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Beyond Ujjwala: Ideas to enhance LPG use sustainably

Ann Josey, Ashok Sreenivas, Ashwin Dabadge

The authors are researchers with Prayas (Energy Group)

Reviewed by

Abhishek Jain

Abhishek Jain is a Senior Programme Lead at the Council on Energy, Environment and Water

Edited by

Santosh Harish and Kirk R. Smith

Collaborative Clean Air Policy Centre, New Delhi

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Executive summary

The Pradhan Mantri Ujjwala Yojana (PMUY) has been successful in providing LPG connections to nearly every household in the country. However, LPG consumption by PMUY beneficiaries and other poor households is quite low. For example, in 2017-18, the average consumption of LPG by a PMUY household was only 3.4 cylinders per annum in contrast with 5.5 cylinders by an average rural household and 7.4 by an average urban household. As a result, the larger objectives of the programme regarding improving health outcomes for rural women and children remain unmet. This calls for interventions that can help increase LPG consumption by poor and rural households.

There are three challenges that need to be overcome for this: affordability, reliable access and behaviour change. In this paper, we provide some suggestions to address the affordability and reliable access challenges. To address affordability, the following measures are proposed:

- i. The current loan scheme under PMUY forces households to buy cylinders at unsubsidised prices until the loans are repaid, thus discouraging them from purchasing refills. Therefore, this should be phased out. This will only involve a one-time cost.
- ii. An increased and graded subsidy may be provided to PMUY and poor consumers which can be tapered off over a period of, say, four years. Providing such a subsidy will encourage them to consume greater quantities of LPG, and over time they are more likely to be willing to pay the normal subsidised price. This will require recurring expenditure for at least some years.
- iii. There are concerns about subsidy amounts being deposited into customer accounts with some delay, which can be a concern for poor consumers with cash-flow challenges. Digital technology can easily be leveraged to address this and ensure prompt subsidy credit to consumer accounts. This will promote digital transactions in addition to addressing cash-flow challenges.

Adopting such measures would result in increased financial burden, which is also a social investment by the government. Some measures to ameliorate this increased subsidy are suggested such as:

- i. The number of subsidised cylinders per annum provided to households can be reduced from the current 12 to 9, which would be sufficient for most households.
- ii. It is possible to increase the efficiency of LPG stoves by more than 10 percentage points, by introducing mandatory standards and labelling for LPG stoves, and expediting a market transformation to efficient stoves. This would reduce LPG consumption significantly, thus not only reducing subsidy but having additional benefits such as reducing India's import bill and saving on GHG emissions.
- iii. The subsidy net is currently cast wide, with over 85% of customers being subsidised. There is room to improve targeting of subsidy and thus reduce subsidy requirements. Measures to do this include gradually moving to an opt-in rather than opt-out mechanism for most non PMUY and poor consumers, and by using other wealth indicators to weed out those who need not be subsidised.
- iv. The financial burden of subsidy can be shared with other ministries (such as the Health ministry) and state governments, since they also gain from improved usage of LPG. Moreover, their expertise and field presence can also be leveraged for the purpose of encouraging LPG usage.
- v. The government could consider using a small part – estimates suggest that 3% should be sufficient – of the various cess amounts being collected for this purpose.

¹ The authors can be contacted at: energy@prayaspune.org. The authors are thankful to N. Karthikeyan for his research assistance and Veena Joshi and an anonymous reviewer for their inputs.

A combination of the above measures can generate the resources required for the extra subsidy for encouraging sustained use of LPG. However, this is possible only if rural distributors are viable and accountable for their quality of service. Some suggestions are provided to enable this as follows.

- i. Rural distributors can be given a performance-based incentive, based on refill sales to poor and PMUY consumers. This will encourage them to provide good quality of service and supply to their consumers.
- ii. The ministry should define a detailed document on standards of performance for distributors as well as oil marketing companies, which includes minimum service requirements, penalties and escalation mechanisms. Data about the performance of distributors and oil marketing companies on the parameters defined in the standards of performance document should be publicly available. This can be augmented by public accountability mechanisms for distributors.

The measures as indicated above attempt to address many of the challenges currently preventing greater LPG uptake. These include issues of affordability by consumers, financial requirements to address the affordability challenge and increasing viability and accountability of rural LPG distribution. We believe that a combination of these measures can go a long way in increasing LPG uptake by poor consumers on a sustained basis, and help address the severe health and gender challenge associated with use of solid fuels for cooking in Indian households.

1. Ujjwala Yojana: need to up the ante

It has been a little more than three years since the launch of the Pradhan Mantri Ujjwala Yojana (PMUY) to provide subsidised LPG connections to women in poor households². When it was launched, the scheme aimed to provide LPG connections to 5 crore poor households by March 2019. The target was subsequently revised to 8 crore connections by March 2020, with a corresponding increase in the budgetary allocation for the scheme from Rs.8,000 crore to Rs.12,800 crore (PIB, 2019).

As of March 2019, 94% of Indian households had an LPG connection, compared to just 62% at the start of the scheme in April 2016 (PPAC, 2019a). PMUY rightly focussed its efforts in states where the number of LPG connections was low. Hence, Bihar, Uttar Pradesh and West Bengal saw a remarkable increase in connections, with 44% of the total PMUY connections being disbursed in these three states. The pace of connection disbursement increased steeply in 2018-19, when around 3.6 crore connections, or about half the total 7.2 crore connections given out in the first three years PMUY, were disbursed.

Evaluated based on connections disbursed, PMUY has been successful. However, the scheme's objectives

included the more ambitious goals of safeguarding the health of poor rural women and their children (MoPNG, 2016). Viewed in this context, connections are just the first stop on the road to sustained and regular LPG use in households, particularly rural households.

It is time for the Government of India to shift its focus and programme goal-post to include measures to ensure sustained use of LPG towards smoke-free Indian kitchens. Without it, the amount invested thus far is unlikely to yield the desired results. Solid fuel use, especially with stacking, will continue leading to perseverance of adverse health outcomes. In this paper, we propose some ideas to achieve sustained use of LPG in a financially prudent manner, after briefly describing the challenges to be overcome.

2. The challenge of ensuring connections translate to sustained use

Connections have reached almost all households in the country and curiously, 9 states are even reporting more connections than the estimated number of households in the state (PPAC, 2019a). This is shown in Figure 1.

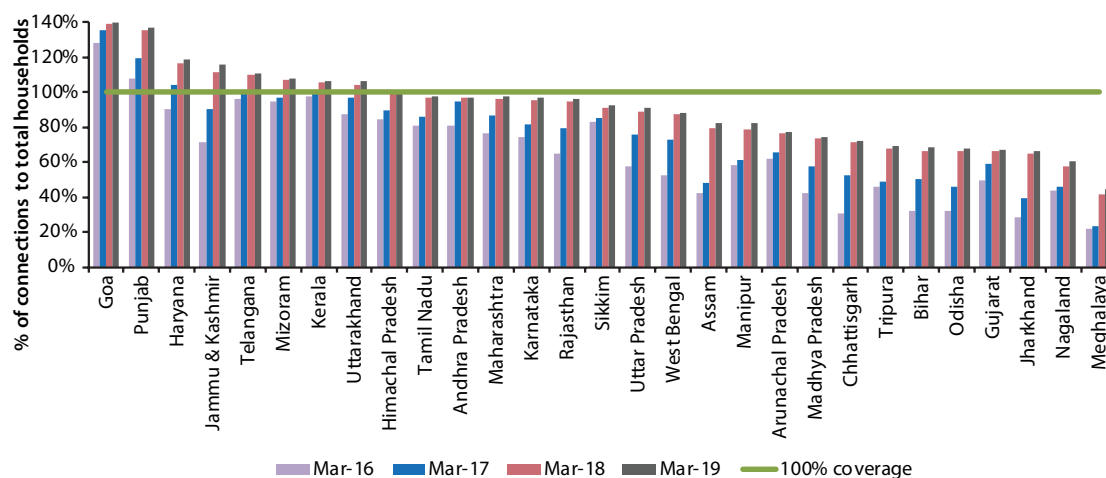


Figure 1: State-wise percentage of LPG connections to total households at the end of March from 2016 to 2019

Source: Various LPG profile reports published by PPAC

² The connection cost of Rs.1,600 per connection is provided by the government. Beneficiaries are expected to bear the cost of the LPG stove and first cylinder (about Rs.1,500), unless they opt for the loan option under the scheme.

However, LPG usage by the beneficiary households has been low. An average Indian household needs between 7.5 and 9 refills a year³. As shown in Figure 2, an average PMUY household consumed only 3.4 refills in 2017-18. They use only about 3/5th the amount of LPG as average rural households, who in turn consume less than the average urban household. Figure 2 also shows that the average consumption of all consumers, including PMUY consumers, fell from FY17 to FY18. This reduction could be due to multiple factors such as the recent increase in PMUY consumers with low consumption and reduced consumption due to rising prices. More analysis is needed to understand this better.

PMUY and other poor consumers: affordability, reliable access and behaviour change. These are elaborated below:

- **Affordability challenge:** Poor households who are recipients of LPG connections at concessional rates often find it difficult to afford LPG even at subsidised prices (CRISIL, 2016). Moreover, the design of PMUY also makes it difficult for consumers to access subsidised cylinders. This is discussed in greater detail in Section 2.1. Additionally, non-clean alternatives such as agricultural residue and firewood might be cheaper than subsidised LPG in many parts of the country.

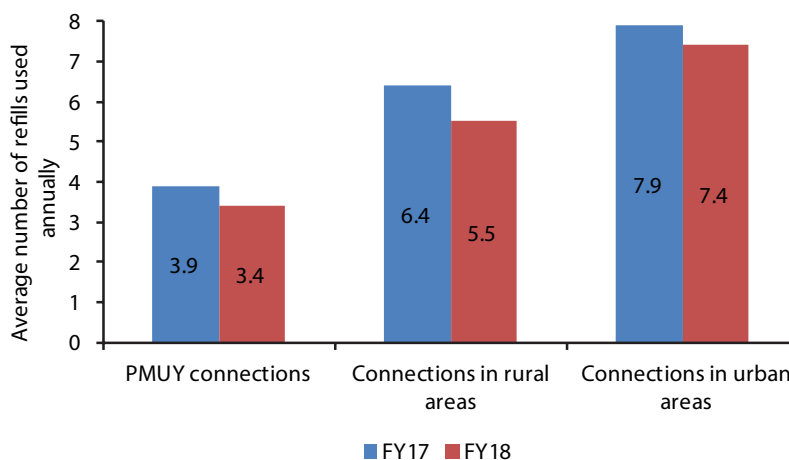


Figure 2: Average number of refills used annually by domestic LPG consumers

Source: (Lok Sabha, 2019; Lok Sabha, 2018a; Lok Sabha, 2018)

Note: Average number of refills consumed in FY18 for rural and urban areas has been estimated from domestic LPG consumption and number of active domestic connections respectively in those areas

There are differences across states too with PMUY consumers in Madhya Pradesh, Chattisgarh, Jharkhand, Tripura and Assam consistently showing the lowest LPG consumption (Lok Sabha, 2018). This clearly indicates that despite large scale uptake of connections, there are several barriers to the sustained usage of LPG, particularly in some states. The nature and influence of these barriers could also vary from state to state and even within a state.

We identify three broad challenges that need to be overcome in order to enable sustained use of LPG by

- **Reliable access challenge:** Even with connections and the ability to pay, obtaining refills may not be straightforward. Several bottlenecks and gaps in the supply chain might result in poor access to refills, poor service quality and unreliable supply. Distributors, especially in rural areas may not be close to the consumer's home, and the cost and inconvenience of transporting cylinders may fall on consumers, acting as a deterrent to complete adoption. Further, distributors have a financial disincentive in focussing on areas with low demand and sporadic refills (which is the case in rural areas with significant PMUY beneficiaries) as the revenue earning potential is low but the cost of service delivery is high. This might result in poor supply as well as service quality.

³ This is based on an assumption of useful heat requirement of 2 MJ / capita / day (van Ruijven, 2011), 4.5 persons per household and LPG stove efficiencies in the range of 55% - 68%. It is understood that most LPG stoves available in the market are in the 55% efficiency range, while PMUY consumers have been given stoves with efficiency in the range of about 68%.

It is also unclear whether the current supply infrastructure such as bottling capacity is sufficient to cater to sustained use by new PMUY consumers. As on April 2019, India had 192 LPG bottling plants located across the country with a capacity of 18.34 million metric tons per annum (PPAC, 2019a). It is not clear if this capacity would be enough to cater to all LPG consumers, especially if poor consumers increase their consumption. If we assume that all active domestic consumers (including PMUY connections) in 2019, use at least 6 cylinders in a year, the bottling capacity required would be 36% in excess of existing reported capacity⁴. Thus, it seems that there is an urgent need to plan to enhance India's bottling capacity in the coming years to meet its demand.

- **Behaviour change challenge:** Sustained uptake could also be slow due to taste preference for food cooked on traditional chulhas, gendered division of responsibilities, low value assigned to time and labour of women and girls, intra-household decision-making practices and current cooking habits. Other residential energy requirements (preparation of cattle feed, water heating etc.) currently met by solid fuels may also deter LPG use. Community factors could also affect the extent of LPG uptake in parts of the country. A lot more research is needed to understand the behaviours and socio-cultural barriers that prevent uptake. Further, context-specific strategies to ensure behaviour change towards sustained use will also

be needed. Many more and larger pilots to assess the effectiveness of various strategies to ensure behaviour change will be crucial in the coming years.

The focus of this paper will be on tackling the affordability challenge. Concerted action on this front in the immediate future can help increase and improve uptake significantly in many parts of the country. Based on available evidence, some suggestions to improve reliable access have also been provided. While the other two challenges are equally important, suggestions to address them would require more research into household decision-making and preferences, and a more in-depth analysis into the current business model, operational practices and planning processes of distributors and OMCs. The former should certainly be a focus of the research community, and the latter is currently challenging with limited publicly available information. Two specific aspects of the affordability challenge and the reliability challenge are discussed below.

2.1 The affordability challenge and the loan scheme

As shown in Figure 3, the unsubsidised price of LPG is high on average with the likely expenditure on LPG in a month comparable to about 70% of the average monthly expenditure on food in rural India⁵. Moreover, it has risen at an average rate of 11% per annum in the three years since the launch of PMUY.

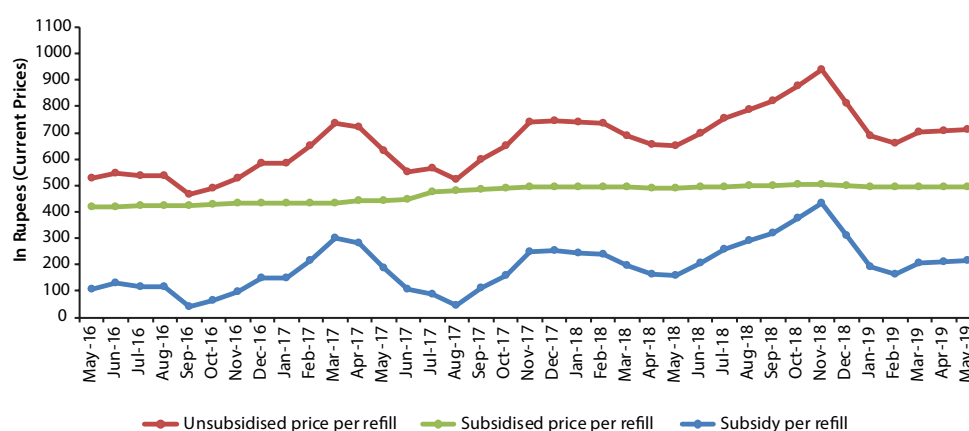


Figure 3: Trends in LPG refill price at Delhi since the launch of PMUY

Source: (IOCL, 2019)

⁴ Assuming there is no change in commercial demand for LPG. The reported bottling capacity is based on the number of eight hour shifts presently in operation in plants and reports indicate that plants are already operating a potentially unsafe 24x7 three shifts to cater to demand. This suggests that there is limited scope to increase production from existing capacity.

⁵ The average rural monthly expenditure on food is estimated from (NSSO, 2014) and adjusted for inflation. It is assumed that a household needs about 9 cylinders a year to meet all cooking on LPG and thus needs about 3/4th refills per month.

In contrast, the subsidised price has remained nearly constant and has provided significant price stability to consumers. However, several deserving PMUY consumers may not have access to subsidised refills. This is because nearly 75% of PMUY connections were availed under its loan scheme, wherein an interest free loan of about Rs.1500-1600 per connection is provided to offset the cost of the stove and first cylinder⁶. This is then recovered from the subsidy due from subsequent refill purchases (PIB, 2019). As per the scheme, such consumers could not access subsidised LPG until they have purchased 7-8 refills at unsubsidised prices to repay the loan. This would limit uptake of refills among many PMUY beneficiaries who would be incentivised to prolong the use of the first refills through stacking or completely switch to alternative fuels.

2.2 The reliable access challenge and the viability of rural LPG distributors

LPG distributors receive a commission per cylinder from the OMCs, which is expected to cover all their expenses and provide some returns. The commission, specified by the MoPNG, consists of an establishment charge (to manage costs and day to day operations), and a delivery charge to cover the cost of last-mile delivery to the consumer premises (MoPNG, 2019). Figure 4 shows the

revisions in the commission since the launch of PMUY and was about Rs.62 per refill in October 2019 (MoPNG, 2019).

While the proposed increase in commission may address some challenges faced by distributors in general, it is unlikely to address the challenges of rural distributors whose clientele is poorer (leading to lower revenues) and dispersed over a wider area (leading to higher costs). Lack of adequate returns is likely to result in poor consumer service and perhaps a temptation to indulge in practices such as refill diversion. This could be detrimental to increasing LPG use among rural poor and should be addressed expeditiously.

3. Suggestions to address some of these challenges

In this section, we provide a few suggestions to overcome the challenges outlined in Section 2 in a sustainable and responsible manner. The costs incurred in supporting the transition to greater use of LPG is really a social investment, given the multiple health, gender and economic benefits that result from it (Prayas, 2018; Smith & Sagar, 2014). Nonetheless, it would be good to minimise and manage these costs, and some suggestions are provided in that spirit.

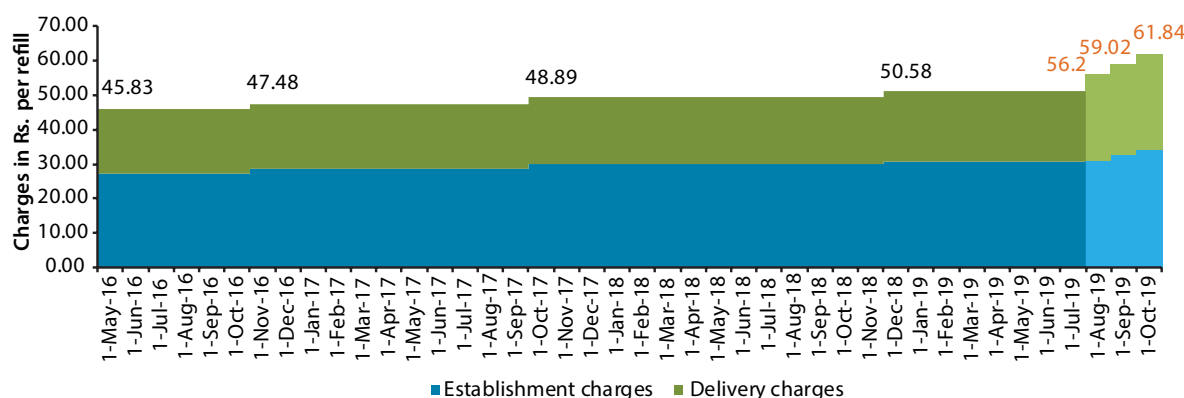


Figure 4: Increase in distributor commission and its break-up since the launch of PMUY

Source: Various MoPNG notifications and (PPAC, 2019)

⁶ The loan scheme was deferred by the OMCs in an attempt to increase uptake of refills by PMUY consumers. However, even this seems to have failed to spur significant uptake of refills.

The suggestions, classified under four strategies, are summarised in Table 1 and discussed in detail below. The suggestions can be implemented in the current framework without fundamental changes in the sector. Moreover, they are not mutually exclusive and it may be desirable to take up many of them in parallel, as the whole may be greater than the sum of the parts.

bottle connections, where the second bottle can be a smaller 5 kg cylinder. Since households in rural areas may have to wait for a few days to get a refill, availability of a smaller, affordable second cylinder would prevent stacking with solid fuels in between cylinders. This measure would have minimal cost implications, since it only involves giving an additional small bottle, while

Table 1: Summary of suggestions made to improve sustained use of LPG	
Strategy	Actionable ideas
Addressing barriers to continued use	Phase out the loan scheme and provide double bottle connections Provide increased but tapering subsidy to PMUY and poor consumers Leverage digital technology to address cash-flow challenges
Reducing government subsidy	Reduce the number of subsidised refills Expedite mandatory efficiency programme for LPG stoves Improve targeting and reduce subsidy requirements
Financing the transition	Gain support from other ministries and state governments Use part of the collected cess amounts
Making rural distributors viable and accountable	Give performance-based incentive to rural distributors Improve accountability of distributors

3.1 Addressing barriers to continued use

Idea 1: Phase out the loan scheme and provide double bottle connections

We suggest that the loan scheme should be withdrawn for all future PMUY connections and the connection subsidy increased accordingly to account for the cost of the stove and first refill. Moreover, the government can take over the pending dues against existing loans of PMUY consumers and write them off. Such a move could encourage refill purchases by some PMUY consumers. However, since deferment of the loan scheme by OMCs does not seem to have resulted in a significant increase in refill purchases by PMUY consumers, the effect may be limited. However, it would at least help improve OMCs' finances that currently have substantial outstanding loans due from PMUY consumers. The write-offs for the existing loans and the increased outlay for PMUY connections to be given out would together involve a one-time cost of only about Rs.8,500 crore.

In addition to writing off loans, it is suggested that PMUY consumers should be provided with free double

consumers purchase the refill at subsidised price. But doing this would enable continued use of LPG, even when the 'primary' refill is exhausted. Indeed, this suggestion should be considered for all single-bottle connections and not only PMUY consumers.

Idea 2: Provide increased but tapering subsidy to PMUY and poor consumers

An increased but tapering subsidy targeted only at PMUY and other poor consumers for 9 cylinders⁷ a year, will encourage beneficiaries to adopt LPG on a sustained basis. A similar scheme is being implemented by the Department of Forests, Government of Maharashtra to incentivise forest-dwellers to shift to LPG since 2013 (GoM, 2017). The subsidy can begin at high levels to encourage LPG adoption, but then taper off across the years. It is expected that this will provide enough incentive to households to begin using LPG and once they see its

⁷ It is understood that all PMUY beneficiaries have received BIS branded stoves that are more efficient. In that case, the number of refills that are offered subsidy under this scheme may be reduced to 7 or 8 per year.

benefits, they will continue using it at the subsidised price after a few years. While a similar scheme seems to be working satisfactorily in Maharashtra, it would be advisable to pilot this scheme before introducing it on a wider basis.

An illustrative subsidy design based on this principle is shown in Table 2, assuming that the unsubsidised price of an LPG refill is Rs.700 and that the subsidised price is Rs.490. This is only an illustrative example and the figures can be fine-tuned based on discussions. In this example, consumers are provided additional subsidies in the first four years, with the price in the first year being just Rs.300 per refill. From the fifth year, they are charged the usual subsidised price. As a result, the total subsidy outgo in this example over the four years of the scheme would be Rs.11,700 per consumer as against Rs.7,560 if they were charged the entire subsidised price through the four years. This implies an additional subsidy of around Rs.85 / month / household for four years. If this facility were provided to all the 8 crore PMUY households, the additional subsidy requirement would be Rs.33,000 crore over 4 years, or about Rs.8,300 crore per year on average⁸.

as soon as a purchase is made. This can be implemented using a scheme similar to the Public Distribution System (PDS) for food grains, where the subsidy is transferred as soon as a consumer's identity is authorised through a point-of-sale machine and the consumer makes the payment. This approach can be adopted whether the consumer pays the amount in cash or digitally from their account to the distributor's account. Since the distributor still acquires refills at the unsubsidised rate, there would be no additional danger of diversion.

3.2 Reducing government subsidy

Some ideas to rationalise existing subsidy, in order to make room for the additional, targeted subsidy as proposed are discussed below.

Idea 1: Reduce the number of subsidised refills

As discussed earlier, an average Indian household requires at most about 9 refills annually to meet its cooking energy requirements on a normative basis. This is corroborated by the fact that urban Indian households, which have negligible solid fuel use, consume less than 9

Table 2: Illustrative example of graded, tapering subsidy for poor / PMUY consumers (all amounts in Rs.)

	Refill number										Total subsidy in year
	1	2	3	4	5	6	7	8	9	>=10	
Year 1 suggested price	300	300	300	300	300	300	300	300	300	No subsidy	3600
Year 2 suggested price	350	350	350	350	350	350	350	350	350		3150
Year 3 suggested price	400	400	400	400	400	400	400	400	400		2700
Year 4 suggested price	450	450	450	450	450	450	450	450	450		2250
Year 5 onwards	490	490	490	490	490	490	490	490	490		1890

Idea 3: Leverage digital technology to address cash flow challenges

Subsidy reimbursement to a consumer's bank account currently takes a few days which could affect the cash-flow of poor consumers. To address this, the central government can make advance subsidy payment to the OMCs based on sales estimates, which can be reconciled on, say, a quarterly basis. This will enable the OMCs to transfer subsidies immediately to consumer accounts

LPG refills per year on an average. Therefore, we propose that the number of refills eligible for subsidy is reduced to 9 per household per year, from the current 12 refills. There is no data available about how much of the LPG subsidy is used to support consumption between 9 to 12 cylinders per annum. If one assumes that only about 5% of total LPG subsidy supports such consumption, it would still save about Rs.1,500 crore of the budgeted Rs.29,500 crore for LPG subsidy in 2019-20 (MoF, 2019). In other words, it can provide the funds required to support the additional subsidy proposed in Section 3.1 for 1.45 crore households.

⁸ The additional subsidy amount in this example is just 8% of the revenue foregone by the government in the year 2018-19, which was about Rs.1,08,000 crore (MoF, 2019).

Idea 2: Expedite mandatory efficiency programme for LPG stoves

Currently, LPG stoves in India are only subject to voluntary efficiency standards, the least efficient of which specifies a thermal efficiency of 68% (BEE, 2019). This is reportedly about 13 percentage points better than the stoves available in the market. MoPNG, supported by the Petroleum Conservation Research Association, can expedite making the efficiency standards for LPG stoves mandatory, and promote rapid market transformation through schemes such as bulk procurement and replacement programmes for efficient stoves as was successfully done with LEDs. If the average efficiency of stoves in use improves to even the lowest rated level (i.e. by 13 percentage points), it would lead to about 19% saving in LPG consumption, resulting in reduced LPG consumption and therefore a reduction in subsidy requirement, energy import dependence and GHG emissions. This will also open the possibility for further reduction in subsidised refills (to, say, 7 or 8 per year). If such a shift can save about 10% of subsidy, it would save about Rs.3,000 crore annually. This amount could support the additional subsidy proposed in Section 3.1 for about 2.9 crore households.

Idea 3: Improve targeting and reduce subsidy requirements

As of 2017, 87% of LPG consumers were receiving subsidised LPG (Lok Sabha, 2017). In the absence of more up-to-date information, assuming the same percentage implies that 23 crore households are currently receiving subsidised LPG. This indicates that there is significant room to reduce the pool of those receiving LPG subsidy even beyond schemes such as 'Give it up'. The existing scheme of excluding consumers with a taxable income of more than Rs.10 lakh per annum (MoF, 2019) has limited impact given the small number of taxpayers in that bracket⁹.

One further way to improve targeting is to shift to an opt-in system of subsidies rather than opt-out. Going forward, LPG consumers who are not in receipt of subsidies under other programmes such as PDS and MNREGA, and who do not hold BPL and Antyodaya cards can automatically be excluded from receiving LPG

subsidy. Since many undeserving households may also hold such cards, other exclusion criteria based on asset ownership can be considered to further identify and exclude households that do not deserve subsidy. In order to ensure that this does not exclude any household that truly deserves the benefit, additional well-defined criteria (based on other deprivations) can be identified, based on which households can avail subsidy even if they are excluded through the automatic process. Introduction of this scheme should be preceded by an extensive information campaign to avoid inconvenience to those who genuinely deserve subsidy, and by extensive pilot programmes.

Even if 15% of consumers (3.5 crore) currently enjoying subsidy are excluded by this, it would save about Rs.4,500 crore from the budgeted outlay for LPG subsidy in 2019-20, and can help to provide additional subsidy to 4.3 crore households. Additionally concerted efforts to encourage adoption of other modern fuels such as electricity and piped natural gas in urban areas can also help reduce LPG subsidies.

3.3 Financing the transition

In addition to limiting subsidy outgo through ideas such as those listed above, the government may also need to finance the greater adoption of LPG. A couple of ideas for this are listed below.

Idea 1: Gain support from other ministries and state governments

Since increased usage of LPG and other clean-burning fuels is a preventive health initiative as much as an energy-access initiative, it would be useful if the Ministry of Health and Family Welfare could have additional budgetary support to develop and implement a programme that can help facilitate increased LPG usage by leveraging its grass-roots infrastructure such as PHCs and health workers.

State governments can also be made partners to provide LPG price support for the poor. There are precedents to this in states such as Chhattisgarh, Jharkhand, Maharashtra, Punjab and Rajasthan (Shailendra Kumar Sharma, 2017; GoR, 2018; GoM, 2017). Since health is a state subject under the Indian constitution, state governments may be interested in supporting the programme if it is pitched as a joint centre-state health intervention. However,

⁹ In the year 2017-18 only 45 lakh consumers reported a taxable income which was more than Rs. 10 lakh per annum – in comparison to over 20 crore subsidised LPG consumers.

different states may have different needs and financial capabilities. Hence MoPNG could develop a suitable national framework for LPG subsidy by consulting with state governments, and state governments can choose to volunteer to partner in this effort to increase LPG usage depending on their capabilities.

Idea 2: Use part of the collected cess amounts

Various cesses are levied by the government such as the education cess, health cess, cess on crude oil, road and infrastructure cess and GST compensation cess, which are together expected to yield more than Rs.3,20,000 crore in 2019-20 (MoF, 2019). The additional annual requirement of Rs.8,750 crore for the additional LPG subsidy is equivalent to just 3% of this expected revenue. Therefore, the government could consider using some of the collected cess for this purpose.

3.4 Making rural distributors viable and accountable

Distributors are the last but most critical link in the supply chain of LPG, and hence their viability and accountability, particularly in rural areas, is critical to ensure good customer service for LPG consumers.

Idea 1: Give performance-based incentive to rural distributors

To improve the viability of distributors in rural areas, an incentive-based commission is proposed. This commission can be a percentage of the total unsubsidised LPG price over and above the flat per-cylinder commission currently being provided. It could include two components. One component could be based on refill sales to PMUY and poor consumers beyond a certain threshold level (say, 5,000 per quarter). In order to minimise the potential moral hazard of distributors trying to divert PMUY refills in order to gain the commission, an electronic mechanism to obtain the consumer's acknowledgement of refill receipt could be introduced. The second component could be directly related to the consumer service performance of the distributor.

Such incentives can increase viability of cash-strapped distributors and would spur greater innovation in business and service models. For example, they can service consumers through intermediaries such as PDS outlets or common service centres (which can stock up

to 100 kg of LPG), which can act as sub-retailers in return for a small fee.

Idea 2: Improve accountability of distributors

Currently, LPG distributors are bound by the LPG marketing discipline guidelines (OMCs in India, 2018). However, this may not be sufficient to ensure quality of service to rural consumers. To address this, it is suggested that MoPNG should publish a standards-of-performance document for OMCs and distributors, which goes beyond the LPG marketing guidelines. For example, it should stipulate the expected time to provide various services, and the escalation pathways and penalties applicable in case of non-compliance. Distributor and OMC compliance to these performance standards should be tracked periodically and made publicly available.

Further, to increase rural consumer awareness and distributor accountability, we suggest that public meetings to promote awareness about consumer rights and to discuss LPG service related issues should be organized in rural areas on, say, a bi-annual basis. The meetings should be attended by OMCs and distributors, but should be organized so that consumers can freely air their problems.

4. Conclusions

After the success of PMUY in providing nearly universal LPG connections to Indian households, there is a need to shift attention to how such households can increase their consumption of LPG. In this paper, we propose some ideas for how this can be accomplished, and hope that a discussion around these ideas can lead to concrete, implementable solutions. Many of these ideas can be implemented on a pilot basis to understand impacts and implementation issues before large-scale roll out.

It should be noted that these ideas may not be sufficient to address the problem by themselves. As discussed, more research is required to understand aspects such as supply-chain infrastructure, distributor business models and facilitating behavioural change.

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