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7 AFFORDABLE AND CLEAN ENERGY

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Sustainable Development Goal 7: Affordable and Clean Energy

Energy is the foundation of development. Yet, affordable and clean energy access remains one of the greatest global challenges. **Sustainable Development Goal 7 (SDG 7)** seeks to ensure access to affordable, reliable, sustainable, and modern energy for all.

Brainware University recognizes that higher education institutions are not just consumers of energy — they are *change agents* capable of transforming the energy landscape through research, innovation, and community outreach.

Over the academic year 2024–25, Brainware University advanced a comprehensive clean energy strategy that combined infrastructural upgrades, applied research, policy alignment, and capacity building.

This report documents that journey — demonstrating how academic excellence and social responsibility can align to drive sustainable energy outcomes.

Institutional Philosophy and Strategic Vision

The University's **Strategic Plan 2023–2028** explicitly aligns with India's National Action Plan on Climate Change and UN's SDG 7.

Its sustainability agenda rests on three institutional pillars:

1. **Energy for Learning:** Every building and laboratory should be powered responsibly.
2. **Energy for Innovation:** Research and development must prioritize renewable and efficient systems.
3. **Energy for Society:** Knowledge must translate into community awareness and empowerment.

The University's **Green Campus Policy** (2023 revision) mandates continuous monitoring of electricity consumption, adoption of renewable alternatives, and integration of energy studies across technical curricula.

Energy Infrastructure at Brainware University

3.1 Renewable Power Generation

By 2024–25, Brainware University had established itself as a model for campus-based renewable integration.

Two major solar installations—one on the main academic block and another on the hostel complex—now contribute a combined **250 KWp of solar power**, meeting nearly **one-fourth of total energy demand**.

Energy-Efficient Infrastructure

- 100% LED conversion across academic, administrative, and hostel areas.
- Solar water heating for hostel kitchens and canteens.

- Passive-cooling designs adopted in academic buildings.
- Procurement policy now requires all air conditioners to be 5-star BEE rated.

Research and Innovation in Clean Energy

Research remains the backbone of the University's SDG 7 contribution. Brainware has integrated renewable energy and sustainability into its **seed grant** and **government-funded project ecosystem**, nurturing faculty and student-led research across departments.

Seed Grant Projects (FY 2024–25)

Principal Investigator	Department	Project Title	Funding (₹ Lakhs)
Dr. Angshuman Majumdar	ECE	*Design and Installation of 150.15 KWp Solar Plant*	47.84
Dr. Debanjan Mukherjee	Electrical Engineering	*Designing of Grid-Connected Photovoltaic (100.10 KWp) System*	36.45
Dr. Sandhimita Mondal	Biotechnology	*Solid Waste Management Model for Academic Institutes*	3.50
Dr. Suvankar Barai	Computational Sciences	*Development of an Interactive Robot for University Campus (Energy Audit)*	1.16

Establishment of renewable infrastructure and clean energy prototypes developed for university and rural applications.

Government-Funded Projects Related to Energy and Environment

- **ICMR Project (₹66 lakhs)**: AI-based deep learning models for lung cancer detection — incorporating energy-efficient computing infrastructure.
- **DSTBT Project (₹13.6 lakhs)**: Modelling of compact astrophysical systems — using low-energy computing frameworks.
- **WBPCB Project (₹11.59 lakhs)**: Citizen science initiative on groundwater filtration using energy-efficient copper-based filters.

While not all directly under SDG 7, these initiatives represent Brainware's growing expertise in *energy-aware technology systems*.

Technological Innovation and Patents

Brainware University has built a strong reputation in applied patents connecting AI, IoT, and energy management.

Many innovations developed during 2024–25 directly align with SDG 7 objectives of energy efficiency, renewable transition, and low-carbon technology.

Community Outreach and Social Impact

Through the **Unnat Bharat Abhiyan (UBA)** and **NSS**, the University extended its clean energy mission to surrounding villages:

UBA Projects under SDG 7

Village	Project Title	Outcome
Faldi	*Installation of Solar Streetlights*	12 units installed; reduced night-time safety issues
Dubgaria	*Solar-Powered Irrigation Pumps*	30% reduction in fuel expenses for farmers
Chaturia	*Awareness on Renewable Energy and Biofuel*	60 villagers trained on solar & biogas usage
Faldi High School	*Energy Literacy Camp*	200 students participated in renewable energy demo

NSS Collaborations

- Clean Energy Awareness Drives on World Energy Day (22 Oct 2024).
- Hands-on workshops in collaboration with the Electrical Engineering Department for local youth.
- Donation of low-cost solar lanterns to 25 households without reliable electricity.

Collaborations and Partnerships

Brainware's partnerships form the backbone of its clean energy advancement. The following MoUs remained active and contributed to SDG 7 outcomes:

Partner Institution	Country	Nature of Collaboration	Department Involved
Fraunhofer IIS	Germany	Joint R&D in Smart Energy Systems	Computational Sciences
Sejong University	South Korea	Research in Green Electronics and Solar Energy	Biotechnology / ECE
Hanyang University	South Korea	Faculty Exchange and Renewable Technology	Biotechnology
Kasama College of Health Sciences	Zambia	Energy-efficient health technologies	BWU

Brainware University's journey under SDG 7 during 2024–25 reflects a genuine institutional transformation — from consumer to innovator, and from innovator to influencer. Every solar panel installed, every patent filed, and every student trained represents a conscious investment in India's clean energy future.

The University's actions demonstrate that clean energy is not only a technological pursuit but also a moral responsibility — a bridge between environmental stewardship and social equity.

Brainware University has proven that affordable and clean energy is not a distant goal but a campus reality — where innovation, education, and compassion converge to power a sustainable tomorrow.