Electricity and Clean Cooking Strategy for India

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More than two-thirds of rural India uses solid biomass for cooking with its attendant harmful effects on health [National Sample Survey Office (NSSO), *68th Round*]. In parallel, the country aims to achieve universal electrification by 2022. Theoretically, if electric cooktops were adopted, universal electrification could translate into universal clean cooking as well!

As of now, there is no target year to achieve universal clean cooking. Indeed, considering the magnitude of the task ahead, the current strategy of promoting liquid petroleum gas (LPG) and efficient biomass cooking via improved cook-stove may take a while to achieve this important objective. The announcement in Union Budget (2016-17) of extending LPG connections to 5 crore BPL families in the next 3 years is a major step forward. However, there is a total of over 12 crore households without a clean cooking solution so that a strategy based on LPG alone may take a long time to get there. India already imports 50% of its domestic LPG requirement and international prices of oil and gas are volatile. Therefore, it makes good sense to include electricity in the overall clean-cooking strategy.

It is likely that for some time to come locally available biomass, LPG and kerosene will all remain a part of the basket of fuels used for cooking in India. It is our view that it is time that we make electricity an integral part of this basket. This energy is emission-free at the point of consumption and therefore alleviates the problem of black carbon that fills a large number of Indian homes today. Additionally, there is no problem of availability of power, it is broadly cost-effective, does not have an import-dependence dimension and is already likely to be delivered to everybody in the next six years or so. Consistent with government's welfare agenda, electricity subsidy dispensation is amenable to an efficient direct benefit transfer (DBT), too. In short, there is plenty in its favour as a cooking energy.

The convenience of electric cooking has led to its adoption as the preferred cooking energy in virtually all the developed economies of the world. With the largest share of population in the world that relies on LPG and zero reliance on electricity for cooking, India is an outlier. This means that substantial scope for the expansion of electricity as cooking energy exists.

What has held back the country from including electricity in the national strategy? Perhaps, we chose to go for a two-pronged strategy — LPG for urban India, and biomass for rural India. To be sure, we tried to usher in efficiency in biomass cooking by promoting improved cook-stoves (normal one and forced-draft type) but until the recent decision to take LPG to rural India, our strategy remained confined to looking for stoves that would minimize the emission of smoke indoors. Hence, it may be stated that for rural India, which comprises 69% of the nation's population as per

2011 census, we have had no '*clean cooking fuel*' strategy until recently. Instead, we only had an "efficient-cook-stove" strategy.

And, how has this strategy fared? As per a recent large-scale study by the Council of Energy, Environment and Water (CEEW), a think-tank, the coverage of efficient cook-stoves in the sample states is not more than 1%! Consequently, the provision in the Union Budget (2016-17) for the extension of LPG to rural India is a major step towards freeing India's rural households from the problem of indoor pollution. While we rollout this programme to cover five crore households in the next three years, let us also look at electricity as a complementary solution.

The number of households without clean cooking fuel today is more than twice that without electricity. An obvious implication is that if we encourage and incentivise households in both rural and urban areas to use electricity for cooking, the clean cooking deprivation problem can be solved faster.

According to a NITI Aayog study, the consumption of 8 to 10 LPG cylinders (14.2 kg each) per year is equivalent to electricity consumption of nearly 4 kWh per day. This implies that at prevailing electricity prices, the electric solution costs about the same as the LPG solution at the crude oil price of around $60 per barrel. While the price of crude is currently below this level, in the long run, we are more likely to face a price of $50 per barrel or higher. Hence, the electric solution to cooking would be financially feasible, especially if the government decided to give an electricity subsidy equivalent to that on LPG.

A potential criticism of electricity-based option concerns adequate availability of electricity. Electric cooktops are usually of above 1 kWh rating. In contrast, our rural electrification schemes provide electricity that is just sufficient for lighting and running fans.

There are two responses to this criticism. First, we could focus on spreading the electric-cooking solution to urban areas where adequate supply of electricity exists. This would then release LPG cylinders currently in use in urban areas for distribution in rural areas.

Second, recognizing that we must eventually provide as much electricity as demanded at all times even in rural areas, we may consider strengthening electricity transmission and distribution infrastructure sooner than later. After all, the LPG or natural gas-based solution in rural areas would also require the creation of a vast distribution network either in the form of LPG distributors or gas pipelines.

An advantage of the electricity-based solution is that it can make use of solar power in both urban and rural areas. The solution may be particularly attractive in remote rural areas where electricity grid may take time to reach but sunshine is plentifully available and solar energy may be easier to provide.

Another potential criticism of electricity-based solution is that electric cooktops do not lend themselves to Indian cooking. This is a misconception. During forty years of living abroad, one of us has had the option to choose between gas and electric cooktops and he always chose the latter. This never came in the way of cooking dishes from any parts of India. And, yes, Chapattis do puff up on an electric cooktop as well as on a gas cooktop. Moreover, the electric cooktop is easier to keep clean!

In concluding, we note that the suggestion here is not to abandon alternative solutions to India's indoor pollution problem. Instead, we suggest that electric cooktop ought to be given serious consideration for inclusion in the basket of solutions to the problem.