

Bearys
SINCE 1981

23rd
National Award for
Excellence in Energy Management **2022**
23 – 26 August 2022



Confederation of Indian Industry



Project : Bearys Global Research Triangle (BGRT), Whitefield, Bangalore, India.
Sector : Buildings - R&D



Company Name : Bearys Properties & Developments Pvt. Ltd
Unit Name : Bearys Global Research Triangle (BGRT)
Ashram Road, Whitefield, Bangalore.

Presenting Team Members with Designation

Syed Mohamed Beary - CMD

Ramesh Suthar - GM, Green Initiatives (Lead presenter)

Abdul Salam - Admin

Shanthakumar - Manager, Electrical

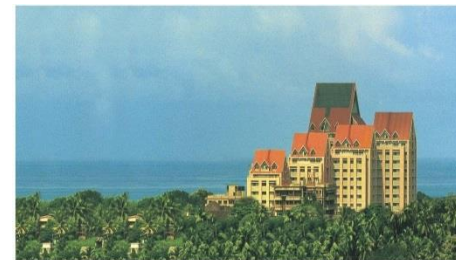


Introduction

- Bearys Group is an award-winning property development company, focussing on Green Architecture & Sustainable Development and all their projects are appreciated by both Industry & Academia

Our Vision

God in His infinite mercy created man as the highest form of creation and provided us with everything we need for our sustenance and well-being. The entire universe, all the physical laws of the cosmos, the splendid earth and the abundance of nature were created for the benefit of humanity. Inspired by these benedictions, we at Bearys Group are committed to create marks of excellence in a responsible and sustainable manner, so that this beautiful planet and its wondrous resources are preserved for the benefit of generations to come.



Introduction

Our Mission

We strive to earn the trust of our clients and build long lasting relationships by delivering excellence consistently and upholding the highest standards of business integrity in all our operations. To this end we will deploy our collective expertise in creating projects that are architecturally significant, functionally sound, environmentally conscious and offer the highest value for investment.

- The Group has developed over 10 million sq.ft. of IT/ITES/R&D Parks, Malls, Data Centres, Residential, Commercial Complexes, Places of Worship, Educational Institutions and Mixed-Use Developments.
- The Group has now evolved as a pioneer in “Design.Build.Deliver” (DBD) model, a unique value proposition and is acclaimed as specialists in Data Centres, Campus Developments, R&D and Lab Spaces among others.



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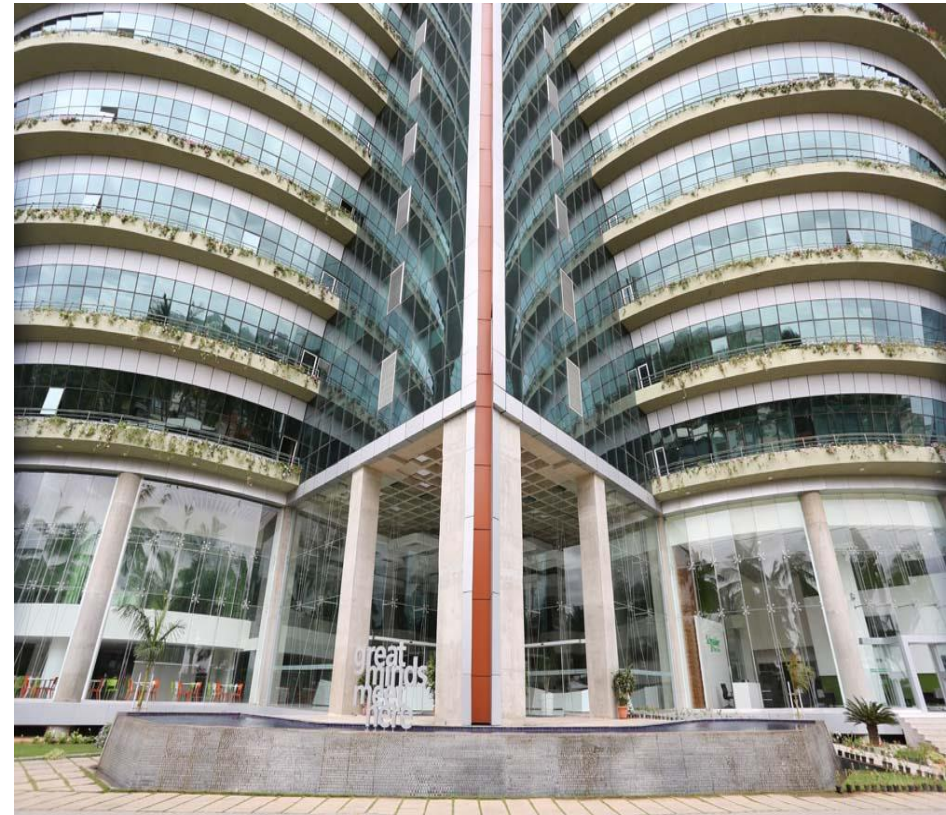


Confederation of Indian Industry



BGRT offers seamless connectivity, a creative workplace and contemporary business lifestyle.

- Oriented the building to have the longer axis along East and West.
- The building consists of three conjoining towers each having square shapes in the plan and so oriented that its facades are at 45° to South, West and East.
- Circular balconies flare outwards from 2nd floor onwards thus shading the lower ones.



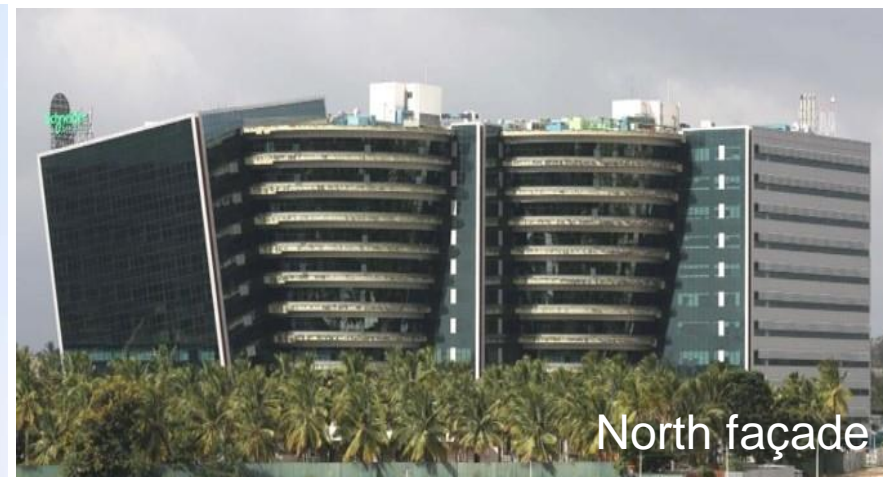
Architectural Energy Efficient Features

- The southern façade receives maximum solar heat and therefore built with double wall of AAC blocks with air gap.
- Entire Northern façade glazed with 6-20-6 high performance glass DGUs with thermal break.
- NW facade of tower C gets bright sun in the afternoon from 13hrs to 16hrs, therefore fitted with external louvres to reduce heat ingress and avoid glare.

Louvres



South facade



North façade

Architectural Energy Efficient Features

- **Terrace** lined with R-15 insulation and having high albedo painting.
- Building footprint restricted to around 28% of the site area.
- Enchanting innovative **Landscaping/Water scaping** done in 5910 sq. m area (167 % more than statutory requirement).
- Note: No recurring cost except to maintain landscape.





FIRST PROJECT TO OFFER

84% FLOOR EFFICIENCY

78% LESS WATER USAGE AND IS A ZERO DISCHARGE BUILDING

56% SAVING ON ENERGY

48% REDUCTION IN MONTHLY OPERATING COSTS

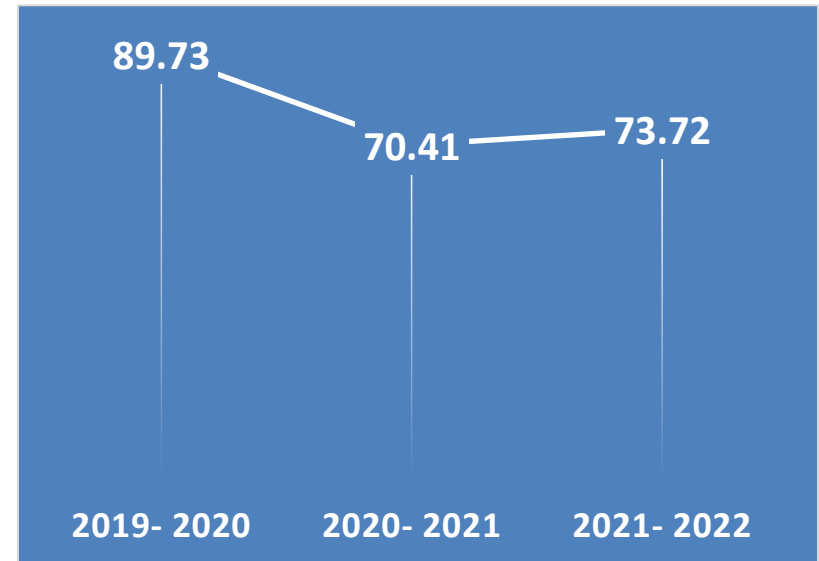
Year	2019 - 2020	2020 - 2021	2021 - 2022
Electrical Energy Consumption (kWh)	7695701	6039088	6322563
Thermal Energy Consumption (kWh)	0	0	0
Specific Energy Consumption (SEC) (Annual kWh Consumption/sq.m)	89.73	70.41	73.72

Electrical Energy Consumption Overview

All occupants in our building are engaged in R&D and there are 43 test labs; of which 36 are high energy consuming labs such as Electrical labs, Biological & Pharma labs, Pilot plant, Ovens, Deep freezers, Scrubbers, RO plants, High capacity servers, etc.

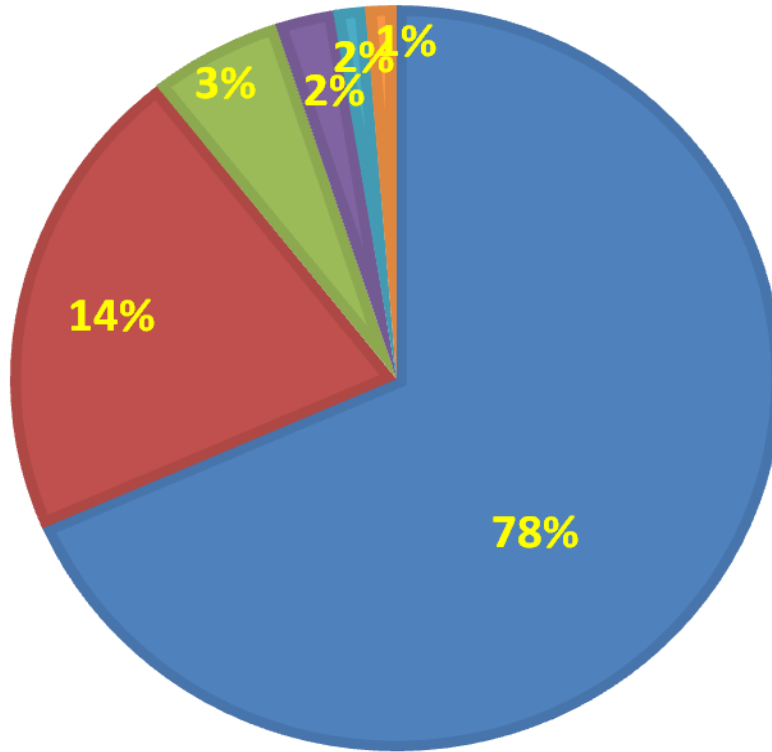
Following operational changes were done to offset last year's out put loss.

1. Staff strength increased to 1650 in 2021-22 from 1150.
2. Most labs operated extra 3 hours during 2021-22 i.e. 12 hours rather than 9 hours.
3. A new client set up their electrical lab in 486 sq. m.



Even with all these energy consuming additions, we achieved SEC of 73.72 through continuous monitoring/use/IOT, introduction of more movement/daylight sensors, periodical use of fresh air in some office spaces, improving HVAC system efficiency (Approach), adding 10 VFDs in HVAC system and Rainwater Reuse.

■ Occupants ■ HVAC ■ Lighting ■ PHE ■ Lifts ■ Misc



Total Building	6322563
Occupants	4943275
HVAC	906242
Lighting	210956
PHE	128474
Lifts	90051
Misc	43565

Occupant energy usage increased in 2021-22 owing to 3 hours extra working in labs & increased staff strength.

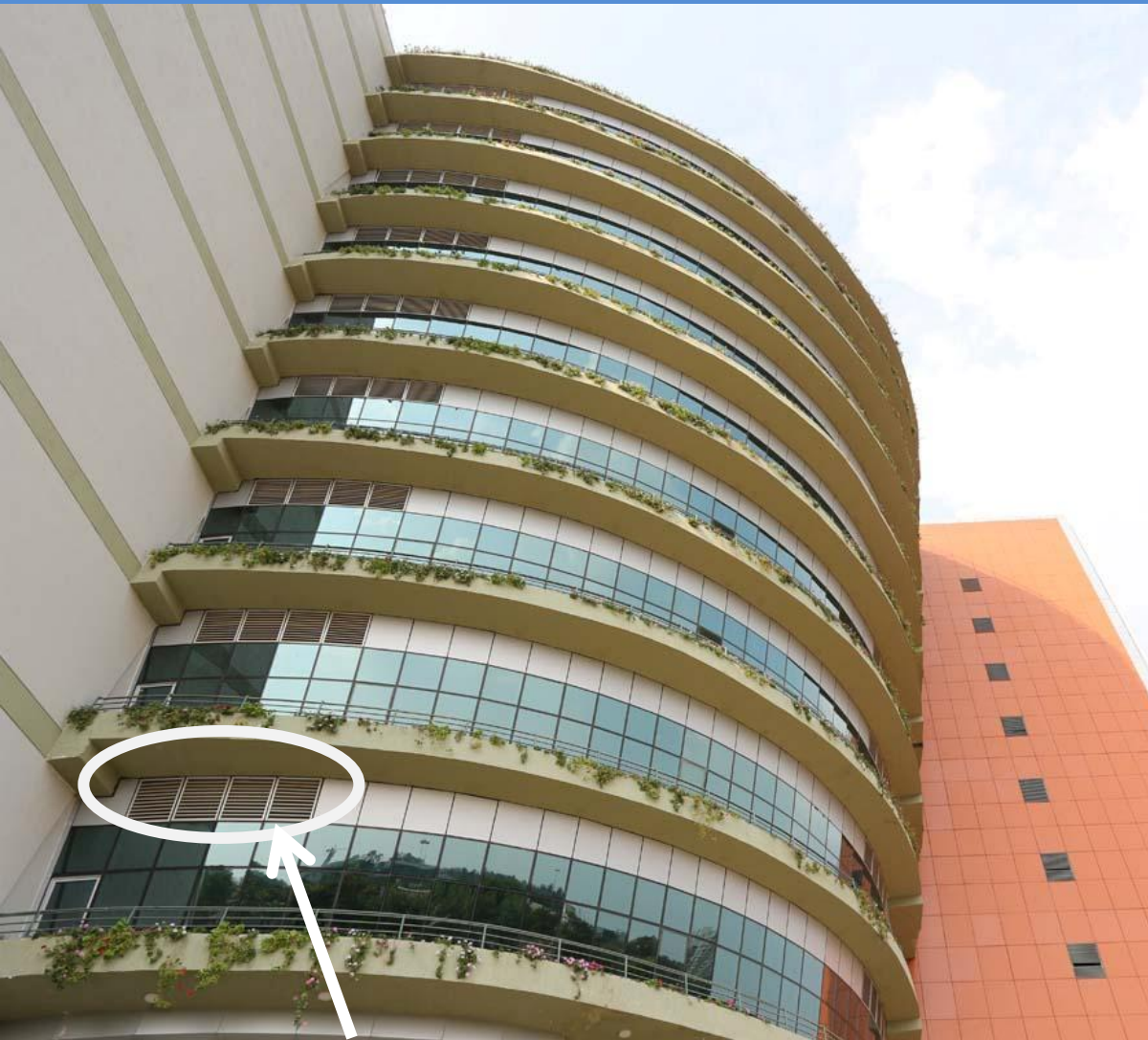
Whole Building Electrical Energy Use (kWh) For 2021 - 22

HVAC - HRW

Installed Heat Recovery
Wheels for pre -cooling
fresh air



HVAC - Free Air Cooling



Air intake

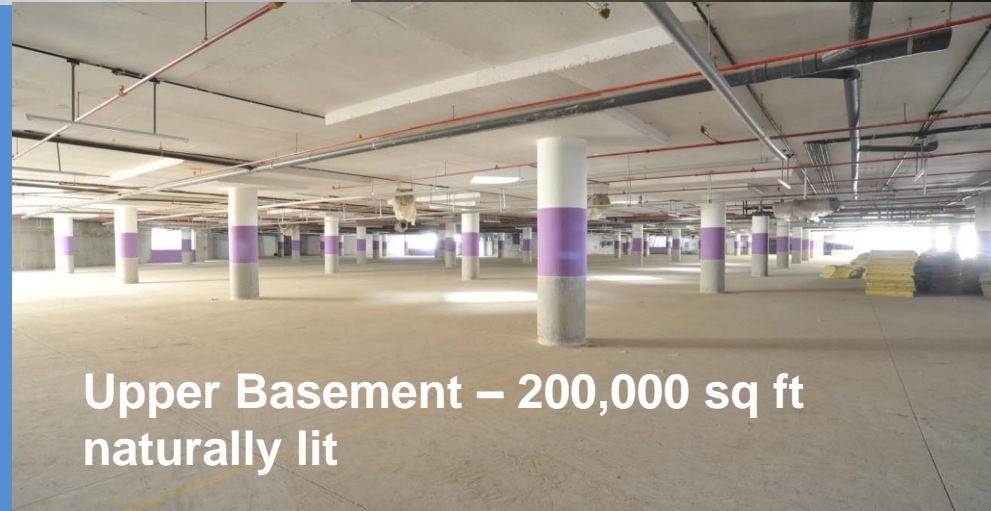


Exhaust grills with motorized dampers

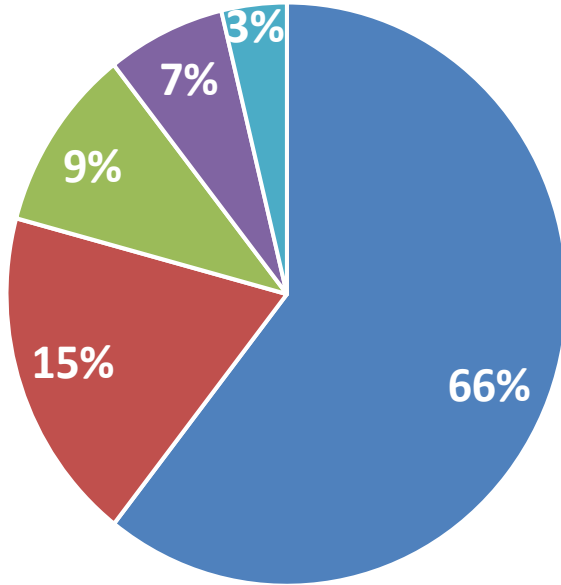
Free Air Cooling / Night Purging taking advantage of moderate weather of Bangalore



Light Wells & Upper Basement Parking naturally lit during the day.



Upper Basement – 200,000 sq ft naturally lit



■ HVAC ■ Lighting ■ PHE ■ Lifts ■ Misc

Percentages reduced in PHE and Lighting

HVAC	906242
Lighting	210956
PHE	128474
Lifts	90051
Misc.	43565
Total	1379288

Information on Competitor National & Global benchmark				SEC (kWh/sq.m/year)	BGRT	
1	Group/Company level (Competitor 1 Bangalore)	CII Energy Award 2020-21	Buildings	75.5	73.72	
2	Group/Company level (Competitor 2 Bangalore)	CII Energy Award 2020-21	Buildings	111	73.72	
3	National level	BEE	Buildings	179	73.72	
4	International level	ASHRAE 90.1-2004	Energy Modelling	Baseline Building	191	73.72
				BGRT	129	
5	BGRT Target 2021 - 22			Not set owing to pandemic	73.72	

Target is to make BGRT “Net Zero Building”

LIST OF ENCON PROJECTS PLANNED: 2022 -23

No	Title of Project	Annual Electrical Saving (Million kWh)	Investment (Rs. in Million)	Comment
1	Increase usage of BMS/IOT to further improve monitoring & SEC	0.1	0.5	Integrate stand alone systems of HVAC, STP, Waterscape & Landscape
2	Alternate server condenser water supply system	0.086	0.5	Only one occupant is using server condenser water being supplied by us. To cater to such requirement we are using around 950 kWh of energy everyday and 20 KLD of top up water. We are evaluating use of alternatives like switch to use of Split ACs, etc.
3	Plan for Roof Top Solar Power installation.	0	0.5	Further add RTSP under OPEX system. This will reduce dependence on costlier BESCO power during March to May period. Will save around Rs. 26,00,000/- and reduce carbon emissions.
4	Diversify Source of Green Energy	0	1	BGRT has renewable energy from wind and didn't get required kWh during April & May. We intend to sign for off-site group captive for solar/Hydel energy to overcome the issue.
5	Electricity generation from Bio-Waste of neighboring Safal (Mother Dairy) plant.	0	0.5	Being Pursued. Around 2200 apartments have been constructed within 400 m radius of the project. Mitigating the smell from the Bio-gas plant is being worked upon.

Energy saving projects implemented in the last three years

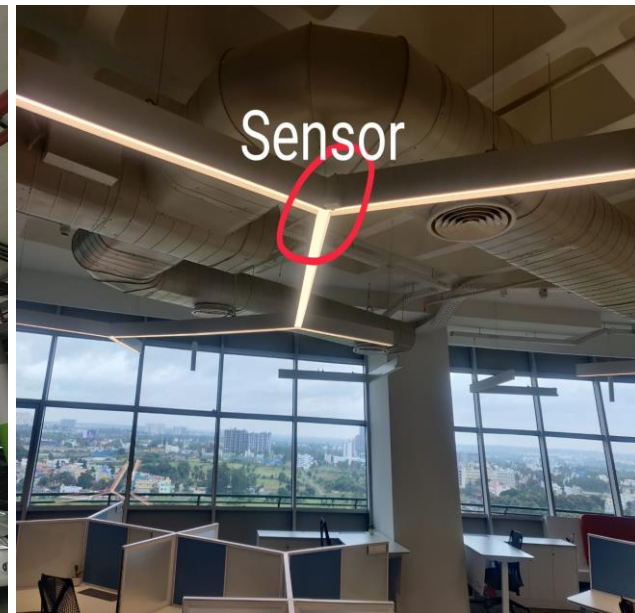
Year	No of Energy Saving projects	Investments (INR Million)	Electrical saving (Million kWh)	Thermal saving Million Kcal/MTOE)	Saving (INR Million)	Impact on SEC (Electrical, Thermal)
FY 2019 - 20	2	0.91	0.2542	0	2.53	3.30%
FY 2020 - 21	4	0.3245	0.2365	0	2.36	3.90%
FY 2021 - 22	4	1.9221	0.1492	0	1.3644	2.36%

ENCON PROJECT COMPLETED 2021- 2022

- ❖ Rain Water Reuse - equivalent kWh saving 50153 Units
- ❖ Water saving – around 3000 kL; 396 tanker trips
- ❖ Diesel saving – around 594 Liters, consequential carbon emission reeducation



ENCON PROJECT COMPLETED 2021- 2022



**10 VFDs Installed in Phase II
Saving 21250 Units
(Total Installed 35)**

**Additional 71 Movement Sensors &
2 daylight sensors installed,
Saving 2300 Units**

ENCON PROJECT COMPLETED 2021- 2022

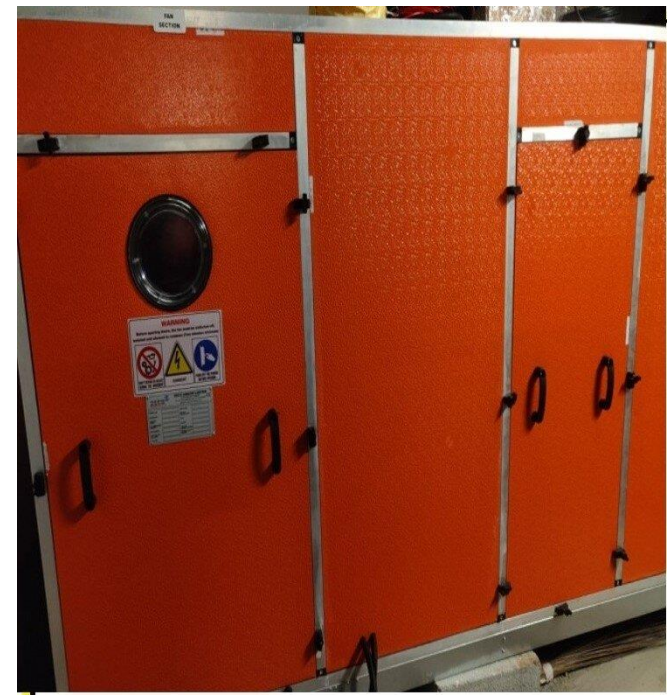
Periodical Use of Fresh Air in Office space Saving 75500 Units



Part wall demolished for blower unit



Ducting done



15kW Blower Unit

Innovative Project implemented : 2021 – 2022

SL. No.	Project	Project Category	Remarks
1	Periodical Use of Fresh Air in Office space	C	There are two AHUs in Canadian Standards Associates space (CSA). We supplied AC air to labs from one AHU. Civil works were done in other AHU room so that air from this AHU will circulate in space occupied by staff. Additional ducting with a chamber having a 15kW blower was done to take air from building's Free Air Cooling /Night Purging system. After discussions with staff and AC consultant, Fresh Air is supplied in between 8:30 AM to 9:30 AM, 12:30 PM to 1:30 PM and 4:30 PM to 5:30 PM that is for 3 hours in a 9 hour shift.
2	Optimizing HVAC in Labs	C	Generally, Labs operated at 20 C to 22 C. We thought, why not optimize the HVAC temperature cluster wise to save energy. We reviewed temperature needs of labs; cluster wise; in relation to equipment in the Lab and heat generation. We were able to optimize HVAC temperature at 24 C in some clusters without impairing the efficiency of labs or up-time

1. During the pandemic period, it was desired to increase fresh air supply in spaces occupied by office staff (no changes in temperature & RH in labs) beyond "ASHRAE Standard plus 30%" to reduce chances of spread of infection. We evolved a scheme and Canadian Standards Associates (CSA) accepted our plan.
2. The urge is to save energy; improve project efficiency/SEC and reduce costs were the triggers



Renewable Energy

Utilisation of Renewable Energy Sources

Year	Technology (Electrical)	Type of Energy	Onsite/Offsite	Group/Building Installed Capacity (MW)	Investment made (INR Million)	RPO Obligation (Million kWh)	Generation Utilized (Million kWh)	% of Overall electrical energy
FY 2019 - 20	Electrical	Wind	Offsite	2.2	0	4.8	6.206	80.64%
FY 2020 - 21	Electrical	Wind & Hydel	Offsite	2.2	0	4.8	4.845	80.23%
FY 2021 - 22	Electrical	Wind & Hydel	Offsite	2.2	0	4.8	5.439	86.03%

Target for 2022 – 23 is 95%

Waste utilization and management

- System of segregation and recycling in place.
- Paper & Carton boxes, Oils & Food/canteen waste is handled by Bearys Facility Management Services and sold to scrap dealers. Horticulture waste is composted by us onsite.
- Electronic waste, Metal waste & some paper waste is recycled by the occupants as per company policy.
- Old PCs, UPS, Converters, chairs, etc are given to desirous employees for use.
- BGRT is Zero Discharge Building. Rainwater is reused.
- Wastewater is treated using MBR technology and 100% of the treated water is used on site for irrigation, flushing and AC cooling tower top-up.

Waste utilization and management

No	Type of waste generated	2019-2020		Type of waste generated	2020-2021		Type of waste generated	2021-2022	
		Quantity of waste generated (MT/year)	Disposal method		Quantity of waste generated (MT/year)	Disposal method		Quantity of waste generated (MT/year)	Disposal method
1	Food	34.8	Given for composting	Food	3.422	Given for composting	Food	4.625	Given for composting
2	Oil	0.76	Sold to scrap dealer	Oil	0.75	Sold to scrap dealer	Oil	0.7	Sold to scrap dealer
3	Paper/ Carton	10.8	Sold to scrap dealer	Paper/ Carton	0.22	Sold to scrap dealer	Paper/ Carton	6.89	Sold to scrap dealer
4	Garden waste	4.8	Converted to compost at site	Garden waste	6	Converted to compost at site	Garden waste	5.5	Converted to compost at site

GHG Emission

Year	Scope 1 Emission (t)	Scope 2 Emission (t)	Scope 3 Emission (t)	Ton of Co2 equivalent	Emission intensity kg/sq.m	Short term Target 2022 - 23	Long term Target
2019-20	458.88	1177.43	0	1636	19	7 kg/sq.m	Make BGRT Net Zero Energy Building
2020-21	93	943.7	0	1036	12		
2021-22	94.98	674.1	0	769	8.9		

Indoor Air Quality

Type of system installed	Supplier	Investment (Rs in Millions)	Operating Cost (Rs in Millions)	Running Hours	Remark
PM 2.5, PM 10 -MERV 13 (& HEPA in Loreal Space) Filters	AAF India Pvt Ltd	0.0858 (common area)	0	—	No Ozone depletion R134a refrigerant & water based fire suppressant
CO2 Sensors (office spaces) and CO monitoring Jet Fan System (parking)	Conaire & Flakt	0.45 Million (Added 6 Co2 sensors in 2021-22)	0	24	
TVOC zero or with in LEED norms Paints , Varnishes, Sealants, & Plywood.	Berger, Nerolac, W R Bonsal, Dove Corning, Green Ply, Uniply.	0.163 (2021-22)	0	—	

Team Work, Employee Involvement & Monitoring

Energy monitoring system

- **Project has installed "MacCloud" Asirax software for energy monitoring & generates consumption reports every 15 minutes.**
- **Additionally manual recording by electricians once a day.**
- **Daily standing review meeting by Manager (electrical)**
- **Weekly/monthly review meeting by Facility Manager.**
- **Periodical review by Higher Management.**
- **Yearly audit/training/familiarization by software suppliers, consultants.**
- **Spent on Encon projects – 1.75 % of BGRT turnover during 2021-22.**

Team Work, Employee Involvement & Monitoring

Quality circle/group activity/kaizen

ENCON Quality Circle regularly meets every month. Following projects were carried out in FY 2020-21:

- Optimized working of various electrical equipments, like PHE pumps, lighting, lift uses, automatic doors etc.
- Fitment of additional daylight and movement sensors
- VFD installation
- Rainwater reuse.
- Periodically supplying fresh air in staff occupied areas.
- Safety project – Discarded the use of Hydro Chloric Acid in cooling tower and adapted organic bio - cleaner.
- **Saved 1,49,203 units during FY 2021-22.**

IGBC rating – First LEED Platinum certified R&D park certified by both USGBC & IGBC



Confederation of Indian Industry



Indian Green Building Council

Indian Green Building Council (IGBC)

hereby certifies that


Beary's Global Research Triangle

Bangalore

*has successfully achieved the Green Building Standards required for
the following level of certification under the Leadership in Energy and Environment Design
(LEED) India Green Building Rating System*

LEED India for Core & Shell Platinum

March 2014



C N Raghavendran
Chairman, LEED India



Dr Prem C Jain
Chairman, IGBC



S Raghupathy
Executive Director, CII-Godrej GBC

Implementation of ISO 50001/Green Co/IGBC rating

- BGRT is a LEED Platinum Certified Green Building. Green Building or Griha Certification by IGBC, USGBC or TERI is comprehensive covering State bylaws, ECBC & NBC norms, Resource Conservation, Environment & Neighbourhood, IAQ/Employee health, etc.
- Bearys Group is complementing LEED certification with ISO 9001:2015 Quality System in phases to bolster development & construction activity. In 2020, we implemented in two verticals namely Bearys Properties & Developments Pvt Ltd. & Bearys Infrastructure & Construction Engineering Pvt Ltd.
- BGRT Invested 1.75% (Rs. 2 Laks) of BGRT's FY 2021-22 turnover in **Energy Management/Encon Projects.**

Learning from CII Energy Award 2021 or any other award program

- Interaction with professional peers of other grade A buildings of Bangalore.
- R&D buildings and IT buildings are different with regard to energy usage.
- Bench marking SEC target for BGRT.
- Cooling tower organic bio - cleaning.
- Continue pursuit of bio energy.

Awards Received for BGRT



2008

- Nominated among best sustainable Architecture Award, Real Estate Investment World Summit, Riyadh

2009

- Outstanding Concrete Structure Award, Indian Concrete Institute
- Best Office Development Award, CNBC Asia Pacific Property Award, Singapore

2013

- Best Commercial Green Development, CREDAI

2014

- LEED Platinum IGBC
- The Emerson Cup Excellence Award, Emerson Climate Technologies, USA
- Most Environment Friendly Commercial Office Space NDTV Property Awards, India
- Design Award for Interiors, IDA, USA

2015

- Design Award For illumination, IES USA
- Merit Award For illumination, IES USA
- Times of India and Honeywell award for Smartest Office Building in India

2016

- Best Foreign Project Best Office Awards OFFICENEXT Moscow

2020

- '21st National Award for Excellence in Energy Management 2020'
- 'IGBC Performance Challenge 2020 for Green Built Environment - Excellence Award'

2021

- '22nd National Award for Excellence in Energy Management 2021'
- 'IGBC Performance Challenge 2021 for Green Built Environment - Excellence Award'



Awards and

Recognitions



Visit of Students, Architects, Consultants & Government official to BGRT



Madya Pradesh Jal Board IAS Officers visit



BMS School of Architecture, Bangalore.



JD Institute, Bangalore



ASADI (Asian School of Architecture and Design Inov.), Kochi, Kerala

Visit of Students, Architects, Consultants & Government official to BGRT



Bearys Institute of Technology, Mangalore



SVIT (Sai Vidya Inst of Tech) Bangalore Visit



CMTI College, Bangalore



Bearys Enviro-Architecture Design School (BEADS), Mangalore

Thank you !

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The Project that has made a difference to the Place, the People & the Planet