

Electric Cooking India: Why Electric Cooking Is Key to India's Energy Transition

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Electric Cooking Latest News

- India spends **\$26.4 billion** annually on LPG imports, mostly transported through the Strait of Hormuz. Despite having 332 million LPG connections, around 37% of households still rely on firewood and dung.
- With electric cooking now cheaper than unsubsidised LPG, scaling up electrified kitchens could reduce import dependence, though it raises concerns about grid capacity, costs, and managing rising electricity demand.

Gas-Based Clean Cooking Faces Affordability and Import Challenges

- India rapidly expanded LPG access from 150 million connections in 2015 to 332 million by 2025, but the **model relies heavily on imports**.
- The country imports about 60% of its LPG and 50% of its natural gas, pushing the combined import bill to \$26.4 billion in FY 2024-25, according to IEEFA.

- This growing dependence makes Indian households vulnerable to price shocks from geopolitical tensions in West Asia, indicating that gas-based clean cooking has reached an affordability and sustainability limit.

Electric Cooking vs Gas: Cost and Efficiency Comparison

- Studies indicate that electric cooking is cheaper than gas-based cooking.
- An IEEFA analysis found electric cooking to be **37% cheaper** than non-subsidised LPG and **14% cheaper** than piped natural gas for a typical urban household.
- Electric cooking technologies are significantly **more efficient**. Induction cooktops transfer about 85% of energy to the vessel, compared with around 40% efficiency for LPG burners.
 - Electric pressure cookers are also among the most energy-efficient devices.

Challenges for Indian Cooking Practices

- Indian cooking often requires multiple pots and simultaneous preparation, making single-plate induction stoves insufficient.
- Experts suggest developing multi-pot and flame-replicating induction technologies to improve adoption.
- Policy experts recommend starting electrification in urban kitchens, which would reduce LPG demand and allow limited gas supplies to support rural households lacking reliable electricity.

Concerns About Grid Capacity

- Large-scale adoption of electric cooking could increase evening electricity demand.
- This raises concerns about grid stability and power supply management if millions of households shift to electric appliances simultaneously.

Understanding Peak Electricity Demand

- Electricity demand fluctuates during the day, rising sharply during certain hours when households simultaneously use appliances such as lights, fans, televisions, and air conditioners.
- These surges are called **peak demand** periods.
- India's peak electricity demand has grown significantly, increasing from 148 GW in 2014 to a record 242.5 GW in December 2025.
- According to the IEA, every 1°C rise in temperature can increase peak demand by over 7 GW.

Impact of Mass Electric Cooking on the Grid

- If millions of households adopt induction cooktops simultaneously during evening peaks, electricity demand could rise sharply, increasing spot-market costs and the risk of grid instability.
- To avoid grid stress while expanding electric cooking, experts suggest automated demand response systems, which help manage electricity consumption intelligently during peak demand periods.

Rooftop Solar and Local Energy Trading to Reduce Grid Stress

- A rooftop solar system combined with battery storage can turn households into prosumers—both producers and consumers of electricity.
- Solar panels generate power during the day, store surplus energy in batteries, and use it later during evening peak demand.
- Using stored solar energy in the evening can offset the surge in electricity demand that may occur if millions of households adopt electric cooking simultaneously.

Growth of Rooftop Solar in India

- India's rooftop solar capacity is expected to increase from 24 GW in 2026 to over 41 GW by 2030.
- This is supported by initiatives like the **PM-Surya Ghar Yojana**, which aims to provide free electricity to millions of households.

Peer-to-Peer Energy Trading

- Peer-to-peer (P2P) energy trading allows households to sell surplus solar electricity directly to neighbours through digital platforms, reducing reliance on traditional distribution companies.
- India's first blockchain-based P2P solar trading pilot in Lucknow enabled real-time energy trading through smart contracts and reduced energy purchase costs by about 43%.
- When neighbourhoods share solar energy locally, evening electricity peaks decline, distribution companies avoid expensive power purchases, and communities effectively function as micro-level virtual power plants.

Policy Steps for Electrifying India's Kitchens

- India has already begun promoting electric cooking through initiatives such as:
 - the Go Electric campaign,
 - the National Efficient Cooking Programme,
 - star labelling for induction cooktops by Bureau of Energy Efficiency (BEE), and
 - rooftop solar incentives under PM-Surya Ghar Yojana.
- To accelerate adoption, experts suggest measures such as redirecting part of the LPG subsidy toward induction cooktop subsidies, expanding bulk procurement models through EESL, and implementing time-of-use electricity tariffs.

Conclusion

- Reducing dependence on imported LPG—much of which passes through vulnerable maritime routes such as the Strait of Hormuz—would strengthen India's energy security and economic resilience.
- Urban areas are well positioned to adopt electric cooking due to reliable grid infrastructure, expanding smart-meter networks, and the growing viability of rooftop solar systems, making them an ideal starting point for large-scale electrification of kitchens.

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