

Data Governance Policy and Sustainability Metric Standards (Appendix C)

1. Scope and Purpose

Purpose: To ensure the integrity, accuracy, and uniformity of the data used within the Environmental Analytics project, and to standardize key metrics for reliable assessment of sustainability, energy efficiency, and ecological balance.

Scope: All data, models, reports, and visualizations generated, used, or stored within the framework of the **EA-01. Analyze Green Building Energy Efficiency** function and other related analytical activities.

2. Data Governance Standards

2.1. Data Quality and Integrity

- **DGS 1.1. Data Sources:** All incoming data (energy consumption, building specifications, climate data) must be sourced from approved and verified sources specified in the Master Data Registry.
- **DGS 1.2. Validation:** All new datasets must undergo automated and manual validation procedures (including range checks, gap analysis, and anomaly detection) before being used in the EBM (Energy Balance Model) analysis.
- **DGS 1.3. Audit Trail:** A complete audit log must be maintained, recording all changes made to raw data, metrics, and model configurations.

2.2. Security and Confidentiality

- **DGS 2.1. Access:** Access to sensitive data (e.g., specific building identifiers or personalized data) must be strictly controlled based on Roles (RBAC).
- **DGS 2.2. Storage:** All analytical data must be stored on encrypted servers that comply with the project's internal security standards.

3. Sustainability Metric Standards

3.1. Uniformity of Definitions

- **SMS 1.1. EUI (Energy Use Intensity):** Must be calculated as total annual energy consumption (kWh or BTU) per square meter or foot of building area $\frac{\text{kWh}}{\text{m}^2}$. Exceptions to this definition must be explicitly documented.
- **SMS 1.2. PUE (Power Usage Effectiveness):** Must be calculated as the ratio of total data center energy consumption to the energy consumed by IT equipment. The standard baseline for comparison is set at $\mathbf{1.5}$.
- **SMS 1.3. EBS (Ecological Balance Score):** The methodology for calculating the EBS must remain constant throughout the reporting period. Any changes in variable weighting (e.g., water, CO_2 emissions) require approval by project management.

3.2. Baselines and Benchmarking

- **SMS 2.1. Baseline Establishment:** The energy efficiency baseline for each building or facility must be determined based on the average of the 3 preceding years (if available) or based on certified industry standards.
 - **SMS 2.2. Measurement Frequency:** All key metrics (EUI, PUE) must be measured and recorded **monthly**. Reporting and analysis must be conducted **quarterly**.
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4. Reporting and Visualization Standards

4.1. Analysis Presentation

- **RVS 1.1. Relevance:** Reports must clearly link deviations from the baseline to their potential impact on ecological balance.
- **RVS 1.2. Visualization:** All charts and diagrams in the **Performance Dashboard** must include clear titles, axis labels, and legends. Clear color coding (e.g., red) must be used for metrics exceeding threshold values (e.g., EUI above $\mathbf{+10\%}$ of the baseline).