Global Electricity Access Dashboard (2006–2022)

By Sedra Baian

🗓️ Project Overview

This project explores global rural electricity access using World Bank Development Indicators from 2006 to 2022. The objective was to analyze and visualize trends, identify top-performing countries, and highlight regions with limited access. The final output includes a cleaned dataset, KPI analysis in Python, and a Tableau dashboard.

📈 Dataset Details

- **Source**: World Bank Development Indicators
- **Indicator Used**: Access to electricity, rural (% of rural population)
- **Time Range**: 2006–2022
- **Data Format**: CSV (reshaped from wide to long format using pd.melt() in Python)

📃 Tools & Technologies

- **Python (Pandas)**: Data cleaning, transformation, and KPI calculation
- **Jupyter Notebook**: Code organization and step-by-step data processing
- **Tableau Public**: Interactive visualizations and dashboard building

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🔧 Data Cleaning Process

- Removed missing and null values
- Standardized column names
- Converted data types for year and value
- Reshaped data using pd.melt()
- Exported a clean dataset for Tableau as world_bank_cleaned.csv

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📊 Key Metrics (KPIs)

1. **Global Average Rural Electricity Access**: 84.3%
2. **Countries with <50% Access in 2022**: Highlights underserved regions
3. **Top Countries by Improvement (2006–2022)**: Nigeria, India, Brazil

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📅 Business Insights

- ✅ **Significant Global Progress**: Many countries reached near-universal access
- ⚠️ **Development Gaps**: Some countries remain below 50%
- 🌐 **Notable Improvements**: Nigeria showed a 42% increase over 16 years
- 🔢 **Infrastructure Disparities**: Still evident between rural and urban areas

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📊 Tableau Visualizations

- **Chart 1**: Top 10 Countries by Rural Electricity Access (2022)
- **Chart 2**: Access Trend from 2006–2022 for multiple countries
- **Interactive Filters**: Country, year, and access indicator

Live Dashboard:
https://public.tableau.com/views/GlobalRuralElectricityAccessTrendsandTopPerformers2006-2022/Global_Development_Dashboard?:language=en-US&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

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📊 Recommendations

1. Invest in countries below 80% rural access
2. Promote off-grid renewable energy solutions
3. Encourage public-private partnerships in energy development
4. Use real-time dashboards to track SDG 7 progress

📍 Project Repository & Code

- **GitHub**: https://github.com/sedrabaian/electricity-access-kpi-visualization
- Includes Jupyter Notebook, cleaned dataset, and project README

🙋 About the Analyst

Sedra Baian is a Computer Science student at Seattle Pacific University, passionate about data analysis, development indicators, and creating actionable insights from open data.

Built using Python, Pandas, Tableau Public, and World Bank Open Data.