Fact sheet: How green are our rated "green buildings"?

The Centre for Science and Environment has carried out an assessment of energy consumption of buildings that have been rated under the LEED rating programme of the Indian Green Building Council (IGBC).

The objective of this analysis has been to assess if the rated buildings, once they are operational, can meet the benchmark of the official star labelling programme of the Bureau of Energy Efficiency (BEE). Under the BEE star labelling programme buildings are ranked according to their energy performance index in relation to the benchmarks created for different building typologies -- day use office, BPO (IT offices with extended working hours) and retail malls, and for different climatic zones. Labelling for hospitals has been launched recently. Under the star labelling programme buildings are ranked based on the energy efficiency level and are awarded 1-5 stars, with 5-star being the most efficient.

If the LEED rated buildings have to comply with the BEE star labelling as per the BEE methods then where will they stand?

Rating systems for buildings in India

Green rating is a voluntary market based scheme that is carried out by the private rating agencies including LEED and GRIHA based on wide ranging criteria for green measures adopted by the buildings. The corporate sector sees reputation advantage in this.

Green building rating system came to India in 2001 with US Green Building Council (USGBC) extending its LEED (Leadership in Energy and Environmental Design) certification to Indian buildings. Over years indigenous version have been developed in the country. Currently India has two matured rating programmes: the LEED-India Programme that was adapted from the USGBC's LEED in 2007. This was run by the Indian Green Building Council (IGBC) till June 2014. The other system is the Green Rating for Integrated Habitat Assessment (GRIHA), conceived and administered by The Energy and Resources Institute (TERI) was also started in 2007.

Both GRIHA and LEED-INDIA are operating at the national level. Both these ratings have a checklist of criteria and points that are assigned to these criteria based on their relative importance. Points are given to a range of criteria broadly grouped as construction practice, energy and auditing. The relative importance of each varies between rating system. Energy efficiency is high on the list of priorities in both ratings, with both dedicating almost one-third of its rating points to it.

It is commendable that the Indian Green Building Council (IGBC) has responded positively to the public demand for information on the actual energy performance of the rated buildings and took the lead in publishing the data on their website. IGBC has put out data for 50 buildings out of about 500 buildings (offices, hospitals, hotels, residences etc) it has rated. This has made the analysis possible. Similar data for GRIHA rated buildings are not available with CSE.

When IGBC had originally put out the energy and water consumption data of the buildings the names of the buildings were not disclosed and they were only coded. (See: Performance Monitoring of IGBC Rated Buildings as of January 2014). Subsequently, IGBC disclosed the names of the buildings as well (See attachment: Performance Monitoring of IGBC Rated Buildings downloaded on September 11). (https://online.igbc.in/igbc/redirectHtml.htm?redVal=showPerformnceMonitoringnosign

After CSE released the findings of its analysis of the comparison of the energy performance of rated buildings with the star labelling programme of BEE during the third week of September, IGBC withdrew the names of the buildings from its website. IGBC needs to carry forward this exercise by implementing an effective and transparent performance monitoring system for rated buildings that have become operational. This can make rated buildings accountable for their resource use and also maximise the resource saving from the rating system.

Based on the information disclosed by IGBC on annual electricity consumption and the total built up area of the individual buildings CSE has calculated the energy performance index or EPI (kWh/sq m/year). This is calculated by dividing the total energy consumed (in kilo-Watt-hour or kWh) over a year by the total built-up area (in square metre or sq m) of the building. CSE has applied the BEE method for EPI estimation.

Day use office buildings: When compared with the BEE benchmark for day use commercial offices as per their climatic zone, about 41 per cent do not qualify for BEE star rating (See attachment: Energy performance of LEED-Rated daytime use building).

The tally

LEED certified Day use commercial office buildings not qualifying for BEE star label:

Climatic Zone- Composite: BEE cut-off for 1star is 190 EPI

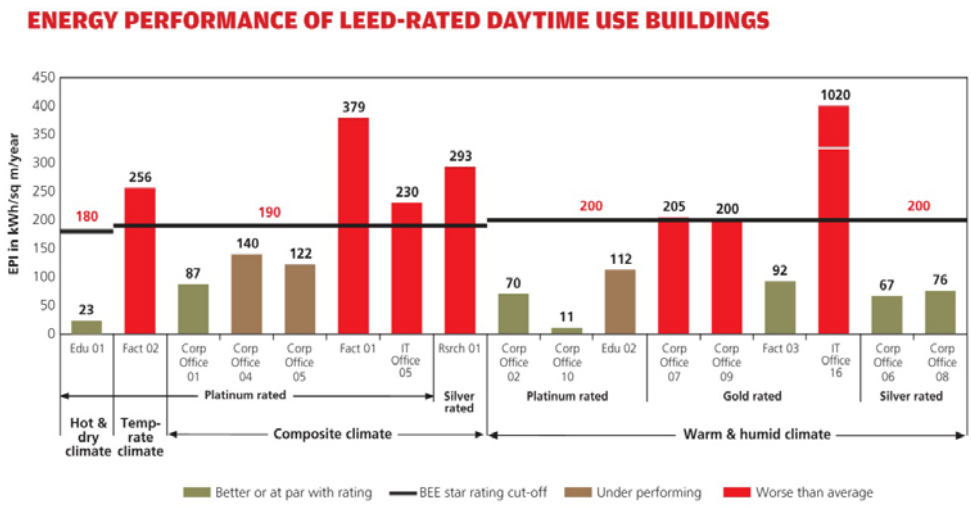
- ITC Ltd., Saharanpur (EPI - 379)
- Du Pont Knowledge Centre, Hyderabad (EPI - 293)
- Wipro Technologies, Gurgaon (EPI - 230)

Climatic Zone- Warm and Humid: BEE cut-off for 1star is 200 EPI

- Wipro Technologies KDC Tower - 4, Kolkata (EPI - 1020)
- Enercon India Pvt Ltd, Mumbai (EPI - 205)
- FL Smidth House, Chennai (EPI - 200)

Climatic Zone- Temperate: BEE cut-off for 1star is NA

- ITC Ltd., Bangalore (EPI - 256)



Note: See Annexure for the names of the buildings
Source: Computed by CSE on the basis of LEED-India (IGBC) data

Annexure: Name of buildings

Corp Office 01	CII-Green Business Centre, Hyderabad
Corp Office 02	Suzlon One Earth, Pune
Corp Office 03	Bayer's EcoCommercial, Noida
Corp Office 04	Spectral Services Consultants Office, Noida
Corp Office 05	ITC Green Centre, Gurgaon
Corp Office 06	CII Suresh Neotia Centre of Excellence for Leadership, Kolkata
Corp Office 07	Enercon India Pvt Ltd, Mumbai
Corp Office 08	Thermax, Pune
Corp Office 09	FL Smidth House, Chennai
Corp Office 10	CRISIL House, Mumbai
Fact 01	ITC Ltd., Saharanpur
Fact 02	ITC Ltd., Bangalore
Fact 03	Grundfos Pumps, Chennai
Edu 01	Birla International School, Jaipur
Edu 02	Great Lakes Institute of Management, Chennai
Rsrch 01	Du Pont Knowledge Centre, Hyderabad
IT Office 16	Wipro Technologies KDC Tower - 4, Kolkata
IT Office 05	Wipro Technologies, Gurgaon

BPO buildings (IT offices with extended working hours): Being an extended working hours sector, BEE's energy efficiency standard for this sector is computed on hourly energy performance instead of the usual annual EPI. BPOs may have varied hours of operation e.g. 24x7, 24x5, 18x7, 16x7 or 16x5 etc. Therefore BEE divides the basic EPI of the building with total number of working hours in the year to arrive at an annual average hourly energy performance index or AAhEPI (Wh/sq m/hour) for rating purpose.

The IGBC has not disclosed working hour details of the buildings. Therefore CSE has computed each building's AAhEPI assuming they function 24 hours of the day and 365 days a year. A generous assumption favouring the buildings.

It has been found that almost 47 per cent do not qualify for BEE star rating (See Table for Building Energy Star Rating Programme BPO buildings).

The tally

LEED certified IT office buildings not qualifying for BEE star label:
Climatic Zone- Composite : BEE cut-off for 1star is 45 AAhEPI

- Wipro Technologies, Gurgaon (AAhEPI - 110)
- Fast Track Building 1&2, Wipro Technologies, Greater Noida (AAhEPI - 81)

Climatic Zone- Warm and Humid: BEE cut-off for 1star is 50 AAhEPI

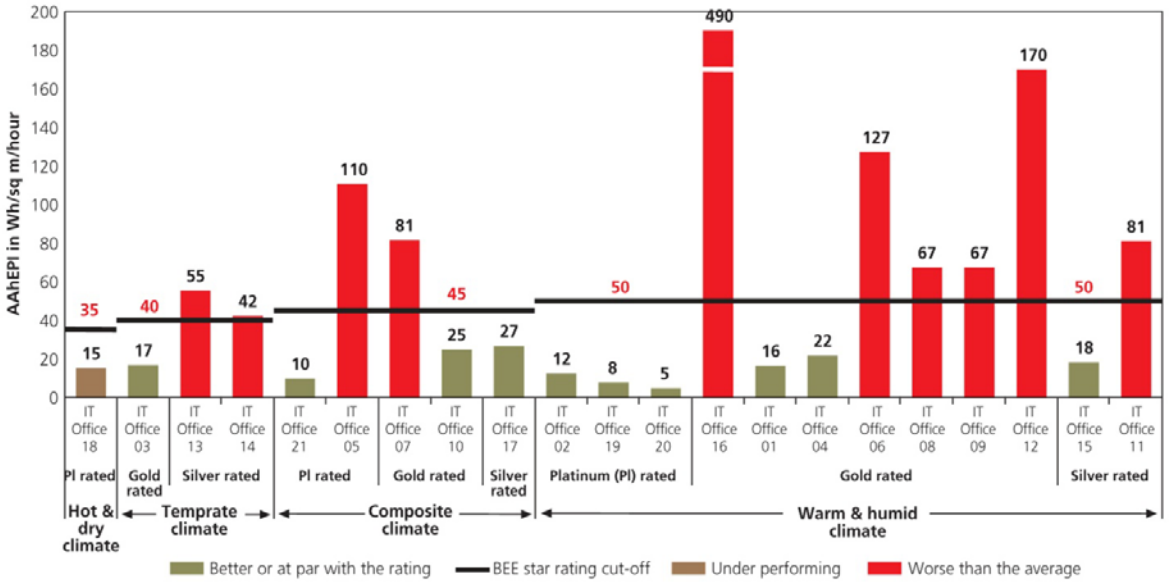
- Wipro Technologies KDC Tower - 4, Kolkata (AAhEPI - 490)

- Chennai Development Center, S3 & S4 blocks, Wipro Technologies, Chennai (AAhEPI - 170)
- Wipro S1, Kochi (AAhEPI - 127)
- Wipro Chennai Development Center- SEZ, Chennai (AAhEPI - 81)
- Software Development Block 3,Wipro Ltd, Phase II, Hinjewadi, Pune (AAhEPI - 67)
- Wipro Limited, Special Economic Zone PDC-2 S2, Pune (AAhEPI - 67)

Climatic Zone- Temperate: BEE cut-off for 1star is 40 AAhEPI

- Wipro Special Economic Zone - S2, Bangalore (AAhEPI - 55)
- Wipro Special Economic Zone (SR) - Tower S3, Bangalore (AAhEPI - 42)

ENERGY PERFORMANCE OF LEED-RATED BPO BUILDINGS



Note: See Annexure for the names of the buildings. AAhEPI – Annual Average Hourly Energy Performance Index
Source: Computed by CSE on the basis of LEED-India (IGBC) data

Annexure: Name of buildings

IT Office 01	TCS Technopark Phase I, Chennai
IT Office 02	TCS Technopark Phase II, Chennai
IT Office 03	GE India Technology Centre 'Phase V', Bangalore
IT Office 04	Olympia Tech Park, Chennai
IT Office 05	Wipro Technologies, Gurgaon
IT Office 06	Wipro S1, Kochi
IT Office 07	Fast Track Building 1&2, Wipro Technologies, Greater Noida
IT Office 08	Software Development Block 3,Wipro Ltd, Phase II, Hinjewadi, Pune
IT Office 09	Wipro Limited, Special Economic Zone PDC-2 S2, Pune
IT Office 10	Wipro special economic zone, Blocks S1 & S2, Gopanpally, Hyderabad
IT Office 11	Wipro Chennai Development Center- SEZ, Chennai
IT Office 12	Chennai Development Center, S3 & S4 blocks, Wipro Technologies, Chennai
IT Office 13	Wipro Special Economic Zone - S2, Bangalore
IT Office 14	Wipro Special Economic Zone (SR) - Tower S3, Bangalore
IT Office 15	Wipro Technologies, BHDC, Bhubaneswar
IT Office 16	Wipro Technologies KDC Tower - 4, Kolkata
IT Office 17	Wipro Ltd. (Infotech), Kotdwar
IT Office 18	BPO-1, Infosys BPO Limited, Jaipur
IT Office 19	Software Development Block 1, Infosys Technologies Ltd, Thiruvananthapuram
IT Office 20	Infosys - SDB 2, Thiruvananthapuram
IT Office 21	Infosys - SDB 1, Pocharam Campus, Hyderabad

NOTE:

- IGBC data also included hospitals, hotels and residences in its performance monitoring but CSE didn't analysis these as by the time the book went into press BEE had no star labelling for these typologies of building.
- Wipro Technologies KDC Tower - 4, Kolkata and Wipro Technologies, Gurgaon were included in both typology day use and BPO as IGBC disclosure labelled them as day use IT building.
- Two factory buildings both exceeding BEE benchmark, were not included in the analysis as they were added to the list by IGBC after the analysis had been finalised.