

ENERGY EFFICIENCY & CONSERVATION

-An effective tool to sustain bottom lines-





MITCON

- Joint venture of Financial Institutions (ICICI, IDBI, IFCI), State Development Corporations (MIDC, SICOM, MSSIDC) and Public Sector Commercial Banks (SBI, BoB, BoI etc.)
- Established in 1982 – 83 as deemed public limited company
- An ISO 9001 - 2000 dividend paying consultancy organisation
- Provides expert services at micro and macro level for specialized subjects, more on www.mitconindia.com



Indian Energy Scenario

- Energy intensity per unit of GDP of the Indian economy is very high compared to world & developed countries averages
- This indicates a very high level of energy wastage or energy saving potential
- The per capita energy consumption in India is too low as compared to developed countries (just 6% of USA & 29% of the world average)
- Energy consumption - 10 to 12 % growth, every year
- Demand in excess of supply



Indian Energy Scenario (Contd.)

- Continued dependence on depleting commercial sources (1,41,500 MW installed capacity, 65 % coal based)
- Peak demand shortages of 11 - 18%, in different states
- Energy availability shortages up to 11 %
- 25 - 35 % T & D loss in different States
- 30 - 35% power to agriculture at marginal rates or free
- 40 - 45% power is consumed in Industrial / Commercial / Domestic Sector and major revenue generates for utilities



Indian Energy Scenario (Contd.)

- Industrial sector accounts for half of the commercial energy use
- Wide variation in energy consumption co-efficient among different industrial units in the same industry using comparable technologies (30 – 150%)
- Energy efficient industrial units improving their specific energy consumption, year after year
- Vast section of industry to still improve their energy efficiency



Indian Energy Scenario (Contd.)

- Insignificant contribution from renewable sources of energy (about 6%)
- Severe shortage of funds
- Delayed initiation of the power sector reforms

- **The obvious focus calls for -**
 - Steps for energy efficiency improvement
 - Speedy tapping of the renewable sources of energy like solar, bio-mass, wind etc.
 - Power from co-generation, municipal and industrial solid / liquid wastes



Why Energy Efficiency?

- To meet the existing shortage and also future demand, 1,00,000 MW is proposed to be added till 2012 requiring investment of Rs. 8,00,000 Crores
- Capacity of less than 40,000 MW could be added during last 10 years. Also, India has neither financial nor natural resources to add this capacity nor it is environmentally sustainable
- India is also highly dependent on imported oil (current import more than 65%) to meet the energy demand, which raises question of energy security of the nation
- The solution lies in more efficient use of available resources by removing inefficiencies in generation, transmission, distribution and utilisation



Importance of EEC

- Energy efficiency and conservation measures can reduce peak and average demand
- One unit saved avoids 2.5 to 3 times of fresh capacity addition
- Investment in energy efficiency and conservation is highly cost effective
- Can be achieved with less than Rs. 1 cr./MW
- Also avoids investment in fuel, mining, transportation etc.



Energy Saving Potential

Sector	Saving Potential
Agriculture	Up to 30%
Industry	Up to 23%
Transportation	Up to 20%
Domestic & Commercial	Up to 20%



Energy Saving Potential (Contd.)

- Estimated total conservation potential of the Indian industry is around 23% of the total energy used by this sector
- Over 5% to 8% saving is possible simply by better housekeeping and another 10% to 15% with small investment towards low - cost retrofitting, use of energy-efficiency devices and controls, etc.
- Quantum of saving is much higher if high cost measures like major retrofitting, process modifications, etc. are considered



Barriers

- Investment on energy conservation is not perceived as Tax Planning Investment
- The control of energy consumption is entrusted as a part time job to maintenance engineer who has no control on energy consumption
- Importance given by many towards initial cost minimization disregarding the more efficient options (which generally are more expensive)
- Shortage of capital to fund energy conservation projects
- Shortage of skilled staff and lack of knowledge / information on technological options



Barriers (Contd.)

- No check on manufacture and marketing of cheaper inefficient product
- Absence of larger players in ESCO industry
- Poor credit or unfamiliar risk profile of clients resulting in reluctance of Financial Institution to fund them
- Lack of medium term loan and leasing facilities for energy saving products & devices.



Energy Conservation Act 2001

- In-force since October 2001. Provides a grace period of 2 - 5 years to comply with the requirements before penal action is initiated.
- Energy audit is mandatory for designated energy users and recommendations of the auditor would have to be implemented in time bound manner.
- The designated consumers are required to comply with prescribed energy consumption norms and incentives / disincentives would be made available in this regard.
- Bill also proposes laying down of energy consumption standards for equipments / appliances and will make energy labelling compulsory for notified equipments/ appliances.
- A Bureau of Energy Efficiency (BEE) is set up which facilitate Government in implementing provisions of the act.



Thrust Areas of BEE

- Indian Industry Program for Energy Conservation
- Demand Side Management
- Standards & Labeling Program
- Energy Efficiency in Buildings & Establishments
- Energy Conservation Building Codes
- Professional Certification & Accreditation
- Manuals & Codes
- Energy Efficiency Policy Research Program
- School Education
- Delivery Mechanisms for Energy Efficiency Services



Energy Audits

The type of energy audit to be performed depends on:

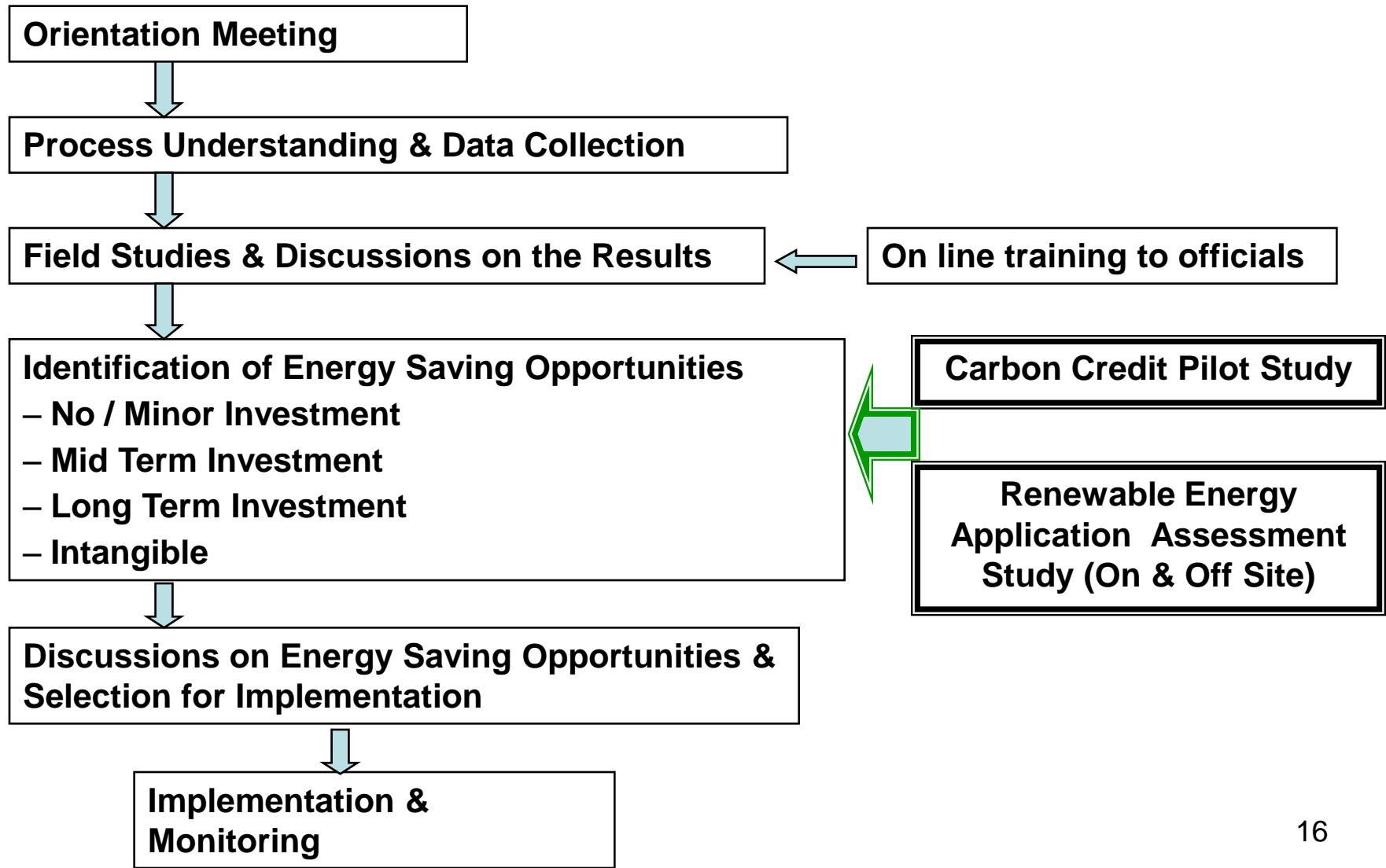
- The function and type of industry
- The depth to which final audit is needed
- The potential and magnitude of cost reduction desired

Types of energy audits

- Preliminary Energy Audit
- Detailed Energy Audit
- Plant Energy Audit
- Process Energy Audit

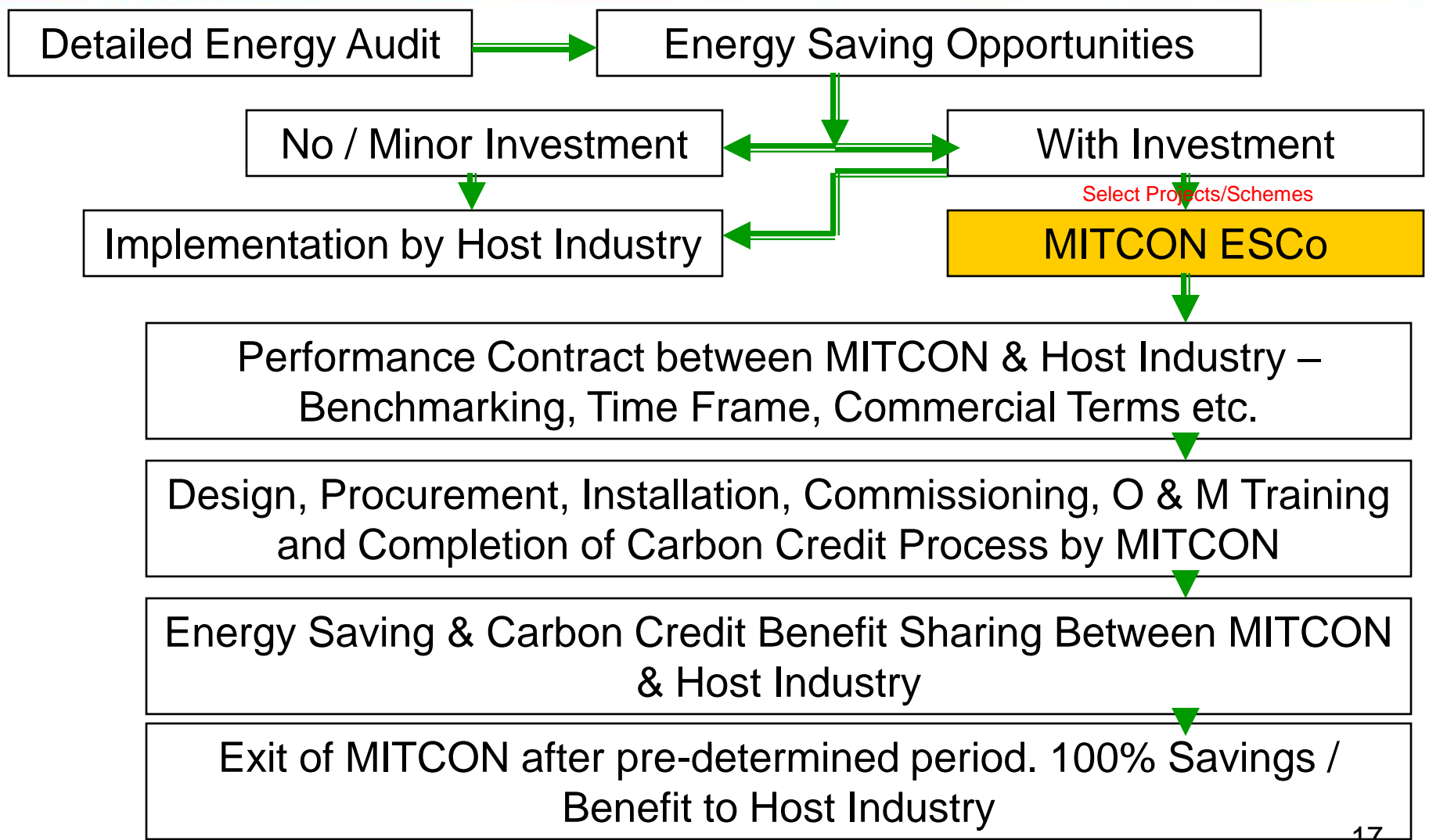


Methodology of An Energy Audit





MITCON's ESCo Services





Advantage of MITCON's ESCo Services

- Host Industry – Not to commit its own human & financial resources
- High probability of reduction in energy costs because the ESCo's remuneration is contingent upon savings being actually achieved and measured.
- Host Industry benefits from the latest energy efficiency expertise and technology
- ESCo can arrange financing, potential subsidies and benefits of carbon credits
- Most importantly, energy savings can begin to affect the Host industries profitability rather than remain as a project in some engineer's pending folder



Teaming with MITCON

- Experienced and dedicated team
- Leading energy auditor for industrial and commercial sector
- Proven track record of more than 400 energy audit & implementation assistance assignments at National & International levels
- Mobile energy audit van with new generation measuring instruments
- In-house detailed design & engineering lab
- Associates of IREDA & PCRA for lending soft term finance to industries for implementation of energy conservation projects
- Empanelled with State Nodal Agencies for leveraging subsidy to industries for conduct of energy audits provided by State Governments



Teaming with MITCON (Contd.)

- ✓ Instrumental in securing sales proceeds worth of INR 32 crs (in US \$ & Euro) towards carbon credit trade for project promoters
- ✓ 75 consulted projects received sales proceeds
- ✓ 08 projects registered with CDM EB within one go
- ✓ 07 projects registered with VCS within one go
- ✓ Memorandum of Understanding with major leaders like ICICI Bank Ltd., IDBI, SBI and HDFC Bank



Energy Savings – MITCON Experience

Sector	No. of Audits Conducted	Energy Saving Achieved
Textile	38	13 to 17 %
Chemical / Pharmaceuticals	60	12 to 18%
Foundry	35	15 to 22%
Engineering	22	9 to 13%
Plastics	05	12 to 14%
Hotels & Commercial Buildings	47	12 to 25%
Paper	08	11 to 18%
Pumping Stations	04	7 to 9%
Sugar/Distilleries	23	6 to 10%
Food	06	10 to 17 %
Rubber & Tire	05	11 to 18%
Plywood	02	9 to 16%
Explosives	02	9 to 13%
Refinery	01	12 to 14%
Steel	01	12 to 20%



Energy Audit Instruments

Sr. No.	Instrument Name	Nos.
1.	Demand Analyzer	2
2.	Clamp on Power Meter	2
3.	Photo Tachometer	2
4.	Lux Meter	2
5.	Thermo Anemometer	2
6.	Relative Humidity and Temperature Indicator	2
7.	Flue Gas Analyzer	2
8.	Infrared Thermometer	2
9.	Portable Temperature Indicator	2
10.	Steam & Air Leak Detector	1
11.	U-Tube Manometer	1



Energy Audit Instruments (Contd.)

Sr. No.	Instrument Name	Nos.
12.	Digital Manometer	1
13.	Lube Oil Viscosity Meter	1
14.	Diesel Oil Viscosity Meter	1
15.	Oil Test Kit	1
16.	Ultrasonic Flow Meter	2
17.	Water Analyzer	1
18.	Thermal Imager	1
19.	Global Positioning System	1
20.	Digital Earth Resistance Tester	1
21.	Stop Watch	1



Case Study

- **Sarla Fabric Pvt. Ltd. - A Profile**
- Location- Loni Road, Mohan Nagar, Ghaziabad, Uttar Pradesh, India.
- Year of Establishment - 1997
- Business Activity-Textile processing unit
- Main Process Areas- Merceriser, Sizing, Looms, Stenters, Curring,Pad steam, Sampling, Printing, Ager etc.
- Utility Plants -Boiler House, Hot Oil unit, R.O pant, CTs, Pumps, Air Compressors, Caustic recovery plant, D.G sets etc.
- Products - Gray cloth and printed cloth



Case Study

- **Energy Scene**
- Total Annual Energy Bill
 - Rs. 9.14 Crores (Apr. 06 to Mar. 07)
- Major Energy Sources
 - Grid Electricity - share 19%, FO – 1%, H.S.D – 14%,
Petcoke – 8% and Rice Husk– 58 %
- Major Connected Loads
 - Humidification plant, Stenters, Loop agers, PAD steam,
Printing, cooling tower fans, Pumps, Lighting, Air
Compressors, chillers, etc.



Case Study

Key Result Areas for Energy Savings & Estimated Potential along with Broad Cost Benefit

S. N O.	Energy Saving Area	Saving Potential in Rs.Lakh P.a.	Investment in Rs. Lakh	Payback period in Month	Action for Implementation
I. No or Short Term Investment Areas					
1.	Insulate bare steam lines & flanges	3.75	0.87	3	Implement Immediately
2.	Fuel saving by tuning air to fuel ratio in boiler	17.75	6.00	4	Implement Immediately
3.	Insulation of caustic recovery plants	4.20	1.50	5	Implement Immediately
	Sub total (I)	25.60	8.37	4	



Case Study

S. NO.	Energy Saving Area	Saving Potential in Rs.Lakh P.a.	Investment in Rs. Lakh		Payback period in month	Action for implementation
II. Mid Term Areas						
4.	Utilizing waste heat from intercooler		0.90	0.50	7	Review & Implement
5.	Saving Potential at water pumping system from main under ground tank		0.90	0.60	8	Review & Implement
6.	Saving potential at hot oil unit FD&IFan by installing VFD		4.20	4.00	12	Review & Implement
7	Saving potential at steam boiler FD & ID fan by installing VFD		7.00	7.00	12	Review & Implement
Sub total (II)			13.00	12.10	9.2	-



Case Study

S. NO.	Energy Saving Area	Saving Potential in Rs. Lakh P.a.	Investment in Rs. Lakh	Payback period in month	Action for implementation
III Long Term Areas					
8.	Improvement or saving potential at humidification plant	2.60	6.00	28	Review & Implement
9	Fuel saving by tuning air to fuel ratio in hot oil unit	2.00	5.00	30	Review & Implement
10	Installing VFD for compressor no.2 & no.3 minimize power Consumption during unload Operation	1.00	3.00	36	Review & Implement
	Sub total (III)	5.60	14.00	31.3	-



Case Study

S. NO .	Energy Saving Area	Saving Potential in Rs.Lakh P.a.	Investment in Rs. Lakh	Payback period in month	Action for Implementation
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IV. Intangible Areas

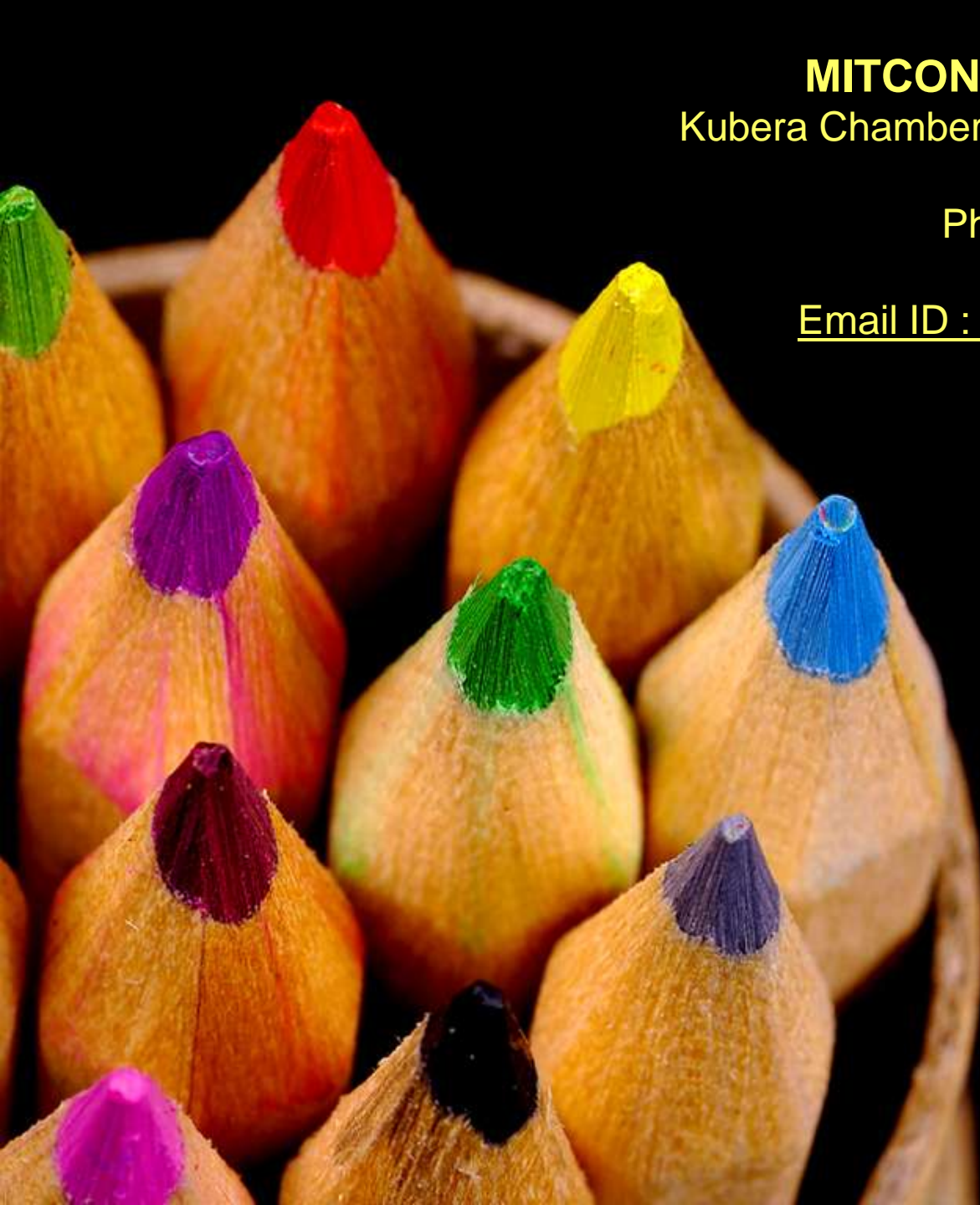
- 11. Replacing ID fan casing & arresting air infiltration
- 12. ECO ventilations for finishing department shed area
- 13. Additional condensate recovery from indirect steam consuming equipments

	Grand Total	44.20	34.47	14.80	
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Request

- In order to submit terms of reference for conduct of energy audit, please submit –
 1. Name & address
 2. Connected load list
 3. Avg. monthly electricity, fuel, gas & water consumption
 4. Total annual energy bill
- Allow us to be a part of your Energy Efficiency & Conservation Initiatives. We will not only identify the energy saving potential but will help you to realize it.



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Thank You