B.S. Abdur Rahman Crescent Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956

17.3.7 a – Progress against SDG7 – Increase of Energy Efficiency, Use of Renewable Energy & Identifying Energy Wastage

ENERGY EFFICIENT APPLIANCES IN THE CAMPUS

LED Fixtures

LED light fixtures are being extensively used for all new interior renovation works in the campus. So far, 50.87 kW capacities of LED lights are fixed which provide around 70% energy saving compared to conventional lighting.

SL NO	Buildings	QTY	TOTAL WATTS
1	Auditorium	156	2059
2	Science block	250	2829
3	Aero block	458	5064
4	Main block	42	602
5	MBA block	23	597
6	First year block	7	105
7	Life science block	80	1818
8	Staff quarters	341	4295
9	Ladies hostel	284	3974
10	Campus street light	136	3730
11	Medical	21	309
12	Pharmacy	13	601
13	Gm office	27	510
14	Canteen	29	682
15	VC office	72	450
16	VC villa	27	193
17	Guest house	17	280
18	Drivers cabin	8	120
19	Staff quarters	5	45
20	Sports lighting	29	5800
21	HR office	5	60
22	Parents waiting hall	12	166
24	New architecture block	588	10288
25	Civil yard class rooms	30	450
26	CSB room Men's hostel	32	480
27	Robotics lab	22	280
28	Research scholar room chemistry	4	144
29	Food waste management plant	8	220
30	Solar street light	10	250
31	Men's hostel	182	1166
32	MBA phase 1	49	595
33	MBA phase 2	80	588
34	Computer science lab	24	250
35	Purchase office (EO)	2	30
36	CIIC block	88	1624
37	CIIC 2nd floor studio	13	225
Total		**3174**	**50879**

AC Units

With an emphasis to energy conservation, all split AC units purchased since the year 2012 are of BEE 5- star energy rating. The star rated AC units are free from ozone depleting CFC.

MODEL	QTY	TON
1.5 Ton Split 5*	29	44
2.0 Ton Split 5*	71	142
TOTAL	**100**	**186**

Old Spilt AC units and window AC units have been replacing gradually with centralized VRF AC units for energy savings. The VRF AC unit saves space, cost and electricity consumption.

Passive Infrared Motion Sensor Lights

Motion sensor lights are provided in computer science lab, staff cabins and toilets for energy savings.

Motion Sensor lights have been provided in computer science lab, staff cabins and toilets for energy savings.

Staff Cabin

Computer lab

GREEN AUDIT REPORT

2018 – 19

B.S. Abdur Rahman Crescent Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956

2019

GREEN CAMPUS INITIATIVES- AUDIT REPORT

- **Roof-top Solar Power Plant I of 150kWp capacity commissioned in June 2014 at a cost of 1.32Cr.**
- **Roof-top Solar Power Plant II of 100kWp capacity commissioned in October 2014 at a cost of 62Lacs.**
- **New Roof-top Solar Power Plant III of 300kWp capacity commissioned in October 2018 at a cost of 1.20Cr.**
- **Avoided emission of greenhouse gases to the equivalent of 1105624kg CO_2 due to generation of renewable energy by Solar PV power plants.**
- **LED fixtures – of around 33KW capacity has been installed in our campus in the past 5 years.**
- **Air-conditioning split units of 5-star BEE rating is installed in various departments in the campus for a total of 203TR.**
- **All the 203 split AC units are free from ozone-depleting CFC.**
- **Solar Water heaters in Hostels and staff quarters – installed capacity 42,500 litres. This is equivalent to 240 electric geysers of various capacities. The power saving is estimated to be around 17Lacs per annum.**
- **Sewage Treatment Plant (STP) – 500KLD of water is treated and utilized for Landscaping and flushing purpose in the University and Hostels. One plant of 250KLD capacity for Men's Hostel and another 250KLD capacity plant for University are in operation.**

- **New Bio-gas plant of 50m^3 capacity for Ladies Hostel is commissioned in June 2017. The gas generated is utilized in Ladies Hostel Mess Kitchen.**
- **All existing buildings are registered with Indian Green Building Council (IGBC) for green building certification under IGBC – EB rating**
- **All New buildings constructed over the last six years and those under construction are registered with GBCI EDGE and USGBC LEED for green building certification for Gold rating.**
- **GBCI-EDGE Green building certification received for New Ladies Hostel & New staff quarters on 23.04.2018.**
- **New Crescent School of Architecture block is conceived as a Net Zero Energy building and registered under USGBC-LEED for Gold rating certification.**
- **Campus Solid Waste Management program is implemented – to segregate and recycle organic waste, paper, cartons, paper cups, soft drink tins, plastic, pet bottles, e-waste, bio-waste, etc.**
- **Use of eco-friendly cleaning chemicals are mandatory in the campus**
- **Retreading of vehicle tyres to extend the life of each tyre is being implemented with an MOU with TVS Retread**
- **MOU with ITC-WOW is in place for recycling of waste paper**
- **To reduce pollution inside campus, 55 Nos bicycles have been provided for students to commute between Men's Hostel, Ladies Hostel and College Main gate. Battery Car and Electric Bike provided for staff.**

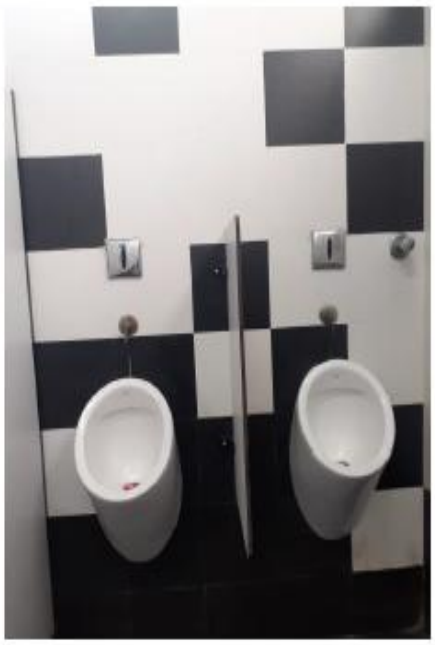
- **Sanitary napkin incinerator with wet scrubber (for pollution control) is installed for disposing the napkins. Wet scrubber is attached at the outlet of burner fumes where the fumes gets scrubbed in water and gets filtered to remove the harmful emissions.**
- **15 Nos new AC buses, which are BS-IV compliant vehicles, have been provided for induction into the student transport fleet from July 2018.**
- **33% of Carbon foot print is offset by the above environment – friendly measures in campus**.

ENERGY EFFICIENT GADGETS

Water - efficient Appliances in the Campus

B.S. Abdur Rahman Crescent Institute of Science & Technology

- Using sensors for automated flushing
- Automatic water level controller for avoiding overflow in overhead tanks



SAMPLE DOCUMENTAL EVIDENCES FOR LED FIXTURES AT VARIOUS BLOCKS

ARCHITECTURE BLOCK

CONVENTION CENTRE

SAMPLE DOCUMENTAL EVIDENCES FOR LED FIXTURES

SIGNAGE, FACULTY CABINS AND CORRIDORS

SIGNAGE

OFFICE CABINS

CORRIDORS

FACULTY CABINS

ENERGY EFFICIENT ELECTRICAL APPLIANCES

B.S. Abdur Rahman Crescent Institute of Science & Technology

LED Fixtures

SL NO	BUILDING	QTY	TOTAL WATTS
1	AUDITORIUM	156	2059
2	SCIENCE BLOCK	250	2829
3	AERO BLOCK	458	5064
4	MAIN BLOCK	42	602
5	MBA BLOCK	23	597
6	FIRST YEAR BLOCK	7	105
7	LIFE SCIENCE BLOCK	80	1818
8	STAFF QUARTERS	341	4295
9	LADIES HOSTEL	284	3974
10	CAMPUS STREET LIGHT	136	3730
11	MEDICAL	21	309
12	PHARMACY	13	601
13	GM OFFICE	27	510
14	CANTEEN	29	682
15	VC OFFICE	72	450
16	VC VILLA	27	193
17	GUEST HOUSE	17	280
18	DRIVERS CABIN	8	120
19	STAFF QUARTERS	5	45
20	SPORTS LIGHTING	29	5800
21	HR OFFICE	5	60
22	PARANTS WAITING HALL	12	166
24	NEW ARCHITECTURE BLOCK	568	10288
25	CIVIL YARD CLASS ROOMS	30	450
26	CSB ROOM MENS HOSTEL	32	480
27	ROBOTICS LAB	22	280
28	RESEARCH SCHOLAR ROOM CHEMISTRY	4	144
29	FOOD WASTE MANAGEMENT PLANT	8	220
30	SOLAR STREET LIGHT	10	250
31	MENS HOSTEL	182	1166
32	MBA PHASE 1	49	595
33	MBA PHASE 2	80	588
34	COMPUTER SCIENCE LAB	24	250
35	PURCHASE OFFICE (EO)	2	30
36	CIIC BLOCK	88	1524

BEE 5-Star Rated Air Conditioners :

MODEL	QTY	TON
1.0 TON Split Inverter	17	17
1.5 Ton Split 5*	29	44
2.0 Ton Split 5*	71	142
TOTAL	117	203




B.S. Abdur Rahman Crescent Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956
An ISO 9001:2015 Certified Institution

Energy Efficient LED Lamps

Since 2017, it has been a policy of this institute to use only LED lamps.

The existing old lamps are replaced with LED bulbs, as and when they are fused out.

Weblink: https://crescent.education/wp-content/uploads/2020/10/Crescent-Campus-Infrastructure-July-2020.pdf

CARBON FOOTPRINT

Carbon foot print / Capita						
Activity Data	**Type**	**unit**	**GHG**	**Emission factor**	**Quantity**	**CO_2 emission /year**
Transportation	petrol	litres	Kg CO_2e	2.196	1300	**2855**
	diesel	litres		2.65	381461	**1010872**
Electricity		kWh	Kg CO_2e	1.2	4376492	**5251791**
Paper consumption		kg	Kg CO_2e	0.683	21900	**14958**
Water consumption	water supply	cum	Kg CO_2e	0.8	160611	**128489**
Solid waste		kg	Kg CO_2e	3.7	259560	**960372**
Total CO_2 Emission Per Year		Kg	Kg CO_2e			**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 / 1000 - 7369 tones
Total Population (Avg.) - 7000 (students)
Carbon foot print per Capita in Ton = 7369 / 7000 - 1.05
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 / 1.58 X 100 - 66.46%
% of Co_2 reduced from National Avg. 100 – 66.46 - 33.54%

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, CO_2 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 CO_2 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 guest rooms 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

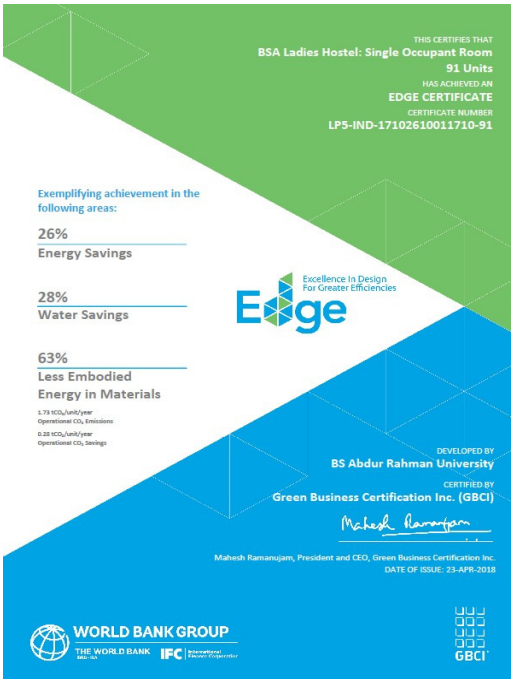
30% Roof top with Heat Resistant Tiles & Solar reflective Index (SRI) value : 97

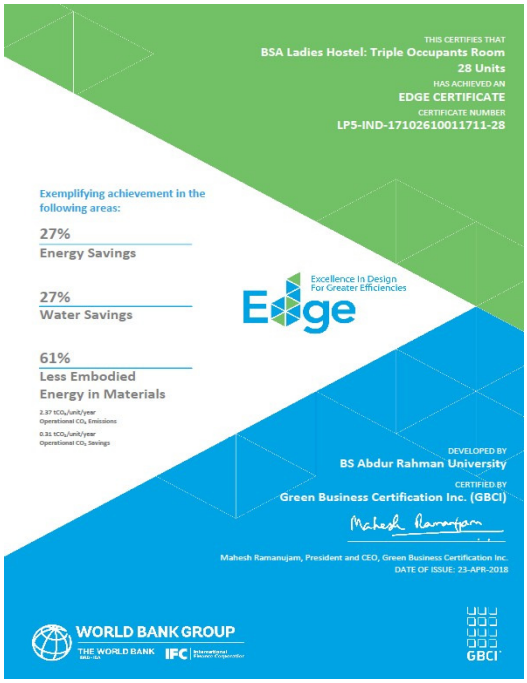
Environment and Campus

- 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

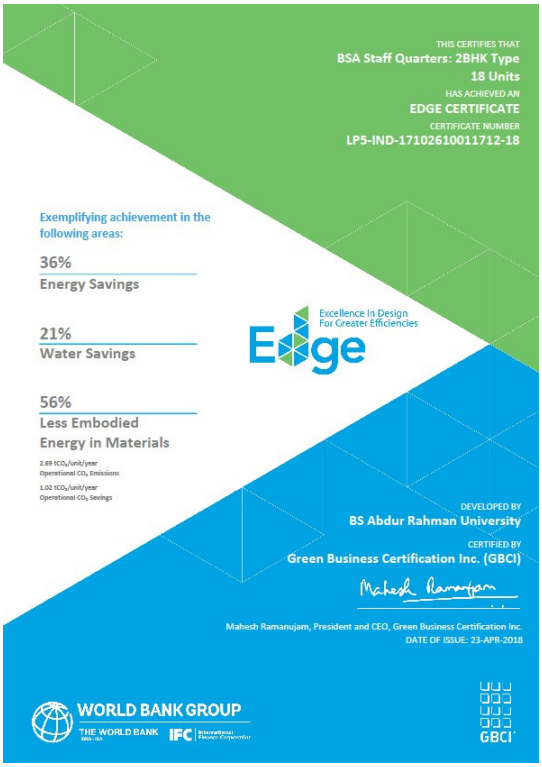
GREEN BUILDING AND CERTIFICICATION

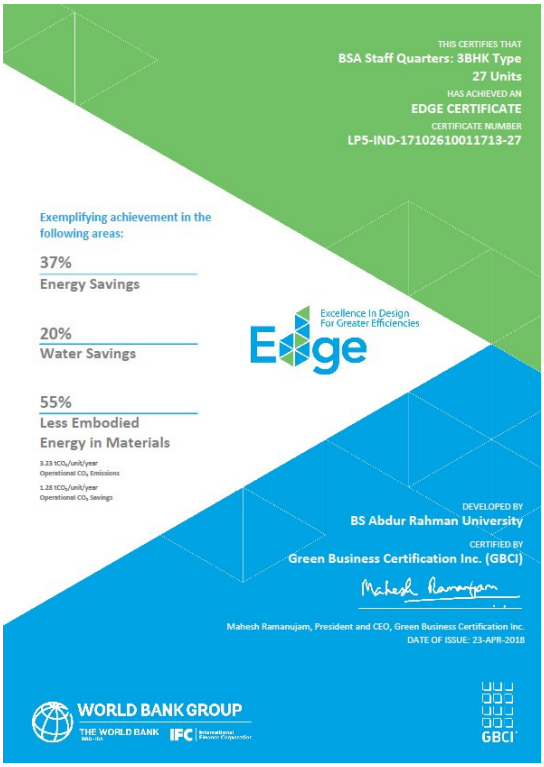
GBCI-EDGE GREEN BUILDING CERTIFICATION FOR LADIES HOSTEL





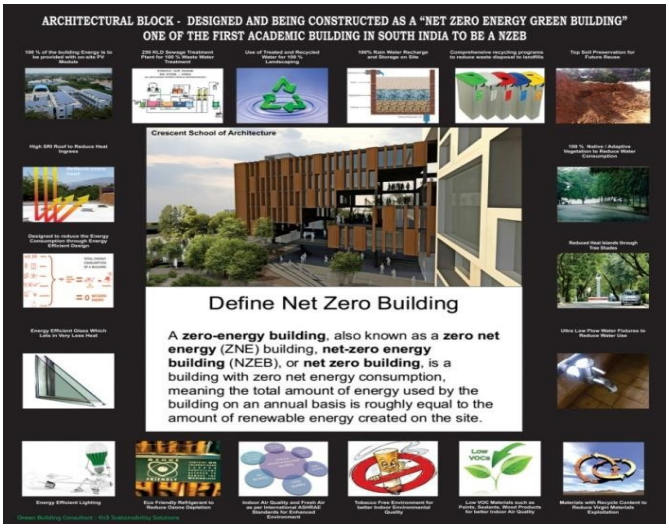
GBCI- EDGE CERTIFICATE FOR STAFF QUARTERS





CRESCENT SCHOOL OF ARCHITECTURE BLOCK, IS DESIGNED AS A NET ZERO ENERGY BUILDING 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.



Weblink: https://crescent.education/wp-content/uploads/2020/10/Crescent-Green-Initiatives-July-2020.pdf

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 to31st 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 CO_2 Baseline Database for the Indian Power Sector (CEA), the emissions from grid electricity were about 820 g CO_2 equivalent per kWh. Our solar plant can prevent 2000 tonnes of CO_2.

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 soar water heating system can save up to 500000 units of electrical energy per year.

A soar water heating system of 100 litres capacity can prevent emission of 1.5 tonnes of carbon-dioxide per year. Our soar 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 Annexure Block	10	5000
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.

Near Sports Village Road

Near Architecture Block

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

Weblink: https://crescent.education/wp-content/uploads/2020/10/Crescent-Green-Initiatives-July-2020.pdf

Dr. A. Azad
REGISTRAR

B.S. Abdur Rahman
Crescent
Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956

Date: 17.03.2020

Lr.No: BSACIST/PROJ/SPP/EL/PO/2020/107

To

M/s Fourth Partner Energy Pvt Ltd,
4-7-19/45, 1st floor,
Raghavendra Nagar,
Nacharam,
Hyderabad 500076.

Dear Sir,

Kind Attention: Mr.Vivek Subramanian, Exucutive Director.

Sub: Purchase order for supply, erection and commissioning of 102.49kWp grid connected Solar power plant in B.S.Abdur Rahman Crescent Institute of Science & Technology - Reg

Ref: Your revised offer dated 26.02.2020

With reference to your referred offer and subsequent discussions had with you we are pleased to issue the purchase order for Supply, erection and Commissioning of 102.49kWp solar power plant in BSACIST campus as per details mentioned below;

S.No	Description	Amount
1	Supply, erection & Commissioning of 102.49kWp solar power plant in our Institution campus as per approved design along with Data logging and remote monitoring system with 1 year AMC	37,40,885
	GST 8.9%	3,32,938
	Total Amount(Rupees Forty lakhs seventy three thousandeight hundred and twenty three only)	**40,73,823**

Contd,2

1. The Roof-tops of New Architecture Block and Crescent Innovation & Incubation council block to be used for installation.
2. Due to buildings site constraints if there is any change in final capacity of the solar plant, either up or down from 102.49kWp, price shall be accordingly adjusted because of inverter capacity range.
3. Formal contract agreement shall be signed as per SECI requirements.
4. Fourth Partner Energy Pvt Ltd shall work in co-ordination with M/s Arbutus Consultants, Pune, who are our Solar Energy Consultants
5. Cleaning of solar panels is coming under client scope once in a week
6. Birds drop V-Shape clip to be fixed
7. The specifications of all the materials used in the project are subject to approval by our consultants, M/s.Arbutus Consultants, Pune.
8. Tap will be provided by us.
9. **Payment Terms**:
   a. 25% advance along with order
   b. 60% on receipt of all materials at site
   c. 15% on successful completion of installation and commissioning
   d. Statutory approval fee paid by us
10. **Warranty:**
    i) 10years product warranty for SPV modules against manufacturing defects
    ii) Linear power output guarantee of 80% for25 years.
    iii) 5 years for manufactures warranty for inverter
    iv) 1 year for balance system
11. **Taxes:**Included
12. **Project Completion**:90-120 days

Thanks and regards,

17.03.2020

REGISTRAR

SOLAR WATER HEATER PURCHASE ORDER

B.S. Abdur Rahman
Crescent
Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956
GST Road, Vandalur, Chennai 600 048

PO No: BSACIST/SWH/MH/PO-2019/82 **Date:06.12.2019**

To

M/s.Mithil Associates
No.14/7, Kanchi Natarajan Street,
Vasudevan Nagar,
Jaffarkhanpet
Chennai-83

Dear Sir,

Sub: Supply and installation of V Guard 500LPD Solar Water Heaters for Men's Hostel at B S Abdur Rahman Crescent Institute of science & technology campus.

Ref: Your Quotation dated: 13.11.2019

With reference to the above, we are pleased to place with you the purchase order for Supply and installation of V Guard 500LPD Solar Water Heaters for Men's Hostel at B S Abdur Rahman Crescent Institute of science & technology.

Sl.No	Description	Qty	Rate	Amount Rs.
1	Supply and installation of V Guard 500LPD ETC Non PR Model- Solar Water Heaters for Men's Hostel. Model Win hot 500plus H	20	65,000	13,00,000
	Grand Total			**13,00,000**

Terms & Conditions:

1. **Payment: 50% advance 50% after installation & commissioning**
2. **Taxes**: Included
3. **Completion of work** : 10 days
4. **Warranty : 5 Years**
5. **GI tank with epoxy coating**

Thanks and Regards

For **B.S.Abdur Rahman Crescent Institute of science & technology.**

V.N.A. Jalal
V.N.A.JALAL
General Manager 6/12/19

Seethakathi Estate, G.S.T. Road, Vandalur, Chennai – 600 048. India.
Tel : +91 (44) 2275 1347, 1348, 1350, Fax : +91 (44) 2275 0520
Email : registrar@crescent.education
www.crescent.education

FOURTH PARTNER ENERGY PRIVATE LIMITED
Fourth Partner House, Plot No.N46, House No.4-9-10, HMT Nagar, Hyderabad - 500076
T : +91-40-27158865 | info@fourthpartner.co | website : www.fourthpartner.co

PROFORMA INVOICE

Bill To,
B S Abdur Rahman Crescent Institute of Science & Technology
Seethakathi Estate
GST Road, Vandalur, Chennai - 600048

Tamilnadu

Proforma Invoice No: PI/4PEL/20-21/023
Dated: 10-08-2020

Buyers Order No.: BSACIST/PROJ/SPP/EL/PO/2020/107
Dated: **17-Mar-20**

Ship To,
B S Abdur Rahman Crescent Institute of Science & Technology
Seethakathi Estate
GST Road, Vandalur, Chennai - 600048
Tamilnadu

All figures in INR

Sl. No.	Description of item	Unit	Qty.	Unit Rate	Total Amount
1	Supply Erection & Commisioning of 102.49kWp Solar Power plant as per approved Drawing along with Data loging and remote monitoring system at BSA Crescent Instiute of Science & Technology, Seethakathi estate, Chennai	No	1	37,40,885	37,40,885
					-
					-
	GST@5%			0%	1,30,931
	GST@18%			18%	2,02,008
	Total Order Value				**40,73,824**

25% Amount Payable Against This PI	**10,18,456**

(Rupees Ten Lakhs Eighteen Thousand Four Hundred and Fifty Six Only)

Terms & Conditions

Price Basis : F.O.R Site
Tranportation: Included in the above price
Payment Terms: 25% along with Order, 60% against dly of Material at site, 15% against completion of Installation and commissioning

GST No.36AABCF6092M1Z8
Our Bank Details
RBL Bank, Opp: Green Park Hotel, Ameerpet , A/C No. 609000467653, IFSC Code:RATN0000112

For FOURTH PARTNER ENERGY PVT. LTD.
Computer Generated. Hence Not Signed
Authorised Signatory

Oxyzone Campus – Carbon Offset

OXYZONE Campus – Beema Bamboo Plantation (2000 Nos)

B.S. Abdur Rahman Crescent Institute of Science & Technology







- Planted bamboo saplings for 5000 sft run area throughout our compound to absorb dust, CO_2 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 .

OXYZONE Campus

Beema Bamboo planted in various location inside the Campus

OXYZONE Campus

We are the proud owner of “Tissue cultured bamboo plant” of variety “Beema”. This is one of the super bamboo, developed by a Biotechnology lab, grown in greenhouse for six months and now it is ready for planting in the soil.

The full growth of the bema bamboo is achieved only by providing the best care by us; both at the time of planting ad growing it for at least 4 to 5 years.

Every plant when it is fully grown to its best growth generates over 300kg of oxygen every year, it is just sufficient for one person for a whole year.

Eco Friendly Vehicles @ Crescent

Eco-friendly Conveyance

B.S. Abdur Rahman Crescent Institute of Science & Technology

As a step towards complete pollution – free environment in campus, Students and Staffs are commute from Main gate to Hostel and avoid Motor cycle movement inside campus (More than 100 bicycles).

Eco-friendly Conveyance

B.S. Abdur Rahman Crescent Institute of Science & Technology

Battery Operated Golf cart

Hero Electric Bike

Eco Friendly Load Vehicle

New AC Busses – Bharat Benz

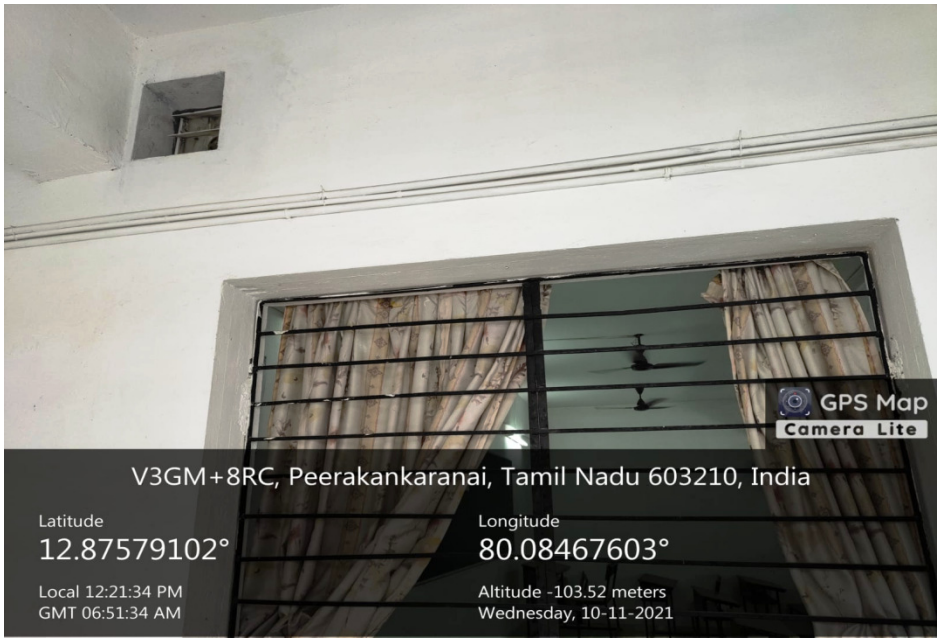
- 15 Nos. new AC buses purchased which are BS-IV (BHARAT BENZ) compliant vehicles, have been provided for induction into the student transport fleet from 2018.

The institution is well connected with the common transport services. In addition to that college buses are available Faculties are also picked by cars and vans.

Vehicle	No
Buses (AC)	20
Buses (Non-AC)	6

TO REDUCE ENERGY CONSUMPTION

Instead of air conditioner, mechanical air circulation is used with natural ventilation to reduce energy consumption in class rooms and staff cabins. Also natural ventilation reduces air pollutants. The ceiling fans and exhaust fans use only a fraction of the energy consumed by an air-conditioner.



MECHANICAL AIR CIRCULATION IS USED WITH NATURAL VENTILATION

MECHANICAL AIR CIRCULATION IS USED WITH NATURAL VENTILATION

To replace the AC units, ceiling fans, wall mounted fans and exhaust fans have been used with energy conservation measures like ventilating provided by window treatments.

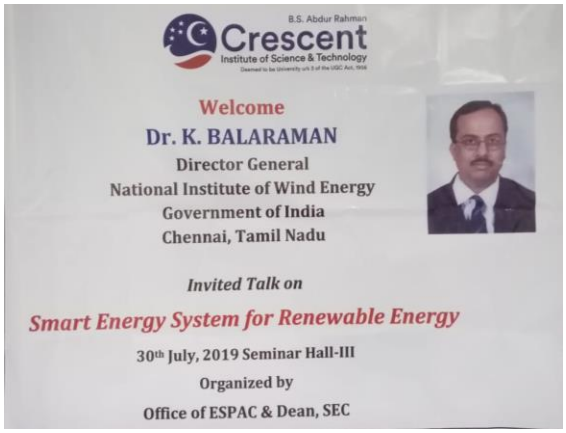
Brief Report on the visit of Dr. K. Balaraman, Director General, NIWE, Government of India, Chennai, Tamil Nadu

Date: 30th July 2019 at Seminar Hall – III, 11.00 – 14.30
Objective of the visit: To promote sponsored projects, research, consultancy and training.

Topic of the invited talk: <u>Smart Energy System for Renewable Energy</u>

The following are the main points of interaction and discussion with faculty members to promote projects on Renewable Energy.

- Government of India has an ambitious plan in a big way for renewable energy
- The problem is need for power and power generation at different times.
- As a customer we require energy at all the time.
- The main challenge is prediction and control power generation.
- Architecture of power system requires data analysis in a big way.
- India has the largest homegrown solar.
- Renewable energy requires multi -parametric data analytics.
- In present scenario the data is a multibillion dollar business.
- The data storage per day may vary from 3 GB to 1 TB
- Wind has grown tremendously in the world and presently 35000 wind turbines across the world.
- National Institute of Wind Energy (NIWE) is looking for innovative solutions for many problems.
- NIWE has been working with 25 private universities by supporting them with projects.
- NIWE requires data analytics in big way, especially in the areas of Advance Analytics (AA), Artificial Intelligence (AI) and Machine Learning (ML).
- Infra day forecasting for 15 minutes and interday forecasting is done at present.
- The present day accuracy is close to 90%.
- He suggested to initiate integrated micro grid concept in our campus.
- There are many problems to take-up under project mode and NIWE can provide the research problems to the research scholars that are of interest to funding agencies.
- Long time forecasting can be taken up by Crescent.



Book on Extra-Mural R & D Projects of Govt. of India, released by Dr. K. Balaraman, DG, NIWE and our Vice Chancellor, Registrar of BSARCIST.

After the talk, the following places were visited by the chief guest

- Power Electronics, High Voltage Lab (in Electrical Sciences Block), Process Control Lab in Electronics and Instrumentation Department.
- Solar plant on the roof top of the Auditorium building
- 3 Pilot units near STP plant adjacent to boys hostel
- Crescent Innovation and Incubation Council

EVENT PHOTOS

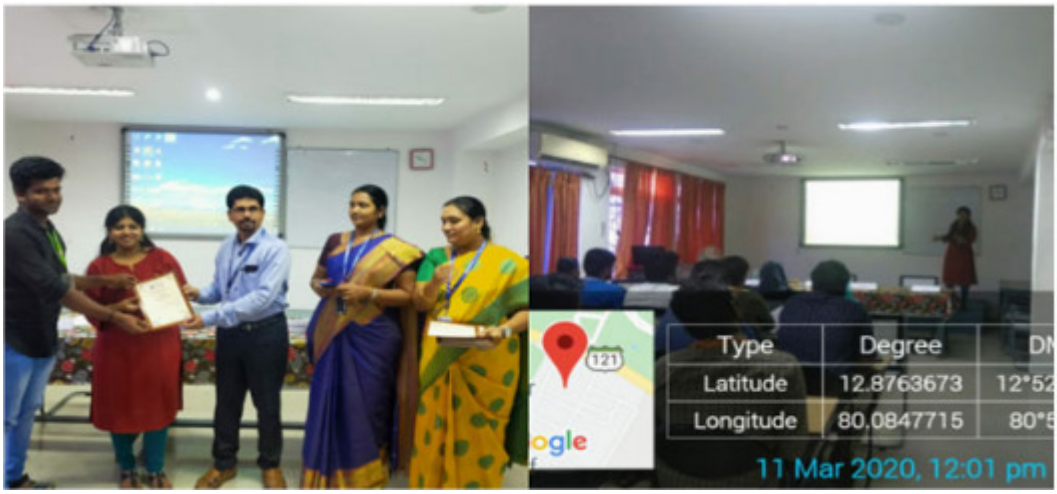
Interaction and discussion with Director ESPAC, Dean & Faculty members

Visit to Solar Plant

Visit to Crescent Innovation and Incubation Council

National Level seminar on "Research potential in Solar Energy & Storage Technologies" – 11th March 2020

Dr.J.Gaayathri, Assistant Professor (S.G.),CO2 research & green energy technologies center, VIT, Vellore

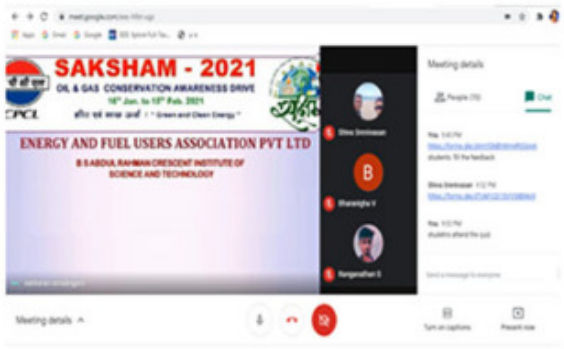


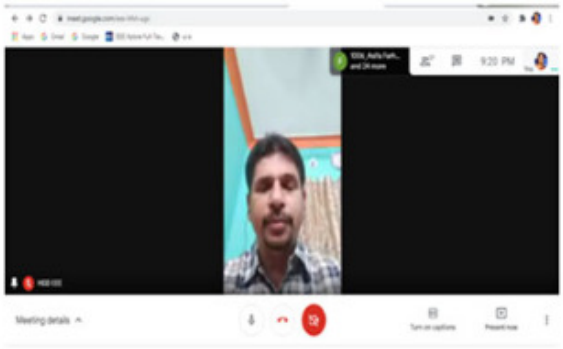
One day training programme on "Operation and Maintenance of Roof Top Solar PV Practices" – 10th February 2020
In association with Estate office / BSACIST

Mr. Lokabhiraman,Sr. DGM, Ex-BHEL & Mr. Pradeep Chavan,Sr. Executive Ex-BHEL Arbutus Consultants PVT LTD., Pune, Maharashtra

GREEN & CLEAN ENERGY-SAKSHAM 2021 on 9th February 2021

Resource person: Mr. S Ramalingam, President,ENFUSE





Awareness programme on "Energy, Oil & Gas Conservation" (Saksham 2020) – 31st January 2020

Prof S. Ramalingam, National President, Energy & Fuel Users Association of India

Workshop on Renewable Energy adopting smart technologies

01st October 2019

Dr. SUKUMAR MISHRA, Professor, Department of Electrical Engineering, IIT Delhi, New Delhi

B.S. Abdur Rahman
Crescent
Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956
ACCREDITED WITH "A" GRADE BY NAAC

Date: 04.02.2020

To
M/s. Arbutus Consultants Pvt Ltd,
J 507-11, West Wing,
Mega Centre, Magarpatta
Hadapsar,
Pune-411028.

Kind Attention: Mr.Vivek Jeyakumar, Executive Director

Dear Sir,

Sub: Training programme on O&M of Rooftop Solar PV practices in BSACIST Campus – Regarding.

Ref: Your revised proposal No: ARB_TRANG_CRESCENT_T01_0_20200109 Dated:9th Jan 2020

With reference to the above cited proposal we are pleased to place with you the work order for One Day Training Programme on O&M of Rooftop Solar PV practices in B.S.Abdur Rahman Crescent Institute of Science & Technology Campus on **10.02.2020**

The overall fee for the programme is Rs.60,000 + GST, Expenses for travel and boarding, over and above included in fees.

The detailed scope of service, payment terms and other terms and conditions shall remain as per your proposal attached herewith.

Thanks and regards,

VNA.
GENERAL MANAGER

National Workshop
On
Design and Control of Power Electronic Devices & Renewable Energy Sources using Matlab

6th &7th April 2018

REGISTRATION FORM

Name :

Designation :

Institution/

Organisation :

Postal Address :

Telephone :

Email address :

Is accommodation required? Yes [ ] No [ ]

DD Details :

DD No. _____dated _____

Bank _____

(Crossed Demand Draft in favour of "The HOD, EIE Department, B.S.Abdur Rahman Crescent Institute of Science & Technology" payable at Chennai, India)

Declaration:

I hereby declare that the given information are true the best of my knowledge.

Place:

Date: Signature of the participant

IMPORTANT DATES

Last Date for Submission of Registration Form along With D.D : 02/04/18

Selection Intimation : 03/04/18

Confirmation from Participant : 04/04/18

The number of seat is limited and the participant will be chosen on first come first serve basis.

Spot registration possible with prior intimation

Address for Correspondence:

The Co-ordinators,
Department of Electronics and Instrumentation Engineering,
B. S. Abdur Rahman Crescent Institute of Science & Technology,
Vandalur, Chennai – 48.
+91-9841232253|9944586576|9840184469

e-mail: crescentuniversityeie@gmail.com

website: **www.bsauniv.ac.in**

B.S. Abdur Rahman Crescent Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956
GST Road, Vandalur, Chennai 600 048

IEEE young professionals

NATIONAL WORKSHOP
On

DESIGN AND CONTROL OF POWER ELECTRONIC DEVICES & RENEWABLE ENERGY SOURCES USING MATLAB

6th &7th April 2018

Convener

Dr.P.K.Jawahar
Dean (Student Affairs) & HOD/EIE

Co-ordinators

Ms.G.Anitha, AP(SG)/EIE
Ms.P.R.Hemavathy, AP(SG)/EIE
Ms.N.Sivaramakrishnan, AP/EIE

Organized by
Department of Electronics and Instrumentation Engineering

School of Electrical and Communication sciences
B. S. Abdur Rahman Crescent Institute of Science & Technology, Vandalur, Chennai – 48.

ABOUT THE INSTITUTION

B.S. Abdur Rahman Crescent Institute of Science and Technology (formerly B.S. Abdur Rahman Crescent Engineering College) has been established under section 3 of the UGC Act 1956. Being one of the most sought after institution in India, B.S. Abdur Rahman Crescent Institute of Science and Technology is committed to provide three dimensions of higher education Viz. Quality teaching, Innovative Research and Appropriate Applications of knowledge through Extension, Outreach and Consultancy Activities. The University has 7 schools comprising of 18 departments offering 12 undergraduate and 17 post graduate programmes, besides research programmes in all the department. All eligible programmes are accredited by National Board of Accreditation (NBA). The quality system of the Institute is ISO 9001:2008 certified. It is located in a sprawling green lush area, spanning 50.19 acres adjacent to the Arignar Anna Zoological Park in the GST Road (NH-45), Vandalur, Chennai, Tamil Nadu.

DEPARTMENT PROFILE

The Department of Instrumentation & Control Engineering was started in the year 1995. Since the year 2009 the department was changed to Department of Electronics & Instrumentation Engineering. At present the department of EIE offers B.Tech (Electronics and Instrumentation Engineering) and M.Tech (Electronics and Instrumentation Engineering). UG Programme accredited thrice since 2002 and PG Programme accredited in 2017. The department has excellent infrastructure with sophisticated equipments procured from reputed companies around the world. Qualified and experienced faculty members of the department are an asset to the department. It endeavors to promote interaction with the industry and to take up R&D activities for the betterment of society.

ABOUT THE WORKSHOP

Recently, renewable energy power generation becoming popular worldwide. Renewable energy sources and its grid connections have various challenges. Power electronics is an extremely important element and widely used in renewable energy systems. Basically, it uses high-efficiency switching power semiconductor devices to convert and control electrical power with the help of dc-to-dc, dc-to-ac, ac-to-dc, and ac-to-ac converters that are applied extensively in industrial, commercial, residential, transportation, aerospace, military, and utility systems. The aim of this workshop is to illustrate the role of Power Electronics in the research and development of renewable energy systems using Matlab.

RESOURCE PERSON

Dr.G.Uma, Professor & Head,
Department of Electrical and Electronics Engineering, AnnaUniversity, Chennai

Dr. M.Venkateshkumar, M.E., Ph.D,SMIEEE
Associate Professor, Dept of EEE, AVIT.
Member of R&D - IEEE Smart Cities USA.
Chairman, IEEE Young Professional Affinity Group, Madras Section.
Vice Chairman, IEEE - Power and Energy Society, Chennai.

COURSE CONTENTS

- Introduction to Simpower system
- Modeling of various Power Electronics Devices (Rectifier, Converter, Inverters)
- Design of Controllers for converters and Inverters
- Design of Renewable Energy System and its controllers
- Hands-on training

ELIGIBILITY

Faculty/ Research Scholars/ PG/ UG students from various engineering colleges.

REGISTRATION FEE

Academicians : Rs.1000/-
Research Scholars : Rs.750/-
PG/UG Students : Rs.500/-
Industry Persons : Rs.2000/-

RECOGNISED SES REC (SOCIAL ENTREPRENEURSHIP, SWACHHTA & RURAL ENGAGEMENT CELL) ACTION PLAN INSTITUTION

Ministry of Education, Government of India

Please post to moetn7sesrec@gmail.com

1.	Name of Institution	B.S. Abdur Rahman Crescent Institute of Science & Technology
2.	Address of the Institution	Seethakathi Estate, GST Road Vandalur, Chennai - 600048, Tamil Nadu
3.	University Affiliated to	Deemed to be University
4.	District & State	Chengalpattu, Tamil Nadu
5.	Name of Principal/HoI (Convener of SES REC)	Dr. A. K. KALILUTHIN Deputy Director (Campus Development)
6.	Contact Number (WhatsApp Number)	9486075577
7.	E Mail ID	deputydirector.cdm@crescent.education

Proposed Activities Post COVID 19

#	AREA	IDEAS/SUGGESTED ACTIVITIES FOR THE TEAM; PLEASE MODIFY AS PER LOCAL NEED	COMMITTEE HEAD (FACULTY) NAME, CONTACT NUMBER, EMAIL
1.	**SANITATION AND HYGIENE (CAMPUS)**	• Post COVID19 Sanitation Measures and Drill • Clean and functional toilets (365x24) • Safe drinking water (365 x24) • Clean surroundings • Clean buildings/rooms • Campus Landscaping • Zero Littering	1. Mr.Basheer , Committee Head 8667018252 basheeruddin.nt@crescent.education 2.Mr.Shafeer Ahamed 9952196629 shafeer@crescent.education
2.	**SANITATION & HYGIENE (COMMUNITY/ADOPTED VILLAGES – To Promote Rural Social Entrepreneurship and Community Engagement)**	• Organizeawareness programmes for better sanitation practices like using the toilet, hand washing, health and hygiene awareness and garbage disposal • Work with SHGs for mask making and other similar activities • Perform Nukkad Nataksor street plays around Swachhta and Covid 19 • Conduct surveys and door-to-door meetings to drive behavioral change with respect to sanitation behaviour • Participate in Monitoring committees is to stop open defecation in villages • Prepare **Information Education Communication Material(IEC)** or wall paintingsto promote Swachhta Activities • Set up RO plants in villages for safe and clean drinking water • Setting up telemedicine and mobile health care centres	1. Mr.Shafeer Ahamed Committee Head 9952196629 shafeer@crescent.education 2.Dr.C.Srinivasan 9842450465 srinivasan.com@crescent.education 3.Mr.Basheer , 8667018252 basheeruddin.nt@crescent.education

#	AREA	IDEAS/SUGGESTED ACTIVITIES FOR THE TEAM; PLEASE MODIFY AS PER LOCAL NEED	COMMITTEE HEAD (FACULTY) NAME, CONTACT NUMBER, EMAIL
		● Support Asha workers with innovative tools to ease their work ● Partner with local NGOs and CSR organizations in this field	
3.	**WASTE MANAGEMENT (CAMPUS)**	● Campus/Dept wise wasteaudit ● Campus/Deptwaste segregation ● Reduction in waste, month-on-month ● Recycling waste (paper, organic waste form canteens and kitchens) ● Set up compost pit for recycling waste ● Ban plastic use in the campus ● Banflexi banners (Only cloth banners to be used) ● Paperless work – use of email, WhatsApp for communication	1. Mr.Chinnaiya Committee Head 9962912573 2. Dr.Muhammed Jamsheer 9495564776 muhammed_jamsheer@crescent.education 3.Mr.Y.Ibrahim 8870264513 ibrahim@crescent.education
4.	**WASTE MANAGEMENT (COMMUNITY/ADOPTED VILLAGES - To Promote Rural Social Entrepreneurship and Community Engagement)**	● Village households'& public offices' waste audit ● Village households'& public offices' waste segregation ● Village households' & public offices' waste recycling mechanisms to be set up ● Recycling Farm waste ● Setting up community compost pits in villages ● Awareness camps for Clean and Green Village (Zero Littering – IEC Material) including banning single-use plastic ● Installing bio-gas plants ● Innovative Technology based solutions for rural waste recycling (eg cow dung cake making machine, converting solid waste into bricks, etc) ● Partner with local NGOs and CSR organizations in this field	1.Mr.Y.Ibrahim Committee Head 8870264513 ibrahim@crescent.education 2. Dr.Muhammed Jamsheer 9495564776 muhammed_jamsheer@crescent.education 3.Mr.Chinnaiya 9962912573
5.	**WATER MANAGEMENT(CAMPUS)**	● Audit of water sources in the campus ● Audit of monthly water use in the campus ● Audit of drinking water on campus (bottled water) ● Constructing/Increasing no. of Rain Water Harvesting pits in the campus ● Fixing leaky taps ● Recycling water (grey, brown and black) ● Activities for recharging dry borewells	1.Mr.Rajiv Gandhi Committee Head 7397788034 rajeev.gandhi@crescent.education 2. Mr.Y.Ibrahim 8870264513 ibrahim@crescent.education 3. Dr.Noushad C noushad@crescent.education
6.	**WATER MANAGEMENT (COMMUNITY/ADOPTED VILLAGES - To Promote Rural Social**	● Audit of water sources in the village ● Audit of drinking water in the village ● Setting up soak pits ● Constructing/Increasing no. of Rain Water Harvesting pits in the villages ● IEC and flow chart for fixing leaky taps ● Recycling water (grey, brown and black)	1.Mr.Y.Ibrahim Committee Head 8870264513 ibrahim@crescent.education 2. Dr.Noushad C noushad@crescent.education

#	AREA	IDEAS/SUGGESTED ACTIVITIES FOR THE TEAM; PLEASE MODIFY AS PER LOCAL NEED	COMMITTEE HEAD (FACULTY) NAME, CONTACT NUMBER, EMAIL
	Entrepreneurship and Community Engagement)	● Activities for recharging dry borewells ● Constructing check dams ● Converting villages into water plus areas ● Partner with local NGOs and CSR organizations in this field	3. Mr.Rajiv Gandhi 7397788034 rajeev.gandhi@crescent.education
7.	**ENERGY MANAGEMENT (CAMPUS)**	● Audit of energy efficient heating, cooling, lighting and water systems in the campus ● Audit of building wise monthly use of electricity ● Incentivize reduced electricity usage by depts/buildings ● Create short-term and long-term plan for the use of solar energy on the campus ● Cycles on the campus (reducing carbon footprints) ● Reducing carbon footprints via intelligent Purchase Standard Operating Procedures(SOPs) ● Partner with local NGOs and CSR organizations in this field	1.Mr.Ramkumar Committee Head 9941602400 ramkumar@crescent.education 2. Mr.Manivannan 8883241585 manivannan.nt@crescent.education
8.	**ENERGY MANAGEMENT (COMMUNITY/ADOPTED VILAGES - To Promote Rural Social Entrepreneurship and Community Engagement)**	● Wind and Solar Energy Plants ● Creating Sustainable Rural Energy Plans ● Survey of CFL/ LED lamps, electric fan regulator and electronic ballast for tube light to conserve electricity ● Frictionless foot valves to considerably reduce the consumption of diesel in running the pump sets. ● Feasibility of using rechargeable battery-operated systems across various occupations and institutions ● Mechanical washing machines to empower women ● Awareness camps on energy efficient electrical appliances ● Partner with local NGOs and CSR organizations in this field ● IEC about benefits of related government Programmes	1.Dr.Ashok Kumar Committee Head 9843748357 ashokkumar.sls@crescent.education 2. Mr.Ramkumar 9941602400 ramkumar@crescent.education 3.Mr.Balaji 7397788026 b.balaji1983@gmail.com
9.	**GREENERY (CAMPUS)**	● Setting up a nursery/kitchen garden ● Setting up a seed bank ● Setting up a compost pit ● Researching trees that take up minimal water and are good for the ecosystem (local, resilient species)and planting them during monsoon and taking care of them (Vanamahotsav) ● Landscaping in the campus ● Use of organic manure for the plants ● New buildings on the campus will follow green building norms	1.Mr.Habeeb sulthan Committee Head 9444008668 **habeebsulthan@crescent.education** 2.Dr.Priya.VS 9884367843 priya@crescent.education 3. Mr.Veeramuthu 6380031047

#	AREA	IDEAS/SUGGESTED ACTIVITIES FOR THE TEAM; PLEASE MODIFY AS PER LOCAL NEED	COMMITTEE HEAD (FACULTY) NAME, CONTACT NUMBER, EMAIL
10.	**GREENERY (COMMUNITY/ADOPTED VILLAGES - To Promote Rural Social Entrepreneurship and Community Engagement)**	● Growing Miyawaki forests/Nakshatravanam on barren land/Village Greenery Programme ● Eco friendly agricultural practices ● Smokeless Stoves ● Village landscaping ● Documenting indigenous knowledge ● Partner with local NGOs and CSR organizations in this field ● Lok Vidya	1.Dr.Priya.V S Committee Head 9884367843 priya@crescent.education 2. Mr.Habeeb sulthan 9444008668 **habeebsulthan@crescent.education** **3.** Mr.Veeramuthu 6380031047

We will observe a minimum of **three** ofthe following Environment, Entrepreneurship & Community Engagement Related Days to inculcate and internalize in our faculty, students and community, the values ofMentoring, Social Responsibility, Swachhta and Care for Environment and Resources(**tick any three**)

#	Day	Date	
1.	National Youth Day	Jan 12	
2.	International Mentoring Day	Jan 17	
3.	Global Community Engagement Day	Jan 28	
4.	World Wetlands Day	Feb 2	
5.	World CSR Day	Feb 18	
6.	World NGO Day	Feb 27	
7.	World Water Day	Mar 22	√
8.	CSR Day India	Apr 1	
9.	Earth Day	April 22	
10.	World Environment Day	June 5	√
11.	No Plastic Day	July 3	
12.	World Population Day	July 11	
13.	World Entrepreneurs Day	Aug 21	√
14.	World Habitat Day	1st Monday of October	
15.	National Mentoring Day	Oct 27	
16.	Women's Entrepreneurship Day	Nov 19	
17.	World Toilet Day	Nov 19	
18.	National Pollution Control Day	Dec 2	
19.	World Soil Day	Dec 5	

Date:26.08.2020

Deputy Director
(Campus Development & Maintenance)
B.S. Abdur Rahman
Crescent
Institute of Science & Technology
Vandalur, Chennai-600 048.

Digital Signature of Principal (Convener of SES REC Institution) with Digital Institutional Seal

Please post to moetn7sesrec@gmail.com