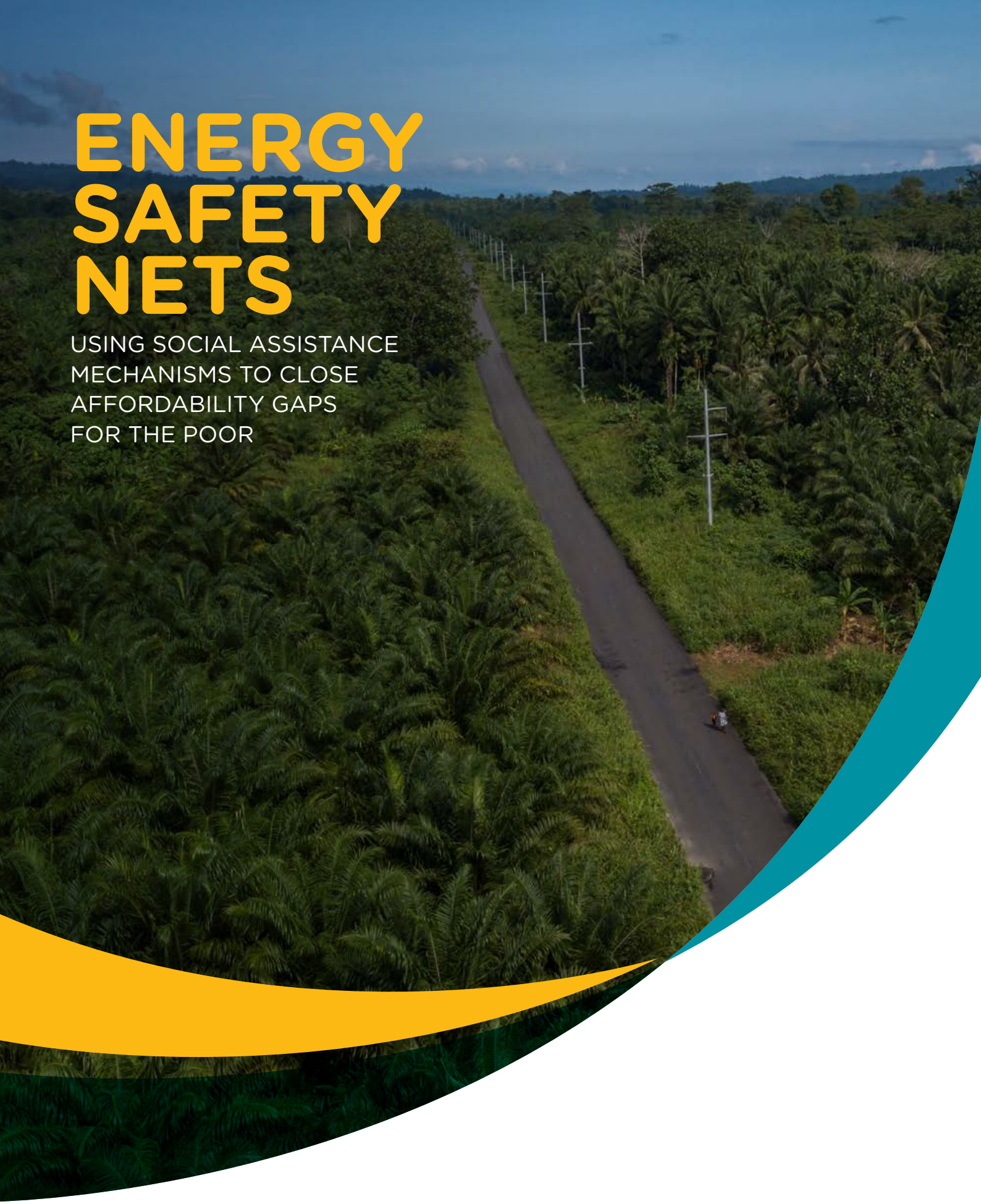

ENERGY SAFETY NETS

USING SOCIAL ASSISTANCE MECHANISMS TO CLOSE AFFORDABILITY GAPS FOR THE POOR

SUSTAINABLE ENERGY FOR ALL

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ENERGY SAFETY NETS

Social assistance, in the form of safety nets, can be a way to enable access to affordable, reliable, sustainable and modern energy, in the same way that it supports access to other essential services such as education, nutrition, or housing.

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ACKNOWLEDGEMENTS

The report series was commissioned by Sustainable Energy for All (SEforALL). The SEforALL team was led by Caroline McGregor and Hannah Girardeau, who worked in close collaboration with the Overseas Development Institute (ODI) team, Andrew Scott, Sam Pickard, and the Catholic Agency for Overseas Development (CAOFD) team, Sarah Wykes, who commissioned the in-country research teams and worked with them to develop and shape the six country studies, and who wrote the synthesis report and policy guide.

The research was designed with an intent to advance the efforts of the People-Centered Accelerator coalition, a broad group of SEforALL partners who share a commitment to extending energy services to the hardest to reach – the remote, the marginalized, the poor.

This report was based on research conducted by several research partners. We would like to thank:

Brazil – Roberto Schaeffer, Alexandre Salem Szklo, André Frossard Pereira de Lucena, Antonella Mazzone, and Régis Rathmann

Ghana – Simon Bawakyillenuo

India – Sasmita Patnaik, Shaily Jha, Karishma Pradhan, and Abhishek Jain

Indonesia – Teguh Dartanto, Qisha Quarina, Rus'an Nasrudin, Fajar N. Putra, and Khaira Abdillah

Kenya – Murefu Barasa, Brian Kinuthia, Beryl Ajwang', Ida Githu, and Clara Kamau

Mexico – Paul Sanchez, Danilo Chavez, Claudia Bello, Adrian Morales, Abigail Bello, and Aban Moreno

The report received insightful comments from peer reviewers. We would like to thank: Sarah Alexander, Christine Eibs Singer, Laura Merrill, Charlie Miller, Sheila Pachauri, Dana Rysankova, Anita Shankar, and Asep Suryahadi. We would like to thank SEforALL staff for their support: Annette Aharonian, Stephen Kent, Glenn Pearce-Oroz, Sameer Ahmad, Juan Cerda, Jem Porcaro, and Tracey Crowe.

We acknowledge with gratitude the financial support provided by the Wallace Global Fund, without which this research would not have been possible.

We also acknowledge the core funding for SEforALL provided by our institutional strategic partners: the Austrian Development Agency; the Charles Stewart Mott Foundation; the Federal Ministry for Europe, Integration and Foreign Affairs of Austria; the IKEA Foundation; the Ministry of Foreign Affairs of Denmark; the Ministry for Foreign Affairs of Iceland; and the Ministry for Foreign Affairs of Sweden. For a full list of SEforALL supporters, please visit our website.

We also thank Jenny Nasser (editor) and Vilmar Luiz (designer).

WALLACE GLOBAL FUND
For a sustainable future

FOREWORD

Sustainable Development Goal 1 (SDG1) calls for eradicating extreme poverty for all people everywhere by 2030. One of its underlying targets is the implementation of nationally appropriate social protection systems and measures covering the poor and the vulnerable. These are people who struggle to have their basic needs fulfilled, such as access to clean air, water and food, which often prompts governments to offer them some form of social assistance.

Energy access is also a basic need. A lack of household power and clean cooking leads to drudgery, reducing people's income potential, while also exposing them to potential harms, such as fumes from burning firewood indoors. If children in poor households cannot read or study after dark, their education suffers, hurting their prospects for breaking the poverty cycle. In short, ensuring access to affordable, reliable, sustainable and modern energy, as demanded by SDG7, is essential for reducing inequalities in opportunities, reducing poverty and catalyzing development.

Incorporating energy access into the social protection systems urged by SDG1 is already happening in various forms around the world. But there is little evidence of how mechanisms are designed and the impact they are having on poverty reduction. Sustainable Energy for All (SEforALL) is closing this knowledge gap with its *Energy Safety Nets* research series. With the Overseas Development Institute (ODI) and the Catholic Agency for Overseas Development (CAFOD), we have developed first-of-its-kind research to inform best practices at the intersection of energy policy and social assistance to protect very poor, vulnerable and marginalized people.

Energy Safety Nets demonstrates how governments are uniquely positioned to target and support populations living in energy poverty. The reality is that the energy needs of poor and vulnerable populations are unlikely to be captured by the private sector, which means public finance must fill this void.

The report that follows is a synthesis of findings from the broader *Energy Safety Nets* research series, which includes six case studies from countries that have experience implementing energy-focused social assistance mechanisms. These case studies have uncovered the many complexities of creating such mechanisms. For example, initiatives need to consider how to make electricity and clean cooking connections and consumption affordable.

One of the overriding messages in this research series is the importance of proper targeting of subsidies. A current lack of evidence on the energy consumption levels within vulnerable households (disaggregated by sex) prevents policymakers from determining appropriate thresholds for subsidies. Additional data collection on the specific energy needs of the poor would enhance program design and SEforALL intends to support this effort. One of our strategic priorities is to build a platform for the collection, organization and dissemination of data to

inform policies aimed at universal energy access in high-impact countries, including policies specific to vulnerable groups.

I am particularly excited by the insights found in *Energy Safety Nets* because of the value they will bring to SEforALL's engagement with national governments for developing integrated energy plans for universal access. The recommendations in this body of work will help governments devise strategies for bringing energy access to their most vulnerable populations, while building on social assistance programs to improve targeting and delivery of public support. While SEforALL will continue to share these lessons in our discussions with governments, I encourage you to read about them in the pages that follow and consider how you can support the development of *Energy Safety Nets*.

Damilola Ogunbiyi
CEO and Special Representative of the
UN Secretary-General for Sustainable Energy
for All and Co-Chair of UN-Energy

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ABBREVIATIONS

BDT	Basis Data Terpadu
ESN	Energy Safety Net
FSUE	Fondo de Servicio Universal Eléctrico
IBT	Increasing Block Tariff
KOSAP	Kenya Off-Grid Solar Access Project
kWh	kilowatt hour
LMCP	Last Mile Connectivity Project
LPG	Liquefied Petroleum Gas
PaHaL	Pratyash Hanstantrit Labh
PMUY	Pradhan Mantri Ujjwala Yojana
PT PLN	Perusahaan Listrik Negara
SDG	Sustainable Development Goal
SDG7	Sustainable Development Goal 7
VA	volt-ampere
VDT	Volume Differentiated Tariff

MAP OF COUNTRIES HIGHLIGHTED IN CASE STUDIES

EXECUTIVE SUMMARY

The Sustainable Development Goal 7 (SDG7) mandate to ensure access to affordable, reliable, sustainable and modern energy services for *all* means that even the poorest and most disadvantaged in society should have access to modern energy by 2030. As progress is made towards this goal, the challenge of ensuring universal access will shift from the question of connections to the question of energy consumption. People who cannot afford basic levels of electricity consumption or clean cooking, even when they have a connection, are at risk of being left behind. Programs to extend access to modern energy will need to be supplemented by policy measures that make modern energy services accessible and affordable to poor and marginalized social groups.

General consumer subsidies for energy are one way of reducing energy costs and making access to modern energy affordable for poor and marginalized people. Though these subsidies have increased accessibility and affordability generally, they also have significant shortcomings, most notably that they do not always benefit the poor. Social assistance, in the form of safety nets, could be a way to enable access to affordable, reliable and sustainable modern energy, in the same way that it supports access to other essential services such as education, nutrition, or housing. Some countries have tried linking energy subsidies to social assistance mechanisms but there is little empirical evidence about how effective these have been in expanding poor households' energy access. To help address this knowledge gap, this study examined 25 different initiatives or measures supporting energy access for poor households in six countries. The countries highlighted in the study are Brazil, Ghana, India, Indonesia, Kenya and Mexico – reflecting different regions, socioeconomic contexts, and experiences implementing social assistance for energy access.

This research is an initial effort to understand how countries have leveraged social assistance mechanisms to close the affordability gaps for sustainable energy, and to spark the discourse around how other governments facing access deficits might devise similar approaches, appropriate to their own contexts, to drive progress toward universal access and achieving SDG7.

Energy Safety Net (ESN) is an umbrella term for government-led approaches to support very poor and vulnerable people to access essential modern energy services, defined as electricity and clean fuels and technologies for cooking, by closing the affordability gap between market prices and what poor customers can afford to pay. ESNs can make physical access (i.e. connections) to electricity or clean fuels affordable or they can make the unit price of electricity or fuel affordable to consume. ESNs include some form of targeting or eligibility criteria to direct benefits to those who need them.

Of the 25 initiatives examined, 13 support connections to electricity or clean fuels and technologies for cooking, and 12 support the ongoing consumption of electricity or clean fuels. Roughly half of these initiatives can be formally considered ESNs, i.e. they are policy measures *specifically targeted* to enable poor and vulnerable people to access and use electricity and/or clean fuels and technologies for cooking (see Table ES1). The other initiatives examined in the country studies fall into the category of more general energy access initiatives that: (a) do not target support to poor households, (b) provide cash support directly to households that may or may not support energy purchases, or (c) are too recent for any lessons to be drawn.

COUNTRY-SPECIFIC INSIGHTS

Electricity

Programs to connect households to grid and off-grid electricity in Brazil, Ghana, Kenya and Mexico have adopted different approaches. In Brazil and Mexico, the focus has been on connecting remote, rural communities that remain unelectrified, while in Ghana and Kenya, national electrification schemes have aimed to extend the grid to large unconnected segments of the population. Targeting has been primarily geographic, although Brazil's *Luz para Todos* program includes administrative selection – in other words, the government targets specific regions or groups for a particular benefit.

In all six countries, the consumption of grid electricity has been subsidized to some extent in the form of a lifeline tariff for consumers of small quantities of electricity. The premise for this quantitative targeting approach is that low-income households generally consume smaller quantities of electricity and that low-consumption blocks are sized to meet basic levels of electricity consumption. However, these assumptions are not always borne out in practice. In Ghana, for example, some low-income consumers use more electricity than the threshold of the first tariff block, and in Kenya the lifeline tariff threshold exceeds the consumption level of many poor households.

In Brazil and Indonesia, quantitative targeting in electricity tariffs is linked to administrative

Table ES1

ESNs examined in the study

	CONNECTION	CONSUMPTION
Brazil	*Luz para Todos*	*Tarifa Social* *Bolsa Família (Vale Gás)*
Ghana		Lifeline electricity tariffs
India	PMUY	PaHaL
Indonesia	Kerosene-to-LPG conversion	Electricity tariffs LPG subsidy
Kenya		Lifeline tariff
Mexico		Differentiated electricity tariffs *Oportunidades Energéticas* Subsidized LPG

selection. The social tariff in Brazil is available only to households on the country's unified social assistance register, and the Indonesian national electricity utility has begun to use the unified database (BDT) of the poorest 40 percent of households to determine eligibility for the lifeline tariff.

Clean Cooking

In the six countries highlighted in this study, government programs to support households' acquisition of equipment for cooking with clean fuels have focused on the promotion of liquefied petroleum gas (LPG). In Ghana and Mexico, support for LPG connections—cylinders, burners and fittings—has had limited reach and been short-lived. In India and Indonesia, on the other hand, programs to connect households to LPG have been on a massive scale, benefiting 80 million and 42 million households, respectively. In India, where the *Pradhan Mantri Ujjwala Yojana* (PMUY) program has targeted below-the-poverty line and socially disadvantaged households, the cash transfer for 50 percent of the cost of a LPG connection is subsidized, while subsidies for gas refills are deliberately transferred to accounts in the name of an adult woman in the household to increase their impact. Meanwhile, in Indonesia, the subsidy of the kerosene-to-LPG conversion program is near universal (i.e., not targeted).

Schemes to enable the consumption of LPG by poor households have been linked to the reform of general fuel subsidies and social assistance programs. In India, the introduction of a Direct Benefit Transfer scheme to improve efficiency in the implementation of social assistance programs was extended to LPG, but the benefit is untargeted. In Indonesia, targeting is being introduced, using the BDT register of the bottom two quintiles of population by income. An energy component included in Mexico's national social assistance cash transfer program (*Oportunidades*) was an important step, yet it was only available between 2007 and 2011 due to changes in administration.

While India and Indonesia have provided LPG connections to tens of millions of households and subsidized LPG prices, the use of LPG as a primary cooking fuel remains lower in rural and low-income households than in richer and urban households. The uptake of LPG for clean cooking faces several challenges in addition to affordability; the extent and efficiency of the LPG distribution system is a key factor affecting its consumption and the widespread practice of fuel stacking – using different fuels and technologies for different cooking needs – is another.

Linkages to Social Protection

The ESNs examined in the six country studies demonstrate links to social assistance programs in two ways – integration and coordination. In Brazil and Mexico, energy components have been integrated into the countries' wider social assistance programs – *Bolsa Família* and *Oportunidades*. In both countries, the separate identity of the energy component was lost or abandoned. For example, Brazil's *Bolsa Família* failed to adjust adequately as LPG prices increased, meaning that the cost of LPG to households increased and households chose to use the subsidy to support other non-energy purchases.

Coordination between ESNs and social assistance programs can allow for an administrative selection of the beneficiaries of the former using databases or registers developed for the latter. In Brazil, India, Indonesia and Mexico, social assistance registers or databases are being used to target support for energy. In Ghana and Kenya however, social assistance programs are at earlier stages of development and unified social registers are unavailable.

CONCLUSIONS

The research for this study examined 12 individual ESNs and compared key lessons learned from the experiences of six countries. Variations in the history, operation and institutional context of these initiatives, as well as differences in the availability of data make comparisons difficult. However, it is possible to draw some general conclusions from the country case studies, which should serve as a basis for the design of future ESNs:

- Distinct approaches are needed to support energy connections (e.g., wired meter boxes and LPG stoves) and ongoing consumption (e.g., monthly electricity bills and regular fuel consumption). These may also require different funding and delivery mechanisms. Support for electricity connections or clean cooking technology distribution may be a necessary first step toward energy access but does not guarantee that energy is affordable or consumed by the most vulnerable among the population.
- Targeting criteria may differ between ESNs seeking to support consumption versus those focused on connections to electricity or access to clean cooking technology. Policymakers must specify and define the intended target population for an ESN as it is being designed. This determines the criteria or indicators that will be used to decide the eligibility of households, including whether support will require one or more targeting approaches and one or more ESN mechanism.
- Household energy consumption data are essential to setting an appropriate and transformational level of subsidy or benefit and should be explicit in the design of an ESN. Policymakers need improved evidence of how much and what types of energy poor households are currently consuming in order to create appropriate, tailored and supportive programs. Further quantitative research, improved data collection, and analysis of household energy consumption and expenditure would inform energy and social protection policymakers.
- The design and implementation of ESNs should be appropriate for the country's institutional, geographic and economic context. Social assistance and ESN initiatives will need to continuously evolve, adapting to changing social and economic conditions and in response to lessons learned from implementation. It may also be necessary to inform and educate citizens about modern energy services and ESNs. The design and implementation of ESNs should also consider the gendered nature of energy management within the household; ESNs can be designed or coordinated with other initiatives to ensure women's empowerment in energy management is protected or enhanced, for example, by targeting resource transfers to women.
- The success of ESNs depends on strong and sustained political commitment. Among the six countries studied, changes in government have led to discontinuations of programs and disruptions in measures to support connections and energy consumption. Political factors have also proven to influence the selection of target populations. However, high-level policy commitment for universal access to affordable, reliable, sustainable and modern energy can provide the basis for the development and implementation of measures to target poor households.

This first-of-its-kind research is intended to build an evidence base that can inform and galvanize further work at the intersection of energy policy and social protection by any government similarly motivated to innovate around ESNs. Experimentation on policy design, robust monitoring and evaluation, and further iteration are necessary to establish best practices and efficient programs to support the very poor and vulnerable to access essential modern energy services.

INTRODUCTION

The Sustainable Development Goals (SDGs), adopted by the world's governments in 2015, embody the principle of 'leave-no-one-behind'. The Sustainable Development Goal 7 (SDG7) mandate to ensure access to affordable, reliable, sustainable and modern energy services for *all*, means even the poorest and most disadvantaged in society should have access to modern energy by 2030.

The world is making progress towards this goal. In 2017, 89 percent of the world's population had access to electricity and 61 percent access to clean fuels and technologies for cooking. In urban areas, which are home to half the global population, the electrification level was 97 percent (IEA et al. 2019). As access levels approach 100 percent, the challenge of ensuring universal access will shift from the question of energy connections to the question of energy consumption. People who cannot afford basic levels of electricity consumption or clean cooking, even when they *have* a connection, are at dire risk of being left behind.

That's where Energy Safety Nets (ESNs) come in.

Many of the approaches to extend access to modern energy, supported by governments and their development partners, focus on connections and the development of commercial markets for energy services and products. Market approaches to extend connections or deliver energy services too often overlook the needs of people on very low incomes or those who may be disadvantaged in other ways. This occurs in rich countries as well as poor. In order to leave no one behind, market approaches must be supplemented by policy measures that make modern energy services accessible and affordable to poor and marginalized social groups.

Consumer subsidies for energy are one way of reducing energy costs and making access to modern energy affordable for poor and marginalized people. Fuel and electricity subsidies have a long history, although poverty reduction has not always been their primary purpose. General subsidies can have significant shortcomings: they can encourage the use of environmentally damaging fossil fuels; they can be a disincentive for energy-efficient consumption; they use scarce public funds; they can affect the financial viability of energy service providers; and they do not always benefit the poor — subsidized electricity tariffs do not benefit households without access to electricity, and households above the poverty line often receive disproportionately more of the total benefit.

Social protection systems are sets of policies and programs designed to reduce and prevent poverty and vulnerability (ILO 2017). There have been suggestions that social protection could be a way to enable access to affordable, reliable, sustainable and modern energy. For example, the Mary Robinson Foundation has proposed using social protection systems 'to rapidly and efficiently extend sustainable energy services to a country's poorest people' (MRFCJ 2016). Subsidies to enable low-income and marginalized households to access essential services, such as health and education, or adequate food and nutrition, are included in the social protection systems of many countries. Social safety nets of this kind are a form of non-contributory social assistance (see Glossary). They are intended to provide regular support to targeted poor and vulnerable populations and have been shown to reduce poverty and inequality (World Bank 2018).

There have been examples of governments linking the delivery of energy subsidies to social assistance programs, and cash transfers (a common tool for social assistance) have been used to compensate consumers when fuel subsidies have been reformed. However, research on the impact and effectiveness of these initiatives has focused on the fiscal questions and the financial burden of subsidies. Only limited evidence is available

about how social assistance measures have affected access to modern energy services. How social assistance programs have affected access to energy or energy consumption by poor households is not well understood, therefore, nor is the potential for social assistance measures to contribute to the goal of universal access to affordable, reliable and sustainable modern energy.

This report is a step towards filling the gap in knowledge about how social assistance affects access to energy and energy consumption by poor households. It builds on a literature review (Scott and Pickard 2018) and presents additional evidence of the potential for social assistance to enable poor and marginalized households to access and use modern energy services. The term 'energy safety net' was coined for the literature review to capture the idea of a targeted measure to enable poor and vulnerable people to access and use electricity and clean fuels and technologies for cooking. The concept focuses on measures to enable access for people who would not be reached by market-based approaches alone.

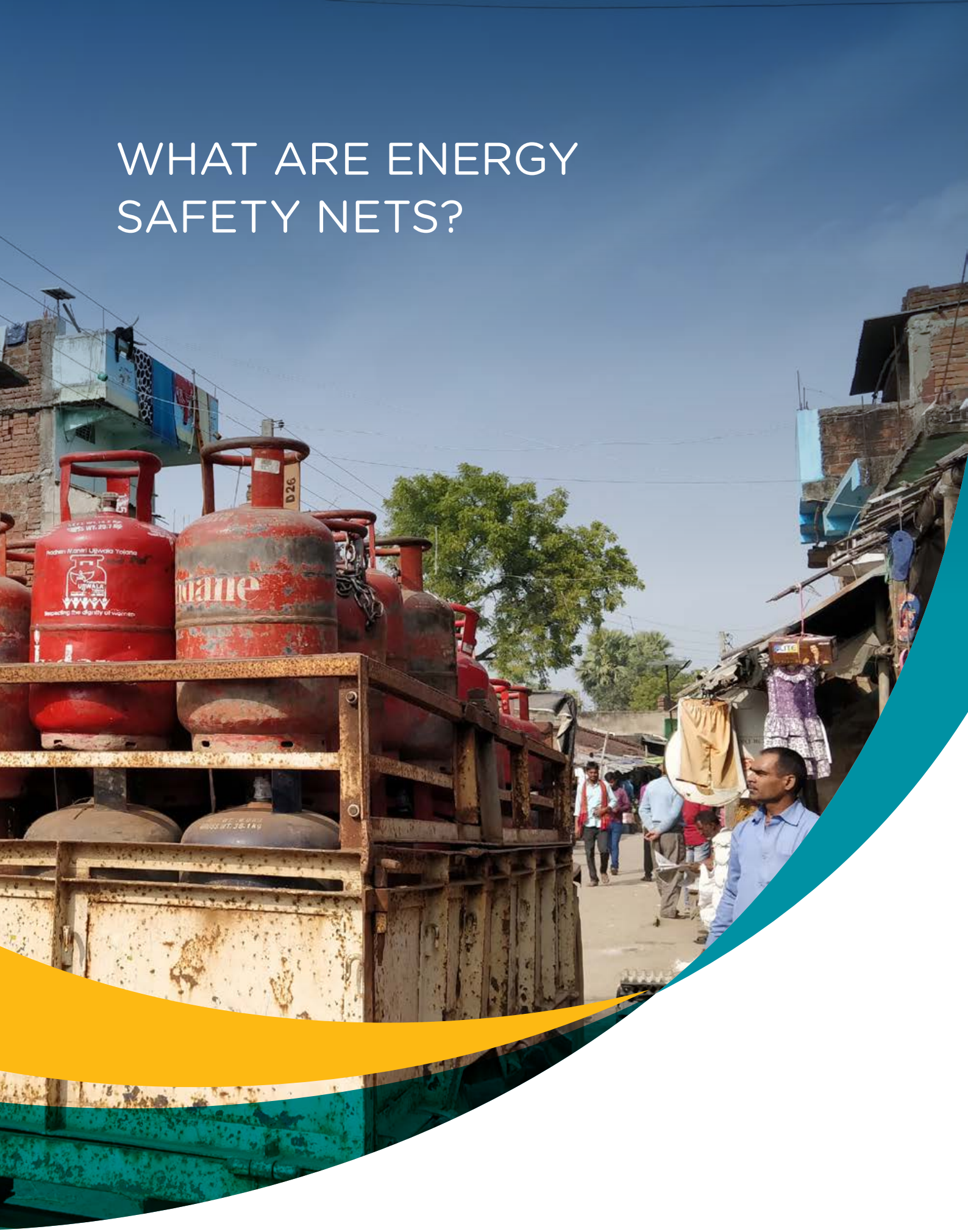
The report is based on research that aims to provide guidance for policy- and decision-makers, by identifying measures that have been successful in enabling very poor people to access modern energy services and exploring the reasons for the successes and challenges encountered. The approach was to explore in depth, through country case studies, the experience in different countries of reaching the poorest social groups with targeted support for energy access. The research reviewed literature, analyzed available statistics, undertook key informant interviews, and conducted group discussions. The countries highlighted in the study—Brazil, Ghana, India, Indonesia, Kenya and Mexico—were selected because they all have experience with programs that support energy access and have some experience implementing social assistance programs. They also represent different regions and present a variety of socio-economic and institutional contexts.

The key research questions were:

- What policy measures have been used to enable very poor and marginalized people to access and use modern energy services?
- How effective have these measures been in enabling the poorest social groups to access and use modern energy services?
- What links have there been/are there between these measures and wider/other social assistance programs?
- What changes could be made to enhance the effectiveness of existing policy measures in enabling very poor people to access modern energy services?

The report is structured around these four questions. Section 2 briefly describes the ESNs identified in the six countries, and Section 3 discusses their effectiveness from the perspective of energy access. In Section 4, the links between ESNs and wider social protection systems are examined. Conclusions can be found in Section 5.

WHAT ARE ENERGY SAFETY NETS?



This section describes the key measures to support access to affordable modern energy services found in the six countries highlighted in this study. To help understand their effectiveness (discussed in the next section) and whether they meet the definition of an Energy Safety Net (ESN), the subsidy schemes can be categorized by their purpose and by the kind of targeting they employ (Komives et al. 2005: Table 2.1).

Support for access to energy has two main purposes: to provide connections to modern energy services ((i) electricity and (ii) clean fuels and technologies for cooking); and to enable the consumption of energy. Connections require an investment to install or purchase equipment (e.g. wiring, meters and stoves), while consumption requires a regular payment to a service provider (e.g. a utility company or LPG distributor). Although consumption cannot occur without a connection, it does not necessarily follow that a connection *results* in consumption, as the country case studies demonstrate. Of the 25 measures examined in the six countries, 13 primarily support connections and 12 support consumption.[i] Table 1 lists the 25 energy support schemes by purpose. Annex 1 provides a summary of information about each measure, and more detail can be found in the country case studies. These schemes are typical of the measures to support energy access that can be found in other countries in Africa, Asia and Latin America (Komives et al. 2005; Scott and Pickard 2018; Siyambalapitiya 2018).

Energy subsidies can be untargeted (available to everyone), implicitly targeted (available by default to anyone in a population group, e.g. those

i Schemes that support connections to solar household systems also enable consumption.

Table 1

Purpose of subsidy schemes and programs reviewed

COUNTRY	CONNECTION	CONSUMPTION
Brazil	• *Luz para Todos*	• *Tarifa Social* • *Bolsa Familia (Vale Gás)*
Ghana	• Self-Help Electrification Program • Improving Rural Energy Access through Solar Home Systems • Improved cookstove programs • LPG Program	• Lifeline electricity tariffs
India	• *Pradhan Mantri Ujjwala Yojana* (PMUY)	• *Pratyash Hanstantrit Labh* (PaHaL) • 'Give it Up' Campaign • Unified Guidelines for Selection of LPG distributorships
Indonesia	• Kerosene-to-LPG conversion	• Electricity tariffs • LPG price subsidy
Kenya	• Slum Electrification Project • Last Mile Connectivity Program • Kenya Off-grid Solar Access Project • Energy and Cash Plus Initiative • *Mwananchi* Gas Project	• Lifeline tariff
Mexico	• *Fondo de Servicio Universal Eléctrico* (FSUE)	• Differentiated electricity tariffs • *Oportunidades Energéticas* • Subsidized LPG price

with existing connections), targeted by self-selection (household behavior) or targeted by administrative selection (Komives et al. 2005). In practice, targeting often involves two of these approaches. For example, a subsidy may be available to anyone living within a defined geographic area (implicit targeting), but the area has been selected because of a high incidence of poverty (administrative targeting). The definition of an ESN implies that support is targeted (by self-selection or administratively) at households that are income poor and/or socially disadvantaged. Fifteen of the schemes reviewed in the six country case studies use self-selection or administrative targeting, six have some form of implicit targeting and four have no targeting (Table 2).[ii]

ii Targeting approaches can evolve. The current or most recent targeting system is used here to categorize the subsidy schemes reviewed in the country case studies.

Table 2

Subsidy schemes and programs reviewed, by targeting method

COUNTRY	MEASURE	UNTARGETED	IMPLICIT TARGETING	TARGETING BY SELF-SELECTION	ADMINISTRATIVE TARGETING
Brazil	*Luz para Todos*				x
	Tarifa Social			x	
	Bolsa Família (Vale Gás)				x
Ghana	Self-Help Electrification Program		x		
	Lifeline electricity tariffs			x	
	LPG Program	x			
	Improving Rural Energy Access through Solar Home Systems		x		
	Improved cookstove programs	x			
India	*Pratyash Hanstantrit Labh* (PaHaL)			x	
	Pradhan Mantri Ujjwala Yojana (PMUY)				x
	'Give it Up' Campaign			x	
	Unified Guidelines for Selection of LPG distributorships		x		
Indonesia	Electricity tariffs				x
	Kerosene-to-LPG conversion			x	
	LPG price subsidy				x
Kenya	Slum Electrification Project		x		
	Last Mile Connectivity Project	x			
	Lifeline tariff			x	
	Kenya Off-Grid Solar Access Project (KOSAP)		x		
	Energy and Cash Plus Initiative				x
	Mwananchi Gas Project	x			
Mexico	Differentiated electricity tariffs			x	
	Oportunidades Energéticas				x
	Subsidized LPG price			x	
	Fondo de Servicio Universal Eléctrico (FSUE)		x		

Each of these 25 programs was designed to advance access to affordable modern energy services and resulted in benefits for various segments of the population.

Twelve of the 25 measures did not target — or only implicitly and indirectly targeted — poor households. The benefit was intended to reach them, but the programs were structured in ways that channelled support via suppliers, subnational governments, etc. As such, they do not conform to the definition of an ESN used in this study. This means that only 13 energy access support measures examined by the study might be described as ESNs (Table 3).

There are many lessons to be learned from the design and implementation of the 12 publicly-funded energy access programs (that do not qualify as ESN programs). They are included in the research to highlight the connection between social protection mechanisms and energy access goals, furthering discourse around solutions to enable very poor and marginalized people to access and use modern energy services.

GRID ELECTRICITY

Connecting customers to the electricity grid

Investment in connections to an electricity grid has three aspects: (a) investment in distribution infrastructure (poles, low voltage lines and transformers), (b) connection to the household (lines to the building and meters) and (c) wiring within the home. Distribution infrastructure is commonly built by utility companies, often with public funds, making a grid supply available to households that can afford to connect. In some countries, the costs of connection to the distribution network and internal wiring are borne by the household. However, connection charges can be a barrier to access for households in lower income groups (Golumbeau and Barnes 2013).

Electrification rates for the six countries are shown in Figure 1. Three of the six countries—Brazil, Indonesia and Mexico—have achieved, or almost achieved, universal access to electricity, as measured by household connections to an

Table 3

Energy sector support programs reviewed in this study that meet the definition of ESNs

	CONNECTION	CONSUMPTION
Brazil	*Luz para Todos*	*Tarifa Social* *Bolsa Família (Vale Gás)*
Ghana		Lifeline electricity tariffs
India	PMUY	PaHaL
Indonesia	Kerosene-to-LPG conversion	Electricity tariffs LPG subsidy
Kenya		Lifeline tariff
Mexico		Differentiated electricity tariffs *Oportunidades Energéticas* Subsidized LPG

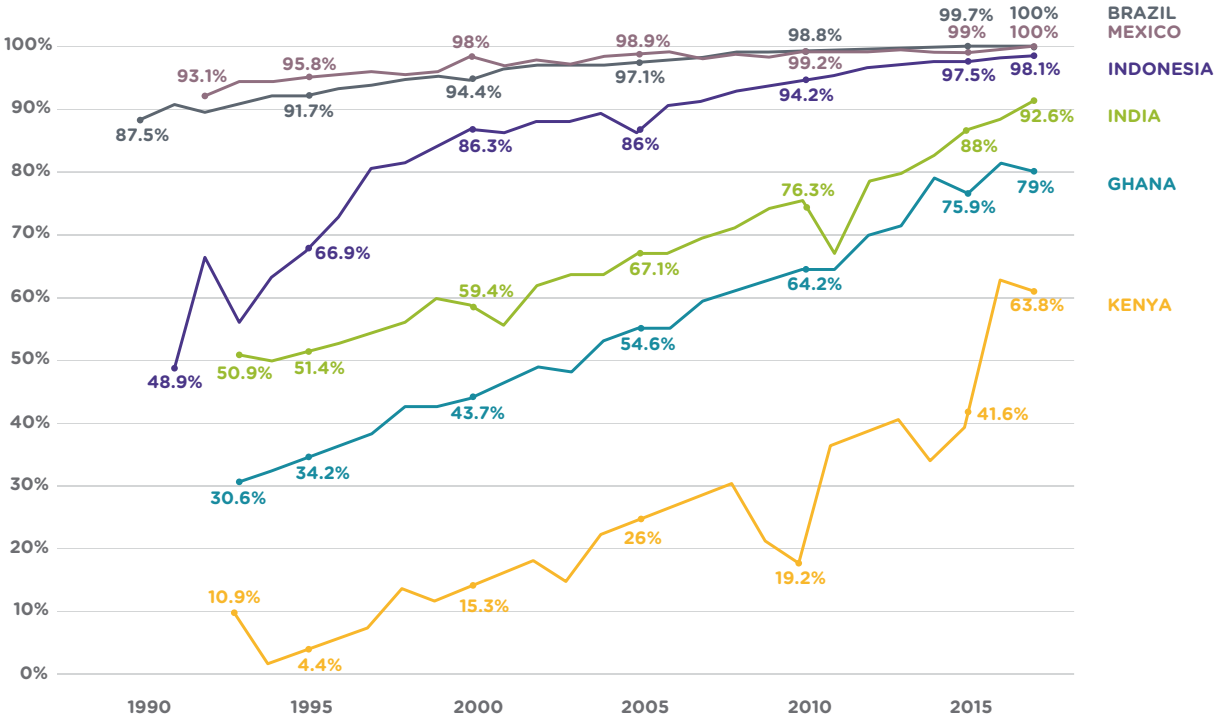
electricity supply. In these countries, only households in the most remote and most difficult to reach settlements have still to be connected – households that are amongst the poorest and most marginalized in each country. The country case studies for Brazil, Ghana, Kenya and Mexico review government initiatives to extend the grid and connect poor and marginalized households to the grid supply. The approach in each country has been different, reflecting their diverse electrification statuses and contextual challenges.

Brazil's *Luz para Todos* (Light for All) program was launched in 2003, when 93 percent of the country's population had access to electricity. The program's aim was to electrify the rural and urban areas that remained without an electricity supply. *Luz para Todos*, which does not require a financial contribution from the households it connects, had reached over 16 million people by 2015 – about 7 percent of Brazil's total population. For practical reasons, the program initially focused on areas near to the grid that had a low score on the Human Development Index. More recently *Luz para Todos* has targeted communities farthest from the grid as well as low-income families, ethnic minorities and vulnerable populations living in protected areas such as national parks, extractive reserves and conservation areas (Mazzone et al. 2020). Targeting under *Luz para Todos* has thus been administrative, including a combination of geographic (remoteness from the grid) and socioeconomic criteria.

National electrification plans in both Ghana and Kenya have set out to achieve universal access to electricity by 2030. Ghana's National Electrification Scheme, 1990–2020 (NES) laid out plans to electrify all settlements with an adult population of at least 500. In its first two phases, the NES focused on district capitals, routes to district capitals and settlements within 20 km of the

Figure 1

Electrification rates for countries highlighted in this study, 1990–2017



Source: https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS

grid (Bawakyillenuo 2020). To accelerate electrification, the government introduced a Self-Help Electrification Program (SHEP) for settlements that were too small for inclusion in the NES plan. Under SHEP, communities contribute the costs of poles for low voltage lines and meters, and are required to ensure that 30 percent of the households are wired and ready to be connected. To this extent, targeting was by (community) self-selection, but neither program in Ghana targeted poor households.

Kenya's electrification strategy has also taken an untargeted, demand-driven approach, extending distribution infrastructure and providing connections to households that requested and could afford them. However, a degree of targeting was introduced with the Slum Electrification Project (2011–2017). This project was aimed at low-income households in urban informal settlements, subsidizing the utility's connection charges for households that would otherwise be unable to afford them. The connection fee charged was equivalent to about USD 15, which could be paid upfront or be recovered from prepaid tokens purchased over a year (EED Advisory 2020). Although the Slum Electrification Project provided a subsidy to enable low-income households to connect to the grid, a key policy driver, and one that was achieved, was increased solvency for the national utility, Kenya Power, by reducing the number of illegal connections.

In 2015, Kenya initiated the Last Mile Connectivity Project (LMCP) with the aim of achieving 70 percent access by 2017 and universal access by 2020 (subsequently revised to 2022 in the Kenya National Electrification Strategy that was launched in late 2018). Initially, this program focused on reaching households within 600 metres of a transformer, installed by LMCP, or at public buildings, such as schools and health facilities, by the Rural Electrification Agency. Households connected under LMCP pay a subsidized connection charge of USD 150, equivalent to 15 percent of the total average cost of a connection. This connection charge is less than half the USD 350 previously charged for connections, yet 10 times higher than the Slum Electrification Project's connection charge. The USD 150 subsidized connection charge can be paid upfront or over three years in a monthly instalment of USD 4.16 included in the household's electricity bill (EED Advisory 2020).

The investment costs of installing wiring and meters within the home are rarely considered in electrification strategies and plans. Indoor wiring may have to meet specified standards before a connection can be made, which increases the total cost to the household. To overcome concerns that these costs were a barrier to electricity access for low-income households, Kenya Power introduced a 'ready board', which includes a bulb, power socket and meter, and relaxed its requirements around proof of legal residence and rights of way.

Supporting grid electricity consumption

For low-income households already connected to an electricity supply, questions of affordability remain, related to the recurring cost of the electricity they consume. In all six countries the consumer price of electricity is subsidized to some extent, in the form of a lifeline or social tariff, for consumers of small quantities of electricity. Either an increasing block tariff (IBT) or a volume differentiated tariff (VDT) structure is used with a subsidized tariff for low consumption blocks (see Box 1). The number of subsidized tariff blocks, the quantity of electricity in the minimum block and the level of subsidy are different in each country (see Table 2).[iii]

iii The India case study did not review electricity tariffs. Tariffs, tariff structures and subsidies are different in each Indian state. Tariff structures in six states examined by Siyambalapitiya (2018) included minimum blocks of up to 30 kWh, 40 kWh and 50 kWh per month with subsidized tariffs between Rs 1.00 and Rs 2.90 per kWh.

Box 1: Increasing block tariffs and volume differentiated tariffs

Two types of electricity tariff are commonly used for quantitative targeting, increasing block tariffs (IBTs) and volume differentiated tariffs (VDTs).

In a block tariff structure, a different price per unit (USD per kWh) is charged for different blocks of electricity consumption. In an IBT, the unit price increases with each successive block. All consumers benefit when the price of the first one or two blocks is subsidized, because those initial increments of consumption are charged at a lower KWh price.

A VDT has a different price per unit depending on the total quantity consumed. Consumption levels are divided into blocks, with a different unit price attached. The higher the quantity consumed, the higher the unit price for all the electricity consumed. When the unit price for low quantity consumption is subsidized, consumers whose consumption is above the quantity threshold do not benefit.

In some countries, including Mexico, tariff structures are hybrids including IBT and VDT for different blocks.

In Indonesia, quantitative targeting is partly based on the power rating of the connection, measured in volt-amperes (VA), with a lower unit price (USD per kWh) for consumers with low power connections.

Sources: Komives at al. 2005; Beylis and Cunha 2016; Siyambalapitiya 2018.

A premise for targeting through IBTs and VDTs is the assumption that poor households generally consume smaller quantities of electricity and that low-consumption blocks – lifeline blocks – are sized to meet basic levels of electricity consumption. The detailed country case studies show that these assumptions are not always reflected in practice. Some low-income electricity consumers in Ghana, for example, consume above the threshold of the first tariff block (Bawakyillenuo 2020), while in Kenya this first tariff block threshold is well above a basic level of electricity consumption (EED Advisory 2020). Figure 2 shows that the size of the subsidized tariff blocks varies widely in the countries highlighted in this study.

In Kenya, the Energy and Petroleum Regulatory Authority (formerly the Energy Regulatory Commission) estimates the subsistence level of electricity consumption to be 10 kWh a month, determined as the likely consumption for one socket and two light bulbs. In July 2018, Kenya replaced its IBT tariffs with a VDT structure that included a lifeline block up to 10 kWh a month (EED Advisory 2020). In November 2018, after consumer and business complaints and intervention by the country's president, the first block was adjusted to 0-100 kWh a month and the unit price reduced.[iv] The lifeline block under the previous IBT tariff structure in Kenya had been 0-50 kWh a month. Ghana, on the other hand, changed the minimum block in the opposite direction, from 100 kWh to 50 kWh, shortly after the introduction of the subsidized tariff in 1998. This was based on consideration of the national minimum wage, affordability for rural consumers, the price of kerosene, and the generation cost of hydropower (Bawakyillenuo 2020).

iv Reuters, 31 October 2018 (https://af.reuters.com/article/commoditiesNews/idAFL8N1XB643).

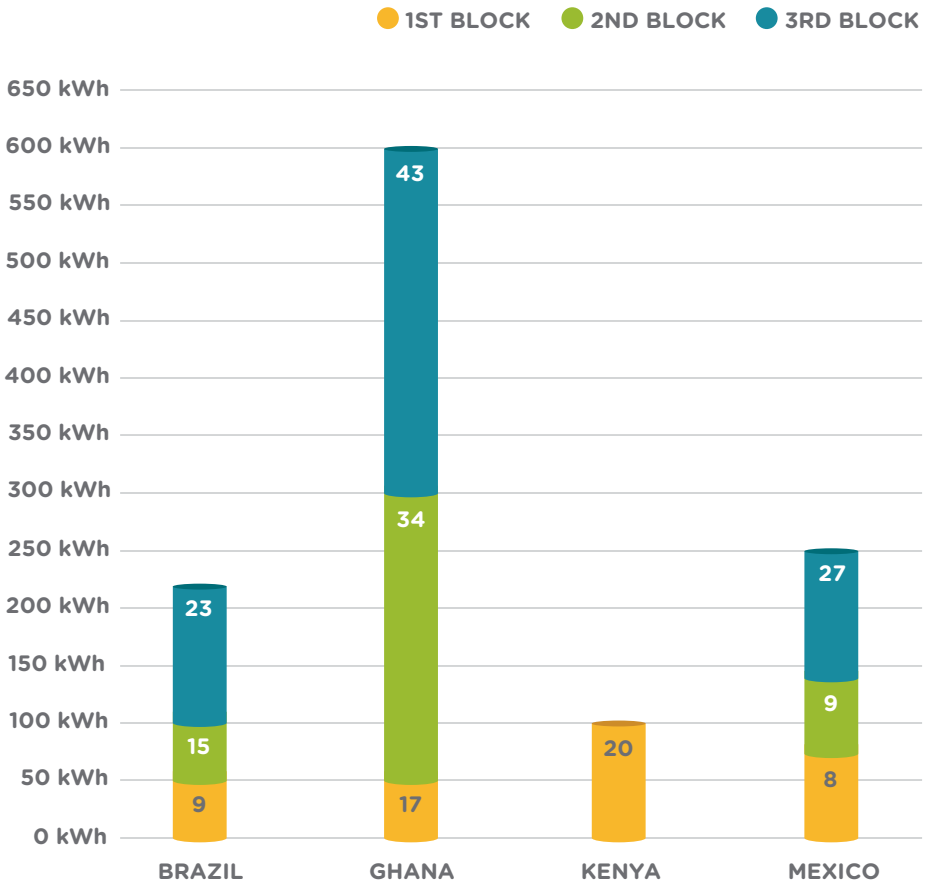
As shown in Table 4, the levels of subsidy in the price per kWh also vary between the countries. In Brazil, the subsidy is 100 percent for some social groups, while in Kenya it is about 37 percent for most consumers. Where there is more than one subsidized block, the higher consumption blocks receive a lower level of subsidy. Mexico's minimum tariff varies by geography and season, in recognition of different basic energy needs.

In Ghana, Kenya and Mexico, quantitative targeting of support for electricity consumption by poor households is, effectively, self-determined; households pay the lifeline tariff if their consumption is below the threshold of the subsidized block, and pay more per unit when their consumption exceeds this (Bawakyillenuo 2020; EED Advisory 2020; Sanchez et al. 2020). (The effectiveness of this targeting in relation to the size of the minimum block is discussed in the next section.)

In Brazil and Indonesia, quantitative targeting is linked to administrative selection. The *Tarifa Social* in Brazil is available only to households on the country's unified social assistance register (*Cadastro Único*). A higher level of subsidy is available to indigenous groups and to households living in areas of extreme poverty and in remote rural areas, specified by the Ministry of Mines and Energy (Mazzone et al. 2020). The national electricity utility in Indonesia has begun to use the BDT

Figure 2

Subsidized tariff blocks and price per unit (US cents PPP per kWh)



Source: Author's analysis

Table 4

Current levels of subsidized tariffs and subsidies in four countries[iv]

	SUBSIDIZED BLOCKS	LOCAL CURRENCY PRICE PER KWH	$ PRICE (PPP) EQUIVALENT PER KWH	LOCAL CURRENCY MONTHLY MAXIMUM COST	$ (PPP) EQUIVALENT MONTHLY MAXIMUM COST	SUBSIDIZED TARIFF AS % OF UNSUBSIDIZED TARIFF
Brazil	0-50 kWh 51-100 kWh 101-220 kWh	BRL 0.20[vi] BRL 0.34 BRL 0.51	$0.09 $0.15 $0.23	BRL 10.00 BRL 34.00 BRL 112.20	$4.45 $15.12 $49.89	35% or 0% 60% 90%
Ghana	0-50 kWh 51-300 kWh 301-600 kWh	GHS 0.28 GHS 0.56 GHS 0.72	$0.17 $0.34 $0.43	GHS 13.85 GHS 166.50 GHS 432.60	$8.36 $18.55 $261.23	35% 69% 90%
Kenya	0-100 kWh	KES 10.00[vii]	$0.20	KES 1,000	$19.90	63%
Mexico	0-75 kWh 76-140 kWh 141-250 kWh	MXN 0.80 MXN 0.96 MXN 2.81	$0.08 $0.09 $0.27	MXN 59.70 MXN 134.40 MXN 703.25	$5.69 $12.80 $66.98	17% 21% 62%

Note: Table uses current 2018 PPP exchange rates. Currency figures rounded to two decimal points.

database of households in the poorest 40 percent to determine whether consumers are eligible for the lifeline tariff (Dartanto et al. 2020).[viii]

Consumers on the minimum tariff block may be required to pay a fixed monthly standing charge in addition to the per kWh tariff, to cover the fixed costs of the service provider (e.g. maintenance and depreciation of infrastructure). These fixed charges raise the average price per kWh actually paid by households and have greater significance for households with lower levels of consumption. Kenya removed the standing charge from the tariff structure in 2018 because it was perceived as a barrier to consumption (EED Advisory 2020).

In some countries, a portion of the cost of the tariff subsidy is covered by the electricity provider through cross-subsidization within the tariff structure where higher tariffs for consumers who consume larger quantities of electricity make up the shortfall. However, in the case of Mexico, the cost of the subsidy is provided to the utility directly from public finance (Sanchez et al. 2020).

v Indonesia is excluded from the table because the tariff structure varies by power rating and payment method. The India case study did not examine electricity tariffs.
vi Tariffs in Brazil vary widely so the average tariff paid in 2018 (BRL 0.568 per kWh) has been used to estimate the tariff for each band.
vii Excluding sales tax.
viii See Box 3 for more information about Indonesia's BDT register.

OFF-GRID ELECTRICITY

Connecting consumers to off-grid electricity and supporting ongoing consumption

In many rural and remote areas distant from existing power grid infrastructure, the cost-effectiveness of supplying electricity through off-grid systems is increasingly recognized (IEA 2017; SE-forALL 2017). In Brazil, *Luz para Todos* has provided off-grid electricity systems in locations where this is the most cost-effective approach. These systems have included mini-grids run on thermal, micro-hydropower, biofuels, wind power and solar PV generation. To date, *Luz para Todos* has installed 3,500 individual solar PV systems and 17 solar PV mini-grids (Mazzone et al. 2020). The national electrification plans of most countries highlighted in this study now recognize these lower-cost off-grid systems to be part of the solution set for universal access.

In Ghana, the 'Improving Rural Energy Access through Solar Home Systems' project, for households in isolated Volta Lake island communities, supported the purchase of 7,991 solar lanterns and 8,831 solar home systems. The purchase price of solar products was subsidized by be-

tween 50 and 60 percent, depending on the product. A loan was available to households to cover the remaining cost, post subsidy. Ghana's National Rooftop Solar Program, with its aim to install 200,000 solar home systems, has provided a capital subsidy in the form of free solar panels (up to 500 watt-peak), equivalent to about 30 percent of the total cost, including the battery, controls and basic fittings (Bawakyillenuo 2020).

The approach to enabling households to connect to off-grid power can be through support to the suppliers of household solar systems. In Kenya, for example, the Kenya Off-grid Solar Access Project (KOSAP), which began in 2018, aims to install 250,000 household solar systems across 14 marginalized, under-served counties. The project subsidizes a financing facility to allow companies to supply solar home systems to households in the targeted counties. KOSAP also aims to install 151 mini-grids through public-private partnerships, which will apply the national tariff structure, including the lifeline tariff (EED Advisory 2020). Subsidies to suppliers, however, do not fall within the definition of an ESN.

CLEAN COOKING

Policy initiatives around clean cooking increasingly involve incentives and support for using LPG, although biomass cookstoves predominate in many parts of the six countries highlighted in this study.

Connecting consumers to clean cooking fuels and technologies

Government clean cooking programs tend to focus on improving access to LPG, a cleaner-burning fuel, rather than supporting deployment of improved biomass cookstove technology. Improved cookstoves (ICS) burn biomass more cleanly than traditional open fire methods, but particulate matter is still often generated during combustion, with harmful health impacts for the women and children breathing that air. However, biomass is not easy to displace, since it can often be foraged for free, and LPG comes at a cost, often considerable. For these reasons, there has been substantial policy experimentation with ways to close the LPG affordability gap.

In Ghana and Kenya, where the proportion of the population using clean fuels and technologies for cooking is lower than in the other four

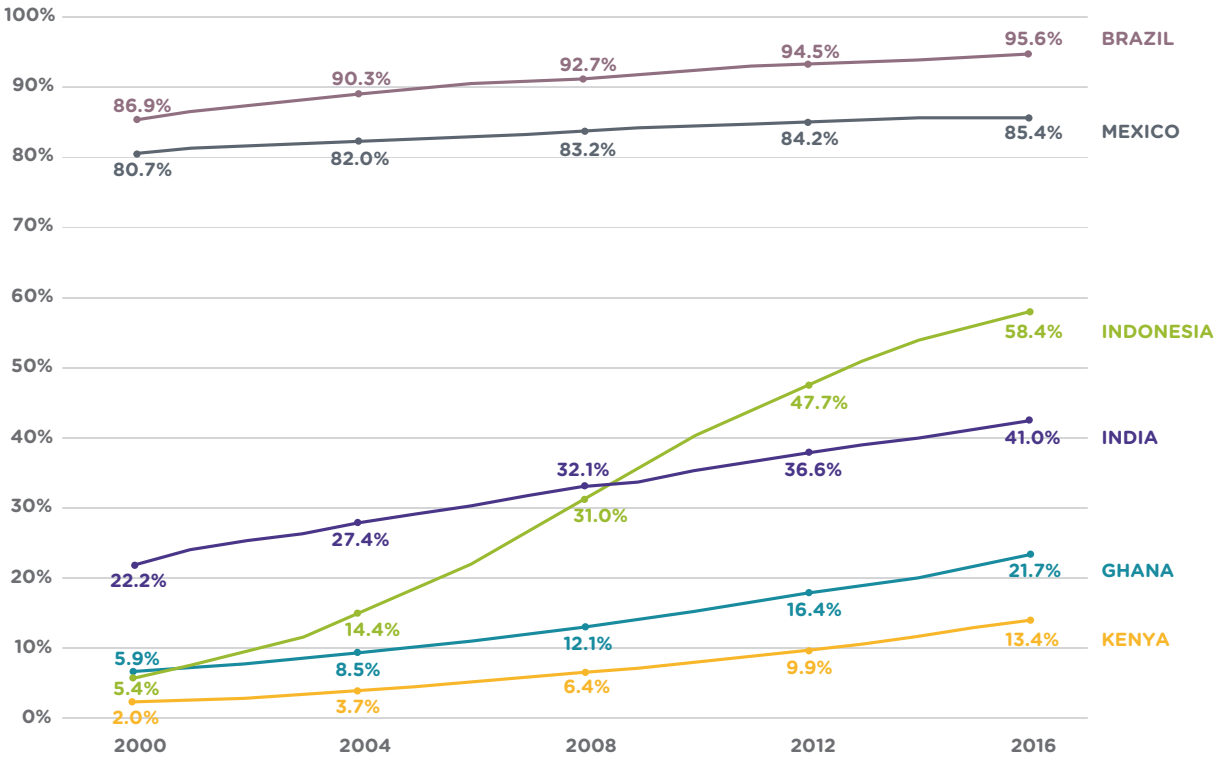
countries, government and non-government initiatives to develop and disseminate improved biomass cookstoves have a long history. However, three-quarters of the population in both countries continue to depend on traditional fuels (see Figure 3). Approximately 320,000 ICS were sold in Ghana between 2015 and 2016 under different arrangements by a variety of uncoordinated programs (Bawakyillenuo 2020). In Kenya, KOSAP aims to facilitate the sale of 150,000 ICS across eight under-served counties (EED Advisory 2020). Government efforts have focused on support for ICS development and manufacture, leaving distribution to businesses and non-governmental organizations. Government subsidies to households for the acquisition of ICS were not found in any of the six countries. This study's examination of ESNs for clean fuels and technologies for cooking is therefore focused on LPG.

In Brazil and Mexico, where the proportion of the population using clean fuels and technologies for cooking is much higher than in the other four countries (see Figure 3), support for connections to LPG has been intermittent. Brazil's *Auxílio Gás* scheme, launched in 2002 to enable households to purchase an LPG cylinder, was later renamed *Vale Gás* and integrated into *Bolsa Família* (Family Allowance), the country's flagship social assistance program (Mazzone et al. 2020). In Mexico, in a short-lived scheme between 2017 and 2019, the Ministry of Welfare donated more than 13,000 stoves and LPG cylinders to poor households in 15 districts, but little is known about the recipients (Sanchez et al. 2020).

Ghana began promoting the use of LPG in 1989. Initially, empty LPG cylinders were distributed to households free of charge. This was comple-

Figure 3

Access to clean fuels and technologies for cooking (% households)



Source: https://data.worldbank.org/indicator/EG.CFT.ACCS.ZS

mented by investment in LPG infrastructure (refilling stations and cylinder manufacture) and, from 1998, a subsidized gas price. When LPG subsidies were removed in 2013, the government began distributing empty 6 kg cylinders and single burner stoves in rural areas free of charge. Although the cylinder, valued at about USD 25 (Dalaba et al. 2018), is free of charge to households, they are required to pay the equivalent of about USD 5 for the gas (Bawakyillenuo 2020). Recipients of the subsidy are selected by district assemblies (local governments) based on the nomination by community leaders of persons interested in using LPG and able to pay for the first fill of gas (Asante et al. 2018). This represents a form of administrative targeting.

Programs to connect households to LPG in India and Indonesia have been on a massive scale, relative to other countries, due to the size of their populations. Indonesia launched a national kerosene-to-LPG conversion program in 2007, driven by the need to reduce national expenditure on kerosene subsidies and fuel imports. The program's initial target was to reach 42 million households and micro-enterprises by 2012. Free filled LPG cylinders, burners and regulators were distributed to qualifying households (Dartanto et al. 2020).

The *Pradhan Mantri Ujjwala Yojana* (PMUY) program in India was launched in 2016 to overcome the high upfront cost barrier to LPG adoption for poor households. The scheme subsidizes half the cost of the connection and provides an interest-free loan for the other half (i.e. a loan for about USD 23). Households eligible for PMUY (those below the poverty line and with one indi-

cator of deprivation used in the Socio Economic Caste Census database)[ix] receive an in-kind subsidy for 50 percent of the cost of an LPG connection when they first register for the scheme. A loan is available for the balance of the connection cost, repayable over time in instalments as refills are purchased. PMUY has now provided subsidized LPG connections to over 80 million households, using administrative targeting made possible by India's Socio Economic Caste Census (CEEW 2020).

In Kenya, 30 percent of households currently use LPG as one of their cooking fuels, and LPG is the primary fuel for 19 percent. In 2017, the government launched the *Mwananchi* Gas Project to promote the use of LPG and achieve a 70 percent penetration rate. The project provided a 6 kg cylinder, burner and grill at a subsidized price (EED Advisory 2020). However, the scheme was suspended in 2018 following irregularities in cylinder procurement.

Supporting consumption of clean fuels for cooking

As countries have phased out expensive general fuel subsidies in a move toward selling LPG at market prices, many have developed schemes to shift the budget support toward enabling poor households to afford LPG.

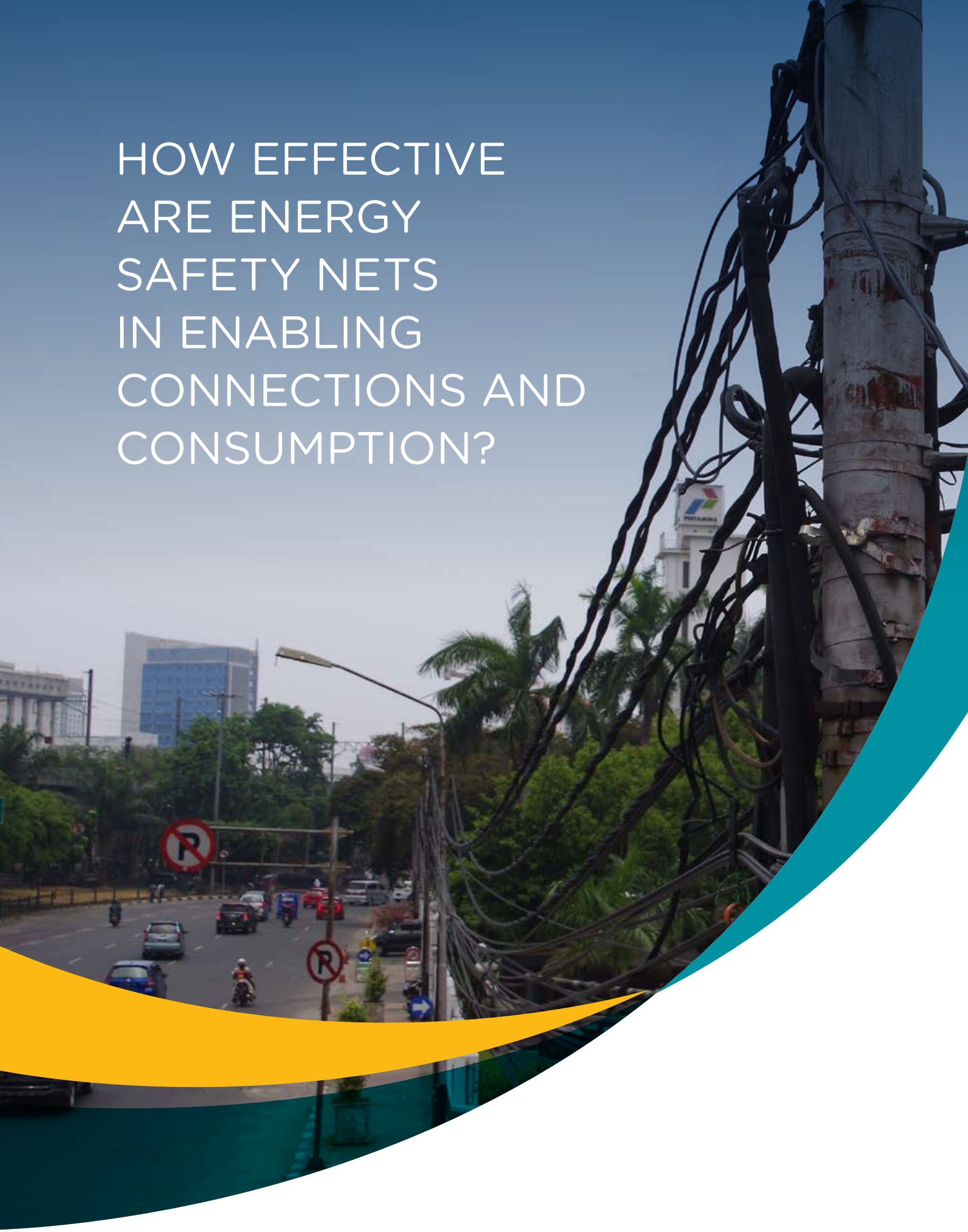
In Indonesia, for example, a trial is making LPG cylinder refills available at a subsidized price to households on the country's BDT social assistance register. As the country phases out the LPG price subsidy, the general social assistance program is expected to become the vehicle to provide support for LPG consumption by households in the BDT register (i.e. the lowest two income quintiles). Those registered will be able to purchase LPG at a subsidized price by presenting evidence of their registration (e.g. an e-voucher) to the LPG distributor (Dartanto et al. 2020).

In Mexico, when LPG consumer price subsidies were removed in 2013, the national social assistance program, *Oportunidades,* was used to compensate the low-income households on its register through cash transfers to support higher LPG payments. Before this, an energy component in the social assistance program—*Oportunidades Energéticas*—operated between 2007 and 2011, The level of subsidy, fixed nationally, varied in percentage terms across the country (from 5.2 percent to 12.9 percent) because the retail price of LPG varied (Sanchez et al. 2020).

In India, government fuel subsidy reforms since 2013 have, over time, led to LPG being sold at market prices. These reforms have built on the national Direct Benefit Transfer scheme introduced in 2013 to improve the efficiency of social assistance programs, by depositing benefits directly into the bank accounts of beneficiaries. LPG cylinder refills are subsidized through the *Pratyaksh Hastantarit Labh* (PaHaL) scheme, established in 2013 as the Direct Benefit Transfer scheme for LPG. The registered consumer pays the market price to the LPG distributor, using an initial subsidy payment, and subsequently receives the next subsidy amount directly to their bank account (CEEW 2020).

ix See the India case study for more information (CEEW 2020).

HOW EFFECTIVE ARE ENERGY SAFETY NETS IN ENABLING CONNECTIONS AND CONSUMPTION?



This section reviews evidence from the six countries about the effectiveness of their Energy Safety Nets (ESNs). The most obvious measure of effectiveness, in relation to the goal of universal access, is whether the ESNs helped to improve levels of access to electricity and clean fuels for cooking – for example, the number of households newly connected, what proportion of those without access this represents, and the share of households connected living in poverty. The previous section draws a distinction between achieving access (connections) and consuming modern energy services (consumption). Evidence for the effectiveness of ESNs in enabling poor and marginalized people to use (consume) electricity and clean fuels for cooking is, therefore, also reviewed here.

In previous studies, the effectiveness of energy subsidies has been assessed in terms of 'benefit incidence', 'beneficiary incidence' and 'materiality' (see Box 2 for definitions) (Komives et al. 2005; Bacon et al. 2010). While some evidence for these measures exists, in some instances in the six countries, a lack of empirical data from secondary sources prevents comprehensive detailed analysis along these three dimensions. The following section focuses on the effectiveness of the mechanisms we call ESNs for advancing both the access and use of grid electricity and LPG. Barriers to effectiveness are also considered.

'ACCESS' AS ENERGY CONNECTIONS

Electricity connection

Over the past decade, the electricity access challenge has taken different forms across the six countries selected for the study. In two, Brazil and Mexico, where per capita incomes are considerably higher than those of the other four (see the Annex for key economic indicators), the challenge has been to deliver access to the small proportion of the population that still lack access (less than 10 percent). When national electrification rates reach 90 percent or more, the unconnected population is likely to be the most difficult to reach and likely to have a high incidence of poverty. This is the case in Indonesia, where the remaining electrification challenge is on islands in the eastern provinces, which are also among the poorest. In Ghana and Kenya, where electrification rates have been lower, the challenge is to extend electricity access to most of the population.

In the 1960s, Mexico launched an intensive program of electrification. Over 99 percent of the population has had access to electricity since the beginning of the twenty-first century. By 2015, when the electrification rate was 99.7 percent, the population without access lived in about 7,000 remote rural communities with an average population of 30. Through the Fund for Universal Electricity Service (*Fondo de Servicio Universal Eléctrico*, FSUE), distributed electricity systems have been used to connect these communities (Sanchez et al. 2020). According to The Energy Progress Report 2019 (IEA et al. 2019) universal access was achieved in 2017.[x]

The *Luz para Todos* program delivered access to over 16 million people in Brazil between 2003 and 2015 – equivalent to 8 percent of the (2015) total population. The program contributed significantly to Brazil's achievement of universal access to electricity in 2017 (IEA et al. 2019). Successive extensions of the program reflected the difficulties reaching low-income households in isolated settlements in thinly populated municipalities, such as the Amazon region, as well as a growing marginalized urban population.

Both Ghana and Kenya have made impressive progress with electrification. In Ghana, 79 percent of the population had an electricity connection by 2017.[xi] Since the start of the century 4.3 million households have gained access (see Fig-

x The *Secretaría de Energía* reported 98.64 percent connected in 2017 (Sener 2018).

xi The electrification levels are taken from the 2019 Energy Progress Report. Ghana's Energy Commission estimates 85 percent with access in 2018, based on a different methodology.

Box 2: Measures of the effectiveness of energy safety nets

Benefit incidence: the share of the total value of the benefits received by people in the target population.

Beneficiary incidence: the proportion of the total eligible population receiving support from the ESN.

Materiality: the significance of the amount of the subsidy for recipient households, e.g. in relation to total expenditure or energy expenditure.

ure 4) and the population without access was reduced by 42 percent. In Kenya, 64 percent of the population had a connection in 2017; 7.75 million have gained access since the year 2000 and the population without access was reduced by almost a third.

Programs to deliver access to electricity to households in poor areas have contributed to this progress. Ghana's SHEP focused on communities more than 20 kilometres from the grid. Kenya's Slum Electrification Project focused on urban informal settlements. Other programs and projects did not target poor and marginalized households and the entire population has benefited. Regrettably, information on the income distribution of households gaining access through non-targeted schemes is unavailable, either because it is unreported or because it was not collected in the first place.[xii]

LPG connections

For LPG, household access is not a question of connections to networked infrastructure but rather one of making the necessary equipment available to households (i.e. cylinder, burner/stove, hose and regulator). Levels of access to LPG are measured in terms of households with 'connections' and households using LPG as their main cooking fuel.[xiii]

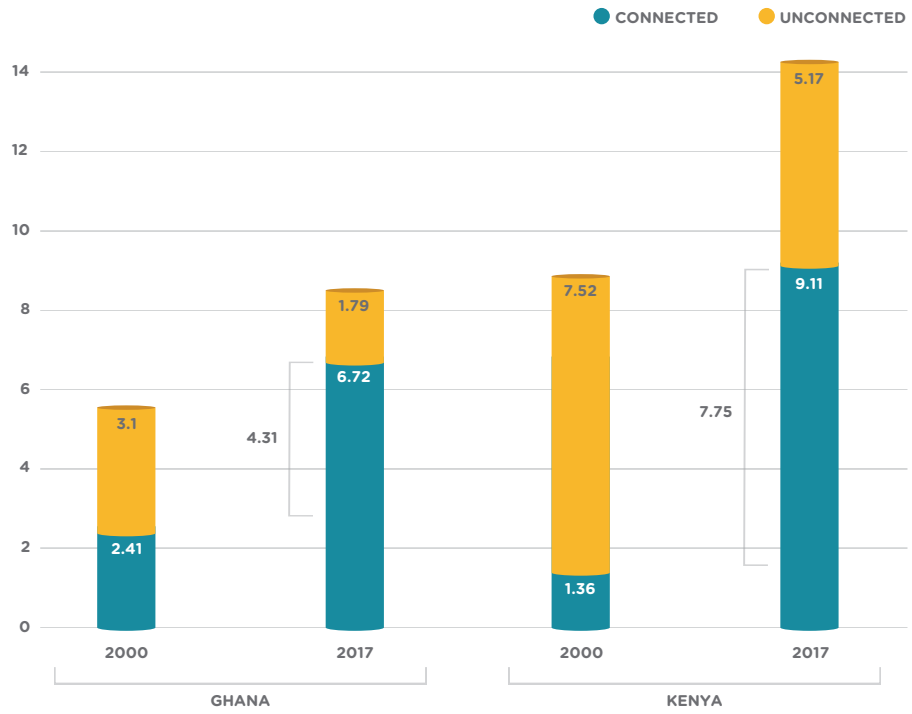
Ghana has been promoting LPG as a cooking fuel since the late 1980s, when a local supply became available. By 2005, only 9 percent of households used LPG as their primary fuel for cooking and most of these consumers were in urban areas. In 2013, the government launched a Rural LPG promotion program to redress the imbalance between urban and rural LPG use that, by the end of 2017, had delivered 150,000 connections. In

xii National household expenditure surveys often report aggregate data on households with connections, but rarely provide analysis by household income group.

xiii Households using LPG as their main cooking fuel may often use other fuels as well; the number of households using LPG is not necessarily the same as the number using it as their main cooking fuel.

Figure 4

Number of households (millions) with and without electricity connections



Source: Authors' calculations from World Development Indicators (World Bank) and UN population data

2015, LPG penetration was 22.3 percent nationally and 5.5 percent in rural areas (Bawakyillenuo 2020). By 2017 the national rate had increased to 24.5 percent (Global LPG Partnership 2018). The small number and uneven distribution of refilling stations has been one of the main factors influencing the limited uptake of LPG. Other factors affecting household decisions to adopt LPG are affordability,[xiv] concerns about safety, and household cooking preferences, which are reflected in fuel stacking by households that have an LPG connection (Dalaba et al. 2018). In 2017, the number of households in Ghana still dependent on traditional fuels was 6.7 million (78 percent of the total) meaning that at the current rate of change the government target, to have 50 percent of households using LPG by 2030, will not be reached.

Since the Government of India launched the PMUY scheme in 2016 to support LPG connections for households below the poverty line,[xv] 80 million households have acquired an LPG connection.[xvi] The initial target was to reach 50 million households by 2019–2020. The number of households connected by the PMUY scheme in 2016 was equivalent to about 50 percent of the total number of households in India without clean fuels and technologies for cooking. PMUY gave priority to socially and culturally marginalized households, increasing the proportion using LPG as a primary fuel from 6-7 percent in 2015 to 21-32 percent in 2018.[xvii] By 2019, when 94 percent of households

xiv The cost of a 15 kg LPG connection, including gas, is about USD 63 (Dalaba et al. 2018).

xv That is below the national poverty line. See India case study for more information about the categorization of Below the Poverty Line (BPL) households (CEEW 2020).

xvi Figure is by September 2019.

xvii The proportions are for Scheduled Castes and Scheduled Tribes. In 2018, the scheme was extended to a variety of other marginalized groups, such as forest and island dwellers, members of the Most Backward Classes (MBCs), and groups such as landless agricultural laborers, households headed by widows, or people who were terminally ill, disabled or HIV positive (CEEW 2020).

Box 3: Indonesia's unified database – BDT

Indonesia's *Basis Data Terpadu* (BDT) is an electronic database containing social, economic and demographic information from census data. It is used to conduct a proxy means test to identify and classify the poorest 40 percent of the population. The proxy means test includes indicators such as household characteristics, demographic, employment, housing, asset ownership, education, health, and social assistance membership information.

The database has been updated several times since its inception in 2005, most recently in 2015 when it was renamed BDT. There are now 25.7 million households classified as the poorest 40 percent of the population. For the next update, local governments will be involved in the registration and verification of new and existing poor households in their regions.

The BDT unified database operates under the supervision of the Ministry of Social Welfare and was initially only used to identify eligible beneficiaries for social assistance programs. Since 2017 it has also been used to identify households eligible for targeted energy subsidies from *Perusahaan Listrik Negara* (PT PLN), the national electricity utility company. By matching the BDT database with its customer database, PT PLN has been able to reduce the number of customers paying concessional tariff rates by sifting out those customers who are in higher income quintiles than the two lowest quintiles captured by the BDT.

Source: Dartanto et al. 2020.

were LPG consumers, more than 23 percent of the population were connected to LPG by the PMUY scheme (CEEW 2020).

The kerosene-to-LPG conversion program in Indonesia (Zero Kero Program), launched in 2007, supplied a free starter package to households and micro-enterprises, comprising a filled 3 kg cylinder, a one-burner stove, a rubber hose and a regulator. By 2014, the program had distributed 56 million starter packages – an average of 8 million a year. About 41 million households now use subsidized 3 kg LPG cylinders and the proportion of the population using clean fuels and technologies for cooking has increased to 62 percent (2017) from 26 percent in 2007 (Dartanto et al. 2020). However, the BDT register (see Box 3) includes 25.7 million households eligible for the 3 kg subsidy, indicating that higher-income households are also benefiting.

'ACCESS' AS ENERGY CONSUMPTION

Although a household may be connected to an electricity supply or have LPG equipment, it does not necessarily follow that it is using electricity or LPG to meet its energy needs. Evidence from the six countries highlighted in the study bears this out. In Kenya, for example, the number of connections to the electricity grid has increased rapidly, yet in 2018 around 900,000 connections were inactive (non-vending). In India, 14 percent of recipients of LPG connections through PMUY were found not to refill their cylinders a second time after the first year. PMUY beneficiaries consumed on average 3.4 cylinders a year, almost half the 6.77 all-India average. Lower LPG consumption can be due to the direct costs of obtaining a refill and its opportunity cost (e.g. forgoing a day's work to travel to the closest depot, which may not be close at all).

Electricity consumption

The determinant of affordability of grid electricity is the price to the consumer. In all six countries, there are tariff structures with a subsidized tariff (USD/kWh) for one or more blocks that apply to consumers of small quantities of electricity. The size of the blocks varies between countries, and the level of subsidy in the price charged varies – see Table 4.

Information about the number of households on the social or lifeline tariff and how much electricity they consume is available only for Indonesia and Kenya. In Kenya, the total number of residential electricity customers reached 6.35 million in 2018,[xviii] the year the lifeline threshold was raised to 100 kWh a month. Over 90 percent of these customers consume under 100 kWh a month (measured as a three-month moving average) and benefit from the subsidized tariff of the lifeline block. A significant share of the total benefit of the lifeline tariff, therefore, is received by non-poor households (i.e. the upper three income quintiles) and the 100 kWh a month threshold is too high to be considered as well-targeted at poor consumers.[xix]

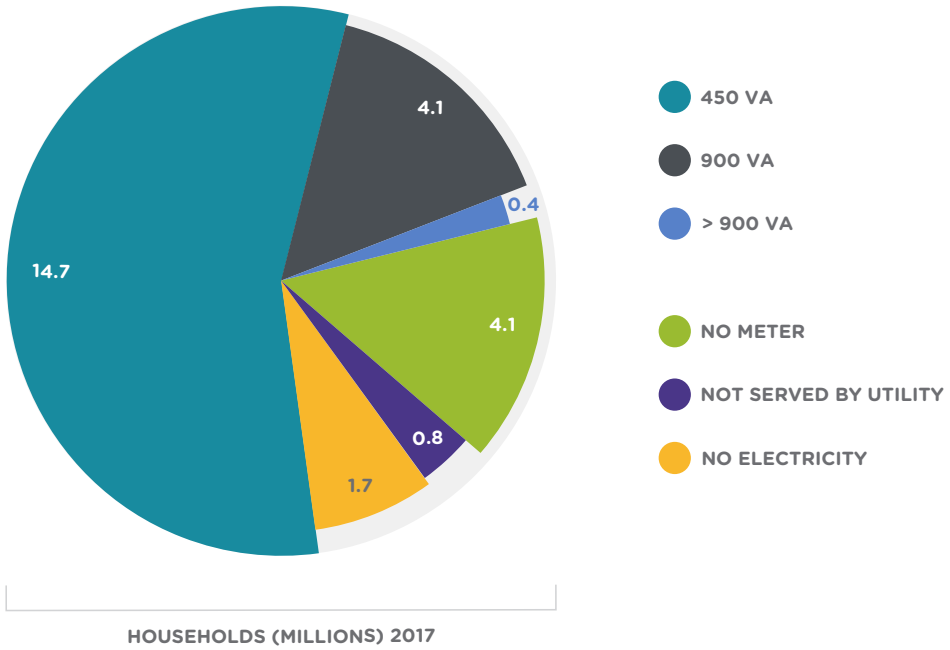
In contrast to tariff changes in Kenya, reform of the tariff subsidy in Indonesia has been designed to ensure that beneficiaries of the lifeline tariff come from the poorest 40 percent of the population. Reforms reduced the number of beneficiary

xviii Kenya Power and Lighting Company (KPLC) Annual Report 2017–18.

xix A detailed assessment of the distribution of the value of the subsidy would require information about the quantity of electricity by households in different income groups, which is unavailable.

Figure 5

Poorest 40% of Indonesian households by type of electricity connection



Source: Dartanto et al. 2020.

households with 900 VA connections from 22.3 million in 2016 to 4.1 million in 2017.[xx] The 14.7 million households with 450 VA connections with subsidized tariffs are also in the poorest 40 percent of the population (see Figure 5) (Dartanto et al. 2020).

In Brazil, 12–13 percent of electricity consumers are on the lifeline tariff (*Baixa Renda*), totalling 8.8 million households in 2018 (ANEEL 2019). Although electricity consumption fell overall in Brazil after 2015, due to worsening general economic conditions, consumption by households on the lowest tariff block (0-30 kWh per month) increased by 11.3 percent. However, consumption by households in the 101-220 kWh and the above 220 kWh blocks, who are also on subsidized tariffs, fell. The electricity consumption increase in the lowest block can be explained partly by the change in the number of consumers on this level of consumption (from 8.8 million to 9.3 million).[xxi] It could also be due to the lifeline tariff's protection for low-income and vulnerable groups, enabling them to maintain consumption during an economic downturn.

The affordability of tariffs is not the only factor influencing whether low-income households use electricity when they have a connection. In some cases, monthly standing charges levied by electricity suppliers are an important factor. These are usually irrespective of the quantity of electricity consumed and can range from 5 percent of the cost of 100 kWh to as much as 100 percent (Komives et al. 2005). In 2018, the Government of Kenya removed standing charges that were perceived to be a deterrent to electricity consumption with consequences for the utility's revenue.

The reliability of the grid electricity supply is also a factor affecting the quantity of electricity households consume and their willingness to pay

xx VA (volt-ampere) is a measure of the power rating (capacity) of the connection.

xxi The proportion of customers on the lifeline tariff increased from 13.1 percent to 13.6 percent (ANEEL 2019).

(Rahnama 2019). Frequent and lengthy outages prevent consumption, and can influence the purchase of appliances.

Clean cooking fuel consumption

One of the reasons governments subsidize LPG prices (i.e. refills for LPG cylinders) is to make this form of clean cooking affordable to low-income households. Poor households can often afford to spend only a small amount at a time to buy fuel for cooking, making the full cost of a filled cylinder a large outlay and a barrier to using LPG, which a subsidy can overcome. LPG use is generally higher in urban areas, while in remote rural areas, where the incidence of poverty is greater, the market price of a filled cylinder is higher because distribution costs are higher. Price subsidies can also protect low-income consumers from variability in gas prices, although it is clear from the six countries reviewed that subsidies do not always protect against price fluctuations.

In Brazil, LPG has been sold at market prices since the general subsidy was removed in 2002. Immediately after the subsidy removal, fuelwood consumption increased as households switched to traditional fuels. LPG use has increased again as incomes have risen, although LPG accounts for less than a quarter of Brazil's energy consumption for cooking (Coelho et al. 2018). For poor and marginalized households, cash transfers from *Bolsa Família* (and *Vale Gás*) are intended to enable LPG consumption. However, the amount received via cash transfers has not kept pace with increasing LPG prices. The cost of a 13 kg cylinder in 2019 (USD 17) was equivalent to 79 percent of the monthly *Bolsa Família* transfer, while in 2015 it was only 58 percent[xxii] (Mazzone et al. 2020). Moreover, the price of LPG in poorer northern states, including Amazonas, is higher than elsewhere, but the *Bolsa Família* transfer is uniform across the country.

Before 2013, the price of LPG was subsidized in Ghana, where the government has a target of 50 percent of all households using LPG by 2020. However, the subsidized price mainly benefited better-off households. The poorest quintile received less than one per cent of the total benefit, while the richest quintile received 85 percent (Cooke et al. 2014). More than a third of the subsidy was procured by taxi drivers who modified their vehicles to run on gas to take advantage of the subsidy. Before the subsidy was removed, three-quarters of the taxis in the greater Accra region used LPG (Bawakyillenuo 2020).

About 22 percent of Ghanaian households were using LPG at the time the government removed the subsidy in 2013. Since then, some low-income households have reverted to using fuelwood and charcoal as their main cooking fuel. In rural areas, the penetration rate was in any case quite low (5 percent in 2015). This was partly due to the inaccessibility of refilling stations, which are unequally distributed across the country (Bawakyillenuo 2020).

In India, the richest 30 percent of households accounted for 97 percent of LPG consumption before the launch of the PMUY scheme in 2016. The program has extended connections to 80 million BPL households, depositing the subsidy directly into the bank accounts of women in eligible households. This has the potential to empower women in the area of household energy management and to improve their financial inclusion. Under the scheme, active LPG connections increased by 60 percent between 2016 and 2019, and the quantity of LPG sold increased by 26 percent. However, the effectiveness of the scheme in enabling poor households to consume clean cooking fuel has been affected by how LPG connections have been subsidized. Almost three-quarters of households benefiting from PMUY used a loan for their 50 percent share of the connection cost. While households

xxii A 13 kg refill is expected to last longer than a month.

are repaying this loan using cash transfers from the PaHaL scheme for gas purchases, they have to purchase LPG at the market price. This means households that take out a loan are putting the subsidy toward loan repayment for the first six to eight cylinder refills. As a result, between 25 and 35 percent of households using LPG did not benefit from the subsidy in 2018, depending on location (CEEW 2020).

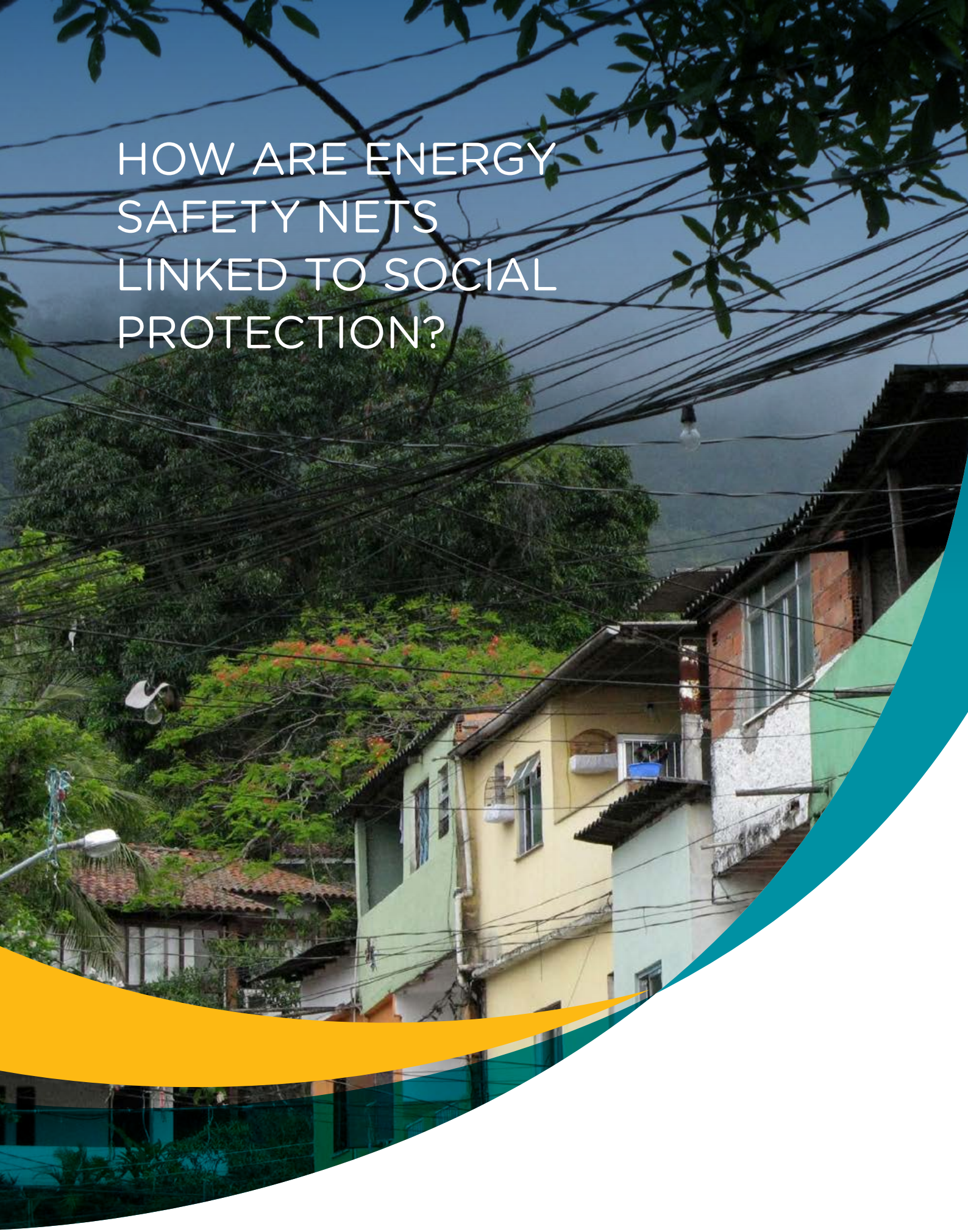
Although millions of poor households in India have gained a connection under PMUY, the number of households consuming reduced-price LPG is lower; while the great majority of households have an LPG connection, it may be consumed in conjunction with other fuels. In 2018, LPG was the primary cooking fuel for about 70 percent of households, but for some marginalized social groups the proportion was lower.

In Indonesia, only a quarter of the beneficiaries of the LPG price subsidy in 2015 were in the poorest 30 percent of the population, and most beneficiaries were in the richer half of the population. Because they consume less LPG, the poorest 40 percent received a lower subsidy than the richest 50 percent. To target the subsidy to poor households, and reduce government expenditure, the LPG subsidy is being reformed to limit the number of subsidized cylinders to three a month per household, and to use the BDT social protection register. According to the BDT register, 25.7 million households are eligible for the 3 kg subsidy, while 41 million have been receiving it (Dartanto et al. 2020).

While India and Indonesia have provided LPG connections to tens of millions of households through government ESN schemes, the use of LPG as the primary fuel for cooking is not universal. The proportion of poorer households and among those living in remote areas using LPG is lower than that of richer households and among those living in urban areas. This is partly due to affordability, even for households receiving social assistance cash transfers. Where lower cost alternatives such as fuelwood are readily available, the non-economic benefits of LPG use may not always be recognized or valued. Another barrier to the uptake of LPG is its availability in rural and remote areas. Although governments such as those of Ghana and Indonesia have been investing in distribution infrastructure, the cost accessibility of refills remains a challenge for households in some areas.

The cost for households to obtain refills for LPG in terms of time and expenditure can be a disincentive to its adoption. While the large-scale distribution of LPG cylinders and burners in a small number of populous countries, including India and Indonesia, has contributed to recent progress globally towards SDG7.1.2, the target of universal access to clean fuels and technologies for cooking (IEA et al. 2018), LPG use in other access-deficit countries remains generally low. Affordability is only part of the reason. One key factor is the physical accessibility of the LPG distribution system. Although Ghana, India and Indonesia have invested in distribution systems, some communities are distant from distributors and cannot always access and purchase a refill when they need to. In remote regions, such as the eastern islands of Indonesia, the distribution network is less effective than in more populous, richer areas (Dartanto et al. 20209). In India, 95 percent of households in villages well-connected to LPG distributors use LPG as their primary fuel, but the proportion in remoter villages is 29 percent (CEEW 2020). Difficulties in accessing refills encourage households to return to solid fuels for cooking (Bruce et al. 2017). Households tend to practice fuel stacking, using different cooking technologies to meet different cooking needs. Overall in India, for example, 48 percent of households using LPG as their primary fuel also use traditional biomass fuel (CEEW 2020). The proportion of households using LPG for cooking tends to be larger than the proportion using LPG as their primary cooking fuel.

HOW ARE ENERGY SAFETY NETS LINKED TO SOCIAL PROTECTION?



Social protection systems combine contributory schemes, such as social insurance, and non-contributory social assistance schemes (see Glossary). Social safety nets, a form of social assistance intended to provide regular support to targeted poor and vulnerable populations, have been shown to reduce poverty and inequality (World Bank 2018), and SDG1 includes a target to implement social protection systems and measures for all.[xxiii] Energy Safety Nets, defined as a mechanism to ensure very poor and marginalized people have access to electricity and clean fuels and technologies for cooking, are a form of social assistance. They serve a similar role to social safety nets by providing access to essential services and income to poor and vulnerable households and improving their standard of living.

This section reviews how the ESNs in the six countries in this study are linked to their wider social assistance programs. There are two main ways this happens: (1) by integrating ESNs into existing social assistance programs; and (2) by linking ESNs to existing social assistance programs (e.g. for identification of the target population).

INTEGRATING ESNS INTO EXISTING SOCIAL ASSISTANCE PROGRAMS

Fuel subsidy reform in the upper-middle income countries of Brazil and Mexico led to the use of general social assistance mechanisms to make LPG affordable for low-income and marginalized households. This was in recognition of the significance of fuel subsidies for poor households, although the driver for reform was a reduction in public expenditure.

In Brazil, *Auxílio Gas* (*Vale Gás*) operated as a separate scheme between 2002 and 2004 when it was incorporated into the *Bolsa Família* cash transfer program and lost its separate identity. This change was part of a wider response to bureaucratic inefficiency in the provision of social assistance (Mazzone et al. 2020). The main purpose of *Bolsa Família* is to address extreme poverty, hunger and education, and the energy element is now invisible. There has been no analysis of how much *Bolsa Família* recipients spend on energy or their energy consumption, although it is clear that LPG prices have increased at a much faster rate than cash transfers. There is some evidence of increasing use of fuelwood and charcoal among poor households, perhaps related to the relatively high price of LPG. The government is considering a return to a separate *Vale Gás* scheme, recognizing that *Bolsa Família* has not been able to ensure access (consumption) of clean fuels for cooking.

In a similar way, an energy component, *Oportunidades Energéticas*, was added to Mexico's general social protection program between 2007 and 2011. *Oportunidades Energéticas* helped households that already had access to electricity or LPG with a cash transfer that amounted to between 21 and 25 percent of household spending on energy. This was initially a conditional cash transfer, requiring beneficiaries to attend medical check-ups and workshops to promote health practices, but this condition was dropped after a year. However, the original condition meant that the program initially excluded communities without health facilities. An assessment of the conditional cash transfer scheme suggested its energy access related impacts were not significant, although the program was effective at reaching the targeted beneficiaries (Sanchez et al. 2020).

There was also a very short-lived attempt to distribute LPG stoves and reduced-price LPG through Mexico's network of government discount (*Diconsa*) stores, which are located in poorer districts. The scheme operated in only 15 districts, between 2017 and 2018, with unknown impact. In this case, the nature of LPG distribution (delivery of a physical product) lent itself to integration with a distribution network of stores selling subsidized food.

[xxiii] Target 1.3: Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable.

LINKING ESNS TO EXISTING SOCIAL ASSISTANCE PROGRAMS

One of the most important questions for the design and implementation of all ESNs is how to target beneficiaries. With the exception of Ghana, the countries highlighted in the study demonstrate efforts to use existing social assistance mechanisms to define or identify potential beneficiaries for energy subsidies. These efforts take two forms, the use of shared geographical targeting approaches and the use of a single database or registry of beneficiary households.

In Kenya, support for energy is targeted geographically by identifying counties that meet agreed measures of deprivation or poverty as used by the Last Mile Connectivity Project (LMCP) and that are also used for government resource allocation. In recent years, Brazil's *Luz para Todos* has also targeted populations by geography, using social welfare indicators.

In Brazil, India, and Mexico, registers or databases of poor and marginalized families that have been established for general social assistance programs are being used to target support for energy. To receive energy subsidies, households must be on a unified or central register. Evidence of this enables them to access subsidized energy prices. In Mexico, there is a unified register for social assistance programs, and *Oportunidades Energéticas* selected communities using socio-economic indicators.[xxiv]

In Brazil, *Bolsa Família* has relied on a single registry (*Cadastro Único*) used by federal, state and municipal social programs since 2003, and is the way for poor and vulnerable households to access over 20 policy measures, including the social tariff for electricity. *Bolsa Família* now covers about 60 percent of poor households, who must register with *Cadastro Único* to be able to access these benefits. However, in some poorer districts, a small proportion of households remain unaware of the registry and the benefits for which they may be eligible (Mazzone et al. 2020).

Indonesia's new reform of gas and electricity subsidies aims to ensure recipients are on the BDT register. Subsidy reform, which has been driven by public expenditure considerations more than by social protection for vulnerable people, can be characterized as a shift from a commodity-based subsidy (e.g. electricity or LPG) to a person-based subsidy (targeted at a social group). In the case of electricity tariff subsidy reform, PLN (the utility) is using the BDT database, matching it against its customer database and visiting households to confirm eligibility (Dartanto et al. 2020).

xxiv This used the National Council for the Evaluation of Social Development Policy's Social Backwardness Index, which is a synthesis of indicators on education, health services, housing and asset ownership.

CONCLUSIONS

The research for this study examined 25 different measures deployed in six countries to support poor households to access electricity or clean fuels and technologies for cooking. These measures have mainly supported connections to electricity and LPG and the consumption of electricity and LPG. Variations in the history, operation and institutional context of these measures, as well as differences in the availability of data about each of them, make comparisons difficult. However, it is possible to draw some general conclusions from the six country case studies.

CONNECTIONS AND CONSUMPTION

The study's review of energy access support measures draws a distinction between support for connections to modern energy services and support for the consumption of electricity or clean fuels. Table ES1 lists three energy safety nets (ESNs) that provide connections to poor households and 10 that support energy consumption. The approach to delivering connections – the conventional measure of energy access – can be different to enabling energy consumption and can require different funding and delivery mechanisms. Support for connections may be a necessary first step but does not guarantee energy is affordable or consumed by the target population. As the policy focus for energy poverty shifts from a question of access (connections) to a question of energy use and services, and as progress is made towards universal access, the policy focus needs to shift from connecting poor and marginalized households to ensuring adequate consumption and affordability.

Although conventional social safety nets tend to overlook energy consumption, energy consumption can be enabled through social assistance programs, but when setting policy and levels of subsidy this requires taking proper account of energy costs (including price volatility) and household energy expenditure, as well as the availability of connections. Where support for energy consumption has been integrated into social safety nets, as is the case in Brazil and Mexico, the energy component can lose its separate identity and purpose under circumstances where energy market prices change without corresponding adjustments to the level of funding transferred under the safety net.

Until social assistance schemes provide for essential energy consumption, broadly defined, and in an ongoing, tracked way, it may be useful to have separate ESN programs. These can use social assistance registers to target subsidies for energy access (e.g. connections, solar household systems, LPG equipment) and use (tariffs, LPG prices) to households meeting the criteria for social assistance. A unified register for all safety nets, energy and social, would tap efficiencies of scale, have lower total costs than separate administrative systems, and help ensure targeting consistency between different safety net measures. However, this requires the inclusion of household data to inform the operation of a variety of safety nets and the involvement of different line ministries (e.g. education, health, social welfare, food and energy).

TARGETING

Where levels of access are low, programs to provide access to energy (connections) tend to be available to the general population. They are not specifically targeted to poor and marginalized social groups and aim to connect all who need access. Some programs have geographic targeting to areas (slums, remote, rural) where access is lower and where there is a higher incidence of poverty. As levels of access increase, it is more likely that unconnected households will be poor or marginalized and barriers to access will include awareness, affordability, and social and cultural factors.

The targeting criteria to ensure a safety net reaches poor or vulnerable people may be different for electricity and clean fuels, and for connections and consumption. Seven of the 13 ESNs exam-

ined by the study (Table 3) use a form of self-selection for targeting, based on quantities, and six use administrative targeting that uses economic, social and cultural indicators.

Policymakers need to specify and define the intended target population for an ESN when it is designed. This determines the criteria or indicators that will be used to decide the eligibility of households, including whether support to achieve energy access objectives will require one or more targeting approach and one or more ESN measure.

CONSUMPTION THRESHOLD LEVELS

The prevalence of quantitative targeting of support for the consumption of electricity and LPG raises the question of the quantity of electricity or clean fuel necessary to meet essential needs. This will not be the same for all poor or vulnerable households, or across countries. Households vary in size and composition; they live in a variety of locations with different climates; they may be in rural, urban or peri-urban settlements; and they have different social and economic contexts and behavior. Energy needs can also vary seasonally.

The question of what level of energy consumption should be subsidized needs more explicit consideration in policymaking and a stronger evidence base. Lifeline tariff blocks in some countries, for example Kenya, appear unrelated to the level of electricity consumption of poor households, but may be justified as necessary to enable them to consume electricity. Consumption blocks can be set at a level to exclude wealthier households from the subsidy benefit, or a combination of quantitative and administrative targeting could be used. Tariff blocks can also vary within a country to reflect socioeconomic and climatic differences.

To determine the quantity of energy that should be supported by an ESN, policymakers should consider the empirical evidence of quantities of energy consumed by poor and vulnerable households that have access to electricity and clean fuels and technologies for cooking. Unfortunately, data on the quantity of energy consumed by households are rarely captured by national household surveys. Utility companies and LPG distributors may have data on consumption by their consumers, but these may not be related to households' socioeconomic characteristics. Further quantitative research and improved data collection and analysis about household energy consumption and expenditure would inform energy and social protection policymakers.

SUBSIDY DELIVERY

There are many ways to provide support to poor and vulnerable people to enable them to access and use electricity or clean fuels and technologies. Resource transfers can be monetary or in-kind; they can be channelled directly to eligible households or through energy service providers; they can be specific to one kind of energy or provide general support for energy consumption.

The design and implementation of ESNs should be appropriate to the country's institutional, geographic and economic context. The status of social assistance policy and implementation is an important factor, and social assistance and ESNs need to evolve continuously – adapting to changing social and economic conditions, and in response to lessons learned from implementation.

Linking ESNs to initiatives for financial inclusion (bank accounts) and digital technologies for cash transfer payments or delivery of electronic vouchers can help to improve their efficiency.

To achieve the goal of universal access to electricity and clean fuels and technologies for cooking it may be necessary to inform and educate citizens who have not used these forms of energy before. The benefits may not be obvious; they may have concerns about safety and affordability; they may not know how to best use them; and there may be a strong cultural attachment to existing energy use behavior. Similarly, citizens may not be aware of the harmful effects of using fuels such as kerosene and fuelwood. Lack of knowledge and awareness is likely to be greater among vulnerable and deprived social groups that ESNs are intended to benefit.

The design and implementation of an ESN should consider the gendered nature of energy management within the household. Traditionally, women have been the main energy managers of domestic energy services, responsible for fuelwood collection and cooking. When electricity or clean fuels such as LPG are adopted, men may assume a larger role in decision-making about energy (e.g. what electricity is used for) and purchasing energy and appliances. ESNs can be designed or complemented with other initiatives that target resource transfers to women to ensure women's empowerment in energy management is protected or enhanced.

POLITICAL COMMITMENT

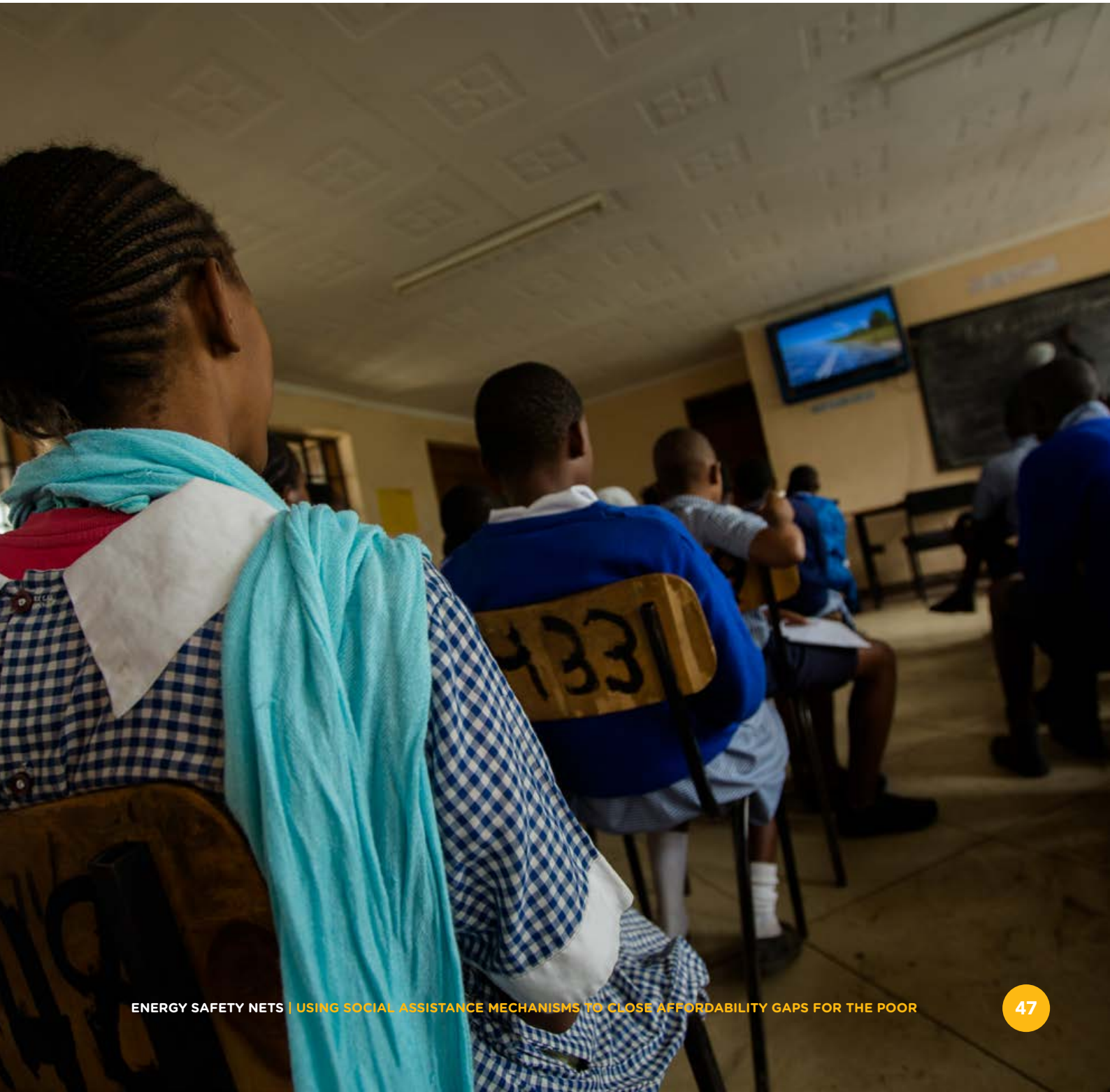
The political salience of energy consumption is reflected in policies for energy access and their implementation in all six countries highlighted in the study. Changes in government can lead to changes in the measures adopted to support connections and energy consumption. Political factors can influence targeting—which social groups receive social assistance, which districts, and the levels of consumption supported—as well as targets for electrification and universal access. Political factors can also lead to short-lived energy access initiatives.

High-level policy commitment to universal access to affordable, reliable and sustainable modern energy, with national targets, can provide the basis for the development of specific measures to achieve it. A policy commitment to social assistance for poor and disadvantaged groups may also be necessary to ensure a commitment to universal energy access goes beyond targets for connections and includes essential energy consumption. For example, under the 2019 Energy Act, the Government of Kenya has a statutory obligation to facilitate the provision of affordable energy services to all persons in Kenya. The country's constitution also asserts that 'the State shall provide appropriate social security to persons who are unable to support themselves and their dependents.'

Politically, for any government developing an ESN program, there is a critical need for communication and coordination among the ministries or agencies that oversee the energy sector and social assistance programs. ESNs are just one form of social assistance, focused on one form of consumption, and should be consistent with and supportive of social assistance objectives.

LOOKING AHEAD

This first-of-its-kind research effort is intended to build an evidence base that can inform and galvanize further work at the intersection of energy policy and social protection by any government similarly motivated to innovate around mechanisms that leverage public finance and social assistance approaches to close energy access affordability gaps and deliver on universal energy access commitments by 2030. More experimentation on policy designs is needed, along with robust monitoring and evaluation to capture impacts and lessons learned. Ongoing evidence can support further iteration and the gradual establishment of best practice around how to reach the hardest to reach with modern energy services.



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GLOSSARY

Access to energy	SDG7 calls for universal affordable, reliable, sustainable and modern energy for all by 2030; this includes access to electricity as well as access to clean cooking fuels and technologies.
Benefit level	This is typically the amount in absolute terms that the benefit confers on the beneficiary. It can also be provided relative to the requirements for a minimum energy consumption threshold (e.g. USD 10 a month, which equates to 40 percent of minimum energy consumption).
Beneficiary incidence	The proportion of the total eligible population receiving support from the ESN.
Benefit incidence	The share of the total value of the benefits received by people in the target population.
Benefit type	What the ESN provides. This may be in-kind (fuel or energy infrastructure), a voucher, a fee-waiver, cash, or a one-off transfer (e.g. connection infrastructure).
Cash transfer	Payments provided by government or non-government organizations to individuals or households. Cash transfers can be contributory or non-contributory.
Cash transfer, non-contributory	Non-contributory schemes normally require no direct contribution from beneficiaries as a condition of entitlement to receive benefits ESNs are non-contributory cash transfers. These can be actively or passively targeted and are either: • conditional (distributed to the beneficiary only if they undertake specified activities), or • unconditional (paid without the beneficiary having to do anything specific).
Concessional tariff rates	Tariffs set at below market prices.

Conditional cash transfer	Periodic monetary benefits to poor households that require beneficiaries to comply with specific behavioral requirements to encourage investments in human capital (such as school attendance, immunizations, and health check-ups).
Coverage	This indicates the absolute number of program beneficiaries or the percentage of the population (or a given population group) that benefits from a specific social safety net program. Coverage may vary depending on the data source (administrative versus household survey data) and requires a clear baseline.
Delivery	The mechanism by which the benefit is transferred to the beneficiary (e.g. for cash, directly to their bank account; for connection subsidies, via a subsidized loan organized through the national fuel/electricity provider; or for a fee-waiver, by creating a subsidized tariff).
Electrification rate	The percentage of a population that has relatively simple, stable access to electricity.
Energy safety net (ESN)	A social assistance mechanism that enables poor and vulnerable people to access and use modern energy services.
Errors of inclusion / exclusion	Inclusion or exclusion errors can be small with categorical targeting, such as by geography or social characteristics, when the category is strongly correlated with poverty or vulnerability. Geographical targeting may include everyone in the area who is poor or vulnerable but may also include people who are not. An ESN for consumption excludes those who do not have physical access.
Fee waiver	This assists households in meeting the cost for a defined class of services, particularly related to education, health, and housing. Waivers can apply to either partial or discounted fees, as well as to other charges or expenditures.
Identification	Identification of the beneficiary population is the first stage in the design of ESNs and represents the group of the population the government wishes to target to receive the benefit. This is usually a policy decision or stated aim (e.g. 'to provide electricity to all rural households').
Increasing block tariff (IBT)	An IBT structure has a different price per kWh for each tariff block, increasing with successive blocks. If a household consumes under a certain threshold per month, then its kWh price is less.

Lifeline tariff	A pricing structure for non-discrete energy sources that aims to make a basic quota of energy universally affordable. It can be: • IBT (blocks of energy use are charged at progressively higher cost) • VDT (the cost per unit of energy for all energy consumption is determined by total consumption; households consuming less energy pay less per unit than those consuming more).
Materiality	This captures how well the target population's essential energy needs are being met. Do recipients of support from the ESN consume enough electricity or clean fuel to meet their needs? What share of their total energy expenditure does the ESN provide? What share of total household expenditure is given to the purchase of electricity or clean fuel (including repayment of loans)?
Means testing	Means testing – using an income level criterion or an appropriate proxy – tends to increase the share of total support that is received by poor or vulnerable people, but inclusion and exclusion errors can occur if the classification of people (or households) is inaccurate or inefficient. Means testing can also entail significant administrative costs, including keeping registers up-to-date.
Number of beneficiaries	Can be direct/indirect, refer to households/individuals, and be ex ante (targets) or ex post (actual).
Poorest	Assumed in this report series to be the lowest two income quintiles (i.e., the lowest 40 percent)
Poverty line	The official level of income that is needed to achieve a basic living standard.
Quintile	Any of five equal groups into which a population can be divided according to the distribution of values of a particular variable (e.g., income).
Social assistance	Non-contributory cash (or near-cash) transfer to households that form an element of social protection. These can be categorical (e.g. to the elderly, disabled, children) or means-tested (targeted to the poor and vulnerable). These transfer programs are sometimes referred to as social safety nets.
Social protection	The set of contributory and non-contributory transfers (cash and in-kind) that provide support for income or consumption to meet lifetime contingencies, such as maternity, disability, retirement; or that respond to or prevent poverty and vulnerability.

Social safety net	Non-contributory interventions that are designed to help individuals and households cope with chronic poverty and vulnerability. Potential beneficiaries are not required to pay a premium (contribute) to access benefits. Social safety net/social assistance programs target the poor and vulnerable.
Spending	Program budget. May include administrative costs, but usually represents the aggregate of benefit(s) provided by the government.
Subsidy	A government regulation or financial contribution that alters the end-user price.
Targeting (active/passive)	A process that occurs during implementation of the ESN and involves the government actively or passively identifying households that fall within its target beneficiary group. Examples of passive targeting include threshold consumption rates, while active targeting is often via proxy means testing or using specific criteria. The targeting process may require several stages; households may be automatically enrolled or may have to apply for the benefit. Targeting can be implicit (available by default to anyone in a population group, e.g. those with existing connections), self-selected (based on household behavior), or administratively selected. Untargeted subsidies are available to everyone.
Unconditional cash transfer	This provides cash without particular co-responsibilities for beneficiaries; they may spend the cash as they wish.
Unconditional in-kind transfer	This allows the distribution of a resource without any form of conditionality or co-responsibility.
Volume differentiated tariff (VDT)	A VDT has the same price for each kWh consumed, the price depending on the level of total consumption, so a household that consumes 100 kWh will pay more per unit than one that consumes, say, 50 kWh.

ANNEX 1

ENERGY SAFETY NETS RESEARCH – SUMMARY OF FINDINGS

	What policy measures have been used to enable very poor and marginalized people to access and use modern energy services?	**How effective have these measures been in enabling the poorest social groups to access and use modern energy services?**	**What links have there been/are there between these measures and wider/other social assistance programs?**	**What changes could be made to enhance the effectiveness of existing policy measures in enabling very poor people to access modern energy services?**
Brazil	*Luz para Todos*: program to provide universal access to electricity – connections to electricity services provided free of charge; in operation since 2003; targets rural off-grid households and now gives priority to indigenous households	*Luz para Todos*: 3.4 million connections benefiting 16.4 million people (7% of population); has helped achieve universal access to electricity in rural areas; increased access correlated with increased economic activity by women	*Luz para Todos*: uses social group categories identified by Ministry of Environment	*Luz para Todos*: none, program due to end in 2022
	Tarifa Social: three subsidized tariff blocks for low-income households and marginalized social groups in VDT tariff structure; subsidy up to 220 kWh a month; household must be registered in *Cadastro Único* to qualify; marginalized social groups receive higher subsidy level	*Tarifa Social*: 9 million households on a subsidized tariff (11% of total)	*Tarifa Social*: household must be registered in *Cadastro Único* to qualify; recipients of Benefit for Elderly and Disabled also qualify	*Tarifa Social*: electricity consumption by some households on a subsidized tariff has fallen; needs further research
	Bolsa Família (Vale Gás): a unified social assistance program, made possible by the establishment of the *Cadastro Único*; incorporated *Vale Gás* benefit (R$7.50 a month)	*Bolsa Família (Vale Gás)*: *Bolsa Família* benefits 13.6 million people, about 25% of the population; 70% of the benefit is received by the poorest 20% of the population; but benefit value fails to keep up with the price of LPG	*Bolsa Família (Vale Gás)*: *Bolsa Família* is a social assistance program	*Bolsa Família (Vale Gás)*: fails to keep up with the price of LPG; government should increase the *Vale Gás* benefit within *Bolsa Família* or introduce an LPG-specific scheme (e.g. vouchers)

	What policy measures have been used to enable very poor and marginalized people to access and use modern energy services?	How effective have these measures been in enabling the poorest social groups to access and use modern energy services?	What links have there been/are there between these measures and wider/other social assistance programs?	What changes could be made to enhance the effectiveness of existing policy measures in enabling very poor people to access modern energy services?
Ghana	*Self-Help Electrification Program*: provision of electricity access to communities more than 20 km from grid; started in 1993; not targeted at any socioeconomic group	*Self-Help Electrification Program*: 3,515 communities connected by 2011; has helped increase rural electrification rate	*Self-Help Electrification Program*: none	*Self-Help Electrification Program*: integrate pro-poor programs to target specific communities
	Lifeline electricity tariffs: introduced in 1998; consumption subsidy but not targeted to poor; initially VDT but IBT since 2018	*Lifeline electricity tariffs*: 45% of residential customers in the south and 33% in the north on lifeline tariff	*Lifeline electricity tariffs*: none	*Lifeline electricity tariffs*: introduce means testing to target; improve customer education
	LPG Program: distribution of free cylinders before 1998; subsidized LPG price (1998-2013); rural LPG promotion program distributing cylinders since 2013	*LPG Program*: c. 24% of households used LPG in 2014	*LPG Program*: none	*LPG Program*: increase in number of refilling stations; cylinder circulation business model to be introduced; establish targeted subsidy for the poor
	Improving Rural Energy Access through Solar Home Systems: scheme under the Ghana Energy and Access Project (GEDAP) providing solar PV systems to households; 50% to 60% subsidy, and loans for balance of system costs	*Improving Rural Energy Access through Solar Home Systems*: provided electricity access to 16,500 households (100,000 people); did not reduce the cost to consumers	*Improving Rural Energy Access through Solar Home Systems*: none	*Improving Rural Energy Access through Solar Home Systems*: Adopt approaches to target financial support to poor and vulnerable
	ICS programs: provision of clean stoves; various programs since 1980s	*ICS programs*: 300,000 to 500,000 stoves sold a year under programs	*ICS programs*: none	*ICS programs*: widen distribution beyond areas reached by schemes funded by carbon credits

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India	*Pratyash Hanstantrit Labh* (PaHaL): LPG prices subsidized since 1970s; Direct Benefit Transfer for LPG since 2013, transfers directly to account of recipient; max. 12 refills a year per household (170 kg); advance for first cylinder	*Pratyash Hanstantrit Labh* (PaHaL): 24% of rural households use clean fuel; subsidy not always received by households paying off PMUY loans; 94% of households covered; LPG unaffordable for many PMUY recipients	*Pratyash Hanstantrit Labh* (PaHaL): Linked to Aadhaar (unique identity) number; linked to wider DBT system	*Pratyash Hanstantrit Labh* (PaHaL): targeting and rationalization to concentrate the subsidy on the poorest households; higher subsidy level for poorest
	Pradhan Mantri Ujjwala Yojana (PMUY): subsidy for half the cost of an LPG connection for households below the poverty line and an interest-free loan for the other half; expanded to include marginalized socioeconomic groups; subsidy is paid to women	*Pradhan Mantri Ujjwala Yojana* (PMUY): 80 million families have received a subsidized connection; provided 80% of connections in 2018/19; increased usage of LPG amongst SC/T	*Pradhan Mantri Ujjwala Yojana* (PMUY): targeting based on out-of-date (2011) BPL data; expanded to include beneficiaries of other schemes; links to improving financial inclusion of women	*Pradhan Mantri Ujjwala Yojana* (PMUY): integrate targeting with other social safety nets; unified database
	'Give it Up' Campaign: (since 2016) to urge wealthy households to voluntarily forfeit their subsidy with the value being used to provide a connection to a poor household	*'Give it Up' Campaign*: 10.4 million households have given up the LPG subsidy; 90% of India's non-poor population continue to receive it	*'Give it Up' Campaign*: none	*'Give it Up' Campaign*: none
	Unified Guidelines for Selection of LPG distributorships: to improve availability of LPG in remote and rural areas and create employment opportunities; rural suppliers required to make home deliveries	*Unified Guidelines for Selection of LPG distributorships*: number of distributors increased and serve 6,400 new locations	*Unified Guidelines for Selection of LPG distributorships*: now linked to Common Service Centers – access points for public services and social welfare schemes in rural and remote areas	*Unified Guidelines for Selection of LPG distributorships*: none

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Indonesia	*Fuel subsidies:* reformed in 2005	*Fuel subsidies:* untargeted	*Fuel subsidies:* four social assistance schemes to compensate for fuel subsidy reformed in 2005 (an unconditional cash transfer, support for schools, health care and infrastructure)	*Fuel subsidies: none*
	Electricity tariffs: lower tariffs for lower power connections (<900 VA are considered poor); IBT and minimum monthly charge; reform initiated in 2013 to target poor households	*Electricity tariffs:* 1.6 million of 25.7 million eligible households are without access; some beneficiaries of subsidized tariffs were not poor (8 million households with 450 VA connections; 18 million with 900 VA); access in terms of connections improved, but poor consume less	*Electricity tariffs:* BDT database used since 2017 to identify poor	*Electricity tariffs:* to benefit currently excluded households, provide connections (e.g. to people on remote islands) and update BDT database; include energy in social protection programs
	Kerosene-to-LPG conversion: begun in 2007 to reduce fiscal burden; starter packs (3 kg cylinder, stove and fittings) distributed to households and micro-businesses; subsidized LPG price; reform begun in 2018 to target subsidy and provide fixed monthly amount	*Kerosene-to-LPG conversion:* 56 million starter packs distributed by 2014; 65% of beneficiaries from richest half of population; value of subsidy to poorest is lower because their consumption lower; c.15 million non-poor households receive LPG subsidy; 27.5 million eligible	*Kerosene-to-LPG conversion:* reform begun to use BDT database to target LPG subsidy; LPG subsidy to be integrated with Non-Cash Food Assistance program (*Bantuan Pangan Non-Tunai*);	*Kerosene-to-LPG conversion:* to benefit currently excluded households, improve LPG distribution network; educate beneficiaries; include energy in social protection programs

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Kenya	*Slum Electrification Project*: residential connections to grid for urban informal sector households at highly subsidized charge ($15); project has since ended	*Slum Electrification Project*: by 2017, 178,000 connected under donor-funded project; over 1 million connections in total (60% had illegal connections before); high share of non-vending meters	*Slum Electrification Project*: none	*Slum Electrification Project*: none
	Last Mile Connectivity Project: residential connections to grid electricity at a subsidized charge ($150) paid in instalments (loan available)	*Last Mile Connectivity Project*: 225,000 connected by 2018; helped achieve 70% electrification rate	*Last Mile Connectivity Project*: none	*Last Mile Connectivity Project*: none
	Lifeline tariff: IBT tariff structure before 2018, now VDT; subsidized tariff for up to 100 kWh a month	*Lifeline tariff*: received by 90% of residential consumers	*Lifeline tariff*: none	*Lifeline tariff*: lower the threshold to better target the benefit
	Kenya Off-grid Solar Access Project: off-grid access to electricity in 16 counties	*Kenya Off-grid Solar Access* Project started in 2018 – too early to know	*Kenya Off-grid Solar Access Project*: counties consistent with national safety net policy	*Kenya Off-grid Solar Access Project*: none
	Energy and Cash Plus Initiative: conditional cash transfers for purchase of household solar systems in Garissa and Kilifi; non-government project	*Energy and Cash Plus Initiative*: too early to know – project is in initial phase	*Energy and Cash Plus Initiative*: integrated with National Safety Nets Program; using social assistance programs to provide cash transfers	*Energy and Cash Plus Initiative*: none
	Mwananchi Gas Project: subsidized connections for LPG (6 kg cylinders); aimed at rural households; project suspended	*Mwananchi Gas Project*: only a pilot has been implemented	*Mwananchi Gas Project*: none	*Mwananchi Gas Project*: project suspended; national clean cooking program needed

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Mexico	*Differentiated electricity tariffs*: includes 8 VDT, IBT and regionally differentiated tariffs; with seasonal variation; lifeline block is up to 75 kWh a month	*Differentiated electricity tariffs*: tariff system benefits 40 million households, poor and non-poor	*Differentiated electricity tariffs*: none	*Differentiated electricity tariffs*: target tariff subsidies at poor households
	Oportunidades Energéticas: implemented between 2007 and 2011; cash transfer to help pay energy costs of households on the social register; covered 21%-25% of household energy costs	*Oportunidades Energéticas*: supported 5.8 million households by 2011 (c. 90% of households registered for *Oportunidades*)	*Oportunidades Energéticas*: part of the wider social assistance (cash transfer) program *Oportunidades*	*Oportunidades Energéticas*: scheme abandoned in 2011 when *Oportunidades* was reformed
	Subsidized LPG price: general LPG price subsidy between 2003 and 2012; 2017-2018 discounted LPG sold through 12 *Diconsa* stores	*Subsidized LPG price*: in 2017/18, 13,000 stoves and cylinders distributed; subsidized c. 9% of cost of a cylinder of LPG	*Subsidized LPG price*: implemented through government discount stores located in low income communities	*Subsidized LPG price*: scheme abandoned
	Fondo de Servicio Universal Eléctrico (FSUE): established in 2016 to support decentralized electricity to remote communities without electricity	*Fondo de Servicio Universal Eléctrico* (FSUE): no information available	*Fondo de Servicio Universal Eléctrico* (FSUE): none	*Fondo de Servicio Universal Eléctrico* (FSUE): reactivate program and widen scope to support access to clean cooking

ANNEX 2

KEY INDICATORS

Brazil

	Year	Total	Urban	Rural
Population	2018	209,469,000	180,772,000	28,697,000
Population (%)	2018	100%	86.3%	13.7%
Average household size	2018	3.3		
Gross National Income ($ million)	2018	1,840,199		
GNI per capita $	2018	9,140		
GNI per capita $ PPP	2018	15,820		
Population below $1.90 PPP per day (%)	2017	3.4%		
Population below $3.20 PPP per day (%)	2017	4.0%		
Access to electricity (% of population)	2017	100%	100%	100%
Access to clean fuels and technologies (% of population	2017	95.6%		
Per capita electricity consumption (kWh)	2014	2,620		

	Year	Total	Poorest quintile	2nd quintile
Social assistance coverage (% of population)	2015	23.7%	58.5%	33.6%
Public spending on social assistance as % GDP	2015	1.4%		
Social assistance coverage of population <$1.90 PPP per day	2015	76.4%		
Social assistance average per capita transfer ($ PPP per day)	2015	1.30	0.80	1.20
Social safety net share of total household welfare (%)	2017	15%		

Ghana

	Year	Total	Urban	Rural
Population	2018	29,767,000	16,491,000	13,276,000
Population (%)	2018	100%	55.4%	44.6%
Average household size	2018	3.5		
Gross National Income ($ million)	2018	64,270		
GNI per capita $	2018	2,130		
GNI per capita $ PPP	2018	4,650		
Population below the national poverty line (%)	2017	23.4%		
Population below $1.90 PPP per day (%)	2017	13.3%		
Population below $3.10 PPP per day (%)	2017	30.5%		
Access to electricity (% of population)	2017	79.0%	90.0%	65.3%
Access to clean fuels and technologies (% of population	2017	21.7%		
Per capita electricity consumption (kWh)	2014	351		

	Year	Total	Poorest quintile	2nd quintile
Social assistance coverage (% of population)	2012	1.4%	1.3%	1.2%
Public spending social assistance as % GDP		0.6%		
Social assistance coverage of population <$1.90 PPP per day	2012	1.3%		
Social assistance average per capita transfer ($ PPP per day)		n/a	n/a	n/a
Social safety net share of total household welfare (%)	2005	1%		

India

	Year	Total	Urban	Rural
Population	2018	1,352,532,000	454,451,000	898,081,000
Population (%)	2018	100%	33.6%	66.4%
Average household size	2018	4.6		
Gross National Income ($ million)	2018	2,698,618		
GNI per capita $	2018	2,020		
GNI per capita $ PPP	2018	7,680		
Population below the national poverty line (%)	2017	26.9%		
Population below $1.90 PPP per day (%)	2017	21.2%		
Population below $3.10 PPP per day (%)	2017	60.4%		
Access to electricity (% of population)	2017	92.6%	99.2%	89.3%
Access to clean fuels and technologies (% of population	2017	41.0%		
Per capita electricity consumption (kWh)	2014	805		

	Year	Total	Poorest quintile	2nd quintile
Social assistance coverage (% of population)	2011	93.2%	95.6%	94.1%
Public spending on social assistance as % GDP	2016	1.5%		
Social assistance coverage of population <$1.90 PPP per day	2011	95.6%		
Social assistance average per capita transfer ($ PPP per day)	2011	0.10	0.10	0.10
Social safety net share of total household welfare (%)	2011	5%		

Indonesia

	Year	Total	Urban	Rural
Population	2018	267,671,000	146,437,000	121,234,000
Population (%)	2018	100%	54.7%	45.3%
Average household size	2018	4.0		
Gross National Income ($ million)	2018	1,009,863		
GNI per capita $	2018	3,840		
GNI per capita $ PPP	2018	12,650		
Population below the national poverty line (%)	2017	10.6%		
Population below $1.90 PPP per day (%)	2017	5.7%		
Population below $3.20 PPP per day (%)	2017	27.3%		
Access to electricity (% of population)	2017	98.1%	100%	95.7%
Access to clean fuels and technologies (% of population	2017	58.4%		
Per capita electricity consumption (kWh)	2014	164		

	Year	Total	Poorest quintile	2nd quintile
Social assistance coverage (% of population)	2015	48.7%	75.6%	65.9%
Public spending on social assistance as % GDP		0.8%		
Social assistance coverage of population <$1.90 PPP per day	2015	79.1%		
Social assistance average per capita transfer ($ PPP per day)	2015	0.30	0.30	0.30
Social safety net share of total household welfare (%)	2017	16%		

Kenya

	Year	Total	Urban	Rural
Population	2018	51,393,000	13,671,000	37,722,000
Population (%)	2018	100%	26.6%	73.4%
Average household size	2018	3.6		
Gross National Income ($ million)	2018	87,180		
GNI per capita $	2018	1,620		
GNI per capita $ PPP	2018	3,430		
Population below the national poverty line (%)	2015	36.1%		
Population below $1.90 PPP per day (%)	2015	36.8%		
Population below $3.10 PPP per day (%)	2015	66.2%		
Access to electricity (% of population)	2017	63.8%	81.1%	57.6%
Access to clean fuels and technologies (% of population	2017	13.4%		
Per capita electricity consumption (kWh)	2014	164		

	Year	Total	Poorest quintile	2nd quintile
Social assistance coverage (% of population)	2015	26.4%	34.5%	27.9%
Public spending on social assistance as % GDP	2016	0.4%		
Social assistance coverage of population <$1.90 PPP per day	2015	32.0%		
Social assistance average per capita transfer ($ PPP per day)	2015	0.0	0.0	0.0
Social safety net share of total household welfare (%)	2017	6%		

Mexico

	Year	Total	Urban	Rural
Population	2018	126,191,000	100,827,000	25,364,000
Population (%)	2018	100%	79.9%	20.1%
Average household size	2018	3.7		
Gross National Income ($ million)	2018	1,191,532		
GNI per capita $	2018	9,180		
GNI per capita $ PPP	2018	19,440		
Population below the national poverty line (%)	2016	43.6%		
Population below $1.90 PPP per day (%)	2016	2.5%		
Population below $3.10 PPP per day (%)	2016	11.2%		
Access to electricity (% of population)	2017	100%	100%	100%
Access to clean fuels and technologies (% of population	2017	85.4%		
Per capita electricity consumption (kWh)	2014	2,157		

	Year	Total	Poorest quintile	2nd quintile
Social assistance coverage (% of population)	2015	32.5%	53.8%	39.3%
Public spending on social assistance as % GDP	2015	1.7%		
Social assistance coverage of population <$1.90 PPP per day	2015	58.5%		
Social assistance average per capita transfer ($ PPP per day)	2015	0.70	0.60	0.70
Social safety net share of total household welfare (%)	2017	14%		

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