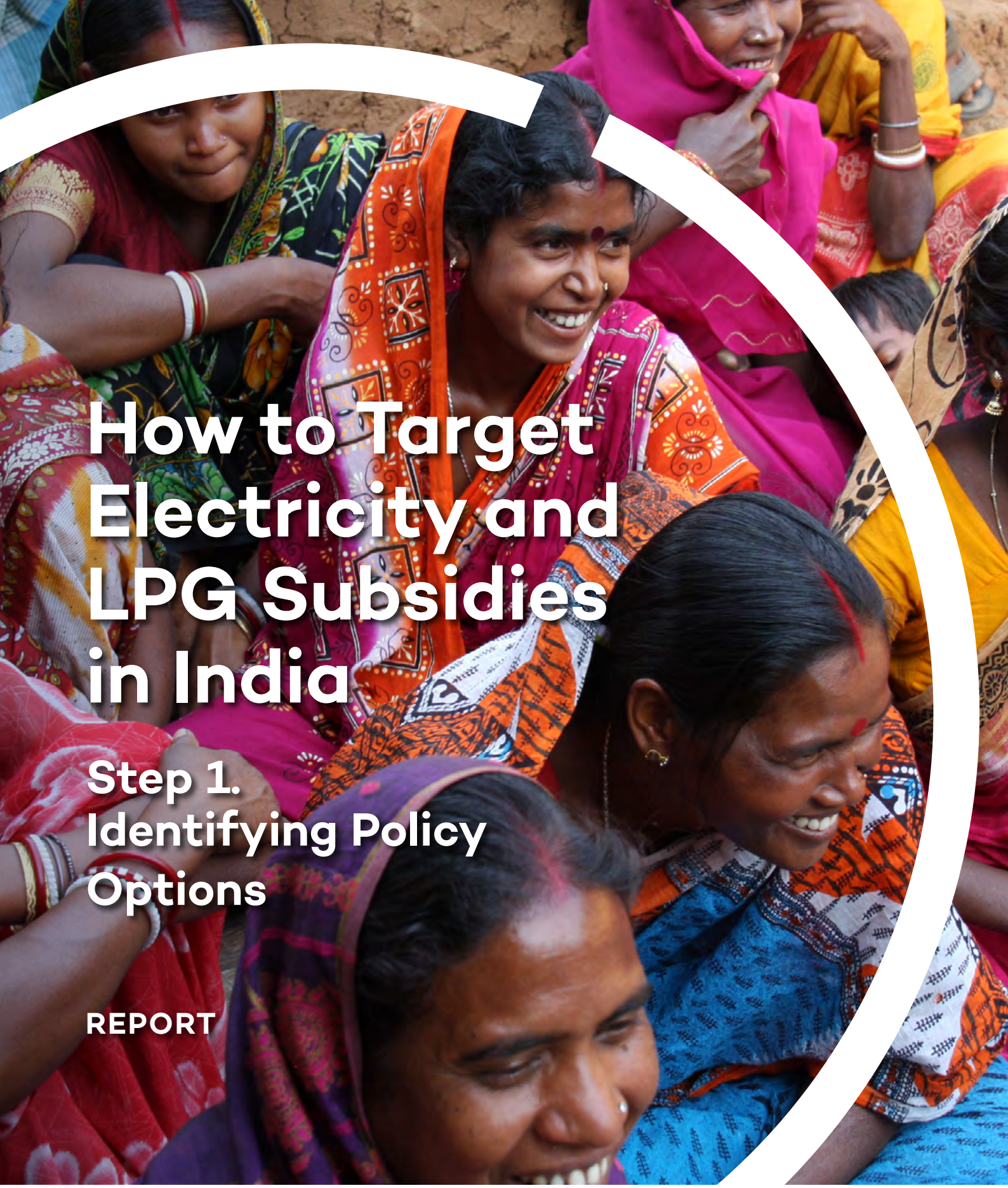

How to Target Electricity and LPG Subsidies in India

Step 1. Identifying Policy Options

REPORT

IISD
International Institute for Sustainable Development

Global Subsidies Initiative

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The IISD Global Subsidies Initiative (GSI) supports international processes, national governments and civil society organizations to align subsidies with sustainable development. GSI does this by promoting transparency on the nature and size of subsidies; evaluating the economic, social and environmental impacts of subsidies; and, where necessary, advising on how inefficient and wasteful subsidies can best be reformed. GSI is headquartered in Geneva, Switzerland, and works with partners located around the world. Its principal funders have included the governments of Denmark, Finland, New Zealand, Norway, Sweden, Switzerland and the United Kingdom, as well as the KR Foundation.

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Executive Summary

India's energy access policies have succeeded in achieving almost universal electricity access and a massive uptake in clean cooking. Connection and consumption subsidies for electricity and liquefied petroleum gas (LPG) have played an important role in driving these changes. But the policies are also costly: in 2017, electricity and LPG consumption subsidies alone cost INR 87,830 crore (USD 13.1 billion). Connection subsidies will naturally decline, but with more consumers and prosperity, demand for consumption subsidies will only grow.

Efforts have been ongoing for years to reduce costs by better targeting subsidies. Most recently, this includes discussions around a Direct Benefits Transfer for Power (DBT-P) for electricity and a possible "Ujjwala 2.0" for LPG. At the same time, higher-level debates are ongoing about the possible merits of a universal basic income transfer. In many cases, however, knowledge gaps are limiting evidence-based decision-making. The last distributional analysis of energy consumption subsidies—that is, how benefits are shared across different income groups—is based on the 2011 census. It is also unclear who would be included or excluded under different targeting approaches.

This paper calls for a dedicated research effort by the energy policy community in India to better inform policy. This includes data collection and analysis in the following areas:

1. **Estimating the distributional performance of existing subsidies.**
2. **Identifying and evaluating targeting interventions.** Based on a review of options, this paper recommends that this should include:
    - **Opt-out schemes:** Schemes that allow beneficiaries to voluntarily unsubscribe, like the Give It Up scheme for LPG.
    - **Quota-based and volumetric targeting:** Adjusting the rules that determine subsidy access or magnitude based on consumption volume.
    - **Categorical targeting:** Adjusting the rules that determine subsidy access or magnitude based on geographic area or social characteristics, such as being part of vulnerable groups or being most affected by indoor air pollution.
    - **Income, asset and consumption-based targeting, including related proxies:** Comprehensive data on income, assets and consumption can identify simple "proxies" for reaching the poorest. This can help define volumetric and categorical targeting approaches. It can also inform the design of the questionnaire for the next national poverty census.
3. **Evaluating opt-in schemes.** Targeting is never perfect and will always unintentionally exclude some people in need. "Opt-in" schemes can let households voluntarily decide if they need to re-register. How well do such schemes work in practice? Can the poor easily navigate them? How many better-off people re-register as well?
4. **Exploring how basic income transfers affect energy consumption.** Energy subsidies can be integrated into the debate on basic income transfers—but only if it would not roll back efforts to promote clean, modern energy consumption.

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Acronyms and Abbreviations

BPL	below poverty line
DBT	direct benefits transfer
DBT-P	DBT for power
DBTL	Direct Benefits Transfer for LPG
DfID	Department of International Development (U.K.)
discom	distribution company
FY	fiscal year
GSI	Global Subsidies Initiative
IBT	increasing block tariff
JBVNL	Jharkhand Bijli Vitran Nigam Limited
LPG	liquefied petroleum gas
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
OMC	oil marketing company
PAHAL	Pratyaksh Hastantarit Labh
PDS	Public Distribution System
PIB	Press Information Bureau
PMAY-G	PM Awaas Yojana – Grameen
SDG	Sustainable Development Goal
SECC	Socio-economic Caste Census
Ujjwala	Pradhan Mantri Ujjwala Yojana
UT	Union Territory

1.0 Introduction

India's energy sector is undergoing rapid transformation. In 2000, only 43 per cent of the population had access to electricity, which almost doubled to 94.6 per cent by 2018 (International Energy Agency, 2018a). A similar increase has been seen on access to clean cooking: in 2000, 25 per cent of the population primarily relied on clean cooking sources, compared to 49.2 per cent in 2018 (International Energy Agency, 2018b).

Government policies have played an important role in driving these changes, particularly subsidies for electricity and cooking gas. But, as more consumers connect to modern energy sources, there is increasing pressure on limited government financial resources. In 2017, India's "energy access" subsidies—policies that directly reduce consumer prices for connections and consumption of electricity and clean cooking—amounted to INR 109,618 crore (USD 16.3 billion) (Soman et al., 2018). The majority of this was made up of subsidies for electricity and liquefied petroleum gas (LPG) consumption, at INR 87,830 crore (USD 13.1 billion). Expenditure is only expected to grow, given long-term trends toward rising energy demand and international crude oil prices.

This has given rise to discussions about the potential for "subsidy targeting": focusing subsidy benefits on a narrower subset of beneficiaries. This would allow higher benefits to be provided to those most in need. It would also encourage more rational energy consumption among higher-income consumers. There has been little in-depth research, however, to identify specific options for design and to evaluate how they perform.

This report:

- Summarizes key literature on energy subsidy incidence and targeting.
- Summarizes existing key data on the size and incidence of India's electricity and LPG consumption subsidies.
- Identifies and discusses specific options for improving targeting.

The report illustrates its findings with a range of case studies, some from India and some international. Where it provides examples of Indian state-level experiences with electricity subsidies, it focuses in particular on Jharkhand. This reflects the fact that IISD plans to publish a second publication on this theme in 2020, based on detailed survey research in Jharkhand.

2.0 Social Protection, Targeting and Energy Subsidies

2.1 Universalism and Targeting in the Wider Context of Social Protection

Social protection is a broad term that captures all of the policies, programs and systems that are intended to eliminate poverty and help people cope with personal and societal risks and shocks. The Asian Development Bank identifies three main subcomponents: labour market schemes, social insurance (contributory schemes, such as health insurance or pensions) and social assistance (non-contributory schemes, such as cash transfers or vaccination programs) (Yemtsov, Honorati, Evans, Sajaia, & Lokshin, 2018). While "social protection" is a common technical term for this kind of policy-making, it is really about making "social investments": enabling people to grow and prosper.

Sustainable Development Goal (SDG) 1 aims for all nations to "implement nationally appropriate social protection systems and measures for all" by 2030 (United Nations, 2019). Progress is to be tracked by reporting the share of the population from various categories that is covered by such systems (United Nations, 2019).

Social protection often involves subsidizing goods and services. In the case of social insurance, schemes are often structured so that contributions by beneficiaries only cover a share of costs, with the government making up the shortfall. In the case of social assistance, many countries provide low-cost or free basic services such as education and health. Social assistance can also include subsidies for key consumer goods such as food and energy. Any of these schemes can be:

- Universal or untargeted: They provide benefits to the entire population, such as a universal healthcare program or a basic pension scheme.
- Targeted: They provide benefits only to a certain sub-group, often but not always low-income or otherwise vulnerable, such as India's ration shops or the United States' food stamps program.

Attitudes to universalism versus targeting vary significantly depending on the policy in question, the country context and political ideology. Any attempt to target a social protection policy will always involve a degree of error, called "errors of inclusion," where non-beneficiaries are unintentionally included, as well as "errors of exclusion," where intended beneficiaries are unintentionally excluded (Coady, Grosh, & Hoddinott, 2004). In some circumstances, such as policies for education, health and pensions, targeting may not be appropriate, because accidentally excluding even a small number of people could have severe impacts on their welfare. In other cases, targeting may not be an option because of practical difficulties in identifying the target population or preventing leakages (World Bank, n.d.b). Political factors can also play a role. If more politically powerful, higher-income classes are included as beneficiaries, they may be more likely to ensure schemes are maintained and well-funded (Kidd, 2015). There could also be a risk that targeted schemes will be co-opted for political purposes, if politicians use programs as "instruments of patronage" to disproportionately benefit people who support them (Desai, 2017).

Targeting may be introduced for many reasons, including when a policy is not relevant to the whole population, funds are highly limited, schemes grow too costly over time or a universal policy is benefiting the rich much more than the poor. In some cases, it can emerge because universal policies have been captured by political factors: for example, if politically powerful high-income groups

drive up the benefits of universal policies for their own self-interests and this prompts a fiscal crisis. Targeting may also reflect the political ideology of governing powers. It is commonly associated with conservative and neoliberal political thought, to the extent that it may emerge from discourse on austerity, limiting state expenditure and restricting benefits to only "deserving" groups. It is not necessarily related to any individual ideology, however, and is employed in many forms around the world by governments from across the political spectrum. Targeting can be introduced through a large reform or may be introduced gradually in a piecemeal fashion.

If targeting is adopted, it must be designed well in order to achieve its objectives (Bhattacharya, 2018). Most approaches require data to identify beneficiaries; this data must be kept up-to-date, which requires administrative and institutional capacity (Dutrey, 2007). In some countries, such as Indonesia, a "unified" targeting system has been created so that the costs of maintaining a complex database on beneficiaries can be spread across numerous policies (TNP2K, 2015). Targeting can also introduce registration processes and new distribution mechanisms for benefits. This can be difficult for low-income households to understand and use, creating time burdens or involving criteria and procedures that may unfairly exclude beneficiaries or degrade their dignity (Kidd, 2015). All of these costs must be carefully weighed when considering whether or not to adopt targeting.

In many countries, growing inequality and accelerating technological change has driven debate on whether to introduce a universal basic income. This would be funded by taking numerous existing policies—universal and targeted—and collapsing them into a single social protection policy that transfers cash to all people unconditionally. This would be costly, but it is argued that such costs could be covered by avoiding the need to administer many independent schemes. In India, this was proposed by the Indian Economic Survey (2017), which noted that, as of fiscal year (FY) 2016/17, the country had about 950 subsidy schemes that could be merged into one universal scheme with considerable savings (Economic Survey, 2017).

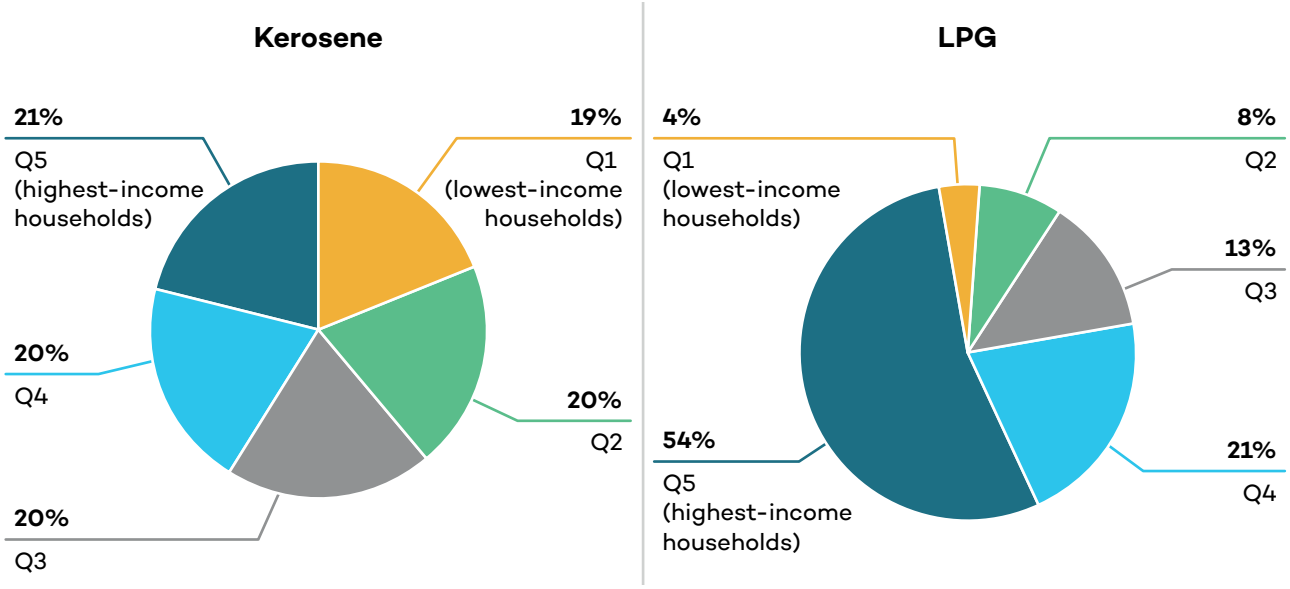
2.2 Targeting in the Context of Energy Subsidies

Universal consumer energy subsidies have been under increasing scrutiny in recent years. Such subsidies are sometimes defended on the grounds that they make energy more affordable for low-income groups. However, they may be for energy sources that the poor do not consume (gasoline or diesel) or that create negative health externalities (gasoline, diesel, kerosene, coal). Among high-income consumers, they can also incentivize inefficient consumption of energy (all energy types) and undermine the business case for clean energy, increasing levels of air pollution and greenhouse gas emissions (Ahmed, 2011). Even when they apply to energy sources that are used by the poor (electricity, LPG), universal subsidies are usually highly costly, can grow to unsustainable levels and can contribute to poor energy sector functioning (Atansah, Khandan, Moss, Mukherjee, & Richmond, 2017; Beaton et al., 2013). Globally, fossil fuel subsidies cost more than 7.5 times the estimated amount required to achieve universal energy access by 2030 (Zinecker, Sharma, Beaton, & Merrill, 2018).

Multiple analyses have concluded that universal energy subsidies for consumers disproportionately benefit the rich and have significant opportunity costs (Anand, Coady, Mohammad, Thakoor, & Walsh, 2013; Coady et al., 2010; Coady, Flamini, & Sears, 2015; Arze del Granado, Coady, & Gillingham, 2010, 2012). As illustrated in Figure 1, an International Monetary Fund (2013) meta-analysis of 20 countries found that, on average, kerosene subsidies achieved the same targeting

efficiency as handing out benefits at random (Arze del Granado et al., 2012). For LPG subsidies, on average, the bottom 40 per cent of households received only 12 per cent of the total benefits (Arze del Granado et al., 2012). The results are even more regressive for gasoline, where the bottom 40 per cent receive only 9 per cent of total benefits (Arze del Granado et al., 2012). A key factor in such an analysis is typically national coverage of the energy type in question. For example, in countries where LPG is only available in large urban centres, consumer price subsidies will automatically fail to provide benefits to all rural consumers, which will typically include a large share of the country's lowest-income households.

Figure 1. Share of direct kerosene and LPG subsidy benefits captured by different income quintiles



Source: Reproduced with permission from Kitson et al., (2016, p. 24), based on Arte del Granado et al. (2012). As noted in Kitson et al. (2016), "Estimates for kerosene and LPG based on a summary of 20 country studies: Cameroon, Gabon, the Central African Republic, Senegal, Ghana, Mali (kerosene only), the Republic of Congo, Burkina Faso and Madagascar (kerosene only) from Africa; Bolivia (LPG only), Peru, El Salvador and Honduras from South and Central America; Bangladesh, Sri Lanka, Cambodia, India and Indonesia from Asia and the Pacific; and Jordan and Lebanon (LPG only) from the Middle East and Central Asia. Analysis based on household surveys and input-output matrices ranging from 1993 to 2007."

In a review of global experience on fossil fuel subsidy reform and energy access, the International Institute for Sustainable Development's Global Subsidies Initiative (GSI) recommends that countries should remove subsidies that have little or no potential for energy access and target ones that are important for energy access, particularly electricity and LPG subsidies (Zinecker et al., 2018). Targeting is important because non-energy-subsidy social assistance policies, such as cash transfers, are not guaranteed to deliver on energy access objectives. Instead, households may decide to put up with the negative side effects of traditional energy, such as indoor air pollution, so they can allocate cash resources to shorter-term needs. For both subsidy removal and targeting, savings can be "swapped" to more effective social protection policies and clean energy. GSI also encourages countries to subsidize connections, not only consumption. Typically, households are much more likely to be poor if they lack a connection to the electricity grid or the basic start-up equipment for clean cooking. Consumption subsidies also become increasingly progressive as more and more poor people get connected.

Figure 2. Strategies for fossil fuel subsidy reform and energy access

REMOVE		**Phase out fossil fuel subsidies that have no or little potential for energy access** Some fossil fuel subsidies have little or no potential to improve energy access. Governments should aim to phase out such subsidies, taking adequate steps to mitigate negative economic or social impacts, particularly for poor households and women. **Examples**: producer subsidies; gasoline and diesel subsidies
TARGET		**Targeted subsidies aimed at access for those that really need them** Some fossil fuel subsidies are used to incentivize the use of energy technologies for which there is no short-term sustainable alternative. If these subsidies are deemed necessary, governments should improve the effectiveness and efficiency of these subsidies through targeted subsidies aimed at poor households. Facilitating new connections should be a major focus in this respect. **Examples**: liquefied petroleum gas (LPG) subsidies; electricity subsidies
SWAP		**Shift fossil fuel subsidies to investments in renewable energy and energy efficiency** Shifting subsidies to renewable energy technologies for energy access and energy efficiency can support households and improve the sustainability of energy access. **Examples**: kerosene subsidies for lighting; diesel subsidies for agriculture; subsidies to transport fuels; subsidies to coal and gas for electricity generation

Source: Reproduced with permission from Zinecker et al., 2018

3.0 India's Electricity and LPG Subsidies

3.1 Electricity Consumption Subsidies

How big are India's electricity subsidies, and how do they work?

Electricity consumption subsidies are the largest of all energy subsidies in India, estimated at 49 per cent of all central government energy subsidies that could be quantified in FY 2017/18: INR 74,925 crore (USD 11.2 billion) (Soman et al., 2018).

In India's federal structure, electricity consumption subsidies are complex, with each state determining its own pricing policy (see Box 1). In all states, a degree of targeting already exists, as subsidized prices are usually provided only for certain consumers—typically, households and farmers—and the magnitude of the subsidy is often varied by geographic area (urban or rural) and for different consumption blocks. For example, in Jharkhand, urban consumption is split into four blocks, each of which has its own subsidy: 0–200 kWh per month; 201–500 kWh per month; 501–800 kWh per month; and above 800 kWh per month. The biggest subsidies are usually provided for the lowest consumption blocks, often called a "lifeline tariff." In addition to these cut-offs, some states also require households to meet other eligibility criteria, such as ownership of a Below Poverty Line (BPL) card.[1]

Another feature of electricity subsidies is the extent to which pricing is determined by total electricity consumption volumes. In 2017, 24 states used an "increasing block tariff" (IBT) system, where all consumers pay the same price for each block of consumption, regardless of their total consumption (KPMG & Department of International Development [DfID], in press). In the above example of Jharkhand, with an IBT, even households consuming over 800 kWh per month would pay a subsidized rate for their first 200 kWh per month. A smaller number of states use a "volume-differentiated tariff" system, where the price for every unit of consumption is determined by a user's final block. Here, a household consuming over 800 kWh per month would pay the 800 kWh rate for every unit consumed, including the first 200.

All of these tariff-based subsidies are based on metered electricity consumption. When several households live on a property with a single meter, the rates they pay will be based on their joint consumption. When households are renting, they do not pay electricity bills directly, but rather through their landlords—in which case, there is no guarantee that subsidies will be passed on. In cases where there are no meters, households typically pay a flat fee that covers all consumption, no matter how large or small.

In all states, the subsidy is provided by electricity distribution companies (discoms) selling electricity at below-cost prices. Discoms can cover the cost of electricity subsidies in two main ways: first, a cross-subsidy, where they charge above-cost rates for other consumer categories, usually industrial and commercial users; second, a transfer from state governments at a later date, to compensate them for subsidy-related losses. These can be delayed or not paid in full, creating borrowing costs for discoms, adding to their financial liabilities (KPMG & DfID, in press).

[1] See Annex A for a summary of the various consumption categories for which subsidized residential tariffs were offered in 2017 in different Indian states.

Box 1. State focus: Residential electricity subsidies in Jharkhand

The state of Jharkhand has one publicly owned discom, Jharkhand Bijli Vitran Nigam Limited (JBVNL), that offers subsidies to approximately 4.5 million consumers. In FY 2019/20, 94.6 per cent of JBVNL's subsidies—INR 984 crore (USD 144 million)—is earmarked for residential consumers, as illustrated in Table 1 (KPMG & DfID, in press). JBVNL is under financial stress, accumulated over many years, because of the significant gap between revenue from sales and the average cost of supply. There are many causes for these losses in addition to subsidies, such as poor bill collection and high technical inefficiency losses. Nonetheless, subsidies are one important factor: they prevent the utility from charging cost-covering tariffs.

Table 1. Consumer category-wise subsidies for FY 2019 (INR crore)

Consumer Category	Subsidy (INR crore)	Subsidy (USD million)
Residential	984	144
Agriculture	32	4.68
Commercial (rural)	24	3.51
Total	1,040	152

Source: KPMG & DfID, in press.

JBVNL sets tariffs through an IBT structure with several sub-categories. As illustrated in Table 2, subsidies are even given to households consuming over 200 kWh per month. The state is undertaking reforms to address its revenue gap. In a 2015 debt restructuring scheme called Ujwal Discom Assurance Yojana (UDAY), it reduced the gap from INR 2.19 per kWh in FY 2015/16 to INR 0.54 per kWh as of July FY 2018/19 (Government of India, 2019).

Table 2. Subsidy for JBVNL household consumers for FY 2019/20

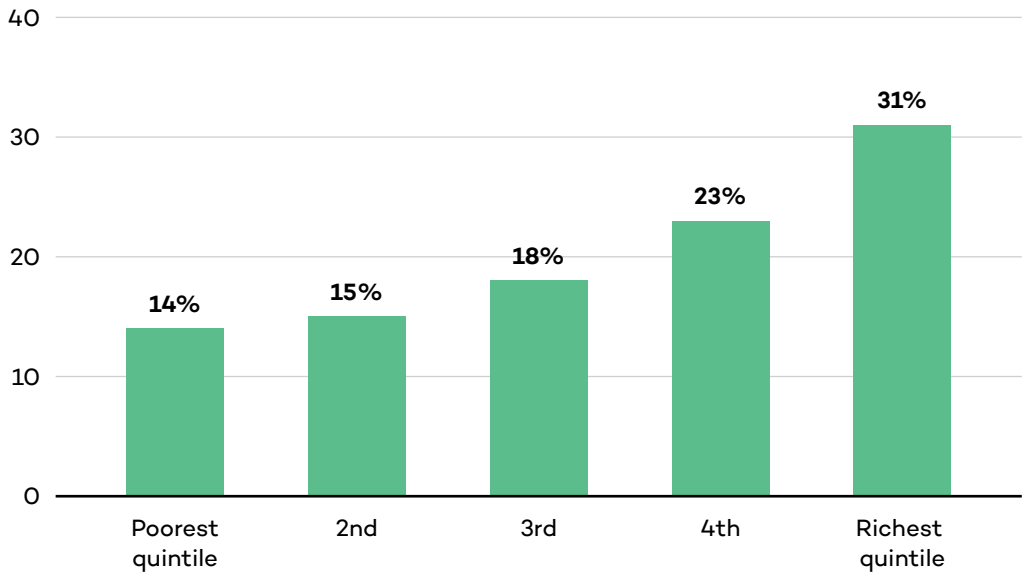
Category	Metering	Fixed Charge (INR)	Variable Charge (INR)	Block (kWh)	State Govt Subsidy (INR)
Kutir Jyoti	Metered	20	5.75//kWh	For all units	4.25/ kWh
	Unmetered	250	-	-	125/Conn.
Rural	Metered	20	5.75/ kWh	For all units	3.9/ kWh
	Unmetered	250	-	-	25/Conn.
Urban	Metered	75	6.25/kWh	0–200	2.75/kWh
				201–500	2.05/kWh
				501–800	1.85/kWh
					1/kWh

Source: DfID-KPMG, in press

Who benefits most from the subsidies?

There are no good data available today on the effectiveness and efficiency of India's electricity consumption subsidies at a national level. The last comprehensive analysis of residential users was conducted by the World Bank in 2015, based on 2009–2010 National Sample Survey data on household consumer expenditure (Mayer, Banerjee, & Trimble, 2015). This analysis found that the poorest quintile received only 14 per cent of subsidy benefits, as illustrated in Figure 3. For agricultural users, various studies have concluded that the subsidies drive overexploitation of water resources, in concert with a range of other policies that promote water-intensive cropping (Badiani & Jessoe, 2018; Beaton et al., 2019; Rentschler & Bazilian 2017; Sharma, Tripathi, & Moerenhout, 2015).

Figure 3. Share of electricity subsidy benefits received by different income quintiles in India, 2010



Source: adapted from Mayer et al., 2015

Given the enormous changes in energy consumption patterns since 2010, including universal electrification at the village level, it is difficult to estimate how the distribution of electricity consumption subsidies has changed. There is a larger population of low-income consumers than before, increasing the share of benefits received by the poorest. At the same time, rapid economic growth could see significant increases in consumption by high-income groups, increasing the share of benefits they receive. While distributional outcomes are unknown, it is clear that, going forward, a higher consumer base and growing consumption will significantly increase the total absolute costs of consumption subsidies. Electricity consumption subsidies have already grown from INR 36,758 crore in FY 2014/15 to INR 74,925 crore in FY 2017/18 (USD 6 billion to USD 11.2 billion)—a 100% increase in only three years. This is a considerable sum of resources. By comparison, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) scheme that provides employment to unskilled workers in rural areas has a central government budget allocation of INR 60,000 crore for FY 2019/20 (Ministry of Finance, 2019).

Are there policy commitments to improve targeting?

In the draft National Energy Plan, NITI Aayog (2017) has proposed that electricity pricing in India should change so that discoms set power prices at cost-recovery levels and subsidies are transferred directly to consumers through a direct benefits transfer (DBT). This has since been reflected in various proposals by the Ministry of Power (Josey, 2018). It is not yet clear how this will be implemented because India's definition of what constitutes a DBT policy is very broad (DBT Mission, n.d.). Some DBT policies, like India's Pratyaksh Hanstantrit Labh (PAHAL) scheme for LPG, charge consumers market-based tariffs to buy a product and then directly transfer subsidies to beneficiaries' bank accounts after their sale (KPMG & DfID, in press). Others, like the Aadhaar enabled Fertiliser Distribution System (AeFDS) fertilizer subsidy, continue to require producers to sell goods at below-market prices and then transfer subsidies to producers to reimburse them for their losses—much like the current electricity subsidy regime (KPMG & DfID, in press). Regardless of the exact implementation, a DBT for power (DBT-P) would not automatically imply targeting, because it is a change in the subsidy delivery mechanism and not a change in determining subsidy eligibility or magnitude. It would, however, involve the creation of a registry of beneficiaries to which targeting methods could then be applied.

3.2 LPG Subsidies

How big are India's LPG subsidies, and how do they work?

The main objective of LPG subsidies in India is to shift households away from traditional solid fuels that are responsible for dangerous levels of indoor air pollution, the health impacts of which are predominantly borne by women and children.

As illustrated in Table 3, LPG subsidies are mainly provided by the central government, through a broad range of measures. The PAHAL cash transfer scheme is India's largest single petroleum product subsidy, estimated at 9 per cent of all central energy subsidies that could be quantified in FY 2017/18, at INR 12,905 crore (USD 1.9 billion). It was gradually phased in from FY 2014/15, initially under the name Direct Benefits Transfer for LPG (DBTL),[2] replacing a previous subsidy policy that operated through under-recoveries. It is accompanied by a number of related smaller schemes that also seek to reduce consumption prices. The next most significant policy is Pradhan Mantri Ujjwala Yojana ("Ujjwala"), launched in FY 2017/18. It is intended to help households afford the initial start-up costs of switching to LPG. In addition to the central government, some subsidies have been provided by India's major oil marketing companies (OMCs). Some states also provide separate, state-level subsidies for LPG, mostly associated with additional assistance for initial start-up costs. National data on such schemes are poor, and, as such, they are not reflected in Table 3.

[2] DBTL was launched in 2014, and the scheme was re-branded as PAHAL in 2015.

Table 3. India's LPG subsidies (INR crore)

Subsidy Policy	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
PAHAL (DBTL) Subsidy on household LPG	3,869	3,971	21,811	12,905	20,880
Permanent Cash Advance for DBTL (PAHAL)	1,234	n/a	5755.0	n/a	n/a
Project Management Exp. for DBTL (PAHAL)	43.2	n/a	200	n/a	25
Fiscal Subsidy on LPG	19,040	22,720	-	-	-
Under-recovery on domestic LPG	46,458	36,580	18	-	-
Excise Exemption on Domestic LPG	4,056	3,703	5,046	5,844	-
Customs Exemption on Domestic LPG	n.d.	n.d.	n.d.	n.d.	n.d.
Ujjwala Scheme	-	-	-	2,999	2,496
Lower Goods and Service Tax rates for Domestic LPG	-	-	-	-	139,649
OMC support for LPG connections for poor households					
391	2,248	7,915	-	-	
Total (INR million)	**576,191**	**467,674**	**336,215**	**217,482**	**373,659**
Total (USD billion)	**7.8**	**6.2**	**4.6**	**3.0**	**3.3**

Source: Soman et al., 2018. All INR numbers are rounded to the nearest integer. "n/a" indicates a policy was not available in that year, "n.d." that insufficient data were available to quantify and "-" that the policy had not yet been introduced or had been permanently removed. USD conversions are based on 2019 exchange rates. Note: There are three key factors that influence total subsidies on LPG. One is the cost of LPG, the majority of which is imported and closely follows world crude prices, which have, on average, fallen significantly since 2014 and until they rose again in 2018. The second is the total number of consumers, which has grown considerably in recent years. The third is the per-unit subsidy for LPG, which varies according to world oil prices but can also change as a result of policy decisions, including a number of marginal price increases in the past several years. For a summary of how these factors have influenced expenditure, see GSI (2018).

LPG is sold in the form of 14.2-kg and 5-kg cylinders by three OMCs through a national network of distributors. To access subsidized LPG, households enroll themselves in the registry of beneficiaries belonging to the OMC that is available in their area. This enrolment (also called a "connection") can be for the purchase and use of a single cylinder at a time or a double cylinder. Since 2014, consumers purchase LPG cylinders at market prices and the subsidy is credited directly to their bank accounts, reducing the effective price of the LPG cylinder after their sale. This cash transfer mechanism is the PAHAL (formerly DBTL) mechanism.

When PAHAL was first introduced, it was largely universal: all households, including the richest, were eligible. The only form of targeting was an annual consumption limit of twelve 14.2-kg LPG cylinders per connection, after which market prices are charged. This had little functional impact, as only a very small share of households consume above this level. The policy was nonetheless reported to have improved targeting because it aimed to remove many "ghost" and illegal connections by requiring beneficiaries to provide formal identification and matching bank account information. To date, it is not clear to what extent this reduced illegal connections and to what extent it cut out intended

beneficiaries who were unable to understand the policy, provide requested authentication details or access banking facilities (GSI, 2018).

Since this time, the government has experimented with various approaches to targeting PAHAL. In 2015, it began encouraging higher-income households to voluntarily surrender their LPG subsidy under a program called Give It Up. In 2016, income-based targeting was introduced to restrict eligibility to households with an annual income of less than INR 1 million by matching the PAHAL beneficiary registry with the government's income tax database (Lok Sabha, 2018). The net impact of these attempts at targeting has been limited, however. The Give It Up initiative has excluded around 5 per cent of active connections and the income cut-off has restricted less than 1 per cent of active connections (GSI, 2018)—though Give It Up is notable for the large-scale communications efforts it has dedicated to the fairness of subsidy distribution. As a result, the policy remains largely universal in nature.

Who benefits most from the subsidies?

As with electricity subsidies, there are no good distributional data available on the effectiveness and efficiency of India's LPG consumption subsidies at a national level. Data from 2012 suggested that 50 per cent of the subsidy was consumed by the richest 30 per cent of households in the country while the poorest 30 per cent of households received only 15 per cent of the total subsidy (Jain, Agrawal, & Ganesan, 2014). However, this was before considerable effort was invested in increasing uptake among poor households. As of September 2019, the government's Ujjwala dashboard reports it has released over 80 million new connections (Ministry of Petroleum and Natural Gas, n.d.). A 2017 survey in Jharkhand and Chhattisgarh found that 48 per cent of PAHAL beneficiaries did not have a BPL card, though it is difficult to interpret this finding, given known discrepancies in BPL card ownership (GSI & Integrated Research and Action for Development [IRADe], 2019).

Despite the lack of good data on subsidy distribution, it is important to note that price subsidies are important for poor consumers. A 2018 survey of six states found that the main reasons for not adopting LPG are high connection costs (92 per cent of households) and high monthly expenses (87 per cent of households) (Jain et al., 2018). The same study asked why households did not use LPG for all cooking: 92 per cent responded that LPG was too expensive and 67 per cent mentioned "easy availability of free biomass." A 2018 survey in Jharkhand and Chhattisgarh asked how households would behave if LPG subsidies were removed: 14 per cent said they would stop using LPG and 39 per cent said they would reduce consumption (GSI & IRADe, 2019).

This has also been demonstrated through the design of the Ujjwala program (see Box 2), which subsidized only around half of a household's initial LPG start-up costs. The other half had to either be paid for by households or could be covered by taking a loan. If a household chose to take the loan, it had to be repaid by foregoing the PAHAL consumption subsidy on subsequent LPG refills. Numerous anecdotal sources have reported that this has made LPG unaffordable for many households (GSI & IRADe, 2019; Sanghera, 2019; Yadavar, 2019).

This experience underlines the extent to which any attempt to target LPG subsidies must be undertaken with full knowledge about who would be included and excluded by different approaches. Badly planned policy design could have real impacts on the affordability of clean cooking.

Box 2. Subsidy targeting in the Ujjwala scheme

India's Ujjwala policy subsidizes LPG connections and has targeting built into its design. One aspect of this is the simple fact that it focuses on connections: households without LPG are much more likely to be low-income than people who already use LPG. The policy also requires households to meet deprivation criteria from the Socio-economic Caste Census (SECC) or to be from a list of recognized vulnerable groups (Jain et al., 2018).

Data suggest that the Ujjwala scheme was relatively successful in clustering its benefits on the poorest. A study in Chhattisgarh and Jharkhand found that 48 per cent of Ujjwala beneficiaries were among the poorest 40 per cent of households, based on self-reported income (GSI & IRADe, 2019). In comparison to many consumption subsidies, this implies a relative clustering of Ujjwala on the poorest, notwithstanding some significant leakage. However, the relative effectiveness of this targeting may have had more to do with self-selection than the suitability of SECC data for targeting, and it does not account for errors of exclusion—the share of low-income households that were unintentionally excluded from benefits. The SECC was conducted in 2011. Since that date, many households and individuals will have changed circumstances and locations. A 2018 survey of Bihar, Jharkhand, Madhya Pradesh, Odisha, Uttar Pradesh and West Bengal found around 37 per cent of villages reporting concerns about the targeting accuracy of Ujjwala, particularly regarding the exclusion of poor households (Jain et al., 2018).

Are there policy commitments to improve targeting?

Over the past year, there has been increasing discussion around Ujjwala 2.0. This follows the success of the scheme in promoting connections but also the challenges that have been experienced in promoting ongoing consumption by low-income households, particularly those who have taken the loan option and thereby foregone consumption subsidies until it is repaid. Proposals have included offering a subsidy for the smaller 5-kg cylinder; writing off any outstanding loans; providing a higher per-cylinder PAHAL subsidy for beneficiaries of Ujjwala; capping consumption to nine 14.2-kg cylinders per year, the estimated average household need; gradually shifting to an "opt-in" subsidy where higher-income households are removed from the current registry and then required to re-register if they feel they still require assistance; removing beneficiaries based on a specific length of time they have been connected (for example, 20 years); and using categorical strategies to focus subsidies, such as concentrating on younger families with children (Harish & Smith, 2019; Josey, Sreenivas, & Dabadge, 2019; Parikh, 2019; Tripathi, 2019; Tripathi & Sagar, 2019). As well as helping Ujjwala beneficiaries afford the costs of ongoing consumption, it may also be important for Ujjwala 2.0 to consider non-subsidy factors that also influence cooking fuel consumption (see Box 3).

Box 3. Are subsidies alone sufficient to achieve clean cooking goals in India?

Although Ujjwala has been enormously successful in converting households to LPG use, this has not necessarily resulted in the abandonment of traditional fuel that causes indoor air pollution.

In 2018, a survey of rural households in Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh found that 98 per cent of households with an LPG stove also owned a traditional *chulha* stove, and 73 per cent reported using the *chulha* to cook some or all foods (Gupta et al., 2019). This was corroborated by survey research in Jharkhand and Chhattisgarh, where 55 per cent of the LPG-using sample continued to use a mix of other fuels, and in Uttar Pradesh, Odisha and Madhya Pradesh, where fuel stacking was practised by 49 per cent, 43 per cent and 37 per cent of households, respectively (GSI & IRADe, 2019; Jain et al., 2018).

While data show that households do increase their LPG use over time (Jain et al., 2018), it is far from clear that this trend will result in the abandonment of traditional fuel, or by what timeline it will lower indoor air pollution. This suggests that current patterns of LPG consumption subsidies alone are insufficient to achieve policy objectives. In essence, it is hard to subsidize any fuel sufficiently to cope with something that is perceived to be "free." Resources may also be required to address perceptions and attitudes to traditional fuel (GSI & IRADe, 2019; Gupta et al., 2019). Better targeting might allow for a much smaller subsidy for the non-poor and a much higher subsidy for the poor. This could enhance usage substantially among low-income households and yet cost the taxpayer less over time.

3.3 Knowledge Gaps

Given the scale of expenditure on energy subsidies, policy-makers are missing up-to-date information on who benefits most from these policies. The last comprehensive distributional analysis of electricity and LPG subsidy benefits is based on data from the 2011 census. Since this time, there have been enormous changes in both energy consumption and energy subsidy policy. It remains unclear whether increased access has significantly improved subsidy distribution or whether growing consumption has increased the unequal distribution of benefits. The government's stated ambition to roll out a DBT-P in the electricity sector underlines the importance of understanding subsidy distribution in order to inform any related discussions on subsidy targeting. Similarly, discussions on a potential Ujjwala 2.0 should ideally be based on strong evidence about the many different targeting approaches that have been proposed.

In the short term, better data are required to inform policy-making. In the medium term, it is vital for data collection exercises to help inform the design of India's next census, currently scheduled for 2021. The census will likely define administrative capacity for targeting through the early 2020s. As such, the design of questions on electricity and LPG are key.

4.0 Options for Targeting

This chapter reviews possible approaches for targeting energy subsidies in India. It aims to identify key options that could be tested in future fieldwork. These approaches were identified by reviewing literature on targeting and through interviews with a range of institutions, including development banks, civil society organizations and other researchers. The approaches here are not an exhaustive list of all possible options. They are also intentionally not limited to energy—they draw on experiences from some of India's broader welfare schemes, including those with a focus on food, employment and agriculture.

The options include:[3]

- **Opt-out schemes:** Benefits are distributed to all except those who choose to exclude themselves from participation.
- **Self-selection or opt-in schemes:** Benefits are distributed only to those who choose to participate.
- **Quota-based and volumetric targeting:** Benefits are provided up to a certain volumetric cut-off, within a certain time period.
- **Categorical targeting, including by geographic and social criteria:** Benefits are distributed to people possessing certain characteristics, such as living in certain geographic areas, being male or female, being pregnant, having a disability, being within a certain age range or having been a beneficiary for a certain period of time.
- **Income, asset- and consumption-based data and proxy means testing:** Benefits are based on an estimate of relative wealth levels, using data on income, assets and consumption, individually or in combination. With proxy means testing, comprehensive data on income, assets and consumption are used to identify a limited number of variables that can be used as a "proxy" to predict relative wealth levels with reasonable accuracy. This is often the basis for adopting and designing some of the above targeting approaches, such as quota-based, categorical and geographic targeting.

In practice, several of these approaches can and are often used in combination, but for the sake of clarity, they are discussed individually below.

[3] In addition to the strategies for targeting listed here, many cash transfer schemes set behavioural conditions that beneficiaries must comply with to receive payments. We do not discuss such conditionalities because we do not consider them to be a targeting strategy. Typically, the intention of a behavioural conditionality is to promote a desired behaviour that is critical to ending the intergenerational cycle of poverty (such as sending children to school or attending maternal health check-ups). While it functionally ends up excluding some people, it is not generally intended to help distinguish between poorer and richer households.

4.1 Opt-Out Schemes

Opt-out schemes are policies that assume universal participation but then allow people to exclude themselves voluntarily.

For LPG, an opt-out scheme already exists—the Give It Up campaign—and there is potential to initiate a second push on that program. The same approach could easily be adapted to electricity subsidies because discoms already possess customer registries that could be used to record if consumers should pay full or subsidized tariffs.

It is difficult to assess the potential number of consumers who would opt out under such schemes. While Give It Up has had an impact on LPG consumption, it seems clear that it is not sufficient alone to target subsidies. Only 5 per cent of total connections have been de-registered under Give It Up, and some unsubscribed consumers have begun to re-register (GSI, 2018). The policy is, however, also notable for its influence on public perceptions. The large-scale, public announcement of high-profile figures and companies opting out of subsidies can help to establish a social norm that such policies are not intended for higher-income households, easing the introduction of other targeting methods (Toft, Beaton, & Lontoh, 2016). It is also true that there is significant deviation in the success of Give It Up in different parts of India. According to investigative media reporting, between 14 and 17 per cent of consumers have unsubscribed from LPG subsidies in Delhi, Mizoram and Nagaland, while only 2 per cent have done the same in states such as Odisha, Andhra Pradesh and West Bengal (Jadhav, 2019).

4.2 Self-Selection or Opt-In Schemes

Self-selection means that benefits are distributed only to beneficiaries who choose to participate. Typically, policies aim to dissuade higher-income households by requiring effort in return for benefits (for example, labour, as in India's MGNREGA scheme, discussed in Box 4) or providing goods that are low-quality (Alatas et al., 2016; Liu & Barrett, 2012), though they may also encourage households to use moral judgment on whether they really need assistance. Policies can also incur costs or inconveniences in some way, such as limiting points of sale to certain vendors, restricting the time of sales and creating time burdens such as queuing (Coady, Grosh, & Hoddinott, 2002). In some cases, the additional cost is simply the need to register, also known as an opt-in scheme (Alatas et al., 2016). An opt-in approach can also be used in combination with other forms of targeting to help reduce the risk of unfairly excluding beneficiaries. For example, geographic targeting might exclude all beneficiaries living in a high-income geographic area but then also adopt an opt-in approach where households can decide to re-register for benefits—throwing a lifeline to any poor consumers who have been unfairly excluded.

While self-selection can effectively dissuade participation from richer consumers, its "hassle costs" place burdens on poor consumers too, and may ultimately dissuade them from participating (Alatas et al., 2016). Hassle costs can also multiply if numerous different schemes all incur a time or inconvenience burden. Even registration systems can deter poor households from applying, as they may face communication barriers in understanding the registration process or struggle to provide mandatory registration details. It also runs the risk that many better-off consumers will pay the hassle costs and decide to re-subscribe.

For electricity subsidies, there would be limited opportunities to introduce self-targeting. Electricity services can be higher or lower quality (for example, the number of hours of supply or the likelihood of voltage fluctuations), but such factors are linked to large-scale infrastructure and cannot be differentiated on a consumer-by-consumer basis, even if there were a desire to do so. The same is true for LPG subsidies, where there is neither a practical means nor a clear benefit to creating new costs for existing beneficiaries. For both energy types, however, there is a case to be made for the use of an opt-in scheme that allows households to re-register if they have been excluded under another targeting strategy. This would reduce the risk of unfair exclusion from other targeting approaches. The biggest knowledge gap is whether or not low-income households would be able to access and understand information about the policy change and then navigate the process to re-register. In Thailand, for example, attempts to introduce an opt-in scheme for LPG subsidies resulted in only around 5 per cent of total eligible beneficiaries joining the program (Toft et al., 2016). It would also be important to estimate the share of better-off households who would be likely to re-register.

Box 4. Self-targeting with the MGNREGA

India's MGNREGA is the largest public works program in the world (World Bank, 2015). It guarantees 100 days of paid employment per year to people in rural households for unskilled manual labour. It is an example of a self-targeted scheme. Only the unemployed can participate, and the relatively low value of the wage is intended to dissuade participants who can compete for higher paid employment. An allocation of INR 61,084 crore (USD 8.94 billion) was made for the scheme in FY 2018/19. It has provided nearly 235 million person-days of employment annually from FY 2015/16 to FY 2017/18 (Press Information Bureau [PIB], 2019a). According to the Ministry of Rural Development (2014), MGNREGA has high participation from marginalized groups, including the Scheduled Castes and Scheduled Tribes.

4.3 Quota-Based and Volumetric Targeting

In quota-based or volumetric targeting systems, benefits are provided up to a certain quantity of consumption, over a certain time period. In the context of electricity subsidies, it is often combined with categorical targeting: for example, distinguishing between consumer types (residential, agricultural, commercial, industrial, government), geographic location (urban rural) and the voltage size of a user's connection. This type of targeting is often built on the premise that energy consumption will be closely correlated with wealth, so a quota or volumetric cut-off will cluster benefits on low-income consumers. Such policies may also be based on simply ensuring the affordability of estimated essential energy needs for all households.

This type of targeting is relatively easy to administer. It only requires some kind of system to track individual consumers' consumption levels and to adjust pricing accordingly. The distributional impacts of this type of targeting depend on the exact design. It still entails risks of exclusion: in some cases, consumption is not well correlated with wealth, such as among large families, multiple-occupancy residences with a shared connection or parts of countries that have higher-than-average cooling or heating needs (Kelly et al., 1976). Evidence also suggests that lifeline tariffs can be subject to political pressure to increase threshold consumption levels and thereby expand benefits to higher-income groups (Wodon, 2003).

Electricity and LPG subsidies in India are already targeted to some degree using volumetric cut-offs. In the case of electricity, block tariff structures typically charge different rates for different volumetric consumption blocks, and the lowest block is often defined as a "lifeline tariff" intended to cover basic needs. In the case of LPG, there is a cap of 12 subsidized 14.2-kg cylinders per year.

There is clear scope to improve targeting by adjusting existing volumetric cut-offs. For electricity, in some states, there may be potential to redesign consumption blocks and the subsidy magnitude per consumption block, particularly in states where subsidies are offered even for high-consuming households (see Annex 1). Due to their billing structure, discoms have detailed data on average household consumption volumes that could be used to inform policy design, although there is currently no way for them to tell how well consumption volume is correlated with poverty. Many states also continue to employ IBT structures that offer all consumers low prices for their initial blocks of consumption. In such states, shifting to a volume-differentiated tariff—where prices for every unit of consumption are determined by a user's total final monthly consumption—provide fewer benefits to high-consuming households and provide a larger incentive for those households to consume energy efficiently.

For LPG, it may be possible to simply reduce the total quota of 14.2-kg LPG cylinders per year, currently set at 12. This was, in fact, already introduced in 2012 when the cap was reduced to six cylinders per year (GSI, 2018). In 2013, this was increased to nine and then in 2014 back to 12 (GSI, 2018). Based on extensive energy access surveying data in recent years, it should be possible to determine quota levels that are well aligned with average consumption. According to a 2018 survey of six states by Jain et al. (2018), few households consume as many as 12 cylinders per year: the median number of cylinders purchased per year by Ujjwala households is five, while for non-Ujjwala households who have used LPG for more than two years, it is eight.

4.4 Categorical Targeting (Geographic, Social)

Categorical targeting is a feature of many social protection programs. Geographic targeting is a common form of categorical targeting and often combined with other targeting methods (Domelen, 2007). The foundation of geographic targeting is a dataset that correlates specific geographic areas with a definition of poverty, typically drawn from census data, or another metric pertinent to the policy in question, like caloric intake or electricity access. This is often based on either political jurisdiction (e.g., districts) or the reach of certain service providers (e.g., zones covered by particular utilities). Targeting built on social criteria may be linked to the specific nature of the benefit being transferred—for example, making disability payments only available for households, including a person with a disability or assistance for the elderly only available to households including persons above a certain age. It can also target social groups among whom poverty is relatively more highly clustered.

Categorical targeting performs best when there is a strong correlation between a particular categorical criterion and the group being targeted by the social program. In particular, for geographic targeting, there is a risk of creating an arbitrage opportunity across geographic areas or of creating perverse incentives for people to travel or relocate to certain areas in order to receive benefits. The type of benefit in question and the delivery mechanism can increase or decrease the risk of these problems. While categorical targeting can be relatively easy to implement if capacity is low, it can also be

politically sensitive and practically challenging to adapt systems over time if populations change and data are not updated (Domelen, 2007; Hanna & Karlan, 2016).

Many state discoms today adopt a modest degree of geographic targeting by differentiating tariffs between urban and rural areas. There is currently no element of geographic targeting in the design of PAHAL consumption subsidies for LPG, although there are some separate central government policies that have targeted specific states or regions to encourage LPG adoption. Empirical research could usefully explore the potential for more disaggregated geographic targeting for electricity subsidies.

There is little use of social categorical targeting for energy consumption subsidies. In some cases, such as the state of Jharkhand, the lowest lifeline electricity tariff has been made contingent upon whether or not a household was previously a beneficiary of the Kutir Jyoti program, which subsidized an electricity connection and was in turn linked to categories such as BPL tribal families (PIB, 2005). Otherwise, it is notable that Ujjwala LPG connection subsidies were made available to a number of recognized social categories, based on data collected during 2011 in the SECC: Scheduled Caste and Scheduled Tribe Households; forest dwellers; Most Backward Classes; Tea and Ex-Tea Garden Tribes; and people residing in river islands (Ministry of Petroleum and Natural Gas, 2019). Households could also qualify if they were already beneficiaries of Pradhan Mantri Awas Yojana, an affordable housing scheme, or Antyodaya Anna Yojana, a subsidized food scheme (Ministry of Petroleum and Natural Gas, 2019). Proposals have been made for an Ujjwala 2.0 to operate by providing a higher consumption subsidy to consumers who received an LPG connection through Ujjwala. If this were to take place, social categorial targeting would effectively become built into LPG consumption subsidies. Given the significant impact that traditional cooking can have on women's respiratory health, it has also been suggested that LPG subsidies under an Ujjwala 2.0 could be targeted at pregnant women in particular (Roy, Patil, Pillarisetti, & Harrell, 2019). Parikh (2019) also suggests cutting off access to subsidies based on the age of households' LPG connections, on the basis that long-standing consumers are unlikely to shift back to traditional biomass fuels. Empirical research could usefully explore how Ujjwala's existing social categorical targeting could be applied to PAHAL subsidies and how other personal characteristics, such as pregnancy or age of connection, could be considered in policy design.

4.5 Income, Asset, Consumption-Based Targeting and Proxy Means Testing

Poverty is a complex, multidimensional concept that has no objective definition. In India, the poverty line is currently determined by the government's official think tank NITI Aayog, based on the estimated per capita average expenditure required to obtain a minimum level of certain goods and services such as food, clothing, rent and energy. The poverty line is set both nationally and state-wise. Over the years, it has changed with changes in the selection and quantity of the basket of minimum goods and services, consumer prices and the range of time over which consumption has been monitored (Vivake, 2011).

With the poverty line in place, it is still necessary to estimate who sits above and below this line, depending on their ability to obtain the minimum level of goods and services. A broad range of social protection schemes in India has addressed this using a combination of data on income, assets and consumption. As of mid-2019, four censuses have been conducted: 1992, 1997, 2002 and 2011. Each has used a different methodology to identify poor and non-poor households. Table 4 summarizes

each methodology and some of the major criticisms that have been made about each one. The most recent iteration of the survey, from 2011, is the SECC. If this survey determines that a household is poor, it will appear on the BPL list. The household can then apply for a BPL card and use it to access subsidized goods and qualify for a range of other social protection schemes.

Table 4. BPL census over the years

Year	Methodology	Major Criticisms of the Methodology
1992	Based on self-reported income, which led to the over-estimation of poor households	Households under-report income, leading to over-estimation of poor households. Many rural agrarian households were engaged in informal sectors where income was difficult to estimate. Household income was not broken down to per capita to account for changing household size.
1997	Based on a combination of assets data[i] and consumption expenditure	Exclusion criteria based on assets was considered very strict. For example, ownership of a single ceiling fan was considered non-poor. Exclusion criteria did not vary between states and therefore did not capture interstate heterogeneity. There were no procedures to add new households to the BPL registry.
2002	Multidimensional view of poverty: scoring households based on 13 questions covering food, housing, work, land ownership, assets and education	The scoring came under severe criticism as the 13 dimensions were given equal weights across all states. There was a cap on the number of households identified as BPL in districts, leading to differing scoring in neighbouring districts. There was wide-spread data manipulation and corruption in some states. There was also criticism of the questionnaire design and response structure.
2011	Based on three stages: (i) exclusion of non-poor households based on a list of assets and income or income alone, (ii) inclusion of households as poor based on eight criteria (such socially disadvantaged households, or women-led households), (iii) a score assigned to the remaining households based on seven criteria	The SECC has inherent design features that lead it to diverge on results from other studies. Researchers found that the SECC's exclusion criteria excluded a much larger share of rural households than other methods. More than half of the excluded households would have been defined as poor by the other methods, of which a significant share used traditional cooking fuel (91.6%), did not have improved sanitation (78.9%) and had at least one undernourished woman or child (76.9%) (Alkire & Seth, 2013). This implied that the SECC's first stage of exclusion criteria parameters needs careful consideration. Other research found relatively low consistency between SECC measures of poverty and estimates from the 2011 Indian Census and the National Family Health Survey 2015–16 (Srinivas, 2019).

Source: Alkire & Seth, 2013.

Note: (i) Assets data included a wide number of factors such as agricultural land holdings, consumer appliances and farm equipment.

There has been no consensus on the approach taken by any of the poverty censuses, yet the resulting BPL cards have been the main tool available for policy-makers to target social welfare to poor households—including through the Public Distribution System (PDS) (see Box 5). This long-standing reliance on BPL cards has led to issues with duplicate, fake or otherwise misused cards, often referred to as "ghost" beneficiaries. Efforts to improve the functioning of the card system include recent digitization of the BPL lists and linking accounts to beneficiaries' Aadhaar

number, the national unique identifier system. This has also seen challenges, however, where the most marginalized have struggled to link BPL cards. According to media reports in Jharkhand, for example, out of 2.3 crore citizens accessing subsidized goods under the PDS, only 1.7 crore linked their Aadhaar (Choudhury, 2018).

Box 5. BPL cards in India's PDS

India's PDS has provided a range of products, such as rice and wheat, at highly subsidized prices through Fair Price Shops since 1944. India's PDS has been subject to a great deal of debate for many years with respect to its effectiveness and efficiency. Despite various efforts to improve the scheme, it is believed to have high exclusion errors, inclusion errors and "ghost" cards (Dutta & Ramaswami, 2001; Ministry of Consumer Affairs, 2015; Planning Commission, 2005).

Before 2013, the policy targeted households who were BPL (Puri, 2017). The exact eligibility criteria varied by state, but all required beneficiaries to possess a BPL card. In the early 2000s, it was estimated that around 42 per cent of subsidized grains reached the target group, while 36 per cent were siphoned off the supply chain, and another 21 per cent reached above-poverty-line households (Planning Commission, 2005). As of 2013, the National Food Security Act extended the coverage of PDS to 75 per cent of the rural population and 50 per cent of the urban population. All states have adopted the National Food Security Act, and the scheme has identified 807.2 million people as beneficiaries (PIB, 2018).

To date, there have been some limited attempts to target energy subsidies to poor households using the poverty census or other data sources on income, assets and expenditure.

For electricity, a number of states have made BPL ownership a prerequisite for accessing certain pricing categories. In the state of Jharkhand, for example, the Kutir Jyoti scheme was used to connect rural BPL households. Households that registered under the scheme pay a Kutir Jyoti tariff rate that has the highest per-unit consumption subsidy in the tariff order, INR 4.25 per kWh (USD 0.06), regardless of consumption volume.

For LPG, there has been no attempt to date to integrate poverty census data in the PAHAL consumption subsidies scheme, but income data from national tax authorities have been used. Currently, households reporting income above INR 1,000,000 (USD 1,488) per year are automatically excluded from subsidies, based on data from income tax returns (PIB, 2016). According to data on tax filings from FY 2015/16, this would have applied to around 3 million people, a little over 7 per cent of the total population filing taxes (Income Tax Department, 2016). Separately, eligibility for Ujjwala connection subsidies has been made contingent on meeting poverty criteria under the SECC (Pradhan Mantri Ujjwala Yojana, 2019). One proposal for Ujjwala 2.0 has been to provide higher-value PAHAL consumption subsidies to Ujjwala recipients, which would integrate SECC criteria implicitly into consumption subsidy design (Tripathi, 2019; Tripathi & Sagar, 2019).

Going forward, there could be potential to upscale the use of poverty census data in targeting electricity and LPG consumption subsidies, but it would be subject to the same criticism that SECC data has received in other contexts, and particularly vulnerable to the fact that the data are now almost 10 years old. This would be mitigated to some extent when the next survey is conducted but would then be vulnerable to increasing inaccuracy unless a system is introduced

to update the data frequently. To some extent, potential gaps in SECC data could be mitigated by using it in conjunction with other exclusion and inclusion criteria, as in the case of the Ujjwala program. There is some potential to expand the national tax data to also limit electricity subsidies, but this would need to be combined with other targeting measures to add up to significant impacts. According to the last data published by the Income Tax Department (2016), only 43.6 million individuals filed taxes in FY 2015/16, around 3.1 per cent of the population, and, of this sum, only 20.2 million individuals owed tax.

To complement existing data sources, an up-to-date representative survey could be used to try to identify proxies that can most effectively predict if households are better or worse off, by collecting comprehensive data on energy consumption, income, assets and expenditure. This could be used to inform the choice and design of targeting approaches discussed above—volumetric and categorical targeting—or to identify a simple set of indicators that are already collected or could be relatively easily collected for ongoing use in targeting programs. For example, being a beneficiary under other non-energy social protection programs could be a good proxy for a household's welfare. This could be at a central level or at a state level, where numerous social protection schemes are in operation (see Box 6). The findings from such survey research could also help inform the design of energy-related questions for the next poverty census and its periodic updates.

Box 6. State focus: Social protection schemes in Jharkhand

At the state level, a number of social protection schemes could be explored to determine whether their targeting systems could be used to help target state-level energy subsidies. Individually, such schemes may often have a fairly narrow focus area, but the overlapping registries of several schemes could feasibly be considered. For covering rural areas in Jharkhand, two such schemes are the PM Awaas Yojana – Grameen (PMAY-G) and the MukhyaMantri Krishi Aashiward Yojana.

PMAY-G is a rural housing program initiated under the government's objective to provide Housing for All by 2022. The scheme aims to provide a *pucca* house with basic amenities to all houseless families and those living in *kutcha* and dilapidated houses by 2022. The central and state governments share the cost of unit assistance in the ratio of 60:40 in plain areas and 90:10 for North Eastern and the Himalayan States. The selection of beneficiaries is conducted through housing deprivation parameters in the 2011 SECC verified by the Gram Sabhas (Ministry of Rural Development, 2018). This is already used as an inclusion criterion for the Ujjwala scheme (Ministry of Petroleum and Natural Gas, 2019).

The Mukhya Mantri Krishi Aashiward Yojana was announced by the state government in 2018 with the objective of increasing agriculture production and lowering the financial burden of farmers and their exposure to non-institutional loans. Under the scheme, the state government offers INR 5,000 (USD 73) per acre per year to marginal and small farmers (up to 5 acres of land) for undertaking activities such as seed purchases, fertilizers, hiring farm equipment, labour and land preparation, and any other agriculture-related work. It targets around 22.76 lakh farmers in a planned manner during FY 2019/20 and covers a kharif cropped area of about 45 lakh acres (Government of Jharkhand, 2019).

5.0 Conclusions

India's energy subsidy policy-making is experiencing a knowledge gap. It is unclear how effectively electricity and LPG consumption subsidies are targeted to the poor, and there is a significant time gap between the availability of data and subsidy policy design. Data on subsidy distribution—that is, how subsidies are shared across different income groups —is very dated, with the last comprehensive national analyses for both subsidy types based on data from 2011. The cost of producing such data could be easily justified, given the joint total expenditure on electricity and LPG consumption subsidies of INR 87,830 crore (USD 13.1 billion) in 2017 (Soman et al., 2018). More timely reviews on subsidy incidence are needed.

What is clear is that electricity and LPG consumption subsidy expenditures appear to be growing rapidly. Driven by a larger connected population and increasing prosperity, this will put pressure on policy-makers to consider additional strategies for subsidy targeting. Such discussions have already been taking place, including a DBT-P and a possible Ujjwala 2.0. Existing data show that price subsidies for electricity and LPG are important for their affordability for poor households, so it is vital that any attempts to better target subsidies are carefully designed and tested.

Despite this, there is little detailed debate on exact options for energy subsidy targeting. This briefing identifies a range of specific measures that could be considered. The most promising of these are:

- **Opt-out schemes:** This already exists for LPG but could be extended to electricity. They are likely to have a modest impact on targeting effectiveness. Nonetheless, they can still play an important role in determining new social norms that subsidies are not for higher-income groups.
- **Quota-based and volumetric targeting:** Electricity and LPG subsidies already contain a degree of targeting based on consumption volumes. In many instances, current volumetric cut-offs are higher than necessary and include the majority of households. This is also an easy-to-administer approach to targeting.
- **Geographic and social categorical targeting:** Some electricity subsidies distinguish between urban and rural areas, but otherwise there is no significant use of geographic targeting for energy subsidies in India. Geographic targeting can work well when poverty is highly concentrated in certain areas and can be an effective targeting design feature in combination with other approaches. Social categorical targeting could focus subsidies on disadvantaged social groups. In the case of LPG, policy-makers could also explore targeting increased subsidies to pregnant women.
- **Income, asset, consumption-based targeting and proxy means testing:** Data on income, assets and expenditures or proxies associated with relative wealth levels are increasingly being used by major social assistance policies in India. While the data and methods underlying these approaches are always likely to be divisive, it is important to explore how well such systems could be adapted to energy subsidies. In addition to major datasets such as the SECC, it may also be possible to consider how well other national and state-level schemes are performing with poverty targeting and using participation in the best-targeted schemes as another proxy for energy subsidy eligibility. Such efforts could help inform the strategies taken around other forms of targeting, including volumetric and categorical targeting.

Further, in cases where there is concern that targeting could unintentionally exclude a significant share of intended beneficiaries, there is potential for opt-in schemes to help address social injustices. This would enable people to re-subscribe to subsidies if they judge that they are in need.

Separately, it is important to ensure that energy subsidies are reflected in national conversations about whether to introduce a universal basic income, as proposed in the 2017 Indian Economic Survey. The significant expenditure on energy subsidies, along with the challenge of maintaining and administering energy subsidy programs, would make it a possible candidate for integration into a merged, universal assistance scheme for all citizens.

The extent of the knowledge gap on this issue requires a dedicated research effort to better inform policy. Empirical data are needed to determine which interventions can best target subsidies without compromising energy access. As a first-stage analysis to filter the above options, this could be achieved by collecting comprehensive income, asset and expenditure data, following norms set out in national poverty assessments, and using these data to estimate rates of inclusion and exclusion from different potential targeting methods. Separately, empirical research could also be used to explore the extent to which opt-in schemes are functioning well for existing policies that use them. This could include an assessment of how well communications have performed in ensuring that households understand their opt-in rights, as well as the extent to which registration processes have created barriers to access and higher-income beneficiaries have chosen to re-subscribe. Finally, studies exploring the impacts of a universal basic income grant should examine how cash transfers affect energy consumption decisions. This is required to determine whether government goals on clean and modern energy can be achieved if subsidy programs are de-linked from energy consumption decisions.

References

Ahmed, M. (2011, May 10). *Subsidies—Love them or hate them, it's better to target them.* Retrieved from https://blogs.imf.org/2011/05/10/food-and-fuel-subsidies/

Alatas, V., Banerjee, A., Hanna, R., Olken, B. A., Purnamasari, R., & Wai-Poi, M. (2016). Self-targeting: Evidence from a field experiment in Indonesia. *Journal of Political Economy, 124*(2), 371–427. https://doi.org/10.1086/685299

Alkire, S., & Seth, S. (2013). Selecting a targeting method to identify BPL households in India. *Social Indicators Research, 112*(2), 417–446. https://doi.org/10.1007/s11205-013-0254-6

Anand, R., Coady, D., Mohommad, A., Thakoor, V., & Walsh, J P. (2013). *The fiscal and welfare impacts of reforming fuel subsidies in India* (IMF Working Paper 12/128). Retrieved from https://www.imf.org/en/Publications/WP/Issues/2016/12/31/The-Fiscal-and-Welfare-Impacts-of-Reforming-Fuel-Subsidies-in-India-40593

Arze del Granado, J., Coady, D., & Gillingham, R. (2010). *The unequal benefits of fuel subsidies: A review of evidence for developing countries.* Retrieved from http://www.imf.org/external/pubs/ft/wp/2010/wp10202.pdf

Arze del Granado, F. J., Coady, D., & Gillingham, R. (2012). The unequal benefits of fuel subsidies: A review of evidence for developing countries. *World Development, 40*(11), 2234–2248. https://doi.org/10.1016/j.worlddev.2012.05.005

Atansah, P., Khandan, M., Moss, T., Mukherjee, A., & Richmond, J. (2017). *When do subsidy reforms stick? Lessons from Iran, Nigeria, and India.* Center for Global Development. Retrieved from https://www.cgdev.org/sites/default/files/when-do-subsidy-reforms-stick-lessons-iran-nigeria-and-india.pdf

Badiani, R. & Jessoe, K. (2018). Electricity prices, groundwater and agriculture: Environmental and agricultural impacts of electricity subsidies in India. In W. Schlenker (Ed.), *Agricultural productivity and producer behavior* (pp. 157–183). National Bureau of Economic Research.

Beaton, C., Gerasimchuk, I., Laan, T., Lang, K., Vis-Dunbar, D., & Wooders, P. (2013). *A guidebook to fossil-fuel subsidy reform.* Retrieved from https://www.iisd.org/gsi/sites/default/files/ffs_guidebook.pdf

Beaton, C., Jain, P., Govindan, M., Garg, V., Murali, R. … Pallaske, G. (2019). *Mapping policy for solar irrigation across the water-energy-food (WEF) nexus in India.* IISD. Retrieved from https://www.iisd.org/sites/default/files/publications/solar-irrigation-across-wef-nexus-india.pdf

Bhattacharya, P. (2018, August 30). *Targeted transfers may be more effective than Universal Basic Income.* LiveMint. Retrieved from https://www.livemint.com/Politics/OBNb1fKuY9wnXiEeHXVEFM/Universal-Basic-Income-in-India.html

Choudhury, A. D. (2018). *Linking Aadhaar with PDS has left some of India's most marginalised hungry.* The Wire. Retrieved from https://thewire.in/rights/aadhaar-welfare-scheme-jharkhand

Coady, D., Grosh, M., & Hoddinott, J. (2002). *The targeting of transfers in developing countries: Review of experience and lessons* (Social Protection Discussion Paper). World Bank.

Coady, D., Flamini, V., & Sears, L. (2015). *The unequal benefits of fuel subsidies: A review of evidence for developing countries* (WP/15/250). International Monetary Fund. Retrieved from https://www.imf.org/external/pubs/ft/wp/2015/wp15250.pdf

Coady, D., Gillingham, R., Ossowski, R., Piotrowski, J., Tareq, H., & Tyson, J. (2010). *Petroleum product subsidies: Costly, inequitable, and rising* (IMF Staff Position Note No. 2010/05). International Monetary Fund. Retrieved from https://www.imf.org/en/Publications/IMF-Staff-Position-Notes/Issues/2016/12/31/Petroleum-Product-Subsidies-Costly-Inequitable-and-On-the-Rise-23584

Coady, D., Grosh, M., & Hoddinott, J. (2004). *Targeting of transfers in developing countries: Review of lessons and experience.* Retrieved from http://siteresources.worldbank.org/SAFETYNETSANDTRANSFERS/Resources/281945-1138140795625/Targeting_En.pdf

DBT Mission. (n.d.). *Standard Operating Procedure (SOP) modules for Direct Benefit Transfer (DBT).* Retrieved from https://dbtbharat.gov.in/data/documents/Standard-Operating-Procedures.pdf

Desai, R. M. (2017, May 31). *Rethinking the universalism versus targeting debate.* Brookings. Retrieved from https://www.brookings.edu/blog/future-development/2017/05/31/rethinking-the-universalism-versus-targeting-debate/

Domelen, J. V. (2007). *Reaching the poor and vulnerable: Targeting strategies for social funds and other community-driven programs.* World Bank.

Dutrey, A. P. (2007). *Successful targeting? Reporting efficiency and costs in targeted poverty alleviation programmes.* United Nations Research Institute for Social Development. Retrieved from http://www.unrisd.org/80256B3C005BCCF9/(httpAuxPages)/0B87C67449C938EDC12573D10049830B/$file/Peyrepap.pdf

Dutta, B., & Ramaswami, B. (2001, May 5). *Targeting and efficiency in the Public Distribution System: Case of Andhra Pradesh and Maharashtra.* Economic and Political Weekly. Retrieved from https://www.isid.ac.in/~bharat/Research/epw_dutta.pdf

Economic Survey. (2017). *Universal Basic Income: A conversation with and within the Mahatma.* Retrieved from https://www.indiabudget.gov.in/budget2017-2018/es2016-17/echap09.pdf

Global Subsidies Initiative (GSI). (2018). *Support for clean cooking in India: Tracking the latest developments in LPG subsidies.* Retrieved from https://www.iisd.org/story/cooking-with-gas-in-india/

Global Subsidies Initiative & Integrated Research and Action for Development (IRADe). (2019). *Gender and fossil fuel subsidy reform: Findings from and recommendations for India.* International Institute for Sustainable Development.

Government of India. (2019, July). *State Health Card Jharkhand.* Retrieved from https://www.uday.gov.in/health-card-state.php?id=3#

Government of Jharkhand. (2019). *Mukhya Mantri Krishi Aashirwad Yojana.* Retrieved from http://mmkay.jharkhand.gov.in/About.aspx

Gupta, A., Vyas, S., Hathi, P., Khalid, N., Srivastav, N., Spears, D., & Coffey, D. (2019). *Persistence of solid fuel use despite increases in LPG ownership: New survey evidence from rural north India.* Retrieved from https://doi.org/10.31235/osf.io/yv2es

Hanna, R., & Karlan, D. (2016). *Designing social protection programs.* Abdul Latif Jameel Poverty Action Lab (JPAL).

Harish, S., & Smith, K. R. (Eds.). (2019). *Ujjwala 2.0: From access to sustained usage.* Retrieved from https://static1.squarespace.com/static/59f2a2038a02c746600f6bbb/t/5d88963547101b6c86be6dbe/1569232611390/CCAPC-Ujjwala+V2.0-Aug+2019.pdf

Income Tax Department. (2019, September). *Income tax return statistics. Assessment year 2015-16* (Version 1.0. 2017). Income Tax Department, Government of India. Retrieved from https://www.incometaxindia.gov.in/Documents/Direct%20Tax%20Data/Income-Tax-Statistics-IT-Return-AY-2015-16.pdf

International Energy Agency. (2017). *World energy outlook 2017.* OECD/IEA.

International Energy Agency. (2018a). *Data on proportion of population with access to electricity, 2018.* Retrieved from https://www.iea.org/SDG/electricity/

International Energy Agency. (2018b). *Sustainable Development Goal 7: Access to clean cooking.* Retrieved from https://www.iea.org/sdg/cooking/

International Monetary Fund. 2013). *Energy subsidy reform: Lessons and implications.* Retrieved from http://www.imf.org/external/np/pp/eng/2013/012813.pdf

Jadhav, P. (2019, January 29). *Just 4% of LPG users have opted out of subsidies.* Hindu BusinessLine. Retrieved from https://www.thehindubusinessline.com/economy/just-4-of-lpg-users-have-opted-out-of-subsidies/article26122784.ece

Jain, A., Agrawal, S. & Ganesan, K. (2014, November). *Rationalising subsidies, reaching the underserved: Improving effectiveness of domestic LPG subsidy and distribution in India.* Council on Energy, Environment and Water. Retrieved from http://www.indiaenvironmentportal.org.in/files/file/Rationalising-LPG-Subsidies-Reaching-the-Underserved.pdf

Jain, A., Tripathi, S., Mani, S., Patnaik, S., Shahidi, T., & Ganesan, K. (2018). *Access to clean cooking energy and electricity: Survey of states 2018.* Council on Energy, Environment and Water. Retrieved from https://www.ceew.in/publications/access-clean-cooking-energy-and-electricity

Josey, A. (2018). *DBT for power: Prepare the ground first.* Hindu Businessline. Retrieved from https://www.thehindubusinessline.com/opinion/dbt-for-power-prepare-the-ground-first/article25569297.ece

Josey, A., Sreenivas, A., & Dabadge, A. (2019). Commentary B. Beyond Ujjwala: Ideas to enhance LPG use sustainably. In S. Harish & K. R. Smith (Eds.), *Ujjwala 2.0: From access to sustained usage* (pp. 8–10). Retrieved from https://static1.squarespace.com/static/59f2a2038a02c746600f6bbb/t/5d88963547101b6c86be6dbe/1569232611390/CCAPC-Ujjwala+V2.0-Aug+2019.pdf

Kelly, K. A., Devanney, J. R., Goldstone, S. E., Kurth, R. E., Storch, S. N., Hampton, B. R., … Konst, R. R. (1976). *Lifeline rates for electricity and natural gas.* National Regulatory Research Institute. Retrieved from http://ipu.msu.edu/wp-content/uploads/2016/12/Kelly-Lifeline-Rates-Electricity-Nat-Gas-1976.pdf

Kidd, S. (2015, October). The political economy of 'targeting' of social security schemes. *Pathways' Perspectives, 19.* Development Pathways. Retrieved from https://www.researchgate.net/profile/Stephen_Kidd3/publication/283498208_The_political_economy_of_targeting_of_social_security_schemes/links/563b3b7908ae405111a68137/The-political-economy-of-targeting-of-social-security-schemes.pdf

Kitson, L., Merrill, L., Beaton, C., Sharma, S., McCarthy, A., Singh, C., … Chowdhury, T. (2016). *Gender and fossil fuel subsidy reform: Current status of research.* Retrieved from https://www.iisd.org/sites/default/files/publications/gender-fossil-fuel-subsidy-reform-current-status-research.pdf

KPMG & Department for International Development (U.K.). (in press). *Direct Benefit Transfer in the Power Sector (DBT-P): A roadmap for Jharkhand.* Government of the United Kingdom.

Liu, Y., & Barrett, C. B. (2012, October). *Heterogeneous pro-poor targeting in India's Mahatma Gandhi National Rural Employment Guarantee Scheme.* International Food Policy Research Institute (IFPRI).

Lok Sabha. (2018, March 26). *Answer to unstarred question 5015*. Government of India.

Mayer, K., Banerjee, S. G., & Trimble, C. (2015). *Elite capture: Residential tariff subsidies in India.* World Bank. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/20538/926480PUB0978100Box385381B00PUBLIC0.pdf?sequence=1&isAllowed=y

Ministry of Consumer Affairs. (2015, September). *Evaluation study of Targeted Public Distribution System in selected states.* Retrieved from https://dfpd.gov.in/1sGbO2W68mUlunCgKmpnLF5WHm/TPDS-140316.pdf

Ministry of Finance. (2019). *Budget provisions, net of receipts and recoveries, for the year 2019-2020 are as under: (Further details are on pages indicated in the last column of this Statement)*. Retrieved from https://www.indiabudget.gov.in/doc/eb/allsbe.pdf

Ministry of Petroleum and Natural Gas. (n.d.). *Pradhan Mantri Ujjwala Yojana.* Retrieved from https://pmuy.gov.in/

Ministry of Petroleum and Natural Gas. (2019). *Frequently asked questions—EPMUY2.* Retrieved from https://pmuy.gov.in/FAQ.pdf

Ministry of Rural Development. (2014, February). *Mahatma Gandhi National Rural Employment Guarantee Act: Report to the People.* Retrieved from http://vikaspedia.in/agriculture/policies-and-schemes/nrega-report-to-people

Ministry of Rural Development. (2018, October). *Pradhan Mantri Awaas Yojana – Gramin.* Retrieved from https://pmayg.nic.in/netiay/about-us.aspx

Parikh, J. (2019). Commentary E. Ujjwala 2: A way forward for sustainable LPG supply. In S. Harish & K. R. Smith (Ed.), *Ujjwala 2.0: From access to sustained usage* (pp. 14–15). Retrieved from https://static1.squarespace.com/static/59f2a2038a02c746600f6bbb/t/5d88963547101b6c86be6dbe/1569232611390/CCAPC-Ujjwala+V2.0-Aug+2019.pdf

Planning Commission. (2005, March). *Performance evaluation of Targeted Public Distribution System (TPDS)*. Retrieved from http://planningcommission.nic.in/reports/peoreport/peo/peo_tpds.pdf

Pradhan Mantri Ujjwala Yojana. (2019, May). *Pradhan Mantri Ujjwala Yojana - Free Gas Connection for SC/ST/MBC People.* Retrieved from http://pradhanmantriujjwalayojana.in/pradhan-mantri-ujjwala-yojana-3/

Press Information Bureau. (2005). *Electricity connection to tribal people*. Retrieved from https://pib.gov.in/newsite/erelcontent.aspx?relid=11231

Press Information Bureau. (2016). *Benefit of LPG subsidy will not be available if the consumer or his/her spouse had taxable income of more than Rs ten lakh in previous financial year.* Retrieved from https://pib.gov.in/newsite/PrintRelease.aspx?relid=133955

Press Information Bureau (2018, January). *80.72 crore persons identified by States/ UTs for coverage under the NFSA*. Retrieved from https://pib.gov.in/newsite/PrintRelease.aspx?relid=175400

Press Information Bureau. (2019a, January 15). *All time high Rs. 61,084 crores for MGNREGA.* Retrieved from http://pib.nic.in/newsite/PrintRelease.aspx?relid=187508

Press Information Bureau. (2019b, February 12). *Installed capacity of various renewable modes of energy.* Retrieved from http://www.pib.nic.in/Pressreleaseshare.aspx?PRID=1564039

Puri, R. (2017, June). *India's National Food Security Act (NFSA): Early experiences.* Leveraging Agriculture for Nutrition in South Asia (LANSA). Retrieved from https://assets.publishing.service.gov.uk/media/5964831e40f0b60a44000154/NFSA-LWP.pdf

Rentschler, J. & Bazilian, M. (2017, October 3). Reforming fossil fuel subsidies: Drivers, barriers and the state of progress. *Climate Policy, 17*(7), 891–914. https://doi.org/10.1080/14693062.2016.1169393

Roy, S., Patil, R., Pillarisetti, A., & Harrell, S. (2019). Commentary G. Health Benefits of PMUY: Challenges in effective implementation and possible solutions. In S. Harish & K. R. Smith (Ed.), *Ujjwala 2.0: From access to sustained usage* (pp. 18–19). Retrieved from https://static1.squarespace.com/static/59f2a2038a02c746600f6bbb/t/5d88963547101b6c86be6dbe/1569232611390/CCAPC-Ujjwala+V2.0-Aug+2019.pdf

Sanghera, T. (2019, April 22). *Cooking gas changes lives but comes at too high a price.* Retrieved from https://www.factchecker.in/cooking-gas-changes-lives-but-comes-at-too-high-a-price/

Sharma, S., Tripathi, S., & Moerenhout, T. (2015). *Rationalizing energy subsidies in agriculture: A scoping study of agricultural subsidies in Haryana, India.* International Institute for Sustainable Development. Retrieved from http://www.iisd.org/library/rationalizing-energy-subsidies-agriculture-scoping-study-agricultural-subsidies-haryana

Soman, A., Gerasimchuk, I., Beaton, C., Kaur, H., Garg, V., & Ganesan, K. (2018, December). *India's energy transition: Subsidies for fossil fuels and renewable energy, 2018 update*. International Institute for Sustainable Development. Retrieved from https://www.iisd.org/sites/default/files/publications/india-energy-transition-2018update.pdf

Srinivas, A. (2019, August). *The targeting challenge in India's welfare programs.* Retrieved from https://www.livemint.com/politics/policy/the-targeting-challenge-in-india-s-welfare-programs-1557294982507.html

TNP2K. (2015). *Indonesia's Unified Database for Social Protection Programmes – Management standards.* National Team for Accelerating Poverty Reduction (TNP2K). Retrieved from http://www.tnp2k.go.id/images/uploads/downloads/Indonesia%20Unified%20Data%20Base.pdf

Toft, L., Beaton, C., & Lontoh, L. (2016). *International experiences with LPG subsidy reform.* International Institute for Sustainable Development. Retrieved from https://www.iisd.org/library/international-experiences-lpg-subsidy-reform

Tripathi, B. (2019, August 14). *Make cooking gas cheaper for poor, remove subsidy for rich: Study.* Business Standard India. Retrieved from https://www.business-standard.com/article/economy-policy/make-cooking-gas-cheaper-for-poor-remove-subsidy-for-rich-study-119081400171_1.html

Tripathi, A., & Sagar, A. (2019). *Ujjwala, V2.0. What should be done next?* (CCAPC/2019/02). Collaborative Clean Air Policy Centre. Retrieved from https://static1.squarespace.com/static/59f2a2038a02c746600f6bbb/t/5d0503a7562f010001cc373f/1560609704122/Ujjwala+V2.0+Jun+19b.pdf

United Nations. (2019, December 9). *Sustainable Development Goal 1. End poverty in all its forms everywhere.* Sustainable Development Goals Knowledge Platform. Retrieved from https://sustainabledevelopment.un.org/sdg1

Vivake. (2011). *How is the poverty line measured?* Retrieved from https://www.prsindia.org/theprsblog/how-poverty-line-measured

Wodon, Q. M. (2003). Lifeline or means testing? Electric utility subsidies in Honduras. In P. B. Irwin (Ed.), *Infrastructure for the poor people: Public policy for private provision* (pp. 27–96). Washington, DC: World Bank and Public–Private Infrastructure Advisory Facility.

World Bank. (n.d.a). *A typology of consumer utility subsidies.* Retrieved from http://siteresources.worldbank.org/INTWSS/Resources/Chapter2.pdf

World Bank. (n.d.b). *Targeted subsidies in public transport: Combining affordability with financial sustainability.* Retrieved from http://siteresources.worldbank.org/INTURBANTRANSPORT/Resources/340136-1152550025185/Targeted-Subsidies-Public-Transport-Note-04-23-2014.pdf

World Bank. (2015). *The state of social safety nets 2015.* Retrieved from http://documents.worldbank.org/curated/en/415491467994645020/pdf/97882-PUB-REVISED-Box393232B-PUBLIC-DOCDATE-6-29-2015-DOI-10-1596978-1-4648-0543-1-EPI-1464805431.pdf

Yadavar, S. (2019, April 30). *Why Goti Bai's LPG cylinder lies in a cowshed, unused.* IndiaSpend. Retrieved from https://www.indiaspend.com/why-goti-bais-lpg-cylinder-lies-in-a-cowshed-unused

Yemtsov, R., Honorati, M., Evans, B., Sajaia, Z., & Lokshin, M. (2018). *Measuring the effectiveness of social protection: Concepts and applications.* Retrieved from https://doi.org/10.1596/978-1-4648-1090-9

Zinecker, A., Sharma, S., Beaton, C. & Merrill, L. (2018, July). *Getting on target: Accelerating energy access through fossil fuel subsidy reform.* Retrieved from https://www.iisd.org/library/getting-target-accelerating-energy-access-fossil-fuel-subsidy-reform

Annex 1. Electricity Pricing Blocks for Different States in India, 2017

Table A1. Monthly electricity consumption volumes with subsidized residential tariffs, 2017

Volume (kWh)	No. of states	States
No subsidy	6	Assam, Bihar, Kerala, Madhya Pradesh, Tripura, West Bengal
0–50	3	Nagaland, Odisha, Rajasthan
0–100	4 + 1 UT + 1 major city	Andaman & Nicobar, Karnataka, Maharashtra, Mizoram, Mumbai, Punjab
0–150	1	Himachal Pradesh
0–200	8 + 1 UT	Andhra Pradesh, Chhattisgarh, Lakshadweep, Manipur, Meghalaya, Sikkim, Telangana
0–250	2	Haryana, Tamil Nadu
0–300	2	Goa, Uttar Pradesh
0–400	3 + 2 UTs	Dama and Diu, Delhi, Jammu & Kashmir, Jharkhand, Puducherry
>400	1	Arunachal Pradesh

Note: UT = Union Territory. Source: Tariff orders, bijlbachao.com and IISD analysis as cited in KPMG & DfID, in press.

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