Uzbekistan State World Languages University

Smart Metering Operational Data Sheet (2023–2026)

Prepared by: Engineering Department
Reporting Period: 2023–2026

1. Purpose and Context

This operational data sheet presents the performance of the Smart Metering System implemented across Uzbekistan State World Languages University (UzSWLU) between 2023 and 2026. The system supports the university's transition toward intelligent energy management, renewable energy integration, and evidence-based sustainability decision-making.

The Smart Metering System forms one of the core components of the **Energy Management and Climate Action Plan (2022–2030)** and the **Sustainability and Climate Action Policy**, enabling continuous monitoring of electricity consumption, renewable energy generation, and carbon emission reductions.

The system directly supports:

- SDG 7 – Affordable and Clean Energy
- SDG 9 – Industry, Innovation and Infrastructure
- SDG 11 – Sustainable Cities and Communities
- SDG 13 – Climate Action

2. Smart Metering System Overview

Parameter	Description
Total smart meters installed	48 units
Coverage	100% of academic and administrative buildings; 60% of student dormitories
Meter type	Digital three-phase smart electricity meters
Data recording interval	Every 15 minutes
Monitoring	24/7 automated
Analytics Platform	SmartPower Analytics v3.2
Dashboard	Fusion Energy Platform & E-IJRO Dashboard
External Integration	Ministry of Energy pilot monitoring system
Operational since	February 2023

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3. System Capabilities

The Smart Metering System provides:

- Real-time electricity monitoring by building and department;
- Continuous monitoring of renewable electricity generation;
- Automatic alerts for abnormal electricity consumption;
- AI-assisted consumption forecasting;
- Carbon emission estimation;
- Monthly and annual energy performance reporting;
- Integration with the university Sustainability Dashboard;
- Data support for preventive maintenance and energy planning.

4. Annual Energy Performance (2023–2026)

Indicator	2023	2024	2025	2026
Purchased Electricity (kWh)	1,304,912	1,075,300	988,600	936,200
Solar Energy Generated (kWh)	650,000	1,424,000	1,612,000	1,785,000
Total Campus Energy (kWh)	1,954,912	2,499,300	2,600,600	2,721,200
Renewable Energy Share	33%	57%	62%	66%
Smart Meter Coverage	100%	100%	100%	100%
System Availability	98.5%	99.2%	99.5%	99.8%

5. Energy Efficiency Performance

Indicator	2022 Baseline	2023	2024	2025	2026
Purchased Electricity (kWh)	1,783,440	1,304,912	1,075,300	988,600	936,200
Solar Generation (kWh)	0	650,000	1,424,000	1,612,000	1,785,000
Energy Use Intensity (GJ/m²)	35.1	33.4	28.6	26.3	24.8
CO_2 Emissions (tCO_2)	1,550	1,220	950	860	790
Electricity Reduction vs Baseline	—	26.8%	39.7%	44.6%	47.5%

6. Operational Improvements

Between 2023 and 2026 the Smart Metering System enabled the university to:

- increase renewable electricity generation by expanding solar photovoltaic capacity;

- continuously reduce purchased electricity from the national grid;
- improve campus-wide renewable energy utilization;
- identify buildings with abnormal consumption patterns;
- optimize HVAC operation through data-driven scheduling;
- support preventive maintenance using real-time monitoring;
- improve institutional energy planning through predictive analytics.

7. Governance and Reporting

Function	Responsible Unit	Frequency	Output
Data Collection	Engineering Department	Continuous	Smart Meter Database
Data Analysis	Chief Energy Engineer	Monthly	Energy Performance Report
Performance Review	Green Campus Committee	Quarterly	Campus Energy Audit
Sustainability Reporting	Sustainability Research Unit	Annual	Sustainability Report
Executive Review	Rectorate	Annual	Strategic Energy Review

8. Transparency and Public Reporting

Energy performance data are visualized through the Fusion Energy Platform and the E-IJRO Dashboard.

Monthly and annual reports include:

- electricity consumption trends;
- renewable energy generation;
- renewable energy share;
- building-level performance;
- carbon emission trends;
- energy efficiency indicators.

The summarized results are published through the university Sustainability Report and official website.

9. Key Achievements (2023–2026)

- Smart meter coverage maintained across all academic and administrative buildings.
- Solar electricity generation increased from **650,000 kWh** to **1,785,000 kWh**.
- Renewable energy share doubled from **33%** to **66%**.
- Purchased electricity reduced by almost **48%** compared with the 2022 baseline.
- Campus carbon emissions reduced from **1,550 tCO_2** to **790 tCO_2**.
- Smart monitoring system availability increased to **99.8%**.
- Continuous data-driven management strengthened institutional sustainability performance.

10. Summary

The Smart Metering Operational Data Sheet (2023–2026) demonstrates UzSWLU's transition toward a fully data-driven energy management model. Through continuous monitoring, intelligent analytics, renewable energy expansion, and institutional governance, the university has significantly improved energy efficiency while increasing renewable energy production and reducing greenhouse gas emissions.

The Smart Metering System now serves as the university's primary platform for monitoring energy performance, supporting evidence-based decision-making, and achieving long-term sustainability objectives in accordance with the Energy Management and Climate Action Plan (2022–2030).