

Welcome to Half-Day Workshop

Supporter



Half-day Online Workshop on Green Data Centers: A Joint Initiative of IGBC and LBNL (DOE) US “Enhanced Energy Efficiency in Indian Data Centers”

19 Aug 2020 | 1400 hrs to 1730 hrs

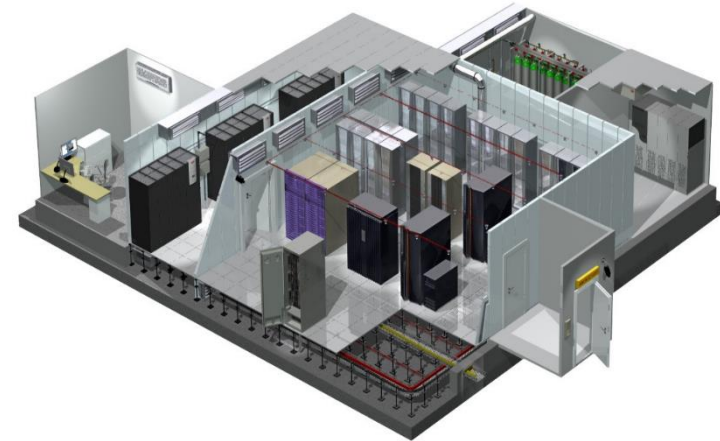
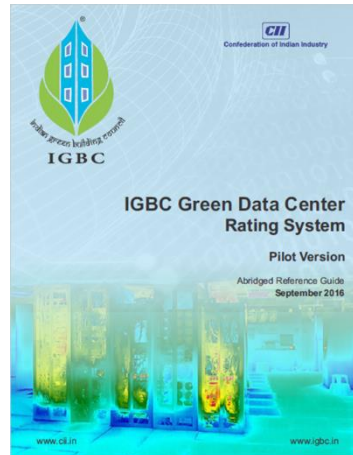
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Green Data Centre Rating and New Initiatives by IGBC and LBNL (DOE) US 16 July 2019 | Hyderabad



Indian Green Building Council (IGBC)

❖ Vision of IGBC

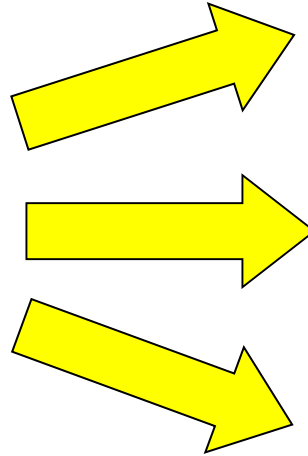
- Enable 'sustainable built environment for all'
- India to be one of the global leaders in sustainable built environment by 2025



Green Building Movement in India



**In 2001,
1 Green Building
20,000 sq.ft.**



**5,900 Registered Projects
7.51 Billion sq. ft.**

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Indian Green Building Council
Greening India since 2001



Unique Features of Green Data Centre Rating System

- ❑ Addresses Data Centre IT & Non-IT load
- ❑ At par with International standards
- ❑ Key focus areas
 - ❑ Energy efficiency
 - ❑ Operation & Maintenance
 - ❑ Indoor Environment Quality (IEQ)
 - ❑ e-Waste management
- ❑ Handholding for implementation of green features

Benefits of Green Data Center Rating

□ Tangible benefits

- ▣ Improvement in Power Usages Effectiveness (PUE)
- ▣ Increased reliability
- ▣ Reduction in water consumption in case of water-cooled chillers

□ Intangible benefits

- ▣ Enhanced e-waste management
- ▣ Improved Indoor Environment Quality (IEQ)
- ▣ Green image and Benchmarking

Energy Performance

□ Intent:

- Optimize energy consumption, to reduce negative environmental impacts from excessive energy use

□ Compliance Options

- Minimise Power Usage Effectiveness (PUE) by reducing total facility energy consumption

$$\text{Power Usage Effectiveness (PUE)} = \frac{\text{Total Facility Energy (kWh)}}{\text{IT Equipment Energy (kWh)}}$$

Minimum Energy Performance

- **New Data Centers**

- **To demonstrate through design document / simulation**
- **PUE to be considered at 33% load**

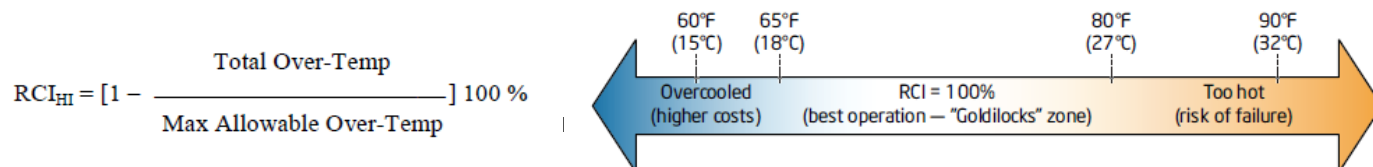
- **Minimum Energy Performance**

- **Power Usage Effectiveness (PUE)**
 - **Existing Data Centre**
 - **New Data Centre**

- ❖ **Energy measurement at PDU level &**
- ❖ **PUE measurement on Daily Basis**

O&M Systems and Practices

- Real time performance monitoring system
 - ▣ Demonstrate a system in place for real time monitoring of operating conditions and performance of Chiller, Cooling and Electrical systems
- Performance Analysis and action taken
 - ▣ System in place for Data analysis, Preventive and corrective measures taken
- Rack Cooling Index
 - ▣ Measure of how well the system is cooled within the specified temperature limits
 - ▣ Demonstrate system in place for measure of RCI and maintained within the limits
 - ▣ Encourages maintenance of temperature 24°C and above



Support from IGBC

□ Feasibility study

- ▣ Site visit / Feasibility study

- ▣ Present status with respect to Green Data Center rating

- ▣ Improvement opportunities

□ Facilitation and Handholding

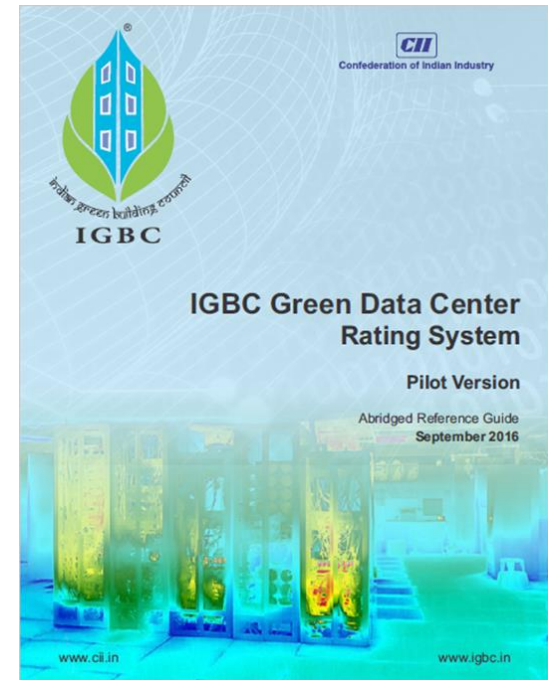
- ▣ Implementation of green features

- ▣ Information sharing

 - Leading data centres

 - Technology suppliers

 - Service providers



Joint Initiative: IGBC and LBNL (DOE) US

- ❑ **Develop and Implement Policies and Programs Supporting**
 - ❑ **Greater Energy Efficiency in Indian Data Centres**
- ❑ **Objectives of the initiative:**
 - ❑ **Develop and recommend Energy Efficiency standards for Indian Data centres**
 - **To augment the minimum energy efficiency requirements: ECBC 2017**
 - **Recommend higher performance rating: Level-I, Level II and Level-III**
 - ❑ **Develop User Guide for implementing the ECBC 2017**
 - ❑ **Document case studies of exemplary Data Centers**
 - ❑ **Capacity building – Spread awareness in DC industry**

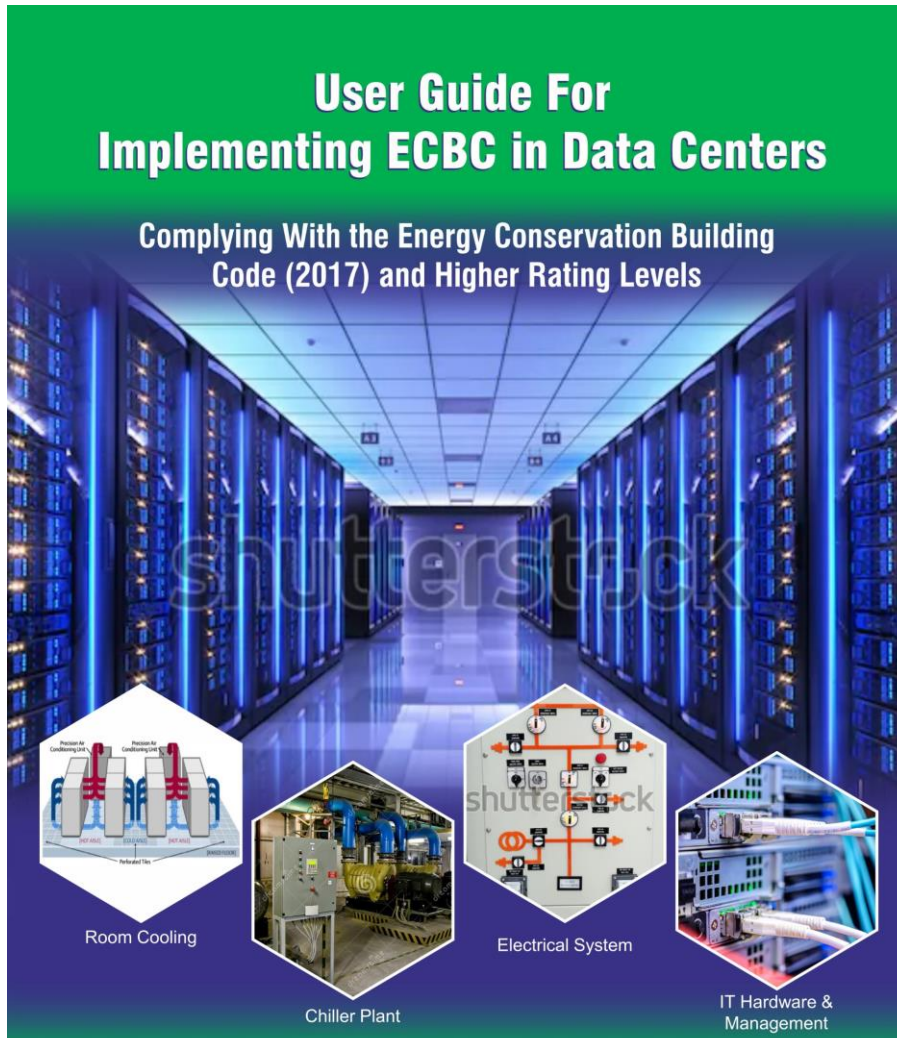
AGM and Task Force

❖ Key DC stakeholders are part of AGM

❖ Task Force Chairman

- ❑ Chiller Plant : Mr P.C. Lohia
Vice President - HVAC,
Reliance Industries Ltd.
- ❑ Electrical Systems: Mr Pritam Goyal
Microsoft
- ❑ Room Cooling: Mr Raghuveer Singh
Director -Thermal Management,
Vertiv Energy Private Limited
- ❑ IT Hardware & Management : Mr Vivek Rajendran
Director, Software Engineering,
Dell EMC, Infrastructure

Launch of User Guide for ECBC 2017 for DCs and Case Studies (Exemplary Data Centers)



 **BERKELEY LAB**
 DRAFT July 25, 2020

 **CII**
 Confederation of Indian Industry
 125 Years - Since 1895

 **Infosys**
 Infosys Limited

 **IGBC**
 Indian Green Building Council

INNOVATION IN ENERGY EFFICIENCY: INFOSYS-BANGALORE DATA CENTER

OVERVIEW

Organization & Data Center Background

Infosys Limited is a multinational consulting, information technology and outsourcing firm that maintains millions of square feet of its own offices and data centers. For its headquarters campus in Bangalore, Infosys built a 250 square meter data center to be a model of innovation and energy efficient computing. Tucked inside a four-story office building, the small data center features a creative combination of novel IT, electrical and cooling technologies. Designers aimed for a Power Use Effectiveness (PUE) score of 1.12. Actual energy performance thus far has averaged 1.33, which nonetheless denotes strong performance, based on available data for India.

Infosys has encountered challenges and is refining the data center in pursuit of higher performance to approach the design target.




Figure 1. Infosys data center server room

Project Highlights

- Designed to achieve a PUE of 1.12
- Achieved PUE of 1.33 at <50% load
- First project in India to maintain high server hall temperatures (~27°C) to enable warm-water cooling to avoid compressor use and thus lower cooling energy cost
- Passive Rear Door Heat Exchangers (RDHx) for efficient cooling at the cabinet level
- Sophisticated Building Management System (BMS) for automation and optimization

Table 1. Design and operational parameters

Facility Characteristics	Description
IT Load (Design)	0.3 MW Design, up to 10kW/rack
Cooling System Specs	Designed to maintain server room temperature of 27°C (vs. a more typical 17-18°C)
UPS Capacity	300 kVA + 300 kVA in a 2N configuration for Tier III availability
Total Current Energy Use	1,308 MWh/year
PUE	1.12 Design
	PUE: 1.33 Operational

Case studies of Exemplary data Centers

Capacity Building Programmes and AGM



20 July 17, Bangalore



14 Sep 17, Mumbai



13 Feb 2019, Bangalore



AGM 2018 Infosys, Bangalore



AGM 2019
Hotel Taj West End Bangalore



CII-IGBC - ANSI – USTDA- BIS
DC Conf

24 Jul 2018, Mumbai



Indian Green Building Council
Greening India since 2001



Indian Industry



18 May 2018, Mumbai

Upcoming DC Activities

- ❑ **Half-day workshop on Green Data Centers – Enhanced Energy Efficiency in Data Centers**
 - ▣ **Sep 2020**
- ❑ **AGM and Launch of User Guide and Case Studies**
 - ▣ **Sep 2020**
- ❑ **National Conference on Data Centers**
 - ▣ **Oct 2020**
- ❑ **Call for Data Center Research Project**
 - ▣ **Proposal is ready and would be shared with interested service providers and Manufactures**

To sum up

- ❖ **Excellent opportunity for Indian Data Centers to improve**
 - ▣ Improved Design Performance
 - ▣ Enhanced Operation & Maintenance
 - ▣ Benchmarking, Green Image and Recognition
- ❖ **Aim for elevated performance**
 - ▣ Meet Performance Standards (Level-I)
 - ▣ Exceed Performance – Level-II
 - ▣ Demonstrate Leadership in Performance – Level-III
- ❖ **Knowledge exchange and best practices**

Thank You !



For any further support, please contact:

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