THE - Impact Rankings 2025

Energy-efficient renovation and building

The Institution follows **NBC 2016 (National Building Code of India - 2016)** design guidelines for the construction of new buildings and the improvement of existing ones. Also, it deals with the installations and the replacements of the equipment.

Green Building Infrastructure:

1. All the **buildings are constructed under NBC 2016 (National Building Code of India - 2016) guidelines**.
2. The university follows the concept of Smart buildings equipped with **efficient ventilation systems** and surrounded by green belts and plantation for healthy environment around the buildings.
3. Most new buildings are designed in a **square or rectangular shape, with open space left in the center**. This layout allows natural sunlight to enter the buildings, making the interiors brighter and more comfortable.
4. The buildings are designed with open courtyards, ensuring that both the inner and outer areas get plenty of light. All the **corridors are properly ventilated** and roof tops have vents for maximum utilization of day light.
5. **Roof skylights and large windows** bring in plenty of sunlight, reducing the need for artificial lighting and saving energy. Central courtyards and ceiling lights also help increase daylight inside.
6. New buildings of the university have a middle garden with or without a glass roof. These **open areas in the middle of the buildings get more sunlight** so that electricity usage for the lighting of halls is reduced.
7. Fly ash, marble dust, granite dust, Ground Granulated Blast-furnace Slag (GGBS), paper burnt ash and sugarcane bagasse ash are used as **source materials for the manufacture of eco-friendly construction products** such as concrete bricks and paver blocks.
8. All **classrooms and laboratories are provided with wide windows to have plenty of natural ventilation** and maximum illumination. These arrangements help to reduce the electricity consumption and provides natural environment for studies.
9. The **energy efficient appliances** are installed when constructing new buildings and during the replacement in all areas like, lightings, Air conditioners, fans and Geysers.

10. 152 automatic day-light sensors are installed in the **solar street lights.** Sensor-based automatic light switching is interfaced with the movement of persons.
11. To tap the alternate energy sources, the institution has installed 1124.22kWp **rooftop solar power panels** on top of nine blocks. About 45% of the energy consumption is met by the solar energy leading to the reduction in carbon foot print. Further, solar water heaters are installed in the hostels and solar pumps are installed in the agriculture farms to tap solar energy.
12. The institution has power **grid substations** to move electricity use from busy times to quieter times. This helps keep the power grid stable and makes our power supply more efficient and reliable.
13. All lifts are grouped and configured to stop at particular floors instead of stopping at all the floors **to save considerable energy**.

Academic Programs:

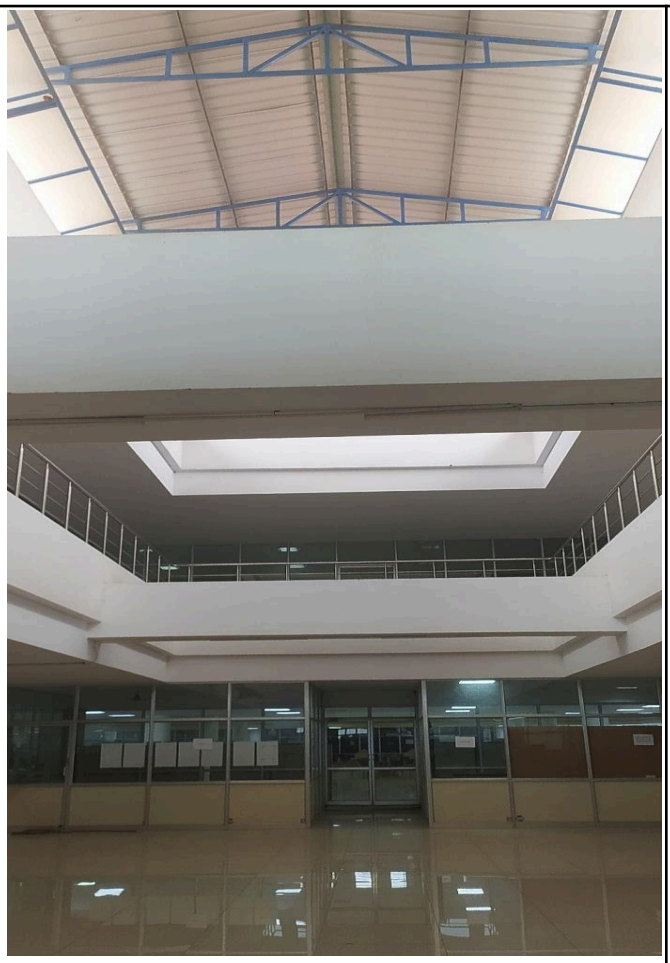
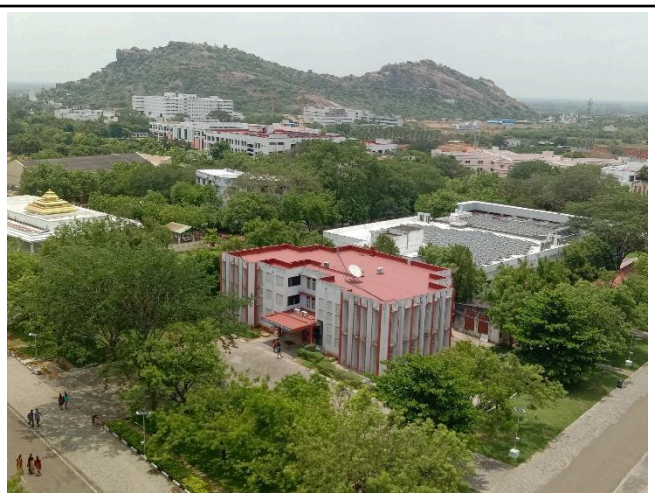
To ensure the success of the sustainable development, the institute offers the following academic programmes. Foundation course on Sustainable development that aimed at educating the campus community about the importance of energy conservation:

1) **B. Arch.,**
2) **M. Arch. (Habitat Design)**
3) **B.Tech., Civil Engineering**
4) **M. Tech., Structural Engineering**
5) **M.Tech., Renewable Energy Technologies**

Related Policies:

The university have separate **policies** to ensure the efficient use and upkeep of all campus infrastructure. https://www.kalasalingam.ac.in/unsdg-sdg7/

Name of the Policy	Link
Maintenance Policy	https://kalasalingam.ac.in/wp-content/uploads/2021/11/Maintenance-Policy.pdf
Sustainable Environment Policy	https://kalasalingam.ac.in/wp-content/uploads/docs/Sustainable_Environment.pdf
Energy policy	https://www.kalasalingam.ac.in/wp-content/uploads/2021/11/Energy-Policy.pdf

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Roof skylights</td><td>Electrical Ventilation fans are replaced with Natural Flow (Power less) Ventilation Turbines</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Green belts and plantation for healthy environment around the buildings</td></tr>
</table>

Building constructed in square or rectangular shape, with open space left in the center to allow more sunlight and ventilation

Usage of Recycled materials for Construction

Natural Ventilation

Ramps and handrails are installed fordiffrently abled persons.

	
2x2 Drop Ceiling LED Light Fixtures	Solar street lighting (Single pole view)
	
Energy Efficient BLDC fans	Ceiling Lamps
	
Solar Water Pumps	Solar Water Heater (Close view)

Policy on Energy-efficient renovation and building

KARE has developed clear policies and guidelines for refurbishing and constructing new buildings, installing and replacing equipment, and promoting energy-saving and carbon-reduction efforts. All campus users must follow these rules when using buildings, facilities, and equipment. More details are provided below.

Weblink: https://www.kalasalingam.ac.in/unsdg-sdg7/

Upgrade buildings to higher energy efficiency

The institution has developed extensive policies and regulations to ensure all renovations or new builds are following energy efficiency standards within these buildings, as well as energy-saving and carbon-reduction practices to be followed by all users of the buildings, facilities, and equipment on campus. Further details are mentioned below.

- The Institution follows **NBC 2016 (National Building Code of India - 2016)** design guidelines for the construction of new buildings and the improvement of existing ones.
- 80 % of our University's lightning system is energy efficient; LED Lights are used in most of the university's buildings with motion sensor.
- The institution has the **Automatic fire alarms sensor**, **Emergency lights system** where both are turned on automatically if a fire occurred or the electricity went down.

Implementing energy-efficient appliances is a strategic move that included to promote sustainability, reduce energy costs, and minimize environmental impact. KARE (Kalasalingam Academy of Research and Education) is committed to reducing its carbon footprint and promoting energy conservation by implementing energy-efficient appliances across the campus. The usage of energy efficient appliances reduces the energy consumption up to 35%. The lower the consumption, and thus increased energy efficiency, significantly reduces operating costs and contributes substantially to climate and environmental protection.

KARE has implemented the following practices towards Energy and climate change:

1. **Upgrading to Energy-Efficient BLDC Fans:** The university has replaced its old ceiling fans, which consumes 75 watts of power, with new BLDC (Brushless Direct Current) fans that only consume 25 watts. This change helps reduce energy use significantly.
2. **Replacing CFL bulbs with LED Lighting:** The institution has replaced LED lights throughout the campus, including academic buildings, hostels, and outdoor spaces. LED lights are known for being energy-efficient and providing effective illumination while being environmentally friendly.
3. **Sensor based Energy Conservation using Solar Street Lights:**
   Institute has taken efforts to save energy by installing sensor-based equipment from the kitchen to common areas in the campus. To highlight some of the major initiatives, around 152 automatic day-light sensors are installed in the street lights.
4. **Upgradation of energy efficient appliances:** Solar water heater with a temperature sensor facilitates ON & OFF switching of the pump and circulation of water. Sensor-based automatic light switching is interfaced with the movement of persons. Movement sensed automatic door opening-closing system is installed in the administrative building to conserve energy. Some of the hand wash pipes are upgraded to sensor-based. Apart from the commercially available equipment, faculty members of the institute have taken special efforts to develop sensor-based passive air coolers and air-conditioners.

5. **Maximizing Daylight using square shape construction:** Most of the campus buildings are designed in a square shape, with an open space or courtyard at the center. This architectural design allows natural sunlight to penetrate the building, the need for artificial lighting is significantly reduced, promoting energy efficiency. Additionally, the open courtyard enhances ventilation, creating a cooler and more comfortable indoor environment. This design not only supports sustainability goals but also contributes to the well-being of the building's occupants by providing ample natural light.
6. **Sustainable Building Materials:** All buildings on campus are constructed using environmentally friendly materials like Fly ash, marble dust, granite dust, Ground Granulated Blast-furnace Slag (GGBS) and paper burnt ash. This approach makes use of local resources, such as soil and laterite from excavations, and helps keep indoor temperatures comfortable due to the natural cooling properties of laterite bricks.

Maximizing Daylight using square shape construction

Carbon Reduction and Emission Reduction Process:

The institution follows several programs and initiatives to reduce its environmental impact and support sustainability, helping to reduce carbon emissions both directly and indirectly. These are some of the common programs followed by KARE:

1. Usage of the solar energy panels in the campus to produce some of the energy for the campus needed.
2. Effective implementation of Rainwater harvesting system
3. Explicit policy on Energy
4. Usage of Energy Efficient appliances
5. Academic programs on Energy and Climate change
6. Usage of E-Vehicles for campus shuttle services
7. Public transport

1. **Usage of the renewable energy sources through solar energy panels in the campus**

   To tap the alternate energy sources, KARE has installed 1124.22kWp rooftop solar power panels on top of nine blocks. About 45% of the energy consumption is met by the solar energy leading to the reduction in carbon foot print. The institution has also installed 152 solar street lights throughout the campus which amounts to a saving of about 9.56 kWh per annum. Further, solar water heaters are installed in the hostels and solar pumps are installed in the agriculture farms to tap solar energy.

2. **Effective implementation of Rainwater harvesting system**

Considering the location of the institution, KARE has installed various rain water collection systems to sustainably manage the water requirements in the campus. The rain water collected is either used for recharging the ground water through water harvesting pits and trenches or stored in tanks and used.

The rainwater is harvested from the roof top of the academic buildings and hostels. The water is collected through pipes and the collected water is either used for recharging the ground water or taken through canals to the percolation ponds situated at three locations inside the campus.

3. **Explicit policy on Sustainable Goals:**

- The Institution has developed comprehensive sustainability plans and policies that include specific carbon footprint reduction targets and strategies. The list of plan and policies are listed below:

Policy URL:

S.No	Policies/Plan	URL Link
1.	Energy Policy	https://kalasalingam.ac.in/wp-content/uploads/2021/11/Energy-Policy.pdf
2.	E-Waste Policy	https://kalasalingam.ac.in/wp-content/uploads/2021/11/e-waste_policy.pdf
3.	Maintenance Policy	https://kalasalingam.ac.in/wp-content/uploads/2021/11/Maintenance-Policy.pdf
4.	Recycle Policy	https://kalasalingam.ac.in/wp-content/uploads/2021/11/Recycle-Policy.pdf
5.	Sustainable Environment	https://kalasalingam.ac.in/wp-content/uploads/docs/Sustainable_Environment.pdf
6.	Water Conservation Policy	https://kalasalingam.ac.in/wp-content/uploads/2021/11/Water-Conservation-Policy.pdf

4. **Academic programs:**

To ensure the success of its energy efficiency initiative, the institute offers various programs on energy and climate change. These programs aim to raise awareness among the student community.

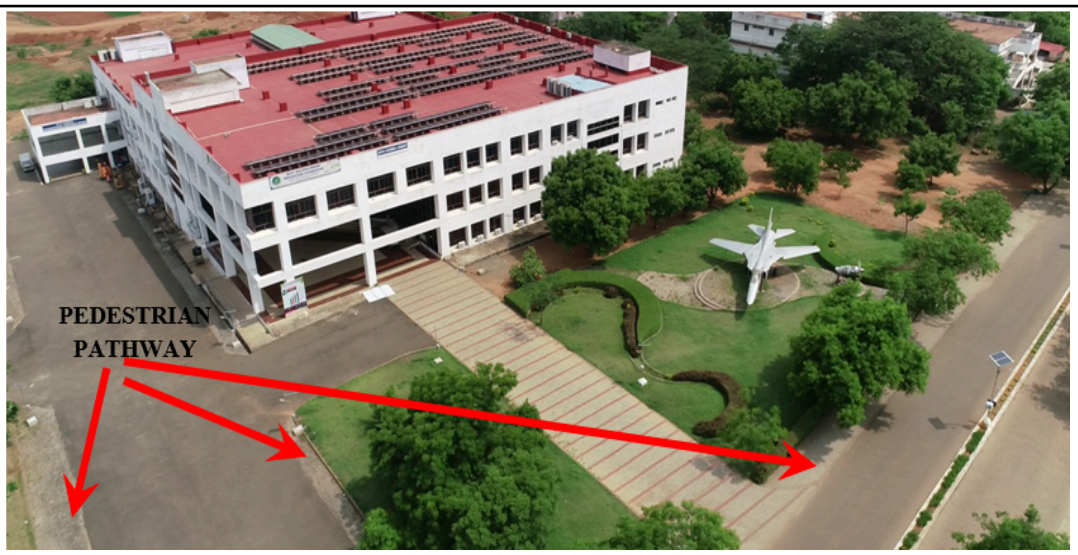
- **M.Tech programme on Renewable Energy Technologies**

  URL: https://kalasalingam.ac.in/course/m-tech-renewable-energy-technologies/
- **Program Elective courses:** B.Tech., EEE Curriculum and syllabi

S.No	Course Code	Course Name	Dept
1	213EEE3132	Solar Photovoltaic Systems	EEE
2	213EEE3133	Wind Power Generation	EEE
3	213EEE3134	Biomass Energy System	EEE
4	213EEE3135	Geothermal and Ocean Energy Conversion	EEE
5	213EEE3136	Industrial & Commercial Aspects of Renewable Energy Sources	EEE
6	213EEE2137	Renewable Energy Sources	EEE
7	213EEE3138	Fuel Cell Technology	EEE
8	213EEE3139	Smart Grid	EEE
9	213EEE2150	Solar and Wind Energy Conversion	EEE

- Foundation course on Sustainable development **(211MEC1401 - Sustainable Design and Manufacturing)** that aimed at educating the campus community about the importance of energy conservation:

5. KARE recognizes the importance of climate change and is dedicated to helping reduce greenhouse gas emissions to support nations' goals. KARE has **banned the entry of vehicles** inside the academic arena. This policy encourages walking or biking for short distances within the campus to cut down on fuel use and reduce carbon dioxide emissions.



Pedestrian friendly pathways around the campus

6. **Campaign on energy saving for reducing of electricity consumption**

Office equipment such as computers, printers, and copiers can contribute significantly to energy usage. Sign boards are kept to adopt the following practices to reduce their energy consumption:

Sign Boards placed in classrooms to adopt the practice among the students for Energy consumption

7. **Transportation Initiatives to reduce Carbon footprint**

- Faculty members and students are encouraged to use bicycles inside the campus.
- 78% of students live in campus hostels, so they don't use any vehicles. Because of this, private vehicles are restricted.

- To reduce air pollution and save fuel, 4 battery-powered electric vehicle facility is available in the campus. People can use the shuttle service that is provided with the use of electric vehicles.

Use of EVs and bicycles for campus shuttle services

Bicycles for University staff for campus shuttle services.

Plan to Reduce Energy Consumption:

1. Green Energy Initiatives:

1. The energy efficient appliances are installed whenever replacement is done in all areas like, LED lightings, Air conditioners, Energy efficient fans and Geysers.
2. Renewable energy sources like **Solar Plant and Biogas Plant** are used to meet 45% of the energy requirement.
3. The institution has also installed **152 solar street lights** throughout the campus
4. **Solar water heaters** are installed in the hostels and solar pumps are installed in the agriculture farms to tap solar energy.
5. Most new buildings are designed in a **square or rectangular shape, with open space left in the center**. This layout allows **natural sunlight** to enter the buildings, making the interiors brighter and more comfortable.
6. Movement sensed **automatic door opening-closing system** is installed in the administrative building to conserve energy.
7. **EV's and bicycles** are used for campus shuttle services.
8. The university follows the concept of Smart buildings equipped with **efficient ventilation systems** and surrounded by green belts and plantation for healthy environment around the buildings.
9. The Indoor environments of the buildings have sufficient intensity of light and well aeration to have the conducive environment for Teaching Learning purpose.
10. Smart buildings improve the indoor air quality and lighting in a significant wing and consumes lesser energy sources.
11. Smart metering improves monitoring and control of electricity usage and eliminates wastages.

    Proof Link: https://www.kalasalingam.ac.in/unsdg-sdg7/#7

2. Impact of policies on Climate and the Environment

To offset the climatic conditions and to have sustainable environment, the institution is committed to carry out all its operations by considering climate and the environment in line with the national and international policies.

1. **Explicit policy on Energy management.**

   KARE sees the importance of energy, which the university has a **policy on energy management**, as well as providing training to educate people about energy management to personnel, including students, to be aware and to comply correctly according to the principles. As a result, the University started use renewable energies through **solar plant, solar street lights, biogas.**

   Policy document: https://www.kalasalingam.ac.in/wp-content/uploads/2021/11/Energy-Policy.pdf

2. **Policy on Maintenance**

The maintenance policy of the institution aims to effectively manage and maintain all facilities, resources, and amenities, including buildings, roads, gardens, trees, computers, classrooms, seminar halls, equipment, and laboratories on the campus.

Maintenance Objectives

- Ensure buildings are safe and efficient for use.
- Minimize risks of fires, accidents, and safety hazards.
- Keep facilities continuously available for academic use without interruptions.
- Protect the college's infrastructure through proper planning, preventive maintenance, and scheduling.
- Conserve energy using modern technologies and energy-saving measures.
- Ensure classrooms, seminar halls, and faculty rooms with ICT facilities are properly maintained and upgraded.
- Ensure IT networks, CCTV cameras, and DVRs are well-maintained throughout the campus.

The institution committed to regularly reviewing and updating the maintenance policy, which is transparently available on the institute's website.

Policy Document: https://www.kalasalingam.ac.in/wp-content/uploads/2021/11/Maintenance-Policy.pdf

Energy wastage identification

The institution carries out energy reviews to find areas where the most energy is wasted. According to the regulation on improving energy efficiency, an accredited third-party company conducts an energy audit at KARE. The audit aims to measure, calculate, and develop projects to use less energy while still providing the same level of service and comfort at the university, without lowering standards.

Energy Audit Report Link:

https://www.kalasalingam.ac.in/wp-content/uploads/2024/11/KARE_Energy-Audit-Report_2022-23-1.pdf

Disinvestment Policy

The university has abstained from investing in solar and biogas plants in compliance with the investment-related decisions issued by the university's governing body and the sustainable development indicators.

Disinvestment Policy Weblink:https://www.kalasalingam.ac.in/unsdg-sdg7/

Energy usage per sqm (July 2022- June 2023)

Total energy consumption (kWh)	= 3282674
Total energy consumption (Gigajoules)	= 11817.6264
Building area of university buildings (square meters)	= 2,43,910
Energy consumption per sqm	= (11817.6264 / 243910)
	= 0.04845

Local community outreach for energy efficiency Provide programmes for local community to learn about importance of energy efficiency and clean energy

1. Organized Energy Conservation week - 2022.

வியாழன் டிசம்பர் 22 2022

தினமலர்

மின்சிக்கன கருத்தரங்கு

ஸ்ரீவில்லிபுத்தூர், டிச.22- ஸ்ரீவில்லிபுத்தூர் கோட்ட மின் வாரியம் சார்பில் மின்சார சிக்கன விழிப்புணர்வு கருத்தரங்கு, கிருஷ்ணன்கோவில் கலசலிங்கம் பல்கலையில் நடந்தது.

மின் வாரிய மேற்பார்வை பொறியாளர் தேன்மொழி தலைமை வகித்தார். ஸ்ரீவில்லிபுத்தூர் கோட்ட செயற்பொறியாளர் சின்னத்துரை, உதவி செயற்பொறியாளர்கள் பெருமாள், ஆகி மூலம், காலசாமி முன்னிலை வகித்தனர்.

ஸ்ரீவில்லிபுத்தூர் நகராட்சி தலைவர் ரவிக்கண்ணன், வத்திராயிருப்பு ஊராட்சி ஒன்றிய குழு தலைவர் சிந்து முருகன், கலசலிங்கம் பல்கலைக் மின்னியல் துறை பேராசிரியர்கள் பங்கேற்று மின்சார சிக்கனம் குறித்து பேசினர்.

விழாவில் மின்வாரிய அதிகாரிகள், ஊழியர்கள், பல்கலை மாணவர்கள் பங்கேற்றனர்.

Department of EEE Celebrated **"Energy Conservation Week"** on December 14, 2022 at K.S. Krishnan Auditorium, KARE. This day is a reminder to reflect on the world's energy challenges and the need to find sustainable solutions. KARE celebrated this day by organizing activities like seminars, workshops, and competitions to raise awareness about energy conservation. Dr.A. Ramkumar, HoD/EEE coordinated the event.

2. Organized an Outreach Awareness Activity program on **"Energy Efficiency and Conservation** on 26.09.2022. 20 Students and 25 public were participated the event.

Web Link:

https://www.kalasalingam.ac.in/wp-content/uploads/2024/11/7.4.1-Energy-efficiency-and -conservation.pdf

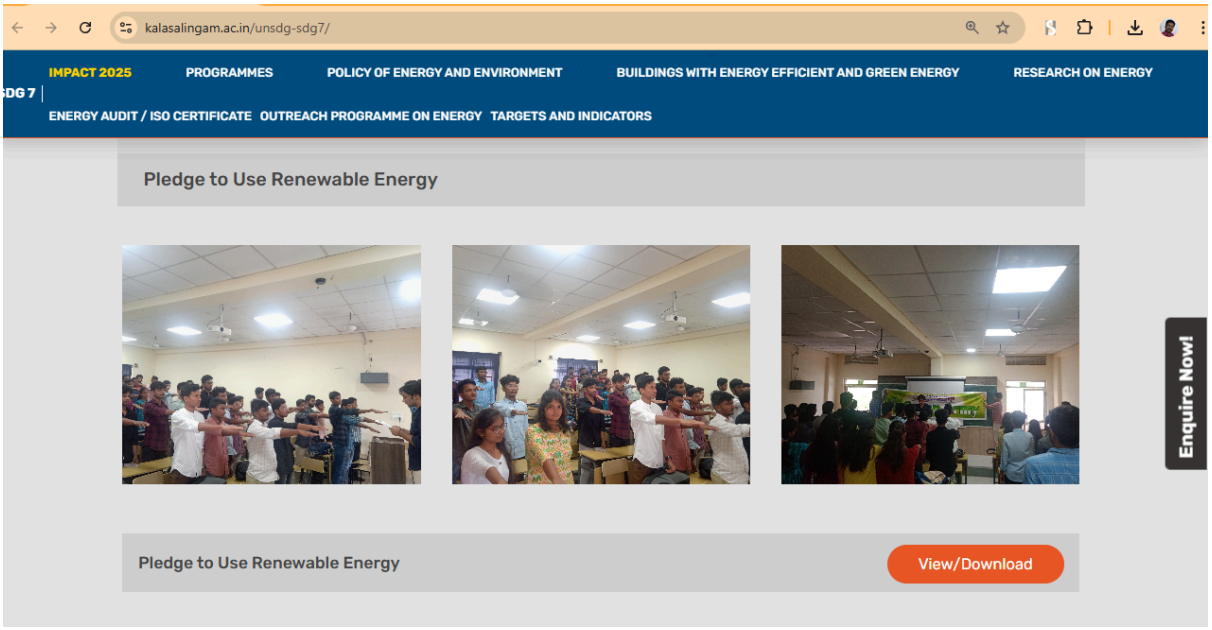
100% renewable energy pledge:

The Institution is proud to generate 45 % of green energy through solar panels to meet all its electricity needs. This year (2022-23), the university produced **14,78,462** kWh of renewable energy, while its total energy usage was **32,82,674**kWh (45 % of the total energy). To ensure a 100% renewable energy commitment, the university has implemented the following measures:

1. Powered the campus buildings with renewable energy sources.
2. Invested in on-campus renewable energy projects, like solar panels and wind turbines, to reduce fossil fuel use and greenhouse gas emissions.

3. Developed a plan to reach **carbon neutrality** by a target year, focusing on energy efficiency, renewable energy, and carbon offsetting.
4. Followed green building standards, all new buildings and renovations **are constructed under NBC 2016 (National Building Code of India - 2016) guidelines**.
5. Integrated sustainability and climate change topics into various courses, encouraging students to address environmental challenges.
6. Funded research on climate change, renewable energy, and sustainability to foster innovation.
7. Established waste reduction and recycling programs to minimize landfill waste and maximize recycling.
8. Prioritized local and sustainable purchases, supporting eco-friendly products and fair trade.
9. Collaborated with the local community on sustainability projects and knowledge-sharing.
10. Provided resources and grants for student-led sustainability projects, empowering students to apply their knowledge in practical ways.

Through these efforts, the institution is committed to achieving a sustainable and environmentally responsible campus.



Energy Efficiency Service for Industry

1. The institution is committed to improve energy efficiency and promote clean energy. Companies in the industrial sector ask for help from energy experts among our university professors, encouraging teamwork between the university and industry.

   The Ministry of Higher Education and Scientific Research provided universities with a platform where they can share ideas about their applied research, so private and public companies can learn about them.

   - Patents Granted In The Area Of Solar Energy : https://kalasalingam.ac.in/wp-content/uploads/2023/11/patent.pdf
     -
   - Research Projects Funded by Government Agencies in the area of Renewable Energy
     - https://kalasalingam.ac.in/wp-content/uploads/2023/11/Document-3a-RESEARCH-IN-RENEWABLE-ENERGY.pdf
     -
   - Synthesis and Characterization of Lithium Garnet Project
     - https://kalasalingam.ac.in/wp-content/uploads/2024/09/Dr.-Samson-Nesaraj.pdf

2. One of our faculty Dr. K. Vijayakumar, Associate prof/EEE consulted with Ms. Mahendra Research Valley, Chennai – 04, Tamil Nadu. Regarding the utilization of PV panels in their products.

   Evidence URL - Letter of Appreciation

Policy development for clean energy technology

Inform and support governments though in clean energy and energy-efficient technology policy development.

1. KARE provides information and support to the government in terms of clean energy and energy-saving technology policies. The relevant actions are as follows:

Policy Name	URL
Energy Policy	https://www.kalasalingam.ac.in/wp-content/uploads/2021/11/Energy-Policy.pdf
Sustainable Development Policy	https://kalasalingam.ac.in/wp-content/uploads/docs/Sustainable_Environment.pdf
E-Waste Policy	https://www.kalasalingam.ac.in/wp-content/uploads/2021/11/e-waste_policy.pdf
Maintenance Policy	https://www.kalasalingam.ac.in/wp-content/uploads/2021/11/Maintenance-Policy.pdf
Re-Cycle Policy	https://www.kalasalingam.ac.in/wp-content/uploads/2021/11/Recycle-Policy.pdf
Water-Conservation Policy	https://www.kalasalingam.ac.in/wp-content/uploads/2021/11/Water-Conservation-Policy.pdf

2. Faculties of the KARE has participated in the conferences and published their research articles and puts forward a number of suggestions on feasible ways to save energy.

S.No	Authors	Title	Year	Source Title
1.	Kumar P.G.A., Jeyanthy P.A., Devaraj D.	Hybrid multi-objective method based on ant colony optimization and firefly algorithm for renewable energy sources	2022	Sustainable Computing: Informatics and Systems
2.	Gokul M., Anisha M., Reshmi C.K., Sathish S.M., Meghana P., Pandi S.	Piezoelectric Energy Harvest for Wearable Devices	2022	International Conference on Edge Computing and Applications, ICECAA 2022 - Proceedings
3.	Madhumitha R., Priya P., Saravanan S.	Hybrid Renewable Energy Based Electric Vehicles Charging Station	2022	2022 2nd International Conference on Advance Computing and Innovative Technologies in Engineering, ICACITE 2022
4.	Baranitharan B., Sivapragasam C., Rajesh K.	Long term monthly prediction of energy requirements from a probabilistic perspective - A case study in southern States of India	2022	Sustainable Energy Technologies and Assessments
5.	Sakthivel K., Krishnasamy R., Balasubramanian K., Krishnakumar V., Ganesan M.	Averaged state space modeling and the applicability of the series Compensated Buck-Boost converter for harvesting solar Photo Voltaic energy	2022	Sustainable Energy Technologies and Assessments
6.	Nagavenkatesh Sambathkumar C., Nallamuthu N., Kumar M.K., Devendran P.	Investigation of electrochemical behaviour and annealing effect on zinc cobaltite nanoparticles as working electrode material for energy storage device	2022	Journal of Materials Science: Materials in Electronics
7.	Ramya R., Srinivasan S., Vasudevan K., Poonguzhali I.	Energy efficient Enhanced LEACH Protocol for IoT based applications in Wireless Sensor Networks	2022	5th International Conference on Inventive Computation Technologies, ICICT 2022 - Proceedings
8.	Hussain I., Ullah I., Ramalakshmi R., Tanzila, Ashfaq M., Nayab D.-E.	Smart Energy Management System for University Campus using Sine-Cosine Optimization Algorithm		2022 International Virtual Conference on Power Engineering Computing and Control: Developments in Electric Vehicles and Energy Sector for Sustainable Future, PECCON 2022
9.	Karthikeyan K., Sunder R., Shankar Lakshmanaprabu S.K., Vijayakumar V., Elhoseny M., Manogaran G.	Retraction Note: Energy consumption analysis of Virtual Machine migration in cloud using hybrid swarm optimization (ABC– BA) (The Journal of Supercomputing, (2020), 76, (3374–3390), 10.1007/s11227-018-2583-3)	2022	Journal of Supercomputing

10.	Shenbagavalli S., Muthuvinayagam M., Revathy M.S.	Enhancement of electrical and electrochemical properties of sodium bromide incorporated with poly (ethylene oxide)/poly (vinylidene fluoridehexafluoropropylene) solid blend polymer electrolytes for electrochemical double layer capacitors	2022	Journal of Energy Storage
11.	Shanmugapriya V., Arunpandiyan S., Hariharan G., Bharathi S., Selvakumar B., Arivarasan A.	Enhanced electrochemical performance of mixed metal oxide (Bi2O3/ZnO) loaded multiwalled carbon nanotube for highperformance asymmetric supercapacitors	2022	Journal of Energy Storage
12.	Venkatesan M., Gouse Basha S., Ramkumar A., Manikandan R., Easwaran M., Khan	Switched Capacitor Based High StepUp Multilevel Inverter with SelfBalancing Ability and Low Switching Stress	2022	International Transactions on Electrical Energy Systems
13.	Ramya W.M.T., Siva V., Murugan A., Shameem A., Kannan S., Venkatachalam K.	A Novel Biodegradable PolymerBased Hybrid Nanocomposites for Flexible Energy Storage Systems	2022	Journal of Polymers and the Environment

3. Patents

Professors of KARE have made remarkable strides in the field of sustainable development, earning various patents for their innovative low-carbon technologies. These patents include cutting-edge solutions that focus on reducing carbon emissions, enhancing energy efficiency, and promoting renewable energy sources.

URL: https://kalasalingam.ac.in/wp-content/uploads/2023/11/patent.pdf

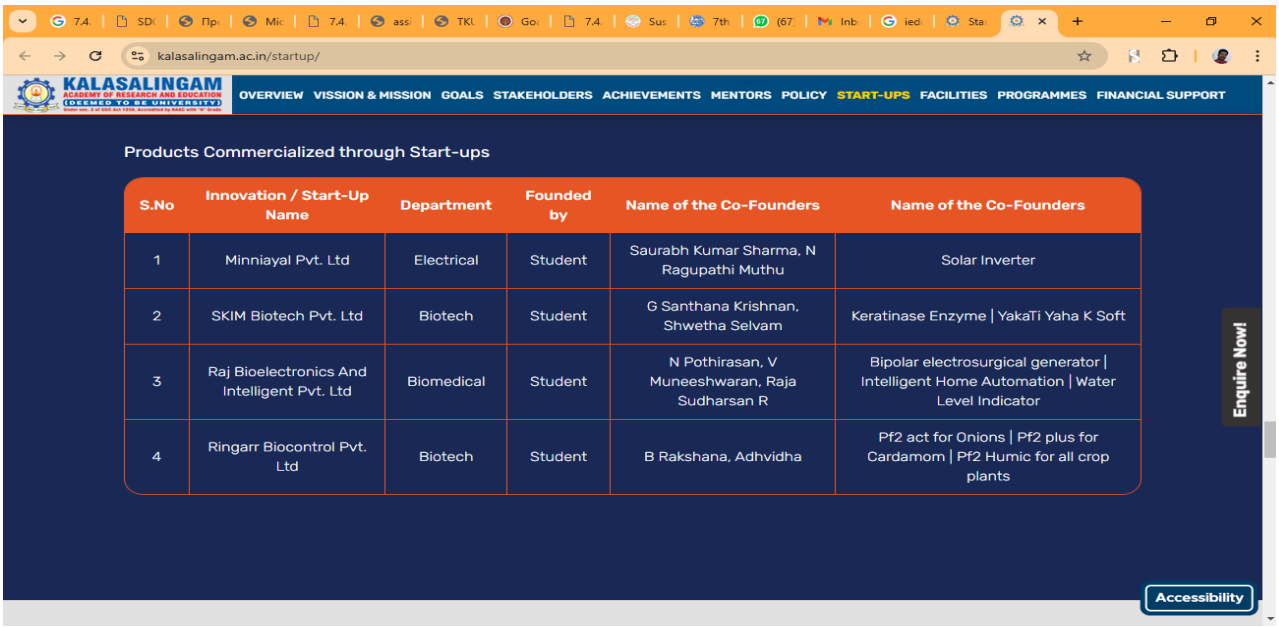
4. Faculty Awards and Recognitions

S.No	Faculty Name	Department	Awarding Agency	Award / Recognition	Date
1	Dr. S. Shantkriti	Biotechnology	Sustainable Materials and Technologies for Bio and Energy Applications (SMTBEA 2022)	Best Paper Presentation Award	13.07.2022 to 15.07.2022

Assistance to low-carbon innovation

1. The Kalasalingam Technology Business Incubator (KTBI) was established in the year 2015, which was started as Innovation and Entrepreneurship Development Centre (IEDC) with the support of NSTEDB National Science and Technology Entrepre-neurship Development Board (NSTEDB), Department of Science and Technology (DST), New Delhi. Students and faculty are motivated to convert their innovative ideas to product with the support of KTBI under IEDC scheme, which strengthens the entrepreneurial ecosystem. To add the feather on the cap recently our KTBI is recognized by MSME under the scheme "Support for Entrepreneurial and Managerial Development of MSME's through Incubator

S. No	Name of Startup	Incorporation Number/CIN	Founder Name	Email address	Phone number
1	Minniyal Pvt Ltd	U73100TN2017PTC118213	Ragupathi Muthu	leo.ragu.001@gmail.com	9442814018
2	Thaaniyal Pvt.Ltd	U73100TN20178PTC126582	Santhoshram Gireeswarakumar	k.vijayakumar@klu.ac.in	96008 93226
3	Optimum Energy Solar System	TN02E0133868	Mr.K.Vijayabaskar	pksvijay@gmail.com	95009 50060
4	SRP Clean Energy Pvt. Ltd	U74999TN2017PTC116751	Sandhoshkumar Singaravelu	sandhosh.s@gmail.com	99429 58899
5	Aanandhamayaa Green Solutions	U40108OR2016PTC025314	Mala R	info@greensolutionsindia.com	712225 0021



Weblink: https://www.kalasalingam.ac.in/startup/

2. Patents

Professors of KARE have made remarkable strides in the field of sustainable development, earning various patents for their innovative low-carbon technologies. These patents include cutting-edge solutions that focus on reducing carbon emissions, enhancing energy efficiency, and promoting renewable energy sources.

URL: https://kalasalingam.ac.in/wp-content/uploads/2023/11/patent.pdf

3. Funded Projects

As the university in its mission seeks to contribute to the development of society, it contributes in many funded projects. Some of these projects aim to improve the clean energy and climate change:

S.No	Name of the faculty investigator(s)	Title of the project	Funding agency	Date of acceptance of the proposal
1.	Dr. Praneeth.K, Issathul Riswan.M	Design and synthesis of Cubased multi-metal electrocatalysts for efficient CO2 reduction technology	TNSCST	03-03-2023
2.	Dr. Meyyappan PL	Studies on arriving effective disposal methods for firecrackerswaste in and around of Sivakasi Regions	TNSCST	03-03-2023
3.	Mr.T.Rajpradeesh	Design and fabrication of automated fire tender system using GPS for industrial sectors	TNSCST	03-03-2023
4.	Dr. Aruna Janani V	A novel jacketed tumbling homogeneous powder mixer for hazard prevention in fireworks	TNSCST	03-03-2023
5.	Dr.B.Perumal	Automatic drainage cleaner	TNSCST	03-03-2023
6.	Dr. Perumalla Srikanth	Development of sustainable agriculture practices for biotic and abiotic stress management in conventional and organic tea plantations	DBT-NER-BPMC	21-03-2022