



Minutes of the Meeting:

1st Advisory Group Meeting, 17 July 2018, Bengaluru

“Enhance Energy Efficiency in Indian Green Data Centers - A Joint Initiative of CII-IGBC and LBNL, USA”

Members attended the advisory group meeting:

- **Mr Syed Mohamed Beary**, Chairman, IGBC Bangalore Chapter & CMD, Bearys Group
- **Mr Vivek Rajendran**, Director, Software Engineering, Dell EMC, Infrastructure Solutions, Bangalore
- **Mr Rajkumar**, VP - Practice Manager - IT Services, Infosys Limited
- **Mr PC Lohia**, Senior Vice President, HVAC, Reliance Corporate Park, Mumbai
- **Mr Ashish Dandekar**, Council Member, Gerson Lehrman Group, Mumbai
- **Mr Pritam Goyal**, General Manager – Data Centers, Advisor
- **Mr B. Rajput**, Senior Technical Director, National Information Centre (NIC), Delhi
- **Mr Pushendra Pandey**, Program Manager - IT Infra & DC Ops, devIT-India, India Software Labs, IBM
- **Mr Angela Barboza**, GM & Head APAC Region, Rittal India
- **Mr Punit Desai**, Regional Manager – Infrastructure, Infosys, Bangalore
- **Mr Mayank Srivastav**, Head, DC Business Development, Schneider Electric India Pvt. Ltd.
- **Mr Shrirang Deshpande**, Country Head-Data Centre Business, Vertiv Energy Pvt. Ltd
- **Mr Raghuvver Singh**, Director – Thermal Management, Vertiv Energy Pvt Ltd
- **Mr Mario Dias**, Manager-Fac Operations, Workplace Resources, NetApp
- **Mr Manoj Kapil**, Practice Head - Data Centre and O&M Services, Wipro
- **Mr Shankar KM**, Senior Manager - Data Centre Operations, STTelemedia Global Data Centers (STT GDC)
- **Mr Mallikarjun V Patil**, CEO, SCHNABEL DC Consultants India Pvt. Ltd.
- **Mr Shubhabrata Sengupta**, Sr Manager, CtrlS
- **Mr Gopi Ravi**, Sales Executive, Stulz-CHSPL (India) Pvt Ltd.
- **Mr Anand**, HVAC, Advisor, Bearys Group
- **Mr Arvind Jain**, Assistant Manager, Green Initiative, Infosys
- **Mr Shubham Agarwal**, Manager, Green Initiative, Infosys

CII-IGBC and LBNL:

- **Mr Dale Sartor**, Staff Engineer, LBNL, US
- **Mr S Srinivas**, Dy Executive Director, CII GBC
- **Dr Shivraj Dhaka**, Counsellor, CII GBC

Introduction:

Mr Rajkumar, Vice President - Practice Manager - IT Services, Infosys Ltd welcomed all the advisory group members in the Infosys campus and thanked CII-IGBC (Indian Green Building Council) & LBNL (Lawrence Berkeley National Laboratory) for taking this particular initiative which will lead to enhancement of energy efficiency in Indian data centers.

Mr Rajkumar has highlighted that new areas such as crypto currency, edge computing, distributed apps, gaming etc. would further boost the requirement of data centers in India.



Mr S Srinivas, Deputy Executive Director, CII-IGBC welcomed all the advisory group members and introduced Mr Syed Beary, Chairman, IGBC Bangalore chapter to the advisory group.

Mr Syed Beary thanked members for their participation and also highlighted that Data Centers have immense opportunities for reducing the resource consumption and become green. Mr Beary thanked Mr Dale Sartor, LBNL for collaborating with IGBC on energy efficiency in Indian data centers.

About the Joint Initiative of CII-IGBC and LBNL, US:

Mr Srinivas highlighted the IGBC green building movement in the country and the milestones achieved till date.

Later, Mr Srinivas mentioned about the IGBC initiatives in data centers in the past and the recent joint initiative by CII-IGBC and LBNL to enhance energy efficiency in Indian data centers.



Further he has informed that IGBC Green Data center rating system is an exclusive rating system for data centers and addresses energy efficiency improvement in both IT load & non-IT load. Implementation of IGBC Green Data Center rating system would help the data centres to achieve significant tangible and intangible benefits.

Key objectives of Phase-3:

Mr Dale Sartor, Staff Scientist, LBNL thanked all the advisory group members for their active participation. He stated that the estimated compound annual growth rate (CAGR) of data centers (measured in square feet) in India between 2010 and 2018 is 19.8%. Since Data centres are energy intensive and growing at much faster rate, there is a need for enhancing energy efficiency on a continuous basis.



Mr Dale presented on the past work done with CII on energy efficiency in data centers (phase-1 and phase-2) and shared the key outcome emerged out of the previous work. Further, Mr Dale mentioned the objectives of the present collaborative work with CII-IGBC, in the Phase-3, between April 2018 to Dec 2019.

He briefed about the key milestones to be achieved in the Phase-3.a and Phase-3.b. During the presentation, Mr Dale also pointed out the need of advancement in cooling such as chilled water-based cooling technologies and the ways to achieve new energy benchmarks e.g. Level-II and Level-III efficiency benchmark, as defined in ECBC 2017 (Energy Conservation Building Code). Mr Dale has also focused on the need for developing case studies for Indian data centers.

After the key objective of Phase-3, Mr Dale presented on energy efficiency requirements as per ECBC17 and proposed threshold limits for the following:

- CRAC equipment efficiency
- Air Management
- Temperature and Humidity Control
- Fan Control
- Cooling Towers
- Economizers
- Diesel Generators
- Metering and Monitoring,
- UPS (Uninterrupted Power Supply)
- Chillers
- Pump Efficiency
- Chiller Plant- Performance Approach

Discussion with Members:

Later, members were requested for their feedback on the threshold limits defined/proposed in the above listed components for Level-II and Level-III energy efficiency benchmarks. These areas are categorised into as the following four areas:



To have continuous engagement with all the members and develop recommendations based on consensus, four Task Forces have formed. All the advisory group members are requested to participate based on their expertise and interest.

S No.	Task Force	Scope for Energy Efficiency	Task Force, Chair
1.	Data Center – Cooling	a) Computer Room Air Conditioning (CRAC) Equipment Efficiency b) Air Management c) Temperature and Humidity Control d) Fan Control	Mr Raghuveer Singh
2.	Data Center – Electrical	a) Diesel Generators b) Metering and Monitoring c) Uninterrupted Power Supply (UPS)	Mr Pritam Goyal
3.	Data Center- Chiller Plant	a) Chillers b) Cooling Towers c) Pump Efficiency d) Economizers e) Chiller Plant (Performance Approach)	Mr PC Lohia
4.	Data Center- IT- Hardware and Software	a) Star ratings for Equipment b) Virtualization c) Geo redundancy	Mr Vivek Rajendran



(Group photographs captured during the data center visit)

Mr Srinivas requested the members for the following:

1. All the advisory group members to support the project, till Dec 2019, for the entire Phase-3.
2. Feedback and inputs for developing ECBC 2017 User guide - Data Centers
3. Support in framing up policies and implementation in data centres

4. Participate and nominate key colleagues in capacity building programmes: workshops, training programmes and join telecons as and when meetings are being organised by IGBC and LBNL.
5. Support the project in conducting case studies for identifying performance gap between ECBC 2017 and the present status. These case studies will demonstrate energy efficiency in Indian Data Centres.

Mr Dale Sartor and Mr Srinivas thanked Infosys team headed by Mr Rajkumar and Mr Punit Desai for holding the data center visit and also for hosting the advisory group meeting. Mr Srinivas thanked all the members for their involvement in the discussion and active participation for efficiency in Indian Data Centers.

All the members will be intimated for further meeting/ telecons. Please refer, annexures for further details on: ECBC user guide, presentations, agenda and participation sheet.

S. Karthikeyan

S Karthikeyan
Principal Counsellor, CII-IGBC

Dale Sartor
Staff Scientist, LBNL

Annexure-E

S No.	Task Force	Task Force, Chair	Members
1.	Data Center – Cooling	Mr Raghuvveer Singh, Vertiv Energy Pvt Ltd	<ul style="list-style-type: none"> • Mr Shankar KM, STT GDC • Mr PC Lohia, Reliance • Mr B Rajput, NIC • Mr Angela Barboza, Rittal • Mr Punit Desai, Infosys • Mr Mario Dias, NetApp • Mr Shubhabrata Sengupta, CtrlS • Mr Gopi Ravi, Stulz
2.	Data Center – Electrical	Mr Pritam Goyal, Advisor, Vodafone	<ul style="list-style-type: none"> • Mr Manoj Kapil, Wipro • Mr Mayank Srivastav, Schneider • Mr Shrirang Deshpande, Vertiv • Mr Mallikarjun V Patil, Schnabel dc • Mr Shubham Agarwal, Infosys
3.	Data Center – Chiller Plant	Mr PC Lohia, Reliance Industries	<ul style="list-style-type: none"> • Mr Mayank Srivastav, Schneider • Mr Mario Dias, NetApp • Mr Raghuvveer Singh, Vertiv • Mr Shubham Agarwal, Infosys
4.	Data Center – IT Hardware and Software	Mr Vivek Rajendran, Dell & EMC	<ul style="list-style-type: none"> • Mr Ashish Dandekar, Gerson Lehrman Group • Mr Pushpendra Pandey, IBM • Mr Rajkumar, Infosys • Mr Manik Kapoor, AMD

Annexure-F: List of advisory group members

1. **Mr Angela Barboza**, GM & Head APAC Region, Rittal India
2. **Mr Ashish Dandekar**, Council Member, Gerson Lehrman Group
3. **Mr Ashish Rakheja**, Managing Partner, Aeon Consultants
4. **Mr B. Rajput**, Senior Technical Director, National Information Center
5. **Mr Brahma Reddy Kasu**, Vice President, Datacenters infrastructure, CtrlS
6. **Mr Durgesh**, Managing Director, Pi Data Centres
7. **Mr Gopi Ravi**, Sales Executive, Stulz-CHSPL (India) Pvt Ltd
8. **Mr Jeyabalan Kythalingam**, Associate, Vice President, DC Facilities Project Netmagic
9. **Mr Kamal Nath**, CEO, Sify Corp
10. **Mr Kamar, Rajkumar Y**, Intel Technology India Pvt. Ltd
11. **Mr Mahesh Trivedi**, Vice President, STTelemedia Global Data Centers
12. **Mr Mallikarjun V Patil**, CEO, SCHNABEL DC Consultants India Pvt. Ltd
13. **Mr Manik Kapoor**, Head Server & Data Center Infrastructure, Asia Pacific & Japan, AMD
14. **Mr Manoj Kapil**, Practice Head- Data Center and O&M Services, Wipro
15. **Mr Mario Dias**, Manager-Fac Operations, Workplace Resources, NetApp
16. **Mr Mayank Srivastav**, Head, DC Business Development, Schneider Electric India Pvt. Ltd.
17. **Mr Murari Sinhal**, Gr Sr Vice President, Reliance Corporate Park
18. **Mr Nikhil Rathi**, CEO, Web Werks India Pvt. Ltd.
19. **Mr PC Lohia**, Senior Vice President, HVAC, Reliance Corporate Park, Mumbai
20. **Mr Pritam Goyal**, General Manager - Data Centers, Advisor
21. **Mr Punit Desai**, Regional Manager – Infrastructure, Infosys, Bangalore
22. **Mr Pushendra Pandey**, Program Manager - IT Infra & DC Ops, devIT-India, Software Labs
23. **Mr R Rajkumar**, VP-IT, Infosys, Bangalore
24. **Mr Raghuvveer Singh**, Director -Thermal Management, Vertiv Energy Private Ltd
25. **Mr Rajgopal A S**, Managing Director & CEO, NxtGen Datacenter & Cloud Technologies Pvt. Ltd
26. **Mr Ravi A Giri**, Enterprise Solutions Architect, Intel Technology India Pvt. Ltd
27. **Mr Saurabh Diddi**, Director, Bureau of Energy Efficiency, BEE, Delhi
28. **Ms Shalini Singh**, Real Estate and Workplace India, VMware
29. **Mr Shankar KM**, Senior Manager - Data Center Operations, STT GDC
30. **Mr Shivakumar V**, Global Offering Manager, IBM Global Resiliency Services-Global Site facilities and Data center services
31. **Mr Shrirang Deshpande**, Country Head-Data Center Business (India), Vertiv Energy Private Ltd
32. **Mr Shubhabrata Sengupta**, Sr Manager, CtrlS
33. **Mr Venkatraman Swaminathan**, VP & CGM IT Division India & SAARC, Schneider Electric
34. **Mr Vinod Kulkarni**, Facility Manager, NetApp India Private Limited.
35. **Mr Vivek Rajendran Director**, Director, Software Engineering, Dell EMC | Infrastructure Solutions Group