KERALA STATE ENERGY CONSERVATION AWARDS 2023

BEST PRACTICES

ENERGY MANAGEMENT CENTRE - KERALA

Department of Power, Government of Kerala

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ENERGY MANAGEMENTCENTRE- KERALA
Department of Power, Government of Kerala

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DIRECTOR'S MESSAGE

Dr. R. Harikumar
Director, EMC

Energy efficiency and conservation complement each other, aiming to curtail energy consumption. Efficiency focuses on technical performance, while conservation involves reducing overall energy use. In Kerala, rising energy demand has pushed us to expand production, but there are limits due to physical, geographical, and economic constraints.

The emissions from energy generation, notably fossil fuels like natural gas, lead to greenhouse gases, fostering climate-related risks. Addressing this crisis hinges significantly on boosting energy efficiency. Efficient measures have proven the most cost-effective in combating climate change, curbing waste, saving money, and promoting renewable energy resources.

Our state actively strives for energy efficiency and sustainability. The Energy Management Centre Kerala plays a crucial role in this endeavour. Congratulations to the Kerala State Energy Conservation Award 2023 winners! I applaud all participants for their innovative contributions toward energy efficiency and conservation, supporting our state's sustainable living goals.

INTRODUCTION

Emphasizing energy conservation is vital in addressing global warming and its effects. Despite the typical correlation between energy use and GDP, there has been a decrease in energy intensity concerning primary energy and GDP. Multiple factors impact this intensity, highlighting the significance of energy efficiency. However, the potential rebound effect could impede efficiency gains. While science acknowledges energy's economic importance, mainstream economic theories often overlook it. India's Energy Conservation Act of 2001 is geared towards regulating energy wastage and advocating energy-saving practices.

Kerala's outstanding strides in energy efficiency set a benchmark for India, showcased in the NITI Aayog's State Energy Efficiency Preparedness Index. This progress stems from well-monitored policies across sectors like construction, industries, municipalities, transportation, agriculture, and power distribution. These measures, alongside public awareness programs, have significantly influenced public behaviour. The Energy Management Centre remains devoted to implementing strategies that promote energy conservation and efficiency across various sectors in the state.

The following paragraphs highlight the major achievements of EMC during the financial year 2022-23

- Kerala is among the Front Runners States in the State Energy Efficiency Index published by the Bureau of Energy Efficiency, Ministry of Power, Government of India.
- Energy Conservation in the State saved 626 MU of electricity and 37503 Toe of fuel.
- Chaithanyam scheme for improving energy efficiency in the Health Sector: implementation of energy efficiency activities in 2 Government Hospitals namely Government Women and Children Hospital, Palakkad, and Regional Institute of Ophthalmology, Thiruvananthapuram.
- Implementation of energy efficiency improvement methods is in progress at Government Secretariat Annex 1, Taluk Headquarters Hospital, Parassala, Family Health Centre, Kakkodi, Kozhikode, and University Institute of Technology, Regional Centre, University of Kerala, Thiruvananthapuram.
- As part of Carbon Neutral Kattakkada, the energy audits of 81 public buildings in the Kattakada Assembly constituency are completed and the implementation of energy audit recommendations in 24 Health Centres in the Kattakada Assembly constituency is in progress.
- As part of the Model Energy Efficient School program, energy audit of 143 Government schools and implementation of energy audit recommendations in 22 Government schools.
- As part of the Urjayan scheme energy audit of 144 Government buildings and implementation of energy audit recommendations were carried out in 20 Government buildings.
- EMC has carried out a detailed energy audit of 80 Government buildings.
- Conducted energy audits of 14 water pumping stations of Kerala Water Authority in Idukki District.
- Replaced 3 Nos of the 'Petty and Para' system used at Kuttanad for dewatering purposes with Energy Efficient Turbine pumps of Capacities 30 HP & 20 HP. This replacement provides energy savings of more than 35% compared to the 'Petti & Para' System.
- A study of performance evaluation of agricultural pumps used in ISD farm, Eruthenpathy Palakkad District was conducted. In continuation of the study, 3 agricultural pump sets were replaced with energy-efficient pumps
- EMC has organized Over 500 awareness training programs, 45 technical workshops, 78 SEP awareness programs, 360 awareness programs, 140 rallies, road shows involving 180 technical educational institutes, 3 resource person trainings, and 33 General energy conservation awareness programs.

- EMC has organized 14 Retailer Training Programs on Standards and Labelling covering all Districts of Kerala.
- Organized three "Investment Bazaar for Energy Efficiency" programs at three locations: Thiruvananthapuram, Kochi, and Kozhikode.
- Organized 23 number of training programs on the Energy Conservation Building Code (ECBC) and Eco Niwas Samhitha (ENS) exclusively for officials of the Local Self Government.
- EMC has conducted 23 district-wise awareness programs on ECBC and ENS exclusively for the engineers and secretaries of local bodies who are the key stakeholders in implementing ECBC.
- EMC has conducted 35 awareness programs on ECBC for the public, engineers, architects, engineering college students/faculties, etc.
- The Smart Energy Program is one of the flagship projects of EMC, which was formed to spark an initiative for curbing energy wastage through active measures and also popularizing the importance of energy conservation and energy efficiency measures among students. As part of SEP, 81 programs had been conducted across the state at 39 Educational Districts. The state-level program was conducted at EMC on 24-01-2023.
- In association with the Confederation of Indian Industry (CII), Kochi has organized the conference cum exhibition, "Kerala Smart Mobility Summit" with the theme "Moving towards the Sustainable Future" on 19th & 20th October 2022 at Kochi.
- EMC conducted the State level of the BEE National Painting Competition 2022 at Bolgatty, Cochin. More than 150 students participated in the event on 17th November 2022.
- Supported to conduct of Mazha Nadatham at Kozhikode Thamarassery Churam targeting students to feel the nature, climate, and its change to have a productive discussion on Climate change. The program was conducted on 03-09-2022.
- Collaborated with M/s Deshabhimani Publications as part of the Smart Energy Program to conduct the Aksharamuttam Talent Show 2022.
- Demand Side Management awareness campaigns were successfully conducted during the summer season of 2022 in Association with M/s Metrovaartha to reduce the peak load demand.
- Calibrated 2169 nos of different types of energy meters/ net meters in NABL Accredited Energy Meter Calibration Laboratory of EMC.
- As part of the Clean Energy Technology Innovation and Business Incubation Centre (CEIBIC), the Clean Tech Challenge Cohort 1 was launched on 22nd June 2022. 100 applications were received and the ideas were evaluated by the committee formed from the member organizations of CEIBIC. The winners were declared at the Grand Award Ceremony organized by the Energy Management Centre.
- A 3-day National Workshop on 'Green Hydrogen Pathways to Sustainable Future' in connection with the arrival of the 'Energy Observer' was organized at Kochi from 15th to 17th November 2022.
- The first meeting of the Working Group for Green Hydrogen Hub was organized under the chairmanship of the Principal Secretary, Department of Power on 14th November 2022 in Kochi.
- In association with IIT Palakkad has organized a "Workshop on Hydrogen Valley" in hybrid mode on 15th February 2023 at Thiruvananthapuram.

KERALA STATE ENERGY CONSERVATION AWARD 2023

The following are the categories for the 2023 Awards

Category 1: Large-scale energy consumers

Including large-scale industries except for buildings – All consumers in the State with a total (electricity + fuel) annual energy consumption of more than 1000 TOE* (Ton of Oil Equivalent)) or 11.6 Million Units and Designated consumers notified by the central Government as per EC Act 2001.

Category 2: Medium-scale energy consumers

Including medium-scale industries except for buildings – All consumers in the State with a total (electricity + fuel) annual energy consumption between 150 to 1000 TOE * or 1.7 Million Units to 11.6 Million Units.

Category 3: Small-scale energy consumers

Including small-scale industries except for buildings – All consumers in the State with a total (electricity + fuel) annual energy consumption of up to 150 TOE* or Up to 1.7 Million Units.

Category 4: Buildings

All Commercial Buildings including hotels, hospitals, Shopping Malls, Office Buildings, Theatres, Educational Institutions, etc that have implemented energy conservation/efficiency/ e-mobility programs in their facilities and Institutions/Buildings which has designed and/ or developed such buildings/campuses including LEED/green Building, GRIHA rated or ECBC Compliant building or with proven/certified Energy Efficiency and conservation including Green/Eco-friendly considerations.

Category 5: Institutions & Organizations

Including Local Bodies, NGOs, and organizations involved in the implementation and promotion of energy conservation, energy efficiency, and clean energy projects/programs & e-mobility.

Category 6: Promoters of energy-efficient products

Including Manufacturers of energy-efficient retrofits/controls suitably proven and certified by competent /accredited labs/institutions in the State and Retailers and traders who are selling/ distributing BEE star labelled products notified by the Ministry of Power, Govt of India as listed below.

under mandatory scheme viz Room Air Conditioners, Frost Free Refrigerators, Tubular Fluorescent Lamp, Distribution Transformer, Room Air Conditioner (Cassettes, Floor Standing), Direct Cool Refrigerator, Color TV, Electric Geysers, Variable Capacity Inverter Air conditioners, and LED Lamps.

under voluntary scheme Induction Motors, Pump Sets, Ceiling Fans, LPG -Stoves, Washing Machine, Computer (Notebooks/Laptops), Ballast (Electronic/ Magnetic), Office equipment (Printer, Copier, Scanner, MFDs), Diesel Engine Driven Mono-set Pumps, Solid State Inverter, DG Sets, Chillers, Microwave Oven, Solar Water Heater,

Light Commercial Air Conditioner, Deep freezers.

Category 7: Architectural firms and Green building Consultancy

Including Architectural firms and Green building consultants who have designed and/or developed such buildings/campuses including LEED/IGBC / GRIHA /other or ECBC Compliant buildings or with proven/certified Energy Efficiency and conservation practices including Green/Eco-friendly considerations.

CRITERIA FOR JUDGING THE MERIT

The recipients of the awards are selected based on their outstanding achievements and contributions in the field of energy conservation and management. The Award may not have been entirely decided based on only quantitative achievements but also considers various other factors, including innovative techniques and technologies adopted, management commitment, consistency, employee participation, environmental friendliness, and the organizational setup promoting energy conservation within the unit.

KERALA STATE ENERGY CONSERVATION AWARD 2023 WINNERS

Category	Name of the applicants
Large Scale Energy Consumers	Apollo Tyres Ltd., Kalamassery, Ernakulam
	Kerala State Electricity Board Ltd, Thiruvananthapuram
Medium Scale Energy Consumers	HLL Lifecare Limited – Akkulam Factory, Thiruvananthapuram
Buildings	Quest Global Engineering Services Pvt Ltd, Thiruvananthapuram
Institutions/ Organizations	Kerala Development and Innovation Strategies Council (K-DISC), Thiruvananthapuram
	Green Technology Centre, Kozhikode
Architectural Firms and Green Building Consultancy	Menon Architectural Solutions, Palakkad

COMMENDATION WINNERS

Category	Name of the Applicant
Large Scale Energy Consumers	Saint-Gobain India Private Limited, Palakkad
Medium Scale Energy Consumers	MRCMPU Ltd. Kannur Dairy, Kannur
Small Scale Energy Consumers	BEML Ltd, Palakkad Complex, Palakkad
Buildings	Grand Hotel,Ernakulam
	SCTIMST - Trivandrum
Institutions and Organizations	St. Thomas College (Autonomous) Thrissur
Promoters of Energy efficient Products	EL SOL Power Solutions Pvt Ltd, Kottayam
Architectural Firms and Green Building Consultancy	Habitat Technology Group, Thiruvananthapuram

KERALA STATE ENERGY CONSERVATION AWARDS 2023

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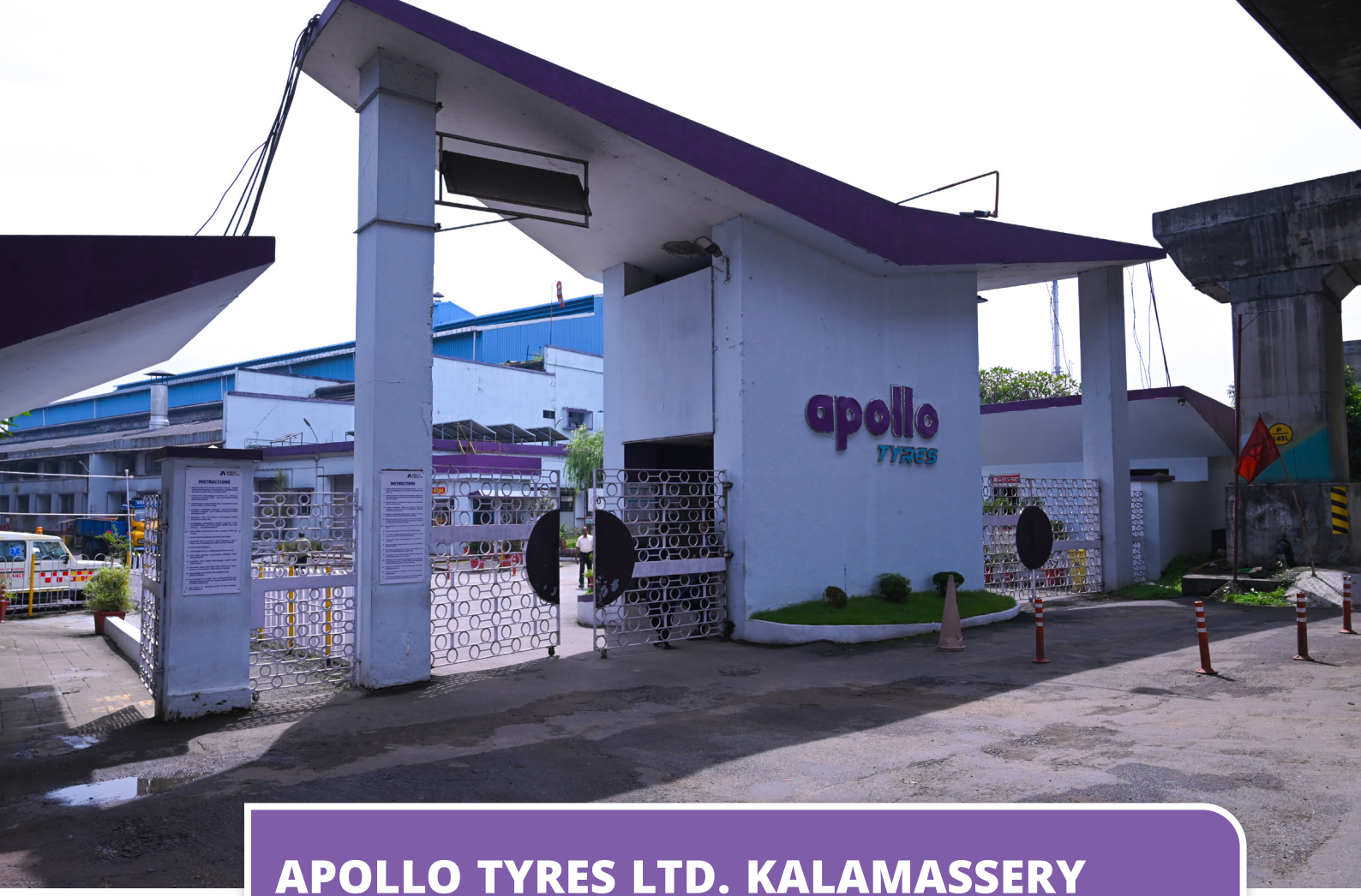
PROFILE OF

INDUSTRIES



APOLLO TYRES LTD. KALAMASSERY

UNIT PROFILE

An international tyre manufacturer and a prominent tyre brand in India, Apollo Tyres Ltd., initiated its operations in 1962 in Kalamassery, Ernakulum, and is known as Apollo Tyres Kalamassery. With a production capacity of 110 MT per day and around 1295 employees, the company also maintains manufacturing facilities in Asia, Europe and Africa, including 8 modern tyre facilities, and engages in exports to over 100 countries. Certification has been obtained for ISO 9001, ISO 50001, QS 9000, ISO/TS 16949, ISO 14001 and IATF 16949.

Energy Manager Name : Aneesh R

Telephone : +91 9895558421

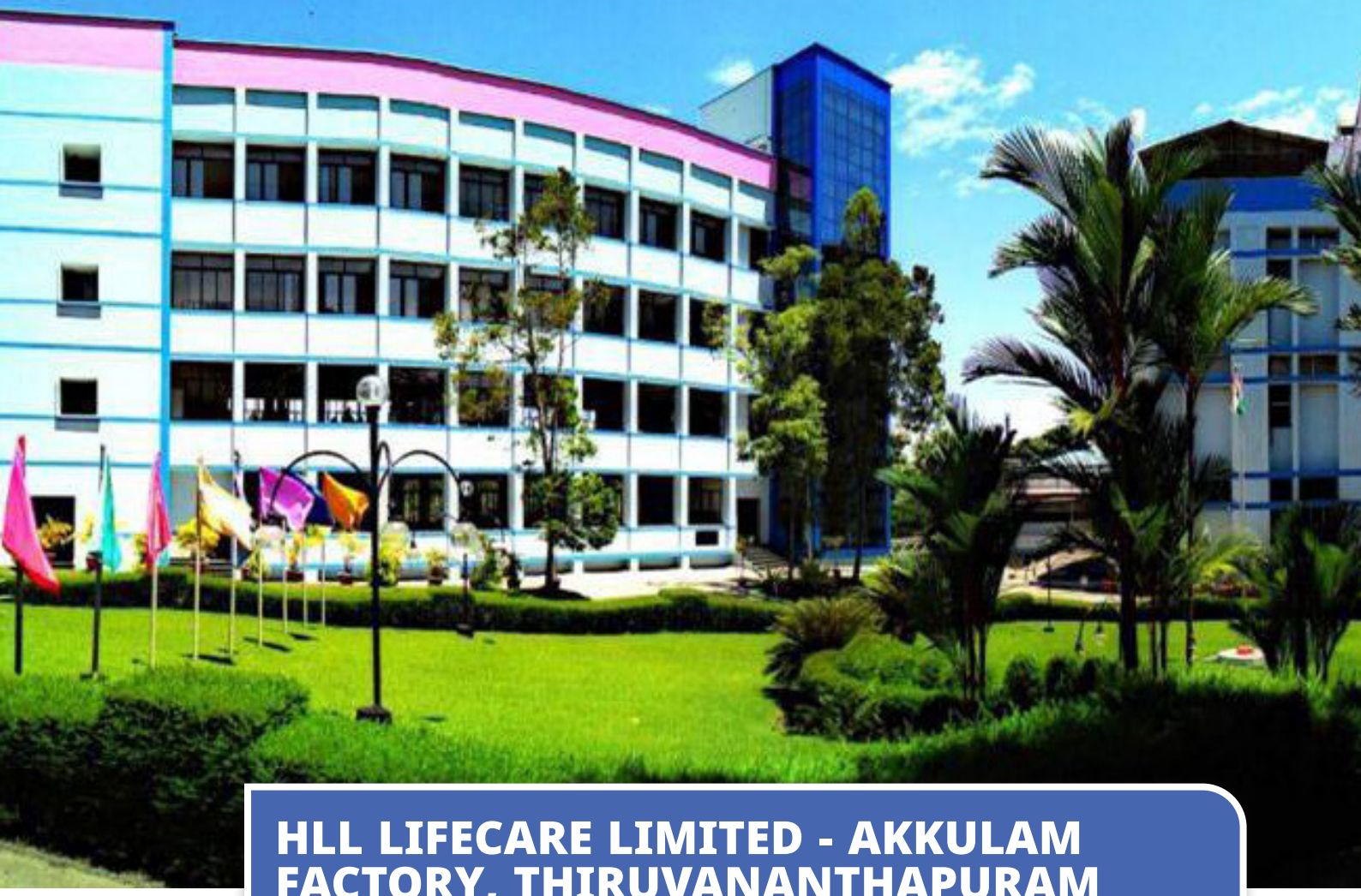
KERALA STATE ELECTRICITY BOARD LTD., THIRUVANANTHAPURAM

UNIT PROFILE

The business of electricity generation, transmission and distribution in the state is served by Kerala State Electricity Board Limited, established as the successor to the Kerala State Electricity Board in 1957 under the Electricity (Supply) Act, 1948. Over the past sixty-one years, substantial expansion has been witnessed by KSEBL, with its total installed capacity increased from 109 MW to 3760 MW, including recent solar projects. Additionally, extensive Transmission and Distribution networks spanning over 15,000 circuit kilometres and 3, 38,000 circuit kilometres have been established by the Board. Currently, the electricity needs of 1.37 crore consumers across both urban and rural areas of the state are served by the Board.

Energy Manager Name : Prasad.V.N

Telephone : +91 9446008899



HLL LIFECARE LIMITED - AKKULAM FACTORY, THIRUVANANTHAPURAM

UNIT PROFILE

Incorporated as a corporate entity, HLL Lifecare Ltd. (formerly known as Hindustan Latex Limited) embarked on its healthcare journey on March 1, 1966, under the Ministry of Health and Family Welfare, Government of India. The Akkulam Plant, established in 1992 in Thiruvananthapuram, specializes in the production of various medical products, including Blood Transfusion Bags, Copper T IUDs, Tubal rings, Surgical Sutures and Hydrocephalus Shunt. In 2003, with a modest turnover of Rs 163 crores, HLL set an ambitious goal to become a Rs 1000 crore company by the year 2010. Remarkably, this target was not only achieved but surpassed in 2010. Today, HLL Lifecare Ltd. stands as a Mini Ratna, Schedule B Company

Energy Manager Name : Mahesh Kumar P R

Telephone : +91 9495626566

QUEST GLOBAL ENGINEERING SERVICES PVT. LTD., THIRUVANANTHAPURAM

UNIT PROFILE

With over 25 years of accumulated experience, Quest Global is headquartered in Singapore and has its presence extended across 17 countries through 67 global delivery centres and offices. Empowered by a team exceeding 17,500 employees, the realm of turning the unattainable into reality is navigated by the company daily. Exceptional end-to-end engineering solutions are provided by Quest Global, drawing upon extensive industry insight and digital proficiency, spanning the aerospace & defence, automotive, energy, hi-tech, healthcare, medical devices, rail and semiconductor sectors.

Energy Manager Name : Sunu Godwin

Telephone : +91 9744000911

SAINT- GOBAIN INDIA PVT. LTD., PALAKKAD

UNIT PROFILE

Located in Palakkad, Saint-Gobain Pvt. Ltd. SEFPRO (Sintered and Electro Fused Products) is recognized as a pioneer in the manufacturing of Fused Cast and Sintered Refractories for glass furnaces. Operations were commenced by the company in April 2002. The plant's production capacity, with a workforce of 1500 members, is 12,000 tons per year, producing Fused Cast AZS, Fused Cast Alumina and Sintered refractories for glass furnace.

Energy Manager Name : Chamimala R

Telephone : +91 9656002678

MALABAR REGIONAL CO-OPERATIVE MILK PRODUCERS UNION LTD. (MRCMPU LTD.)

UNIT PROFILE

Kannur Dairy, formerly known as Malayora Dairy, is one of the major dairies under the Malabar Regional Cooperative Milk Producers' Union Ltd. (MRCMPU), located in Sreekandapuram, Kannur. It was commissioned on 15 November 2017. The dairy actively markets a diverse range of milk and value-added products, including Pasteurized Homogenized Toned Milk, UHT Milk, Skim Milk Curd, Ghee, Buttermilk, Kattimoru and Sampushta (a Government scheme for Anganwadis kids). Notably, Kannur Dairy holds the distinction of being the only dairy in Kerala producing Ultra High Temperature Sterilized milk, boasting a shelf life of 90 days.

Energy Manager Name : Premanandan K

Telephone : +91 9446072396

BEML LTD., PALAKKAD COMPLEX, PALAKKAD

UNIT PROFILE

Established in May 1964 as a Public Sector Undertaking under the administrative control of the Ministry of Defence, BEML Limited specializes in the manufacture of rail coaches, spare parts, mining equipment, defence equipment, aerospace components and more. It is listed on both the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE), with a 54.03% stake held by the Government of India, while the remaining 45.97% is owned by financial institutions, foreign institutional investors, banks and employees.

Energy Manager Name : Ullas R Shenoy

Telephone : +91 9496332960

GRAND HOTEL, ERNAKULAM

UNIT PROFILE

Founded in 1963, The Grand Hotel is characterized by a seamless blend of the best in technology and traditional charm, offering guests a memorable experience of God's Own Country, Kerala; conveniently located on MG Road, the heart of Ernakulam city.

Energy Manager Name : V S Vijayakumar

Telephone : +91 9895721012

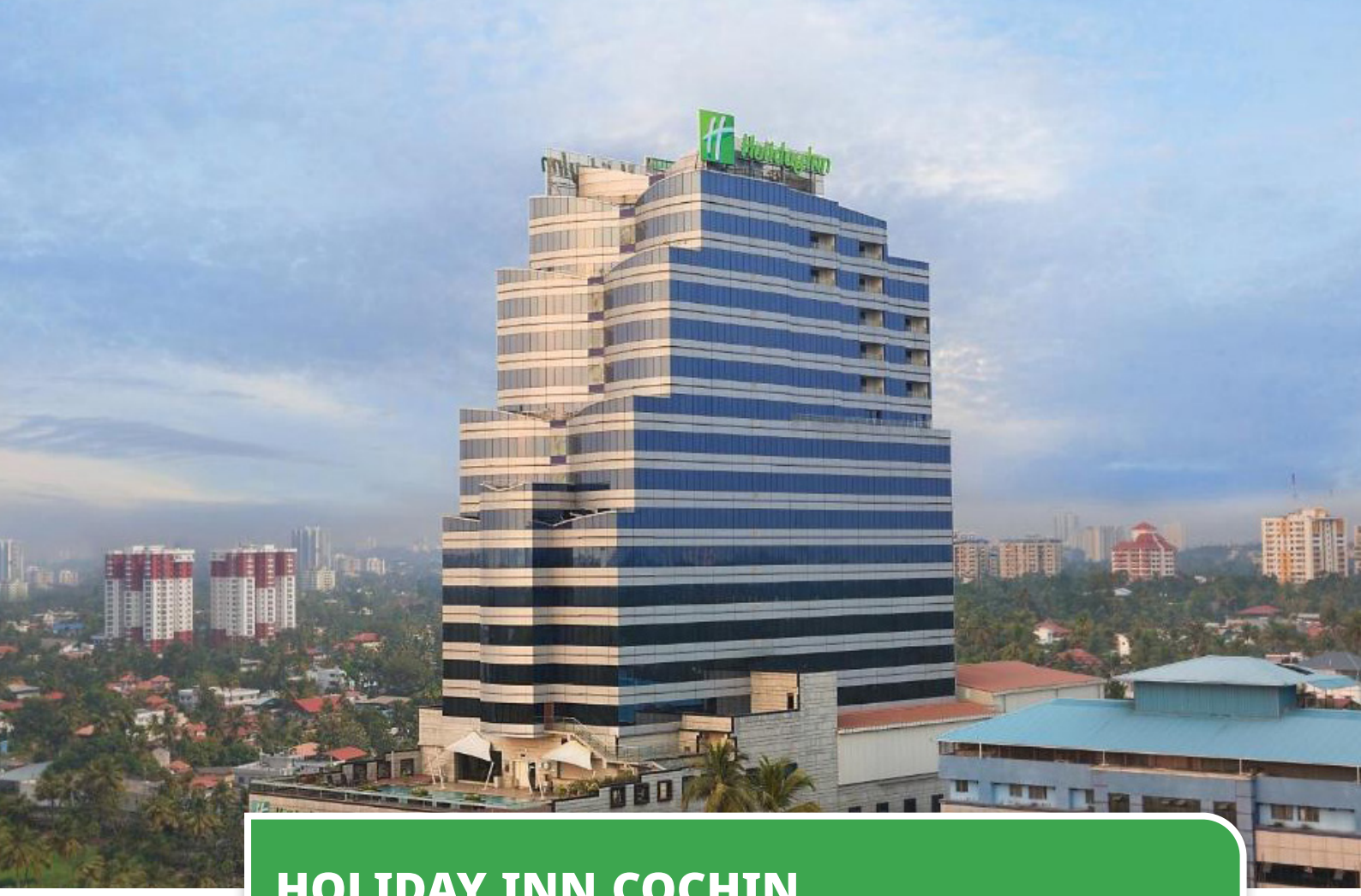
CROWNE PLAZA KOCHI

UNIT PROFILE

The luxurious Crowne Plaza Kochi offers elegant modern rooms with views of the backwaters and city. Located on the NH 47 Bypass, it features 4 food and beverage options. Commercial Operation started in 2012. Mosaic Restaurant features a breakfast buffet and specializes in traditional Kerala, pan-Asian and international cuisines. All rooms are equipped with an ergonomic work area, flat-screen satellite TV, iPod dock and mini-bar. They also include tea/coffee making facilities and a safe. Hotel have a total built-up area of 34115sqm out of which total air conditioned area is 19886.65sqm and non-air conditioned area is 7910sqm making a gross floor area of 27796.65sqm.

Energy Manager Name : Satheesh M B

Telephone : +91 8129822929



HOLIDAY INN COCHIN

UNIT PROFILE

Holiday Inn Cochin - Leading the Way in Sustainable Practices Holiday Inn Cochin is more than just a hotel; we're dedicated to promoting energy efficiency in the beautiful state of Kerala. Our commitment to sustainability is at the core of our operations. We have invested in cutting-edge LED lighting, advanced HVAC systems, and an effective waste management program, significantly reducing our carbon footprint. Moreover, we've harnessed renewable energy sources like solar power to further our green initiatives. Our commitment to environmental conservation extends to our guests and community. We strive to inspire responsible practices and set an example for a more sustainable future in "God's Own Country."

The total built-up area of 21612 sqm out of which total airconditioned area is 12252 sqm and non-airconditioned area is 1249 sqm making a gross floor area of 21612 sqm.

Energy Manager Name : Prem Kumar

Telephone : +91 7667477788

CHAPTER – 1

MECHANICAL SYSTEM

1. Dedicated 150 CFM Screw Compressor for 150 psi air instead of 1000 CFM

PURPOSE

To reduce the specific energy consumption in 150 PSI Compressed air

Existing System

- The Present 1000 CFM, 150 psi Reciprocating compressor is running in VFD and unloading time is also more

Modified System

- Compressor derating by rearrangement of Post Cure Inflation units (PCI) using 100 psi compressed air
- Install Energy efficient Screw compressor in 150 psi.
- Pressure controlled mode with VFD, to cater for variable demand-Downsizing from 200kW motor to 35 kW motor

Organisation Name	Apollo Tyres Ltd., Kalamssery
Category	Large Scale Energy Consumers
Investment (INR Lakh)	15
Financial savings per year (in lakhs)	5.94
Year of implementation	Sep 2022
Energy savings (in kWh/day)	250
Vendor (Name)	Kaser
Vendor (Contact details)	+91 6235088000

2. Energy efficient Grundfos pump for Factory Cooling Water

PURPOSE

To reduce the specific energy consumption in FCW Pumps

Existing System

- The present Pump is having lesser efficiency in tune of 37%

Modified System

- To have energy efficient Grundfoss Pumps
- Pressure controlled mode with VFD, catering to variable demand

Organisation Name	Apollo Tyres Ltd., Kalamassery
Category	Large Scale Energy Consumers
Investment (INR Lakh)	6
Financial savings per year (in lakhs)	2.4
Year of implementation	Nov 2022
Energy savings (in kWh/day)	100
Vendor (Name)	Allen Tech
Vendor (Contact details)	+91 9947129095

3. Pneumatic to Electrical motor for Awling machine

PURPOSE

To reduce the Specific Air Consumption

Existing System

- At present, 150 psi compressed air is used for pneumatic awling of green tyres

Modified System

- To provide 2 HP Motor for the awling machine so that compressed air is not required, resulting in power savings

Organisation Name	Apollo Tyres Ltd., Kalamassery
Category	Large Scale Energy Consumers
Investment (INR Lakh)	5
Financial savings per year (in lakhs)	2.4
Year of implementation	Jan 2023
Energy savings (in kWh/day)	100
Vendor (Name)	In House development
Vendor (Contact details)	+91 9947129095

4. Energy Efficient Pumps for Dome Vacuum

PURPOSE

To reduce the Specific Energy consumption in Dome Vacuum pumps.

Existing System

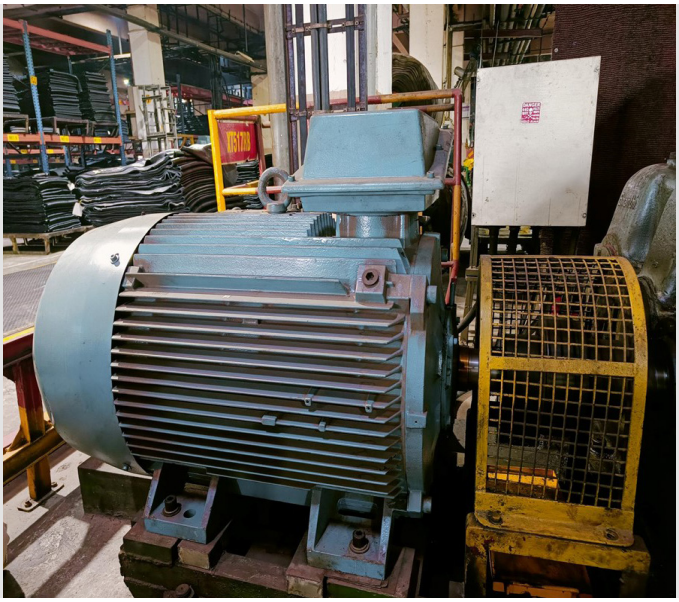
- The existing pumps in the dome vacuum system are having lesser efficiency-32%

Modified System

- Replace pumps in the OHT and NBOM Curing trenches with energy efficient pumps with a higher efficiency of 65% to improve the Energy performance

Organisation Name	Apollo Tyres Ltd., Kalamassery
Category	Large Scale Energy Consumers
Investment (INR Lakh)	12
Financial savings per year (in lakhs)	1.9
Year of implementation	Aug 2022
Energy savings (in kWh/day)	80
Vendor (Name)	Atlas Copco
Vendor (Contact details)	+91 895632633

5. Energy efficient Motor for Cap Cracker Mill



PURPOSE

To reduce the Specific Energy consumption in Dual Extruder Mills.

Existing System

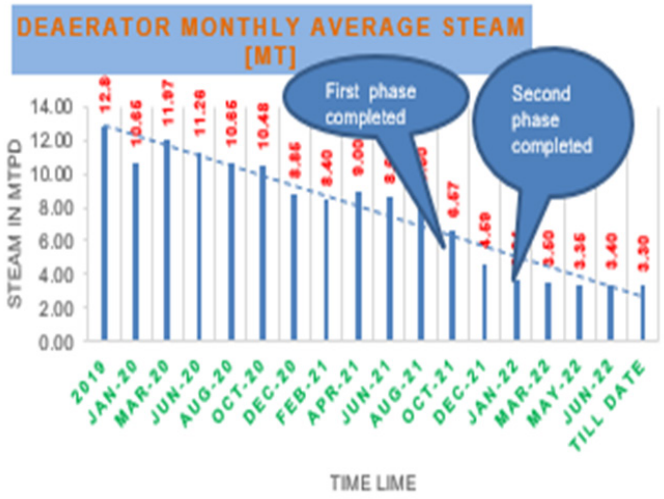
- The present Motor is old and rewound multiple times and is having an efficiency of 86% only

Modified System

- To have Energy efficient IE3 Motor.
- The efficiency increased from 86% to 95%.

Organisation Name	Apollo Tyres Ltd., Kalamassery
Category	Large Scale Energy Consumers
Investment (INR Lak)	12
Financial savings per year (in lakhs)	1.6
Year of implementation	Sep 2022
Energy savings (in kWh/day)	70
Vendor (Name)	ABB
Vendor (Contact details)	+91 895632633

6. Good/ Bad Condensate separation in Tyre Curing Area



PURPOSE

To maintain the Deaerator water temperature at the desired level and subsequently reduce Deaerator steam specific consumption.

Existing System

- Good and bad condensate is directly connected to a common header.
- Due to mix up of both condensates the water cannot be directly taken to Boiler deaerator.

Modified System

- Provide a separate Good condensate header in OHT, NBOM and OBOM tyre curing trenches so that the good condensate can be directly used in Coal Fired Boiler Deaerator

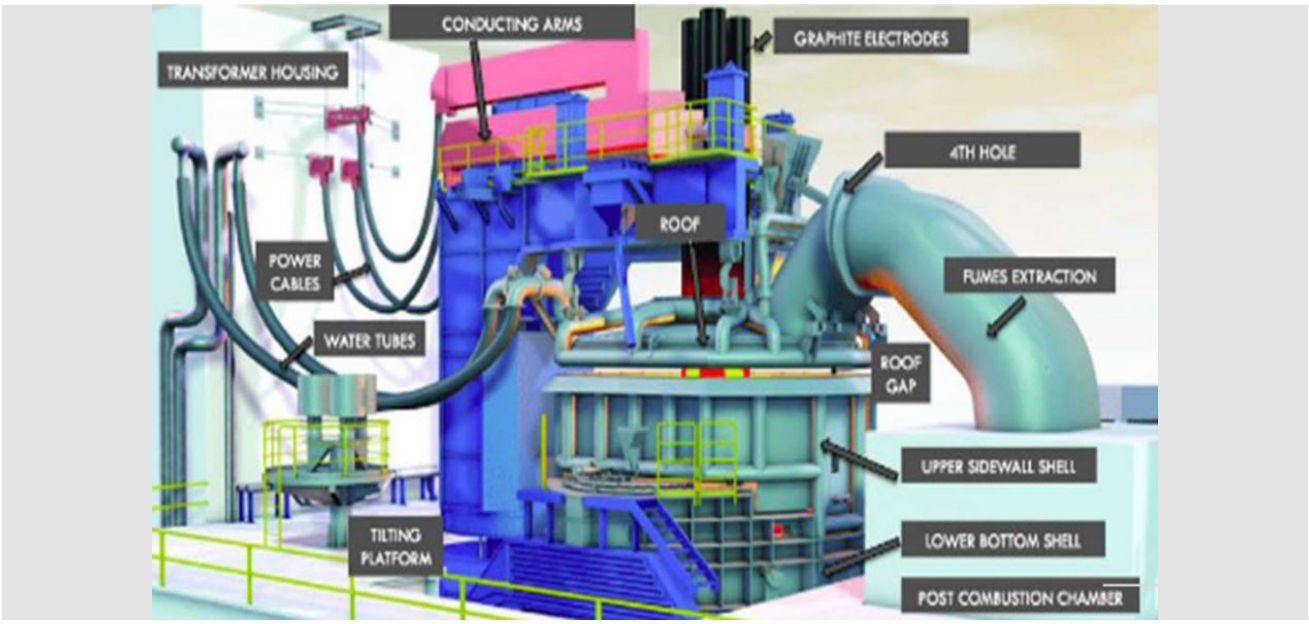
Organisation Name	Apollo Tyres Ltd., Kalamassery
Category	Large Scale Energy Consumers
Investment (INR Lak)	80
Financial savings per year (in lakhs)	62.8
Year of implementation	Jun 2022
Energy savings (in kWh/day)	9.4
Vendor (Name)	In House
Vendor (Contact details)	+91 895632633

7. Installation of Pressure Reducing Valve System for steam pressure optimization in NCG tank for Pure steam Generator, AHU's for Suture clean room RH Control and Canteen

Installed Pressure Reducing Valve (PRV) System for steam pressure optimization in NCG tank for Pure Steam Generator, AHU's for Suture Clean room RH Control and Canteen. The pressure requirement for the above mentioned locations is 2-3kg/cm2. The Steam generation pressure is 8kg/cm2. The NCG tank and Canteen operates around 12 hours per day. The AHU's for Suture clean room operates 24 hours per day. The 3 PRV systems implementation resulted in approximate fuel savings of Rs 4.8 Lakh.

Organisation Name	HLL Lifecare Limited
Category	Medium Scale Energy Consumers
Investment	Rs.5.4 Lakh
Financial savings per year	Rs. 5.2 Lakh
Year of implementation	2022-2023
Vendor (Name)	This work was implemented by M/s.Forbes Marshall, Pune with the support of in-house Engineering team.

8. Energy Optimization in Furnace – C Duct Collector



Initially, the dust collector was running at different frequencies based on energy consumption: 50 Hz for 0-300 KWH, 42 Hz for 300-1250 KWH, and 38 Hz for 1250-1800 KWH. To enhance energy efficiency, adjustments were made after evaluating performance. The revised settings changed the frequencies to 50 Hz for 0-300 KWH, 42 Hz for 300-1250 KWH, 38 Hz for 1250-1500 KWH, and 25 Hz for 1500-1800 KWH during lancing and pouring. This recalibration saved 450 KWH per day by eliminating reheating energy losses, significantly improving overall energy efficiency.

Organisation Name	Saint Gobain
Category	Large Scale Energy Consumers
Investment	Rs 50 LAKH
Financial savings per year (in lakhs)	Rs.7.08 LAKHS
Year of implementation	2022-2023
Energy savings (in kWh)	118000

9. Energy Optimization in Dust Collectors – Horizontal Deployment

The dust collector's efficiency was significantly improved by introducing several automated features. Firstly, automatic control was implemented for the blower motor, allowing it to operate in accordance with the machine's running status, thus minimizing unnecessary idle time and energy consumption. Additionally, a vibro fork level sensor was installed in the material dump hopper to monitor material presence. If no material is detected, the blower motor is programmed to turn off automatically after five minutes, further preventing energy wastage. Moreover, the frequency of the blower drive is now controlled based on the process sequence, ensuring that the system operates at optimal energy levels tailored to the production requirements. These enhancements collectively optimize the dust collector's performance, reduce energy usage, and improve overall operational efficiency.

Organisation Name	Saint Gobain
Category	Large Scale Energy Consumers
Investment	40 Lakhs
Financial savings per year (in lakhs)	10.21
Year of implementation	2022
Energy savings (in kWh)	177420

10. Pressure Loop Control in Ovens

There were no proper regulation of inlet air, air damper will work based on burner flame length. Pressure loop system introduced in PLC by taking feedbacks from thermocouple & pressure transmitter, to monitor internal pressure and temperature. Exhaust damper controlled such that the LPG supplied to the system was not exhausted through the outlet.

Organization Name	Saint Gobain
Category	Large Scale Energy Consumers
Investment	80 Lakhs
Financial savings per year (in lakhs)	47.6
Year of implementation	2022-2023
Energy savings (in kWh)	8860

11. Installation of energy-optimal air blower at ETP

The project involves the installation of an energy-efficient air blower at the Effluent Treatment Plant (ETP). The total project cost is Rs. 1.57 lakhs. This initiative results in daily electrical energy savings of 28 kilowatt-hours (kWh), leading to an annual savings of 10,220 kWh. The annual monetary savings from this project are Rs. 62,286. With these savings, the payback period for the investment is estimated to be 2.53 years.

Organisation Name	MRCMPU Ltd. Kannur Dairy
Category	Medium Scale Energy Consumers
Investment	1.57 lakhs
Financial savings per year	0.62286
Year of implementation	2022
Energy savings (in MU)	0.010220

12. Replacement of obsolete Air blower motor set with new Air blower & energy efficient IE2 motor set

In STP plant, Air blower set is used for aeration of waste water collection tanks for treatment. This air blower set is 10 years old and consist of blower & conventional motor. The obsolete Air blower set causing maintenance issues like oil leak, less air output etc. At present one set of Air blower is replaced with new IE2 motor. IE2 motor being energy efficient compared to conventional motor helps in energy saving.

Organisation Name	BEML Ltd, Palakkad Complex
Category	Small Scale Energy Consumers
Investment	Rs. 1.15 Lakhs
Financial savings per year	Rs. 3600/-
Year of implementation	January 2023
Energy savings (in kWh)	480
Vendor (Name)	Blower make: Kay, Supplied by M/s. Innovation Technologies
Vendor (Contact details)	393/3, KILAKKAL THOTTAM, MALUMICHAMPATTI, COIMBATORE- 641050

13. Replacement of obsolete STP outlet pump motor set with new pump & energy efficient IE2 motor set

In the STP plant, Pump sets are used for pumping treated water from the collection pit to the gardening area. This pump set is 10 years old and consists of a pump & conventional motor. These two sets of pump sets are replaced with new energy-efficient IE2 motors.

Organisation Name	BEML Ltd, Palakkad Complex
Category	Small Scale Energy Consumers
Investment	Rs. 0.7 Lakhs
Financial savings per year	Rs. 5000/-
Year of implementation	February 2023
Energy savings (in kWh)	600
Vendor (Name)	Pump make: Shakti, Supplied by M/s. Omega Corporation
Vendor (Contact details)	1006-B, Lokmat Bhavan, Wardha Road, Nagpur-440012, Maharashtra - 27

14. Replacement of pumps and pump motors to Energy Efficient system

3 pump sets of 5HP pump motors alternatively were in use for pumping water from the sump to the overhead tank for daily purposes. The entire pump set was changed in 2022 August with energy-efficient pump motors of 2 HP with a filter plant.

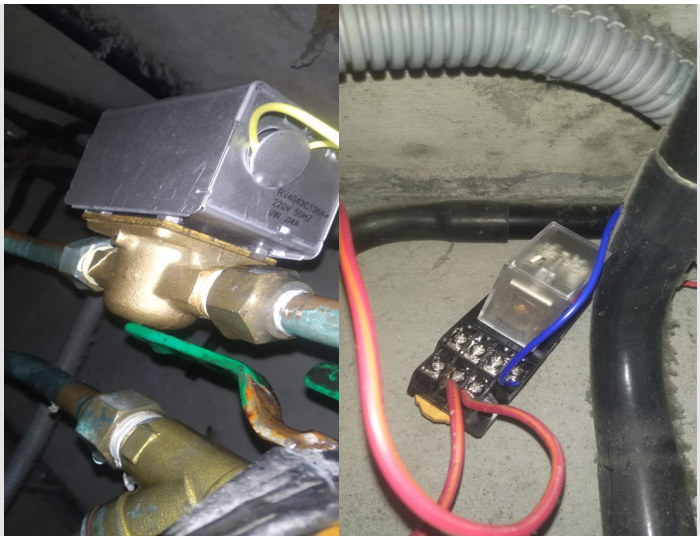
Organisation Name	Grand Hotel , M G Road, Kochi
Category	Buildings
Investment	2.75 lakh
Financial savings per year (in lakhs)	0.474Lakh
Year of implementation	2022 August
Energy savings (in kWh)	4745
Vendor (Name)	Flowmax ,Aluva , Ernakulam
Vendor (Contact details)	9388601978

15. Water connection from KWA

Water connection from Kerala water authority. This has eliminated the use of tanker water and its filtration & subsequent pumping requirements.

Organisation Name	Crowne Plaza Kochi
Category	Buildings
Investment	5 Lakhs
Financial savings per year (in lakhs)	2.5 Lakhs
Year of implementation	2022
Energy savings (in kWh)	25000
Vendor (Name)	Kerala Water Authority
Vendor (Contact details)	Kerala Water Authority

16. Replacement of Motorized valve with relay

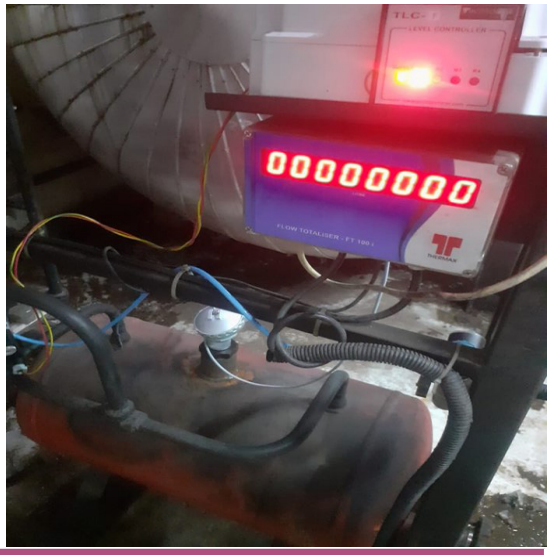


Holiday Inn Cochin is dedicated to energy conservation. We have successfully replaced 80% of the motorized valves in the guest floor chilled water system, incorporating relay control for both occupied and unoccupied modes. This significant upgrade underscores our commitment to sustainability and enhancing guest comfort.

Organisation Name	Holiday Inn Cochin
Category	Buildings
Investment	5 lakh
Financial savings per year (in lakhs)	7 lakh
Year of implementation	22-23
Energy savings (in kWh)	75000
Vendor (Name)	Puja Enterprises
Vendor (Contact details)	9650011105 (Fixing work in house)

17. Steam line Condensate Recovery

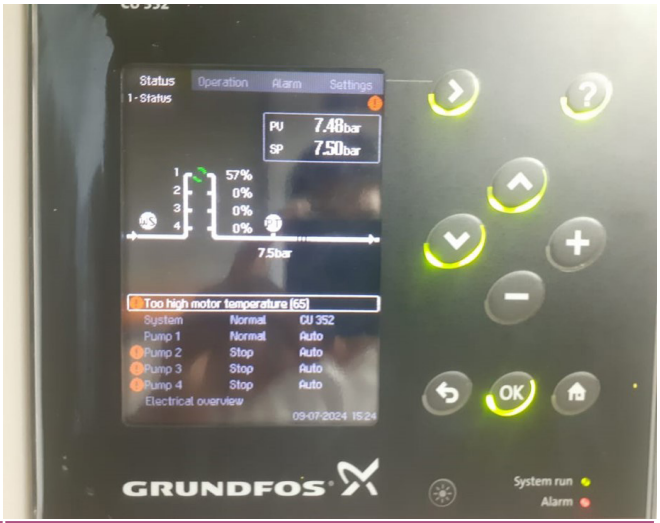
We enhanced our steam condensate recovery system, allowing us to efficiently reuse condensate water in our boilers. This modification has resulted in significant savings in both energy and water.



Organisation Name	Holiday Inn Cochin
Category	Buildings
Investment	1.0 lakh
Financial savings per year (in lakhs)	4 lakh
Year of implementation	2023
Energy savings (in kWh)	2.5 lakh
Vendor (Name)	Martin
Vendor (Contact details)	8590624203

18. Chilled water pump controller

Our secondary chilled water system, which previously operated at a fixed manual speed, now intelligently adjusts the motor speed according to demand thanks to the implementation of this advanced controller. This innovation enhances efficiency and optimizes performance.



Organisation Name	Holiday Inn Cochin
Category	Buildings
Investment	1.2 lakh
Financial savings per year (in lakhs)	3 lakh
Year of implementation	2022-2023
Energy savings (in kWh)	30000
Vendor (Name)	Manoj-9447701992
Vendor (Contact details)	Vi marketing

CHAPTER – 2

ELECTRICAL SYSTEM

1. Urjjam Karuthi Vekkam Nalekku scheme & Campaigns on National Energy Conservation Day

DSM scheme to promote Energy Conservation to award Domestic and Industrial Consumers who reduce their electricity consumption in February – May 2022 period was implemented. Consumption during summer season of 2022 was analysed via billing software and 19400 consumers under domestic category and 958 consumers under industrial category with highest energy savings were shortlisted. After site verification of aforesaid consumers by field officials, 3880 domestic consumers and 140 industrial consumers, across the state, with highest energy savings were awarded prizes on National Energy Conservation Day 2022. Various modes of energy conservation promotion were also conducted on 14th December which included training sessions among students and public, bike rallies with placards and notices, painting competitions for students, interactive sessions etc.

Organisation Name	KSEBL
Category	Large Scale Energy Consumers
Investment	15 Lakhs
Financial savings per year (in lakhs)	1138
Year of implementation	2022 May
Energy savings (in MU)	23.22

2. Filament free Kerala

FFK project envisaging replacement of entire Filament lamps in the state with Energy efficient LED lamps was implemented and 1.15 crore LEDs have been distributed for 14.7 lakh consumers as on date. Out of the above, 4.06 lakh LED lamps were distributed for 86.1 thousand consumers during 2022-23.

Organisation Name	KSEBL
Category	Large Scale Energy Consumers
Investment	5500
Financial savings per year (in lakhs)	900
Year of implementation	2022 August
Energy savings (in MU)	18.36

3. Nilaavu

Implemented the project of replacing conventional streetlights across the state with energy efficient LED light fittings in coordination with LSGDs. 1.23 lakhs of 18W LEDs, 1.09 lakhs of 35W LEDs, 9046 Nos of 70W LED Streetlights and 9120 Nos of 110W LED streetlights were installed in place of conventional streetlights

Organisation Name	KSEBL
Category	Large Scale Energy Consumers
Investment	29800
Financial savings per year (in lakhs)	3312
Year of implementation	2022 November
Energy savings (in MU)	67.6

4. Implementation of Advanced Energy Monitoring System

Advanced multifunction energy meters are installed at all electrical panels inside the factory. Data from all energy meters are synched with the Energy Management System (EMS) in real time. Data is being presented in a user-friendly manner in dashboard formats and reports. The system aids in live monitoring of the energy consumption of all electrical installations including production and utility equipment at AFT. Helps in executing timely corrective and preventive measures to control and optimize energy consumption. The system helps in obtaining actual energy consumption product/area-wise instead of assumptions.

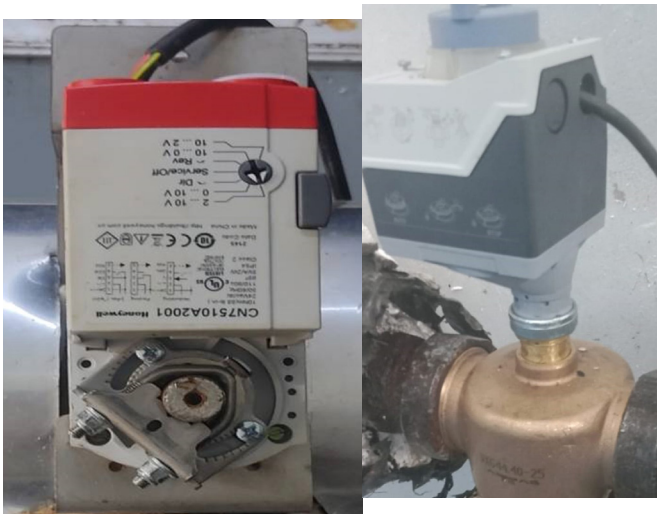
Organization Name	HLL Lifecare Limited
Category	Medium Scale Energy Consumers
Investment	Rs. 9 Lakh
Financial savings per year	Rs. 8.90 Lakhs
Year of implementation	2022-2023
Energy savings (in kWh)	131851
Vendor (Name)	M/s.Syntax Automation, Trivandrum

5. Installation of VFD for Fan of 200TR Processing Cooling Tower

VFD provided in the cooling tower used for process application. The 200 TR processing cooling tower has a fan motor of rating 7.5 HP –5.5KW. The fan is operational 24 hours and 330 days in a year. The installation of VFD resulted in daily energy savings of around 52 units. The annual energy savings will be around 17,160 kWh

Organisation Name	HLL Lifecare Limited
Category	Medium Scale Energy Consumers
Investment	Rs.2.5 LAKH
Financial savings per year (in lakhs)	Rs. 1.55 LAKHS
Year of implementation	2022-2023
Energy savings (in kWh)	23100
Vendor (Name)	This work was implemented by in house Engineering team.

6. Installation of Electrically actuated flow control valves in Air Handling Units (AHU)



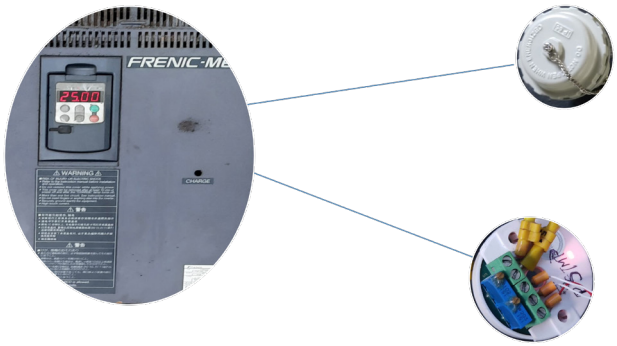
Installed electrically actuated flow control valves in 11 Air handling units (AHU).The Average daily energy consumption of Chiller unit was around 3600 kWh before installation of electrically actuated flow control valves. The installation of electrically actuated flow control valves resulted in approximate energy savings of 70 kWh/day. This installation resulted in an annual energy savings of 23,100 kWh.

Organization Name	HLL Lifecare Limited
Category	Medium Scale Energy Consumers
Investment	Rs.1 Lakh
Financial savings per year (in lakhs)	Rs.1.15 Lakhs
Year of implementation	2022-2023
Energy savings (in kWh)	17160
Vendor (Name)	This work was implemented by in house Engineering team

7. Installation of feedback control mechanism in AHUs

Temperature transmitters were installed within the return air ducts of Air Handling Units (AHUs). These transmitters regulate the speed of AHUs based on the return air temperature. The speed of AHUs is optimized according to the current load requirements. The total connected load of the AHUs equipped with this feedback control mechanism amounted to 92.8 kW.

Before implementing the feedback control mechanism, the AHU motors were running at frequencies between 40 and 45 Hz. Following the installation of the feedback control mechanism, the AHU motors now operate within the range of 25 to 30 Hz, adjusted according to the current load requirements.

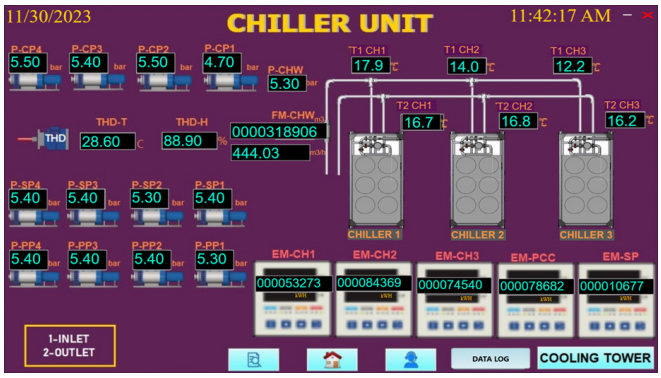


Organisation Name	HLL Lifecare Limited
Category	Medium Scale Energy Consumers
Investment	Rs 1.5 Lakh
Financial savings per year	Rs. 4.96 Lakhs
Year of implementation	2022-2023
Energy savings (in kWh)	73480
Vendor (Name)	This work was executed by the in-house Engineering team

8. Energy Intelligent performance monitoring system for HVAC chiller plant (IPMS)

Intelligent performance monitoring system for HVAC chiller plant (IPMS)

IPMS is implemented for optimizing Air conditioning and Power by measuring flow, temperature, pressure and energy consumption. This system is more advanced than a conventional BMS system. Our inhouse team is developing a physics-based model to run "what if" scenarios based on the sensor data and the Artificial Intelligence - AI team will create a Physics Informed Neural Network to further improve the prediction and thereby automating the entire system.



Organisation Name	Quest Global Engineering Services Pvt Ltd
Category	Buildings
Investment	13.91 Lakh
Financial savings per year (in lakhs)	21.42 Lakh
Year of implementation	2021-2022
Energy savings (in kWh)	2.7 Lakh
Vendor (Name)	Developed In house

9. Solar Hybrid Air Conditioning

Replaced 2 no's of conventional air conditioners with Solar hybrid Ac's as a pilot project. The new advanced technology AC, works with solar panel power & Grid power. This AC run with 4.5 A Current, in which it takes 4A From solar panel & only 0.5 A from grid so it saves the electricity consumption. The ISEER rating is 5.13.

Organisation Name	Quest Global Engineering Services Pvt Ltd
Category	Buildings
Investment	1.8 Lakh
Financial savings per year (in lakhs)	0.68 Lakh
Year of implementation	2021-2022
Energy savings (in kWh)	0.095 Lakh
Vendor (Name)	Moseta

10. Desktop to Laptop

Replacement of conventional desktop computer with advanced laptops for energy conservation. This is a continuing process reaching 100% laptop usage.

Organisation Name	Quest Global Engineering Services Pvt Ltd
Category	Buildings
Investment	45.5 Lakh
Financial savings per year (in lakhs)	2.45 Lakh
Year of implementation	2021-2022
Energy savings (in kWh)	0.34 Lakh
Vendor (Name)	Direct Purchase from Dell

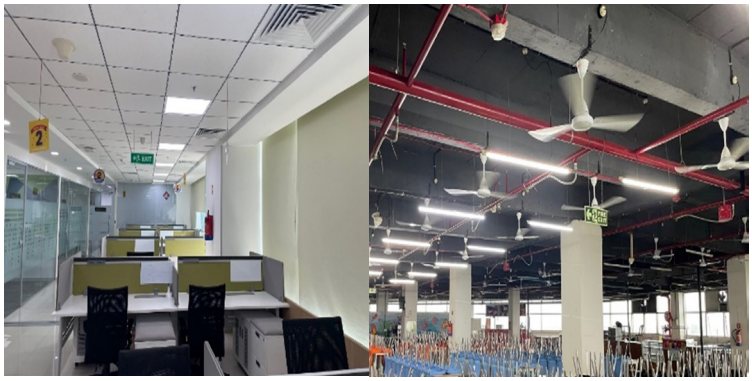
11. Introduction of Modular UPS and optimization of conventional UPS System

Replacement of conventional UPS system (12 no's) with advanced energy efficient Modular UPS to provide greater reliability, redundancy and ease of expansion. Removed underutilized UPS's which is connected to cater a base load by rewiring the circuits and connected with the New Modular UPS

Organisation Name	Quest Global Engineering Services Pvt Ltd
Category	Buildings
Investment	90.47 Lakh
Financial savings per year (in lakhs)	7.49 Lakh
Year of implementation	2021-2022
Energy savings (in kWh)	1.03 Lakh
Vendor (Name)	Schneider

12. CFL to LED Light fixtures, Sensors for lighting and introduction of BLDC Fans

Replacement of conventional CFL lights (518 no's) with energy efficient LED light fixtures to reduce power consumption. Introduced occupancy and ambient light sensors to enhance power saving measures. Introduced Brush less DC motor fans (50 no's) and replaced old conventional fans at cafeteria thereby reduction in energy consumption.



Organisation Name	Quest Global Engineering Services Pvt Ltd
Category	Buildings
Investment	6.16 Lakh
Financial savings per year (in lakhs)	6.27
Year of implementation	2021-2022
Energy savings (in kWh)	0.86 Lakh

13. Implementation of energy efficient VFD's (Variable Frequency Drives for AHU's

Implemented 13 no's of energy efficient Variable frequency drives (VFD) to AHU's enable control of the speed of three phase motors which allows the motor to be operated with variable current reducing energy consumption.

Organisation Name	Quest Global Engineering Services Pvt Ltd
Category	Buildings
Investment	12.09 Lakh
Financial savings per year (in lakhs)	4.59 Lakh
Year of implementation	2021-2022
Energy savings (in kWh)	0.64 Lakh
Vendor (Name)	In-House
Vendor (Contact details)	

14. Lighting System Improvements

Before the lighting improvements, all bay lights remained illuminated during breaks, with manual control overriding ambient light conditions. Following the implementation of PLC (Programmable Logic Controller) with LDR (Light Dependent Resistor) based controls, significant changes have been made to the plant's lighting operations. Now, only emergency lights remain active during breaks, lunch periods, shift changeovers, and holidays. This upgrade ensures more efficient and environmentally friendly use of lighting resources, aligning operational needs with energy conservation goals.

Organisation Name	Saint Gobain
Category	Large Scale Energy Consumers
Investment	5 Lakhs
Financial savings per year (in lakhs)	3.59 Lakhs
Year of implementation	2022-23
Energy savings (in kWh)	59800

15. Replacement of conventional light fittings with energy-efficient LED light fittings

In factory premises, conventional MHL/ CFL lights were used in Production Hangars, Office buildings etc for illumination. These lights were consuming more energy and as a part of energy conservation, at various locations, conventional light fittings are replaced with energy-efficient LED light fittings. The installation of LED lights will eliminate the requirement of spares, labour etc for maintenance and there by a reduction in maintenance costs too.

Organisation Name	BEML Ltd, Palakkad Complex
Category	Small Scale Energy Consumers
Investment	Rs. 9.51 Lakhs
Financial savings per year (in lakhs)	Rs. 2 Lakhs
Year of implementation	FY 2022-23
Energy savings (in kWh)	30000
Vendor (Name)	LED make: Syska, supplied by M/s. LED House
Vendor (Contact details)	38 Sukheja Tower Wright Town, Jabalpur- 482002, Madhya Pradesh – 23, Mob: 9893325561

16. Inverter type split AC units

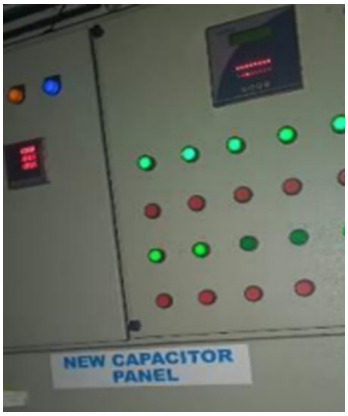
In FY 2022-23, Palakkad Complex has installed 9 nos of 3 Star inverter type split ACs in Office buildings. The inverter type ACs will reduce 10-15% energy consumption compared to conventional split ACs.

Organisation Name	BEML Ltd, Palakkad Complex
Category	Small Scale Energy Consumers
Investment	Rs. 4.06 Lakhs
Financial savings per year (in lakhs)	Rs. 0.26 Lakhs
Year of implementation	March 2023
Energy savings (in kWh)	4125
Vendor (Name)	AC make: LG, Supplied by M/s. Innovation Enterprises
Vendor (Contact details)	6/315, KUPPIYODE, MARUTHAROAD, PALAKKAD-678007, Kerala - 32

17. Installed new 160kvar capacitor panel

To improve the power factor, installed a new 160kvar capacitor panel (starts from 5kvar to 25kvar type).

Through this reduced maximum demand and daily consumption was reduced and achieved pf incentive also.



Organisation Name	Grand Hotel, MG Road, Kochi
Category	Buildings
Investment	3.25 lakh
Financial savings per year (in lakhs)	3.26 Lakh
Year of implementation	2022 May
Energy savings (in kWh)	23896
Vendor (Name)	Unicorn Engineers Corporation Kochi
Vendor (Contact details)	9846563853

18. Zero-watt Energy Intelligence

Installed ZeroWatt Energy Intelligence which uses artificial intelligence and data analytics to optimize energy usage. One of its main benefits is reducing energy costs significantly by identifying and eliminating inefficient energy usage patterns. The system's machine learning capabilities continually adapt and improve energy efficiency over time.

ZeroWatt Energy Intelligence also provides valuable data for regulatory compliance and reporting, making it easier to meet energy efficiency standards. This helps control energy consumption, cut costs, and contribute to a more sustainable future. The upgrade involves replacing current pumps in the dome vacuum system, which operate at 32% efficiency, with energy-efficient pumps boasting 65% efficiency in both the OHT and NBOM trench. The goal is to enhance performance, optimize power usage, and achieve a daily energy saving of 80 units, while also improving overall reliability and system performance.

Organisation Name	Grand Hotel , M G Road, Kochi
Category	Building
Investment	1.7 lakh
Financial savings per year (in lakhs)	0.58 lakh
Year of implementation	24/03/2023
Energy savings (in kWh)	5800
Vendor (Name)	Alphageek Enterprises pvt Ltd . Alappuzha
Vendor (Contact details)	9961101994

19. Installed PIR sensors & timer for energy efficient lighting

Installed timer for 1 no cold well machine to efficiently power off the machine after the designated time. In addition to this, installed PIR sensors in basement parking areas & Gent's locker rooms to switch off the lights when unoccupied.

Organisation Name	Crowne Plaza Kochi
Category	Building
Investment	0.25 Lakhs
Financial savings per year (in lakhs)	1 Lakh
Year of implementation	2023
Energy savings (in kWh)	10000
Vendor (Name)	In house team
Vendor (Contact details)	In house team

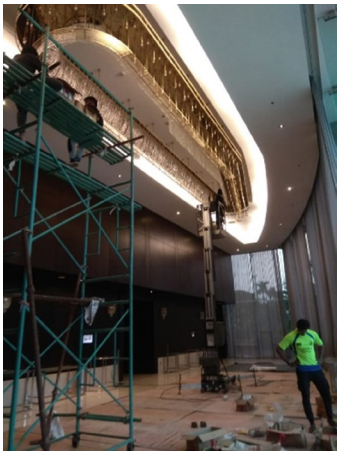
20. Energy efficient room

Replaced key card controls, thermostats and AC solenoid cartridges in 100 no's room

Organisation Name	Crowne Plaza Kochi
Category	Building
Investment	Large
Financial savings per year (in lakhs)	2 Lakhs
Year of implementation	1 Lakh
Energy savings (in kWh)	2022
Vendor (Name)	10000
Vendor (Contact details)	In house team

21. Energy efficient lighting

The crystals in the chandelier lights were cleaned and replaced the defective pieces. This has resulted in the efficient illumination inside the room. Hence, we were able to dim the LEDs on the chandelier and switch off the complementary lights and hence, considerable energy was saved.



Organisation Name	Crowne Plaza Kochi
Category	Building
Investment	4.8 Lakhs
Financial savings per year (in lakhs)	1 Lakh
Year of implementation	2023
Energy savings (in kWh)	10000
Vendor (Name)	M/s LIGHT N DEZINE
Vendor (Contact details)	accounts@lightndezine.com, 9489041988

CHAPTER – 3
THERMAL SYSTEM

1. Temperature Based Hot water Recovery in Curing Presses

Purpose

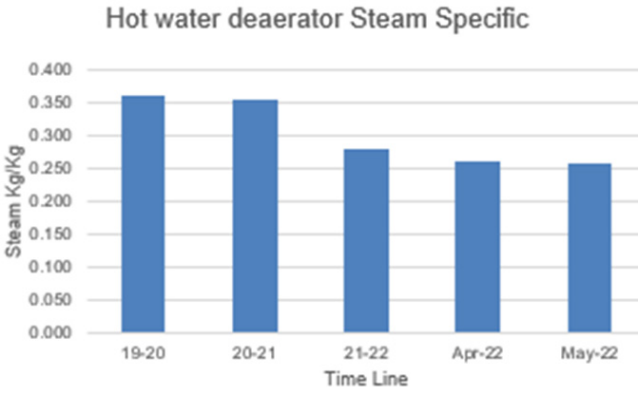
To maintain the Deaerator water temperature at the desired level and subsequently reduce Deaerator steam specific consumption

Existing System

- Hot water recovery is time based in curing presses.
- Due to extended Hot water cycle in Tyre Curing cycle time for some sizes, the temperature is dropping below the required temperature and will be recovered to deaerator.

Modified System

Introduced temperature based hot water recovery (recovery valve will shut off if water temperature drops), so as to ensure that water at the desired temperature is only going to deaerator



Organisation Name	Apollo Tyres Ltd., Kalamassery
Category	Large Scale Energy Consumers
Investment (INR Lakh)	5
Financial savings per year (in lakhs)	10
Year of implementation	May 2022
Steam savings (MTPD)	1.5
Vendor (Name)	In House

2. Rerouting of the steam header in Old Bag-O-Matic Curing trench to reduce the dead loss

Purpose

To reduce dead loss by relocating Old Bag-O-Matic control station.

Existing System

Steam line tapping for Old Bag-O-Matic control station is taken from a distant location resulting in radiation loss

Modified System

Steam line for Old Bag-O-Matic Curing trench control station rerouted, so as to reduce the pipe length by 120m.

Organisation Name	Apollo Tyres Ltd., Kalamassery
Category	Large Scale Energy Consumers
Investment (INR Lakh)	30
Financial savings per year (in lakhs)	8.62
Year of implementation	Sep 2022
Steam savings (MTPD)	1.29
Vendor (Name)	In House

3. Provide SS bellow type flexible spacers to fill up the vacant spaces in between Press cavity and mould

Purpose

To avoid steam loss when smaller size tyre sizes are running in bigger cavities (when more tyre sizes are there)

Existing System

- High steam consumption in case lower tyre sizes are scheduled in bigger cavities
- Cavity utilization will drop upto 50%

Modified System

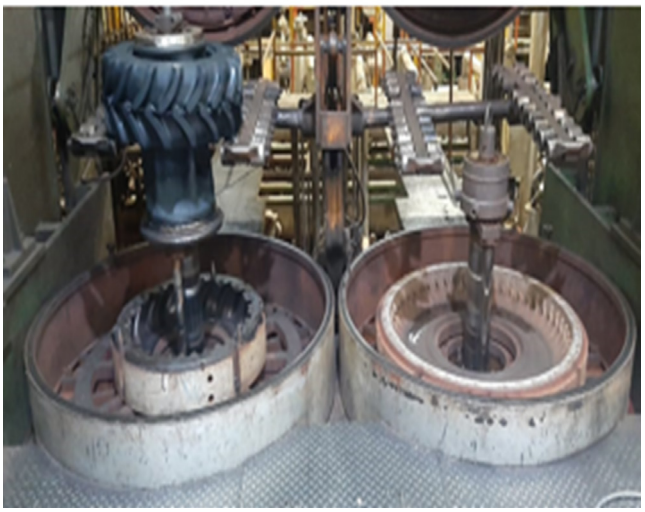
Fill up the non- utilized volume with SS bellow type flexible spacer

Organisation Name	Apollo Tyres Ltd., Kalamassery
Category	Large Scale Energy Consumers
Investment (INR Lak)	5
Financial savings per year (in lakhs)	3.34
Year of implementation	Jun 2022
Steam savings (MTPD)	0.5
Vendor (Name)	In House

4. Single cavity Dome steam Isolation for One Side Curing

Purpose

To avoid steam loss when twin cavity presses are running with a single mould (In case of low demand sizes)



Existing System

No provision for Single cavity dome steam isolation in case single mould is loaded in twin cavity presses.

Modified System

- Dome steam controlling and recording shifted to left cavity in all presses and single mould also will be placed in the left cavity
- Single cavity isolation being carried out by providing isolation valves

Organisation Name	Apollo Tyres Ltd., Kalamassery
Category	Large Scale Energy Consumers
Investment (INR Lak)	8
Financial savings per year (in lakhs)	3.34
Year of implementation	Jul 2022
Steam savings (MTPD)	0.5
Vendor (Name)	In House

5. Online Temperature Monitoring System in Internal bundle

Purpose

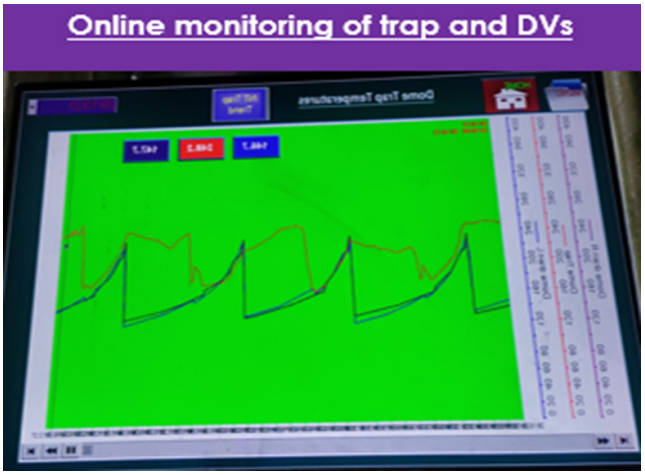
To avoid steam loss due to internal leaks such as Steam trap and Piston valve passing

Existing System

Internal leaks are identified by manual checking with IR thermometer which is not always accurate and also time consuming.

Modified System

- RTDs provided in Steam trap and Piston valve output line
- Internal temperature will be monitored continuously for any leaks.
- Alarm will be generated if any abnormality in the temperature.



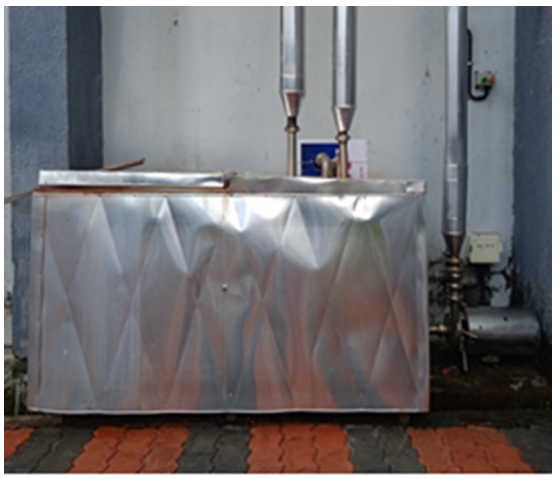
Organisation Name	Apollo Tyres Ltd., Kalamassery
Category	Large Scale Energy Consumers
Investment (INR Lak)	25
Financial savings per year (in lakhs)	3.34
Year of implementation	Jul 2022
Steam savings (MTPD)	0.5
Vendor (Name)	In House

6. Revamping of Condensate Recovery System

Revamping of condensate recovery system by connecting all steam return line points and optimizing the return pressure.Re-insulation of all steam lines based on surface temperature to prevent heat loss.

Organisation Name	HLL Lifecare Limited
Category	Medium Scale Energy Consumers
Investment	Rs. 5.75 Lakh
Financial savings per year	Rs. 12.80 Lakh
Year of implementation	2022-2023
Vendor (Name)	This work was implemented by M/s. Forbes Marshall, Pune with the support of an in-house Engineering team.

7. Condensate Recovery System



The system consumes a total of 3,294,520 kilograms of steam and recovers 2,635,616 kilograms of condensate after accounting for flash steam loss. Initially, the water in the system is at 25°C, but with the recovery system in place, the average feed water temperature increases to 75°C. This temperature boost requires 551,766,210 kilojoules of energy.

The briquettes used in the boiler have a calorific value of 17,585.4 kilojoules per kilogram. The system's equivalent briquette savings are calculated to be 31,376.381 kilograms, but with a boiler combustion efficiency of 70%, the actual briquette savings amount to 44,823.401 kilograms, translating to a daily saving of approximately 211.43114 kilograms of briquettes. Given the cost of briquettes at Rs. 7.3 per kilogram, the total annual financial savings reach Rs. 327,210.83. The initial investment for the system is Rs. 213,000.

Overall, the condensate recovery system significantly reduces energy consumption and operational costs by efficiently recycling condensate, improving the steam generation process, and yielding considerable financial savings.

Organisation Name	MRCMPU Ltd. Kannur Dairy
Category	Medium Scale Energy Consumers
Investment	2.13 lakhs
Financial savings per year (in lakhs)	3.2721083
Year of implementation	2022
Energy savings (in MU)	0.22924756

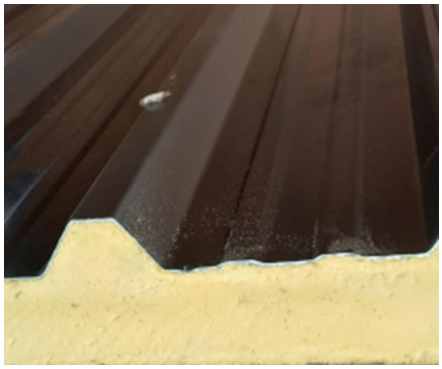
8. Desuperheater For Waste Heat Recovery

The desuperheater system efficiently recovers waste heat to heat water, reducing operational costs and improving energy efficiency. It heats water from 30°C to 68°C, operating for a total of 25 hours daily across compressors. Water flow varies with compressor usage, yielding 4,550 litres of hot water daily. It provides 172,900 kcal/day, saving 20,440 kg of briquettes annually, worth Rs. 1,86,515 at Rs. 9.125/kg. Initial investment is Rs. 40,000, offering a quick 4-month payback period.

Organisation Name	MRCMPU Ltd. Kannur Dairy
Category	Medium Scale Energy Consumers
Investment	0.4
Financial savings per year (in lakhs)	1.86515
Year of implementation	2022
Energy savings (in MU)	0.0099872

9. GI corrugated sheet roofing to puff sheet roofing

The roofing has been changed from GI corrugated sheets to high-quality puff roofing sheets, resulting in a 3-degree reduction in room temperature compared to GI roofing. The air-conditioner uses less power due to the lower temperature. Energy is saved by setting the air conditioner to 24 degrees Celsius.



Organisation Name	Grand Hotel, MG Road, Kochi
Category	Buildings
Investment	3.25 lakh
Financial savings per year (in lakhs)	1.26Lakh
Year of implementation	2023 February
Energy savings (in kWh)	14172
Vendor (Name)	Skylite Roofing , Kochi
Vendor (Contact details)	9947688877

10. Energy efficient cooking

Shifting of live cooking station to the open space. This has reduced the heat load inside the kitchen and thereby saving the energy by reducing the load on chiller. The conventional cooking units are replaced with high efficiency induction cooker thereby reducing the PNG consumption.

Organisation Name	Crowne Plaza Kochi
Category	Building
Investment	3 Lakhs
Financial savings per year (in lakhs)	0.1 Lakh
Year of implementation	2023
Energy savings (in kWh)	1000
Vendor (Name)	In house team
Vendor (Contact details)	In house team

CHAPTER – 4

RENEWABLE SYSTEM

1. 2 Ton 4-wheel battery-operated platform trucks

Introduced 4-wheel battery operated platform trucks in shop floors for movement of small materials used for Production purposes. By introduction of battery-operated trucks, the usage Diesel operated Forklifts is eliminated which in turn reduces the emission of Diesel Forklifts.

Organisation Name	BEML Ltd, Palakkad Complex
Category	Small Scale Energy Consumers
Investment	Rs. 4.75 Lakhs
Year of implementation	March 2023
Vendor (Name)	M/s. Jost Engineering Co. Ltd
Vendor (Contact details)	MATERIAL HANDLING DIVISION C-7, WAGLE INDUSTRIAL ESTATE, ROAD NO. 12, THANE- 400604, Maharashtra - 27

2. E mobility Program

Introduction of E vehicle for movements inside campus and employee commute EV charging stations in parking lots.

Organisation Name	Quest Global Engineering Services Pvt Ltd
Category	Buildings
Investment	7 Lakh
Year of implementation	2022-2023

3. Solar water heater for tray washer

The installed capacity of the solar water heater is 3000 litres per day. The temperature of the feed water entering the solar water heater is 30°C, and the temperature of the water exiting the solar water heater is 65°C. The total heat value generated by the solar water heater is 105,000 kilocalories (kCal).

Organisation Name	MRCMPU Ltd. Kannur Dairy
Category	Medium Scale Energy Consumers
Investment	4.45 Lakhs
Financial savings per year (in lakhs)	0.93324
Year of implementation	2022
Energy savings (in MU)	0.052276

4. Solar Yard Lights

Our campus is equipped with 100% Solar Yard lights, sensor taps, sewage treatment plant to conserve water and thereby reducing running hours of underground sump pumps.

Organisation Name	Quest Global Engineering Services Pvt Ltd
Category	Buildings
Investment	9.36 Lakh
Financial savings per year (in lakhs)	1.36 Lakh
Year of implementation	2021-2022
Energy savings (in kWh)	0.083 Lakh

CHAPTER – 5

KERALA STATE ENERGY CONSERVATION AWARD 2024 GUIDELINES

OBJECTIVE

To give recognition to the selected enterprises, organizations, and institutions who have made systematic and serious attempts for efficient utilization of energy, conservation of energy, research, and promotion of energy efficiency during the year 2023-24 in the State of Kerala.

THE AWARDS

The awards are proposed to be given in the form of a Plaque with an appropriate citation on such award, as may be decided by the State Level Monitoring Committee for Energy Conservation (SLMCEC) in Kerala.

Sl No	Category	Prize
1	Large Scale energy consumers	Citation, Plaque, Rs. 1,00,000/-
2	Medium Scale energy consumers	Citation, Plaque, Rs. 1,00,000/-
3	Small-scale energy consumers	Citation, Plaque, Rs. 1,00,000/-
4	Buildings	Citation, Plaque, Rs. 1,00,000/-
5	Institutions & Organizations	Citation, Plaque, Rs. 1,00,000/-
6	Promoters of energy efficient products	Citation, Plaque Rs 50,000/-
7	Architectural firms and Green Building Consultancy	Citation, Plaque, Rs 50,000/-

In addition to the prize money the added benefits for all applicants* includes:

Sl No	Benefits	Prize
1	Financial assistance for ISO 50001 Certification.	**Public Sector Undertakings/ Govt. Buildings/ Govt. Organizations:** The financial assistance is 50% of the total expenditure for ISO 50001 certification (Excluding taxes) limited to a maximum of Rs.1, 00,000/- (Rupees One lakhs). **Private Industries/Buildings/Organization:** The financial assistance is 50% of the total expenditure for ISO 50001 certification (Excluding taxes) limited to a maximum of Rs.50,000/- (Rupees Fifty Thousand)
2	Financial assistance for Energy Audit. Mandatory Audit *(As per G.O (Rt) No. 2/2011 dated 01/01/2011)*	Public Sector Undertakings/ Govt. Buildings/ Govt. Organizations: Financial assistance 50% of the total Energy audit fee (Excluding taxes) limited to a maximum of Rs.75,000/- (Rupees Seventy-five Thousand) for industries as per Mandatory Audit G.O (Rt) No. 2/2011 dated 01/01/2011. If the industry/building/organization is having an LT connection the total energy audit fee (excluding taxes) shall be given as financial assistance subject to a maximum of Rs. 10,000/-(Rupees Ten Thousand only) Private Industries/Buildings/Organization: Financial assistance 50% of the total Energy audit fee (Excluding taxes) limited to a maximum of Rs.50,000/- (Rupees Fifty Thousand). If the industry/building/ organization is having an LT connection the total energy audit fee (excluding taxes) shall be given as financial assistance subject to a maximum of Rs. 10,000/-(Rupees Ten Thousand only) This scheme is not applicable to “Designated Consumers” (DC)

3	Financial assistance for CEA/CEM examination.	Engineer in the industries shortlisted for EC Award who has got certification as a Certified Energy Auditor or Energy Manager of BEE during the financial year 2023-24 onwards the examination fee shall be reimbursed by EMC. The maximum financial assistance is limited to Rs.10,000/- (Rupees Ten thousand).

**The above assistance will be provided under EMC's scheme – Priority will be given to shortlisted applicants on first come first serve basis upon fund availability. The support for implementing Energy Management System - whose detailed guidelines as published in EMC website www.keralaenergy.gov.in.*

SHORTLISTING OF APPLICANTS

The applicants in each category shall fill up the details in the prescribed proforma (format enclosed) and submit the proforma on or before the last date of application as mentioned in these guidelines. Based on the details submitted by the applicants in the prescribed proforma (format enclosed), the applicants will be shortlisted. The shortlisting shall be conducted by a suitable technical committee constituted by EMC. The performance of the shortlisted applicants would be evaluated by the Committee and if needed through a video documentation/visit/interview by the committee. EMC will provide a certification of appreciation to all the shortlisted applicants.

The technical committee reserve the right to move an entry of a participant from the category applied by to another category, at their discretion, if the criterion of participants profile and/or Energy Efficiency & Energy Conservation measures is found so by the Judges.

The technical committee would take a final decision depending upon the number of entries received and other considerations. If suitable applicants are not identified to qualify, the award in that category will not be given. Those applicants, who have received Awards within the last two years in particular category, if adjudged to be eligible for award in this qualifying year too, based on their performance, in addition to the award they will be recognized as Alpha awardee. Certificate of appreciation would be given to shortlisted applicants except for those who won award and commendation.

The qualifying period for the award is the previous financial year from 1st April 2023 to 31st March 2024. However, as conservation efforts require longer period for implementation in some cases, the work in this direction for the immediately past 3 financial years will also be reviewed. For the HT/EHT consumer compliance of G.O (Rt) no.2/2011/P.D. dated, Thiruvananthapuram 01-01-2011 is desirable.

ELIGIBILITY/CATEGORISATION

The scheme is open to all enterprises in the State of Kerala, as per the categorization listed below.

Category 1: Large scale energy consumers

(Including large scale industries except buildings –All consumers in the State with a total (electricity + fuel) annual energy consumption more than 1000 TOE* (Ton of Oil Equivalent)) or 11.6 Million Units and Designated consumer notified by central Government as per EC Act 2001.

Category 2: Medium scale energy consumers

(Including medium scale industries except buildings – All consumers in the State with a total (electricity + fuel) annual energy consumption between 150 to 1000 TOE * or 1.7 Million Unit to 11.6 Million Unit.

Category 3: Small scale energy consumers

(Including small scale industries except buildings – All consumers in the State with a total (electricity + fuel) annual energy consumption up to 150 TOE* or Up to 1.7 Million Unit.

Category 4: Buildings

(All Commercial Buildings including hotels, hospitals, Shopping Malls, Office Buildings, Theatres, Educational Institutions etc who have implemented energy conservation/ efficiency/e-mobility programs in their facilities and Institutions/Buildings who has designed and/or developed such buildings/campus including LEED/green Building, GRIHA rated or ECBC Compliant building or with proven/certified Energy Efficiency and conservation including Green/Eco friendly considerations).

Category 5: Institutions & Organizations

(Including Local Bodies, NGOs ,and organizations involved in the implementation and promotion of energy conservation, energy efficiency and clean energy projects / programs e – mobility.

Category 6: Promoters of energy efficient products

(Including Manufacturers of energy efficient retrofits/ controls suitably proven and certified by competent / accredited labs/institutions in the State and Retailers and traders who are selling/distributing BEE star labelled products notified by Ministry of Power, Govt of India as listed below).

- under mandatory scheme viz Room Air Conditioners, Frost Free Refrigerators, Tubular Florescent Lamp, Distribution Transformer, Room Air Conditioner (Cassettes, Floor Standing), Direct Cool Refrigerator, Color TV, Electric Geysers, Variable Capacity Inverter Air conditioners and LED Lamps.
- under voluntary scheme Induction Motors, Pump Sets, Ceiling Fans,LPG -Stoves, Washing Machine, Computer (Notebooks/Laptops), Ballast (Electronic/ Magnetic),Office equipment's (Printer, Copier, Scanner, MFD's),Diesel Engine Driven Mono-set Pumps, Solid State Inverter,DG Sets,Chillers,Microwave Oven, Solar Water Heater, Light Commercial Air Conditioner, Deep freezers.

Category 7: Architectural firms and Green building Consultancy

(Including Architectural firms and Green building consultants who has designed and/or developed such buildings/campus including LEED/IGBC / GRIHA /other or ECBC Compliant building or with proven/ certified Energy Efficiency and conservation including Green/Eco friendly considerations)

Toe – Calculation

$$\text{* Energy consumed in (toe)} = \frac{\text{Fuel consumed quantity (kg or kL) x gross calorific value (kcal/kg or kcal/kg)}}{10\text{^}7}$$

FINAL EVALUATION

The Award Judging Committee constituted from the panel decided by the State Level Monitoring Committee for Energy Conservation Activities in Kerala will decide on the recipient of the awards on the basis of outstanding achievements and contributions in the field of energy conservation and management. The Award may not necessarily be decided on the basis of only quantitative achievements but also taking into account the various other factors such as innovative techniques and technologies adopted, commitment of the management, environment friendliness organizational set-up to promote energy conservation in the unit, etc.

The members of the Award Judging Committee or their nominees may visit participating enterprises/ organizations/Institutions for verification of data supplied, if felt necessary, and it will be obligatory on the part of the participating units to provide necessary assistance and co-operation for such visits. For finalizing the list of award winning units the Committee may invite / visit the short listed enterprises/organizations/ Institutions for judgment of their activities. The short listed applicants will have to bear all the expenditure of their travel in this connection, also they shall make necessary arrangement for the technical committee's visit upon prior intimation from EMC.

CRITERIA FOR JUDGING THE MERIT

Aspects that could be considered while judging the application includes the following

Industries (Category 1,2 and 3) (Designated consumers, Large, Medium, Small scale industries)	Buildings (Category 4) (including Designated consumers in Building category)
• Corporate Energy & environment policy • Green purchase policy • Energy Manager • Energy Conservation cell • Worker's representation in Energy Conservation cell • Energy Audit Frequency • Monitoring/Evaluation set up • Energy savings achieved • Capital invested for Energy Conservation • Training Programs/ number of personals trained in Energy Efficiency and Energy Conservation • Innovative Programs or Projects • Reduction in Specific Energy Consumption 2023-24 • Reduction in Specific Energy Consumption 2022-23 • Reduction in T&D Losss • E-mobility schemes /programs • Measures implemented exclusively for Energy Saving • Consistency in energy conservation efforts (last 3 years) • Efforts in Fossil Fuel Substitution • Quality Of Reporting • Final Presentation	• Certified Green Building Or Rated • Building management & Energy policy • Energy Manager • Energy Conservation cell • Energy Audit Frequency • Provision for Monitoring/Evaluation of energy conservation efforts • Energy savings achieved & carbon foot print prevented • Capital invested for Energy conservation programme • Training Programmes for employees • Innovative Programmes or Projects on energy conservation • Reduction in Specific Energy Consumption 2023-24 • Reduction in Specific Energy Consumption 2022-23 • Measures implemented exclusively for Energy Saving • E-mobility schemes /programs. • in energy conservation efforts (last 3 years) • Fuel substitution efforts • Quality Of Reporting • Final Presentation

Institutions & Organizations (Category 5)	Promoters of energy efficient products (Category 6)
• Specify what is exactly innovation in promoting energy conservation • Carbon neutral initiatives • Participatory approach between society at large and NPO • Replicability • Coverage (District, State, country wide& International) • Consistency in efforts • of Energy Saving Possible through your efforts • Benefit to society attributed to your Energy conservation effort • Recognition received for energy - environment conservation or management efforts • Efforts in Fossil Fuel Substitution attributed to your effort • E-mobility schemes /programs • Socio economic & environmental impact of your effort in promoting Energy conservation • Final Presentation	• Manufacturing of energy efficient products and controls. • Efforts in Promotion of star labelled products • No of various star labelled products sold/ • Demarcated area in showroom to display star labelled products • Energy efficiency /conservation measures/ energy audit conducted/implemented in own building • Training programs for employees on star labelled product • Attending Retailers /traders program for star labelling conducted by Bureau of energy Efficiency or energy management Centre • Incentives /discounts/offers for star labelled products, if any • Empanelled with Energy management Centre for distribution of star labelled products • Final Presentation • Maintaining database of Energy Efficient Products sold

Architects and Green building consultants (Category 7)
• Architects and Green building consultants (Category 7) • Design of energy-efficient building projects • No of buildings with Green building certification (IGBC, LEED, GRIHA or others) • Empanelment /certification • Attending Certificate/training program /webinars on ECBC conducted by EMC • Design of ECBC-compliant buildingv • Innovative design interventions or Energy Efficient technologies • Consistency in energy conservation efforts (last 3 years) • Quality Of Reporting • Final Presentation

The Committee's decision would be final and no appeal for re-consideration is encouraged.

INSTRUCTIONS FOR FILLING UP THE 'AWARD PRO FORMA'

The data required for the proforma pertains to the accounting years 2021-22, 2022-23 and 2023-24.

The enclosed proforma is only a format and thus information sought may be separately computer printed or neatly typed. The proforma could also be downloaded from the website of Energy Management Centre; www.keralaenergy.gov.in. (Duly filled in Application form, with supporting documents may be submitted in Soft copy/email to ecawardsemc@gmail.com , no hard copy required if soft copy is submitted).

Certificates to the effect that the enterprise/ organization is presently following all the statutory requirements pertaining to safety and pollution control wherever applicable should be attached along with the proforma.

Important: Annual reports for the last three years are required to be attached along with the "Award Proforma" in the case of large-scale energy consumers

The answers to the questions should be precise and specific and should be supplied in total compliance with the pro forma format. Additional information so as to support the case may be included referring to the criteria of evaluation as specified above. The deviations may lead to improper evaluation or the rejection of the application. Each and every query mentioned in the proforma needs to be answered. Even, if the answer is 'NO' or 'NOT APPLICABLE' the same may be stated, instead of ignoring it. The Chief Executive of the enterprise/organization /institution should sign the duly filled-in proforma.

The shortlisted applicants shall present their credentials and initiatives in the field of energy efficiency in the following format

Category 1,2 ,3 and 4 (Large, Medium,, Small scale industries and Buildings)		
Sl No:	**Content**	**No of slides**
1	Company profile	1
2	Major energy conservation activities, Savings and investments during 2023-24	5
3	Next year program and projects in Energy conservation	1
4	Renewable Energy program	1
5	Training program in Energy conservation for workers, supervisors Engineers and others	1
6	Innovative ideas and suggestions	1

Category 5 (Institutions & Organizations)		
Sl No:	**Content**	**No of slides**
1	Profile of institution/organization	1
2	Major energy conservation activities, Savings and investments during 2023-24	5
3	Next year program and projects in Energy conservation	1
4	Carbon neutral initiatives	1
5	Energy conservation campaigns	1
6	Innovative ideas and suggestions	1

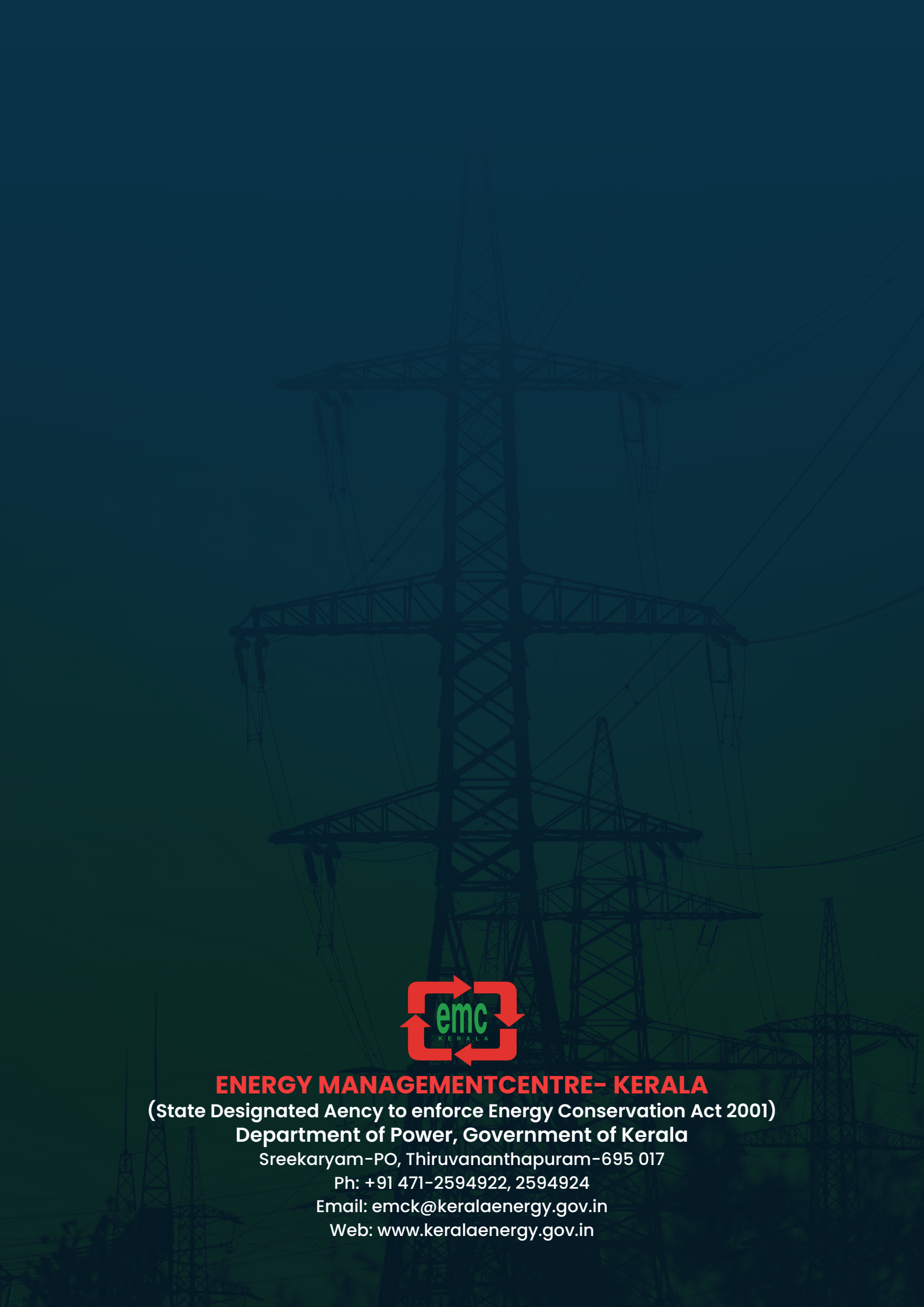
Category 6 (Promoters of energy efficient products)		
Sl No:	**Content**	**No of slides**
1	Profile of applicant	1
2	Major promotional activities , energy efficient products promoted /sold during 2023-24	5
3	Innovative ideas and suggestions	1

Category 7 (Architectural firms and Green Building Consultancy		
Sl No:	**Content**	**No of slides**
1	Profile of applicant	1
2	Details of energy-efficient building projects during 2023-24	5
3	Innovative design interventions or Energy Efficient technologies	1

SUBMISSION OF NOMINATION

Last date of application: **10th October 2024**

For more details visit our website: www.keralaenergy.gov.in



ENERGY MANAGEMENTCENTRE- KERALA

(State Designated Aency to enforce Energy Conservation Act 2001)

Department of Power, Government of Kerala

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