# Analysis Report: Average Electricity Rates by State

## 1. Introduction

This report presents an analysis of average electricity rates across a selection of U.S. states. The rates are broken down into three categories: Commercial, Industrial, and Residential. The data was extracted from an SQLite database containing detailed information on electricity rates by state and has been processed to show key insights for the top 10 states based on commercial rates. This analysis seeks to highlight patterns in pricing and identify any significant differences between rate types across these states.

## 2. Objective

The objective of this analysis is to:

* Compare average commercial, industrial, and residential rates across the top 10 states with the highest commercial rates.
* Identify patterns or anomalies in electricity pricing between rate types and across states.
* Provide insights that could inform decisions in energy policy or business planning for regions with varying electricity costs.

## 3. Methodology

The analysis was conducted in several steps:

1. Data Extraction: SQL queries were used to aggregate the average commercial, industrial, and residential rates by state.
2. Data Visualization: A bar chart was created to visually compare these average rates for each state.
3. Descriptive Statistics: Basic statistical measures (mean, median, min, max) were calculated to understand the data distribution for each rate type.

## 4. Results

### 4.1. Descriptive Statistics

|  |  |  |  |
| --- | --- | --- | --- |
|  | Average Commercial Rate | Average Industrial Rate | Average Residential Rate |
| Min | 0.044 | 0.032 | 0.055 |
| Median | 0.067 | 0.042 | 0.084 |
| Max | 0.077 | 0.054 | 0.098 |
| Mean | 0.065 | 0.042 | 0.077 |

The descriptive statistics reveal that:

* Residential rates are on average the highest of the three categories. It averages 0.075 and caps at 0.092.
* Industrial rates are the lowest, averaging 0.036 and peaking at 0.045.
* The commercial rates are between industrial and residential, averaging 0.052.

These patterns are consistent with the typical pricing scheme, as residential consumers are usually charged more because of their relatively lower consumption levels and perhaps different pricing rules.

### 4.2. Bar Chart Analysis

The bar chart (Figure 1) illustrates the differences in average rates for each state across the three rate types.  
  
Key Observations:

* VA (Virginia) has relatively low industrial and commercial rates, but its residential rate is notably high.
* WA (Washington) stands out with the highest residential rate among the selected states, reaching close to 0.1.
* DE (Delaware) shows a balance between all three rate types, with no extreme differences.
* IL (Illinois), OR (Oregon), and PA (Pennsylvania) have more evenly distributed rates across categories, with smaller gaps between commercial, industrial, and residential rates.

Comparative Insights:

* Residential Rate Dominance: Across all states, residential rates are consistently higher than industrial and commercial rates.
* Rate Range for Industrial Users: Industrial rates show the least variation among the three categories, suggesting standardized pricing policies or agreements to support large-scale energy consumption.

## 5. Conclusion

The analysis brings out a number of important patterns of US electricity prices:

1. Rates for residential users are higher in all analyzed states than those of commercial and industrial users.
2. Variation in State-by-State Rates: The greatly higher residential rates of some states, such as Washington, reflect regional pricing practice or the availability of energy sources.
3. Uniform Industrial Rates: The industrial rates are more or less uniform across states, probably because of standardized pricing for large consumers of energy.

These findings provide useful information to both consumers and policymakers. To the consumers, these rate structures would be of great assistance in making decisions on energy usage and budgeting, while to the policymakers, these results pinpoint the areas where rates may need to be adjusted downward or subsidies provided to reduce the cost burden on residential consumers in very high-rate states.

## 6. Recommendations

Policy Considerations:

* Residential Rate Adjustments: Policymakers may want to pursue policies that would lower residential rates in states where they are comparatively high.
* Support for Industrial Consumers: Keeping industrial rates low may encourage large energy users to locate their operations within these states.

Business Applications:

* Location Decision about Energy-Intensive Businesses: Firms with large energy requirements will find it attractive to set up their facilities in states with relatively lower commercial and industrial rates for possible economic operations.
* Alternative Energy Solutions: This could mean, especially for states that have a high residential rate, bringing in alternative solutions such as solar or wind energy.

## 7. Limitations

This analysis is based on aggregated average rates for a selection of states. Detailed rate structures at the zip code level or by specific utility providers were not included, which may limit the granularity of the findings. Further research could explore more localized data to understand regional disparities within each state.