

Sustainability Challenges – circa 2008 to 2019

Challenges in building structure and systems

- **24*7 operated luxury hotel chain** – Our 24*7 operated luxury hotel chain. It was perceived impossible to balance between energy and water efficiency with guest satisfaction. Meeting thermal comfort and control with optimum energy was challenging.
- **Aged buildings with large variety of topology** – We have some very old buildings (30 – 35 years), other 15 to 25 years and some were relatively new (<10 years). Some building are horizontally spread (resorts) and some building are high rise (30+ stories). Spread in all climate zones of India with RCC, wood, steel construction.
- **Variety of space functions** – Have large pools and lagoons. Have 24X7 restaurants, laundry, discotheques, business area, spa, banquet, open air dining.
- **Retrofitting in running building** – In order to target sustainability, there was lot of retrofit needed in HVAC, Electrical and plumbing systems which was a difficult task to do in a running building.



High rise building – ITC Grand central



Aged building (more than 35 year old) – ITC Maurya



Large swimming pool and lagoon space – ITC Grand Goa



Horizontally spread resorts with variety of spaces – ITC Grand Bharat

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Sustainability Challenges – circa 2008 to 2019

Regulatory challenges

- **Open access or Renewable energy certificate** – Open access and renewable energy certificate were not available in India.
- **Use of least toxic pesticide for pest control** – Most least toxic pesticide not sold in India (in 2008 to even now) is not approved by Central Insecticide Board (CIB). Consultation and coordination with the COB board was required to procure least toxic pesticides.
- **National air quality standard** – Earlier there was no national air quality standard in India. Also there was no mapping of attainment zone and non-attainment zone for ambient air quality.

Lack of service provider

- **Availability of testing tools in India** – On site testing for air tightness and smoke infiltration was not available in India. Brought service provider from UAE.
- **Testing of tiles for solar reflectance of roof insulation and hardscape tiles** – Then and even now, very few agencies for testing of solar reflectance are available.



Open access for wind farm in 2016-17 – ITC Maratha.



In 2010-11, ITC purchase REC certificate to obtain renewable energy credit



Blower door testing for smoking room to check air infiltration

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Sustainability Challenges – circa 2008 to 2019

Lack of material availability

- › **Use of green certified housekeeping chemical and green certified equipment**– Before it was difficult to get green certified chemical and housekeeping equipment.
- › **FSC certified furniture**– In India, it was difficult to get third party certified sustainable building material. Not many forests were approved by the FSC council.
- › **CRI certified carpet**– In India, it was difficult to get CRI certified carpet (low emitting material). Imported from abroad.
- › **High SRI paint for roof insulation** – Earlier, there were very few suppliers of solar reflective paint for roof insulation.
- › **Costly Energy and water efficient product** – Before energy efficient technology such as VFDs, LED lighting, energy efficient pumps and motor was costlier.



Certified housekeeping chemical



CRI certified carpet



High SRI paint on roof



FSC certified furniture

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What ITC Hotels has achieved....



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ITC Hotels - Energy and Carbon

- ▶ Over 60% of our total Electrical Energy requirements are met through renewable sources.
- ▶ Domestic hot water requirement met by Solar Concentrators and heat pumps
- ▶ Nano fluid used in heat pump for higher heat transfer rate and to enhanced efficiency of heat pump
- ▶ Demand control ventilation - CO2 Sensor based fresh air handling units for optimum guest comfort & saving energy
- ▶ Use of multi glazed window and roof insulation to reduce cooling load.
- ▶ Fully automated energy efficient boilers with air-fuel ratio controller - Enhanced efficiency and lesser fuel consumption.
- ▶ Fuel Switch – Maximizing renewable energy usage



BMS Adoption



Self-owned wind farm



Solar concentrators



ATCS for chiller plant



Heat pump



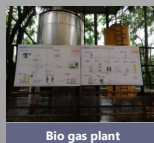
Boiler Air Flow Controller

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ITC Hotels – Energy and Carbon

- ▶ Bio gas plants for waste to energy conversion
- ▶ Chiller Plant Optimizer – Online Energy Manager to enhance HVAC system efficiency
- ▶ Room Automation System - Digital Valet for room controls & other guest services.
- ▶ Constant Water Pressure through PICV
- ▶ Electronically commutated (EC) high efficient ventilation fans and motors



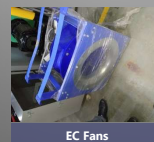
Bio gas plant



Chiller Plant Manager



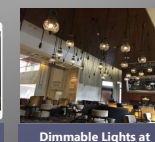
LED Lighting



EC Fans



Digital Valet System



Dimmable Lights at Restaurant

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ITC Hotels – Energy and Carbon

- ▶ ITC Sonar is the first hotel to receive carbon credits in the world through the CDM (Clean Development Mechanism) initiatives of UNFCCC (United Nations Framework Convention on Climate Change).
- ▶ Brushless DC motors in fan coil units
- ▶ Occupancy sensors for all meeting rooms and public areas
- ▶ Steam condensate recovery system.
- ▶ Energy efficient motors for HVAC plant and plumbing system
- ▶ The CO monitoring based jet fan ventilation system of the basements compared to a conventional ducted system which save energy



Brushless DC FCU Motors



Water Cooled Cold Storage



Jet Fans



ITC Sonar, Kolkata

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ITC Hotels – Indoor air quality

- ▶ Fine filtration and air purification system to maintain superior level of indoor air quality.
- ▶ Use of only green cleaning chemicals
- ▶ Use low noise housekeeping equipment
- ▶ Use of low VOC paint and adhesive
- ▶ Use of eco-responsible pesticides.
- ▶ Use of Maximum Natural lights in the occupant areas.



Fine filtration and air purifier



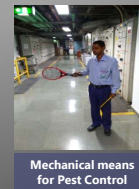
CRI Certified Cleaning Chemicals



Paint and adhesive



Entryway mats at building entrances



Mechanical means for Pest Control

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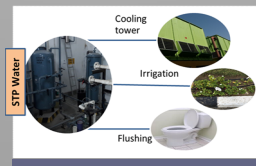
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ITC Hotels – Water

- ▶ Most of the irrigation, flushing, and cooling tower requirements is met through treated effluent
- ▶ Sensor operated fixtures, waterless urinals, dual flush water closets and flow restrictors (aerators) for reducing water consumption
- ▶ Native and adaptive and low maintenance vegetation species to minimize water requirement.
- ▶ Shading of ground covers by trees helps reduce evaporation losses thus reducing water consumption
- ▶ External pervious areas and green roofs along with water harvesting structures will retain 100% of storm water catchment onsite
- ▶ Drip irrigation and timer based controls for operating the irrigation valves further eliminates the wastage of water



Drip irrigation for landscape



Use of treated water for flushing, irrigation and cooling tower



Water Efficient Fixtures



Native/ Adaptive Species



Shading of ground covers by trees

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ITC Hotels – Water

- ▶ Segregation of black and grey water for sewage treatment plant and waste water recycling. Surplus water to neighboring areas/ communities gardens.
- ▶ In laundry, the water from last wash is used for the pre-wash of the subsequent cycle. Further, use of low alkaline environmental friendly washing liquids helps reduce run time and saves water
- ▶ Rain water harvesting system to capture roof and non-roof rain water



Sewage Treatment Plant



Rain Water Harvesting



ITC Maurya supply excess treated water to local municipality



3D TRASAR – Chemical dosing system

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ITC Hotels – Solid Waste and Responsible Purchasing

- ▶ Recycling of solid waste – more then 99%.
- ▶ Waste segregation at source
- ▶ Bio- Methanation Plant & Organic waste converter for Organic Waste treatment
- ▶ More than 50% of consumables used at hotels are either local or recycled.
- ▶ ITC Hotels endorse socially and environmentally responsible forestry by ensuring that more than 50% of the paper, stationery and wood is either FSC (Forest Stewardship Council) certified, sourced locally or recycled
- ▶ Journey towards - NO SINGLE USE PLASTICS



Waste Segregation at Source



Organic Waste Converter



Journey towards - NO SINGLE USE PLASTICS

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Thank you