



COLLABORATIVE
Clean Air
POLICY CENTRE

POLICY BRIEF

June 2019 • CCAPC/2019/02

Ujjwala, V2.0

What should be done next?

Alok Tripathi and Ambuj Sagar

Reviewed by

E Somanathan
Indian Statistical Institute, New Delhi

Edited by

Santosh Harish and Kirk R. Smith
Collaborative Clean Air Policy Centre, New Delhi

ccapc.org.in

Contributors

Alok Tripathi is Executive Director of the Petroleum Conservation Research Association. He was previously Director, Ministry of Petroleum and Natural Gas, GoI, and was associated with programmes like Give It Up, PAHAL, and Direct Benefit Transfer for Kerosene.

Dr. Ambuj Sagar is Vipula and Mahesh Chaturvedi Professor of Policy Studies and Founding Head, School of Public Policy at IIT Delhi.

Executive Summary

Stopping the use of wood and other solid fuels for cooking and other household uses is the single most important step we need to take to mitigate air pollution and its staggeringly high health impacts in India. In addition to its ill effects on the households themselves, it accounts for 25-30% of exposure to *outdoor* particulate matter pollution in the country. The health costs are enormous: about 480,000 premature deaths annually due to direct exposure of the households, and another 270,000 due to “indirect” exposure outdoors. The bulk of this could be attributed to cooking with fuels like firewood, dung, and agriculture residue. Any government effort that effectively reduces the use of solid fuels in cookstoves should hence be recognized as an important pollution control and public health initiative.

Launched in May 2016, the Pradhan Mantri Ujjwala Yojna (Ujjwala henceforth) is the world’s largest programme to provide access to clean cooking energy to poor people. Under this scheme, a financial assistance of Rs.1600 was provided to each eligible household under Socio Economic and Caste Census (SECC) list to underwrite an LPG connection with one of the Oil Marketing Companies. A budgetary provision of Rs.8000 crores was initially made to cover five crore households under the scheme. Having already achieved this initial target, the government revised the target to eight crore to be achieved by 2020.

Although the Government of India has been successful with its ambitious effort to provide LPG connections to the poor, the beneficiaries’ inability to afford sustained use of LPG cylinders remains a concern.

There are three main barriers to access of LPG by poor households: *accessibility* facilitated by LPG distributorship networks, *affordability* in terms of high upfront cost and high refill cost, and *awareness* about the impact of use of LPG. Ujjwala primarily tackles access, and partly affordability as it takes care of upfront expenditure making a new connection affordable and convenient. However, access is only the first step towards regular usage of LPG — it is a necessary, but not a sufficient, condition to bolster usage. To ensure sustained use of LPG by poor households requires additional interventions, an “Ujjwala 2.0”.

The affordability issue is particularly salient for poor communities since they have access to free fuel (wood, dung, crop residues) and will switch back to such fuel if LPG prices are too high for them. But addressing this issue requires the government to walk the fine line between providing LPG at a cost that the poor can afford and its budgetary constraints. The latter is especially of concern since more than 50% of the country’s LPG requirement is met through imports. Any solution has to make LPG affordable to poor without increasing the financial burden on the government.

The provision of universal subsidy to all LPG consumers reduces the subsidy rate, since the overall amount available for subsidy is shared across a large number of beneficiaries. The reduced subsidy rates are also regressive: LPG remains unaffordable for the poor, while the benefits accrue to the relatively wealthy.

We propose that Ujjwala 2.0 should have a two-tier, differential pricing for households: LPG at subsidized price for identified poor households, and at the unsubsidized price for other consumers. In order to achieve our objective, the subsidy rate for the identified poor households should be based on their willingness and ability to pay. Our analysis of the National Sample Survey data suggests that households should be willing to use LPG as the primary cooking fuel, if the fuel costs are within 4% of their total monthly expenditure. Subsidies could be calculated to ensure the prices the households face meet this condition. The quantity of subsidized LPG could be restricted to 126 kg, or 9 cylinders, per annum. The delivery of the subsidy would continue to be through conditional cash transfers (the existing PAHAL scheme), minimizing risks of diversion of subsidies to non-intended beneficiaries.

LPG subsidy should not be seen as financial burden, as provision of LPG results in improved health outcomes for poor households, especially women and children. Access to LPG also results in improved economic productivity of the household, due to reduced time spent in cooking. The government expenditure on the health system also reduces with the reduction in diseases attributed to household air pollution. Thus subsidy provision for the poor to ensure regular use of LPG for cooking should be seen as a social investment by the government.

There still remains the third barrier discussed above, namely, awareness. The government had in the past launched the “Give It Up” campaign, requesting well-off people to give up their LPG subsidy voluntarily and to create awareness among them about the benefits to the poor households switching to clean fuels. The scheme was a huge success, as more than one crore consumers gave up their LPG subsidy entitlement. Under Ujjwala 2.0, the government must include intensive education campaigns sensitizing the general public about the need for targeting the subsidy to the poor only, myths about the taste of food cooked using LPG, and safe handling and conservation.

Such an approach for Ujjwala 2.0 has the potential to take the outstanding success of the Ujjwala programme to the next level, and help the poor gain from the benefits of the clean cooking energy transition.

1. Introduction

In order to provide clean energy for cooking to poor households in the country, the Government of India announced in 2016 an ambitious project named Pradhan Mantri Ujjwala Yojana (Ujjwala). Under the scheme, the government provides financial assistance to the identified poor households to meet the upfront cost of LPG connection. The beneficiaries were identified from the Socio Economic and Caste Census (SECC) list, which was prepared by the Ministry of Rural Development, based on comprehensive door-to-door enumeration across the country to generate information on a large number of social and economic indicators relating to households.

The central government had initially targeted to cover 5 crore households under the scheme by 2019 and allocated a budget of over ₹8000 crores (1.2 billion USD). However, in the wake of huge response to the scheme, the government in 2018 approved the enhancement of Ujjwala target from five crore to eight crore with an additional budgetary allocation of ₹4800 crore. The revised target of Ujjwala will be achieved by 2020. Furthermore, while expanding the target, the government also expanded the coverage of the scheme¹. This expansion was done to ensure that no genuine beneficiary was left out of the scheme (PIB, 2018). The Government of India approach to expand the LPG coverage among the poor households is laudable, and is unprecedented in its scale.

1 Additional beneficiaries include all SC/ST households with BPL cards, beneficiaries under Pradhan Mantri Awas Yojana (PMAY Gramin), Antyodaya Anna Yojana (AAY), Forest Dwellers, Most Backward Classes (MBC), tea and Ex-Tea Garden Tribes, people residing in Islands and rivers etc

Women and children have been the worst affected by household air pollution (HAP). Despite this, women are typically not involved in decision-making regarding the choice of cooking fuel they use in their kitchen. Under Ujjwala, the LPG connections are issued in the name of the women of the identified households. Issuing LPG connection in the name of women shows the government’s determination to improve their living conditions and empower them in deciding the cooking fuel. In addition, Ujjwala saves time that they spend in collecting solid biomass fuel such as wood, crop residue and cow dung.

Ujjwala has significantly increased the LPG penetration in the country. The LPG coverage has increased to nearly 89% in recent years, thanks to various policy initiatives of the government (PPAC, 2019a). However, a significant portion of the population, especially the poor and those living in rural areas, is still dependent upon solid fuels like wood, crop residue, cow dung, or coal for meeting its primary cooking needs. Use of such dirty fuels results in HAP, which is one of the most important risk factors in the country for chronic respiratory diseases, cardio and circulatory diseases and diarrhea and other infections. According to the estimates by the University of Washington, about 4.8 lakh people died prematurely in India in 2017 from illnesses attributable to the smoke indoors (GBD, 2017).

The paper is structured as follows. In the next section, we outline the main barriers to the expansion of access to LPG. Section 3 discusses the design of the subsidies, chiefly the subsidy rates, and the quantum of subsidized LPG. Section 4 compares the subsidies to the benefits

of improved usage of LPG, and shows how the benefits substantially exceed the costs. Section 5 argues for targeting of subsidies to the poor. Section 6 concludes.

2. Barriers to the expansion of LPG

The main barriers to access of LPG by poor households are affordability, accessibility and awareness. The affordability constraint is composed of two parts, upfront costs and monthly refill costs. Ujjwala directly provides the upfront cost, by providing free LPG connections (about ₹1600 covering the costs of cylinder deposit, regulator, hoses, etc.), thus ensuring access of LPG to deprived sections of the society. For recurring refill cost, everyone in the country has been provided some relief via a national subsidy program. The government regulates the LPG price for every household up to the consumption of 12 cylinders per annum to insulate the consumer from fluctuating international prices of LPG. However, this has not led to a significant penetration of LPG among the poor and instead, resulted in significant subsidy payments to better-off segments of the population that do not require subsidies.

The “Give It Up” scheme, precursor of Ujjwala, started in 2015 with the aims of generating awareness about the ill

effects of using dirty solid fuels for cooking, and developing sensitivity among the people about the need to provide access to LPG for the poor (Give It Up, 2016). As of March 2019, about 1.04 crore middle-class households had given up their subsidy in order to provide free connection costs to poor families (MOPNG, 2019). Pioneering and valuable as this was, this programme was seemingly unable to provide the many tens of millions of additional connections needed for poor households. Ujjwala was designed to fill this gap by providing subsidized access to the poorest households.

Although access is an essential first step, it is clear that many *Ujjwala* beneficiaries have not yet adopted LPG as a regular cooking fuel after they were provided LPG connection, due to recurring costs of refills. Early in the program, the government said that the refill percentage of *Ujjwala* connections is 80%, (Financial Express, November 10, 2016). A survey conducted by CRISIL indicates that the LPG refill rates for many poor households are highly dependent upon the purchasing price of LPG (CRISIL, 2016, 59). The programme is still new, however, and there may be increased usage over time in many households.

Figure 1 shows that the non-subsidized LPG prices has fluctuated from a minimum of Rs.468 in September

Graph Showing Trend of Subsidized and Non-Subsidized Price of LPG in India

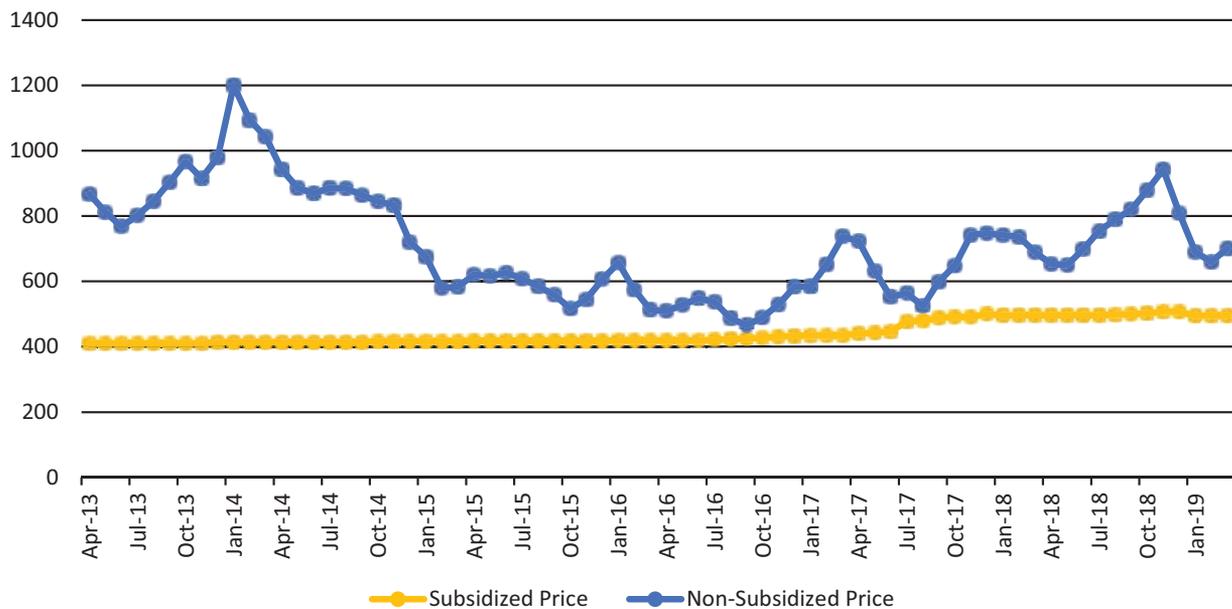


FIGURE 1: Subsidized and non-subsidized prices (in ₹) of LPG in India over time

Source: PPAC website

2016 to a maximum of Rs.1207 in January 2014 (PPAC, 2019). On the other hand, the subsidized prices increased marginally from Rs. 412 to Rs. 495 per cylinder (as of March 2019) due to the government's earlier decision of slowly increasing the refill price of a cylinder by Rs.4 every month until the subsidized price reaches at the level of non-subsidized price. Since October 2017, however, there has not been any increase in the price of subsidized LPG, apparently due to the government's decision to stop the Rs.4 monthly increase (NDTV, 2017).

With the introduction of the PAHAL scheme, every LPG consumer gets the subsidy in their bank account and pays the non-subsidized price to buy LPG. Therefore, when non-subsidized LPG price is high, the poor household finds it difficult to pay the full market price at the time of purchase and gets demotivated to use LPG even though the government subsidy is deposited quickly in the consumers' bank account. Perhaps, this issue can be addressed to some extent by making access to banking services convenient. However, if subsidy given to poor households is eliminated, slowly or not, many will likely shift back to biomass fuel as it is almost free of cost in many parts of the country. While the government is ensuring the accessibility of LPG to poor households by providing them free connections, the consistent use of LPG by these households depends on the price they pay for LPG.

3. Design of subsidies

3.1 Universal subsidy is regressive

Universal LPG subsidies are not ideal as they are regressive in nature, benefitting the richer income groups more than the poor. As per Jain et al. (2016), an average household requires 126.4 kg per annum (or 11kg a month) to meet its complete cooking needs from LPG. This is also in line with the Niti Aayog's assessment in regard to energy demand for cooking (Niti Aayog, 2018).

Table 1 shows that the percentage expenditure on LPG (column 3) increases as one moves from the richest quintile to the poorest quintile. Granado and others conclude that the subsidy benefits availed by the top income quintile is 14 times more than that the bottom quintile, and that the universal LPG subsidy is a costly and inefficient way to protect the welfare of poor households (Granado et al., 2012).

The provision of universal subsidy results in a financial burden on the government. Therefore, after getting a massive response with the "Give It Up" campaign, the Government, in early 2016, linked subsidy eligibility with income to exclude those earning Rs.10 lakhs or more per annum. Although, these initiatives are a start at improved targeting of subsidies, they are not sufficient to focus the subsidies on the poor entirely.

TABLE 1: PRICE OF LPG DESIRED FOR HOUSEHOLDS OF DIFFERENT QUINTILE CLASS TO BE WILLING TO PURCHASE

Quintile Class	Monthly Household Consumption Expenses (MHCE)*	Percentage MHCE required for 11 kg of LPG if purchased at March '19 subsidized price of Rs. 495 per cylinder	Price of LPG per 14.2 kg cylinder to keep the % expenditure on fuel below 4% (INR)	Subsidized price of 14.2 kg cylinder (March '19)	Non Subsidized price of 14.2 kg cylinder (March,19)	Subsidy required to keep the expenditure on fuel below 4 %
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Quintile 5 (Richest 20%)	15882	2.4	820	495	701	-119
Quintile 4	11675	3.2	600			101
Quintile 3	9739	3.8	500			201
Quintile 2	8580	4.4	440			261
Quintile 1 (Poorest 20%)	6980	5.4	360			341

*Data taken from Household Survey on India's Citizen Environment & Consumer Economy (ICE 360 Survey), 2016. Estimates rounded to whole numbers

3.2 Is LPG subsidy to poor households a burden on the government?

While the government effort to curb the LPG subsidy burden is understandable, elimination of LPG subsidy to poor households would result in avoidable loss of social benefits such as improved health and time saved in cooking, by causing many households to switch back to dirty cooking fuel options. Hence, we need more efficient targeting of the benefits to the poor only, and better design of subsidies to sustain their usage of LPG.

3.3 How much LPG subsidy is required to help poor households sustain their use of LPG?

In order to determine the LPG subsidy level for poor households, recent surveys offer important insights.

- From the latest available survey of National Sample Survey Organization (NSSO) (68th Round in 2011-12), the percentage expenditure on fuel and light varied from 4.6 % in highest decile class in urban area to almost 12 % in poorest decile class in rural area (NSSO-555, A-936, A-972). The survey further showed that the LPG penetration in these two-decile classes was more than 80 % and 0.45 % (close to zero) respectively (NSSO-567, 19), indicating that the richest class was primarily meeting its cooking requirement from LPG while poorest class was not using LPG at all.
- Similarly, previous surveys of NSSO show that, on average, households in India spend approximately 7-8 % of the total monthly expenditure on all fuel and lighting (NSSO-555, 13); the percentage expenditure on cooking fuel alone will naturally be lower.
- A recent household survey conducted by CRISIL found that the willingness to pay for LPG at Rs. 313/ month in rural and Rs.333/ month in urban areas, which is around 4.5 % of the total monthly consumption expenditure of the lowest income class household observed in the ICE 360 survey (CRISIL, 2016).

Thus, we can assume that if we keep the LPG expenditure for all households within 4% of their overall expenditure, everyone may be able to use LPG as a primary fuel for cooking. Table 1 compares the price of LPG different quintile classes of households would be willing to pay to buy LPG, based on subsidized and non-subsidized prices from March 2019. The analysis is meant to be illustrative

to show how the subsidies can be computed from time to time, to keep the prices to within 4% of the monthly household expenditure of the poorest quintile.

From Table 1, it is seen that the price of subsidized LPG cylinder (column 5) for the households in top three quintile classes is lower than the price these households are willing to pay to use LPG (column 4). Therefore, even if the subsidized price for these households is increased, they will likely continue buying LPG. On the other hand, the subsidized price for bottom two quintile classes are higher than the price these households may be willing to pay to purchase LPG. Therefore, these households are likely to be unable to pay for LPG, and would further shift away from LPG if the price they face increases. Most households without access to LPG belong to the two poorest quintile classes. Although *Ujjwala* ensures access of LPG to these households, the consistent use of LPG by them would need prices to be at a level at which they would be willing to buy LPG. In other words, in the above example with March 2019 prices, the subsidy amount for these households will have to be increased to roughly Rs.350.

While, any increase in subsidy amount for poor households will result in higher financial outgo from the government's exchequer, LPG subsidy should not merely be seen as a financial burden. Provision of LPG results in improved health for poor households (especially women and children), time saved for cooking, and thus increased economic productivity of the household. The government's expenditure on health system also reduces to the extent of reduction in diseases attributed to HAP. Thus provision of subsidy for the poor to ensure consistent use of LPG for cooking should be seen as a social investment by the government for welfare of the poor households.

4. Understanding LPG subsidy burden with social benefits of providing access to LPG

Applying the decadal growth given in the Census, the estimated number of households in the country was about 28.04 crore on January 1, 2019 (PPAC, 2019a). There are about 25.21 crore LPG connections in India, although some may be "ghost" connections representing black market and other misuses of the system (PPAC, 2019a). Thus, the households without any LPG access at all seems to be around 2.83 (28.04-25.21) crores. Actual number of

people affected from HAP would be substantially higher as many of the households with LPG access do not use LPG as the primary fuel for cooking.

4.1 Health Benefits

There are various ways of estimating the health related benefits of mitigating household air pollution. Here, two ways of calculating the benefits have been described.

WHO CHOICE Method: Nearly 1.58 crore DALYs (Disability Adjusted Life Years) were lost in India on account of household air pollution in 2017, just as the current LPG programs began (GBD 2017). Although the economic impact of the HAP is difficult to evaluate, Smith and others take the WHO CHOICE approach to use the per capita annual income as the value of one DALY, to determine the upper bound of the amount for the government to spend on health interventions (Smith et al, 2014, p 728). Taking World Bank data regarding gross national income per capita of \$ 1800 (World Bank, 2019) and the USD-INR exchange rate as 69, thus, the total lost economic value from HAP is Rs. 196,236 crore ($1.58 \times 1800 \times 69$) or roughly Rs.69,000 ($196236/2.83$) per non LPG household. The country ought to be willing to pay this much to reduce the health cost on account of HAP.

Value of Statistical Life (VSL) method: Nearly 4.8 lakh people lost their life in India on account of household air pollution in 2017 (GBD, 2017). If these people were provided clean fuel like LPG, their lives could have been saved. VSL for India is estimated to be \$275000 (Viscusi & Masterman, 2017). Assuming that the non-LPG households have to spend money to avoid the risk of death on account of HAP, we find the average willingness to pay to avoid this health risk as around Rs.3.2 lakh ($4.8 \text{ lakh} \times \$275000 \times 69/2.83 \text{ crore}$).

The health benefits estimated using WHO Choice method and VSL method may not be fully available due to a number of reasons: such as, access to LPG among the non LPG population not resulting in sustained use of LPG, or significant percentage of rural population having access to LPG not using LPG as the only fuel. Let's say we discount the health benefits by 50%: we would still have benefits of Rs.35,000 as per WHO CHOICE, or Rs.1.60 lakh as per VSL as our willingness to pay to avoid health risks.

The above estimates are still undervalued since HAP also contributes to outdoor air pollution. Residential biomass

burning was responsible for 267,700 deaths, or nearly 25% of the deaths attributable to PM2.5 air pollution (GBD MAPS Working Group, 2018). Although, this would significantly increase the value of health benefit, it has not been included in the calculation. Even without accounting for these "indirect impacts", the health benefit to the population affected directly (due to use of solid dirty fuel) is far higher than the subsidy burden as can be seen in subsequent paragraphs.

4.2 Improved economic productivity due to time saved

By using the empirical data from Haryana, Pillarisetti and others have estimated time saving of 170 hours in a year per household when it shifts from biomass to LPG to meet its complete cooking needs (Pillarisetti et al, 2016). This is 21.3 days for employment and is equivalent to economic activity worth roughly Rs.3500 ($21.3 \times \text{Rs.168}$ daily wage rate of Bihar, minimum among all the states) for the household per year. This valuation of time saved is based on the assumption that the saved time will get fully utilized for economic activity. The assumption may be partially true and therefore, we suggest a lower bound of zero when the time saved is not used for wage earning at all, and an upper bound of Rs.3500 when the saved time gets completely utilized for economic activity.

Adding the value of health benefit and saving in time as estimated above gives us an upper bound of ₹1.635 lakh per family per annum using VSL method and a lower bound of ₹35000 using WHO CHOICE method of potential impact of the LPG intervention. Based on the requirement of LPG, estimated earlier (9 cylinders per annum per household), the social benefit of providing one 14.2 kg LPG cylinder to the household is estimated to have a lower bound of around Rs.3800 in WHO CHOICE method, and an upper bound of around Rs.18000 in VSL method.

If a poor household is provided one LPG cylinder at a price that it is willing to purchase (column 4 of Table 1), the government will have to subsidize it by Rs. 350 (column 6-column 4 of Table 1), at March 2019 prices. But the potential social welfare, ranging from Rs. 3800 to 18000 as estimated above, generated due to provision of this cylinder, is far greater than the subsidy. Therefore, the subsidy to poor households should be considered

as a social investment. The analysis is also in line with the report of International Energy Agency (IEA), which states that the social benefit of half of the world population dependent upon solid biomass fuel switching over to LPG by 2015 would be around \$ 90.6 billion, an amount far greater than the total cost (capital cost of stove and cylinder and recurring fuel cost) of \$ 21.6 billion for providing LPG to them (IEA, 2006, 439-440).

5. Streamlining LPG subsidy

In view of the above, instead of phasing out the LPG subsidy, we should find ways of targeting it better and setting it at a level that will make LPG affordable for the poor to use it as their primary cooking fuel.

5.1 Targeted Subsidy Mechanism

Besides *Ujjwala*, if poor households are to switch over to LPG for meeting their cooking needs, LPG must be provided at a price that would be even lower than the current subsidized price. This would increase the subsidy burden of the government if we do not increase the price of LPG for the richer class. Thus, ideally we should have an income-based differential pricing mechanism. But, implementation of such differential pricing, in India, at present is a challenging task, as it is difficult to map income data with the LPG consumer data. However, with the increased penetration of Aadhaar, there is a future possibility of linking the income data of the household with LPG data. Till this mapping is achieved, there could be only a two-tier differential pricing: lower price (in other words higher subsidy) for identified poor under SECC list, higher price (in other words lesser or no subsidy) for LPG consumers other than SECC list.

Tripathi et al. (2015) analyze the impact of differentiated pricing, and find that the total subsidy burden on the government to have 70 % LPG coverage in rural areas, and 90 % in urban areas would be significantly lesser than what it would have been if subsidy were provided to all.

A criticism of differential pricing in the market is the opportunity for diversion of lower priced LPG to the non-subsidized commercial market. In this regard, it is commendable on part of the government of India for having already implemented PAHAL. This is a cash transfer scheme, which besides introducing the LPG sale

at a single market price also eliminates the middleman between government and consumer, thus avoiding an important source of leakage of subsidy. This scheme has been declared as the largest bank cash transfer scheme in the world (PIB, 2015). PAHAL coupled with another scheme of the government—Jan Dhan Yojana—ensures both the financial inclusion of the poor households, and the transfer of subsidies directly into the bank accounts of the poor households.

5.2 Rate of subsidy should be dependent upon the ability to purchase

We recommend that the amount of subsidy should be based on the household's willingness to spend for LPG. As shown in column 7 of Table 1, at March 2019 prices, the recommended subsidy rate for poorest households to switch over to LPG as primary cooking fuel is roughly ₹350 per LPG cylinder. The table also shows that the poorest two-quintile classes require LPG prices to be lower than the present subsidized price of ₹495 per kg to keep their LPG costs to be within 4 % of their overall expenditure. For the richest quintile, on the other hand, the same calculation suggests that households do not require subsidies. In fact, an argument could be made to provide LPG to them at higher prices than the marginal cost.

5.3 Quantity of LPG to be subsidized

As stated above, an average household requires 126.4 kg (about 9 cylinders each weight 14.2 kg) per annum to meet its complete cooking needs from LPG (Jain et al., 2016). The quantity of subsidized LPG for an Indian poor household could be restricted to this level.

5.4 Identification of genuine beneficiaries for implementation of targeted subsidy mechanism

One of the challenges in the implementation of a targeted subsidy mechanism is in identifying households who should be provided LPG subsidy. Here, we recommend that 'Poor Households' as identified by central government under Socio Economic Caste Census (SECC) list should be considered as eligible beneficiaries for LPG subsidy. As per the SECC data, there are 8.73 crore households meeting at least one of the seven deprivation

criteria². Initially, Ujjwala included 5 crore identified households under SECC as the prospective beneficiaries of the scheme. Later, the scheme was expanded to cover more categories³. This expanded group may be taken as the targeted segment for providing the subsidy.

5.5 Consumers' sentiments

Provision of LPG subsidy has created an impression among the LPG consumers that the subsidy is their right and the government cannot take it away. Although linking household income with subsidy provision has changed the concept of universal subsidy, the income threshold (Rs. 10 lakh per annum) is fixed at such a high number that most LPG consumers are still entitled to receive the subsidy. If the government decides to restrict the LPG subsidy to the identified households under SECC list, a significant portion of the consumers (more than 65%) would go out of the subsidy regime. Naturally, this targeting would significantly reduce the financial burden. However, such a provision would generate negative sentiments among the LPG consumers, enough to desist the government to implement targeting of LPG subsidy. Therefore, we recommend an intensive education campaign should also be launched sensitizing the consumers about the need for targeting the LPG subsidy to poor only. The importance of raising awareness and building public support for LPG subsidy reform has also been stated in a Global Subsidy Initiative report (Toft et al, 2016).

5.6 Indicative financial implications

The recommended approach of restricting subsidies only to the SECC deprived households list would reduce the subsidy burden substantially from the status quo, despite increasing the subsidy rates for the beneficiaries. As an example, based on the above recommendations (LPG subsidy on 9 cylinders @ ₹350 per cylinder to the 8.73

² The deprivation criteria are as follows: (i) households with one or no rooms, kuccha walls and kuccha roof, (ii) no adult member in household between age 18 and 59, (iii) female headed household with no adult male member between 16 and 59, (iv) households with differently abled member with no other able bodied adult member, (v) SC/ST households, (vi) households with no literate adult above age 25 years, and (vii) landless households deriving a major part of their income from manual labor

³ These include all SC/STs households beneficiaries of Pradhan Mantri Awas Yojana (PMAY) (Gramin), Antyoday Anna Yojana (AAY), Forest dwellers, Most Backward Classes (MBC), Tea & Ex-Tea Garden Tribes, people residing in Islands/ river islands having no LPG connection

crore SECC deprived households), total financial burden on the government of India would be Rs. 27500 crore (9*350*8.73). This is significantly lower than the subsidy burden of around Rs.65000 crore, estimated as per the current practice (LPG subsidy on 12 cylinders @Rs.205 per cylinder to all 28.04 crore households). Again, the subsidy of Rs.350/cylinder is based on the illustrative example of March 2019 prices in Table 1. The larger recommendation is to determine the subsidy such that the subsidized price the targeted beneficiaries face is affordable enough to make LPG their primary fuel—as we have argued earlier, a good rule of thumb would be to restrict expected expenditure on LPG to within 4% of the targeted households' average monthly expenditure.

6. Conclusion

In this paper, we provide suggestions to design the next version of Ujjwala to ensure that the objective of ensuring the poor households continue using LPG is more fully met. We argue that the LPG subsidy, if targeted, is not a financial burden but rather a social investment to achieve socio-economic benefits. However, it is also true that the untargeted energy subsidies would reduce the amount of money that can be spent on programs that really benefit the poor. Therefore, the aim should be to keep the total subsidy within current levels, and perhaps even reduce overall, but to target it better based on the "ability to purchase" principle, differential pricing, and a cap on subsidized LPG. Such a targeted mechanism would not only result in a much lesser subsidy burden, but would also help in motivating the poor households to use LPG in a sustained manner and thus would help the government in achieving the true objective of Ujjwala.

References

Bruce, Nigel, Padilla, Rogelio Perez, Albalak, Rachel, 2002, "The health effects of indoor air pollution exposure in developing countries"; World Health Organization, http://who.int/indoorair/publications/health_effects/en/ accessed on 21st March 2016.

Census of India, 2011, "Percentage households to total households by Amenities and assets"; <http://www.censusindia.gov.in/2011census/hlo/Houselisting-housing-PCA.html> accessed on 21st March 2016.

CRISIL, 2016, "Assessment report: Primary survey on household cooking fuel usage and willingness to convert

to LPG June 2016”, Petroleum Planning and Analysis Cell, Ministry of Petroleum and Natural Gas, <http://ppac.org.in/WriteReadData/Reports/201710310449342512219PprimarySurveyReportPPAC.pdf>, accessed on 9th July 2018.

GBD MAPS Working Group. 2018. Burden of Disease Attributable to Major Air Pollution Sources in India. Special Report 21. Boston, MA: Health Effects Institute. <http://www.indiaenvironmentportal.org.in/files/file/GBD-MAPS-SpecRep21-India.pdf>, accessed on 12th July 2018.

GBD 2017, “GBD Results Tools”, <http://ghdx.healthdata.org/gbd-results-tool>, accessed on 23rd March 2019.

Give It Up, 2016, <http://www.givitup.in/about.html>, accessed on 19th April 2016.

Granado, J. A., Coady, D., and Gillingham, R., 2012, “*The unequal benefits of fuel subsidies: A review of evidence for developing countries*”, IMF Working Paper WP/10/202. IMF. Retrieved from <https://www.imf.org/external/pubs/ft/wp/2010/wp10202.pdf>, Accessed on 21st March 2016.

IEA, 2006, “Energy for Cooking in Developing Countries” Chapter 15 in World Energy Outlook 2006, International Energy Agency, <http://www.worldenergyoutlook.org/media/weoweb/2008-1994/WEO2006.pdf> accessed on 12th April 2016.

Jain, Abhishek, Agrawal, Shalu, Ganesan, Karthik, 2014, “Rationalising Subsidies, Reaching the Underserved: Improving Effectiveness of Domestic LPG Subsidy and LPG Distribution in India”, CEEW Report, Council for Energy, Environment and Water, <http://ceew.in/pdf/CEEW-Rationalising-LPG-Subsidies-Reaching-the-Underserved-5Dec14.pdf>, Accessed on 19th April 2016.

MOPNG website, 2019, <http://petroleum.nic.in/>, accessed on 23rd March 2019.

NDTV, 2017, “Cooking Gas Hike Of Rs. 4 Per Cylinder Every Month Withdrawn”, <https://www.ndtv.com/business/cooking-gas-hike-of-rs-4-per-cylinder-every-month-withdrawn-1793109>, accessed on 11 July 2018.

Niti Aayog, 2018, “Energy Demand for Cooking”, http://indiaenergy.gov.in/iess/demand_cooking.php, accessed on 9th July 2018.

NSSO Report no 567, 2015, “Energy Source of Indian Households for Cooking and Lighting. 2011-12”, Ministry of Statistics and Programme Implementation, National Sample Survey Office.

NSSO Report no 555, 2015, “Level and Pattern of Consumer Expenditure 2011-12”, Ministry of Statistics and Programme Implementation, National Sample Survey Office.

ICE Survey, 2016, “Household Survey on India’s Citizen Environment & Consumer Economy”, People Research on India’s Consumer Economy (PRICE), 2016

Pillariseti, Ajay, Jamison, Dean T., Smith, Kirk R., “Household Energy Intervention and Health and Finance in Haryana, India: An Extended Cost-Effectiveness Analysis”, Disease Control Priorities 3rd edition, World Bank, 2016.

PIB, 2018, “Cabinet approves enhancement of target under Pradhan Mantri Ujjwala Yojana”, Press Information Bureau, Government of India, Cabinet Committee on Economic Affairs (CCEA), <http://pib.nic.in/newsite/PrintRelease.aspx?relid=176351>, accessed on 24th June 2018.

PPAC, 2019, “Petroleum price and under recoveries”, Petroleum Planning & Analysis Cell, Ministry of Petroleum and Natural Gas, [https://www.ppac.gov.in/WriteReadData/userfiles/file/PP_7_b_PS_oil_prices\(H\).pdf](https://www.ppac.gov.in/WriteReadData/userfiles/file/PP_7_b_PS_oil_prices(H).pdf) accessed on 25.03.2019.

PPAC, 2019a, “LPG PROFILE (Data on LPG Marketing) as on 01.1.2019”, Petroleum, Planning & Analysis Cell, <https://www.ppac.gov.in/WriteReadData/Reports/201902190515530896582LPGProfileWeb1.1.19.pdf>, accessed on 24th March 2019.

PPAC, 2018b, “Petroleum Prices and Under-Recoveries”, Petroleum, Planning & Analysis Cell, http://ppac.org.in/content/149_1_PricesPetroleum.aspx accessed on 15th July 2017.

Press Release dated December 5, 2015, “Pahal- Guinness World Record”, Press Information Bureau, Government of India, <http://pib.nic.in/newsite/PrintRelease.aspx?relid=132587> Accessed on 19th April 2016.

Smith, Kirk R., 2014, “Making the Clean Available: Breaking out of India’s Chulha Trap”, a presentation in Energy Access Department, World Bank on January 30, 2014, ehsdiv.sph.berkeley.edu/krsmith/Presentations/2014/WB.pdf accessed on 23rd April 2016.

Smith, K.R., A. Woodward, D. Campbell-Lendrum, D.D. Chadee, Y. Honda, Q. Liu, J.M. Olwoch, B. Revich, and R. Sauerborn, 2014: Human health: impacts, adaptation, and co-benefits. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral

Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 709-754

Toft, Lasse., Beaton, Christopher., Lontoh., Lucky., 2016, "International Experience with LPG subsidy Reform", International Institute for Sustainable Development (IISD), <http://www.iisd.org/sites/default/files/publications/international-experiences-with-LPG-subsidy-reform.pdf>. Accessed on 23rd January 2018.

Tripathi, A., Sagar, A. D., Smith, K.R., 2015, "Promoting Clean and Affordable Cooking Smarter Subsidies for LPG", Economic and Political Weekly, November 28, 2015, Vol. 48.

Viscusi, W. Kip, Masterman Clayton J., 2017, "Income Elasticities and Global Values of a Statistical Life", *Journal of Benefit-Cost Analysis*, 8(2): 226-250, 2017

Viscusi, W. Kip, 2005, "The Value of Life", The Harvard John M. Olin Discussion Paper Series, JOHN M. OLIN CENTER FOR LAW, ECONOMICS, AND BUSINESS, Harvard Law School, http://www.law.harvard.edu/programs/olin_center/papers/pdf/Viscusi_517.pdf, accessed on 12th July 2018.

WHO, 2012, "Household air pollution burden of disease by country, 2012", Global Health Observatory data repository, <http://apps.who.int/gho/data/node.main.HAPBYCAUSEBYCOUNTRY?lang=en> accessed on 21st March 2016.

World Bank, 2019. "GNI per capita, Atlas method (current US\$)" World Bank Website, <https://data.worldbank.org/indicator/NY.GNP.PCAP.CD>, accessed on 24th March 2019.



COLLABORATIVE
Clean Air
POLICY CENTRE

The Collaborative Clean Air Policy Centre explores, evaluates, and compares policy options for dealing with India's health-damaging air pollution problems.

A joint activity of

Berkeley
UNIVERSITY OF CALIFORNIA



Sri Ramachandra Medical College and Research Institute
(Deemed to be University)

teri

THE ENERGY AND RESOURCES INSTITUTE
Creating Innovative Solutions for a Sustainable Future

URBAN
emissions
.info | 

Collaborative Clean Air Policy Centre
India Habitat Center
Lodhi Road, New Delhi, 110003

Visit ccapc.org.in
info@ccapc.org.in
 [@ccapc_org](https://twitter.com/ccapc_org)