Importance of demand side data and energy efficiency indicators for policy - buildings

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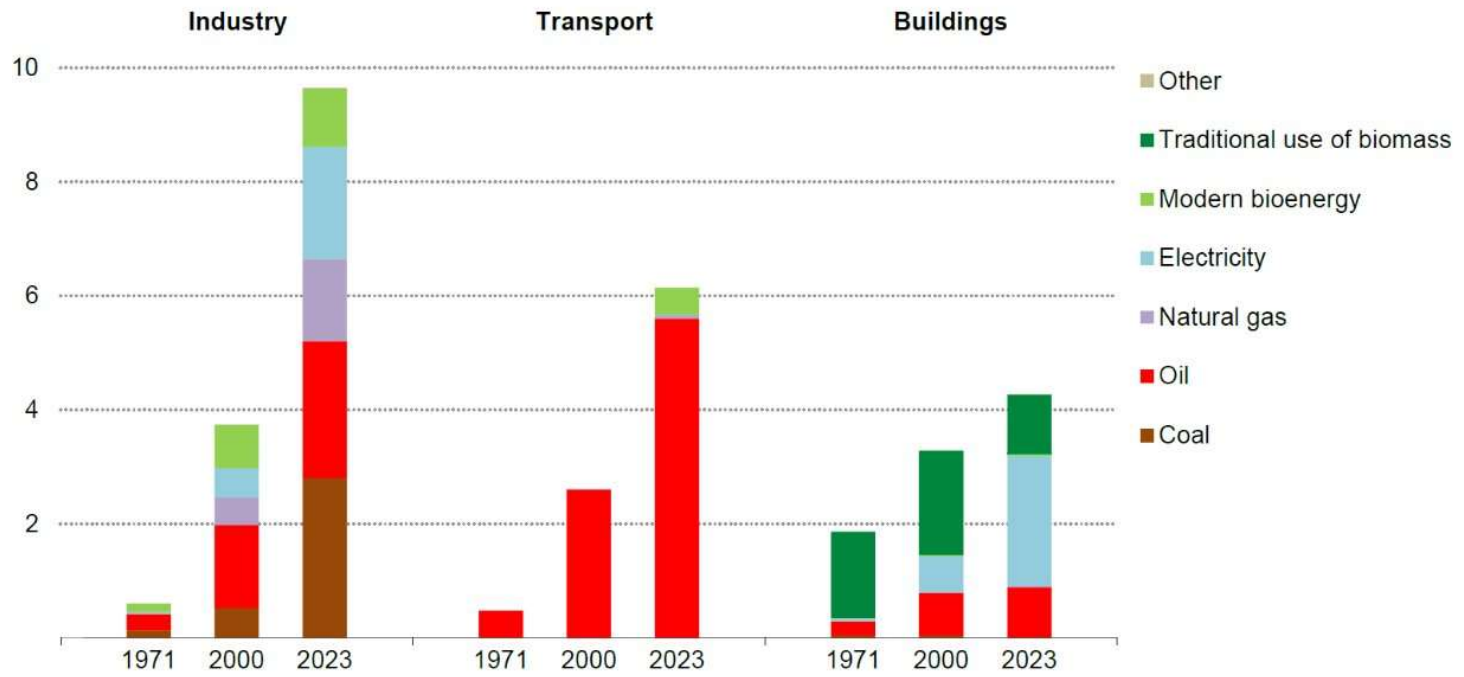
Online workshop – 11 June 2025

International Energy Agency

Demand side data and energy efficiency indicators - buildings

Building sector electricity demand

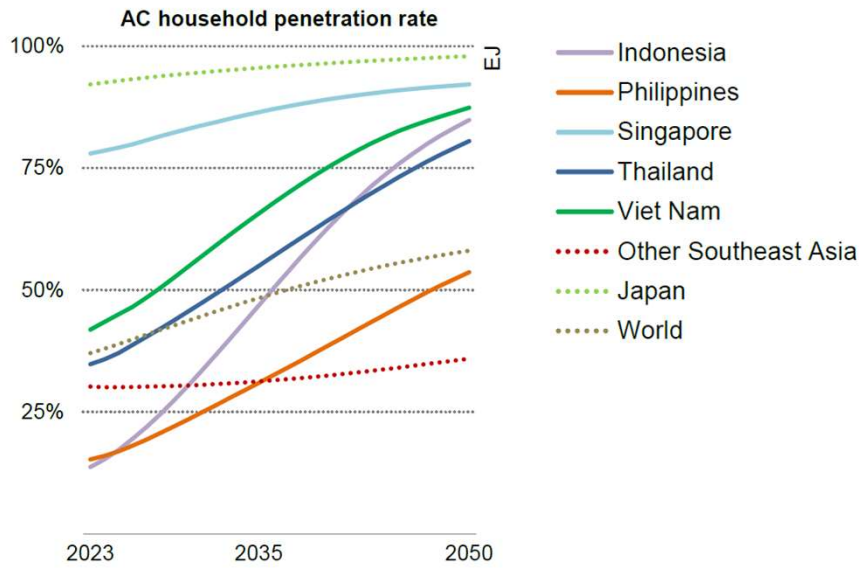
Energy consumption by sector, 1971-2023, Southeast Asia



The building sector has seen the largest increase in electricity demand in Southeast Asia (compared with other sectors)

Stock of air conditioners in Southeast Asia

AC penetration rate in households Scenario, 2023-2050

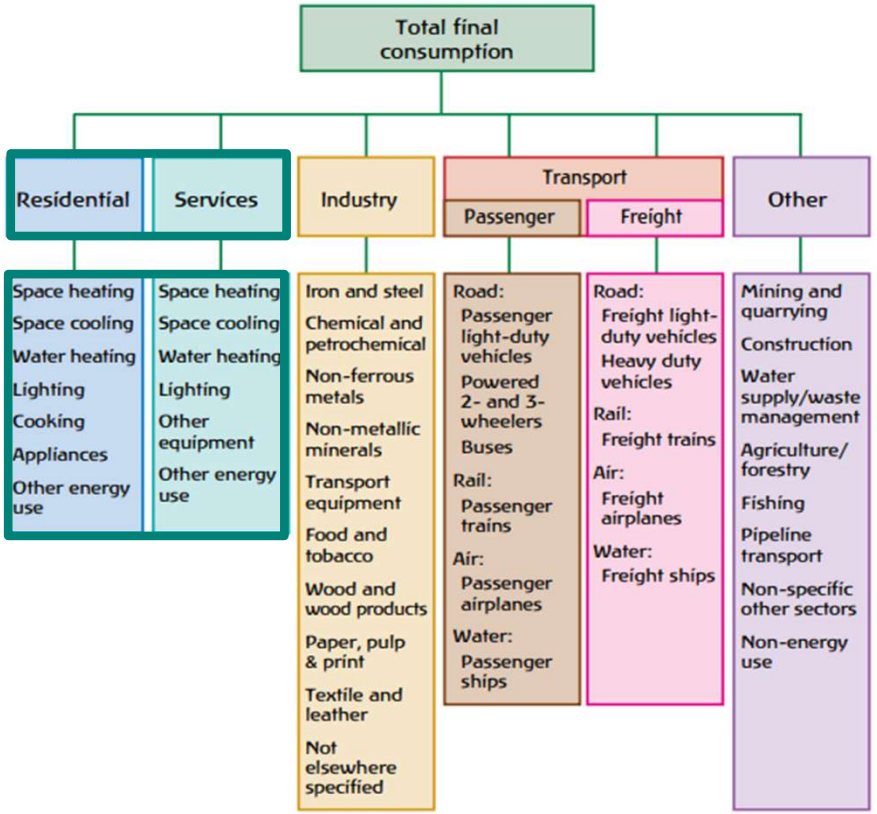


Note: “AC” = air conditioner. “Other Southeast Asia” comprises Brunei Darussalam, Cambodia, Lao PDR, Malaysia and Myanmar.

The stock of air conditioners is projected to grow ninefold from 30 million units in 2020 to 275 million units in 2040

Demand side data

- Demand side data represents the **energy consumption** and **activity data** for the end use sectors
- Often grouped into the three end-use sectors of **buildings** (residential and services), **industry** and **transport**
- Energy consumption data is typically the **per annum consumption by fuel-type** for a given category. It can be expressed in various units (kWh, joule, tonnes of oil equivalent)
- **Activity data varies by category** and covers a wide range of activities: population, floor area



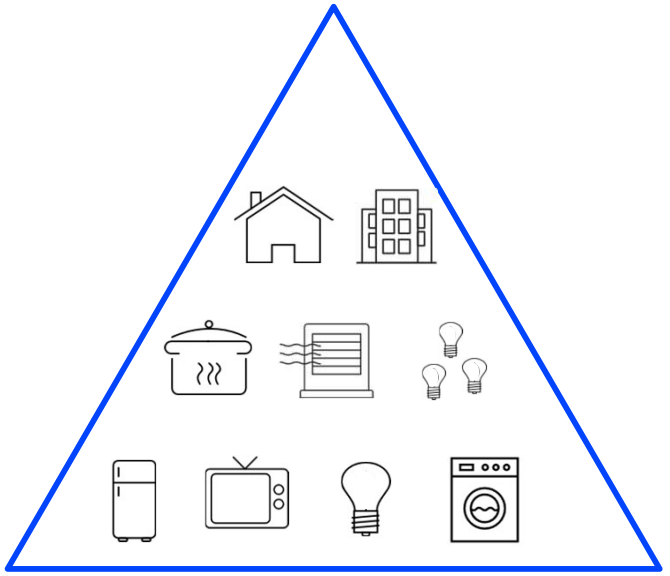
Energy efficiency indicators

- An energy efficiency indicator is typically a **ratio** that represents **energy consumption per unit of activity** of the given category

$$\frac{\text{energy consumption}}{\text{activity}}$$

Indicators are signs describing observable changes or events. They provide useful evidence for policymaking

- Energy intensity is the most general indicator of energy efficiency
- This concept applies at different scales (economy, sectoral and sub-sectoral, /appliances)
- Indicators **allow for tracking and comparisons**



Examples

Residential energy consumption per floor area
kWh/million square metres

Residential energy consumption per capita
e.g., GJ per capita

Demand side data is vital for effective policy making

Sectoral level demand side energy and activity data often supports data-driven policy in:

Policy development

Identify high potential opportunities to inform the policy approach, establish the baseline and set realistic targets for policy initiatives (e.g., targets for the penetration of electric motors in industry for equipment replacement programs)

Monitoring and enforcement

Track the progress towards the interim to long-term targets

Refinement

Modify policies based on the progress tracking to maximise their relevance and effectiveness

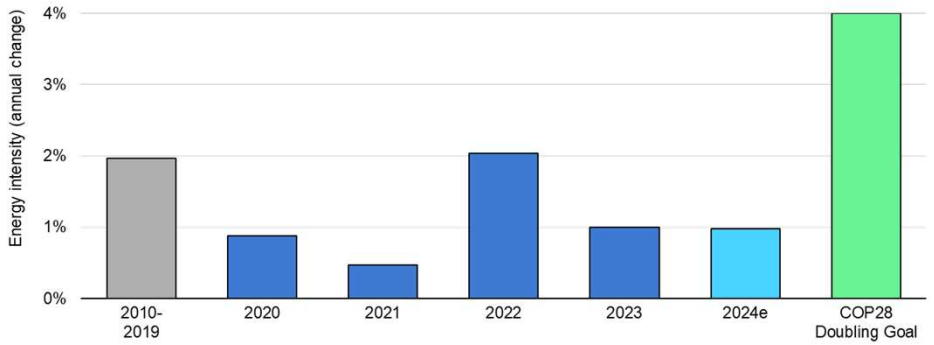
Global energy efficiency progress tracking

- COP28 global doubling energy efficiency goal
- Tracking energy efficiency progress at the global level
- Tracking energy efficiency progress at the regional and country level
- Helping countries to determine, what might be an appropriate level of progress to contribute to the COP28 2030 global doubling goal

Energy Efficiency Progress Tracker

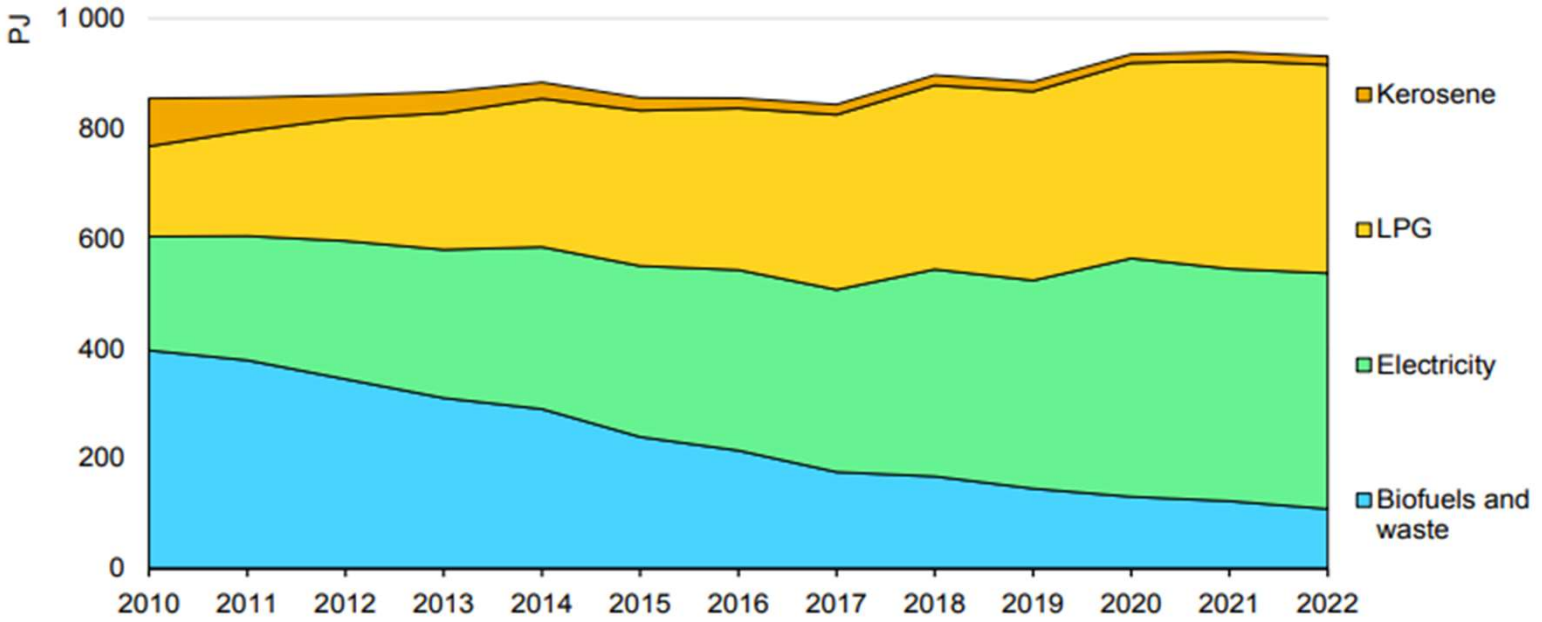
Tracking energy efficiency progress for all regions and countries

Global annual improvement in primary energy intensity, 2020-2024e, and rate needed to achieve the COP28 doubling goal



Example: monitoring progress on clean cooking in Indonesia

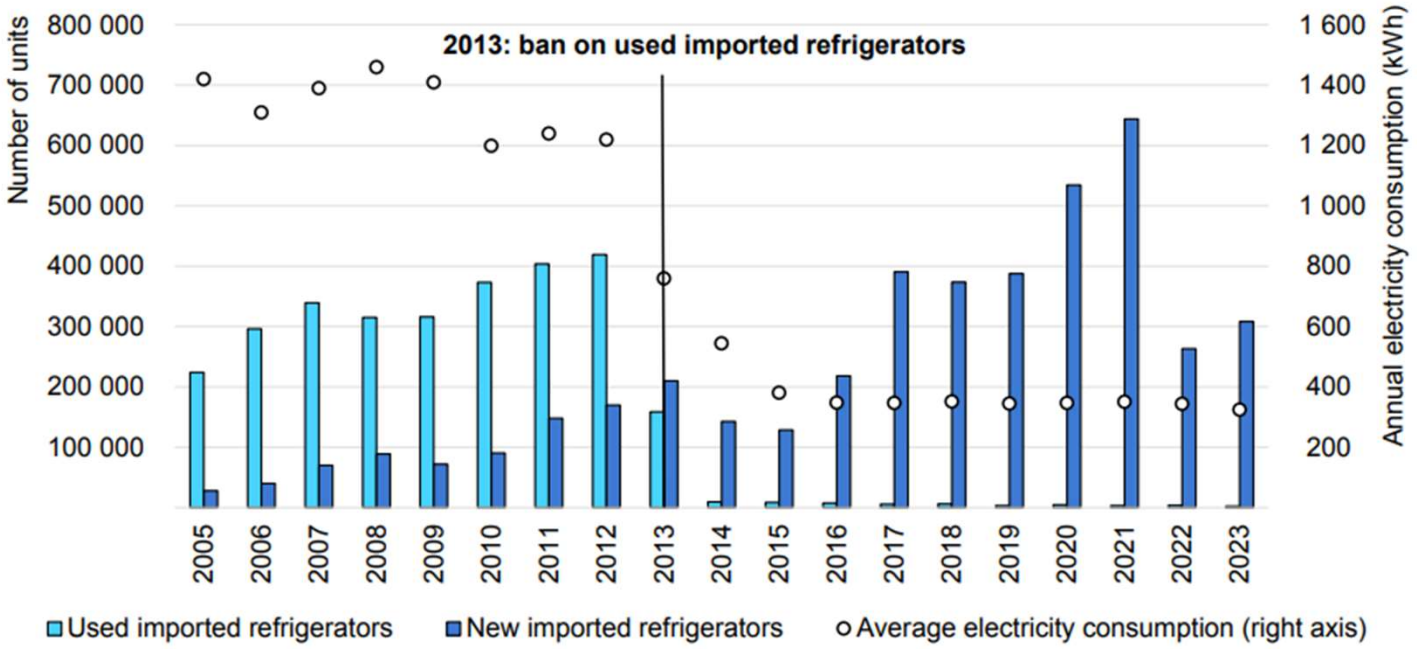
Residential energy consumption in Indonesia, by fuel, 2010-2022



Indonesia made concentrated efforts to accelerate access to clean cooking. Changes in residential energy consumption by fuel type give an indication of progress against the Indonesian government's objectives over time

Example: assessing the impact of the imported refrigerators ban in Ghana

Imports and average consumption of imported refrigerators in Ghana, 2005-2023



Ghana implemented a ban on the import of used refrigerators and ACs in 2013. The share of imported refrigerators on the market decreased to 1% in 2023 and (combined with energy efficiency compliance policies) led to significant energy savings