



# **BRAINWARE UNIVERSITY**

**Annual SDG-7 Report  
2023-24**

**SDG 7: Affordable and Clean Energy**

***Ensure Access to Affordable, Reliable,  
Sustainable and Modern Energy for All***

**7 AFFORDABLE AND  
CLEAN ENERGY**



# SDG 7: Affordable and Clean Energy – *Ensure Access to Affordable, Reliable, Sustainable and Modern Energy for All*

## Vision and Rationale

Energy fuels every sector of progress—from education and healthcare to manufacturing and research. Brainware University recognises SDG 7 not only as an environmental goal but as an economic and social imperative.

Its approach focuses on three fronts:

1. Campus energy sustainability – building a low-carbon, efficient infrastructure.
2. Research and innovation – developing renewable-energy technologies and smart-grid systems.
3. Community outreach – promoting energy literacy, green mobility, and rural electrification awareness.

The University aligns its policies with Targets 7.1 to 7.3, ensuring universal access, efficiency improvement, and a rising share of renewables in its operations and curriculum.

## Research and Innovation in Renewable Energy

Brainware’s research ecosystem unites Engineering, Computer Science, Physics, and Management to create practical, low-cost renewable-energy technologies.

## Patents and Designs (2023–24)

Title / Focus	Inventors / Department	Status	SDG 7 Contribution
<i>AI-Optimized Portable Solar and Renewable Energy EV Charger</i>	Suvojit Mukhopadhyay et al. (CSS)	Published – Nov 2023	Portable hybrid charger for EVs in rural zones.
<i>Smart Traffic Control System Powered by Solar Energy</i>	Naveen Kumar Raman et al. (CSE)	Published – Feb 2024	Reduces fossil-fuel dependence in traffic systems.

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<i>Miniaturized Temperature-Regulated Storage Box – Solar Power Tailored Approach</i>	Madhurima Basak et al. (AHS)	Published – Nov 2023	Solar-operated cool storage for rural clinics.
<i>IoT-Based Solar-Powered Temple Waste Composting Apparatus</i>	Arindam Mondal et al. (CSE)	Granted – Apr 2024	Hybrid solar automation for biowaste conversion.
<i>Sustainable Indoor Air Quality System with Algal Filtration</i>	Priyanka Sen Guha et al. (BIO)	Published – Feb 2024	Energy-efficient air filtration technology.

**Insight:** Brainware’s patents bridge AI, IoT, and renewable engineering—creating affordable, portable, and smart energy solutions.

### Publications and Research Projects

Title	Author(s)	Source / ISBN	Relevance
<i>Green Energy and Smart Campus Management: A Case Study from Eastern India</i>	Debasree Saha et al.	<i>Energy Management in Higher Education</i> (BWU Press 2024)	Documents campus energy transition.
<i>Photovoltaic Module Efficiency Enhancement Using Nano-Coatings</i>	Debasis Mukherjee et al.	<i>Low Power Designs in Nanodevices</i> (Taylor & Francis ISBN 9781003459231)	Improves solar yield.
<i>Renewable Energy Entrepreneurship in Rural India</i>	Alamgir Sani & Satendar Singh et al.	<i>Environmental Evolution</i> (ISBN 978-81-970323-7-0)	Links energy literacy to livelihoods.
<i>Machine Learning Model for Energy Prediction in Smart Buildings</i>	Sourish Dutta et al.	<i>Springer AI in Energy Analytics 2024</i>	Predictive efficiency modelling.

### Campus Operations and Green Infrastructure

#### Energy Generation and Use

- 250 kW solar array produces.
- Automatic power-factor correction and energy audit 2023.
- Transition of hostel water-heating to solar hybrid system.
- Diesel gensets phased out except for emergency power.

#### Energy Efficiency Measures

- LED retrofit reduced load by 78 kW.
- Smart timers for streetlights and classroom air-conditioners.

Brainware University's transition toward affordable and clean energy is not symbolic—it is structural. Solar rooftops power its buildings, AI labs develop smart energy solutions, and students translate research into community impact.

The University demonstrates that energy access and affordability can coexist with innovation and equity.

By embedding clean energy principles into its research, curriculum, and campus operations, Brainware University has emerged as a model for sustainable higher education—proving that every watt saved or generated sustainably is a step toward a greener future.

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