

17.3.13 a – Progress against SDG13 – Low Carbon Energy Tracking

CARBON FOOTPRINT

Carbon foot print / Capita						
Activity Data	Type	unit	GHG	Emission factor	Quantity	CO ₂ emission /year
Transportation	petrol	litres	Kg CO ₂ e	2.196	1300	2855
	diesel	litres		2.65	381461	1010872
Electricity		kWh	Kg CO ₂ e	1.2	4376492	5251791
Paper consumption		kg	Kg CO ₂ e	0.683	21900	14958
Water consumption	water supply	cum	Kg CO ₂ e	0.8	160611	128489
Solid waste		kg	Kg CO ₂ e	3.7	259560	960372
Total CO ₂ Emission Per Year		Kg	Kg CO ₂ e			7369336
Over all carbon foot print / year		Ton				7369
Total population (avg)						7000
Carbon Foot Print per capita in Ton						1.05

National average per capita	1.58 Ton/Capita/Year
Actual CO ₂ emission	1.05 Ton/Capita/Year
% of CO ₂ emission - on national avg.	66.63%
% of CO ₂ reduced from National avg.	33.37%

CARBON OFFSETTING

Total Carbon Emission : 7369 tons/year				
Classification of Green Areas	Area	Unit	CO ₂ (avg.) absorption rate t/year	Total CO ₂ absorption ton/year
Area of Tree - ref Google Map	2	Acre	160	336
Lawn & plant area	14	Acre	15	211
Beema Bamboo	2.5	Acre	80	200
Total green area in acre	19	Acre		
Total CO ₂ Absorption				747
% of CO ₂ offset within the campus				10.13%
% of Green Area				37.86%

- ❖ 10 % of Carbon foot print is offset by the above environment – friendly measures in campus.

Calculation:

Carbon Offsetting

Total trees green area	-	19 Acres
Total Co ₂ absorption ton/year	-	747 tones
Over all carbon foot print/year (Co ₂ Emission)	-	7369 tones
% of Co ₂ → offsetting within campus (747 / 7369 X 100)	-	10.13%
Bal: 90% to be offset by planting more trees or trading		
% of Linear area (19/50 Acres - carbon foot print)	-	38%

Carbon Footprint

Total Co ₂ Emission per year: Kg⇒	-	7369336
Over all carbon foot print / year =	7369336	
	-----	- 7369 tones
	1000	
Total Population (Avg.)		-7000 (students)
Carbon foot print per Capita in Ton =	7369	
	-----	- 1.05
	7000	
National Avg. per emission	-	1.58 / ton / capita / year
Actual Co ₂ Emission	-	1.05 / ton / capita / year
% of Co ₂ Emission on National Avg. 1.05		
	----- X 100	- 66.46%
	1.58	
% of Co ₂ reduced from National Avg. 100 - 66.46	-	33.54%

SOLAR POWER PLANT

B.S.Abdur Rahman Crescent Institute of Science and Technology is searching for ways to lessen the cost and effect on the environment related with their green initiatives. A 550 kWp grid tied roof top solar photovoltaic plant commissioned at institution is one of the largest solar power plants with the site receiving a good average solar radiation of 4.97 kWh/m²/day.

As a part of its 'Green Campus' initiative, our Institution has set up a 550 kWp grid tied Rooftop Solar PV Power Plant on its academic buildings. The plant is located in the vacant roof space of various buildings.

The outputs from all the plants are connected to the institute grid through local AC distribution boards. This output can be used anywhere in the campus. Available diesel generator set is being used to create the local grid during load shedding.

INSTALLED ROOFTOP SOLAR PV POWER PLANT

Installed 550 kWp Rooftop solar plant shares all the power generated with DG set to reduce its dependence on diesel as fuel.

Most recently, a 100 kWp rooftop plant is being installed on New Architecture Block and CIIC Block. This installation shall run in parallel to the existing 550 kWp solar plants.



100 KWP ROOFTOP SOLAR PLANT UNDER CONSTRUCTION

RENEWABLE ENERGY – SOLAR POWER PLANTS

B.S.Abdur Rahman Crescent Institute of Science and Technology undertakes initiatives to obtain energy from various natural resources. The Institute is pioneer in establishing renewable energy sources to meet the energy requirement of the campus.

Three Roof top solar power plants of total capacity of 550 KWp (against the sanctioned demand of 1200 KW)are installed in our campus.



SOLAR PANEL INSTALLED AT ROOF TOP IN VARIOUS BUILDINGS





Google Satellite Map View

150kWp Solar PV Power Plant - Generation from 2014 -2020			
S.No	Year	Units Generated	Amount saved
1	2014	1,03,248	8,77,615
2	2015	2,14,937	18,26,969
3	2016	2,05,374	18,42,140
4	2017	1,93,912	16,57,963
5	2018	1,98,162	17,12,369
6	2019	1,96,269	16,83,398
7	2020	1,81,064	19,52,642
	Total	12,92,966	1,15,53,096

100kWp Solar PV Power Plant - Generation from 2014 -2020			
S.No	Year	Units Generated	Amount saved
1	2014	17,458	1,48,398
2	2015	1,46,940	12,48,990
3	2016	1,50,730	13,56,665
4	2017	1,41,458	12,08,720
5	2018	1,50,464	13,00,737
6	2019	1,42,965	12,26,905
7	2020	1,29,606	13,95,243
	Total	8,79,621	78,85,656

300kWp Solar PV Power Plant - Generation from 2018 -2020

S.No	Year	Units Generated	Amount saved
1	2018	41,037	3,74,495
2	2019	4,19,309	35,95,084
3	2020	2,98,201	31,55,265
	Total	7,58,547	71,24,844

Total Solar Power Generation - 550kWp up to 31st December 2020		
Plant	Units	Amount
150Kwp	12,28,567	1,08,00,699
100kWp	8,33,832	73,51,332
300kWp	6,42,255	57,82,158
Total	27,04,654	2,39,34,189

As per the CO₂ Baseline Database for the Indian Power Sector (CEA), the emissions from grid electricity were about 820 g CO₂ equivalent per kWh. Our solar plant can prevent 2000 tonnes of CO₂.

SOLAR WATER HEATERS

168 number of solar water heaters have been installed on the roof top of the Hostels and staff quarters. The total capacity is 36,500 liters.

Normally, solar water heating system can save up to 1500 units of electricity per year, for every 100 litres per day of solar water heating capacity. Our 36,500 liters of heating capacity of solar water heating system can save up to 500000 units of electrical energy per year.

A solar water heating system of 100 litres capacity can prevent emission of 1.5 tonnes of carbon-dioxide per year. Our solar water heating system can prevent emission of 500 tonnes of carbon-dioxide per year.



Men's Hostel



Ladies Hostel



New Staff Quarters

Men's Hostel		
Block	No. of tanks	Capacity in liters
A Block	20	5000
B Block	6	3000
C Block	6	3000
D Block	8	4000
Main block	20	5000
PG block	12	3000
Ladies Hostel		
Main block	10	5000
Annexure Block		
New Block Phase 1	11	2750
Staff Quarters		
New Staff Quarters	23	5750
Total Capacity	116	36,500Litres

RENEWABLE ENERGY – SOLAR STREET LIGHT

Installed towards staff quarters to Men's hostel road and Architecture block area. This project was done by our III yr. EEE students along with our Estate electrical dept. team.





CENTRALIZED SOLAR POWERED STREET LIGHTS - Near Sewage Treatment Plant (STP)

Web link: <https://crescent.education/wp-content/uploads/2020/10/Crescent-Green-Initiatives-July-2020.pdf>

CENTRE OF SUSTAINABLE DEVELOPMENT

Brief Report on

Interaction with the Chairman, TNPCB along with other educational Institutions regarding utilization of CAAQM stations and Data

Venue: TNPCB Seminar Hall

Date: 25-2-2021; Time: 11:30 AM



Director CSD and CSRIC Prof. T Harinarayana and Dy. Director (Campus Development) and Associate Professor Dr. A. K. Kaliluthin, have visited TNPCB and interacted with the Chairman, Thiru AV Venkatachalam IFS, and other engineers from TNPCB along with various scientists who have established CAAQM stations in their campuses in the state of Tamil Nadu. The Continuous Ambient Air Quality Monitoring Stations are located at 25 different locations in the state. For the above meeting, officials from Siriperumbur, Vellore, Trichy, Salem, Namakkal, Tiruppur and Coimbatore stations have participated and shared their issues and problems being faced by them. Chairman pointed out that wealth of data being generated need to be analysed scientifically to come out with a tangible solution to the air pollution problem. The equipment has established near the educational institutions with the sole motive of better utilization by the research community. He also assured that the data will be freely shared to the institute by TNPCB officers. Everyone has agreed to his suggestion and promised to work on this and come out with a report. He invited suggestions from the participants. We suggested that apart from air quality monitoring, water quality monitoring is also necessary for the state of Tamil Nadu as the water quality is being polluted at different times. The data from water quality monitoring will help to pinpoint the issues and find a tangible solution. The chairman has appreciated and noted down the suggestion given.

Later, Mr. R Dhanasekaran, Dy. Director, Labs has shared his PPT report of analysis related to Ambient Air of NCR-Delhi. His findings are 1. Vehicular pollution is the main contributor for the particulate matter levels in Ambient air 2) CO, NO and NMHC in ambient air, PM10, PM2.5 are happening at the same time 3) Anthropogenic activity of vehicles is the main cause for pollution in NCR-Delhi and not the farmers burning of the crop which was widely believed and blamed them before by the media. As a part of solution, EV transportation need to be used instead of HC based vehicles at Delhi. We also met the member secretary of TNPCB, Dr. Selvan and discussed on various possibilities of working jointly on sponsored projects.

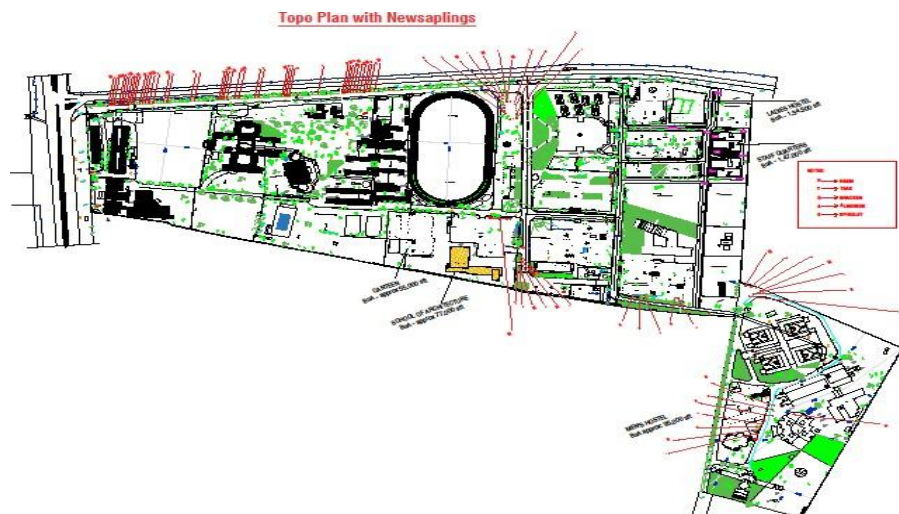
GREEN LANDSCAPING WITH TREES AND PLANTS

The campus had 909 trees before the Vardha cyclone in December 2016. A total of 341 trees were uprooted in the cyclone. 451 trees are newly planted in the last 3 years and are being well maintained. Beema Bamboo Plants 2075 numbers has been planted in whole campus to reduce Co2. Now the total number of trees in campus is 3094 Nos. List of trees are available now in our campus and tabulated below.

List of Trees in Campus

TREE NAME	TOTAL Nos
NEEM TREE	272
PORTIA	51
TAMARIND	22
MANGO TREE	33
BRACKEN TREE	253
COCONUT TREE	48
SPIKELET	145
ASH	40
ARECA	49
CASUARINA	36
SPASMA	6
ALMONDS	18
KING TREE	3
BANYAN TREE	4
PALMYRA	4
TEAK TREE	35
BEEMA BAMBOO PLANTS	2075
TOTAL	3094

PLANTING TREES IN THE CAMPUS



Plan showing location of new saplings planted in campus

OXYZONE CAMPUS – BEEMA BAMBOO PLANTATION

Planted bamboo saplings for 5000 run area throughout our compound to absorb dust, CO₂ and to release more oxygen and to create pollution free environment. In future, Central bus stand will produce lot of pollution inside our campus, by planting bamboo, our campus become dust free zone with good oxygen supply. Our Institute is provided first OXYZONE inside our campus. Beema Bamboo Plants 2000 Nos Planted in whole campus for CO₂ reduction.



OXY PARK

Oxy Park created in the campus opposite to Convention Centre



Oxy Park

GREEN BUILDING IN CONSTRUCTION

Sustainable and eco-friendly campus development has been adopted with following materials

- ❖ Grass Crete: Method of laying Grass paver flooring, walkways, sidewalks and driveways to improve storm water absorption and drainage
- ❖ Ash Crete: Fly ash (recycled) content with cement is being used for all Reinforced Cement concrete works.
- ❖ Low - VOC paints: Painting with low VOC less than 50gm/liter is using for all painting works -Nippon and Berger
- ❖ Engineered wood: MDF (Medium Densified Fibre) wood used for interior partition, doors and furniture's.
- ❖ Structural Insulated Panels (SIP): Foam board wall panels are used for prefab structures such as class room and indoor game space.
- ❖ Insulated Concrete Forms: GFRC Technology being adopted to construct parent waiting guestrooms and essential staff quarters.
- ❖ Steel: Steel roof panels (recyclable) used for workshop roofing.
- ❖ Composites: Roof panels made of composite materials such as foam sandwiched between two metal sheets used for prefab class room ceiling.
- ❖ Fibreglass: Fibreglass is also used in insulation in the form of Fibreglass batts for interior partition works.
- ❖ AAC Blocks: Autoclaved Aerated Concrete blocks (non- toxic product) are used for the construction of all buildings to reduce low environmental impact.
- ❖ Thermatek Roof tile: Heat Resistant Terrace tiles are used for all buildings.
- ❖ VAV system: Variable air volume HVAC system is adopted to reduce energy consumption



Grass Crete



30% Roof top with Heat Resistant Tiles & Solar reflective Index (SRI) value:

Environment and Campus

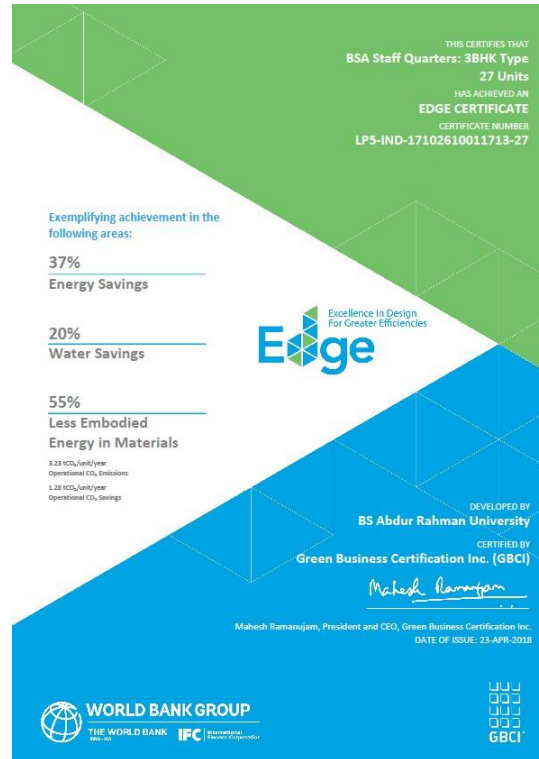
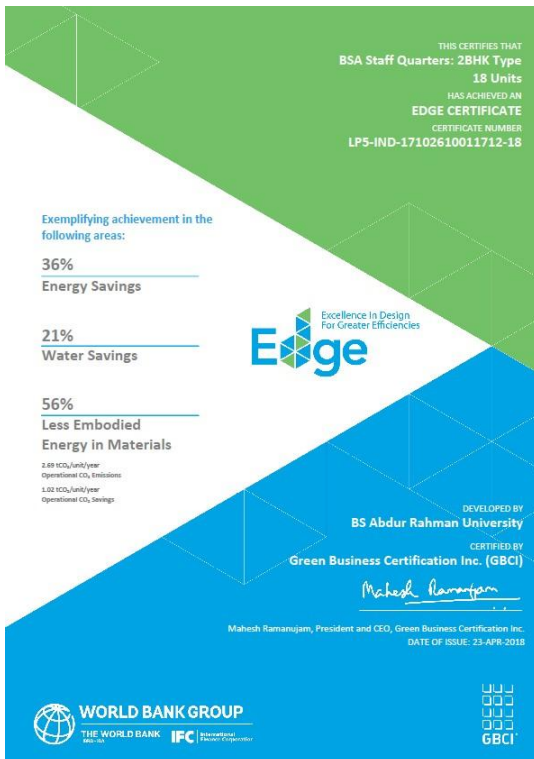
- ❖ 1.Green open space and Landscape
- ❖ 2. Preservation of Eco - system
- ❖ 3.Public space for students and staffs - Cafe, Lounge, Square Garden
- ❖ 4.Recycling based campus
- ❖ 5. Enhancing sustainable consumption of available resources i.e water & Energy.
- ❖ 6. Promoting low - carbon practices among campus community.
- ❖ 7. Minimizing waste and pollution through effective waste management.
- ❖ 8.Innovation in building Design with improved daylight and natural ventilation

GREEN BUILDING AND CERTIFICATION

GBCI-EDGE GREEN BUILDING CERTIFICATION FOR LADIES HOSTEL



GBCI- EDGE CERTIFICATE FOR STAFF QUARTERS



CRESCENT SCHOOL OF ARCHITECTURE BLOCK, IS DESIGNED AS A NET ZERO ENERGYBUILDING AND REGISTERED UNDER USGBC-LEED GOLD CERTIFICATION

New Crescent School of Architecture block, is designed as a Net Zero Energy building and registered under USGBC-LEED Gold certification.



Crescent School of Architecture

S.No	Name of the building	Plinth area	Covered area	Estimated cost	Date of completion	Certificate applied to
1	School of Life sciences Block	58,000.00	G+7 (RCC)	110,200,000	2013	USGBC
2	School of Mechanical science block	135,000.00	G+7 (RCC)	310,500,000	Dec 2014	USGBC
3	VC Villa	4,300.00	G+1 (RCC)	9,030,000	May 2014	GBCI EDGE
4	Staff Quarters - Phase 1	75,000.00	G+9 (RCC)	150,000,000	May' 2015	Received on 23.04.18
5	New Ladies Hostel Block - Phase 1	50,000.00	G+8 (RCC)	100,000,000	Dec'2015	Received on 23.04.18
6	New School of Architecture block	98,000.00	G+7 (RCC)	196,000,000	July 2017	USGBC

AWARDS & ACHIEVEMENTS OF THE INSTITUTE

- ❖ Mahatma Gandhi National Council of Rural Education Department of Higher Education, Ministry of Education Government of India has certified B.S. Abdur Rahman Crescent Institute of Science & Technology, Chengalpattu, has a **Recognized Social Entrepreneurship, Swachhta & RuralEngagement Cell (SES REC) Institution**. The Institution has successfully framed the SES RECAction Plan and constituted ten working groups for improving facilities in the Campus and the Community/Adopted Villages in the areas of Sanitation & Hygiene, Waste Management, Water Management, Energy Conservation and Greenery post COVID-19.
- ❖ Our Institute has been participated in MHRD Swacchta Ranking 2017, 2018 & 2019 for HigherEducational Institutions.
- ❖ Our institute has been ranked "5" amongst the **“Cleanest Higher Educational Institutions” in the country, in the category - "Residential University"** and the award was presented by the MHRD Minister/Secretary, Government of India on 3rd December 2019 at New Delhi.
- ❖ Our institute has been awarded by AICTE for the significant contribution in the "**Clean & SmartCampus Award 2019**"
- ❖ Our institute has been awarded by AICTE for the significant contribution in the "**Jal Sakthi Abhiyan** "
- ❖ Our institute has been awarded by AICTE for the significant contribution in the "**One Student One Tree**" Scheme.
- ❖ Our Institute has received the **ASSOCHAM award "University of the year for Eco-Friendly Sustainable Campus"** for its eco-friendly self-sustaining efforts in conserving the environment. The award was presented by Dr. Mahendra Nath Pandey, Hon'ble Minister of SkillDevelopment and Entrepreneurship. Govt. of India.

