



7.2.4 Plan to reduce energy consumption. Have an energy efficiency plan in place to reduce overall energy consumption

KITS has installed solar PV systems, solar water heaters and waste to energy conversion plants. Energy efficiency criteria have been followed for lighting and other appliances. Green audit is carried out regularly. With the support of this policy, efforts will be taken to reduce greenhouse gas emission and support the environment to improve the climate. The Institution is committed to zero emission from the Campus to be achieved by 2060.

Appliance	Total Number	Savings Per Annum in Rs	Percentage
Solar Street Light	7	-	5%
LED street lights	222	4,08,706.56	90%
Solar water heater	87600 capacity	1,00,44,640.00	90 %
LED tube lights	All	81,88,050	100%
Solar power plant	115kW	17,04,618	20%
		Average Percentage	61%

Policy on Mitigating the Impact on Climate and the Environment

1. Introduction

The atmosphere, ocean, cryosphere and biosphere have undergone rapid changes due to human-caused climate change. It is affecting hydrological extremes in every region across the globe and lead to adverse impacts and losses and damages to nature and people. To offset the climatic conditions and to have sustainable environment, KITS is committed to carry out all its operations by considering climate and the environment in line with the national and international policies. India in its Nationally Determined Contributions (NDC) has pledged to reduce the emission intensity of its Gross Domestic Product (GDP) by 45% by 2030. This is a measure of the amount of greenhouse gas emitted per unit of economic activity.

KITS shall carry out a number of activities as mentioned in this policy document to reduce its carbon footprints and thus contributing to global climate mitigation and support to the Nation's commitment. Carbon offset measures shall be taken to mitigate part of its carbon footprint. The efforts will continue until it becomes effectively carbon neutral.

2. Green Energy

- i. KITS shall use solar heating systems by making solar water heaters mandatory inbuildings
- ii. KITS shall use solar as an off-grid solution to provide electricity and reduce the consumption from fossil-fuel based power plants
- iii. Use of energy efficient equipment, appliances including lighting
- iv. Utilizing natural lighting in all the buildings
- v. Using renewable energy sources to meet the energy requirement
- vi. Transforming its buildings into more green and smart ones
- vii. Awareness campaign on energy conservation shall be conducted for all the stakeholders of the institution
- viii. Usage of IC engine vehicles inside the campus shall be minimal
- ix. Avoiding fossil fuel-based vehicles and introduction of EVs and HEVs.
- x. Solar PV charging infrastructure to be installed.
- xi. Flow battery-based energy storage units to be adopted as the backup energy source
- xii. Annual energy auditing to be conducted

3. Sustainable Habitat

- i. Adopting holistic approach to solid and liquid waste management to ensure their full potential for energy generation, and recycling and reuse.
- ii. Planning and laying out eco-friendly and energy free campus with green pedestrian path ways and bicycle trails
- iii. Envisions a net-zero waste and emission campus by 2060
- iv. Sustaining and enhancing the floral and faunal biodiversity of the campus
- v. Utilizing technologies for producing energy from waste

4. Water Conservation

- i. Automatic control system to be installed in all the water distribution networks to avoid overflow and dry run
- ii. Regular maintenance to be carried out to avoid water leakage which will reduce the needfor pumping of water
- iii. Waste water treatment methods to be adopted
- iv. Installation of rain water harvesting systems
- v. Promote water purification and desalination techniques
- vi. Provide guidelines for different water users on efficient water usage
- vii. Awareness campaign on water conservation shall be conducted for all the stakeholders of the institution

5. Recycling of Plastic and Paper

- i. Plastic usage inside the institution shall be restricted.
- ii. Plastic and solid wastes in the campus to be converted to energy, utilizing the existing “Rotary Kiln Gasification Plant”
- iii. Paperless administration is envisaged and the paper waste, if any, has to be recycled using eco-friendly paper recycling unit in the campus.

6. E-Waste Management

- i. The Institution’s stores officer has to collect all the E-Wastes at the end of every month from various academic divisions, research laboratories, workshops, hostel buildings etc. and shall transport to the authorized dismantler or recycler.
- ii. The Institution will ensure that no damage is caused to the environment on account of transporting such items.
- iii. A detailed inventory to be maintained on E-Waste Disposal
- iv. Following components/equipment/Appliances are considered as E-Waste after their life period
 - a. All forms of Computers (Desktops, Laptops, Notebook Computers, Notepad Computers)
 - b. Computer Peripherals (Keyboards, Mouse, Display Units, Printers, Copiers and Scanners)
 - c. Telephones, Cordless telephones, Cellular telephones
 - d. Television sets [including sets based on Liquid Crystal Display (LCD) and Light Emitting Diode (LED) technology]
 - e. Refrigerators, Washing Machines, Air-conditioners (excluding centralized air conditioning plants)
 - f. Fluorescent lamps, lamps which contain mercury, and other Consumer electrical and electronic items

7. Sustainable Agriculture

The School of Agricultural Sciences of KITS will be involved in the following activities with the support of other Schools.

- i. Development of strategies to evolve low input agriculture by creating crops with enhanced water and nitrogen use efficiency.
- ii. Use of micro irrigation systems
- iii. Promotion of agricultural techniques like precision farming, organic farming and rainwater conservation
- iv. Production of large scale bio-fertilizer in the campus to substitute chemical fertilizers

8. Strategic knowledge for climate change

- i. Curriculum on low carbon operational practices
- ii. More research shall be initiated related to sustainable environment and climate change to create technologies that mitigate climate change
- iii. PG and UG students shall be encouraged to design and device methods to reduce carbon emissions.
- iv. More research on water neutral and water positive technologies

9. Conclusion

KITS has installed solar PV systems, solar water heaters and waste to energy conversion plants. Energy efficiency criteria have been followed for lighting and other appliances. Green audit is carried out regularly. With the support of this policy, efforts will be taken to reduce greenhouse gas emission and support the environment to improve the climate. The Institution is committed to zero emission from the Campus to be achieved by 2060.

Plan in Action during 2021-22

SOLAR STREET LIGHTING IN KARUNYA UNIVERSITY



SOLAR WATER HEATER IN KARUNYA UNIVERSITY



Total lights Installed in Karunya University are 7 lights

Street Light Installed Place	Panel Used	No. of Lights
Guest House	Crystalline Type	4 Nos
Opposite to S&H Auditorium	Crystalline Type	2 Nos
Mechanical Building Yard	Crystalline Type	1 Nos

Specifications for Solar Street Lights

Electrical Parameters

Panel Type	: Crystalline Type
Cell Type	: High efficiency Solar Cells
Nominal Capacity	: 1*120 W
Peak Power Voltage	: 16.2 Volts
Peak Current	: 8.3 Amps
Tolerance	: $\pm 5\%$

Mechanical Parameters

Front cover glass	: Toughened Glass
Encapsulate	: Ethylene Vinyl Acetate (EVA)
Mounting frames	: Anodized aluminium channel
Rear panel	: Polyvinyl Fluoride (PVF)
Junction box	: ABS moulded box
Weight	: 5.4 Kgs

Battery

Electrical Parameters

Normal capacity	: 100 Ampere Hours
Rated current Discharge	: C/10
Normal voltage	: 12V
Self-discharge	: About 0.5% per week
Expected life	: About 1500 cycles

General parameters

Types	: low maintenance lead acid
Construction	: 12V block
Container material	: polypropylene

Solar light controller:

Charge Controller Type And Rating : Series Pulsed Two Step 15A max.

Cable Assembly:

Module to Light Controller : 4.0 m²- cable with ring terminal
 Luminary to Lighting Controller : 1.5 m² dual sheathed cable
 Battery to Lightning : 4.0 m² with ring and fork terminal

Details of Solar Water Heating System in KITS Campus				
Sl.No	Description of Work	Location	Capacity in Litres per Day	Total installed capacity in LPD
1	Solar Water Heating system	Hostel Campus	87600	87,600
Total capacity				87,600
Total Kilo Calories				35,04,000
Total Units Saved per Day				4,793
Total units saved per Month				1,43,803
Total units saved per Annum				15,81,833
Power saving Cost per Annum (Rs)				1,00,44,640.00
Solar Water heating system of total capacity of 87,600 LPD is installed in our campus and Electricity power savings per Annum is Rs. 1 Crore				

LED Tube Light fittings

LED LIGHTS IN KARUNYA UNIVERSITY



Sl.No	Description	Existing Light Fittings	Replaced LED Tube Light fittings
1	Power Consumption	40 Watts	18 Watts
2	No of Light Fittings	15066 Nos	15066 Nos
3	Units consumed per day	4,821 Units	2,169 Units
4	LUX (Intensity of Light)	95 Lx	150 Lx
5	Units consumed per year	15,66,825 Units	7,04,925 units
6	EB Charges/year	Rs. 1,48,84,837/-	Rs. 66,96,787/-
7	Maintenance Charges/Year	Rs. 45,000/-	Replacement warranty upto 3 Years
		Electricity Charges Savings/Annum	Rs,81,88,050/-

Details of Power Savings by Using LED Street Lights in KITS Campus



Sl.No	Description of Work	Location	Wattage	Qty	Total
1	LED Street Lights	College Campus	48	48	2,304
2		College campus	70	43	3,010
3		Hostel Campus	48	103	4,944
4		Hostel campus	70	28	1,960
Total Units Consumed by LED Street Lights per day					147
Total Units Per Month					4,398
Total units consumed by LED street lights per Annum					52,782
Total units consumed through SV Lamp Per Annum					98,194
Savings Per Annum by Using LED Street Lights					45,411.84
Savings Per Annum by Using LED Street Lights in Rs					4,08,706.56

SOLAR POWER GENERATION OF 115KW IN KARUNYA INSTITUTE OF TECHNOLOGY AND SCIENCES



Sl.No	Month	Unit Generated in kWh
1	March'2022	16566
2	April'2022	14639
3	May'2022	13,910
4	Jun'2022	13974
5	Jul'2022	11367
6	Aug'2022	12955
7	Sep'2022	14410
8	Oct'2022	13520
9	Nov'2022	9962
10	Dec'2022	10403
11	January'2023	13075
12	February'2023	13416
13	March'2023	16566
14	April'2023	14639
Annual Generation in kWh of 115kW		1,89,402
Annual Savings for the Year 2020 in Rs		17,04,618

Summary:

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