

Tata Centre, Kolkata

Building Profile

Tata Centre is a multistoried building in Kolkata owned by Tata Steel. Being one of the tallest buildings it is a great and well-deserved honour for Kolkata. The foundation stone was laid by Jehangir Jivaji Ghandy in the year 1964. It houses more than 20 offices of the TATA group of companies.

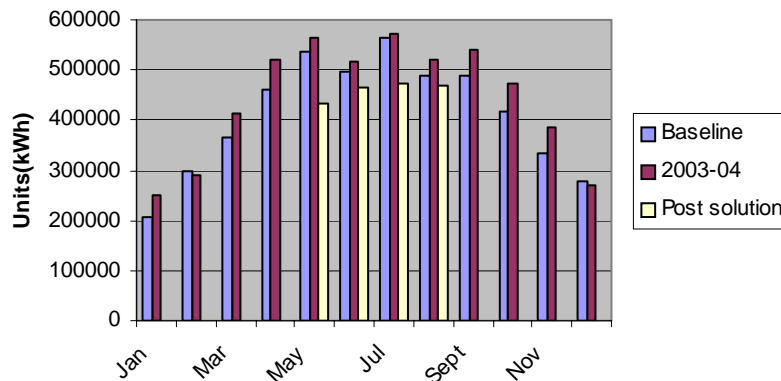
The total area of Tata Centre is 2,12,482 sq.ft, the air-conditioned area being 1,97,741 sq.ft. The temperature maintained throughout the air-conditioned space is 24 deg. The actual working hours stretch beyond 1900 hrs/ year
The connected load is approximately 2000 kW.

Energy Consumption

Figures of the Energy consumption at Tata Centre have shown decline as seen in the fig. below



Energy Consumption at Tata Centre



The average reduction of energy consumption over the last 4 months has been about 18%.

Energy Conservation Commitment, Policy & Setup

Tata Steel team closely monitor the energy consumption patterns each month. Targets are decided every month & ensured that they are met. Deviations from the target are reasoned and documented.

Not only does the top management emphasize on achievement of the highest level of energy efficiency but it also provides secure funding to implement energy efficiency measures. Their timely approvals of the energy conservation plans help speedy implementation of measures to conserve energy. Training & regular briefings are done to help the plant personnel understand the terms related to energy consumption.

Energy Conservation Achievements

Implemented Measures: - The following energy efficient measures have been implemented in the following areas

1. PC based Energy Management System: -

The building control Automation System is a state of art system that is microprocessor-based system. One scaleable system that pulls together all core building systems and integrates information from many different enterprise subsystems. With the Honeywell Enterprise Buildings Integrator, the building has the information needed to make critical decisions quickly - decisions that ultimately help us to conserve energy



2. Energy management strategy for Chillers

a) Load reset

Chilled water flow control responds quickly to load changes, to maintain the chilled water temperature. The chilled water temperature may be reset from chilled water return temperature.

b) Chiller sequencing

In Chiller sequencing the chilled water flow temperature is controlled by switching chillers on & off. If the flow and temperature are below the specifications for the chillers, then the system first circulates the cooling load, checks the load, and decides number of chillers to be on line.

c) Cooling Tower

A cooling tower's capacity to cool the water is limited by the ambient conditions. If the condenser water design temperature minus the approach temperature of the tower is lower than the outside air temperature, then Cooling tower fans can be sequenced, Set point of the condenser water can

be raised, quantity of water can be by-passed to reduce the load on C/T, Fans can be switched off to provide free cooling etc.

3. Energy management strategy for Air handling units

a) Duty Cycling

The duty cycling, software program reduces energy consumption (electrical and mechanical) in HVAC systems by switching fans OFF & ON periodically, on a fixed time schedule. However, if space temperature exceeds the limits, duty cycling program is disabled.

b) Optimum Start/Stop

Air handling units are switched ON depending upon the outside air/inside air temperature and the capability of the AHU to recover the space temperature to the middle of the comfort band before occupancy.

Optimum stop function is the opposite of optimum start function. It calculates the earliest possible point in time when the HVAC system can be stopped, ensuring that the minimum comfort condition has just been reached at the end of the occupancy period.

4. HVAC upgrades/modifications & Lighting upgrades/modifications



Light & VFD upgrades

Energy Conservation plans & Targets

The road ahead is promising and challenging. The future endeavors to reduce the Specific Energy Consumptions are:-

1. **Modernization of Elevators:** Tata Centre has a total of 7 lifts. Of these 7 lifts, 5 passenger lifts cater to the general public, officers, employees at Tata Centre.
2. Present Operation Mode: 3 nos. passenger lifts cater to all 17 floors.
2 nos. passenger lifts cater to 7th & above floors.
Modified Operation Mode: 1 nos. passenger lifts cater to all 17 floors.
1 nos. passenger lifts cater to all even floors.
1 nos. passenger lifts cater to all odd floors.
2 nos. passenger lifts cater to 7th & above floors.

All existing DC drives to be converted to variable frequency drives.

The status/position of the Lifts can be monitored from the EBI (Enterprise Building Integrator) installed by Tata Honeywell Ltd. The estimated cost is 20 lakhs.

3. **Overhauling of the Diesel Generators:** The total overhauling of (3 x 650 KVA) DG's will ensure that they will be able to take the entire load of the building. As the DG's are old & they have become energy guzzlers over a period of time. The estimated cost for this is Rs18 lakhs.
4. **Improved Air Distribution System for all floors:** As & when the floors of Tata Centre are available for renovation the Central A/C air distribution system design is being studied & modified so as to optimize the air flow requirements of the floor. Estimated cost is Rs 1 lakh per floor.
5. **Improving power Factor:** Installation of capacitors across all inductive loads to further improve power factor.
6. **Installation of Smart Energy meters:** These devices will be installed on all floors so that energy consumption on each floor can be closely monitored. These Smart Energy Meters will be directly connected to the computerized system of Tata Honeywell Ltd. The EBI will then monitor the energy consumption automatically.
7. **Solar panels on the east wall of Tata Centre:** This implementation will ensure that partial electrical load of the building can be fulfilled by these solar panels. However a detailed Cost-Benefit analysis needs to be done before taking this up.

Details on the Energy Efficiency Improvement projects/Measures

| Description of the upgrades & approximate investment at Tata Centre | | | | | |
|---|---------------------|--|---|----------|-----------|
| Sl. No. | Solution | Make | Description | Quantity | Value |
| | | | | Nos. | Rs. Lakhs |
| 1 | Chillers | York / Carrier / McQuay / Ciat / Trane | 300TR water cooled Screw chiller | 2 | 85.00 |
| 2 | Cooling Tower | Wet bulb / equivalent | Modification / Up gradation of existing Cooling Towers | Lot | 8.00 |
| 3 | Pumps | Kirloskar / equivalent | Chiller primary pumps - 3 nos Condenser pumps - 3 nos Secondary pumps - 3 nos | 9 | 5.70 |
| 4 | Tubelights | Osram / GE / Asian / equivalent | Energy Efficient Fluorescent Tube lights | 4800 | 3.36 |
| 5 | Electronic Ballasts | Asian / Opel / equivalent | Electronic Ballasts | 3150 | 15.75 |
| 6 | CFLs | Osram / GE / Asian / equivalent | Energy Efficient Compact Fluorescent Lamps | 100 | 0.25 |
| 7 | VFD | Danfoss / ABB / equivalent | Variable Frequency Drives with Panel suitable to Drive | 2 | 3.50 |

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|----|----------------------------------|---------------------------------|---|-----|---------------|
| | | | Secondary Pumps of suitable capacity | | |
| 8 | CCTV system | Tata Honeywell | CCTV | Lot | 4.00 |
| 9 | Energy Management System | TataHoneywell | EBI license for monitoring and control of Central AC plant, AHU's, Pumps, Cooling tower + Direct Digital Controllers + Panels + PC + Sensors etc. | Lot | 32.70 |
| 10 | Energy Meters | Nippen / Enercon / equivalent | For monitoring Chiller/AHU power consumption | 5 | 0.25 |
| 11 | Electrical cabling | TataHoneywell approved vendors | For EMS & CCTV system | 1 | 6.50 |
| 12 | HVAC related Mechanical Upgrades | Tata Honeywell approved vendors | Modifications / Upgrades of the existing HVAC system to accommodate new Chillers, Primary and Secondary pumping systems, upgraded cooling towers and modifications in the AHU | 1 | 12.50 |
| 12 | Water Treatment Plant | Tata Honeywell approved vendors | Water treatment | 1 | 2.51 |
| | TOTAL | | | | 180.02 |

Environment & Safety

Safety is a key priority area at Tata Centre & will continue to be a priority in the future as well. This is done by maintaining a safe plant & equipment, ensuring safe handling & use of substances, providing information, instruction & supervision to our employees & maintaining safe & healthy working conditions.

By reducing the energy consumptions a significant amount of reductions in CO₂ have been attained. By saving an average 99,344 units of electricity per month Tata Centre prevents 2,12,596.16 pounds of CO₂ equivalent emissions every month into the atmosphere. This endeavor helps in reducing of global warming; & contributes to both environment & economy.



To prevent wastage the following practices are encouraged:

- Use of Network printers instead of Individual Printers
- Promoting inter office communication via email
- Proofreading documents before printing.
- Circulating memos/documents/reports instead of distributing multiple copies.
- Posting announcements on bulletin boards.
- Encouraging air dryers in Restrooms instead of paper towels.
- Reusing paper printed on one side in fax machines, copiers, printers while printing draft documents.

To make the vicinity of Tata Centre greener, Tata Steel has undertaken beautification & gardening work.