

DAY 1 -HOUSEHOLD ENERGY CONSUMPTION ANALYSIS OVERVIEW

Key Insights

1. Overall Consumption

- Total **electricity usage**: 75,335 kWh
- Total **gas usage**: 30,816 units
- Total combined energy usage: **106,151 units**

2. Top 10 Households

- Highest consumers include **H244, H174, H078** (all small families or even single-person households).
- Some single-member households show very high **per capita usage** (e.g., H244: 689 units per capita).
- Larger families (e.g., H053, H075 with 7 members) consume similar **total energy** but far lower **per capita energy** (~93 units).

3. By Family Size

- Larger families (size 6–7) contribute the highest share of **total energy use**, but **per capita consumption** is much lower.
- Smaller families (size 1–2) show much higher **per capita consumption**, indicating less efficient usage.

4. By Income Group

- High-income households consume the most energy (**41,732 units**).
- Medium-income: **36,183 units**.
- Low-income: **28,236 units**.
- This shows a **positive correlation** between income and energy usage.

5. Seasonal / Monthly Trend

- **Highest consumption months: July (10,699 units) and October (10,107 units)** — likely due to cooling/heating demand.
- **Lowest consumption months: April (5,748 units) and September (7,529 units)**.
- Clear **seasonal spikes** in summer and autumn.

6. By Appliance Count

- Households with **14 appliances** are the highest contributors (**266 total appliance count across households**).
 - Usage scales strongly with **appliance ownership**, especially beyond 10+ devices.
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Insights

- **Efficiency Gap:** Larger families spread energy use more efficiently per person, while small/single households are disproportionately high consumers.
 - **Income Effect:** High-income households use more energy, likely due to higher appliance ownership and comfort-based usage.
 - **Seasonal Spikes:** Cooling/heating drives peak consumption in **July** and **October**.
 - **Appliance Saturation:** Households with **10+ appliances** show the steepest rise in usage, confirming that appliance count is a major driver.
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Recommendations

1. **Targeted Energy Audits:** Focus on **small-family high per-capita consumers** to identify inefficient devices.
2. **Subsidy Design:** Prioritize **low-income high-consumption households** for efficient appliance replacement.
3. **Appliance Efficiency Campaigns:** Promote energy-star rated appliances, especially ACs, heaters, and refrigerators.
4. **Seasonal Demand Programs:** Offer peak-time tariff rebates in **July** and **October** to reduce load.
5. **Smart Meter Rollout:** Help households track appliance-level consumption to control usage better.