SDG 12

RESPONSIBLE CONSUMPTION AND PRODUCTION

INTRODUCTION

Sustainable Development Goal 12 calls on institutions to fundamentally rethink how resources are used, consumed, and disposed of — decoupling growth from resource degradation through efficient use of natural resources, environmentally sound management of waste, and responsible procurement and consumption practices. For a residential university campus, this translates into everyday choices: how energy is generated and used, how waste is segregated and diverted from landfill, how materials are sourced, and how the wider community is engaged in building sustainable habits.

SRM University–AP has embedded responsible consumption and production into its campus operations, academic programmes, and community outreach. The university's approach spans energy-efficient infrastructure (extensive LED lighting, sensor-based automation, and a growing rooftop solar footprint), a shift toward electric and shared mobility, active research on circular economy and waste valorisation, and sustained student-led outreach on waste segregation, plastic reduction, and resource conservation in neighbouring communities. Together, these efforts reflect a campus-wide commitment to reducing waste, improving resource efficiency, and fostering a culture of sustainable consumption among students, faculty, and staff.

RESPONSIBLE CONSUMPTION & CAMPUS INITIATIVES

The following verified figures capture the scale of SRM University–AP's resource-efficiency and clean-energy infrastructure — the operational backbone of the institution's responsible consumption practices.

27,783 *LED fixtures installed campus-wide*	**959 kWp** *Installed rooftop solar capacity*	**10.12 lakh kWh** *Renewable energy generated per year*
4.8% *Of total campus energy met by solar*	**103** *Buses (95) & electric vehicles (8) in the campus fleet*	**16,310 t CO2e** *Annual GHG emissions monitored (Scope 1+2)*

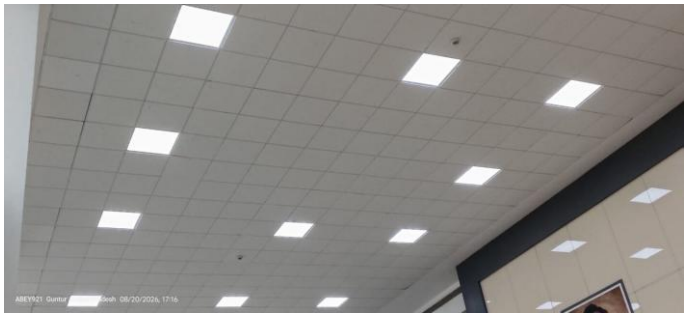
The 27,783 LED fixtures across academic blocks, hostels, and common areas represent a campus-wide shift away from conventional lighting, cutting electricity demand and the associated resource and maintenance burden of frequent bulb replacement. This is reinforced by 1,303 sensor-based devices that automatically regulate lighting and equipment use, minimising energy wasted in unoccupied spaces. On the generation side, the 959 kWp solar installation — already meeting close to 5% of campus energy demand — is being actively scaled, with three new renewable energy projects initiated in the past year alone. In transport, a fleet of 95 buses supplemented by 8 electric vehicles (89 kWh combined capacity) point to a deliberate move toward shared and low-emission mobility over individual vehicle use. Together, these measures are tracked annually against a Scope 1+2 GHG footprint of 16,310 tonnes CO2e, giving the university a measurable baseline against which future resource-efficiency gains can be assessed.

Energy-Efficient Campus Infrastructure

The photographs below document LED lighting installed across campus academic and event spaces — concrete evidence of the resource-efficient retrofits underpinning the numbers above.

● Recessed LED Panel Lighting — Academic Corridor

Energy-efficient LED panel fixtures fitted into a suspended ceiling grid along a campus corridor. LEDs consume a fraction of the electricity of conventional lighting for the same light output and last far longer, directly reducing both energy consumption and lighting-related waste from replacement bulbs.



● LED Accent Lighting — Auditorium Acoustic Wall

Integrated LED strip lighting along the acoustic wall panels of a campus auditorium, combining energy efficiency with functional design. Such fixtures are used in place of higher-wattage conventional lighting in large gathering spaces, keeping energy use proportionate to actual need.



● LED Ceiling Lighting — Lecture / Event Hall

Distributed LED point lighting set into the acoustic ceiling panels of a lecture and events space, illustrating how energy-efficient fixtures have been integrated into both new and renovated campus infrastructure rather than added only to select buildings.



OUTREACH

Through the Samaj Seva community engagement programme, SRM University–AP students run structured outreach activities in neighbouring schools, several of which are directly aligned with SDG 12 — waste segregation, reuse of materials, and reduction of single-use plastics. Four of the strongest such activities from the past year are presented below.

● Awareness Program on Waste Management and Segregation

Purpose & Beneficiaries: A Paari School of Business student team educated 56 students of Sree Rama High School, Mothadaka, on the difference between wet and dry waste and the importance of source segregation.

Activity & Outcome: Delivered as an interactive session with relatable examples and small rewards for participation, the programme left students able to distinguish waste categories and understand why segregation matters for cleanliness and environmental sustainability.



● Newspaper Craft Activity — Promoting Reuse Over Waste

Purpose & Beneficiaries: 38 boy students at a Mangalagiri school were guided to turn old newspapers into paper bags, hats, and craft items instead of discarding them.

Activity & Outcome: Framed explicitly around reusing materials and reducing waste, the session paired creativity and teamwork with a practical lesson in resource reuse, reinforcing responsible consumption habits at an early age.



● Cleanliness and Waste Management Student Engagement Program

Purpose & Beneficiaries: Conducted for 43 fifth-grade students at a Mangalagiri school, this session linked personal and environmental hygiene to effective, everyday waste management.

Activity & Outcome: Through interactive, age-appropriate discussion, students connected cleanliness practices to environmental sustainability, coming away with a clearer sense of responsible disposal habits.



● Plastic-Free Awareness Drive

Purpose & Beneficiaries: Reaching 56 students (Classes 6–8) at ZPHS Mothadaka, this session tackled plastic types, their health and environmental harms, and the 3R framework — Reduce, Reuse, Recycle.

Activity & Outcome: A presentation and pre-awareness questionnaire were followed by a poster-making task on "Plastic-Free Awareness," translating theoretical knowledge into a hands-on, responsibility-building exercise for students.

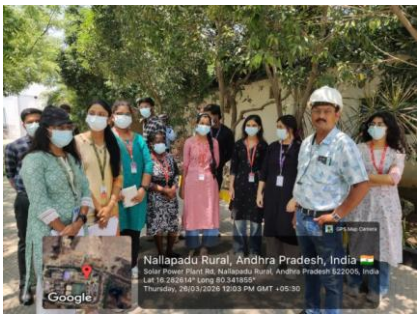


EVENTS AND INITIATIVES

Institutional records identify six events during the year as directly aligned with SDG 12, spanning industrial exposure, circular-economy research, sustainable chemistry, and ESG-focused industry dialogue.

● Industrial Visit to Jindal Urban Waste Management, Guntur

Commerce students visited an operating urban waste management facility to see waste-processing operations, segregation, and recycling workflows first-hand. Beyond bridging classroom learning with industrial practice, the visit built awareness of pollution control, resource-efficient operations, and the professional pathways available in environmental and waste management.



● Green Metallurgy and Circular Materials Recovery

Delivered by Dr Dina Magdy Abdo (CMRDI, Egypt) under an active MoU, this lecture introduced 56 attendees to environmentally responsible metal extraction and circular recovery of materials from industrial and e-waste streams — directly addressing SDGs 9, 12, and 13 and opening avenues for research collaboration in sustainable metallurgy.





● Industrial Decarbonisation: From GHG Accounting to Net-Zero Roadmap

A Department of Environmental Science and Engineering lecture on corporate GHG accounting and net-zero pathways, drawing on live industry roadmap work. The session gave 28 student and faculty attendees a working grasp of how emissions inventories translate into concrete decarbonisation and resource-efficiency strategies.

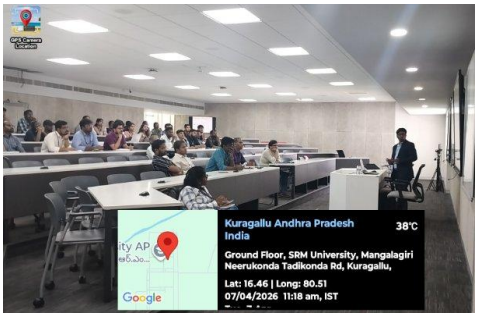
● The Role and Opportunities for ESG Managers in Various Industries

Mr Karthick V, Sustainability Manager at Rialto Enterprises, spoke to 28 attendees on how ESG functions are shaping industrial decision-making, including waste governance and responsible-production reporting — linking classroom sustainability concepts to an emerging industry career path.



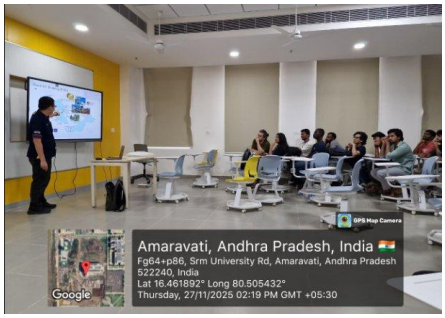
● Sustainable Catalysis for Molecular Complexity

A chemistry guest lecture by Dr Suman Dana (University of Basel) on catalytic methods engineered explicitly for resource economy, waste minimisation, and energy efficiency in organic synthesis, reaching 340 attendees and demonstrating how green-chemistry principles apply from bench-scale synthesis to biomolecular applications.



● Guest Expert Lecture: Toward Greener Phenolic Resins

Dr Seng Hua Lee (Universiti Teknologi MARA, Malaysia) presented research on substituting phenol with renewable precursors in wood-adhesive manufacturing to a mixed audience of postgraduate and undergraduate students, illustrating how substituting sustainable raw materials for petrochemical inputs supports more responsible production in the materials industry.



RESEARCH & PUBLICATIONS

SciVal-tracked activity within the SDG 12: Responsible Consumption and Production category shows a substantial and internationally connected research base at SRM University–AP.

126 *Scholarly outputs (2025–26)*	**1.46** *Field-Weighted Citation Impact*	**50** *Publications with international collaboration*
526 *Citations received*	**5,308** *Views count*	**39.7%** *International co-authorship share*

Recurring keyphrases across this output — waste treatment, electronic waste, circular economy, life-cycle analysis, biochar, and municipal solid waste — closely track the themes of SDG 12. The strongest publications for this goal are highlighted below.

Publications

Sustainable E-waste management: Global challenges, recovery techniques, and regulatory approaches — Iqbal, Dagwar & Dutta (2026). Reviews the global e-waste crisis and the recovery technologies and regulatory measures needed to close the loop on electronic waste.

Upcycling E-waste for sustainable innovation: functional materials, toxicity reduction, and circular design — Dagwar, Kundu & Dutta (2026). Explores converting e-waste into functional materials, reducing toxicity while enabling circular product design.

Sustainable recovery of rare Earth elements from industrial waste: a path to circular economy and environmental health — Dagwar, Iqbal & Dutta (2025). Examines recovering high-value rare-earth elements from industrial waste streams as a circular-economy and pollution-reduction strategy.

Recovery of metals from spent lithium-ion batteries using agricultural waste — Iqbal, Ramadan, Dagwar, Dutta & Abdo (2025). Applies agricultural waste as a resource-efficient input for recovering metals from spent batteries, tying two waste streams into one circular process.

Biowaste-derived biochars for treatment of wastewater contaminated by dyes — Chizitere Emenike et al. (2025). Converts organic waste into biochar for treating industrial wastewater, an example of waste valorisation applied to pollution control.

Plastic Pollution Management — Innovative Solutions for Plastic Waste — Ray, Singh, Ganesapillai & Ahn (2025). Surveys innovative technical and policy solutions for managing plastic waste and reducing plastic pollution.

AI-Powered Waste Segregation: Enhancing Recycling Efficiency Through Machine Learning — Nuthalapati, Muddana, Kommineni, Vegesna & Senapati (2026). Applies machine learning to automate and improve the accuracy of waste segregation, directly supporting more efficient recycling systems.

Geotechnical / Shear Strength / Physicochemical Characterization of Incinerated MSW Ash for Liner Applications (3-part study) — Kaveri & Raviteja (2025–26). A multi-part investigation into reusing incinerated municipal solid waste ash as a construction material for landfill liners — turning a waste product into a resource input.

Mining tailings as a frontier for sustainable nanomaterials: advancing circular economy and environmental innovation — Singh, Maurya, Karmakar, Maurya, Pandey, Kumar & Gupta (2025). Investigates converting mining tailings, an industrial waste stream, into sustainable nanomaterials.

Integrating sustainable development goals in higher education: A review and framework — Dutta, Moganti & Kundu (2026). Proposes a framework for embedding SDGs into higher-education institutions — directly relevant to SRM-AP's own institutional sustainability strategy.

CONCLUSION

Across infrastructure, outreach, events, and research, SRM University–AP's SDG 12 activities reinforce one another in a single continuous cycle.

From energy-efficient LED infrastructure and a growing solar footprint to circular-economy research on e-waste and biochar, and from student-led plastic-free drives in neighbouring schools to industry dialogues on ESG and net-zero pathways, SRM University–AP's contribution to SDG 12 spans the full chain from campus operations to community and scholarship. Sustained investment in resource-efficient infrastructure, combined with a growing body of applied research and consistent community outreach, positions the university to keep deepening its responsible consumption and production practices in the years ahead.