Progress Report: SDG 7 (Affordable and Clean Energy) – Chukwuemeka Odumegwu Ojukwu University (COOU)

2024/2025 Session

Executive Overview

Chukwuemeka Odumegwu Ojukwu University (COOU) aligns its operations, academic research, and campus infrastructure with **Sustainable Development Goal 7 (SDG 7: Affordable and Clean Energy)**. Anchored on the university's **"3Vs Agenda" (Values, Viability, Visibility)** under the leadership of Vice-Chancellor Prof. Kate Azuka Omenugha and the Office of the Deputy Vice-Chancellor (Administration and Environmental Sustainability), COOU is transitioning toward clean energy reliance. The university addresses energy poverty and power instability through campus-level solar photovoltaic (PV) deployments, bioenergy research, power grid optimization studies, and institutional climate partnerships.

Key Areas of Progress & Implementation

1. Decentralized Solar PV Deployment & Campus Power Resilience

To mitigate the impact of national grid unreliability and minimize carbon emissions from fossil-fuel generators, COOU has expanded off-grid and hybrid renewable power installations:

- **Solar Systems for Critical Facilities:** Decentralized solar panel arrays, battery storage, and inverter systems have been progressively installed across key units, administrative offices, e-libraries, and research laboratories across campuses (Igbariam, Uli, and Awka).

- **ICT and Night-Study Illumination:** Solar-powered lighting and uninterrupted power supply (UPS) units support ICT testing centers, computer laboratories, and perimeter security lighting, lowering operational energy costs and ensuring continuous academic activities.

2. Clean Energy Research & Engineering Innovation

COOU advances applied research into renewable energy technologies tailored to Sub-Saharan Africa's climate and grid conditions:

- **Grid Integration & Renewable Energy Modeling:** Faculty within the Faculty of Engineering (Uli Campus)—publishing through university outlets such as the

International Journal of Innovative Engineering, Technology and Science (IJIETS)—conduct research on solar PV systems, wind-solar hybrid configurations, and renewable energy penetration limits for the Nigerian national power grid.

- **Biogas & Agricultural Bioenergy:** Through interdisciplinary efforts between the Faculty of Agriculture (Igbariam) and Chemical/Mechanical Engineering, research explores anaerobic digestion of agricultural crop residue, organic waste, and livestock manure to generate biogas for cooking and low-cost energy generation.

- **Solar Thermal & Material Applications:** Academics investigate solar radiation forecasting, solar drying technologies for agricultural produce, and materials for energy efficiency.

3. Institutional Governance, Climate Action & Partnerships

- **Centre for Climate Change and Environmental Sustainability:** COOU operates a specialized Centre for Climate Change, Environmental Sustainability, and Laboratory Services. The centre collaborates with industrial partners, non-governmental organizations, and healthcare institutions to promote clean energy adoption, environmental impact monitoring, and carbon reduction strategies.

- **Executive Sustainability Leadership:** By appointing a Deputy Vice-Chancellor overseeing Environmental Sustainability, COOU integrates clean energy and eco-friendly practices directly into university governance and capital project planning.

Performance Summary against SDG 7 Targets

SDG 7 Target Area	COOU Operational & Academic Contribution	Impact Level
7.1 Universal Access to Modern Energy Services	Solar-inverter installations powering critical campus labs, ICT units, e-libraries, and offices.	**High** (Campus Infrastructure)
7.2 Increase Share of Renewable Energy in Energy Mix	Integration of solar PV arrays and bioenergy research across Igbariam, Uli, and Awka campuses.	**Moderate to High** (Campus Energy Mix)

SDG 7 Target Area	COOU Operational & Academic Contribution	Impact Level
7.3 Double the Global Rate of Improvement in Energy Efficiency	Transition to energy-efficient LED lighting and IoT-assisted energy monitoring research.	**Moderate** (Facility Management)
7.a International Cooperation & Clean Energy Research	Peer-reviewed research in *IJIETS* on renewable grid integration and climate centre partnerships.	**High** (Academic & Regional Outreach)

Strategic Recommendations for Acceleration

1. **Construct Campus Utility-Scale Solar Microgrids:** Transition from isolated solar-inverter setups to a centralized, multi-megawatt hybrid solar farm across major campuses (particularly Igbariam and Uli) to achieve 60%+ clean energy self-sufficiency during daytime peak loads.

2. **Scale Organic Waste-to-Biogas Facilities:** Capitalize on the expanding university farms at the Faculty of Agriculture to build an industrial digester plant that converts crop and animal waste into clean cooking gas for student cafeterias and campus staff quarters.

3. **Establish a Green Campus Energy Policy:** Mandate energy-efficiency standards for all newly constructed university buildings, including passive solar architectural designs, mandatory LED lighting, and rooftop solar readiness.

Signature:  Date: 24/09/2026

Prof. Kate Azuka Omenugha, Fnipr

Vice Chancellor