



## **JSS Academy of Higher Education & Research**

(Deemed to be University) (Accredited A+ Grade by NAAC)

### **COMPENDIUM ON SDG-7**

### **AFFORDABLE AND CLEAN ENERGY**

#### **Compendium of Activities in Achieving UN Sustainable Development Goals**



**2021-22**

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# 7 AFFORDABLE AND CLEAN ENERGY



Our universe is a sea of energy -  
free, clean energy. It is all out there  
waiting for us to set sail upon it.

— *Robert Adams* —

## **ABOUT THE GOAL**

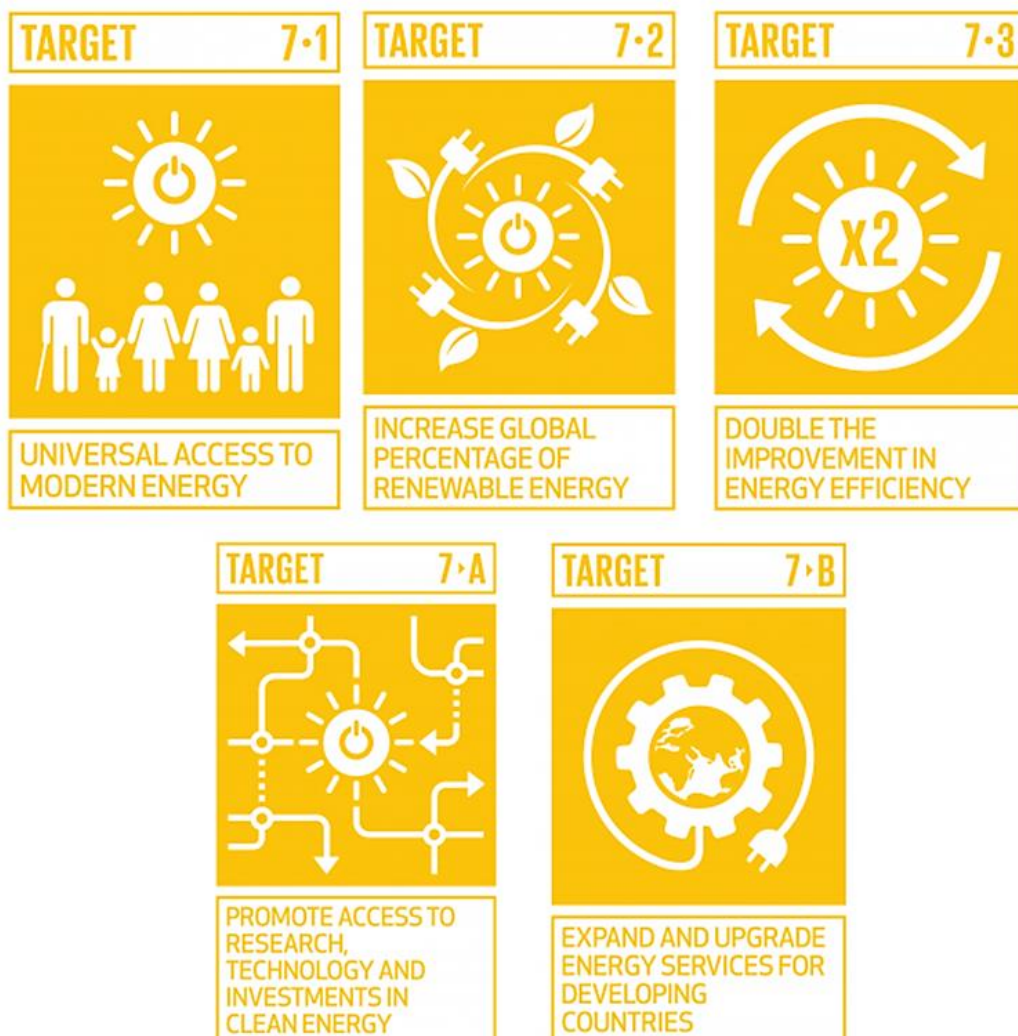
Sustainable Development Goal 7 (SDG 7 or Global Goal 7) is one of 17 Sustainable Development Goals established by the United Nations General Assembly in 2015. It aims to "Ensure access to affordable, reliable, sustainable and modern energy for all. SDG 7 has five targets, measured with five indicators, which are to be achieved by 2030. Three out of the five targets are "Outcome targets", and two are "Means of achieving targets".

As SDG 7 accounts for Affordable and clean energy, which plays a crucial role in all-round development of the nation and the global health & prosperity, achieving the efficient use of renewable and non-renewable source of energies takes care of all other 16 goals. The overall sustainability is the way to overcome poverty, hunger, to get a better ecosystem to confront climatic changes, to reduce inequality thus maintaining integrity, Global peace, and partnership that in turn addresses the socio-economic growth of the world. This helps to achieve infrastructure and industrialization increasing the sustainable production and helps the channelized utilization of natural resources. Better employment addresses the end of hunger, gender inequality and assures better and healthy lives.

## INSTITUTIONAL APPROACH TOWARDS SDG 7

1. “Go green”- Reducing paper communication
2. Recommends usage of Electric vehicles
3. Energy conservation strategies – For e.g. use of CFL/LED lights and Solar heaters and Air source heat pumps in the hostels
4. Provision for natural light in all its buildings
5. Cycles in campus
6. Solar plant

### Targets t:



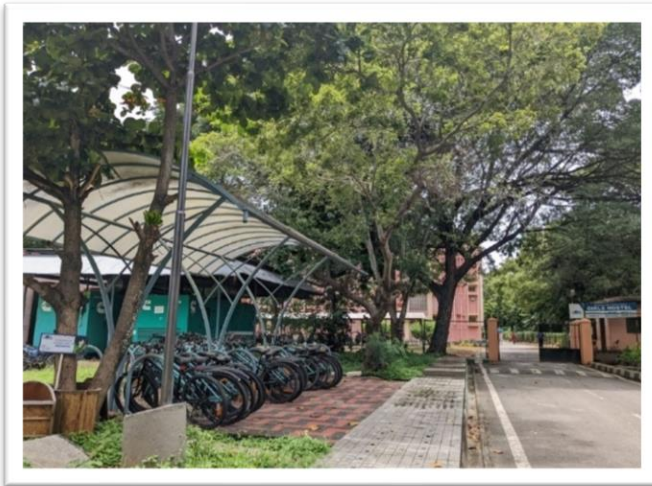
## ACTIVITIES TARGETING SDG-7

### The first target of SDG-7



#### 7.1: Universal access to modern energy:

- Our implementation includes using clean fuel for cooking at the hostel and reducing fossil fuels and biofuel usage.
- Bi-cycles are provided for students and staff to use in and around campus to encourage the youth to reduce the use of non-renewable sources of energy and reduce the air-pollution by decreasing the release of CO<sub>2</sub> to the environment.



## The second target of SDG-7

TARGET

7-2



INCREASE GLOBAL  
PERCENTAGE OF  
RENEWABLE ENERGY

### 7.2: Increase the global percentage of renewable energy:

- Our implementation includes using solar panels in the hostels and usage of LED lights all over campus.
- We have a timely and needy use of lights; Majority of the lights are turned off during night and only provided in paths to ensure hostel student's safety.
- We avoid the use of lights in day time as we have provided better ventilation that suffices the need off light in the classes and laboratories.
- We have avoided the installation of ACs in office and chambers to ensure the environmental safety.



## The third target of SDG-7

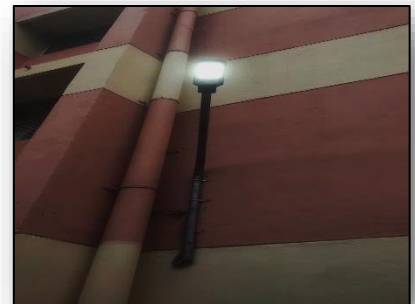
TARGET 7-3



DOUBLE THE IMPROVEMENT IN ENERGY EFFICIENCY

### 7.3: Double the improvement in energy efficiency:

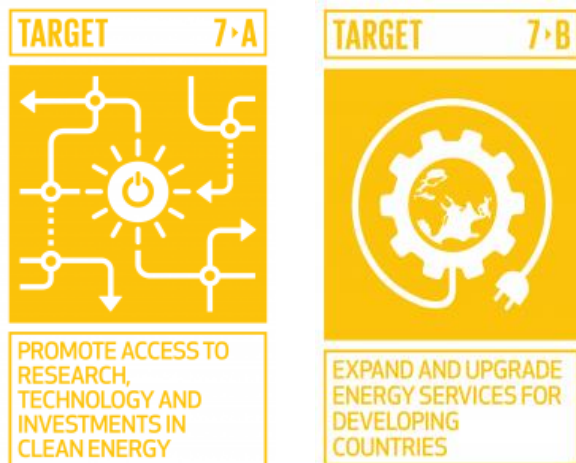
- Our implementation includes solar panels and LED as they reduce energy consumption to a great extent.
- We have provided the pooled-transport systems to students to travel from college to hospital or to other campus to ensure the less use of petroleum fuels.





## The fourth target of SDG-7:

**7A: Promote access to research, technology, and investments in clean energy & Target 7. B: Expand and upgrade energy services for developing countries.**



The JSS MC located in the cleanest city Mysuru, has sprawling 43 acres of campus with a bioclimatic architecture that ensures enough shading, natural ventilation, passive heating, and cooling. It also possesses an internal atrium for insolation and natural lighting. The structure uses solar energy for passive heating and has canopies of trees for sun protection in the summer. JSS AHER is committed to a cleaner and greener campus and the University commits to this by:

- Complying with applicable rules, regulations, and other recognized requirements to encourage and educate staff to conserve energy wherever applicable.
- Avoiding and reducing pollution caused by fossil fuels by implementing and supporting the use of bicycles in and around campus.
- Implementation of solar panels at hostels and LED lights throughout campus for efficient use of energy and its conservation.
- Rainwater harvesting at the hospital.
- Screening the soil samples around the Hospital and around the University to contain the spread of MDR bugs through the soil contaminating the environment around the JSS Hospital and JSS Dental College Hospital. Ensured the use of an Effluent treatment plant for the effluents of Microbiology laboratory.
- Reduced the use of Plastic in CSSD by using brown paper instead of Steripack made of plastic, for wrapping the instruments used for dressing.

➤ The culture samples and microbiology specimens are autoclaved and discarded to be further treated by Shree consultancy to prevent contamination of the environment.

➤ Ensuring active participation of students in sustainable development goals. During the current year.

Looking forward to achieve a better global environment, we have been promoting the efficient use of renewable source of energies and along-side we have put-forth the ideas and working mode to confront the polluted environment and to avoid or to use as much of least non-renewable energies that counts on the sustained health of the nature around. In fact, we have been working to educate the students and the staff regarding the “Affordable and Clean energy” in order to cope-up with the motto of achieving the Sustainable environment. Frequent educative sessions are being conducted to help them practice the non-renewable energy management.

Our college has mostly invested to provide one of the most greenish campus among most of the other institutions. The campus has retained the earlier planted trees and has been re-cultivating the annual, biennial, and long-living trees which also provide a better ecosystem for the local fauna. The rainwater is redirected to the garden to irrigate the plants and in nearing days we are planning on the installation of rainwater harvesting friendly infrastructure. Thus we are a step forward to using clean energy in a sustained manner.





The students are encouraged to plant the saplings as part of certain occasions and celebrations and that is indeed a practical way to help them inculcate the attitude of achieving a sustainable environment.

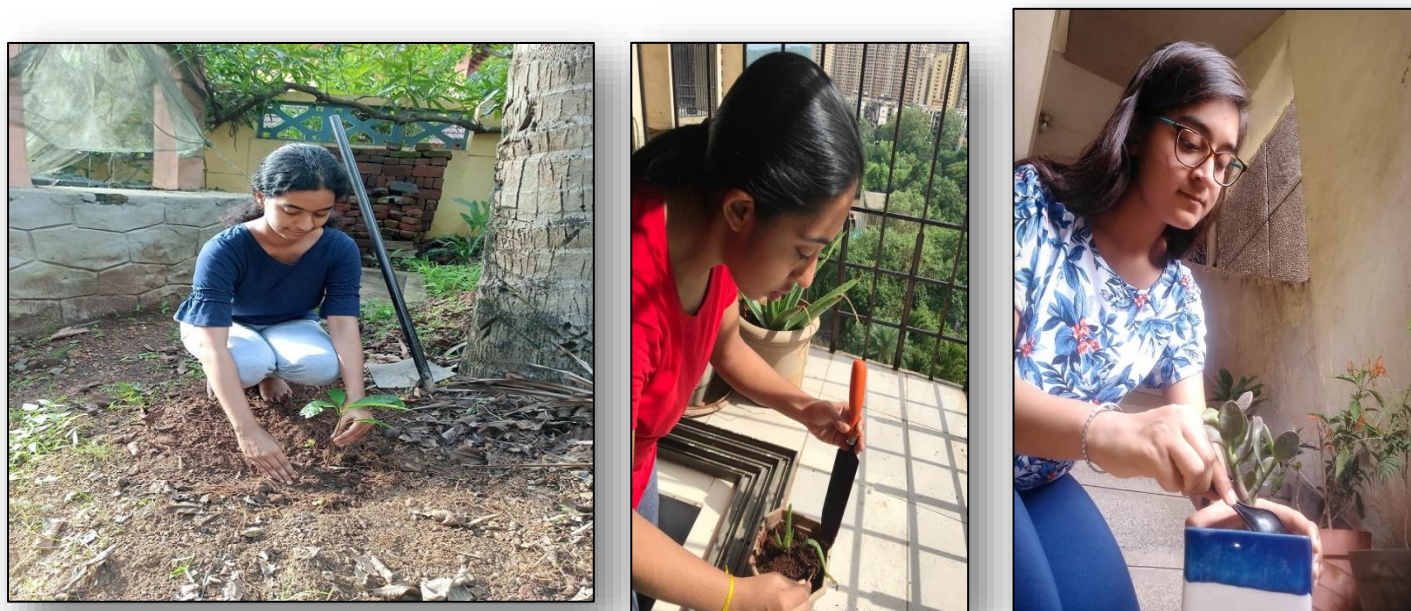


## **CONTRIBUTION TO ENVIRONMENTAL AWARENESS**

To inculcate the knowledge of afforestation and rebuilding the green life on the earth, humans can merely contribute but a little effort on behalf of our college is put into the view of educating the students.

They are made to participate in certain events that include planting the saplings and creating the working models of certain ideas that shall in high-end infrastructure bring fair change in the betterment of a healthy environment.

Knowledge of recycling and reuse of energy productively and constructively would help to accomplish the sustenance of affordable and clean energy.



## **WORLD ENVIRONMENT DAY OBSERVATION**

"The #OnlyOneEarth campaign for World Environment Day 2022 calls for collective, transformative action on a worldwide scale to celebrate, protect, and restore our planet," according to UNEP.

JSS School of Public Health, JSS Medical College, and JSS Environmental Sciences Department of JSS AHER, Mysore, in association with the Education Department and Forest dept, Govt of Karnataka, organized an awareness program for #worldenvironmentday2022 on 6th and 7th June in the government schools of Mysuru district. The theme for the year was 'Only One Earth,' which encourages us to do our part while living

in perfect harmony with nature - without becoming a burden to it. Every year, a different subject is chosen to commemorate this day to emphasize the essential message it conveys. The major focus was to spread awareness among school children about the environment and its protection.

About 16 schools in Mysuru District were visited, including 15 government schools and JSS School in the Suttur area where painting competitions among the students in 3 categories per school (Class 1 to 4, Class 5 to 7, Class 8 to 10) and other awareness activities like Qu, planted saplings, additional video making, etc were organized. Students enthusiastically took part in the events, planted saplings, and took an oath to take care of our environment by taking small steps. Later we oriented the students and spread awareness among them and also facilitated the winners of the painting competition with prizes and distributed saplings among the students which they planted in the school compound and they took an oath to take care of these saplings.

Saplings were provided to all winners. They were given a chance to plant the saplings and register with us using a photo with them and their parents now and after a year show the photo at the same location with sapling has grown - This is to just ensure they own the responsibility themselves with a small act.



## **GREEN CAMPUS - GREEN AND CLEAN CAMPUS INITIATIVE**

The campus area has more than 60% of greenery with herbal garden and 20 varieties of Fruit bearing trees. The College has won Prize from Dept. of Horticulture for garden maintenance during Dasara Festival.





## CLEAN AND RENEWABLE ENERGY UTILIZATION

As initiative towards smart campus the college have installed solar panels to reduce the electricity requirements as part of clean and renewable energy utilization. The total dependency for electricity of the college was at around 100% from the governmental agency (CESCOM). The dependency has reduced by 50 % or more after the installation of Solar panels. The saving of electricity is recorded on regular basis which is given in the table below.



Duration	KEB				Solar units generated		Total= (KEB & Solar)	
	Import Units KEB (A)	Export Units from Solar (B)	Actual Consumption of Units C= (A-B)	Amounts (D)	Units (E)	Amounts (F)	Units G=(C+A)	Amounts H=(D+F)
April-August 2022	102390	8670	93720	957625	60276	373711	153996	<b>879889</b>



## **NATURAL LIGHTS AND VENTILATION**

The labs are designed to use natural lights and ventilation, in this regard the pharmaceutical chemistry lab is being renovated into modern labs.



### **REDUCTION OF ELECTRICITY CONSUMPTION:**

- The total electricity usage in the campus was brought down to 31000 watts from 45000 watts through switching over to LED bulbs from incandescent bulbs.
- Installation of motion sensor lights to save electricity in the no men place. Motion sensor lights are placed at college elevator and the college corridor.
- Awareness program to the students and faculties to conserve the electricity and other forms of energy.
- Awareness is given on a regular basis to students and staff to conserve the electricity and sign board are placed to execute the same conserve the electricity.



- Encouraging students in actively participate in competitions as extempore, which creates awareness among the students about energy conservation.



**Reshma Bobby of 6<sup>th</sup> PharmD speaking on the topic, 'Fossil Fuels, a boon or a bane'.**

#### **Reduction of Carbon foot print:**

- The college encourages the staff for carpooling, in which many of the staffs are actively practicing.
- The college/university is actively encouraging for use of E- Vehicles to reduce carbon foot print.

JSSCPO is working towards energy conservation and improving energy efficiency through using the energy-efficient

LED light bulbs, sensor lights.

### Energy Efficient LED Lights in Library and Campus



### Energy use density

### Energy Efficient Sensor Lights





**JSS COLLEGE OF PHARMACY, OOTY**  
**ELECTRICITY CONSUMPTION IN CAMPUS -2021-2022**

S.NO	MONTH	UNIT	AMOUNT
1	Jul-21	17654	112103.00
2	Aug-21	32719	270320.00
3	Sep-21	50822	395285.00
4	Oct-21	48094	350543.00
5	Nov-21	49245	405967.00
6	Dec-21	44307	348055.00
7	Jan-22	36203	293645.00
8	Feb-22	48107	373176.00
9	Mar-22	49793	394007.00
10	Apr-22	43003	339001.00
11	May-22	48314	374629.00
12	Jun-22	33805	279828.00
	<b>TOTAL</b>	502066	3936559.00

Normal bulbs and old fitting lights were replaced by LED bulbs which are power saving. Glass windows are present for good supply of green energy.



## SIGN BOARDS ON WATER AND ELECTRICITY PRESERVATION



## RESEARCH ACTIVITIES ALIGNING TO THIS GOAL

### Research related to this SDG

1.	Comprehensive Understanding of Urban Water Supply 6 Management: Towards Sustainable 7 Water-socio-economic-health-environment Nexus
2.	UV-LED driven photodegradation of antibiotic and organic dye using strontium titanate nanostructures
3.	Potentiality of polymer nanocomposites for sustainable environmental applications: A review of recent advances
4.	Fundamentals, synthesis, characterization, and environmental applications of layered double hydroxides: a review
5.	Tabebuia rosea: a prospective non-edible biodiesel feedstock
6.	Azadirchta excelsa seed oil, a potential non-conventional Biodiesel feedstock

To overcome the problems of fuel and associated material, in **Department of Environmental Science**, students working on the extraction of oils and conversion of biodiesels are carried out under the guidance of Dr. Vadiraj K T. The biomass is being used to extract the energy and helps to achieve one of the sustainable development goals of affordable Clean Energy.



Extraction of Biodiesel from Swietenia mahogany seeds

## **PUBLICATIONS RELATED TO SDG 7**

- 1) Pandey A, Brauer M, Cropper ML, Balakrishnan K, Mathur P, Dey S, Turkgulu B, Kumar GA, Khare M, Beig G, Gupta T. Health and economic impact of air pollution in the states of India: the Global Burden of Disease Study 2019. *The Lancet Planetary Health*. 2021 Jan 1;5(1):e25-38.
- 2) Amaral AF, Burney PG, Patel J, Minelli C, Mejza F, Mannino DM, Seemungal TA, Mahesh PA, Lo LC, Janson C, Juvekar S. Chronic airflow obstruction and ambient particulate air pollution. *Thorax*. 2021 Dec 1;76(12):1236-41.
- 3) Thippeswamy HM, Devananda D, Nanditha Kumar M, Wormald MM, Prashanth SN. The association of fluoride in drinking water with serum calcium, vitamin D and parathyroid hormone in pregnant women and newborn infants. *European Journal of Clinical Nutrition*. 2021 Jan;75(1):151-9.
- 4) Shetty BS, D'Souza G, Padukudru Anand M. Effect of indoor air pollution on chronic obstructive pulmonary disease (COPD) deaths in Southern Asia—a systematic review and meta-analysis. *Toxics*. 2021 Apr;9(4):85.
- 5) Pandey A, Brauer M, Cropper ML, Balakrishnan K, Mathur P, Dey S, Turkgulu B, Kumar GA, Khare M, Beig G, Gupta T. Health and economic impact of air pollution in the states of India: the Global Burden of Disease Study 2019. *The Lancet Planetary Health*. 2021 Jan 1;5(1):e25-38.
- 6) Burney P, Patel J, Minelli C, Gnatiuc L, Amaral AF, Kocabaş A, Cherkaski HH, Gulsvik A, Nielsen R, Bateman E, Jithoo A. Prevalence and population-attributable risk for chronic airflow obstruction in a large multinational study. *American journal of respiratory and critical care medicine*. 2021 Jun 1;203(11):1353-65.
- 7) Mahesh PA. Is the impact of air pollution on lung function moderated by body mass index. *Lung India: Official Organ of Indian Chest Society*. 2021 Sep;38(5):489.
- 8) Amogha G, Paladhi, Jacob Thomas Joshi, Arvind George, M.V. Manohar, Sugumari Vallinayagam, Junaid Ahmad Malik, Chapter 14 - Lipase and lactic acid bacteria for biodegradation and bioremediation, *Microbes and Microbial Biotechnology for Green Remediation*, Elsevier, 2022, Pages 265-286, ISBN 9780323904520, <https://doi.org/10.1016/B978-0-323-90452-0.00004-9>
- 9) Manohar, M.V., Paladhi, A.G., Jacob, S., Vallinayagam, S. (2022). ZnO Nanocomposites in Dye Degradation. In: Muthu, S.S., Khadir, A. (eds) *Advanced Oxidation Processes in Dye-Containing Wastewater. Sustainable Textiles: Production, Processing, Manufacturing & Chemistry*. Springer, Singapore. [https://doi.org/10.1007/978-981-19-0882-8\\_12](https://doi.org/10.1007/978-981-19-0882-8_12).