Philippine Power Generation & Capacity (2003–2023)

A 20-Year Overview of Energy Supply Trends Across Luzon, Visayas, and Mindanao

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Project Objective

Guiding Questions

- How does the 2023 power mix look?
- How has total generation changed across Luzon, Visayas, and Mindanao?
- Which sources have the most installed capacity?
- Is capacity expanding in line with generation?
- How dependent is each region on renewable vs non-renewable energy?

Objective:

Use historical DOE data + Power BI to explore long-term trends and reveal insights through an interactive dashboard.

Dataset Overview

Source: PH Department of Energy (DOE)
Years: 2003–2023
Contains:

- Total grid generation
- Generation by source
- Installed capacity
- Island group + year breakdown

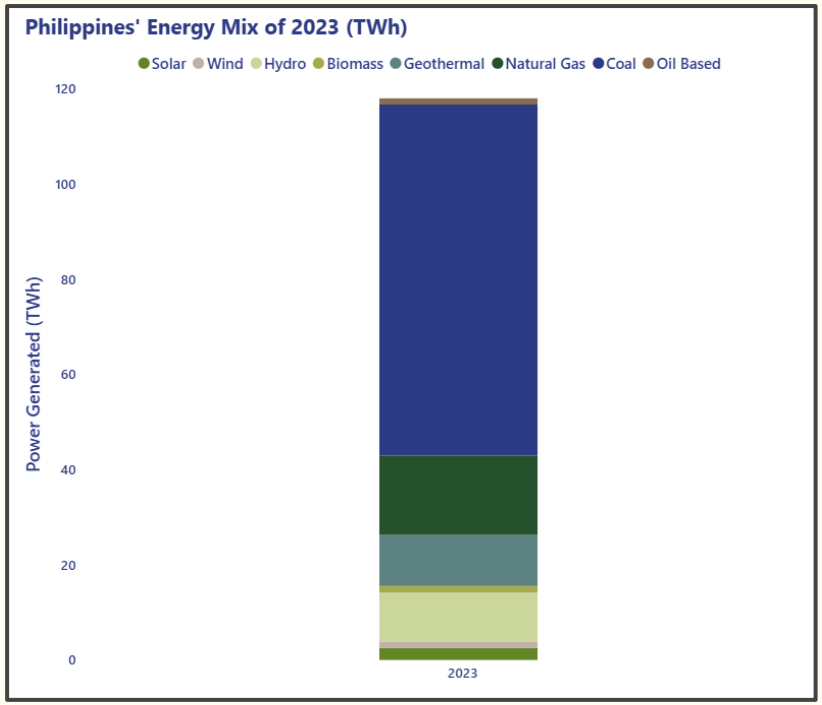
Tools used:

Power BI, DAX, Power Query

Methodology

- Cleaned and validated DOE data
- Unpivoted and transformed data for analysis
- Validated inconsistencies, checked totals
- Built DAX measures (TWh, % Share, YoY, Top Sources)
- Designed an interactive dashboard

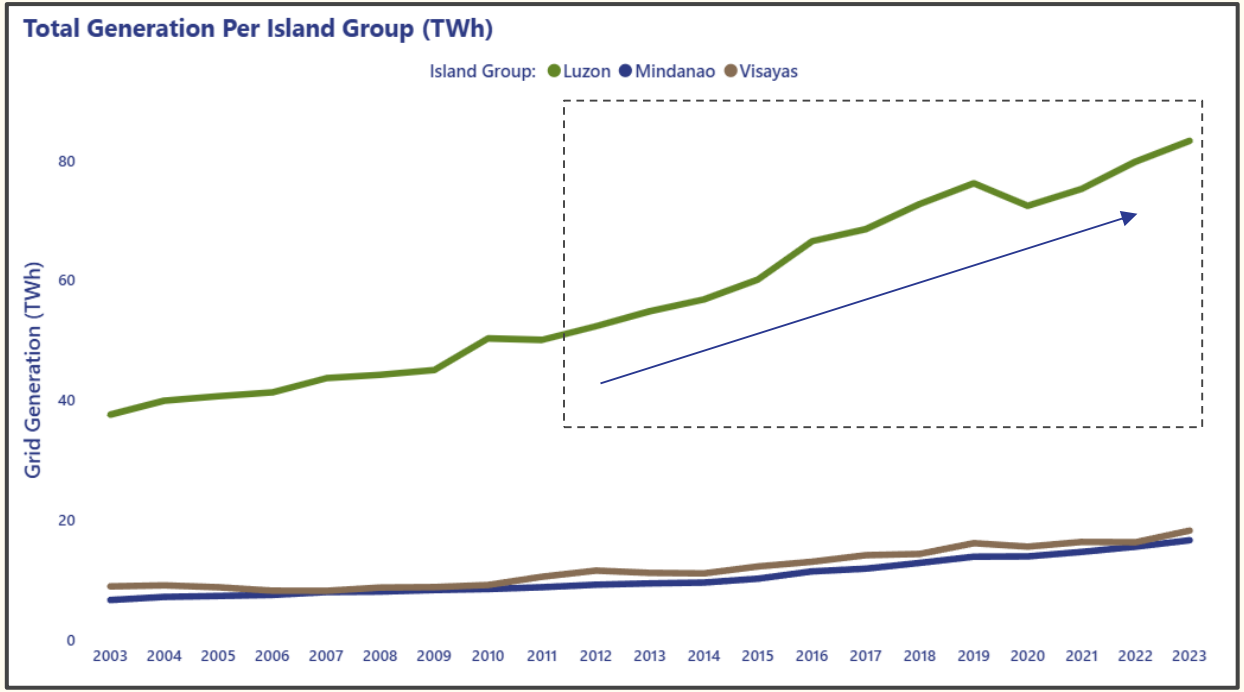
How does the 2023 power mix look?



Breakdown of electricity generation by source, showing strong reliance on fossil fuels.

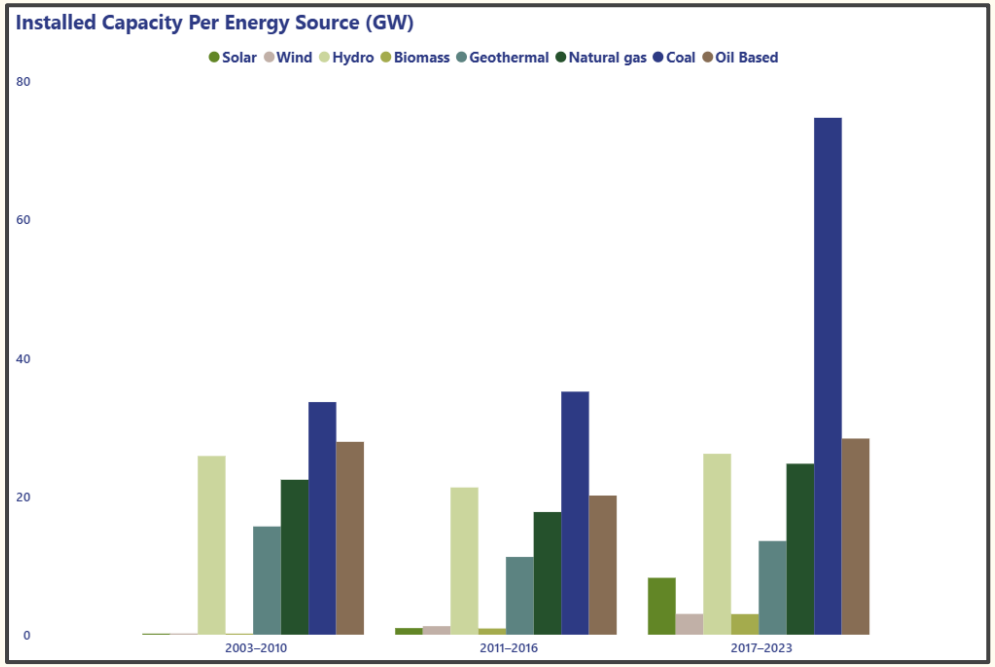
- Coal is the largest contributor to the national grid.
- Fossil fuels still supply majority of energy, highlighting need for transition.
- Renewables contribute a meaningful but smaller share.

How has total generation changed across Luzon, Visayas, and Mindanao?



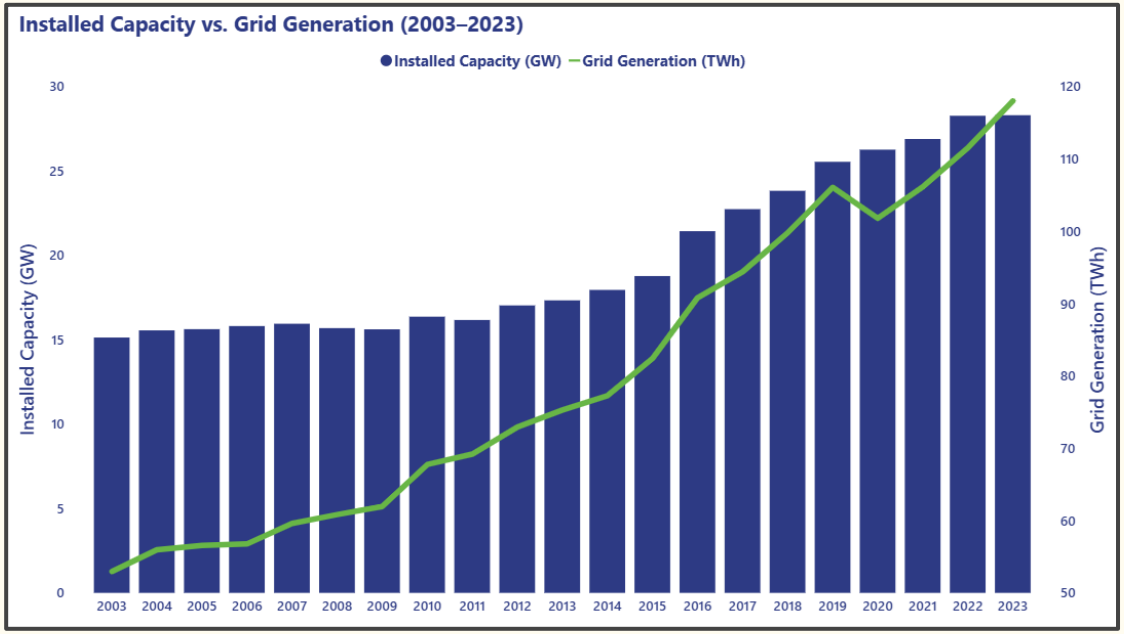
- Luzon produces the majority of the country's electricity.
- Visayas and Mindanao contribute steadily but at smaller scale.

Which sources have the most installed capacity?



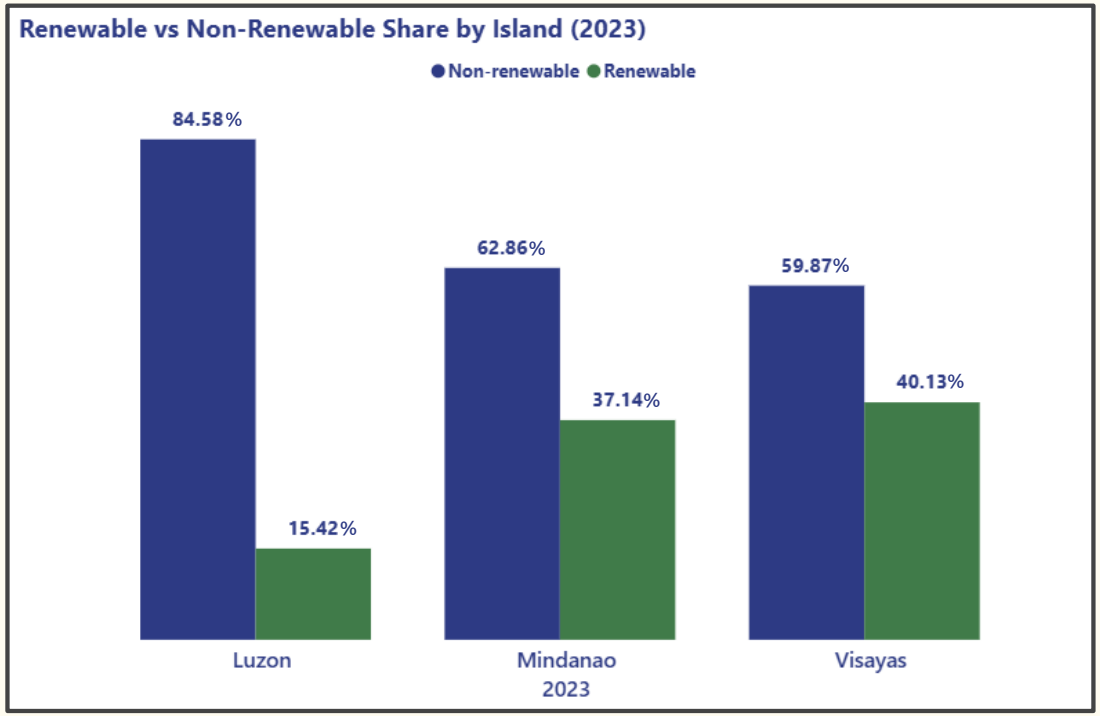
- Coal and natural gas have the largest installed base from 2003-2023
- Renewable capacity increased but remains smaller overall.

Is capacity expanding in line with generation?



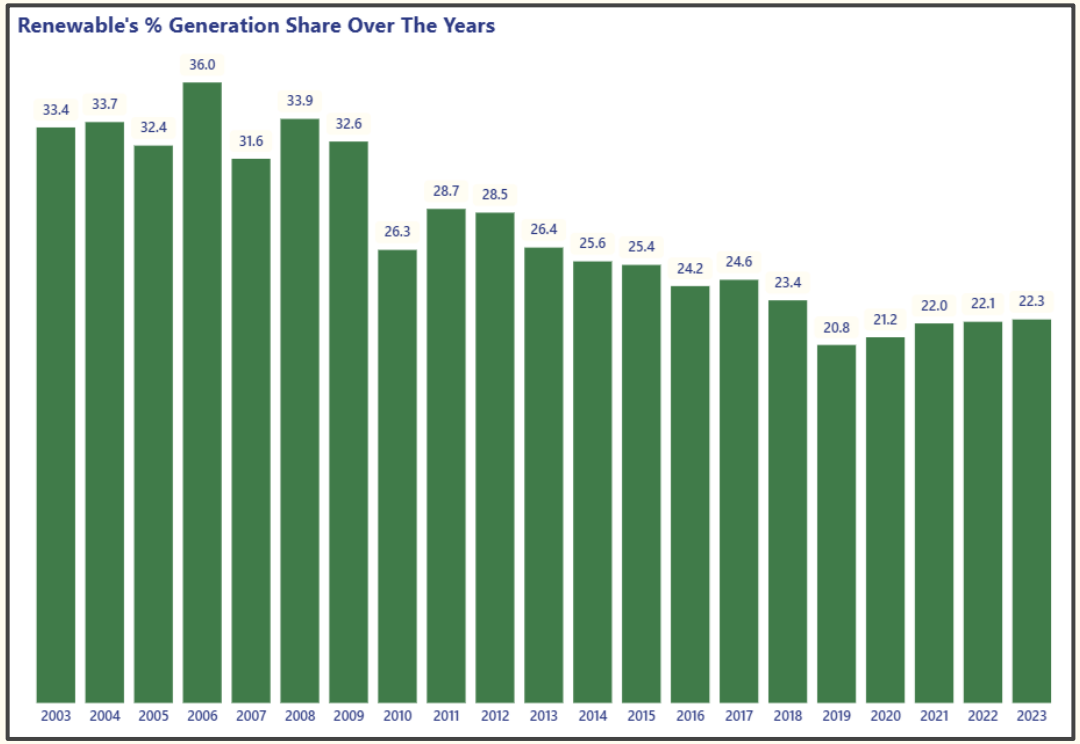
- Generation is outpacing capacity growth, signaling rising pressure on the grid. Sustained demand will require capacity upgrades to prevent supply risks.

How dependent is each island group on renewable energy compared to fossil fuels?



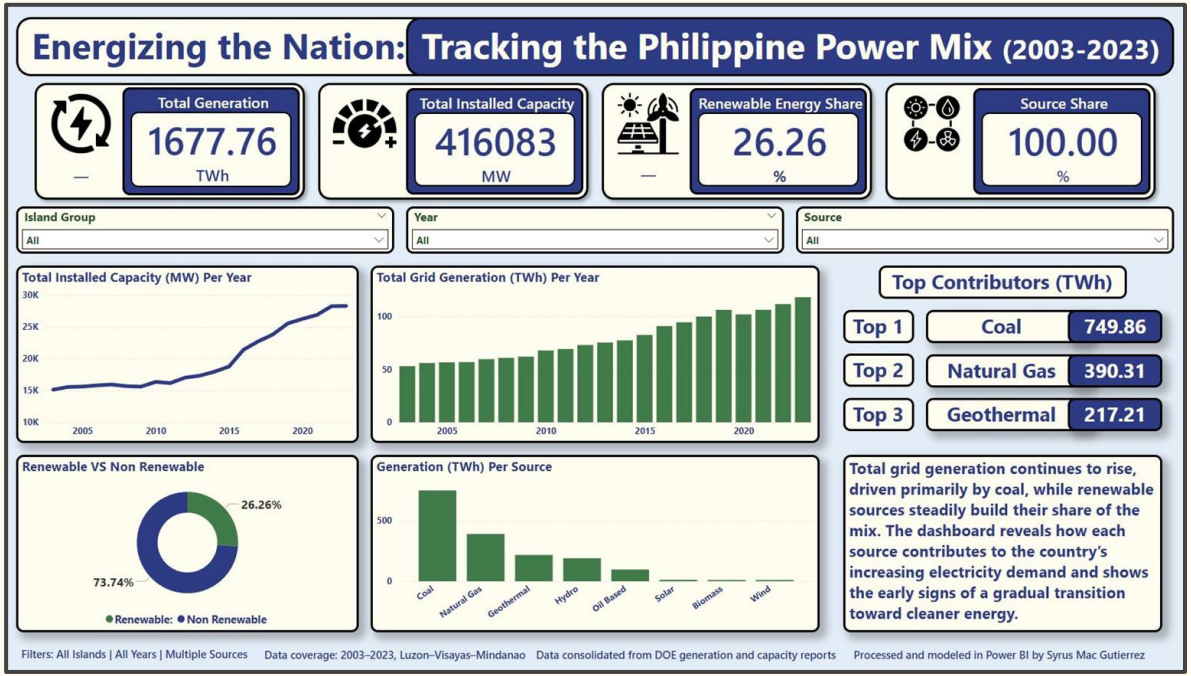
- Visayas and Mindanao have stronger renewable penetration because of geothermal and hydro plants.
- Luzon remains heavily dependent on fossil fuels.

Has the share of renewable energy in the power mix improved over the past 20 years?



- Renewables peaked in 2008, then declined for nearly a decade before stabilizing around 21–22% in recent years.
- This shows that renewable growth has not been consistent and remains vulnerable to changes in generation mix.

Dashboard Preview



This dashboard enables interactive exploration by year, island group, and energy source.

How to Use the Dashboard

- Select Year, Island Group, or Source to filter everything
- KPIs update instantly (TWh, % Share)
- Hover over visuals for detail
- Top-contributor cards show the leading energy sources
- Use the slicers to compare regions and years

Key Insights

- **Electricity demand surged.**
  Total grid generation increased by more than 100% over 20 years.
- **Coal remains the main driver.**
  Luzon heavily relies on coal throughout the entire period.
- **Renewables grew steadily but remain secondary.**
  Hydro and geothermal have stable output; solar accelerates after 2015.
- **Each region has distinct strengths.**
  Luzon = coal, Visayas = geothermal, Mindanao = hydro.
- **Capacity expansion does not always equal generation.**
  Some renewable capacity additions still underproduce compared to fossil fuels.

Sources

1. Installed Capacity Per Grid
2. Gross Power Generation