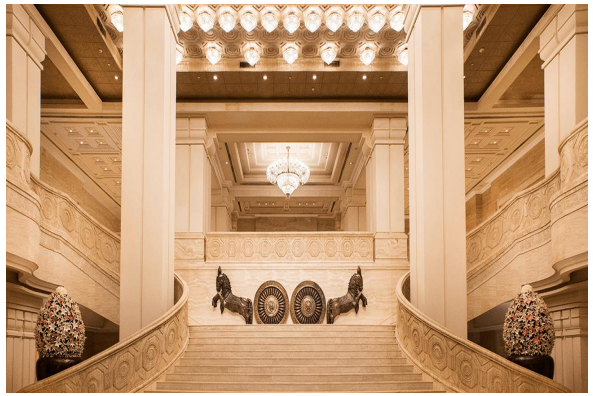
CII 25th NATIONAL AWARD FOR EXCELLENCE IN ENERGY MANAGEMENT 2024

ITC HOTEL
RESPONSIBLE LUXURY
ITC GRAND CHOLA
CHENNAI

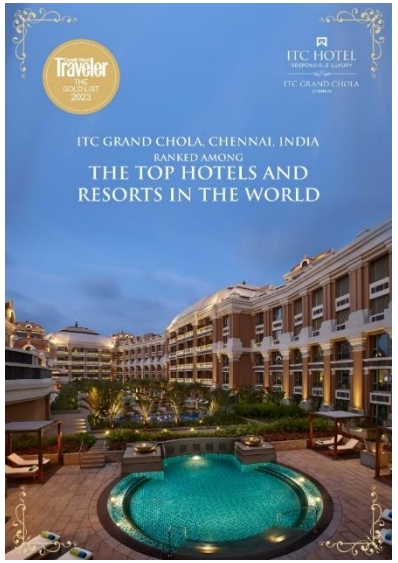
ITC Grand Chola – ITC Limited
A Luxury Collection Hotel, Chennai.

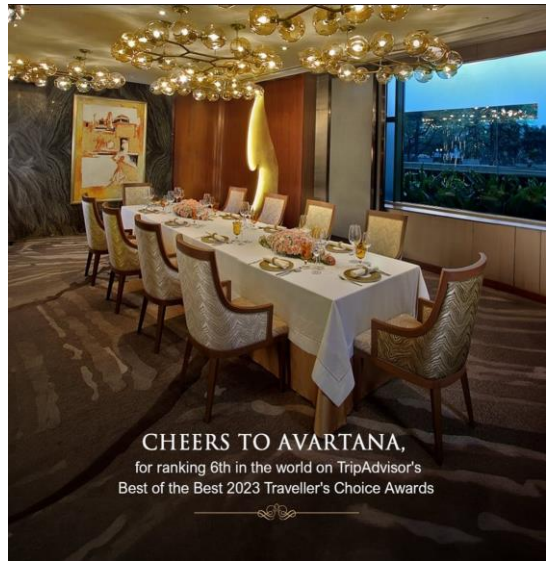
Presented by,
Sandeep Pednekar
Head of Technical Service, ITC Grand Chola, Chennai.

ITC Grand Chola - Introduction



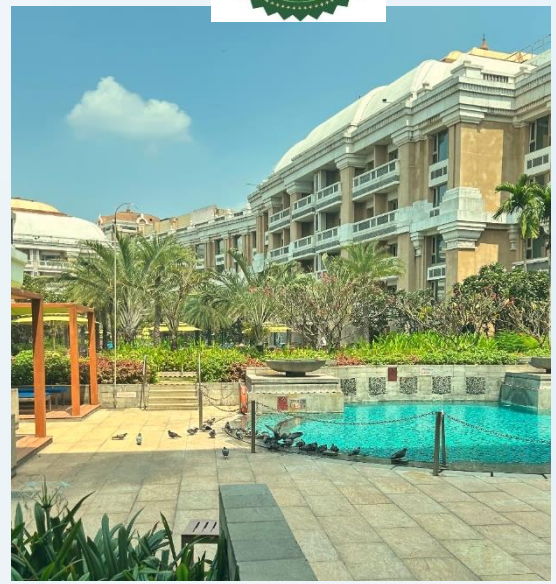
- ITC Grand Chola – A Palatial Tribute to Southern India greatest empires – **The Imperial Cholas.**
- Beautifully constructed luxury hotel sprawling over 8 acres with the **total buildup area of 15 Lakhs Sq. feet** with Lobby + 10 Storied grand structure.
- ITC Grand Chola offers **600 luxury rooms** and 10 award winning F&B Outlets offering the finest of specialty cuisines.
- At a sprawling **26500 Sq. feet, Rajendra is one the country's largest pillar-less banquet halls.**
- Responsible Luxury: One of the world's largest hotel to achieve LEED Platinum and LEED Zero Carbon Certification by USGBC.
- **Asia's 50 best Restaurants 2024 - Avartana ranked at 44.**
- Awarded as Best Classified 5 Star Hotel by Tamil Nadu Tourism department.
- Listed as one of the best hotels and resorts in the world : The Gold list 2023 – Condé Nast Traveler.





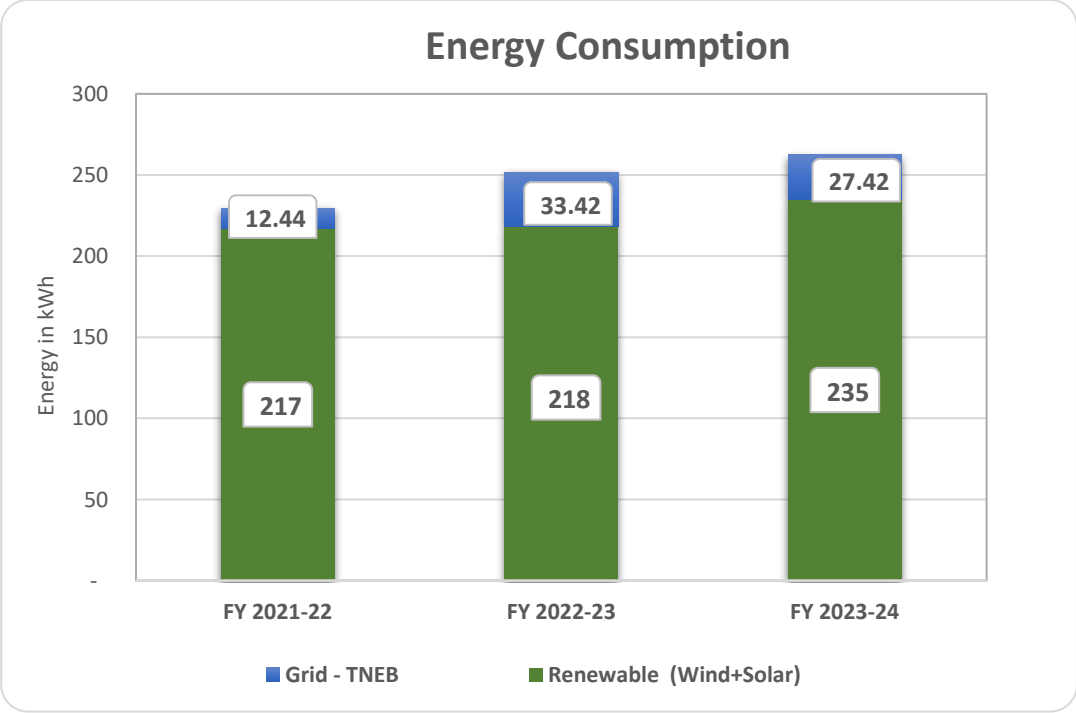
ITC Grand Chola – Passive Design Features

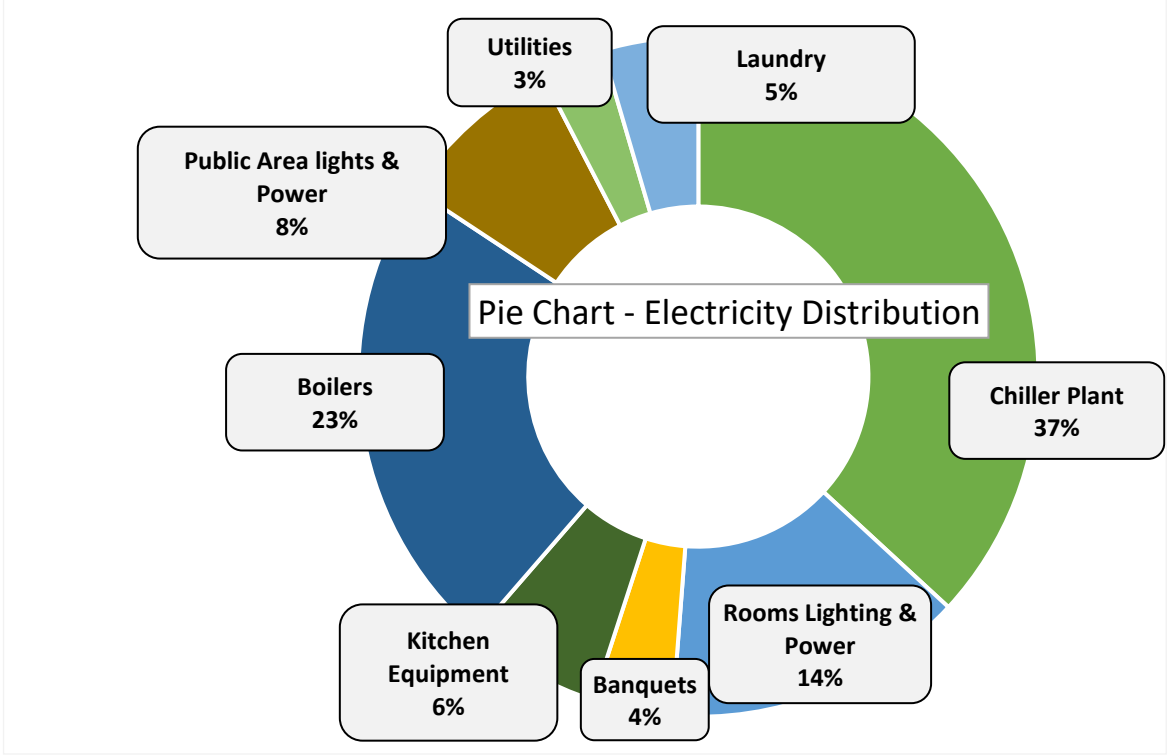
- **Climate Zone:** ITC Grand Chola falls in the climate zone of Warm Humid.
- **Building Orientation:** Building oriented to East & West facing.
- **SHGC of Glass:** ITC Grand Chola has used the window glasses with **SHGC of 25%.**
- **Walls:** Walls are constructed with Thick stone and **AAC (Autoclaved aerated concrete)** block walls to reduce solar heat gain.
- **WWR (Window to Wall Ratio)** : WWR restricted to 25% to reduce solar heat gain inside the building.
- **Windows:** Recessed windows to cut direct sun rays and glare inside the building.
- **Heat Island Reduction:** Paint applied in roof and façade with **high SRI of close to 95.**
- **Green roof:** A large percentage of the terrace area (4784 sq.mt) is provided with a green roof.
- **OSR Park:** Maintaining green space with an Open Space Reserve Park (OSR Park) area of 3233 Sq. Meters featuring lush landscaping.
- **Shading:** Rooms provided with closed balconies to optimize the indoor thermal environment.
- **Thermal Insulation Effect:** Building has Specially designed 17 no's domes covering the terrace providing the thermal insulation effect to the building.



Energy Performance Index - Overview

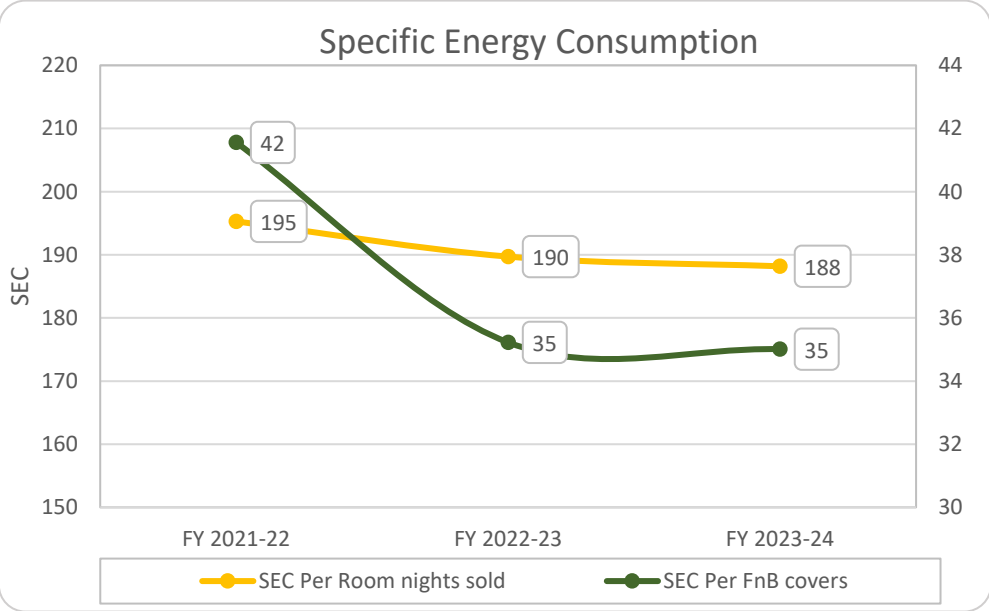
Year	Sources of Energy - Electricity			Total Electricity consumption	Other Energy Sources			Total of other Consumption	Total Energy Consumption	Energy Performance Index
	Grid - TNEB	DG Generated	Renewable (Wind+Solar)		Biodiesel	LPG	Charcoal			
	In Lakh kWh	In Lakh kWh	In Lakh kWh	In Lakh kWh	Litres	Kgs	Kgs	In Lakh kWh	In Lakh kWh	KWh/Sq.m
FY 2021-22	12.44	1.54	217	231	18,000	95,655	1,36,360	6.62	237.78	**167.26**
FY 2022-23	33.42	1.20	218	253	12,000	1,19,747	1,83,512	43.20	296.01	**208.23**
FY 2023-24	27.42	2.14	235	265	53,000	1,30,150	1,93,437	42.08	306.63	**215.70**





Specific Energy Consumption

Description	Units	Specific Energy Consumption		
		FY 2021-22	FY 2022-23	FY 2023-24
Total Energy in Lakhs kWh	kWh	237.78	296.01	306.63
SEC Per Room nights sold	**kWh**	**195**	**190**	**188**
SEC Per FnB covers	**kWh**	**42**	**35**	**35**
Occupied room nights sold	Room nights sold	1,21,759.00	1,56,034.00	1,62,949.00
FnB Covers	Pax	5,72,165.00	8,40,339.00	8,75,849.00
Reason for Variations	-		**1. Increase in Overall occupancy of 28% and FnB covers of 47% over LY due to Post Covid**	**1. Increase in Overall occupancy of 4% and FnB covers of 4% over LY. 2. Additionally Unit installed Electric dishwashing machine.**



- SEC per Sq. Meters has been controlled at 216 against 208 despite increase in the occupancy & FnB covers and new addition of electric equipment's such as electric dishwasher and new kitchen equipment.
- Whereas unit has reduced **SEC per room nights to 188 from 190** despite increase in occupancy and FnB covers.
- Additionally, Unit has implemented multiple energy conservation measures to improve the SEC.

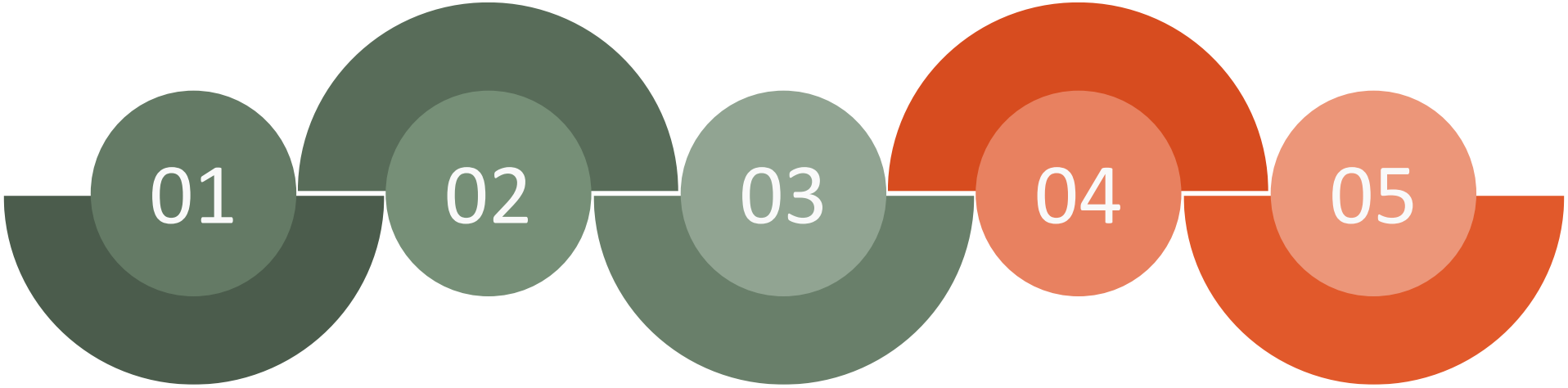
Information on Competitors, National & Global benchmark

Benchmarking	Souce of Information	SEC (kWh/ Sqm/ Year)	
		Standard	Actual – ITC Grand Chola – FY 2023 24
Regional Benchmarking among our 3 competitors	BEE	Lowest - 285 Highest - 638	**216**
National Level	BEE	333	**216**
Global Level	International Tourism Partnership	285	**216**

Roadmap to further reduce the Specific Energy Consumption

Upgradation to Energy Efficient Cooling Towers

Power Quality Enhancement – Hybrid Active Harmonics Filter with reactors.



Optimization of HVAC System Operations

Implementation of Energy Efficient motors for AHU's and Water Pumping system.

Bio-Gas Plant for Bulk cooking.

Energy Savings Projects Completed in last 3 years

Year	No of Energy saving projects	Investments (INR Lakhs)	Electrical savings (kWh)	Thermal savings (Million Kcal/ Annum)	Savings (INR Lakhs)
FY 2021 - 22	2	72.7	0.24	546	51.52
FY 2022 - 23	1	30	2.88	-	8.64
FY 2023 - 24	2	77	4.82	-	14.40
		179.70	**7.94**	**546.43**	**74.56**

SI#	Year	Description of energy efficiency improvement measure	Category	Investment Lakhs Rs.	Cost savings in Lakhs (Rs)	Electricity savings in Lakh kWh
1	FY 2021 22	Installation of Electric boiler to eliminate the fossil fuel consumption from fuel boilers.	Electrical/ Thermal	57.3	50.80	-
2	FY 2021 22	Upgrading to Energy Efficient Motor based Air Handling Units.	HVAC	15.4	0.72	0.24
3	FY 2022 23	Upgradation of BMS and HVAC System to optimize the operations and energy effieicncy	Building Automation	30	8.64	2.88
5	FY 2023 24	Replacing the existing the TFA Units with Energy Efficient EC Fan TFA Units.	HVAC	17	5.40	1.82
6	FY 2023 24	Optimization of energy by replacing the existing cooling tower to Energy efficient cooling tower	Chiller Plant	60	9.00	3.00

Innovative Projects 1 – First ITC Hotel to Convert to Electric boiler from fuel fired boiler with 100% renewable energy

1. ITC Grand Chola had its own Wind farm of 14.6 MW and was planning for a renewable capacity addition of 5 MW Solar plant.
2. Hence for the maximum utilization of renewable energy and in line with ITC ‘s strong commitment to sustainability unit took a decision to transition from Bio Diesel fired boilers to Electrical Boilers for reducing the environmental impact.
3. Electric Boilers produce no onsite emissions, unlike bio diesel boilers which still emit some greenhouse gases and other pollutants even though Bio diesel is cleaner fuel as compared to fossil fuels. By switching the electric boilers, ITC Grand Chola could further reduce its carbon footprint and improve air quality. Particularly in the context of sustainability, operational efficiency and cost management.
4. Electric Boilers have higher energy conversion efficiency compared to Biodiesel boilers, which mean more of the energy input is converted into usable heat, reducing energy waste.

Average daily Electricity consumption of the electrical boiler (in KWH)	Yearly amount of Electricity unit consumption by electrical boiler (In Lakhs KWH)	Rate (Rs) Electrical unit after Wind & Solar adjustment	Total cost of electricity consumed by the Electrical boiler (Lakhs Rs)
16000	58.40	2	116.8

Average daily Bio Diesel consumption (in liters)	Yearly bio Diesel consumption (in liters)	Average rate (Rs) of per liter bio Diesel	Total cost of Bio Diesel for the year (Lakhs Rs)
1600	5,84,000	90	552.6

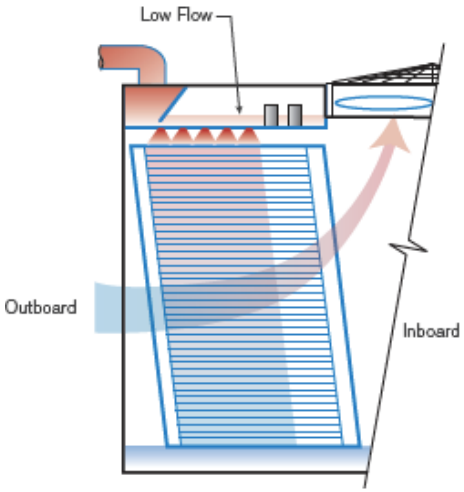
Therefore unit has achieved estimated saving of Rs 4.36 Crores in a year by introducing Electrical boiler. Payback of investment achieved in 4 months

Innovative Projects 2 – Advanced Energy Efficient Cooling Tower

40% Energy Savings in Cooling Tower Operations by advanced technology features:

- The Advanced cooling tower uses technology optimized fan designs, helix fills, high efficiency motors and advanced water distribution systems.
- Using **Helix curtain fills gives better heat exchange** as fills are on both side of the tower top to bottom.
- Crossflow tower can run effectively even at 30% flow rate.
- In Crossflow Cooling tower, the process water is pumped to the top of the tower and discharges into a hot water basin with nozzles. The nozzles are gravity fed with the height of the water above the nozzles being the driving force.
- Achieved overall annual **savings of 3 Lakh units** by installing advanced energy efficient cooling tower having lower approach of 5.4 deg F and rated motor power of 18.5 kW**.**

Sl	Particulars	Rated Power in kW	CT Approach deg F	Operational hours in year	Input Motor kWh
1	Existing conventional Cooling Tower	30	7.1	8760	1.97
2	Advanced Energy Efficient Cooling Tower	18.5	5.4	8760	1.21
	Net Savings in Fan Motor (In Lakh kWh)				**0.75**
	Net Savings in Chiller in Lakh kWh by improving the approach by 1.7 deg F				**2.24**
	Total annual Savings by Motor + Chiller in Lakh kWh				**3.00**

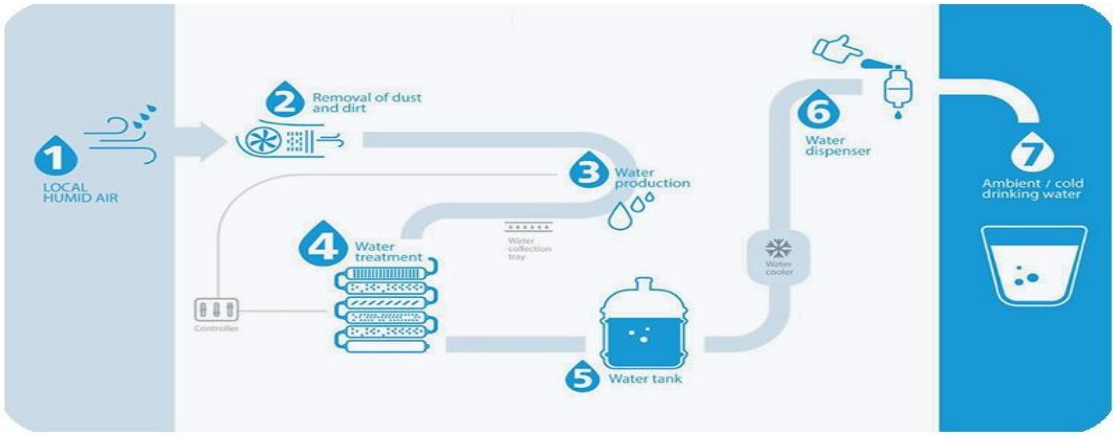


Cross Flow Cooling Tower can run effectively even at 30% flow rate

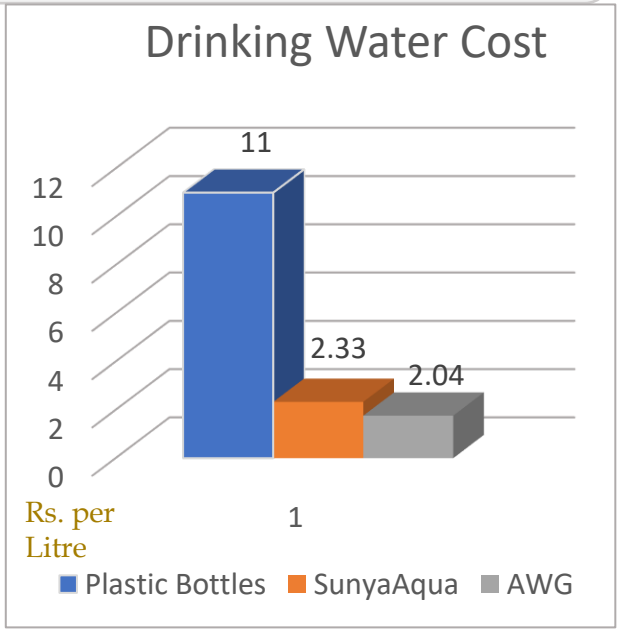
Innovative Projects 3 – Atmospheric Water Generator along with SunyaAqua Water Bottling Plant

ITC Grand Chola is the first luxury hotel to implement the Atmospheric water generator technology.

- In line with our motto of “Responsible Luxury “(Delivering Luxury Responsibly), ITC Hotels had installed effective water purification and glass bottling plant in their premises to produce international quality drinking water in the year Jan 2020.
- ITC Grand Chola wanted to utilize the renewable energy from owned Wind farms to produce water locally with the highly advanced patented technology and ultra efficient plant called as Atmospheric water generator.
- Condensing water from the atmosphere will be one of the most important innovations in the coming years as freshwater becomes more scarce/controlled due to overpopulation, government policies, geopolitics, and climate change.
- The system capable of extracting 2000 Liters of clean water per day Collected water is channelized to SunyaAqua Water Bottling Plant to ensures zero plastic pet bottle waste generation.
- Single use plastic waste eliminated per year – **34938 Kgs Annually and unit has eliminated 10.83 Ton of CO2 Emissions** annually.



- ***Cost of water generation at Rs. 2.04 compared to Rs. 2.33 of SunyaAqua and Rs. 11 of plastic bottles***



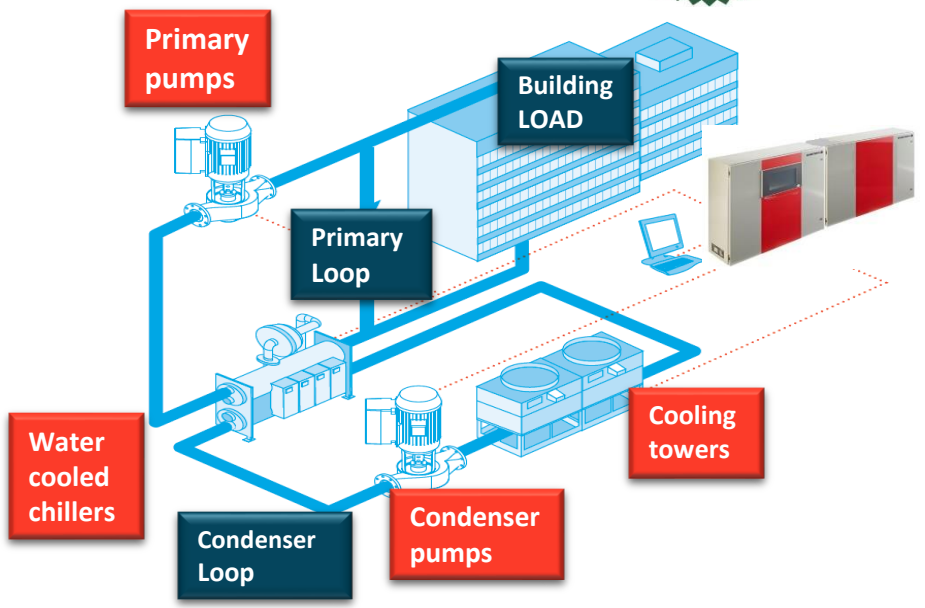
Major Encon Projects Planned in FY 2024 - 25

SI#	Description of Encon Projects	Category	Investment Lakhs Rs.	Energy savings in Lakhs kWh per annum
1	Upgradation of IPC Integrated Plant Controller System for Chiller plant.	Chiller Plant	40	7.06
2	Upgrading existing Treated Fresh Air Units (AHU) to Energy Efficient motor based TFA Units	HVAC	60	3.08
3	Upgrading existing Air Handling Units (AHU) to Energy Efficient motor based AHU Units	HVAC	17	1.82
4	Upgradation of existing cooling tower with advanced energy efficient cooling tower.	Chiller Plant	80	3.00
5	Upgrading to energy efficient Pumps for Chilled water systems	Chiller Plant	20	3.52
	Total		**217**	**18.48**

Major Encon Projects Planned in FY 2024 - 25

Integrated Plant Controller

- Unit has 4 Nos Water Cooled Chiller of 900 TR each with 4 CHW, CDW Pumps and 4 Cooling Towers.
- The IPC works in a variable primary configuration and keeps the entire plant including water - cooled chillers, cooling towers, chilled water and condenser pumps running smoothly inline with the building actual cooling requirement based on the occupancy and movements.
- Overall savings of **07.06 Lakhs kWh units annually** and improved system life cycle by optimizing the operations hours.



Description	Savings
Average Chiller Consumption per day	24195
Improvement in Chiller Efficiency	8%
Unit Saved	1935.6
Annual Unit Saved	7.06
Cost per unit	3
Annual Cost Savings in Lakhs	21.19

Utilisation of Renewable Energy Resources – Offsite

- ***One of the Largest Hotel in India to contribute and Utilise 90% renewable energy from overall electricity consumption.***
- ***ITC Grand Chola received the best performing windfarms award under 2 distinct categories by IWPA (Year 2023-23). ITC Hotel have won these special awards for the First time in Indian hospitality sector.***

Year	Installed Capacity in MW	Source	Capacity addition (MW) after FY 2021	Total Generation in Lakh kWh	Total Electricity Consumption in Lakh kWh	Share in% w.r.t overall energy consumption	Capacity considered under group captive
FY 2021 - 22	14.6	Wind	-	206	231	89%	NA
FY 2022 - 23	14.6	Wind	-	172	253	68%	NA
FY 2023 - 24	14.6	Wind	-	183	265	69%	NA
FY 2021 - 22	18	Solar	-	12	231	5%	5 MW
FY 2022 - 23	18	Solar	-	46	253	18%	5 MW
FY 2023 - 24	18	Solar	-	52	265	20%	5 MW

- ITC Grand Chola owns 6*2.1 MW & 1*2 MW capacity windfarms in southern part of Tamil Nadu totalling to 14.6 MW **and nearly 90% of building's electricity demand is fulfilled by its renewable energy.**
- Unit has installed Solar Power Plant capacity of 18 MW in the year of 2021 and getting a share of 5 MW under group captive.
- Unit also converting and expanding to electric based equipment operations to utilise the green energy effectively.

Utilisation of Renewable Energy Resources – Onsite Solar Water heating system

Rooftop Solar Water heating system: In an effort to reduce the carbon footprints.

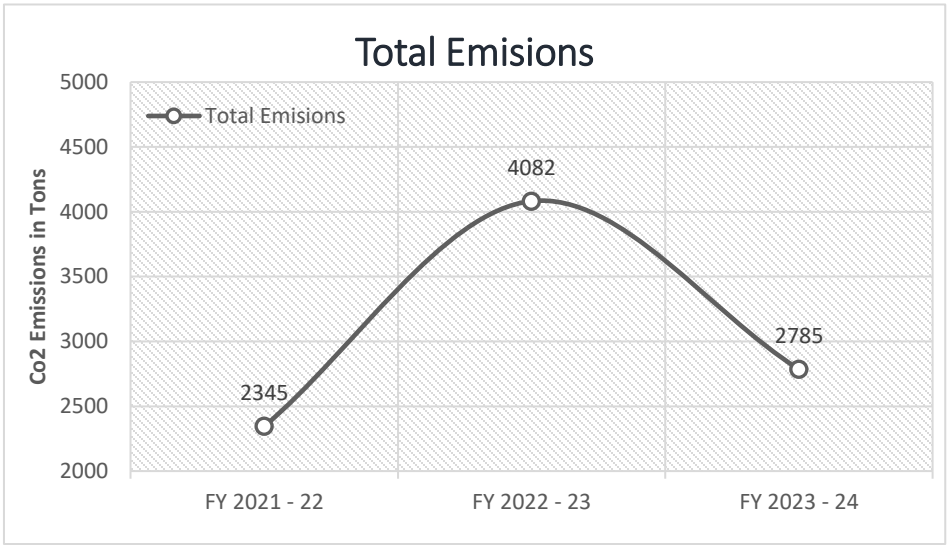
- Unit had a requirement of Hot water for Rooms and Kitchen. Hot water demand is fulfilled by heat pumps.
- Unit installed a rooftop Solar water heating system with the capacity of 20 KL per day.
- With this initiative, unit generates 20 KL hot water everyday. This has Significant impact on heat pumps operations.
- Collected water is used as make up for hot water system and saving of 140 units per day.
- Added benefit of providing shade by installing solar panels on roof impacting on thermal insulation of building.

GHG Emissions and Control Measures

Year	Units	Scope 1 (Onsite fuel consumption)	Scope 2 (Electricity Purchase from grid)	Scope 3 (Only Transportation)	Total Emissions
FY 2021 - 22	Ton of Co2/ Annum	791	983	571	2345
FY 2022 - 23	Ton of Co2/ Annum	944	2618	520	4082
FY 2023 - 24	Ton of Co2/ Annum	1011	1224	550	2785

Measure Emissions:
Measuring greenhouse emissions generated by the unit

Reduce Emissions:
Implementing environmental friendly initiatives.



GHG Emissions – Implemented Control Measures

Scope 1 Reduction – Key Reductions

- Switching to electrical boiler to eliminate the Co2 emissions by fuel fired boiler.
- Heat pumps for hot water.
- ESP – Electrostatic precipitator for diesel generators.

Scope 2 Reduction – Key Reductions

- 90% building electricity demand fulfilled by Renewable resources.
- Enhancement of windfarms capacity.
- Energy efficient and conservation measures.
- Electric based equipment operations.

Scope 3 Reduction – Key Reductions

- Inhouse Water bottling - eliminated the transportation of water bottles to the hotel.
- EV Charging Station for guests and associates.
- Atmospheric water generator.

Renewable Energy

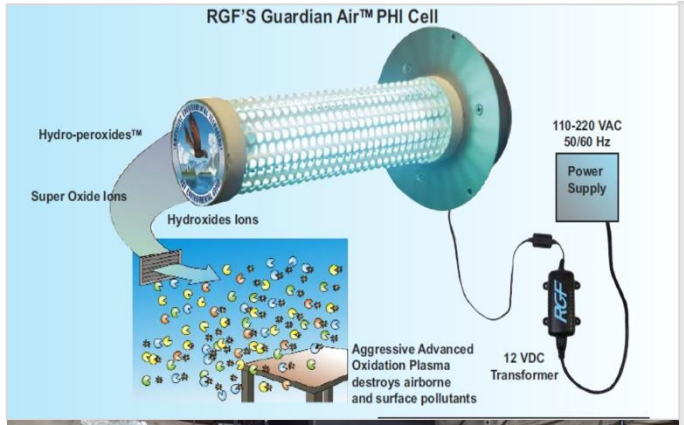
EV Car Charging station

ESP Electrostatic Precipitator for Diesel Gensets

Electrical boilers

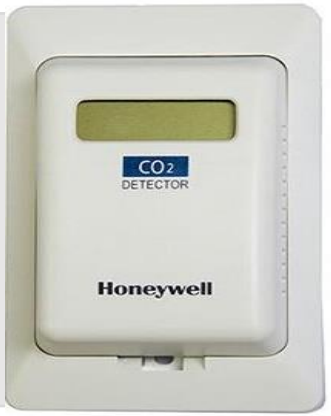
Green roof and landscaping

Indoor Air Quality Monitoring and Control



- Unit has installed **PHI (Photo-Hydro Ionization)** - The PHI cell technology creates hydrogen peroxide in an ionized form, also referred to as vaporized hydrogen peroxide.
- The low level vapor is created by the PHI-cell itself. The technology utilizes a broad wavelength UV element that is targeted onto a quad-metallic catalyst surface.
- It proactively sends ionized aggressive advanced oxidizers into the occupied space to destroy the pollutants at the source, in the air and on surfaces, before they can reach guests and employees

Unit has equipped with CO2 based ventilation systems in all guest the floors and CO sensor based ventilation systems in basement parking to monitor and maintain the air quality.

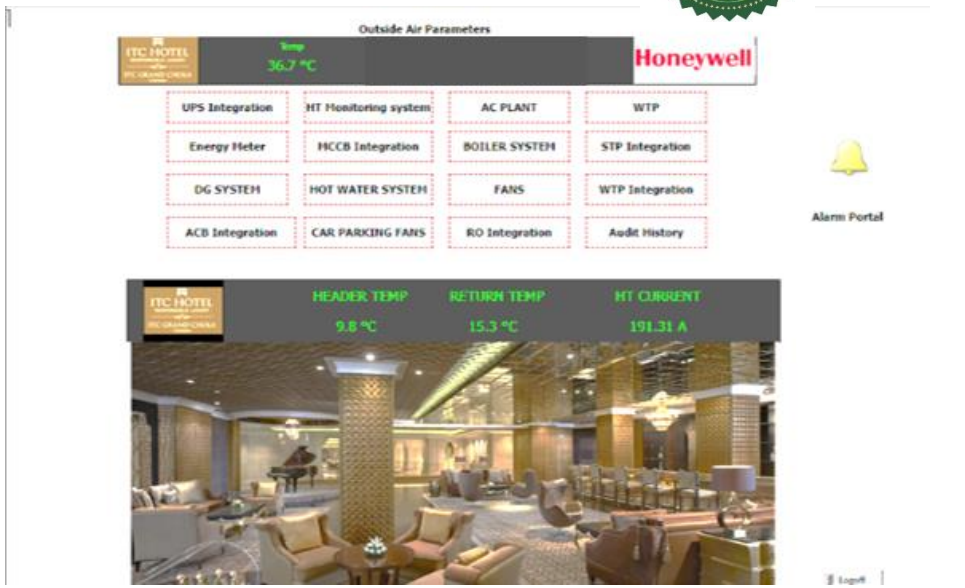


All AHU and TFA units in the building provided with MERV-13 filters to improve the Indoor air quality by filtering PM10, PM2.5 Airborne particles, dust, pollen and molds.

Periodical Monitoring of the Indoor Air Quality Testing is being carried out by NABL accredited laboratory.

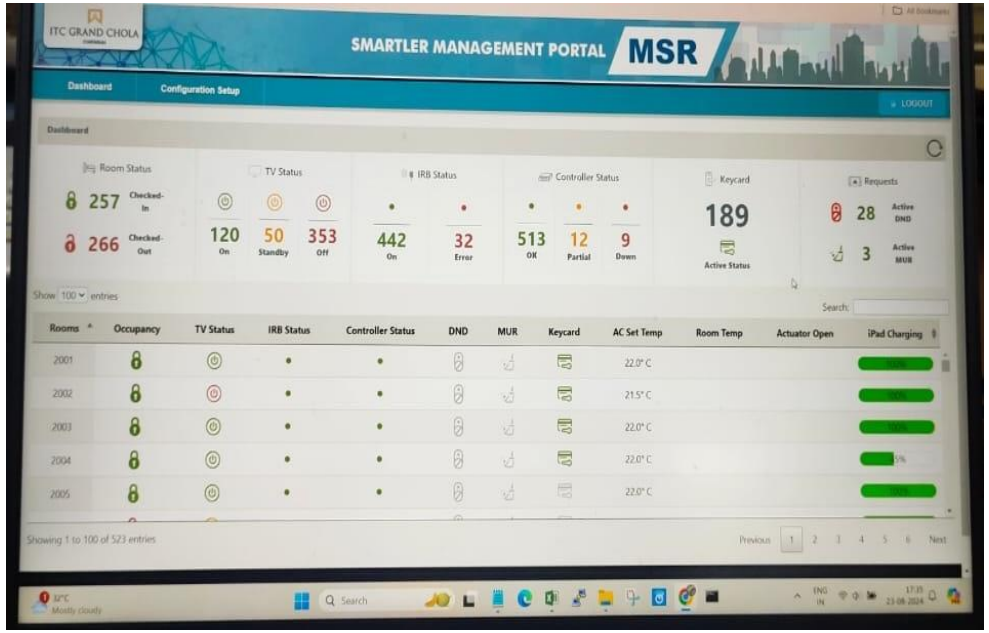
Building Management System (BMS)

- Unit have an integrated operational building management system by Honeywell in 2012 for monitoring and controlling the building.
- In 2021, Software of BMS was upgraded from AX to N4 unit further expanded the coverage and integrations with BMS such as Kitchen cold rooms, CO Monitoring systems, Water tank levels, Electric boilers and heat pumps.
- Automation of Chiller Plant system with IPC controller system to optimize the Chiller plant components such as Chillers, Pumps and Cooling Towers according to the Building's need.
- Building equipped with automated Ventilation Systems Provided with CO2 monitoring and controlled by Integrated BMS.



Room Automations

- 522 Guest rooms provided with IPAD controlled Room Automation system integrated with GRMS. Room Temperature, Lighting, TV Operations can be operated by IPAD which enables the guest to operate at one touch.



Certifications – LEED Certifications

RESPONSIBLE LUXURY:

- **One of the Word's Largest Hotel to receive LEED Platinum by USGBC:** ITC Grand Chola has earned the distinction of becoming the Word's largest LEED Platinum Green Hotel through efficiency is energy, water and waste management.
- **Highest LEED Score in Hospitality:** ITC Grand Scored Highest LEED score 104 in the hospitality segment.
- **USGBC LEED ZERO:** One of the World's Largest LEED ZERO Hotel and Commercial Building.

Certifications – ISO Certifications

DNV

MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 10000269803-MSC-RvA-IND
Initial certification date: 08 August 2019
Valid: 08 August 2022 – 07 August 2025

This is to certify that the management system of
ITC Limited
ITC Grand Chola, 63, Mount Road, Guindy, Chennai - 600032, Tamil Nadu, India

has been found to conform to the Food Safety Management System standard:
ISO 22000:2018

This certificate is valid for the following scope:
Food Preparation and Servicing throughout the hotel premises including restaurants and room services. Category E

Place and date:
Barendrecht, 30 July 2022

For the issuing office:
DNV - Business Assurance
Zwolseweg 1, 2994 LB Barendrecht,
Netherlands

Sabrina Bianchini
Management Representative

DNV

MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 175937-2015-AE-IND-RvA
Initial certification date: 19 March 2015
Valid: 17 August 2021 – 18 March 2024
Expiry date of last certification cycle: 18 March 2021
Date of last re-certification: 31 July 2021

This is to certify that the management system of
ITC Grand Chola
63, Mount Road, Guindy, Chennai - 600 032, Tamil Nadu, India

has been found to conform to the Environmental Management System standard:
ISO 14001:2015

This certificate is valid for the following scope:
Operations of hotel and its premises

Place and date:
Chennai, 17 August 2021

For the issuing office:
DNV - Business Assurance
ROMA, No. 10, GST Road, Alandur, Chennai - 600 016, India

Shrabasee Mukherjee
Management Representative

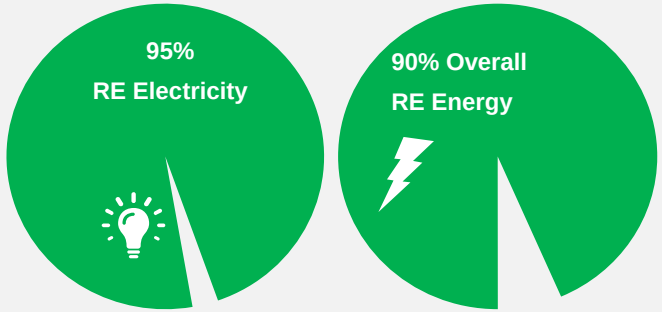
- **ITC Grand Chola ISO 14001:2015 and 22000:2018 Certified Facility for Environment Management System and Food Safety Management System Standards.**

Road Map - NetZero

ITC Grand Chola: Sustainability Targets & Roadmap 2023 – 2030

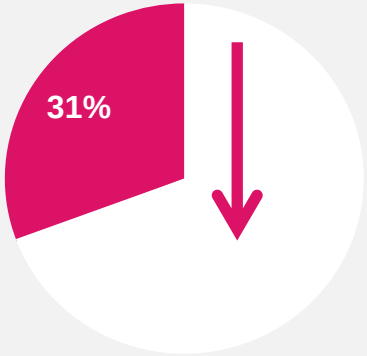
Hotel has set its goals inline with ITC Hotel's Sustainability Goals.

Renewable Energy (RE)



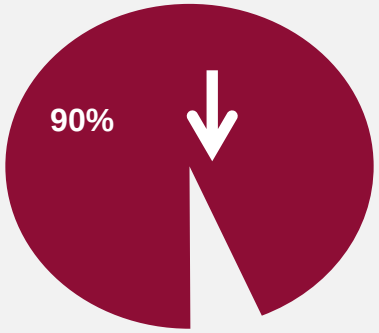
- 95% Renewable Electricity
- 90% Overall Renewable Energy

Specific Energy



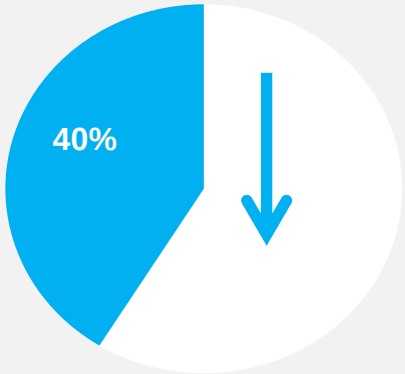
31% reduction in Specific Energy

Specific GHG Emissions



90% reduction in Specific GHG Emissions

Specific Water



40% reduction in Specific Water Consumption

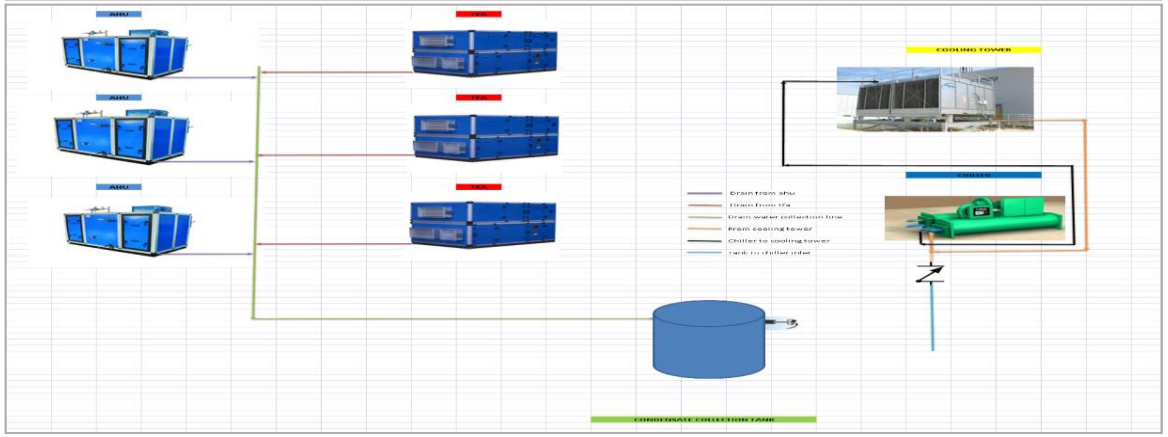
Water Management

Waste Water Treatment

- Unit has Sewage Treatment Plant - Sequential Batch Reactor Technology (Capacity - 675 KL/Day) with 100% Tertiary Treatment including Ultra Filtration.
- 100 % recycled water used for Cooling Towers, Flushing and Gardening process.
- Real Time Monitoring of STP for Parameters and performance to improve efficiency and adhere compliance.

Condensate Water Recovery system from AHU & TFA Units

- Condensed water generation from AHU and TFA Units due to 100% fresh air is used for TFA units and 10-15% AHU.
- Heavy condensed water is collected in AHU cooling coil tray due to high humid conditions in Chennai.
- Collected condensed chilled water channelized to FRP tank of 2000 liters and pumped to cooling tower..
- ***Water collection for 24 hrs : 833.3 x 24 = 19999.2 Liters (19 KL/day)***

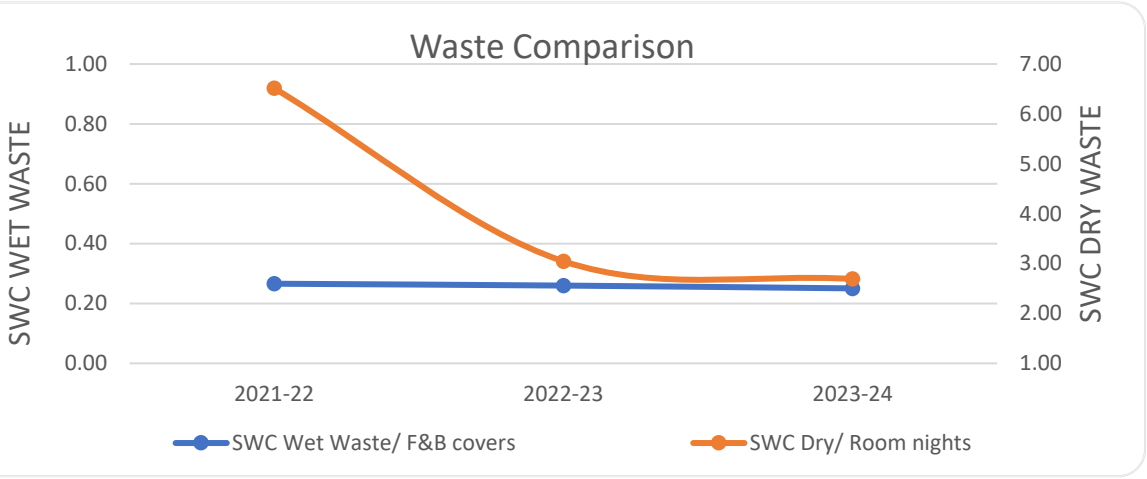


Rainwater Harvesting

- Unit has 5 no rainwater recharge pits with volume 27 m3 each are designed to recharge water.
- Collected from terrace (12673sqm) to the aquifer which improves the water table of the area.

Year	Water Consumption in KL	Waste water Recyled & Reused in KL	% Waste water recycled	Rainwater Recharged to ground (in Cu. Mtr)	Rainfall (in mm)
2021-22	1,14,192	93,091	82%	14,995	2174.10
2022-23	1,43,784	1,19,947	83%	10,712	1553.10
2023-24	1,64,328	1,37,671	84%	14,000	2029.71

Waste Management



Waste Handling

- Waste Segregation starts from the source.
- All paper, metal and plastic wastes sent to authorized recyclers. Used cooking oil (UCO) being given to FSSAI approved Bio-Diesel Manufacturers. Used lube oil, e-waste is sent to designated waste handlers.
- 100% organic waste treatment including food & landscaping waste is being converted to manure with help of OWC.

Plastic Waste Reduction by Inhouse Plant

- Hotel has inhouse water bottling plant to cater the hotel drinking water requirement.
- By which, hotel has discontinued purchasing plastic water bottles. So, single use plastic waste eliminated per year – **34938 Kgs Annually and unit has eliminated 10.83 Ton of CO2 Emissions** annually.

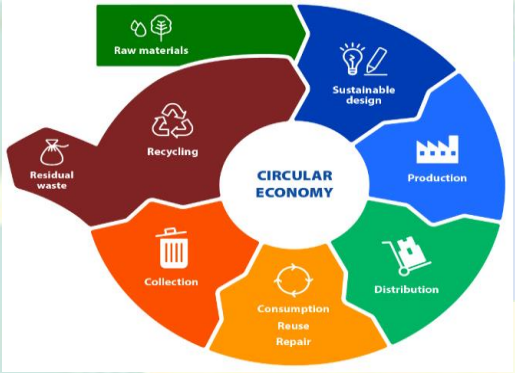
Business Responsibility and Sustainability Reporting (BRSR): Engaging and encouraging stakeholders for sustainable procurement.

Plastic substitution: Efforts are founded on the reduce, reuse, recycle policy, and include a special packaging made from compostable material, trading plastic drinking straws and stirrers and other basic amenities with paper and wooden alternatives.

ITC Grand Chola Energy Management - Way Forward

Capacity Addition of Renewable Energy and increasing the utilization.

Inhouse Biogas plant to eliminate the fuel consumption for bulk cooking



Reuse, Repair, Reduce and Recycling - Minimizing the use of resources, efficient recycling of waste and reusing for inhouse operations.

Awards and Achievements

ITC HOTEL
RESPONSIBLE LUXURY
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CHENNAI

THANK YOU

Presented by,

Mr. Sandeep Pednekar

Head of Technical Service, ITC Grand Chola, Chennai.

M 9676913131

Sandeep.Pednekar@itchotels.in

Co-presented by

Mr. Akashdeep Sharma, Engineering Manager

Mr. Ganapathi MD, Chief Engineer