

SDG 11 SUSTAINABLE CITIES AND COMMUNITIES



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Sustainable Development Goal 11 — Sustainable Cities and Communities

Sustainable Development Goal 11 focuses on making cities and human settlements inclusive, safe, resilient, and sustainable. For a university located at the urban–rural interface of Kolkata’s expanding periphery, this goal has deep local relevance. Brainware University’s campus at Barasat sits amid a fast-growing suburban zone where urban migration, waste generation, housing pressure, and transport congestion pose real environmental and social challenges.

In response, Brainware University integrates SDG 11 into its academic, infrastructural, and outreach frameworks—aiming to build sustainable communities through research, technology, and civic partnership. The University’s approach combines three layers: (i) **on-campus sustainability** through green and energy-efficient infrastructure; (ii) **community engagement** through rural and peri-urban outreach; and (iii) **applied research** that develops low-cost urban management solutions.

Strategic Vision and Institutional Commitment

The **Strategic Plan 2023–28** of Brainware University identifies *sustainability and livable environment* as a core direction for institutional growth. The plan connects infrastructure, student life, and research to sustainable-city outcomes:

- **Sustainable Campus Operations:** solar energy integration, green building design, waste segregation, and water reuse.
- **Research on Urban Sustainability:** applied projects under Seed Grant and Government funding on renewable energy, solid waste management, and sustainable mobility.
- **Community Partnerships:** collaboration with local municipal bodies for health, sanitation, and waste management awareness.
- **Curricular Integration:** environmental studies, sustainable architecture, urban planning, and climate-change topics embedded in UG and PG syllabi.

This strategy is aligned with **Target 11.3 (sustainable urbanization and participatory planning)** and **Target 11.6 (reduce adverse environmental impact of cities)**.

Campus Sustainability and Infrastructure Management

Renewable Energy Transition

Brainware University took decisive steps toward clean energy self-reliance in 2024–25. Two large-scale solar projects—both funded under the University’s Seed Grant Scheme—were completed:

1. **Renewable Energy Integration Project (ECE Department)** – Installation of a 150.15 kWp solar power plant with grid synchronization, sanctioned ₹ 47.84 lakh.
2. **Photovoltaic (PV) System for Institute Buildings (Electrical Engineering)** – 100.10 kWp capacity, sanctioned ₹ 36.45 lakh.

Water Management and Sanitation

Rainwater harvesting systems installed in 2023 were optimized during 2024–25. Recycled greywater is reused for irrigation across 12 acres of landscaped areas.

The Department of Biotechnology's **Solid Waste Management Model** created a campus-wide segregation protocol—biodegradable waste for composting and non-biodegradable waste for recycling.

Green Mobility and Transport Efficiency

Mechanical Engineering developed a **six-seater electric golf cart** to replace fuel-based vehicles for internal campus transport. In addition, 20 bicycles were introduced for inter-departmental movement of staff and students.

The University's parking policy now prioritizes electric two-wheelers, reflecting **Target 11.2 (sustainable transport systems)**.

Technological Innovations (Patents 2024–25)

- **IoT-Enabled Smart Waste Management Bin** — affordable automation for municipal waste segregation.
- **AI-Based Food-Safety Prediction Tool** — assists urban health departments in detecting contamination.
- **Smart Building using IoT** — energy optimization in mixed-use buildings.
- **Device for Measuring Water Pollutants Level** — supports environmental monitoring for urban utilities.
- **AI-Based Intrusion Alert Device** — urban security enhancement.

Each of these patents demonstrates Brainware's growing R&D capacity to create **technologies that make cities cleaner, safer, and more efficient**.

Safe Drinking Water Awareness

Under UBA, awareness workshops were conducted at Dubgaria Village, promoting simple filtration and boiling techniques—directly improving community health resilience.

Solar Street-Light Installation

A cross-disciplinary project by CSE and ECE installed solar streetlights in Faldi Village under MoE UBA, ensuring safety and extending usable hours for students and workers.

These interventions demonstrate Brainware's outreach impact in building resilient peri-urban settlements.

Collaborations and Partnerships

Brainware's sustainability work draws strength from collaboration.

- **Municipal Partnership:** Barasat Municipality cooperated on solid-waste audit and awareness drives.
- **Industry Linkages:** *Eco Fast Agri Solutions* and *Swachh Urja India* supported workshops on composting and solar applications.
- **International MoUs:**
 - *Fraunhofer IIS (Germany)* — smart infrastructure and sustainable materials research.
 - *Kasama University (Zambia)* — curriculum exchange on environmental health.
 - *University of South Carolina (USA)* — biotechnology and sustainability joint research.

These alliances ensure Brainware's SDG 11 efforts are connected to global expertise.

Research Publications and Academic Contribution

During 2024–25, faculty published several papers addressing sustainability and urban issues:

- “*Solid Waste Management in Academic Campuses: A Model for Semi-Urban Institutions*” — Biotechnology.
- “*Smart IoT Systems for Energy Optimization in Higher-Education Campuses*” — ECE Dept.
- “*AI Applications for Urban Health and Waste Monitoring*” — CSE Dept.
- “*Environmental Impact of Plastic Alternatives: A Case Study from Barasat*” — Environmental Science.
- “*Community Perception of Renewable Energy Projects in Rural West Bengal*” — Management Sciences.

These contributions collectively advance research aligned with **Target 11.6 and 11.a**, producing actionable insights for sustainable urban management.

The academic year 2024–25 consolidated Brainware University's standing as a campus where sustainability is not rhetoric but routine. Through investment in renewable energy, responsible waste management, sustainable transport, and community-based action, the University demonstrated how an educational institution can model the principles of **Sustainable Cities and Communities**.

The tangible results—reduced emissions, cleaner surroundings, empowered rural neighbours, and engaged students—mark clear progress toward SDG 11.

Looking ahead, Brainware University aims to serve as a regional living laboratory for urban innovation: a place where ideas, people, and technology converge to shape a cleaner, smarter, and more inclusive urban future for West Bengal and beyond.