# Exploring Australia's Renewable Energy Trends (2015–2023)

I have explored Australia's renewable and non-renewable energy consumption trends using data from the **Australian Government – Department of Climate Change, the Environment and Water** (<https://www.energy.gov.au/>)

The primary sources were two datasets from <https://www.energy.gov.au/publications/australian-energy-update-2024>:

* **Table D**: “Australian energy consumption by fuel type” (2015–2023), and
* **Table R**: “Australian renewable energy consumption” (2015–2023).

The focus was on understanding how renewable energy has evolved in comparison to non-renewable sources post the **Paris Agreement**, starting from the financial year 2015–16.

## Preliminary Data Exploration & Analysis

After loading and cleaning the datasets, I created a consolidated dataframe categorizing fuels into **‘Renewable’** and **‘Nonrenewable’** groups. Redundant renewable entries in Table D were excluded to avoid duplication, and only relevant fuel types were retained from both tables.

## Key Characteristics:

* The dataset includes **17 fuel types** (8 renewable, 9 non-renewable), each with annual consumption figures from **2015–16 to 2022–23**, resulting in a matrix of **17 rows × 10 columns**
* The main variables are **Fuel-Type**, **Fuel**, and yearly energy consumption in **Peta Joules**

## Notable Statistics:

1. **Renewable Energy Share**: The renewable portion of Australia’s total energy consumption rose from **4.37%** in 2015–16 to **7.32%** in 2022–23, indicating a gradual shift toward cleaner sources.
2. **Total Energy Consumption in 2022–23**: Australia's overall energy usage in that year was approximately **6,167 PJ**, of which **609 PJ** came from renewable sources.
3. As per **prediction by Linear Regression model**, by 2030, **10.4923%** of energy consumed in Australia will come from renewable sources. As per **2nd Order Polynomial Prediction, 19.4717%** of energy consumed in Australia will come from renewable sources.

## Data Visualization: Renewable Energy Trend (2015–2032)

To visualize the trend, I plotted the **percentage of renewable energy consumption** from 2015 to 2023 and projected future values up to **2032** using **linear** and **polynomial regression models**. The visualization shows a consistent upward trend, with both models predicting that renewable energy could constitute **~13–15%** of total consumption by **2030** if current trends persist.

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Australia has set an ambitious target of meeting 82% of its total energy requirements from renewable sources by 2030. However, the analysis indicates that current trends fall significantly short of this goal. Substantial efforts and accelerated action will be required to scale up renewable energy adoption and align with the national target.

A graph with a line and a line

AI-generated content may be incorrect.

This visualization helps illustrate the slow but steady growth of renewables in Australia's energy mix and sets the stage for more detailed modelling in the next phase of analysis.