



Confederation of Indian Industry

22nd
National Award for
Excellence in Energy Management **2021**
24 - 26 August 2021

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



**Company : 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)

Ar. Tapasya Das – Lead, HSE

Shanthakumar - Manager, Electrical





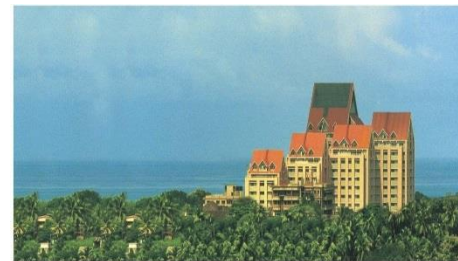
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Introduction

- Bearys Group is an award-winning Green Developer.
- “Delivering Excellence. Consistently” sums up the group’s spirit. ■
- The Group has developed around 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 value proposition and specialists in Data Centres, Campus Developments, R&D and Lab Spaces among others.



Introduction

Triple E i.e. ‘Entrepreneurship’, ‘Environment’ & ‘Education’ forms our foundation.

- **Entrepreneurship:** The group’s activities span the entire gamut of the real estate sector. Over the years we have evolved as a specialist Turnkey Solution providers and pioneers of the singular **design-build-deliver (DBD)** model, underpinned by stringent quality, cutting-edge technology, speedy delivery, architectural high resulting in several high-profile projects of manifold diversity.
- **Environment:** From inception, we develop projects that respect nature, contribute to the environment and are synonymous with “Sustainable Development”. To our credit, we have won several prestigious awards in India & abroad including **7 IGBC / LEED Platinum certified projects**. We have the privilege of developing India’s first LEED Platinum R&D Park and the World’s first Zero Energy Green Mosque certified by IGBC & USGBC.
- **Education:** Since 1906, education is at the core of all our endeavors. The group manages and operates over 20 institutions from Montessori to Collegiate level including Bearys Institute of Technology (BIT) and Bearys Enviro-Architecture Design School (BEADS) at Mangalore, Karnataka State.





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

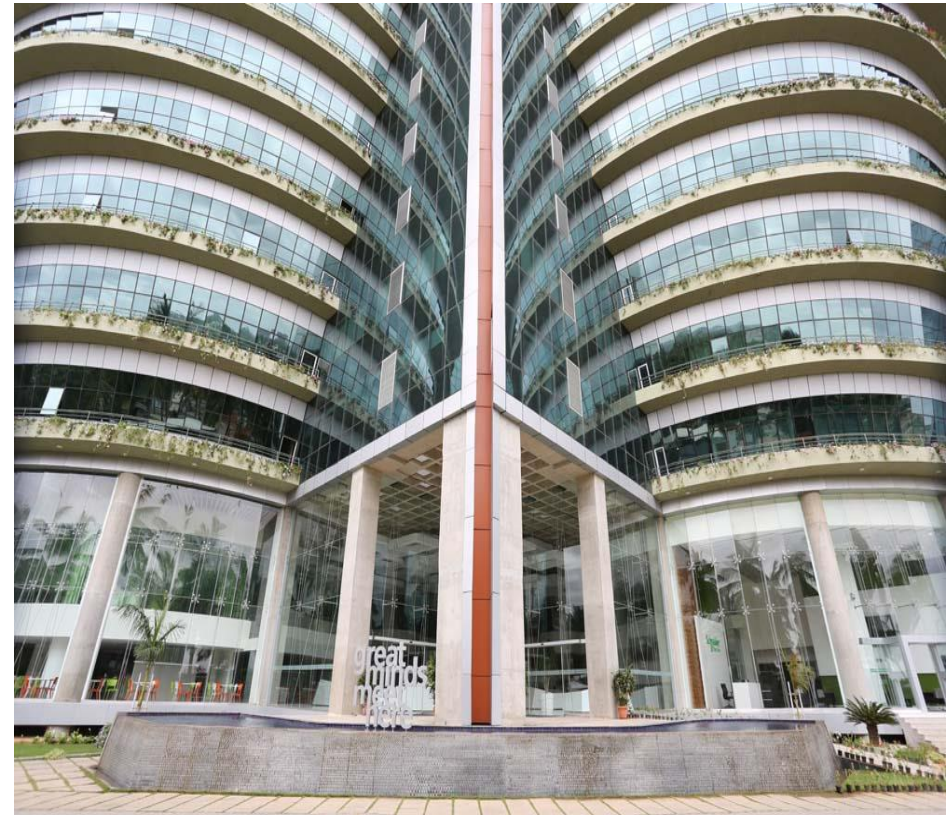


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- Oriented the building to have the longer axis along East and West.
- The building consists of three conjoining towers having diamond shapes in the plan and so oriented that its facades are at 45⁰ to South, West and East.
- Circular balconies flare outwards from 2nd floor onwards thus shading the lower ones.



Architectural Energy Efficient Features



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- 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



Architectural Energy Efficient Features



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- **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.



Architectural Energy Efficient Features



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FIRST PROJECT TO OFFER

84% FLOOR EFFICIENCY

74% LESS WATER USAGE AND IS A ZERO DISCHARGE BUILDING

54% SAVING ON ENERGY

46% REDUCTION IN MONTHLY OPERATING COSTS



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Year	2018 – 2019	2019 - 2020	2020 - 2021
Electrical Energy Consumption (kWh)	7162238	7695701	6039088
Thermal Energy Consumption (kWh)	0	0	0
Specific Energy Consumption (SEC) (Annual kWh Consumption/sq.m)	83.51	89.73	70.41

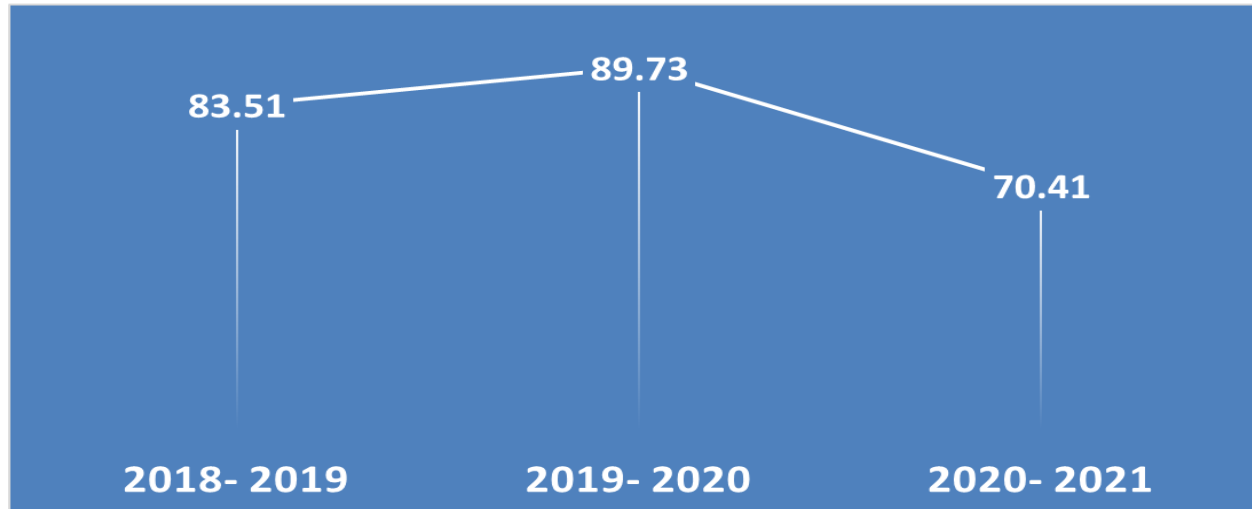
Electrical Energy Consumption Overview



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Reason for variance:

1. Specific Energy Consumption (SEC) Increased by 7.4% in 2019 – 20 as number of electrical lab tests increased by 5%.
2. All occupants in BGRT are in R&D having labs. Even though normal functioning of all labs was ensured during 2020-21, like previous year still SEC was brought down to 70.4 (by 21%). Main energy saving came from HVAC as employees were working from home & those attending the labs/offices were relocated to cease operation in number of floors.
3. Implementation of an innovative software “Power Monitoring Expert (PME)”, in critical labs reduced their energy consumption by 16%.
4. Usage of lifts, lighting, PHE pumps, etc., was optimized.

Specific Energy Consumption (kWh/sq. m/year)



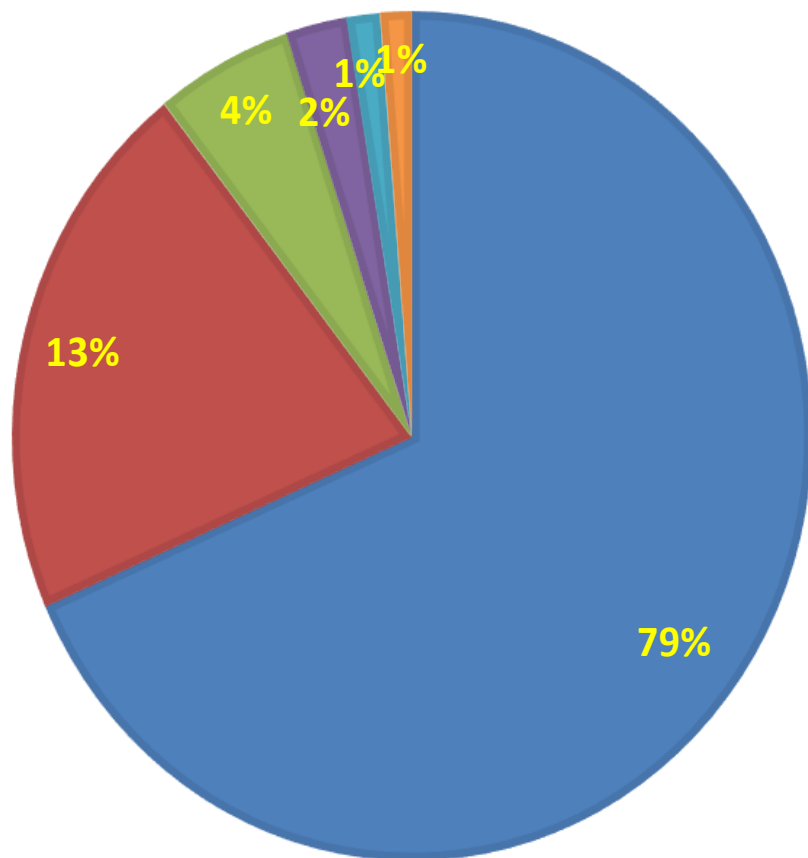
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■ Occupants ■ HVAC ■ Lighting ■ PHE ■ Lifts ■ Misc



Total Building	6039088
Occupants	4786641
HVAC	758682
Lighting	233097
PHE	127942
Lifts	85566
Misc	47160

Whole Building Electrical Energy Use (kWh) For 2020 - 21



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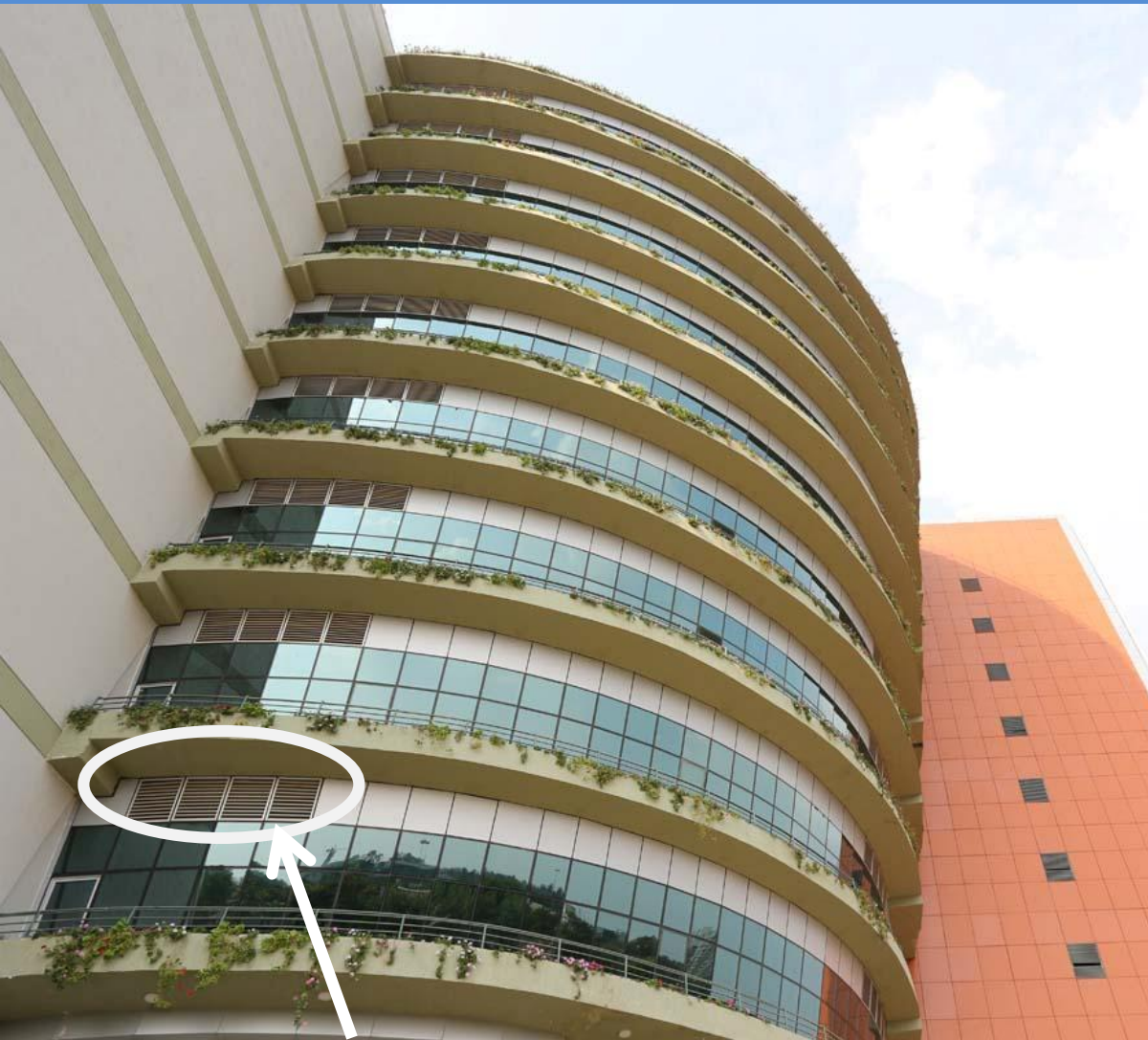
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HVAC - HRW

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



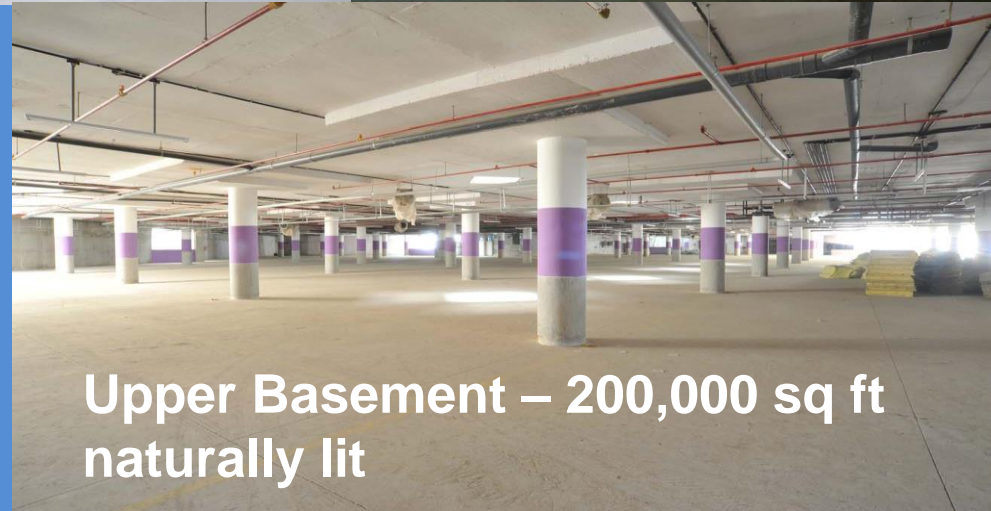
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Light Wells & Upper Basement
Parking naturally lit during
the day.



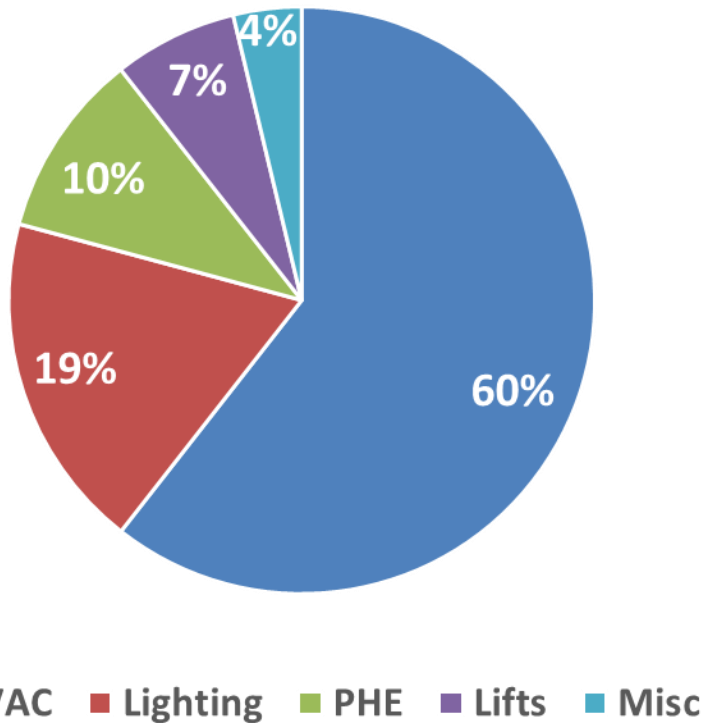
Upper Basement – 200,000 sq ft
naturally lit



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HVAC	758682
Lighting	233097
PHE	127942
Lifts	85566
Misc.	47160
Total	1252447

Common Area Electrical Energy Use (kWh) For 2020 - 21



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Information on Competitor National & Global benchmark				SEC (kWh/sq.m/year)	BGRT	
1	Group/Company level (Competitor 1 Bangalore)	CII Energy Award 2019-20	Buildings	108.5	89.73	
2	Group/Company level (Competitor 2 Bangalore)	Professional Peer Group 2020-21	Buildings	110	70.41	
3	National level	BEE	Buildings	179	70.41	
4	International level	ASHRAE 90.1-2004	Energy Modelling	Baseline Building	191	70.41
				BGRT	129	
5	BGRT Target 2020 - 21			88	70.41	

Road map to optimize the SEC during 2021-22

1. Introducing 10 more VFDs in HVAC & PHE Pumps.
2. Try a combination of atmospheric cool air & AC for cooling some non-critical labs (Covid dependent).
3. Long range target is to make BGRT “Net Zero Energy & Net Zero Water Building“. Deliberating with Bio & Bloom energy companies.



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LIST OF ENCON PROJECTS PLANNED: 2021 -22

No	Title of Project	Annual Electrical Saving (Million kWh)	Investment (Rs. in Million)	Comment
1	Bio-waste electricity generation project - continued	0	0.25	Payback period was more than 14 years. The project will be continued during 2021-22 to optimize payback period
2	Introducing 10 more VFD's in HVAC & PHE Pumps	0.020	0.085	Payback period around 6 months
3	Explore feasibility of using Energy Blooms	0	0.50	Feasibility Studies. Presently the rate being quoted is costlier than Solar or Wind energy.



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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 2018 - 19	2	0.606	0.285	0	2.694	3.90%
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%



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Innovative Project implemented : 2020 - 2021

SL. No.	Project	Project Category	Remarks
1	Deep monitoring of energy consumption & temperature of critical labs.	B	PME software capability enhanced to monitor energy consumption & temperature of critical labs. 16% energy saving achieved in power consumption of critical labs. Temperature monitoring also enabled. The project was to use power tags & no wiring. Power tags procured but couldn't be fitted owing to shortage of manpower at site due to Covid restrictions.



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Renewable Energy



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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 2018 - 19	Electrical	Wind	Offsite	2.2	0.25	4.8	5.565	77.70%
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%



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Waste utilization and management

- We believe in "waste to wealth" and we adapted the system of segregation and recycling since beginning.
- 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 handled by the occupants and they sell to the authorized dealers.
- Old PCs, UPS, Converters, chairs, etc are given to desirous employees.
- BGRT is Zero Discharge Building. Storm water goes to RWH.
- 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.



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Waste utilization and management

No	Type of waste generated	2018-2019			2019-2020			2020-2021	
		Quantity of waste generated (MT/year)	Disposal method	Type of waste generated	Quantity of waste generated (MT/year)	Disposal method	Type of waste generated	Quantity of waste generated (MT/year)	Disposal method
1	Food	31.2	Given for composting	Food	34.8	Given for composting	Food	3.422	Given for composting
2	Oil	0.522	Sold to scrap dealer	Oil	0.76	Sold to scrap dealer	Oil	0.75	Sold to scrap dealer
3	Paper/Carton	13.2	Sold to scrap dealer	Paper/Carton	10.8	Sold to scrap dealer	Paper/Carton	0.22	Sold to scrap dealer
4	Garden waste	4.56	Converted to compost at site	Garden waste	4.8	Converted to compost at site	Garden waste	6	Converted to compost at site



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GHG emission and indoor air quality

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 2021-22	Long term Target
2018-19	1312.9	1282.5	0	2595	30	10 kg/sq.m	To make BGRT an "IGBC Net Zero Energy Building"
2019-20	458.88	1177.43	0	1636	19		
2020-21	93	943.7	0	1036	12		

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	24	No Ozone depletion R134a refrigerant & water based fire suppressant
CO2 Sensors (office spaces) and CO monitoring Jet Fan System (parking)	Conaire & Flakt	5 and 10	0	24	
TVOC zero or with in LEED norms Paints , Varnishes, Sealants, & Plywood.	Berger, Nerolac, W R Bonsal, Dove Corning, Green Ply, Uniply.	0.16 (2020-21)	0	0	



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Team Work, Employee Involvement & Monitoring

Energy monitoring system

- Every half an hour recording of energy consumption by “Maccloud (Asirik Infotech software)
- Email to Manager (electrical) every morning
- Additionally manual recording by electricians once a day
- Daily reporting to Manager (electrical) and review
- Weekly/monthly review meeting by Facility Manager
- Periodical review by Higher Management
- Yearly training/familiarization by software suppliers, periodic visit by advisor/consultants and advice to technical staff
- Budget for Encon projects – 0.5 % of BGRT turnover during 2020-21



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Team Work, Employee Involvement & Monitoring

Quality circle/group activity/kaizen

Electrical Staff and Managers meet every month and discuss ways and means of conserving energy. Following projects were carried out in FY 2020-21:

- Optimized working & number of machines, PHE pumps & motors to be put to use daily.
- Overriding control on common area lighting, Lift usage and Operation of Automatic doors/Boom Barriers.
- Added 4 energy meters in the system and also incorporated in MacCould energy monitor system.
- Added more movement sensors for better control of common area lighting.
- **Saved around 70,000 units during FY 2020-21.**



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



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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



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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 0.33% (Rs. 3,24,500) of BGRT's turnover of FY 2020 – 21 in Encon Projects.



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Learning from CII Energy Award 2020 or any other award program

- GHG emission classification under Scope 01, Scope 02 & Scope 03.
- Software tool for calculating GHG emission under the 3 categories.
- Interaction with professional peers of other grade A buildings of Bangalore.
- R&D building and IT building are different with regard to energy usage.
- Clarity on EPI/SEC.

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'



Awards and

Recognitions





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Visit by final year Architecture students from ASADI, Cochin

Thank you !

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