

A tale of two states

Energy consumption patterns of households in Uttar Pradesh and Maharashtra

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India is pushing for adoption of clean and efficient energy sources and end-use technologies at the household level. SAUBHAGYA has extended electricity connections to 26 million homes and UJJWALA has provided 75 million LPG connections. Significant efforts are also being made to increase awareness and adoption of LED bulbs, energy efficient appliances, electric vehicles, and rooftop solar. These efforts along with increase in incomes, urbanization, and rapid advances in technology are expected to change the household energy consumption patterns substantially. It is crucial to study these emerging patterns to inform policies aimed at influencing demand as well as planning of resources required to meet the demand. However, there is very little information on how people use energy in their homes in India. A detailed residential energy consumption survey of 3000 semi-urban and rural households of Uttar Pradesh (UP) and Maharashtra (MH) by Prayas (Energy Group) gives some insights that can potentially inform policy decisions. We briefly describe three key insights.

Duration of electricity supply is the most important factor to allow meaningful use of appliances. Households reported about 15 hours of average daily supply in UP and 22 in MH. Furthermore, about 47% of surveyed households in UP and 6% in MH reported damage to appliances due to poor power supply quality. Issues with quality of electricity supply should be addressed in both states, more so in UP. Lighting, the most basic use of electricity, presents a more positive story. More than 80% of the total bulbs and tubelights in the surveyed households in UP and 60% in MH are the energy efficient LED lighting. UJALA, a government programme, should be credited for this widespread adoption. Majority of the surveyed households cited good performance as a primary reason for buying LED bulbs. Hence the focus now needs to be on ensuring the availability of good quality LED bulbs to sustain this on-going market transformation.

Space cooling is the next common use of electricity. More than 90% of the surveyed households in both the states own ceiling fans while the ownership of air-coolers is about 40% in UP and 23% in MH. About 3.5% of the surveyed households in both states own an air-conditioner. Ceiling fans and air-conditioners are covered under Bureau of Energy Efficiency (BEE)'s star-rating programme under which more efficient appliances are given labels with more stars. Only about 6% of the surveyed households in UP and 18% in MH reported owning star-rated ceiling fans. In the case of air-conditioners, the number is higher at about 51% in UP and 68% in MH. BEE can conduct a national level campaign to increase awareness about the star-rating programme targeted at ceiling fans while also introducing the programme for air-coolers.

Cooking is mostly non-electric but contributes significantly to the total household energy consumption. Several government interventions, UJJWALA being the latest, have aimed at eliminating the use of solid fuels for cooking to avoid the adverse health impacts associated with them. More than 90% of the surveyed households in both states have LPG connections. Furthermore, about 67% of the households in UP and 95% in MH use LPG for *most* of their

cooking. However, the use of solid fuels has not completely stopped. About 45% of all the surveyed households in UP and 12% in MH still use solid fuels for part or all of their cooking. Majority of these households find LPG to be expensive while some prefer the taste of food cooked over fire to shift to LPG for all of their cooking. Interventions, both economic and behavioural, are needed to push for sustained and exclusive use of LPG or other clean alternatives to eliminate the use of solid fuels for cooking. Additionally, survey findings show that people continue using solid fuels to heat water for bathing even though they may have shifted to LPG for cooking. Among households that use solid fuels for water heating, about 37% of the households in Uttar Pradesh and 91% in Maharashtra use LPG for *most* of their cooking. This suggests interventions focused on eliminating the use of solid fuels for cooking may not work for water heating.

These insights highlight the value of a detailed residential energy consumption survey. Periodically collecting such information which is representative at both national and sub-national level is crucial for informing and evaluating policies aimed at managing the rapidly changing household energy demand in India. The newly formed National Statistical Office (NSO) which includes the National Sample Survey Organization (NSSO) can periodically conduct this survey similar to its other large scale surveys on household expenditure, housing conditions, health and other aspects at household level.

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