such as Ankleshwar where the knowledge of such programs is limited but the scope for implementation is large.

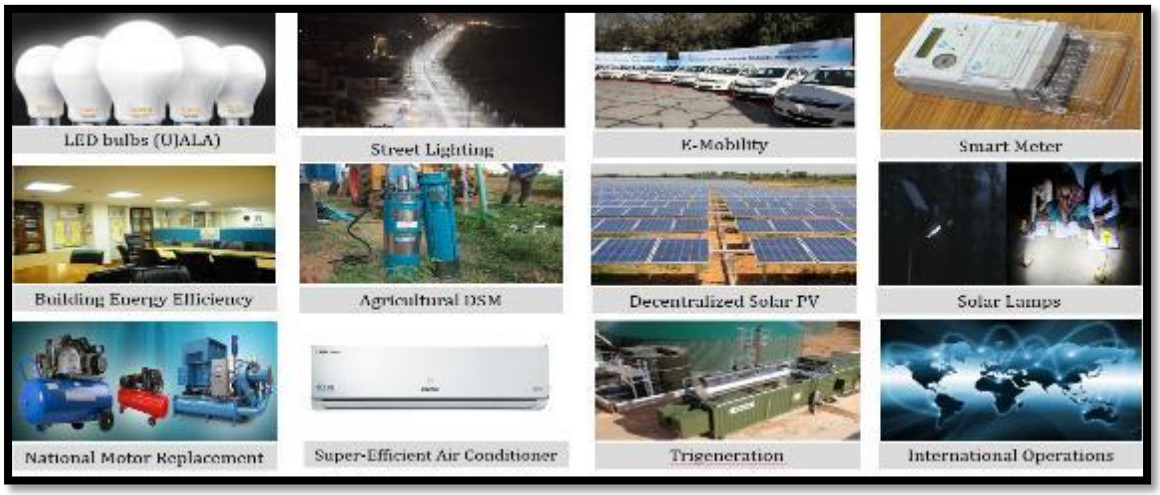


***Figure 1: EESL Programmes and Initiatives***

# 2 PURPOSE OF THE ROUNDTABLE

## About Ankleshwar

Ankleshwar, (sometimes written Anklesvar) is a city and a municipality in the Bharuch district of the state of Gujarat, India. The city is located fourteen kilometres from Bharuch.

The town is known for its industrial township called GIDC (Gujarat Industrial Development Corporation). Ankleshwar has over 1500 chemical plants, producing products such as pesticides, pharmaceuticals, chemicals and paints. Around 27% of basic chemicals and 28% of petrochemicals produced in India come from the industrial town of Ankleshwar. The MSMEs of Ankleshwar use a variety of basic chemicals as raw materials to manufacture their end products, with the majority sourced locally. The process equipment used in typical units includes steam boilers, thermic fluid heaters, reaction vessels, hot air generators, centrifuges, air compressors, circulation pumps, dryers, and electric motors. Energy use therefore accounts for a sizeable portion of the manufacturing costs in the cluster (5-15%). These Micro, Small and Medium Sized enterprises (MSMEs) can reduce their energy consumption by investing in Energy Efficient technologies, equipment's or process improvement which increases energy efficiency of their facilities. The various programs offered by EESL will be advantageous to the industries and will help make their processes cleaner and energy efficient. [1]

Some of the best opportunities for greater energy efficiency in the cluster include:

- Fuel switchover in steam generator and thermic fluid heater
- Replacement of inefficient boiler with energy efficient boiler
- Optimisation of combustion to reduce the flue gas losses
- Installation of energy efficient burner
- Replacement of inefficient air compressor with energy efficient compressor
- Installation of VFD to cater to variable process load requirements
- Replacement of low energy efficiency motor with IE3 category motor
- Replacement of air conditioners with super-efficient air conditioners
- Changeover from open pan evaporator to spray dryer
- Changeover from single stage evaporator to multi-stage evaporation system

With enormous opportunities, it was decided to organize a roundtable to bring EESL services in remote districts where the clients are unaware of such services and the need is plenty. Listed below were the expected outcomes envisaged from the roundtable.

- Encourage the participants to improve EE of their establishments, to mainstream the EE across industrial and commercial processes.
- Create awareness about the different programs and schemes that EESL offers for implementation.
- Provide opportunity to the participants for establishing a partnership with EESL and get the support in design and implementation of customized EE programs.
- Bring together senior management from EESL, Industries and Hotels to provide them with a platform for peer to peer knowledge, exchange

Ankleshwar Industrial Association (AiA) is the largest organisation in Gujarat Industrial Development Corporation (GiDC) where over 2000 industries are registered. Thus, with help of AiA the roundtable was organised and information about EESL's programs was disseminated.

[1] Carbon Trust

# 3 PROCEEDINGS OF ROUNDTABLE & EESL SERVICES

Dr. Anant Shukla (Additional General Manager (Technical), EESL) and Mr, Manoj Kumar M (Project Manager, EESL) made presentations about the products/services offered by EESL and allowed the representatives of Industry Association in Ankleshwar to share their views and requirements about achieving improved energy performances in the industries, hotels and other business establishments in Ankleshwar. Mr. Sanjay Dube, CEO, IIEC also shared his experience and views about the overall benefits of energy efficiency programs.

A list of participants including their contact information and their respective organizations is enclosed in the Annexure.

The roundtable started with the detailed introduction about EESL, its history, growth and the success stories. Mr. Anant Shukla, Additional General Manager (Technical), EESL elaborated about EESL services. He presented about how EESL was founded in 2009 by the Government of India and how it has reduced India's carbon footprint, peak energy demand, and electricity bills through energy efficiency intervention projects worth Rs. 43 billion in domestic lighting. EESL's flagship initiative, Unnat Jyoti by Affordable LEDs for All (UJALA), has revolutionized India's access to energy efficient LED bulbs and reduced carbon emissions by up to 32 million tonnes every year. The success stories delivered by EESL through the implementation of energy efficiency programs in India namely Unnat Jeevan by Affordable LEDs and Appliances for all (UJALA), Street Light National Program, Super-efficient AC Program, National Motor replacement Program (NMRP), etc. were also shared during the presentation.

During the inaugural session, Mr. Manoj Kumar explained about EESLs work for the enabling smooth implementation of their programs. He explained that EESL work on two specific models which are innovative, scalable, flexible, embraces different and emerging technologies, is independent of public funding, and incentivises all stakeholders:

The details of the models as shared with participants is as follows:

**1. Energy Service Company (ESCO) Model**

Under this model, EESL undertake the entire upfront investment for the project, instead of relying on consumers or clients. The investment is recovered through periodic instalments which result from deemed energy savings over a mutually agreed-upon project period. Operation and maintenance of new equipment is liability of EESL during the contract period. This can enforce effective product warranties to ensure minimal downtime due to equipment malfunctions.

**2. Project Management Consultant (PMC) Model**

Under this model, EESL plays the role of Project Management Consultant (PMC) for project implementation. The upfront investment for the project in this model is borne by the client. For a one-time payment cost of services for energy efficiency projects, the client benefits from a lifetime of energy savings, translating to monetary savings.

## Step by Step Proceedings of the Roundtable

Mr. Manoj Kumar M, Project Manager, EESL welcomed all the participants. During his welcome address, Mr. Manoj Kumar provided an overview about the energy consumption opportunities in the industries and hotels in his welcome address.

Further, Mr. Anant Shukla, Additional General Manager (Technical), Energy Efficiency Services Limited shared his technical presentation about EESL services. He explained in detail about the Super-Efficient Air Conditioner Programme of EESL.


***Below are some of the key excerpts from his presentation.*** For further details, please refer to the attached detailed presentation.

**Topic**: Super-Efficient Air Conditioner Programme

**Speaker**: Dr. Anant Shukla

Air conditioners are anticipated to consume 45% of Indian households' power demand by 2050, which will increase expenditure for consumers and contribute to global warming. With the goal of integrating energy efficiency into India's cooling sector, Energy Efficiency Services Limited (EESL) has initiated a first of its kind, Super-Efficient AC programme.

Under this programme, Consumers will be able to buy the superior, Super-Efficient Air Conditioners distributed of EESL at prices that are comparable to the most energy efficient ACs in the market. These Super-Efficient ACs will provide 1.5-TR cooling capacity at high ambient temperature; in contrast, ACs currently available in the market degrade their cooling capacity as outdoor temperature increases. The superior ACs consumes about 750 kWh/annum; whereas conventional AC consumes 1160 kWh/annum. As a result, the new AC line-up will enable consumers to save up to 40% in cooling energy costs. Further, the new ACs will use 100% copper coil and additional anti-rust coating, enhancing product longevity.

Mr. Manoj Kumar M, Project Manager EESL further shared the details of Motor replacement program, He elaborated about the potential of energy saving through replacement of motors with efficient IE3 and IE2 motors

***Below are some of the key excerpts from his presentation.***
(Workshop presentations are enclosed for reference).

**Topic**: National Motor Replacement Program
**Speaker**: Mr. Manoj Kumar M

The primary objective of National Motor Replacement Programme (NMRP) is to enable easier and faster adoption of premium efficiency IE3 motors by the industry. Through the demand aggregation, EESL is achieving an attractive price and providing a quality product for the industry through bulk procurement process. The benefits of cost reduction & extended warranty achieved through bulk procurement are passed on to the end use industries, hence making IE3 motors affordable.

The program flow activities are mentioned in the below figure.


**Energy Saving through Pilot Demonstration by EESL**

EESL undertook pilot studies of 36 motors on pan India basis. By quantifying the energy saving and potential of implementation of 36 nos. of IE3 motors across different motor ratings chosen to be procured as a part of Phase-1.

**Type of Industries:** Brass, Textile and Automobile.
**Type of Load:** Compressors, pumps, fans and blowers.

**Result:** Power Savings were observed across all the pilot installations of IE3 motors, which varied across different installations due to difference in operating parameters. Various benefits are derived after retrofitting IE3 motors which are (4.9 to 39.7%) kWh saving, (0.6 to 2.2%) increase in speed, (8.4 to 17%) less in bearing temperature, (3 to 5.6%) less vibration (Horizontal & Vertical).

Below is the figure showing the **Value Addition**

# 4 KEY TAKEAWAYS & HIGHLIGHT OF THE ROUNDTABLE

Mr. Rushi Shah, Member, Ankleshwar Industries Association (AiA) gave the closing remarks. He felt that in the competitive market the production cost has to be reduced and that is possible only when energy efficient production is in place and energy efficient equipment's are being used. He felt that industries will come forward for these programs. Mr Shah expressed that in Ankleshwar demonstration model works best to promote any energy efficiency intervention. He further suggested that AIA can help in identification of few industries as a model for implementation of energy efficiency programs. These model industries would further become driving force and other industries will follow the lead.


Mr Shah also urged the participants to further disseminate the information provided by EESL to the fellow member industries.

Industry association has promised to further disseminate to the 2000 registered members of Ankleshwar Industries Association (AiA). The further questions and queries will be shared with EESL in the coming months.

The participants resonated the importance of energy efficiency in industry. The information on programs of EESL was well received among the present industry participants. Few of the participants showed particular interest in motor replacement program with the rational that motors are most important component in industry and it provides significant opportunity for energy saving.

Specific question on size, life and efficiency of EESL motors were asked, Mr. Manoj Kumar shared the relevant information with individuals.

Participants also requested information on installation and after sales services of the products to which EESL responded that the products are procured through stringent tendering process and EESL negotiates with manufacturers for extended warranty. EESL also ensures facilitate the proper installation and commissioning of the products and perform thorough pre-dispatch inspection of each product to ensure quality of the products.

Participants also requested further information on super-efficient AC program. The specific question on cost of the products were asked, they pointed that normal 5-star ACs are available in the market at competitive cost. Mr. Manoj Kumar shared the insight on the technical details such as use of copper coils, anti-rusting quoting and other features which are often not present in the ACs available at this cost. He further explained that since super-efficient AC is more efficient than standard 5-star AC and thus will provide higher energy savings compared to most advanced 5-star AC available in retail market.

On the questions of installation and after sales service Mr Manoj Kumar shared that the online portal for procurement of super-efficient AC in now available nation-wide and everyone can use the facility. He also shared that the proper installation and commissioning of the ACs is ensured by EESL. He also shared that EESL announces additional discount offers on important festivals and encouraged participants to avail the online service.

Participants showed interest in further association with EESL at organizational level to implement the energy saving measures in their industries. The industrial association suggested to aggregate such interest and approach to EESL formally.

IIEC being present in Ankleshwar through other projects and program will continue to further pursue with the association to establish formal contract with EESL. In remote areas like Ankleshwar opportunities for EE implementation are rarely offered by organizations of such scale as EESL.

# 5 ANNEXURE

## Concept Note & Agenda

## Industrial Energy Efficiency Meet -Towards a Sustainable Future

**4th February 2020**

**AIA Seminar Hall, 618/619, GIDC Industrial Estate, Ankleshwar**

**Background**

India is the 7th largest country in the world and home to over 1 billion people living across five different climatic zones. According to Ministry of Statistics and Programme India is a rapidly growing economy with industry and construction sector contributing to around30% and 7.74% respectively to the total GDP of the country. These sectors also consume a large amount of energy over their life cycle, thus becoming one of the major sources of GHG emissions. The energy statistics of India 2019 reports that the Industrial and building sector in India contributes to 42% and 33% of the total energy consumption. Realizing the urbanization and need for industrial growth, and requirement of infrastructure facilities for commercial and residential purposes a significant growth in energy demand from these sectors is expected.

Over the years, Energy Efficiency Services Limited (EESL) has emerged as a vital entity for energy efficiency in India by delivering EE solutions. EESL has been a key implementing agency in the implementation of the national vision on energy efficiency. To support India's drive towards developing the market for energy efficiency, the EESL has developed various programs and mechanisms to scale up the investments in the sector. The success stories delivered by EESL through the implementation of energy efficiency programs in India namely Unnat Jeevan by Affordable LEDs and Appliances for all (UJALA), Street Light National Program, ongoing pilot demonstration on tri-generation, Super-efficient AC Program, National Motor replacement Program (NMRP), etc. still require wider replication by various sectors.

There is a need to establish a dialogue with industry & corporate leaders to understand their needs & requirements, challenges faced by the sector in improving the energy performance and to discuss the various offerings EESL has for the sector.

**The Roundtable**

EESL along with International Institute for Energy Conservation – India (IIEC-India) is conducting a roundtable with key industry and corporate leaders in Ankleshwar to share and discuss the innovative EE mechanisms and schemes along with the success stories to initiate the dialogue and provide support in overcoming the technical and financial barriers in the implementation of energy efficiency. The roundtable will also establish a mechanism to where industries and corporates can work with EESL for the design and implementation of EE programs in future.

**Expected Outcome**

- The participants will be encouraged to improve EE of their establishments to mainstream the EE across industrial and commercial processes.
- Awareness will be created about the different programs and schemes that EESL can offer for implementation.
- The participants will get an opportunity to establish a partnership with EESL and get the support in design and implementation of customized EE programs.
- The roundtable will bring together senior management from EESL and CEO/CFO's of industries and hotels to provide them with a platform for peer to peer discussions and an open environment to share knowledge, learnings and challenges and to advocate change.

**Agenda**

| Time | Session |
|---|---|
| **2:30 PM – 3:00 PM** | Registration |
| **3:00 PM – 3:30 PM** | Inaugural Session<br>*Welcome Address by* ***Mr. Manoj Kumar M, Project Manager, EESL***<br>*Importance of Energy Efficiency in Institutions, Industries etc. by* ***Mr. Sanjay Dube, CEO, IIEC***<br>*Keynote Address by* ***Dr. Anant Shukla, Additional General Manager (Technical), EESL*** |
| **3:30 PM – 4:00 PM** | Introduction to Programs by EESL: Integrated Energy Service model, Super Energy Efficient AC Program, LED Retrofits, Energy Efficient Motors, Trigeneration, etc.<br>*by* ***Dr. Anant Shukla, Additional General Manager (Technical), EESL*** |
| **4:00 PM – 5:00 PM** | Open Discussion<br>***Moderated by: Dr. Anant Shukla & Mr. Sanjay Dube***<br>• *Challenges in implementing Energy Efficiency projects*<br>• *Data monitoring and Verification Requirements*<br>• *Innovative Financial Mechanisms*<br>• *Enablers for a favourable ecosystem in implementing Energy efficiency projects*<br>• *Advantages of collaborating with EESL and Unique proposition of EESL*<br>• *Future Work for Action to Improve EE* |
| **5:00 PM – 6:00 PM** | High Tea |

# List of Attendees
# Industrial Energy Efficiency Meet
## February 4 (Tuesday), 2020 (Ankleshwar)

| S. No. | Name | Designation and Organization | Email | Contact Number |
|---|---|---|---|---|
| **1** | Keyur Desai | Head – Engineering<br>Sanofi India Ltd. | keyur.desai@sanofi.com | 9898019286 |
| **2** | Anil Joshi | Executive Director<br>Surya Life Sciences Ltd. | aniljoshi@suryalifesciences.com | 9987008440 |
| **3** | Nikunj J Patel | Envi. Engineer<br>ION Exchange (INDIA) Ltd. | nikunjpatel@ionexchange.co.in | 9909921322 |
| **4** | Ashish Chauhan | Head – Utilities<br>Sanofi India Ltd. | ashish.chauhan@sanofi.com | 9898086774 |
| **5** | Mr Atul Patel | Sr. Technical Engineer<br>DyStar India Pvt Ltd | patel.atul@dystar.com | 9913400395 |
| **6** | Shashikant Baviskar | Assistant Analyst<br>Development Environergy Services Ltd. | shashiant.bbaviskar@veolia.com | 8390472526 |
| **7** | Mahesh Borase | Executive (Engg.)<br>Surya Life Sciences Ltd. | mahesh@suryalifesciences.com | 9408708126 |
| **8** | Pragnesh Upadhyay | Manager-Electrical<br>Deccan Fine Chemicals (India) Pvt Ltd | pragnesh.upadhyay@deccanchemicals.com | 9825754411 |
| **9** | Hemant Prajapati | Utility | hemant.prajapti@deccanchemicals.com | 8469648949 |

| | | | | |
|---|---|---|---|---|
| | | Deccan Fine Chemicals (India) Pvt Ltd | | |
| **10** | A A Dolti | CEO<br>Ankleshwar Waste Management Limited | awml@aiaindia.org | 9879964841 |
| **11** | Pankaj Dahide | Maintenance Officer | pankajdahide73@gmail.com | 9765765495 |
| **12** | B. S. Parihar | Production Manager | barjenderparihar@suryalifesciences.com | 9428511141 |
| **13** | Jaynish Parihar | Electrician | - | 9687015845 |
| **14** | Rakesh Patel | Electrician | patelrakesh2345@yahoo.com | - |
| **15** | Pranav Modi | Dy. Manager<br>ION Exchange (INDIA) Ltd. | - | - |
| **16** | Nikhil Chauhan | Sr. Officer<br>ION Exchange (INDIA) Ltd. | Chauhannikhil58@gmail.com | 9624050361 |
| **17** | Karan Sadu | Engineer | karansadu@ suryalifesciences.com | 9479780362 |
| **18** | Bhasin Swati | Envi. Engg. | awml@aiaindia.org | 9979855020 |
| **19** | Rahul Kumar Rohit | Sr. Executive – Utility<br>Deccan Fine Chemicals (India) Pvt Ltd | rahul.rohit@deccanchemicals.com | 9924124275 |
| **20** | Sushil K. Tiwari | Executive – Environment | sushil.tiwari@vpi-ltd.com | 8400798884 |
| **21** | Anil K. Gohel | Ankleshwar Industrial Association | abgohel@hotmail.com | 9723880064 |
| **22** | Rawal Bhavesh | Ankleshwar Industrial Association | rawalbhavesh@yahoo.in | 9104909455 |
| **23** | Manoj Karmakar | Site Incharge, Detox India | manoj.karmakar@detoxindia.com | 9924440491 |
| **24** | Rushi Shah | DGM – EHS (Intas Pharma) | rushi_shah@intaspharma.com | 9099031865 |
| **25** | Patel Tejaskumar M. | Engineer<br>EESL | pateltejas995@gmail.com | 9106667621 |
| **26** | Yash A Joshi | Director | yash.joshi20@gmail.com | 9428511156 |
| **27** | S B Parmar | DEE GPCB, Ankl. | nro-gpcb-ankl@gujarat.gov.in | 9427312901 |
| **28** | Mayuri Prajapati | AWML | mayuri.prajapati46@gmail.com | 7698224060 |

| | | | | |
|---|---|---|---|---|
| **29** | Kaushikbhi S Patel | ICCIL | patelkaushikpatel@yahoo.in | 9824667751 |
| **30** | V R Ghadge | BEIL, Ankleshwar | vijay.ghadge@beil.co.in | 7574812399 |
| **31** | Sanmukh Ahir | Electrician | sanmukhahir@gmail.com | 9427337230 |
| **32** | Sumit Nai | EHS | sumitkumar.nai@zyduscadin.com | 9428685022 |
| **33** | Bhavesh Rami | EHS | bhavesh.rami@deccanchemicals.com | 9662504743 |
| **34** | Shreya Kundu | Executive – UPL Ltd. | shreyakundu@upl-ltd.com | 9558734767 |
| **35** | M. S. Pandey | Aahan Engg. P | Egen.aahan@gmail.com | 9979870422 |
| **36** | Jignesh Kayastha | Prime Consultants & Engg. | Prime.pce@hotmail.com | 9824477374 |
| **37** | Pankaj Bharadia | V & P Engineers | vpengg@hotmail.com | 9824110691 |
| **38** | Praful Bharadia | Unibic Engineers | prafulbharadia@gmail.com | 9824477374 |
| **39** | Amit Kumar Pandey | Asst. Manager<br>Lords Plaza, Ankleshwar | fnblpa@lordshotels.com | 9377778929 |

# Photographs of Industrial Energy Efficiency Meet


Industrial
Energy Efficiency
Meet
04.02.2020


Industrial
Energy Efficiency
Meet
04.02.2020



Below is the link with the pictures and PPT:

https://drive.google.com/open?id=15mK_nJKmFoST6Y35aGXhZJ4AHJjrLWt4