Household Energy Consumption Analysis

**Summary of Findings & Recommendations**

**Findings (Insights from Data Analysis):**

1. **Family Size & Consumption**
   * Households with **4–7 members** have the **highest electricity usage** (10,000–12,600 kWh).
   * Smaller families (2 members) consume much less energy.
2. **Income Group & Consumption**

* Less income households (₹20,000–30,000) show relatively highest consumption, possibly due to not using the 5rated appliances.
  + Very high-income households (₹90,000–1,00,000) show relatively **lower consumption**, possibly due to energy-efficient appliances.

1. **Appliance Count**
   * Households with **8+ appliances** consume **significantly more electricity**.
   * Fewer appliances directly correlate with lower usage.
2. **Gas vs. Electricity Usage**
   * Some households with **high gas consumption** also show **high electricity usage**, indicating overall higher energy demand.
3. **Seasonal & Monthly Patterns**
   * Consumption peaks in **December–February** (winter) and **moderately rises in August**, while it dips in mid-year months like May–June.
   * Indicates **seasonal variation** due to heating/cooling needs.
4. Household level analysis shows some households or income groups consistently consume more energy, regardless of the month, pointing to either family size, more appliances or inefficient usage habits.

**Recommendations (Energy-Saving Measures):**

1. **Targeted Subsidies**
   * Provide **subsidy schemes** for families with **4+ members** to purchase energy-efficient appliances (refrigerators, ACs, washing machines).
2. **Energy Efficiency Programs**
   * Encourage **smart appliance usage** (LEDs, inverter ACs) especially for households with **+8 appliances**.
3. **Awareness Campaigns**
   * Educate on energy-saving practices (switching off unused appliances, efficient lighting, thermostat adjustments).
4. **Seasonal Energy Management**
   * In summer, promote **solar-powered appliances** and cooling alternatives.
5. **Gas-Electric Balance**
   * For households with **high gas & electricity usage**, introduce **dual-fuel efficiency schemes** and incentives for renewable adoption (e.g., solar panels).