Gender and Fossil Fuel Subsidy Reform

An audit of data on energy subsidies, energy use and gender in Indonesia

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Acknowledgements

Executive Summary

The Government of Indonesia is considering reform of its consumer subsidies for liquefied petroleum gas (LPG) due to its rising fiscal cost: IDR 25 trillion (USD 1.9 billion) in 2016: around half of its total energy subsidy expenditure. Subsidized 3-kg LPG cylinders are currently available to all citizens. Reforms are likely to target the subsidy to the poor or replace it with cash transfers through the social assistance system.

The impact of energy subsidy reform on the poor has been widely studied. Most subsidy benefits tend to be captured by the wealthy that have the most purchasing power. But poor households are most vulnerable because they can least afford higher energy prices. Gender differentiated impacts are, however, poorly understood. In the case of LPG, a household fuel used for cooking, women are likely to be more affected than men because they do most of the cooking and household management.

This study provides an initial investigation into LPG subsidy reform and gender in Indonesia by examining the available data on household use of energy and relevant gender issues. The focus is on the poor and near-poor, which comprise the bottom 35 per cent of the population by income. Information is derived from five national household surveys and a review of relevant literature. The study is part of a broader project on energy and gender supported by the International Network on Gender and Sustainable Energy (ENERGIA) and the U.K. Department for International Development, which includes an international literature review and scoping studies in Bangladesh, India and Nigeria.

This data audit aims to do two things. First, it gathers general data on the status of women in Indonesia. This demonstrates the degree of gender equity and whether women face disadvantages. Second, the report examines energy use, particularly by poor women, to establish whether women are more likely to be affected by subsidy reform. The audit aims to establish a baseline and to identify data gaps. A later phase of work may seek to address some of these data gaps and identify policy implications and solutions.

How Well Are Existing Subsidies Reaching the Poor?

The data collected in this report make a compelling case that the current subsidy regime is not meeting the needs the majority of poor and near-poor women in Indonesia. On a national average, subsidized LPG is the most widely used cooking fuel. But there are major differences when income level and geographical location are taken into account. LPG is most used by non-poor households in urban areas. Almost two-thirds of poor household use LPG in Java, the most populous and urbanized island, while almost zero used it in Maluku and Papua. Thus many poor households are not accessing the subsidy.

Consumption of subsidized LPG increases with income level. Analysis of the distribution of LPG subsidies reveals that only 12 per cent of the benefits of the LPG subsidy flow to the bottom income quintile and 30 per cent to bottom two quintiles (the poor and non-poor). The remaining 70 per cent of LPG subsidy spending benefits the non-poor. The wealthiest households consume the most 3-kg LPG cylinders per household, more than double that of poor or near-poor households.
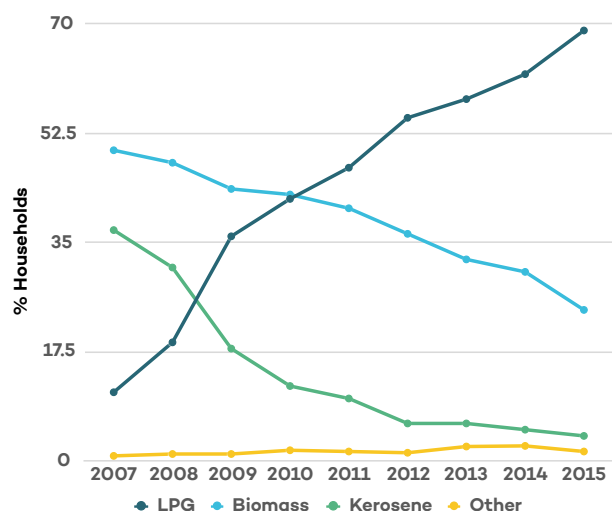
Table ES1. **Primary fuel used for cooking**
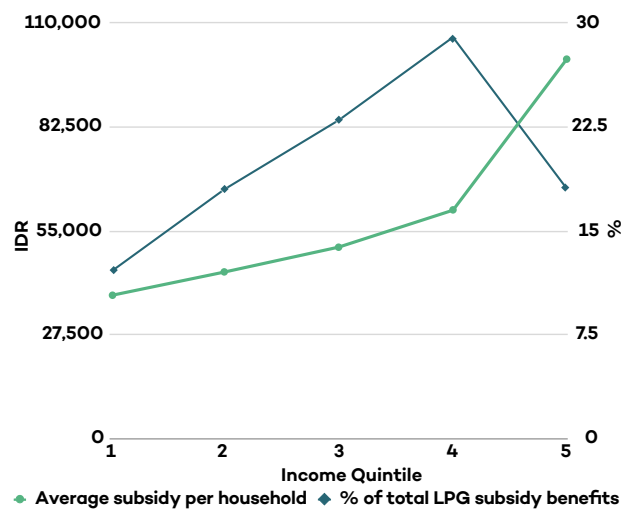
Table ES2. **Distribution of LPG subsidy**

LPG distribution is patchy and unreliable. Very few consumers obtain subsidized LPG from authorized distributors at the official price. Usually several sub-agents are involved in distribution, adding to the price (see figure below). Most consumers purchase LPG from small retailers at unofficial prices up to 200 per cent higher than the agent price. Most consumers said that LPG is only available some of the time. Therefore most poor women that access subsidized LPG pay inflated prices.
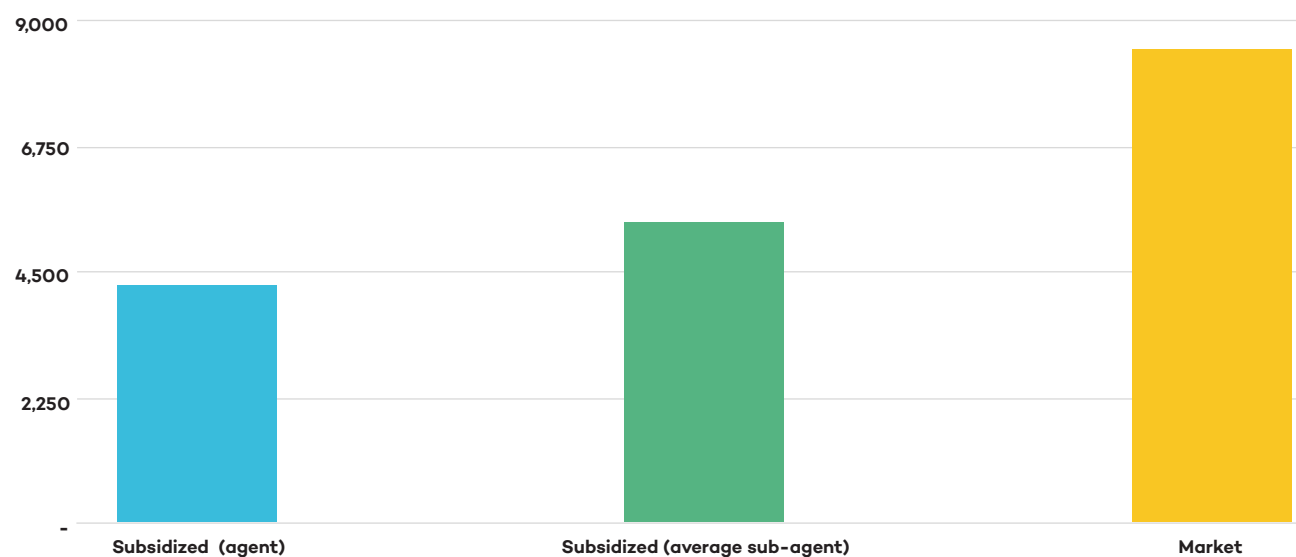
Table ES3. **Subsidized LPG price per kilogram (IDR), 2016**

Note: Retail prices were not available as they are unofficial and vary dramatically.

Alternative cooking fuels are kerosene, biomass and electricity. These are used in varying proportions as the main cooking fuels. Many households use a mix of cooking fuels depending on their price, availability and what is being cooked. Kerosene and wood are the most common alternatives for cooking. Electricity is widely available but rarely used as the main source of energy for cooking. Between 56 per cent and 90 per cent of poor households (depending on the province) rely on biomass as their main source of cooking fuel. Most rural households use biomass.

How Does the Income Shock of LPG Price Changes Affect Women?

Subsidized LPG is an important energy source for the 50 per cent of poor and near-poor households that use it. Women in these households are more vulnerable than their male counterparts to the impact of any price increases in LPG. Poor women may be affected economically by: 1) rising LPG prices eroding household budgets, 2) reducing scope for leisure or economic activity due to greater time spent cooking or collecting fuel, or 3) increased input costs to small businesses.

No quantitative studies were found that examine the impact of higher LPG prices on women in Indonesia. However, several studies examine the impact of energy subsidy reform on poor Indonesian households. Economic modelling suggests that price increases of LPG could have a considerable effect on the poverty rate particularly in rural areas. Modelling also predicts that unless savings from energy subsidy reform were redistributed to poor households, the poorest 40 per cent of the population would experience declines in income, employment and consumption.

How these sorts of household-level impacts are distributed across the women and men living within households depends upon the level of intra-household inequality, which may vary considerably across different regions and household structures. Data shows that women tend to be at a disadvantage in decision making about spending on energy sources and appliances. Survey data indicate that most poor and near-poor women are responsible for minor household finances. Major purchases are jointly decided between husband and wife in two thirds of households. But over 20 per cent of men say women have no say in expenditures. Beyond a certain financial threshold, men tend to have the dominant decision-making power. One study found that many men do not value expenditure on modern fuels or cooking appliances because they do not cook or spend extended periods exposed to indoor air pollution.

Survey data indicate that Indonesian women are economically more vulnerable than men, as they experience lower employment rates, earn lower incomes (around 60 per cent that of men) and have fewer working hours. Poor women in rural areas had the lowest rates of employment, income and working hours. Women—and poor women in particular—are also more likely to be unschooled and have lower exposure to media.

What About Energy Access and its Importance for Women?

Several studies indicate that the demand for LPG is elastic: households will switch cooking fuel in response to price signals, often to traditional biomass fuels. Rural households were observed to be more elastic in responding to LPG price changes due to low purchasing power and the availability of biomass for substitution. These changes may have a number of implications for women, including:

- **Time use:** No data was found on the impact on women's time of switching from modern to traditional fuels. But research suggests that switching from traditional to modern fuels saves women time. One study found that switching from kerosene to LPG saves women 8–15 minutes per day. Another observed that switching to biogas and electricity saves time and, in the case of electricity, increased opportunities for income generation for the poor. Presumably, the converse is true if households switch back to biomass.

- **Health:** If households switch to biomass or kerosene as a result of higher prices, women may experience health as well as economic impacts due to an increase in indoor air pollution. Survey data revealed that women are solely responsible for cooking, spending around three hours per day cooking. Time spent cooking by men is negligible. Most cooking is done indoors, often with poor ventilation. Indoor air pollution results in 45,000 premature deaths in Indonesia annually. Women and children are much more likely to report cough symptoms if they live in a household that primarily uses firewood for cooking. Indonesian households that use firewood have a significantly lower lung capacity than those that cook with cleaner fuels. Some studies also found higher incidence of asthma and tuberculosis with biomass stoves, but this is not supported by the survey data reviewed in this project.

What Does This Mean for LPG Subsidy Policy?

This data audit demonstrates a strong case for the consideration of women in the design of LPG subsidy policy. This may have practical relevance in the following areas:

- If LPG prices increase, income and energy access impacts may be clustered on women. This suggests that any mitigation measures used to target LPG subsidies to low-income consumers or to provide non-energy forms of compensation may want to target women as principal beneficiaries.

- Many women and men in low-income households do not receive any benefit from the current subsidy program. Those purchasing subsidized LPG are paying much more than the official price. This indicates a need to reform the current distribution and pricing system. If LPG subsidy reforms result in savings, a share of these savings should be dedicated to extending the reach and fairness of LPG distribution.

- If LPG prices increase, households need to be educated about the impact of switching to lower-quality energy sources. Both men and women need to be targeted in communication materials, as men often play a dominant role in financial decisions.

In considering the impact of LPG subsidy reform on women, further data would be useful in the areas of:

- Household likeliness to switch fuels if prices increase (including if cash transfers replace the LPG subsidy)

- The impact of switching from LPG to biomass fuels on household time usage

- Why electricity is not used more widely for cooking

- The impact of rising LPG prices on small businesses run by women

- Awareness by men and women of indoor air pollution as a health issue

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1.0 INTRODUCTION

Reforming liquefied petroleum gas (LPG) subsidies requires careful consideration because it is the dominant source of cooking fuel for many low-income households. "Low-income households" is defined by this study as households that are "poor" and "near-poor." In Indonesia, those below the poverty line comprise 11 per cent of the population and those at 1.2 times the poverty line ("near-poor") make up 24 per cent of the population.[1]

Reduction of the subsidy would cause hardship for poor households that rely on LPG and potentially result in a shift to traditional biomass or kerosene, which are known to cause greater indoor air pollution than LPG and therefore have negative health impacts. The time taken collecting firewood can have an opportunity cost for other activities such as paid work or education. As women tend to be the primary homemakers, there are potentially greater impacts on women than on men. Yet gender is rarely taken into account when designing subsidy policies or their reform, despite the Government of Indonesia's (GoI) strong and explicit legal and policy frameworks for the inclusion of gender in policy-making.

In poor households that do not rely on LPG, subsidy elimination would have little impact. On the other hand, the low use of LPG in certain areas demonstrates a policy failure of the current LPG subsidy program, with women again potentially the greatest affected, because of their traditional role as primary homemakers. A better-designed and targeted subsidy program with improved distribution channels could improve energy choices and standards of living, particularly for women, given their greater household responsibilities.

The scoping phase of this research project found there is a poor body of evidence exploring the impacts on women of subsidies for cooking fuels, and the possible subsidy reforms that have been made or could be made. In part, this is because there is a complex chain of causation leading from the creation of a subsidy through to its impacts on women's lives (see Kitson et al., 2016). Figure 1 provides a summary of these relationships as relevant to this data audit and outlines the framework for the report.

The first step is to gather contextual data on subsidy policies, energy use and gender relations. Information regarding the subsidy policy is needed to understand the form of the subsidy and its intended operation, including aims and beneficiaries. Data on the status of women is used to assess the extent of gender equity and whether poor women face a disadvantage. It establishes a baseline regarding poor women's welfare, productivity and empowerment against which subsidy reform can be assessed.

Data on energy use and access demonstrates how subsidy policies affect fuel distribution, the extent to which subsidy expenditure flows through into lower retail prices and the extent to which lower prices influence fuel use. Finally, the study considers the extent to which fuel use affects the lives of women through a literature review of secondary sources. Data gaps are identified. A later phase of work may seek to address some of these data gaps and identify policy implications and solutions.

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[1] The methodology section provides definitions of "poor" and "near-poor" for key data sources.

Assess context   **Assess subsidy access**   **Assess change in fuel use**   **Possible impacts on poor women**

Form and nature of subsidy
Data needs: Policy settings and objectives Affordability

Energy use
Data needs: Baseline data on energy consumption

Gender relations
Data needs: Baseline data on welfare, productivity and empowerment

Fuel distribution
Data needs: subsidy's impact on fuel distribution

Price
Data needs: is the subsidized price passed through to retail price?

Awareness
Data needs: Survey to show whether poor women aware of subsidy

Yes

No

Access and switching: Poor women use more of the subsidized fuel
Data needs: consumption of subsidized fuel

Access and switching: Poor women use alternatives
Data needs: Consumption of alternative fuels

Subsidy works

Assess consequences for women

Subsidy does not work: review and reform

Welfare
Data needs: Health, leisure, drudgery

Productivity
Data needs: Employment, income

Empowerment
Data needs: decision-making, participation

Assess and address data gaps

Figure 1. Pathway of Causation from Fuel Subsidy Policy to Impacts on Women

Source: Authors, simplified from Kitson et al., 2016

1.1 Methods

Figure 1 provides the guiding framework for the data audit.

Data on energy use, the status of women and gender relations were collected from national household surveys, regional surveys and any specific studies. Taking each in turn, the subsidy policy is the theory behind the subsidy: how it is intended to work; were poor women target recipients? Information on the subsidy policy was collected from government sources and recent analysis.

The next step was to assess the reality—whether the subsidy is reaching poor women. This was done by assessing distribution, price and availability. Data were collected in these areas primarily from household surveys.

Regarding the status of women, the first stage was to establish whether women are generally disadvantaged. Thus data was collected in the areas of government policy, education, employment, income and empowerment (e.g. decision making, representation within government). This is important given the premise of the study that women are more vulnerable to energy subsidy reform. These data also provide a baseline so that the impact of any change in subsidy policy can be assessed against these measures. The impact of the subsidy can be tested by assessing whether the subsidy has influenced fuel choice by women. For this, data was collected on fuel consumption and stove use.

Energy use and gender impacts vary widely across regions and incomes. In all cases, differentiated data were collected—where available—by welfare level and region (rural/urban, main islands or provinces).

Very little quantitative data was available on how energy use affects welfare, productivity and empowerment of poor women in Indonesia. Therefore the impact of fuel use on women was approached as a literature review of domestic and international sources.

The study identifies data gaps that will be later addressed.

1.1.1 Primary Data Sources

Data were collected primarily from five national household data surveys:

1) National Socioeconomic Survey (SUSENAS) 2015[2]

2) Indonesian Family Life Survey (IFLS 5) 2014–15[3]

3) National Labor Force Survey (SAKERNAS) 2015[4]

4) Indonesia Demographic and Health Survey (IDHS) 2012[5]

5) Lembaga Servei Indonesia (LSI) Social Issues Survey 2014

SUSENAS is a nationally representative repeated cross-section household survey conducted by Statistics Indonesia (*Badan Pusat Statistik Indonesia*—BPS). SUSENAS provides data that are representative of the total population and every province. It employs the two-stage stratified sampling method started from sampling 7,500 out of 30,000 census blocks, followed by sampling 10 households in each census block by implicit stratification of the highest educational attainment of the household head. It resulted in a sample of 75,000 households in 2015. SUSENAS was first implemented in 1963. Up to 2010, SUSENAS data collection was conducted annually. In 2011, there was a change, and SUSENAS data collection was done quarterly. Starting in 2015, SUSENAS data collection was conducted in semi-annually in March and September. SUSENAS March 2015 is used as a data source for this report.

The **Indonesia Family Life Survey (IFLS)** is a longitudinal household survey conducted by RAND Corporation in collaboration with a range of Indonesian research institutions (Strauss, Sikoki, & Witoelar, 2016). IFLS covers a subset of the total population, but explores a rich variety of issues, some of which are not included in SUSENAS—such as gender, intra-household relations and decision making—and some with more details of employment and migration data compared to SUSENAS.

The first IFLS took place in 1993, with follow-up waves in 1997, 2000, 2007 and 2014. Even though it adopted the same sampling scheme as SUSENAS, the IFLS only represents 83 per cent of the Indonesian population, in order to be more cost-efficient. It covers 13 of Indonesia's 26 provinces, which are mostly located in the west and middle part of the country. IFLS also oversamples the urban areas and the small provinces. To be representative for the overall 13 provinces, the weights are designed to match with the SUSENAS sample proportions in those 13 provinces in each year. IFLS is urban-biased and excludes the east part of Indonesia in which people are more likely to be poor and have traditional lifestyles. In IFLS 1993, over 30,000 individuals from 7,224 households were sampled and re-contacted for the subsequent waves with a very high completion rate (around 90 per cent). In 2014, the total sample size grew to 50,000 individuals from 15,000 households as new household members have been added following marriage or migration (Strauss et al., 2016).

SAKERNAS was initiated in 1976 to cover national labour market characteristics of all working-age individuals within sampled households. The survey has generally been conducted since 1986, either on a quarterly or annual basis. Samples were selected using a two-stage methodology, with one phase stratifying sampling. 2015 SAKERNAS was implemented in all areas of the Republic of Indonesia with a total sample of 200,000 households, spread over 20,000 census blocks in all provinces in both urban and rural areas. Of the 20,000 census blocks, the 5,000 blocks were sampled for the annual SAKERNAS.

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[2] Published by Badan Pusat Statistik (BPS, 2016A), the survey will be referred to as SUSENAS, 2015 throughout this report.

[3] The survey was authored by Strauss, Sikoki, & Witoelar (2016), and will be referred to as IFLS 5, 2014–15 in this report.

[4] Published by BPS (2016b), the survey will be referred to as SAKERNAS, 2015 throughout this report.

[5] Published by BPS, National Population and Family Planning Board, Kementerian Kesehatan (Kemenkes—MOH) and ICF International (2013), the survey will be referred to as IDHS, 2012 in this report.

The **Indonesia Demographic and Health Survey (IDHS)** is conducted under the auspices of the Demographic and Health Survey program initiated in 1987. Since 2002/03, the survey has expanded to include a survey of currently married men aged 15–54 and never-married women and men aged 15–24, referred to as adolescents. The 2012 IDHS also included never-married women aged 15–49. In addition to women aged 15–49, the 2012 IDHS interviewed currently married men aged 15–54 and never-married men aged 15–24. The 2012 IDHS was implemented by BPS in collaboration with the National Population and Family Planning Board and the Ministry of Health.

The **Lembaga Survei Indonesia (LSI) Social Issues Survey** is a nationally representative survey designed to study people's perception of governance related to socioeconomic issues. LSI conducts the survey every year. The data used in this report is from the LSI Social Issues Survey 2014. The 2,899 samples were collected from all provinces, taking into account the spatial distribution of urban and rural populations. The majority of samples were collected from the island of Java, which reflects population distribution given that over half of Indonesia's population resides in Java. The LSI was used primarily to collect data on energy use. The categories of fuels in the questionnaire are gasoline, diesel, kerosene and LPG. Data on electricity was not collected in this survey.

Table 1. LSI Social Issues Survey, proportion of data collection by region (%)

Region	Data collection (%)
Java	58
Sumatera	21
Kalimantan	5.9
Bali and Nusa Tenggara	5.6
Sulawesi	7.2
Maluku and Papua	2.5

Source: LSI Social Issues Survey, 2014

The **Pilot Study Time Use Surveys** were conducted in 1999, 2004 and 2005 by the national statistical agency BPS. The 2004 and 2005 surveys are not available publicly but limited access to 2004 data is available in Gagliardone (2015). The time use surveys were originally part of a 100-village survey in 1998 and 1999 undertaken in the context of the Mother and Child Survival Development and Protection framework. The objective of the Time Use Survey was to find the time allocation of household members, representing children aged 0–11 months, 1–5 years and 6–21 years; women ages 15–49 years; and heads of household (BPS, 1999). Household head data disaggregated by gender was not available. BPS conducted two other time use surveys in 2004 and 2005. The 2004 Time Use Survey was conducted in five districts in DKI Jakarta, which covers 1,024 households (which are the subsample of the 2003 National Socio-Economic Survey). However, time use data was obtained from only 24 households that receive the IPTEKDA program[6] (Gagliardone, 2015). The 2005 survey included four provinces (West Sumatra, Bali, Central Java and North Sumatra).

A **literature review** was also undertaken of relevant academic studies, government and non-government reports and papers by intergovernmental organizations.

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[6]   An Indonesian initiative that implements development and empowerment programs for small and medium-sized enterprises.

1.1.2 Definition of Poverty

At the national level, Indonesia's poverty line is set at a monthly income of IDR 330,211 (USD 23.8) for March 2015 (BPS, 2016). In this report, those households living below this poverty line are defined as "poor." The definition of "near-poor" is those living at 1.2 times the poverty line. As SUSENAS is based on BPS data, this poverty line is directly applicable to SUSENAS data. Approximately 11 per cent of households captured in SUSENAS are "poor" while the "near-poor" captures the next poorest 24 per cent of households.

Adjustments were required to apply the BPS poverty line to the IFLS. Poverty lines were calculated following the method used by Strauss et al. (2004). The food component is based on the single national food poverty basket, but the non-food component is computed using the Engel curve method.[7] The poverty line is then inflated based on a reweighted consumer price index to have 80 per cent food share, rather than 55 per cent as in BPS poverty line. The poverty rate is significantly different between SUSENAS 2015 and IFLS 5 2014–15. While the poverty rate under SUSENAS 2015 is 11.22 per cent, it is only 2.43 per cent under IFLS 2014. Note again that similar data calculated from IFLS and SUSENAS may not always be directly comparable. Comparison of poverty lines at the urban and rural provincial levels show that IFLS poverty lines are lower than BPS poverty lines (IFLS poverty lines are 80 per cent of BPS poverty lines). In addition, IFLS is only representative of 83 per cent Indonesia's population and excludes eastern provinces of Indonesia where more poor people live. Consequently, the significant difference of poverty rates in datasets should be expected.

Adjusting the BPS poverty line for LSI was not possible and therefore a simpler approach was used. For the LSI, the poor refers to the bottom 10 per cent while the near-poor is between 10 per cent to 20 per cent.

Disaggregation of the SAKERNAS and IDHS samples into poor and non-poor was not possible because these datasets do not have consumption or expenditure variables, nor can they be merged with SUSENAS data (which has consumption or expenditure information, hence allowing for classification of poor). This report therefore does not analyze data from SAKERNAS and IDHS based on welfare groups, but only by location (urban and rural).

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[7] An Engel curve describes how household expenditure on a particular good or service varies as a function of household income (total expenditure) (Kumar et al., 2008). This method uses the Engel curve to arrive at a measure of non-food consumption deprivation.

2.0 ENERGY POLICY CONTEXT

The LPG subsidy program was launched in 2007 in an attempt to reduce the fiscal burden associated with the government's subsidy for kerosene (Presidential Decree No. 104/2007). In 2006, kerosene subsidies totalled USD 3.8 billion, equalling 57 per cent of Indonesia's total expenditure on fuel subsidies (PT Pertamina & World LP Gas Institute, 2013).

The Conversion Program from Kerosene to LPG (hereafter the "Zero Kero Program") promoted the use of LPG in Indonesian households by providing free starter kits (3-kg LPG tank, stove, regulator and hose) as well as subsidized LPG refills. Subsidized LPG is only available in 3-kg cylinders (which is the focus of this report). Non-subsidized LPG is available in 9-kg, 12-kg and 14-kg cylinders.[8]

LPG produces more heat per unit weight compared with kerosene. Based on end-use energy-equivalent calculations, one litre of kerosene equates to 0.57 kg of LPG (PT Pertamina & World LP Gas Institute, 2015). The government intended to reduce its subsidy burden by switching subsidies to a more efficient fuel. An additional benefit is that LPG burns cleaner than kerosene and improves the health of families affected by indoor pollution (PT Pertamina & World LP Gas Institute, 2015).

The Zero Kero Program was developed by the Ministry of Energy and Mineral Resources, Ministry of Industry, Ministry of Women's Empowerment, Ministry of Small and Medium Enterprises and PT Pertamina, a state-owned petroleum company (PT Pertamina & World LP Gas Institute, 2015). The Ministry of Women's Empowerment was primarily involved in promotion and public outreach for the policy (Rachmi, 2008).

The LPG subsidy burden has risen over time as uptake has increased and the geographic distribution of the conversion program has expanded. Universal application of the subsidy has also led to ballooning costs. The subsidy is regressive because anyone can buy 3-kg LPG cylinders, so a larger share of benefits tends to be captured by higher-income households that have more buying power. Major reductions in the budget for LPG have taken place recently: in 2014, as a result of the crash in world oil prices and in 2017, as a reflection of government ambitions for LPG subsidy reform.

Table 2. Cost of the LPG policy over the past 10 years (USD)

	2007	2008	2009	2010	2011	2012	2013[i]	2014[ii]	2015	2016	2017[iii]
IDR billion	0	3,891	7,903	14,852	22,593	32,849	30,982	48,975	25,872	25,197	22,000

Notes:

i) 2013 expenditure was lower than 2012 because part of the payment for 2013 LPG subsidy was carried to 2014 state budget.

ii) Above-trend expenditure in 2014 was the result of part of the 2013 payment being shifted into 2014 and a spike in the international price of LPG

iii) Budgeted expenditure only. Actual expenditure may be higher.

Source: Author calculations from various State Budgets

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[8] The 12-kg LPG is officially unsubsidized but the government requires Pertamina to sell it below cost, thus there is an unofficial subsidy. Given that this is not a quantified or "on-budget" subsidy, the 12-kg cylinders are not a focus of this report.
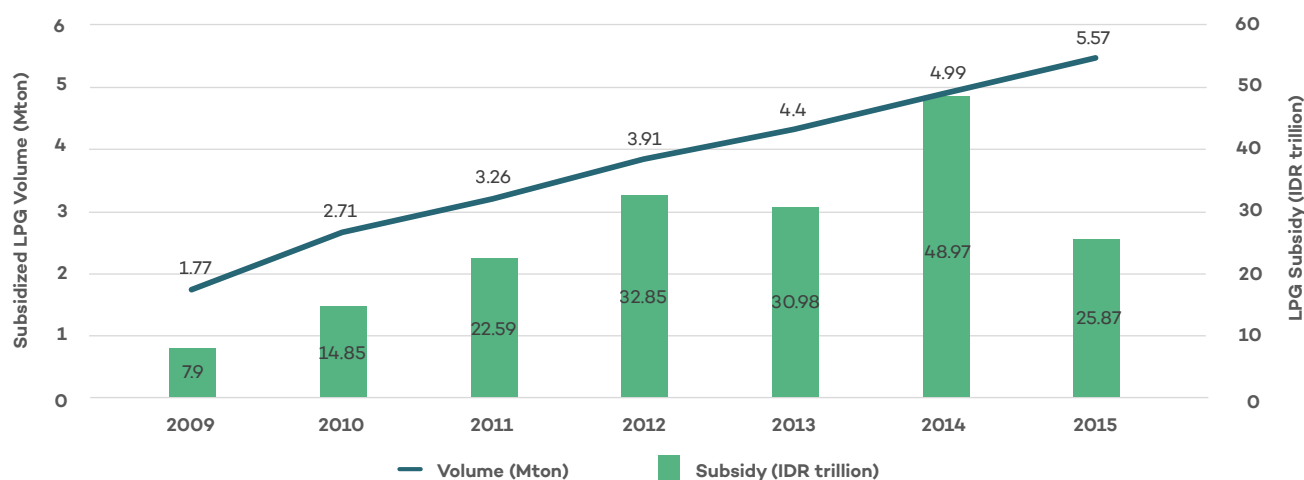
Figure 2. LPG 3-kg subsidy, 2009–2015

Source: Author calculations from various State Budgets; Ministry of Energy and Mineral Resources, 2016b

2.1 LPG Subsidy Reform

The Indonesian State Budget 2017 proposed a significant reduction in LPG subsidies (Haryanto, 2016). The exact way to implement this has yet to be determined. One option is to limit eligibility to those on Indonesia's unified poverty database (a registry of the poorest 40 per cent of households used to target many of the country's major social protection policies [TNP2K, n.d.]), small businesses, small fishers and farmers (Antara News, 2017). This plan would shrink the number of participants from 57 million households currently accessing the Zero Kero Program to 26 million poor households (based on the unified poverty database), 2.3 million small businesses, and an undetermined number of small fishers and farmers (Ministry of Energy and Mineral Resources, 2016c). Another option is to link the subsidy and social assistance programs though a unified family welfare card system linked to bank accounts (Cabinet Secretariat, 2017), following models such as the social protection card system (Ministry of State Owned Enterprises, 2017).

The government aimed initially to announce the LPG subsidy reform policy in January 2017. There are several issues that complicate the proposed LPG reform policy including:[9]

1. The lack of administrative and physical infrastructure to enforce the implementation of a national-scale banking system or smart-card system.

2. Data deficiencies, especially on small business, small fishers and small farmers: many of Indonesia's subsidized LPG customers are not registered.

3. Disproportionate spread between LPG distribution points and the location of targeted subsidy recipients.

4. The need to coordinate the policy with regional governments.

5. Modalities in merging subsidies and social assistance programs.

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[9]   Key issues are summarized from an unpublished report by IISD-GSI, which worked with branches of Indonesia's government offices and recorded the process of designing Indonesia's LPG subsidy reform policy from December 2016 to January 2017.

Although the LPG subsidy reform policy should be launched in 2017 in accordance with the mandate from the State Budget 2017, in April 2017, the Minister of Energy and Mineral Resources stated that launching the reform is revised to January 2018, or as late as March 2018 (Kompas, 2017).

2.2 Gender and Energy Policy

The Zero Kero Program does not have any explicit or implicit objectives related to gender, nor does the national energy policy. The LPG reform program is still under development and therefore it is too early to say whether gender will be a factor in the new targeting arrangements.

3.0 ENERGY USE CONTEXT

Final energy consumption by households in Indonesia accounts for 36 per cent of total energy use when biomass is taken into account (Figure 3). As a national average, households spend the largest amounts on diesel and gasoline, with subsidized 3-kg LPG cylinders representing the lowest expenditure item for modern energy (Table 3).
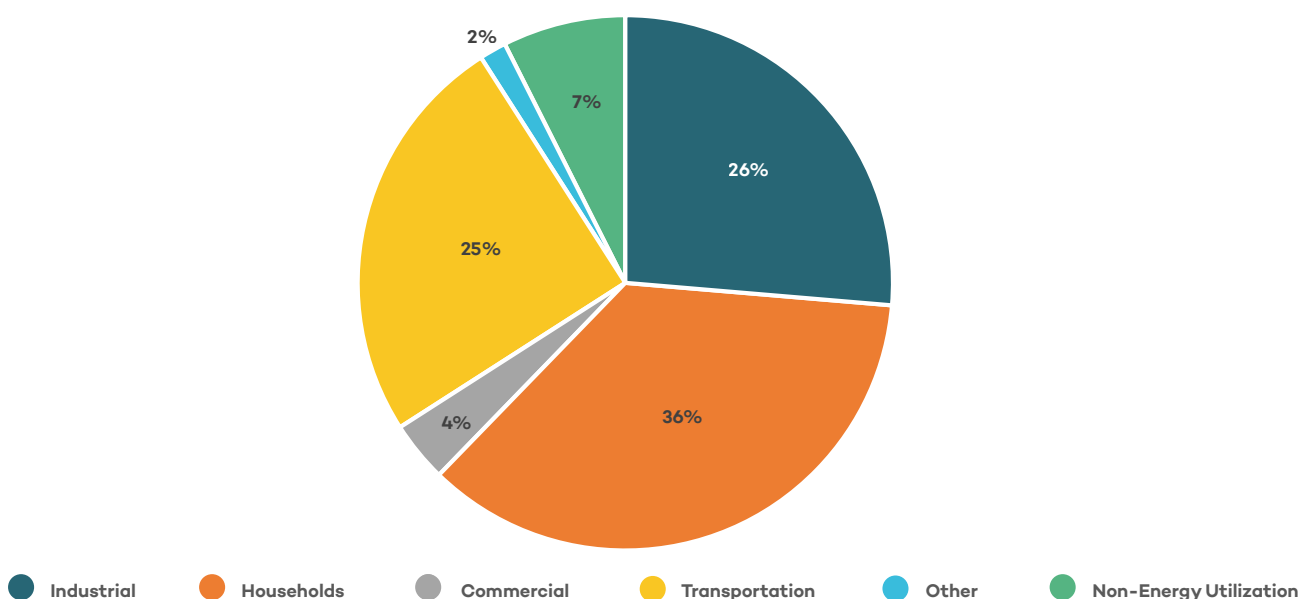
Figure 3. Final energy consumption by sector including biomass, 2015

Source: Indonesia Energy Outlook, 2016

Table 3. Monthly average fuel expenditure per household in 2014, by type of fuel (IDR)

Fuel	Average Expenditure	Price
Diesel Fuel	179,718	6,450
Gasoline		22,100
LPG 12 kg	115,335	100,000
Kerosene	26,566	2,500
LPG 3 kg	20,869	12,750

Note: Prices listed are official prices only. Households may in fact be paying higher prices than this by the time they get to market.
Source: Author calculations from various State Budgets

As a national average, LPG is the most commonly used cooking fuel (Table 4). The use of kerosene and wood has declined in recent years. Few households use electricity as the main energy source for cooking despite high rates of electricity access (84 per cent in 2016) (International Energy Agency, 2016).

Table 4. Main cooking fuel used by households (%), 2007–2015

	Electricity	LPG	Kerosene	Charcoal/ briquette	Wood	Other
2007	1.9	11	37	0.8	49	0.8
2015	0.6	69	4	0.2	24	1.5

Source: Indonesian Bureau of Statistics, 2017

National average data hide major differences between urban and rural households, welfare levels and provinces (see subsequent sections). In general, urban households were more likely to use modern fuels while rural households rely on traditional biomass (IDHS, 2012; Table 5). Data for individual provinces show that LPG as the primary cooking fuel varies from zero in Nusa Tenggara Timur to 92 per cent in Kalimantan Timur (Indonesian Bureau of Statistics, 2017) (see Appendix Table A1). The same sources show that kerosene as the primary cooking fuel varies from zero in seven provinces to 60 per cent in Papua Barat. Wood as the primary cooking fuel varies from zero in Jakarta to 78 per cent in Tenggara Timur.

Table 5. Type of cooking fuel used by households, urban and rural (%)

	Urban	Rural
Traditional	21	59
Modern	79	41

Note: Traditional fuels for cooking include fuel wood, charcoal, animal dung, agricultural residues.
Source: calculated from IDHS, 2012

Official survey data only show the primary source of cooking fuel by households. In reality, households use a range of fuels for different purposes. A 2013 survey in peri-urban Yogyakarta found that, while 75 per cent of households use LPG, only 9 per cent of them use LPG only (Figure 4) (Tuntivate, 2015). The majority use LPG in combination with biomass or a rice cooker/warmer or both. These data accord well with national data (Table 4) that show that 69 per cent of households use LPG as of 2015, which they cited as their primary source of cooking fuel. Only 24 per cent cite wood as their primary cooking fuel (25 per cent cite biomass or biomass and/or a rice cooker in the Yogyakarta survey).

In Yogyakarta, households that use only biomass are among the poorest, with monthly income estimated at IDR 1,454 million (still significantly higher than the poverty line of IDR 333,211 per month). The average household monthly income of LPG users was the highest at IDR 3,094 million. This figure was IDR 2,534 million for users of both biomass and LPG (Tuntivate, 2015).
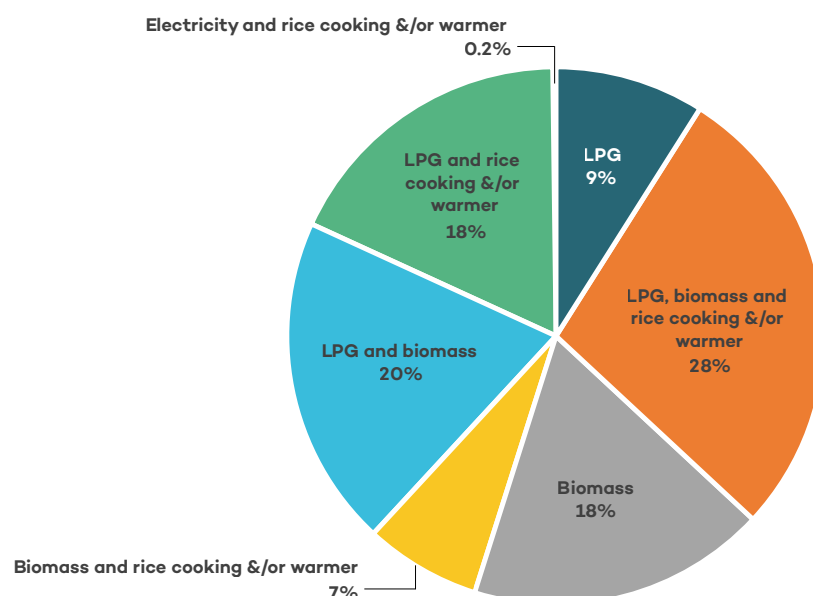
Figure 4. Type of cooking fuel used by households in peri-urban Yogjakarta

Source: Tuntivate, 2015

3.1 Subsidized LPG

On average, around 50 per cent of the poor use 3-kg LPG cylinders (see Table 6). As income increases, the percentage of households consuming subsidized LPG increases, with 78 per cent of non-poor buying subsidized LPG (LSI Social Issues Survey, 2014).

Table 6. Use of 3-kg LPG in Indonesia based on income group, 2014 (in %)

Income Group	Use LPG 3kg
Poor	50
Near-Poor	64
Poor & Near-Poor	51
Non-Poor	78
All	75

Notes:

1) The survey asked the type of fuels purchased without specifying the purpose of use.

2) May overestimate the proportion using LPG, as the LSI survey is urban-biased. For the LSI, the poor refers to the bottom 10 per cent while the near-poor is between 10 per cent and 20 per cent.

Source: LSI Social Issues Survey, 2014

LPG consumption also varies by province (Table 7). The largest consumers of LPG are non-poor households in Java, while very few households in Maluku and Papua consume LPG. The LSI and SUSENAS surveys provide similar results, with more of the non-poor purchasing LPG than the poor across all regions. Subsidized 3 kg LPG cylinders are preferred to the more expensive 12-kg cylinders by all households (Table 8). In a survey of peri-urban Yogyakarta, Tuntivate (2015) found that two thirds of households in the study area believed that LPG is the best cooking fuel but approximately 59 per cent consider LPG expensive.

Table 7. LPG use in 2014, by region and income (%)

Region	Income group									
	LSI[i]					SUSENAS[ii]				
	All	Poor	Near-Poor	Non-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Non-Poor	Poor & Near-Poor
Java	89	74	81	90	75	82	59	74	86	66
Sumatera	83	70	88	84	73	67	46	58	72	51
Kalimantan	70	75	100	70	80	62	46	51	64	49
Sulawesi	66	42	0	73	40	57	35	45	62	39
Bali and Nusa Tenggara	45	2	0	70	2	30	10	18	36	13
Maluku and Papua	0	0	0	0	0	0.9	0	0.1	1.3	0.0

Notes:
i) The question asked the type of fuels bought without specifying the purpose of use.
ii) LPG used as the main source of cooking energy
Sources: LSI Social Issues Survey, 2014; SUSENAS, 2015

Table 8. Preference of LPG cylinders by households, 2014 (in %)

Fuel Type	Yes	No
LPG 3-kg (subsidized)	75	25
LPG 12-kg	7	93

Source: LSI Social Issues Survey, 2014

According to LSI (2014), only 12 per cent of the benefits of the LPG subsidy flow to the bottom income quintile and 30 per cent to the bottom two quintiles (which include the poor and non-poor) (Table 9). The remaining 70 per cent of LPG subsidy spending benefits the non-poor. The wealthiest households consume the most 3-kg LPG cylinders per household, more than double that of the poor and near-poor households (Figure 5).

Table 9. Distribution of 3-kg LPG subsidy, 2015

Income quintile	Households using 3-kg LPG	% of total households	Average monthly expenditure on 3-kg LPG (IDR)	Average consumption in number of 3-kg cylinders[i]	Average subsidy per household (IDR)	% of total LPG subsidy benefits
1	6,914,541	11	32,021	2.5	37,792	12
2	8,899,932	14	37,332	2.9	44,061	18
3	10,133,570	15	42,932	3.4	50,670	23
4	10,576,994	16	51,229	4.0	60,462	29
5	3,945,672	6	85,326	6.7	100,705	18
Total using 3-kg LPG	40,470,708	62				
Total Households	65,592,720					

Note:
i) Calculated from expenditure by household assuming the official price per LPG cylinder of IDR 12,750. It was not possible to use SUSENAS data on consumption because this included all LPG not just subsidized.
Source: Calculated by authors from LSI (2014) data
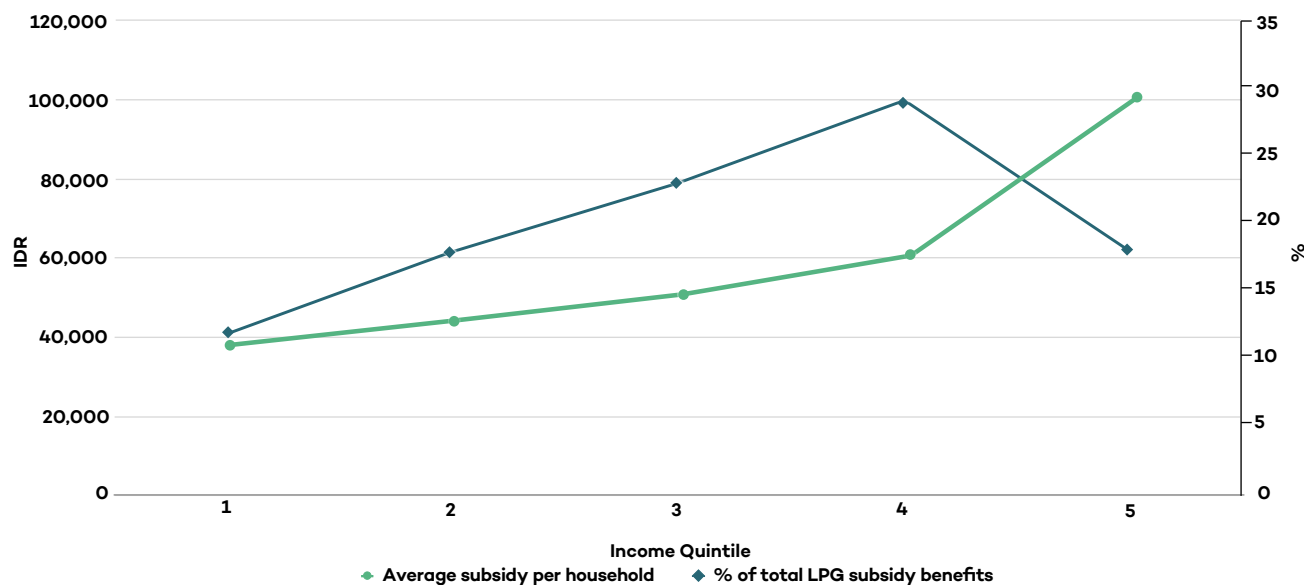
Figure 5. Distribution of the benefits of subsidies for 3-kg LPG

Source: calculated by authors from LSI (2014) data

3.2 Other Fuels for Cooking and Lighting

3.2.1 Electricity

The National Energy Council (Dewan Energi Nasional) estimates that the electrification rate for households was over 88 per cent in 2015 (Table 10). The International Energy Agency (2016) quotes a lower national average of 84 per cent (96 per cent urban and 71 per cent rural) for 2016. These figures mask major differences among regions and welfare levels. Rates of electrification vary from 46 per cent in West Papua to 100 per cent in Java in 2015. ESDM's Directorate General of Electricity PLN also publishes rural electrification rates by village that show that most villages have electricity installed, if not available to individual households (Table 11). The poor have the lowest access to electricity in any given province (SUSENAS, 2015) (Table 11).

Table 10. Electricity access by province, 2015 (%)

Province	Household	Village	Province	Household	Village
Aceh	95	100	West Nusa Tenggara	73	100
North Sumatera	93	99	East Nusa Tenggara	59	99
West Sumatera	83	100	West Kalimantan	82	99
Riau	89	100	Central Kalimantan	70	100
Riau Island	74	100	South Kalimantan	87	100
South Sumatera	80	100	East Kalimantan	95	100
Jambi	85	100	North Kalimantan	73	99
Bengkulu	87	99	North Sulawesi	89	100
Bangka Belitung	100	100	Central Sulawesi	80	100
Lampung	85	100	South Sulawesi	88	100
DKI Jakarta	100	100	South East Sulawesi	69	100
Banten	96	100	West Sulawesi	77	100
West Java	94	100	Gorontalo	79	100
Central Java	91	100	Maluku	85	90
Yogyakarta	86	100	North Maluku	94	100
East Java	87	100	West Papua	46	83
Bali	89	100	Papua	83	57
			INDONESIA	**88**	**97**

Source: Dewan Energi Nasional (DEN), 2015; Direktorat Jenderal Ketenagalistrikan, ESDM, 2016

Table 11. Household access to electricity by income group and region, 2014 (%)

	All	Poor	Near-Poor	Non-Poor	Poor & Near-Poor
Java	100	100	100	100	100
Sumatera	96	90	94	97	92
Sulawesi	94	87	91	96	89
Kalimantan	91	82	88	92	85
Bali and Nusa Tenggara	86	68	78	91	72
Maluku and Papua	66	43	54	76	46

Note: *The question asked whether households have access to electricity without specifying the purpose of use.*
Source: SUSENAS, 2015

Very few households use electricity as their main source of cooking energy (Table 12). But this does not mean that electricity does not play some role in cooking. Half of the households surveyed in a 2013 survey of peri-urban Yogyakarta used electric rice cookers or rice warmers (Tuntivate, 2015). The survey found that the use of rice cookers and warmers increased with income—from 22 per cent in the bottom income quintile to 52 per cent in the top quintile. Nearly half of surveyed households said that electricity is convenient for cooking but over two thirds thought it is expensive. The use of an electric rice cooker or warmer significantly reduced demand for biomass and LPG.

Table 12. Household use of electricity as the main cooking fuel by income group, 2014 (%)

	All	Poor	Near-Poor	Non-Poor	Poor & Near-Poor
Urban	0.7	0.8	0.0	0.7	0.7
Rural	0.3	0.2	2.0	0.3	0.4

Source: IFLS 5, 2014–15

3.2.2 Kerosene

The poor and non-poor use kerosene widely as a cooking and lighting fuel in all provinces except Java (SUSENAS, 2015) (Table 14). The national average indicates that only around 4 per cent of the population relies on kerosene as their primary cooking fuel (Table 4) but this hides the fact that large shares of poor households in some provinces rely on kerosene for cooking (Table 14). Wealthier households also use kerosene for cooking, often in a greater proportion than the poor and near-poor (SUSENAS, 2015).

Table 13. Kerosene purchased by households by region and income, 2014 (%)

	All	Poor	Near-Poor	Non-Poor	Poor & Near-Poor
Maluku and Papua	80	62	50	92	58
Bali and Nusa Tenggara	42	74	0	24	74
Sulawesi	35	52	100	29	54
Kalimantan	32	25	100	31	40
Sumatera	24	24	25	24	24
Java	2	2	0	2	2

Note: The survey asked the type of fuels bought without specifying the purpose of use.
Source: LSI Social Issues Survey, 2014

Table 14. Household use of kerosene as the main cooking fuel by income group and region, 2014 (%)

	All	Poor	Near-Poor	Non-Poor	Poor & Near-Poor
Maluku and Papua	67	48	58	74	52
Bali and Nusa Tenggara	42	44	44	41	44
Sulawesi	33	38	39	32	38
Kalimantan	31	29	33	31	31
Sumatera	21	23	22	20	22
Java	1.1	1.3	1.3	1.1	1.3

Note: The survey categorized the type of fuels used as main cooking fuels into LPG, kerosene, charcoal/coal/briquettes and wood/other.

Source: SUSENAS, 2015

3.2.3 Biomass

The proportion of the population using traditional biomass has fallen dramatically over the past decade. But over one third of households in Indonesia was still using fuel wood, charcoal, animal dung and agricultural residues as the main fuel for cooking in 2014 (International Energy Agency, 2016) (Table 15). Households may use multiple fuels depending on availability and price as well as the type of food being cooked. Rural households are far more likely to use biomass for cooking (Tuntivate, 2015) (Table 16).

Table 15. Use of biomass as main fuel for cooking in Indonesia

Year	Population using traditional biomass (million)	Percentage of population relying on traditional use of biomass[i] (%)
2004	156	72
2009	124	54
2011	103	42
2014	97	38

i) The International Energy Agency's database on the traditional use of biomass for cooking makes use of the World Health Organization's Global Health Observatory estimates of reliance on solid fuels (excluding coal). It focuses on the population where solid fuels are the primary fuel for cooking. Biomass for cooking includes fuel wood, charcoal, animal dung, agricultural residues.

Source: International Energy Agency, 2016

Table 16. Share of Yogyakarta households using biomass, urban and rural (in %)

Type of Biomass	Urban	Rural
Wood	15.5	58.9
Charcoal	0.2	0.6
Straw/shrubs/grass	0.0	0.1

Note: The data source does not specify whether wood is the primary source of cooking fuel

Source: Tuntivate, 2015

In a 2013 survey of peri-urban Yogyajarta, wood was the most commonly used biomass fuel (Tuntivate, 2015) (Table 16). Rates of fire wood use vary widely by region and income group. Wood is most commonly used by the poor in rural areas and in the regions of Maluku, Papua, Bali and Nusa Tenggara (Tables 17 and 18). The Tuntivate (2015) and SUSENAS (2015) present slightly different data on biomass consumption, but it is not possible to compare them because the geographical division is different. IFLS 5 (2014–15) survey data was incomplete given that not all provinces were included, therefore the data is not provided here. Charcoal is used very little as a cooking fuel (Tables 18 and 19).

Table 17. **Household use of wood as the main cooking fuel by income group and region, 2014 (%)**

	SUSENAS					IFLS 5				
	All	Poor	Near-Poor	Non-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Non-Poor	Poor & Near-Poor
Maluku and Papua	68	92	85	56	90	-	-	-	-	-
Bali and Nusa Tenggara	63	89	81	55	86	26	44	31	25	42
Sulawesi	55	81	72	50	77	16	21	33	15	24
Sumatera	37	61	51	31	56	22	43	33	21	41
Kalimantan	35	61	52	31	56	22	42	25	21	40
Java	31	63	48	25	56	17	34	25	16	33

Notes:
- = not available

SUSENAS categorized the types of fuels used as main cooking fuels into LPG, kerosene, charcoal/coal/briquettes and wood/other.
Source: SUSENAS, 2015; IFLS 5, 2014–15

Table 18. **Household use of charcoal as the main cooking fuel by income group, rural and urban, 2014 (%)**

	All	Poor	Near-Poor	Non-Poor	Poor & Near-Poor
Urban	0.1	0.1	0.0	0.1	0.1
Rural	0.2	0.6	0.0	0.1	0.6

Source: IFLS 5, 2014–15

Table 19. Household use of charcoal as the main cooking fuel by income group and region (main island), 2014 (%)

	SUSENAS					IFLS 5				
	All	Poor	Near-Poor	Non-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Non-Poor	Poor & Near-Poor
Sulawesi	2.8	2.6	4.0	2.7	3.2	1.2	5.9	0.0	1.0	4.3
Sumatera	0.8	0.9	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0
Bali and Nusa Tenggara	0.3	0.1	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0
Kalimantan	0.6	0.2	0.3	0.7	0.3	0.0	0.0	0.0	0.0	0.0
Java	0.2	0.3	0.4	0.2	0.3	0.1	0.0	0.0	0.1	0.0
Maluku and Papua	0.1	0.1	0.3	0.1	0.2	-	-	-	-	-

Notes: - = not available

SUSENAS categorized the types of fuels used as main cooking fuels into LPG, kerosene, charcoal/coal/briquettes and woods/other.

Source: SUSENAS, 2015; IFLS, 2014–15

3.2.4 Location of Cooking and Types of Cookstoves

The vast majority of households cook inside the house (Table 20). This is potentially a health risk for those using kerosene and biomass given the elevated risk of indoor air pollution compared with cleaner burning fuels such as LPG (Zhang et al., 2013). One study in peri-urban Yogyakarta found that in nearly one fifth of households, the kitchen or designated cooking area has no ventilation (Tuntivate, 2015).

Table 20. Location of cooking, 2012

	% of households		
	World Bank	IDHS	
Location of cooking		Urban	Rural
Inside the house	87	93	89
Separate building	8	4	8
Outdoors	4	3	3
Other	0	0.03	0.03

Source: Gender Statistics Database, 2012, calculated from IDHS, 2012 and World Bank 2017
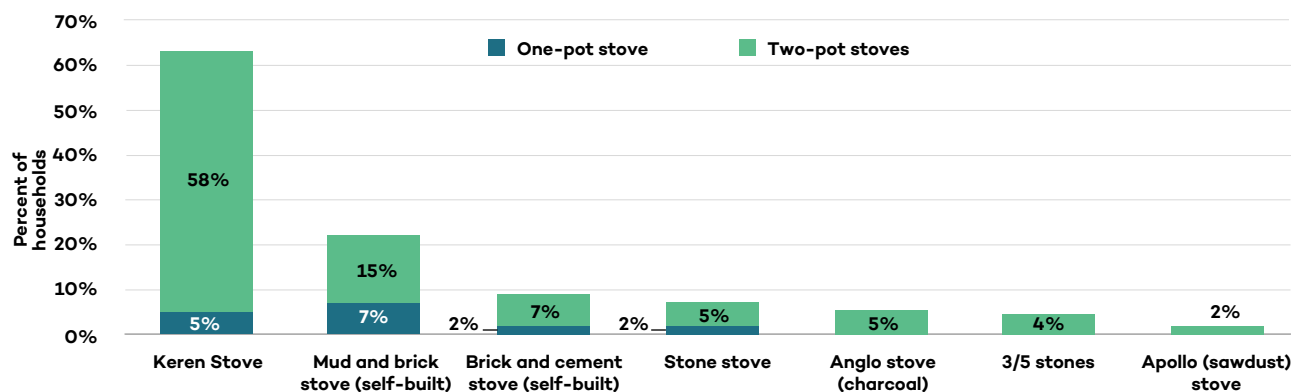
Figure 6. Types of cook stoves used among biomass users, Central Java (in %)

Source: Tuntivate, 2015

4.0 GENDER CONTEXT

Indonesia is a largely patriarchal society where traditional social norms and religious values prescribe different roles for women and men within the family and the government. In a patriarchal community, power relations between men and women are perhaps best illustrated by a popular saying in Indonesia: "A woman's domain is around the house; a man's domain extends to the limits of the sky" (Pelras, 1996).

In recent decades, development and social change have facilitated profound changes in women's work participation and in societal attitudes toward gender roles in marriage. This change is reflected in declining fertility rates, increasing age at first marriage and a narrowing gender gap in education (Cameron, Suarez, & Pye, 2015).

The GoI has shown a strong commitment to enhancing gender equality and women's empowerment, as demonstrated by the legal instruments and national laws and policies in place on this issue (Table 21). A foundational initiative by the GoI was to include women's issues in the Basic Guidelines of State Policy (GBHN) in 1978. This led to the establishment of the Office of the Minister of State for the Role of Women in the same year. The name and function was subsequently changed in 2009 to the Ministry of Women Empowerment and Child Protection (MoWECP).

The MoWECP is a coordinating agency to enhance the profile of gender issues in departments and ministries. Presidential Instruction No. 9/2000 on Gender Mainstreaming instructs ministries, state institutions (including the armed forces) and subnational governments to mainstream gender in all development processes. [10] Since 2003 the MoWECP has been tasked with monitoring and evaluating the implementation of the gender mainstreaming (Hermawati & Saari, 2011).

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[10] Mainstreaming involves ensuring that gender perspectives and attention to the goal of gender equality are central to all activities—
policy development, research, advocacy/dialogue, legislation, resource allocation, and planning, implementation and monitoring of programs and projects.
http://www.un.org/womenwatch/osagi/gendermainstreaming.htm

Table 21. **Government commitments on gender equality and women empowerment (international and national)**

International Commitments

1945	National Constitution (UUD 1945) article 34
1957	Ratification of the International Labour Organization's Convention number 1000 on Equal Remuneration for Men and Women Workers for Work of Equal Value (Law 80/1957)
1958	Ratification of the UN Convention on the Political Rights of Women (Law 68/1958)
1984	Ratification of the UN Convention on the Elimination of All Forms of Discrimination Against Women (Law7/1984)
1995	Commitment on Copenhagen Declaration on Social Development
1995	Commitment on Cairo International Conference in Population and Development
1995	Commitment on Beijing Platform for Action
2000	Ratification of the Optional Protocol to the Convention on the Elimination of All Forms of Discrimination Against Women
2000	United Nations Millennium Declaration
2012	Ratification of The International Convention on the Protection of Rights of All Migrant Workers and Members of Their Families (Law 6/2012)
2012	Ratification of The Optional Protocol to The Convention on the Rights of the Child on Child Trafficking, Child Prostitution, and Child Pornography (Law 10/2012)

National Commitments

1978	The Basic Guidelines of State Policy (GBHN) [led to the establishment of The Office of the Minister of State for the Role of Women]
1999- 2000	GBHN (*Garis-garis Besar Halauan Negara*/The National Guidelines of State Policy)
2000	Presidential Instruction 9/2000 on Gender Mainstreaming
2000- 2004	PROPENAS (*Program Pembangunan Nasional*/The National Development Program)
2002	Ministry of Women Empowerment and Child Protection Decree about Gender Mainstreaming Sector Focal Point 2002
2005	National Strategy in Poverty Reduction

Source: Asia Development Bank, 2006; BAPPENAS, 2002; BAPPENAS, 2006

However, challenges remain. The 2016 *Human Development Report* showed that Indonesian men achieved a Human Development Index (HDI) of 0.712, while Indonesian women achieved an HDI of 0.66 (United Nations Development Programme [UNDP], 2016).[11] The percentage of women living in poverty decreased by 3.18 per cent (or over 2.55 million women) from 2009 to 2014, but this rate of decrease was smaller than that among men (3.39 per cent) (SUSENAS, 2015).[12] This indicates that development policies in Indonesia had a greater impact on men than women. The report also showed that Indonesian women lagged behind in several indicators of education, per capita income and labour force participation (UNDP, 2016).

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[11]   HDI is a measure of life expectancy, educational attainment and per capita income. A higher HDI indicates a high level of achievement of these indicators.
[12]   Calculations based on the GoI national poverty threshold.

The gender aspect of poverty has been acknowledged in national development and poverty alleviation strategies. The National Strategy in Poverty Reduction (SNPK) 2005 identified enabling factors as well as challenges related to divergent burdens and opportunities faced by men and women that may hinder poverty reduction. These include the low participation rate of women in politics, weak institutional and network support for gender mainstreaming, and limited availability of gender-disaggregated data (BAPPENAS, 2005).

Education, health and employment statistics for women also lag behind men. Although national aggregate statistics do not show major gender disparities in access to education especially for the primary level, gender disparities among provinces are still evident for higher levels (World Bank, 2013). Indonesian women face critical health issues due to high maternal mortality and high adolescent birth rates (UNDP, 2016). As of 2014, female labour force participation was only 51 per cent, less than two thirds of men's (Cameron, Suarez, & Pye, 2015). Women earn less than men across all welfare levels and urban/rural locations (see data presented in this report).

The proportion of seats held by women in parliament has shown improvement from 11 per cent in 2004 to 17 per cent in 2009 but still falls short of the GOI target of 30 per cent and well short of proportional representation (Pusat Kajian Politik Universitas Indonesia, 2014). Politics is seen as a male-dominated sector (Pelras, 1996). There has been only one female president and one regional governor in Indonesia's history and women are under-represented at all levels of elected government. Internal selection processes in political parties generally favour men simply because party leadership positions are dominated by men (Pusat Kajian Politik Universitas Indonesia, 2014). According to a perception survey, 20 per cent of voters who voted for male candidates did so because they believe that women are incapable of being leaders (Pusat Kajian Politik Universitas Indonesia, 2014). Lack of confidence among women to compete with men in the political and professional world has contributed to the proportionally low presence of women in the legislature bodies and executive positions as well as the widely held view that women's primary roles are as wives and mothers (Ministry of Women Empowerment and Child Protection, 2013).

Other factors contributing to the lower development status of women in Indonesia include: early marriage; limited access to contraception, especially for non-married women; lack of support structures like affordable child care; inadequate support for married or pregnant girls; and gender segregation of industries and occupations with women being concentrated in lower paying roles (Cameron, Suarez, & Pye, 2015; Rahmitha et al., 2016; World Bank 2013).

4.1 Key Areas of Vulnerability in Relation to LPG Subsidy Reform

Even though gender has been mainstreamed in almost all development planning and programs, some challenges persist at the level of implementation. Many of the documents do not specify a gender target in regard to access, participation, benefits or outcomes. A study conducted by the Institute for Essential Service Reform showed that gender mainstreaming has not been strongly internalized, including in the Ministry of Energy and Mineral Resources (MEMR) (Suhud, 2017). One example is MEMR Decree 3/2016 on sustainable energy that does not take gender into account for disbursement of the Special Allocation Fund for energy for villages.

Gender has not been taken into account in energy subsidy reform policies to date, despite the primary role of women in domestic roles and the preparation of food.

5.0 GENDER: DATA AUDIT

Data collected on gender issues serve two purposes: to assess whether poor women in Indonesia suffer economic or other disadvantages that may affect their fuel choice and to provide a baseline on the status of women against which the impact of subsidy reform can be assessed. The data audit is conducted over the following indicators:

1. Welfare: time spent on different household activities, education and media access
2. Productivity: employment and income
3. Empowerment: decision making on household expenditure, ownership and political empowerment.

5.1 Welfare

5.1.1 Time Spent on Different Household Activities

Relatively little data was found on time use by women in Indonesia. The limited sources available suggest that women spend two thirds of their day on housework and caring for children or the elderly and around one third on economic activities.

According to a 2004 survey conducted in Jakarta, women spent on average 3 hours per day cooking food (Gagliardone, 2015) (Table 22). The amount of time men spent cooking was, on average, negligible. Time use data on other activities further emphasizes that domestic work tends to be the responsibility of women. Men spend most of their daily time in economic activities and their engagement in domestic work is very minimal.

Table 22. **Average time spent on household activities (hours per day), Jakarta 2004**

Activities	Women (wife)	Men (husband)
Cooking	3	0
Cleaning the house and yard	2	0
Washing clothes	1	0
Caring for small children	Continuous	0
Caring for the elderly	Continuous	0
Collecting water	1	0
Collecting firewood	1	0
Going to the market	1	1
Working for business	6	8
Animal caring	1	Not daily
Fixing the house	0	Not daily
Watching TV talking	1	1
Community gatherings	1 (Not daily)	2 (Not daily)
Taking sick people to hospital	0	Not daily
Total	15	12

Note: Only for beneficiaries of IPTEKDA program (24 households)
Source: Gagliardone, 2015

The Pilot Study on Time Use Survey 1998/1999 records cooking as part of the housekeeping activity group. The other activities included in housekeeping are making beds, collecting water for bathing, washing or cooking, cleaning the house and yard and buying food (BPS, 1999). On average, women in rural areas allocated 4.5 hours per day for housekeeping whereas urban women spent 5.5 hours per day for the same activity.[13]

Women may conduct more than one activity at the same time leading to the total number of hours for all activities to be greater than 24 hours a day (Table 23). For example, caring for children and the elderly is usually performed continuously while cooking or gathering with neighbours. In general, the data show similarities in women's time allocation across urban and rural areas. However, urban women spent more time a day on paid working; whereas rural women spent more time a day on social activities.

Table 23. Time allocation of women age 15–49, 1999 (hours per day)

Activities	Urban	Rural	Urban + Rural
Housekeeping (incl. cooking)	5.53	4.53	4.73
Caring for children age 1-5 years	4.70	4.69	4.69
Caring for elderly	1.40	1.45	1.44
Schooling	1.44	0.82	1.13
Working	5.64	4.63	4.79
Leisure	2.00	1.52	1.64
Social Activities	5.09	6.09	5.88

Note: Excludes private activities such as eating, bathing, and praying. Some activities are conducted concurrently leading to a total >24 hours per day.
Source: BPS, 1999

Other studies also provide time use data by women for activities other than cooking. In Lombok, Aristanti (1997) found that women spent four hours each week collecting dead wood or agricultural residues to be used as fuel. Rural women without a toilet spent 5 minutes a day finding a place to defecate, and rural men spent 4 minutes. In urban areas, women spent 8 minutes and men spent 9 minutes (Asian Development Bank, 2015).

5.1.2 Education

Kojima (2011) found that the higher the education level attained by female and male members of a household, the more likely the household was to select LPG. The effect was larger for women than men. Once education levels were accounted for, the study found no evidence that female-headed households were more inclined to choose LPG.

Women are less likely to be educated than men in Indonesia (UNDP, 2016). Women were found to be more likely to be unschooled (Table 24). Educational attainment levels are lower in rural areas than in urban and for the poor compared to the non-poor. Therefore poor rural women are the most likely to be uneducated.

The proportion of adults who went to high school is lower in rural areas, with the proportion of women being significantly lower than men in both surveys (Appendix Table A2). In the poor and near-poor category, SUSENAS (2015) found that significantly fewer women complete high school than men, but the IFLS 5 (2014–15) found no significant difference.

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[13] The sample size for 1998/1999 Time Use Survey is 10 per cent of 100 villages surveyed, i.e., 12 households per village or 1,200 households in total.

Barriers for girls completing their education include: cultural or religious beliefs that prescribe different roles for girls and boys, early marriage, inadequate school support for married or pregnant girls, safety and cost issues related to remote schools, and lack of separate school sanitation facilities for girls (World Bank, 2013, 2014).

SUSENAS revealed a higher portion of unschooled adults in all welfare categories than IFLS.

Table 24. Proportion of unschooled men and women across welfare groups (%)

Category	IFLS 5				SUSENAS			
	All	Poor	Near-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Poor & Near-Poor
All								
Men	5	11	11	11	13	22	18	20
Women	11	17	19	18	15	25	21	23
T-test (p-value)	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.00
Rural								
Men	7	15	16	15	18	25	22	23
Women	17	23	25	24	21	27	24	26
T-test (p-value)	0.00	0.01	0.01	0.00	0.00	0.05	0.20	0.02
Urban								
Men	2	6	5	6	8	18	13	15
Women	6	10	12	11	11	21	16	18
T-test (p-value)	0.00	0.02	0.07	0.00	0.00	0.02	0.42	0.03

Source: Calculated from IFLS 5, 2014–15 and SUSENAS, 2015

Educational attainment in Indonesia appears to be undergoing a generational shift. While the proportion of unschooled adult women[14] is higher than men across all welfare levels, school enrollment is around 90 per cent across rural and urban areas with no significant difference between boys and girls (Table 25). Challenges remain for the poor, as the enrollment rate of boys and girls decreases with welfare level, a result that holds across urban and rural areas.

The school enrollment rate calculated using SUSENAS (2015) is slightly higher than that based on IFLS 5 (2014–15). SUSENAS (2015) data shows statistically significant results across all welfare levels and locations. It implies that the school enrollment rate of girls is higher than that of boys. The enrollment rate is very small (1.3 per cent, on average).

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[14] Adult is defined as a person aged older than 17 years.

Table 25. Enrollment rate for children across welfare groups by gender (%)

Category	IFLS 5				SUSENAS			
	All	Poor	Near-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Poor & Near-Poor
All								
Boys	91	78	87	83	94	90	94	92
Girls	92	83	89	86	95	92	95	94
T-test (p-value)	0.76	0.21	0.21	0.87	0.00	0.00	0.00	0.00
Urban								
Boys	90	76	82	80	96	92	96	94
Girls	91	65	77	72	97	94	97	95
T-test (p-value)	0.95	0.56	0.23	0.85	0.00	0.00	0.00	0.00
Rural								
Boys	91	78	89	84	93	89	92	91
Girls	93	90	93	91	94	91	94	92
T-test (p-value)	0.68	0.25	0.56	0.67	0.00	0.00	0.00	0.00

Note: Children are defined as under 18 years old.

Source: Calculated from IFLS 5, 2014–15 and SUSENAS, 2015

Table 26 shows that educational attainment (as years of education) increases with income. Women are less educated than men across all sectors, with rural poor women being the lowest educated.

Table 26. Distribution of mean years of schooling across welfare groups, working sector and gender of individuals aged 15–49 (years)

Category	IFLS 5				SUSENAS			
	All	Poor	Near-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Poor & Near-Poor
Agriculture								
Men	4.6	3.4	4.3	3.9	6.4	5.6	6.0	5.8
Women	3.2	2.9	2.9	2.9	5.2	4.5	5.0	4.8
T-test (p-value)	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Industry								
Men	6.7	5.9	5.7	5.8	8.7	7.1	7.6	7.4
Women	6.2	5.5	5.8	5.7	8.4	6.3	7.1	6.7
T-test (p-value)	0.00	0.38	0.93	0.56	0.00	0.00	0.00	0.00
Trade and Services								
Men	6.1	4.7	5.8	5.4	10.2	7.8	8.6	8.3
Women	5.0	4.3	4.8	4.6	9.8	6.8	7.9	7.4
T-test (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Calculated from IFLS 5, 2014–15 and SUSENAS, 2015

5.1.3 Media Access

Television is the most common form of media exposure for both women and men, followed by radio and newspapers. This pattern persists across urban and rural areas. However, women and men living in urban areas are more likely to have access to all three forms of media than their rural counterparts. According to data collected from IDHS (2012), approximately 88 per cent of women watched television at least once a week (Table 27). Women's exposure to radio and newspaper were somewhat lower than television (20 per cent and 12 per cent, respectively). Access to all three media tended to be higher for men and almost all t-test results were statistically significant.

Table 27. Access to media by gender and location of individuals aged 15–49 (%)

Category	Newspaper			Radio			TV		
	Not at all	Less than once a week	At least once a week	Not at all	Less than once a week	At least once a week	Not at all	Less than once a week	At least once a week
Rural + Urban									
Men	48	32	20	40	37	23	2	9	89
Women	52	36	12	44	36	20	2	10	88
T-test (p-value)	0.00	0.00	0.00	0.08	0.04	0.00	0.00	0.00	0.00
Urban									
Men	36	36	28	36	39	24	2	6	92
Women	42	41	17	39	39	22	1	8	90
T-test (p-value)	0.00	0.00	0.00	0.07	0.56	0.00	0.13	0.00	0.00
Rural									
Men	62	27	11	43	35	22	2	12	86
Women	63	30	6	50	32	18	4	11	85
T-test (p-value)	0.02	0.00	0.00	0.12	0.07	0.00	0.00	0.00	0.00

Note: IDHS (2012) does not provide data on access to Internet.
Source: Calculated from IDHS, 2012

The proportion of men who are able to read Indonesian newspapers was significantly higher than women across all welfare levels and locations (Table 28). The proportion of men and women who are able to read Indonesian newspapers is higher in urban areas. Only 60 per cent of rural women could read an Indonesian newspaper, the lowest among the categories.

Table 28. Ability to read Indonesian newspaper (%)

Category	All	Poor	Near-Poor	Poor & Near-Poor
Rural+Urban				
Men	90	80	82	81
Women	81	66	70	69
T-test (p-value)	0.00	0.00	0.01	0.00
Urban				
Men	95	86	88	87
Women	89	78	80	79
T-test (p-value)	0.00	0.00	0.11	0.00
Rural				
Men	86	76	75	76
Women	72	56	63	60
T-test (p-value)	0.00	0.01	0.04	0.00

Source: Calculated from IFLS 5, 2014–15

Women have lower access to the mobile phones and the Internet than men across all welfare groups and locations (Table 29). Access to mobile phones and the Internet decline with welfare level and for those in rural areas. Poor and near-poor rural women have the lowest access (3–6 per cent) and urban men have the highest access (37–38 per cent).

Table 29. Internet and mobile phone access across welfare groups by gender (%)

Category	All	Poor	Near-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Poor & Near-Poor
Internet								
Rural+Urban		IFLS 5				SUSENAS		
Men	30	16	20	19	26	6	10	8
Women	19	8	10	9	20	4	7	6
T-test (p-value)	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Urban								
Men	38	18	28	24	37	9	15	13
Women	28	10	15	13	29	6	11	9
T-test (p-value)	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00
Rural								
Men	22	14	13	13	14	4	6	5
Women	10	6	5	5	9	3	4	3
T-test (p-value)	0.00	0.08	0.01	0.00	0.00	0.00	0.00	0.00

Table 29 (continued). Internet and mobile phone access across welfare groups by gender (%)

Category	All	Poor	Near-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Poor & Near-Poor
Mobile phones								
Rural+Urban			IFLS 5				SUSENAS	
Men	72	48	54	51	76	52	64	59
Women	55	33	40	37	56	31	40	35
T-test (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Urban								
Men	78	50	58	55	83	59	72	67
Women	66	44	51	48	68	37	49	44
T-test (p-value)	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Rural								
Men	66	45	50	48	68	48	58	53
Women	48	24	31	28	43	27	32	30
T-test (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Calculated from IFLS 5, 2014–15 and SUSENAS, 2015

5.2 Productivity

Five indicators were analyzed in this section: employment rate, working hours on paid work, work sector, working hours on unpaid work, and income.

5.2.1 Employment Rate

The employment rate for women is always lower than that of men across all welfare levels and locations (Table 30). On average, the gap in employment rate between men and women is approximately 30 percentage points. Rural men and women tend to have higher employment rates than their urban counterparts. Women's employment rates decrease with welfare level.

Table 30. Employment rate by gender and location (%)

Category	Urban+Rural	Urban	Rural
Men	76	74	79
Women	45	43	47
T-test (p-value)	0.00	0.00	0.00

Source: Calculated from SAKERNAS, 2015

Cross tabulation of modern stove usage by employment status did not reveal any consistent trends that would indicate that women are more likely to choose a modern stove when they are have accesses to resources (with employment being a proxy for economic resources). While significantly more employed urban female-headed households use a modern stove than male-headed households, this trend is reversed in rural households (Table 31). There is no significant difference among poor households but sample sizes were low. Paid male-headed households are more likely to use a modern stove than female-headed households.

Table 31. Modern stove usage by gender and the employment of the household head (%)

Category	Employed		Unemployed	
Urban	**All**	**Poor+Near-Poor**	**All**	**Poor+Near-Poor**
Male household head	70 (3,313)	66 (103)	90 (397)	62 (18)
Female household head	87 (533)	70 (16)	86 (308)	33 (4)
T-test (p-value)	0.00	0.16	0.00	0.09
Rural				
Male household head	60	27	55	15
Female household head	56	23	59	26
T-test (p-value)	0.00	0.27	0.35	0.96
	Paid Workers		**Unpaid Workers**	
Male household head	75	45	69	30
Female household head	72	38	59	43
T-test (p-value)	0.00	0.03	0.03	0.67

Note:
The number of households in the poor and near-poor categories was low (in the case of rural unemployed households the sample was three men and six women).

Source: Calculated from IFLS 5, 2014–15

5.2.2   Hours Spent in Paid Work

Men spend more hours in paid work than women across all welfare level and locations (Tables 32 and 33). Urban men and women tend to spend more working hours on paid work compared to their rural counterparts. Working hours on paid work for women tend to decrease with welfare level, as the poor and near-poor spend fewer hours on paid work compared to aggregate welfare data (Table 32). A similar pattern is also observed among men in the SUSENAS data but not in the IFLS 5 data.

Table 32. Hours spent on paid work during the past week (hours)

Category	IFLS 5				SUSENAS			
	All	Poor	Near-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Poor & Near-Poor
Rural+ Urban								
Men	41	42	42	42	43	39	41	40
Women	38	34	37	35	39	33	36	34
T-test (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Urban								
Men	43	46	48	47	46	43	44	44
Women	40	31	43	39	43	38	40	39
T-test (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rural								
Men	38	38	36	37	40	37	39	38
Women	36	36	29	32	35	31	33	32
T-test (p-value)	0.00	0.36	0.10	0.07	0.00	0.00	0.00	0.00

Source: Calculated from IFLS 5, 2014–15 and SUSENAS, 2015

Table 33. Hours spent on paid work during the past week (hours)

Category	Urban+Rural	Urban	Rural
Men	43	46	39
Women	41	44	37
T-test (p-value)	0.00	0.00	0.00

Source: Calculated from SAKERNAS, 2015

5.2.3 Employment by Sector

According to SUSENAS, which has a more comprehensive geographic and urban/rural coverage, poor and near-poor women are most likely to be employed in the agricultural sector (around 55 per cent), followed by services and manufacturing (Appendix Table A5). Poor women and near-poor women are significantly more likely to be employed in agriculture and services than men and significantly less likely to be employed in manufacturing.

In IFLS 5 (2014–15), the largest employment sector for poor and near-poor women is services followed by agriculture and manufacturing (Appendix Table A5). The discrepancy between IFLS and SUSENAS might reflect the sample area of the data sets: IFLS is urban-biased and excludes the east part of Indonesia in which more likely people are engaged in primary industries.

According to SAKERNAS (2015), the rank of working sectors according to the highest proportion of men and women working in that sector is: services, agriculture and manufacturing. However, the order changes with rural and urban areas (Appendix Table A7). In urban areas, the main work sector is services followed by manufacturing and agriculture, whereas in rural areas the main work sector is agriculture followed by services and manufacturing.

5.2.4 Number of Hours Spent on Unpaid Work by Women and Men

SAKERNAS (2015) reports that men spent more time than women in unpaid work (where unpaid work refers to helping another in their business without remuneration)[15] (Table 34). Women and men in urban areas spend a similar number of hours on unpaid work, while rural women spend two fewer hours for unpaid work compared to rural men. IFLS 5 reports a lower number of hours spent on unpaid work compared with SAKERNAS.

Table 34. **Hours spent on unpaid work during the past week by gender and location (hours)**

Category	SAKERNAS			IFLS 5		
	Urban+ Rural	Urban	Rural	Urban+ Rural	Urban	Rural
Men	30	34	28	26	32	23
Women	28	33	26	26	33	24
T-test (p-value)	0.00	0.42	0.00	0.18	0.62	0.66

Note: The small sample size for poor and near-poor groups prevented disaggregation by welfare levels

Source: Calculated from SAKERNAS, 2015 and IFLS 5, 2014–15

5.2.5 Income

Women earn less than men across all welfare groups, and the pattern persists across rural and urban locations (Table 35).[16] On average, women's income is only two thirds of men's income. Further decomposition by welfare level shows that the income gap between men and women tends to widen among the poor and non-poor groups especially in urban areas. On average, poor women in urban areas earn approximately only half of men's average earnings. Women in rural areas earn less than women in urban areas.

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[15] Both IFLS and SAKERNAS identify unpaid family worker as someone who works to help others' business without receiving remuneration/salary, either in form of cash or goods. Consequently, unpaid family workers may consist of:
  1) Household member of the person being helped, for example wife who helps her husband works in the fields
  2) Family member of the person being helped such as relative/family that helps selling in shops
  3) Individuals other than household or family member of the person being helped, such as a neighbour who helps in weaving for a textile home industry
  The definition of unpaid work by BPS does not cover household work or domestic activities such as cooking, caring for the children, or cleaning the house.
[16] Both IFLS (2014) and SAKERNAS (2015) datasets provide similar information of income but the SAKERNAS data does not allow for decomposition of income by welfare level. SAKERNAS is more nationally representative compared to IFLS.

Table 35. Approximate monthly income (salary/wage/profit) across welfare groups by gender (IDR)

Category	All	Poor	Near-Poor	Poor + Near-Poor
Rural+Urban				
Men	2,238,067	903,108	1,222,100	1,097,005
Women	1,447,840	492,240	770,853	666,616
T-test(p-value)	0.00	0.00	0.00	0.00
Women's average income as % of men's average income	65%	55%	63%	61%
Urban				
Men	2,723,275	975,875	1,409,490	1,304,130
Women	1,812,364	520,169	788,780	704,080.1
T-test(p-value)	0.00	0.00	0.01	0.00
Women's average income as % of men's average income	67%	53%	56%	54%
Rural				
Men	1,738,349	624,161	1,025,066	871,993.2
Women	1,004,382	432,692	747,639	621,660
T-test(p-value)	0.00	0.03	0.04	0.00
Women's average income as % of men's average income	58%	69%	73%	71%

Note: Combines paid and self-employed workers. Respondents asked to answer based on their incomes in the most recent previous month at the point the survey was conducted.

Source: Calculated from IFLS 5, 2014–15

The income gap between men and women is larger for self-employed workers than salaried workers. According to SAKERNAS (2015), women that are salaried workers earn an average of 80 per cent of male income while self-employed women earn around 65 per cent of male earnings (Table 36). Average incomes were always larger for paid workers compared to self-employed workers across location and gender.

IFLS 5 (2014–15) found that self-employed women on average earn 50 per cent of male income (Table 36). The pattern is similar across rural and urban locations. Disaggregation by welfare level found no significant difference in incomes between self-employed men and women.

Table 36. **Approximate income (salary/wage/profit) during the last month by gender and location (IDR)**

Category	Urban+Rural	Urban	Rural
Salaried and self-employed workers			
Men	1,309,492	1,773,782	1,676,838
Women	890,149	1,328,641	1,216,346
T-test (p-value)	0.00	0.00	0.00
Women's average income as % of men's average income	68%	75%	73%
Self-employed workers[i]			
Men	1,659,404	1,963,416	1,346,929
Women	1,118,236	1,361,838	824,729
T-test (p-value)	0.00	0.00	0.00
Women's average income as % of men's average income	67%	69%	61%
Salaried workers			
Men	1,899,833	2,194,653	1,387,442
Women	1,644,070	1,893,348	1,087,846
T-test (p-value)	0.00	0.00	0.00
Women's average income as % of men's average income	87%	86%	78%

i) *Excluding self-employed workers with unpaid/permanent workers*

Source: Calculated from SAKERNAS, 2015

Table 37. Approximate income for self-employed workers during the last month across welfare groups by gender (IDR)

Category	All	Poor	Near-Poor	Poor + Near-Poor
Rural+Urban				
Men	2,374,904	919,757.8	1,443,252	1,256,081
Women	1,154,414	590,023	801,104	726,092
T-test (p-value)	0.0	0.51	0.08	0.08
Women's average income as % of men's average income	49%			
Urban				
Men	3,051,353	1,593,519	1,975,426	1,836,081
Women	1,438,002	608,739	570,958	584,751
T-test (p-value)	0.00	0.21	0.11	0.06
Women's average income as % of men's average income	47%			
Rural				
Men	1,902,742	428,094.6	1,075,426	847,319
Women	885,709	568,500	1,043,363	879,617
T-test (p-value)	0.00	0.49	0.34	0.57
Women's average income as % of men's average income	47%			

Note: Including self-employed workers with unpaid/permanent workers.

Source: Calculated from IFLS 5, 2014–15

Table 38. Approximate income for salaried workers during the last month across welfare groups by gender (IDR)

Category	All	Poor	Near-Poor	Poor + Near-Poor
Rural+Urban				
Men	2,152,456	893,922	1,067,024	995,311
Women	1,697,143	426,542	747,490	623,001
T-test (p-value)	0.03	0.00	0.00	0.00
Women's average income as % of men's average income	79%	48%	70%	63%
Urban				
Men	2,574,623	972,536	1,132,417	1,065,558
Women	2,069,510	505,272	931,615	784,916
T-test (p-value)	0.15	0.00	0.015	0.00
Women's average income as % of men's average income	80%	52%	82%	74%
Rural				
Men	1,598,261	778,511	974,706	894,522
Women	1,134,397	347,813	466,700	413,861
T-test (p-value)	0.00	0.00	0.00	0.00
Women's average income as % of men's average income	71%	45%	48%	46%

Source: Calculated from IFLS 5, 2014–15

5.3 Empowerment

5.3.1 Decision Making on Household Expenditure

According to women, decisions related to major household purchases are commonly made together by husband and wife (62 per cent) (Table 39). The majority of women say that they are the main decision makers on how her cash earnings are used. For decisions related to the use of husband's cash earnings, the majority of women say that they decide on their own (43 per cent) or jointly with the husband about how the earnings are used (45 per cent). Only 12 per cent of women said that their husband is the main decision maker on the husband's earnings.

Table 39. Women's perspective on control over major purchases and cash earnings (%)

Category	Rural	Urban	All
Person to decide about making major household purchases			
Mainly wife	16	22	19
Wife and Husband	62	62	62
Mainly Husband	21	16	18
Other	1	1	1
Person to decide how the wife's cash earnings are used			
Mainly wife	63	70	67
Wife and Husband	31	25	28
Mainly Husband	5	5	5
Other	0.2	0.2	0.2
Person to decide how the husband's cash earnings are used			
Mainly wife	43	47	43
Wife and Husband	45	42	45
Mainly Husband	12	11	12
Other	0.1	0.2	0.1

Note: Data from currently married women and men age 15-49 who earn cash for their work.

Source: Calculated from IDHS, 2012

Both men and women agree that women are the main decision makers related to minor expenditures such as food and the purchase of household supplies. The pattern is observed in the poor and near-poor groups. However, more than one fifth of poor and near-poor men say that women are not involved at all in food expenditure. Approximately 18 per cent of men say that women are not involved at all in purchase decisions of household supplies.

The wife and husband mainly decide the purchase of large and expensive items jointly. According to men, 52 per cent agree that a woman and her husband are decision makers on purchase of expensive items. Around 50 per cent of women agree that they decide on the purchase of large and expensive items jointly with their husbands. Similar patterns are also observed on the poor and near-poor groups.

These results are broadly consistent with findings from other studies. Tuntivate (2015) found that, in general, women either can independently decide to buy a lower-cost biomass cookstove or consult with their husband and make a joint decision to purchase a more expensive stove. Women decide alone on small home appliances below a given ceiling, but the decision becomes a joint one above that amount. The threshold for joint decision making is lower in poorer households.

Another study found that, while men may do little cooking, they have a major role in choosing stoves (World Bank, 2015). Fieldwork identified that, as new and more expensive cooking technologies appear, the role of men in decision making has increased. Women, who must ensure that the household's needs are met, manage household finances. But there is a threshold in their decision-making power beyond which men must be consulted or take over as decision maker. Thus purchasing a stove or access to credit also requires the husband's consent. The study found that men might not consider the purchase of a "cleaner" cookstove a priority for the household. Men are not aware of the negative effects of indoor air pollution and considered the current traditional options appropriate. Women interviewed indicated that obtaining a new, modern stove is not easily negotiated. Married women all said that they would need their husband's consent to purchase a stove.

Table 40. Approximate income for salaried workers during the last month across welfare groups by gender (IDR)

Category	All		Poor+Near-Poor	
	Male's Perspective	Female's Perspective	Male's Perspective	Female's Perspective
Decision on expenditure on food eaten at home				
Woman only	63	76	55	70
Women and her husband	18	14	18	12
Woman's parents involved	1	2	1	3
Husband's parents involved	1	1	2	1
Others involved[i]	1	3	2	3
Women not involved at all[ii]	17	4	22	10
Decision on routine purchases for the household (e.g., cleaning products)				
Woman only	71	80	65	75
Women and her husband	13	10	11	8
Woman's parents involved	1	1	1	2
Husband's parents involved	1	1	3	2
Others involved*	1	3	2	3
Women not involved at all**	14	5	18	10
Decision on large expensive purchases for the household (e.g., refrigerator)				
Woman only	19	40	22	45
Women and her husband	52	50	43	40
Woman's parents involved	0	1	0	1
Husband's parents involved	0	0	0	1
Others involved*	2	2	2	2
Women not involved at all**	26	6	33	12
Decision on time the husband spends socializing				
Woman only	8	68	10	73
Women and her husband	29	32	27	27
Woman's parents involved	0	0	1	0
Husband's parents involved	0	0	0	0
Others involved*	0	0	0	0
Women not involved at all**	63	0	62	0
Decision on time the wife spends socializing				
Woman only	47	61	48	66
Women and her husband	36	38	34	34
Woman's parents involved	0	0	0	0
Husband's parents involved	0	0	0	0
Others involved*	0	0	0	0
Women not involved at all**	17	0	18	0

i) Others include siblings, children, or grandchildren

ii) Can be husband only, or other household/family member only

Source: Calculated from IFLS 5, 2014–15

5.3.2 Ownership

Indonesia's 1847 Civil Code stipulates that men and women have the same legal capacity, implying that men and women have equal ownership rights. Article 34 of the 1974 Marriage Law formally adopts the concept of joint ownership of property purchased during marriage.

Land inheritance rights are governed by 1847 Civil Code for the non-Muslims and by Islamic law for Muslims. The 1847 Civil Code provides for equal rights to inheritance, while the Islamic law of inheritance rights stipulates that daughters and wives inherit half as much as sons and husbands. With a majority of Muslim population in Indonesia, courts often follow Islamic law regarding to land inheritance rights.

The data shows that women are less likely to own a house or land compared to men (Table 41). Fifty per cent of women say they own their house, with the majority of them (64 per cent) owning their house jointly with someone else and only 30 per cent owning a house by herself. The majority of men also own property jointly with someone else. This is likely to be due to marriage law in Indonesia that assumes joint ownership of property purchased during marriage.

The proportion of women owning land is 41 per cent. Again, the majority of women who own land (60 per cent) say they own land jointly with someone else. Approximately only one third of women own land alone. The pattern persists across urban and rural areas, although rural women are more likely than urban women to own both a house and land.

Table 41. **The Ownership Status of Properties Across Locations of Married Men and Women Age 15-49 (%)**

Category	House			Land		
	Rural	Urban	All	Rural	Urban	All
Women						
Do not own	44	56	50	52	65	59
Own	56	44	50	48	35	41
Alone[i]	28	33	30	32	35	33
Jointly[i]	67	60	64	62	53	60
Both alone and jointly[ii]	5	7	6	6	7	6. 4
Men						
Do not own	26	38	32	36	48	42
Own	74	63	68	65	52	58
Alone[i]	48	37	42	47	35	41
Jointly[i]	51	61	56	52	63	57
Both alone and jointly[ii]	1	2	2	2	3	2

Notes:

i) The proportion of "alone," "jointly," and "both alone and jointly" are calculated from men/women who own a house or land. "Jointly" does not necessarily mean with husband, can be with anyone else

ii) "Both alone and jointly" is a possible answer for individuals owning more than one house or land as the original question in 2012 IDHS is "Do you own this or any other house either alone or jointly with someone else?"

Source: Calculated from IDHS 2012

Women's access to loans is similar to that of men (Global Findex Database in Demirgüç-Kunt & Klapper, 2012; Demirgüç-Kunt, Klapper, Singer, & Van Oudheusden, 2015). The source of loans for both men and women are family and friends, financial institutions, private informal lender, buying on credit from a store and their employer (Table 5.26). The practice of borrowing from a financial institution is more prevalent among women (11%) than men (4%).

Table 42. **Loan source of men and women age 15+ (%)**

Category	Indonesia			South Asia	Year
	Men	Women	All		
Borrowed any money in the past year	58	55	57	47	2014[i]
Borrowed from family or friends	42	41	42	31	2014[i]
Borrowed from a financial institution	4	11	13	6	2014[i]
Borrowed from a private informal lender	2	4	3	11	2014[i]
Borrowed from a store by buying on credit	8	5	6	9	2014[i]
Borrowed from employer	6	2	4	-	2011[ii]

Source: i) 2014 Global Findex Dataset (Demirgüç-Kunt et al., 2015); ii) 2011 Global Findex Dataset (Demirgüç-Kunt and Klapper, 2012)

5.3.3 Political Empowerment

Indicators of political empowerment presented in this section are 1) voting participation by gender, 2) proportion of seats in parliament by gender, 3) participation of women in government and 4) proportion of civil servants by gender.

IFLS 5 (2014–15) data shows that the proportion of women who vote is higher than that of men across all levels of welfare (Table 43). Further analysis based on a perception survey held by Pusat Kajian Politik Universitas Indonesia (2014) of the 2014 election finds that women voters do not necessarily vote for women legislature candidates, as 55 per cent of women voters vote for men candidates and only 45 per cent of women voters vote for women candidates. Indonesian voters mainly vote based on the personal integrity of a candidate (Pusat Kajian Politik Universitas Indonesia, 2014). Among voters of female candidates, only 23 per cent did so to support women's participation in politics. The majority of the voters (48 per cent) voted for female candidates based on the personal integrity of the candidates, whereas 29 per cent of them voted based on their preference for the female candidate's vision and mission (Pusat Kajian Politik Universitas Indonesia, 2014).

Table 43. **Voting participation by men and women (%)**

Category	All	Poor	Near-Poor	Poor + Near-Poor
Men	81	80	81	80
Women	86	84	85	85

Note: An individual is considered to be a voter if he or she voted during one of the following most recent elections: presidential election to legislative, governor, district head, and village head.

Source: Calculated from IFLS 5, 2014–15

The proportion of seats in the parliament held by women increased from 11 per cent in 2004 to more than 18 per cent in 2009 with a slight decrease to 17 per cent in the 2014 elections (Pusat Kajian Politik Universitas Indonesia, 2014). This is well short of the 30 per cent gender quota for parliamentary positions adopted by Indonesia in 2003. Of the 33 provincial assemblies elected in 2014, only DPRD Provinsi Sulawesi Utara surpasses the 30 per cent quota and around 33 per cent other provinces elected no women at all. Only 20 of the 403 district assemblies (roughly 5 per cent) fulfilled the gender quota (Pusat Kajian Politik Universitas Indonesia, 2014). The low representation of women also appears in all government levels from national to village level (Table 44).

Table 44. Parliament seats by gender (%)

Category	DPR RI	DPD RI	DPRD Provinsi	DPRD Kab/Kota
2009				
Men	82	71	84	88
Women	18	29	16	12
2014				
Men	83	74	84	86
Women	17	26	16	14

Notes:

1. DPR RI (Dewan Perwakilan Rakyat Republik Indonesia) is the national-level legislative body composed of directly elected members from political parties authorized to contest general elections (560 seats in total).

2. DPD RI (Dewan Perwakilan Daerah Republik Indonesia) is the national-level legislative body which consists of four politically non-aligned representatives from each of the 33 provinces in Indonesia (132 seats in total).

3. DPRD Provinsi (Dewan Perwakilan Rakyat Daerah Provinsi) is the provincial house of representatives.

4. DPRD Kab/Kota (Dewan Perwakilan Rakyat Daerah Kabupaten/Kota) is regional house of representatives at districts or municipalities level.

Source: Calculated from IFLS 5, 2014–15

Table 45. Summary of participation of women in government

Year		Source
2001—2004	Indonesia's only female president, Megawati Soekarnoputri	
2007—2015	Indonesia's only female governor (Banten Province)	BPS, 2016
2015	The current national-level cabinet has the highest number of female ministers in the history of Indonesia (23.5% women; 8 out of 34)	Ministry of Women's Empowerment and Child Protection, 2015
Up to 2013	3% of district heads or mayors were female (17 out of 504) 5% vice-district heads or vice-mayors were female (23 out of 485)*	BPS, 2016a
2014—2016	Only 6% of 78,736 village head positions are women	Potensi Desa (Podes), 2014 (BPS, 2016)
2014—2016	10% of 70,780 village secretary positions are held by women	Potensi Desa (Podes), 2014 BPS, 2016

Note: Difference in the number of district heads/mayors and vice-district heads/vice-mayors is due to permanent absence of some vice-district heads or vice-mayors (BPS, 2016a)

Overall, the proportion of female civil servants is almost on par with male civil servants (Table 46). The number of female civil servants showed an increasing trend from year to year. Echelon refers to senior positions, with Echelon I the most senior. The share of women who occupy echelon positions is very low. The gender gap becomes wider as seniority increases.

Table 46. Civil servants by gender (%)

Category	2016		2012	
	Men	**Women**	**Men**	**Women**
All	51	49	52	48
By Structural Position				
Echelon I	0.3	0.1	0.2	0.04
Echelon II	5	1	4	1
Echelon III	17	5	19	5
Echelon IV	47	24	47	23

Notes: Echelon I is most senior
Source: Badan Kepegawaian Negara, 2017

6.0 IMPACTS OF SUBSIDIES ON FUEL USE

6.1 Distribution

The Zero Kero Program has been phased in across Indonesia gradually since 2007. By 2016, the program had reached most of Indonesian provinces. East Nusa, North Moluccas, the Moluccas, Papua and West Papua were included last. Official LPG agents are not uniformly or widely available across every region. For many consumers, the only option is to purchase LPG from unofficial distributors at higher prices or not purchase LPG at all. In 2014, consumers reported that LPG was most widely available in Java and Sumatera while consumers in Maluku and Papua said it was unavailable (Table 47).

Table 47. **Consumer perception of LPG availability in main regions, 2014 (%)**

Main islands	Available	Unavailable
Sumatera	74	26
Java	83	16
Bali and Nusa Tenggara	34	66
Kalimantan	60	40
Sulawesi	56	45
Maluku and Papua	0	100

Source: LSI Social Issues Survey, 2014

There are two official methods of LPG distribution to end-consumers (based on a survey study in Palembang, South Sumatera, conducted by Effendy, 2015):

a) **First Type: Pertamina > Agents > Consumer**

In this first type of distribution chain, consumers are able to obtain subsidized products through certified agents. The official price for 3-kg cylinder in this type of distribution is set as IDR 12,750 (approximately half of the market price). Even though this method provides the best price for end-costumers, it was found that very few consumers were obtaining LPG via this type of distribution. LPG is generally purchased from agent distributors by sub-agents or retailers.

Each regional government in Indonesia is given authority to set a price ceiling for 3-kg LPG at the sub-agent level, which comprises the agent-level price plus transportation costs and a sub-agent profit margin. The price may differ between regions reflecting distance to the agent and geographical difficulties. The price can be IDR 2,000–3,000 higher than the agent-level price. This is what the government considers the "retail price," which is intended to be the price paid by end users. But again, that is not necessarily the case, since even at the sub-agent level most customers still face difficulties reaching the sub-agent's location or because of lack of supply. This leads to the second type of distribution.

b) **Second Type: Pertamina > Agents > Warehouse > Consumer**

In the second type of distribution, consumers buy subsidized LPG from the warehouse, rather than directly from agents. On average, consumers will experience a price premium due to the longer distribution chain, which leads to a higher unofficial retail price of around IDR 17,000.

There are also several unofficial distribution channels:
> Pertamina > Agents > Unofficial Collectors > Consumer
> Pertamina > Agents > Warehouse > Unofficial Collectors > Consumer
> Pertamina > Agents > Warehouse > Small Retail Store > Consumer
> Pertamina > Agents > Unofficial Collectors > Small Retail Store > Consumer
> Pertamina > Agents > Warehouse > Unofficial Collectors > Small Retail Store > Consumer

Longer distribution chains add costs and additional distributor margins and therefore lead to a higher retail price. This price may range from 150 per cent to 200 per cent of the official agent price (personal communication, Minstry of Energy and Mineral Resources and TNP2K, December 18, 2016).

Most Indonesian households purchase 3-kg LPG cylinders from small retailers (Table 48). The number of households that buy subsidized fuel from regulated distribution channels such as certified retail agents and/or public gas station is small. Beyond the sub-agent or warehouse level, which is characterized in the government distribution scheme as the end point where seller and buyer meet, the government's price policy is no longer effective. In this "informal" territory of subsidized LPG distribution, the prices that are paid are unregulated.

Table 48. Main point-of-purchase of 3-kg LPG cylinders in 2014, by region (in %)

Distribution Chain	Geographic region						
	All	Sumatera	Java	Kalimantan	Sulawesi	Bali and Nusa Tenggara	Maluku and Papua
Certified Retail Agents	0.4	0	1	0	0	0	0
Small Grocery Stores	7.1	7	8	0	0	15	0
Small Retailers	92	93	90	100	100	85	0
Others	0.4	0	1	0	0	0	0
Prefer not to answer	0.4	1	0	0	0	0	0

Source: LSI Social Issues Survey, 2014

On average, consumers spend 315 minutes per week acquiring 3-kg LPG cylinders, while kerosene purchases require substantially less time at 94 minutes. Consumers also reported that the supply of subsidized LPG is unreliable and often not available (Table 49). Around one half of consumers surveyed said they had no problems in purchasing 3-kg LPG cylinders, while the other half reported that prices were too high and supply inadequate.

Table 49. Availability and problems with purchasing LPG 3kg (%)

Availability	Percentage	Problems	Percentage
Always available	5.3	Long queuing time	0.8
Most of the time	1	Have to pay more	24
Occasionally	51	Lack of supply	14
Seldom	24	Others	8.4
Never available	2.7	None	52

Source: LSI Social Issues Survey, 2014

6.1.1 Distribution of Alternative Fuels

The availability and distribution of alterative fuels to LPG will influence whether consumers will switch to these fuels if LPG prices were to increase in the context of subsidy reform. This section presents data on the distribution and availability of kerosene, electricity and biomass for household use. While no survey data could be found on other alternative fuels, such as biogas or solar electricity, data from a pilot study on biogas is presented.

6.1.1.1 Kerosene

Most Indonesian households purchase kerosene from small grocery stores, an unofficial distribution channel (Table 50). Most people buy kerosene from small grocery stores, which is broadly consistent across regions (LSI Social Issues Survey, 2014). Meanwhile, the formal distribution chain that is supervised by Pertamina (certified retail agents) represents only a small proportion of sales (slightly more in Maluku and Papua). Unofficial vendors result in higher distribution costs and additional margins.

Table 50. Main point-of-purchase kerosene, 2014 (%)

Distribution Chain	% of Kerosene Purchased
Certified Retail Agents	4.2
Small Grocery Stores	78
Small Retailers	13
Others	2.1
Prefer not to answer	2.1

Note: Data have been rounded
Source: LSI Social Issues Survey, 2014

Like LPG, subsidized kerosene is not available all of the time (Table 51). Long queuing times, price and lack of supply were also factors discouraging purchase. Given these restraints, consumers may be more likely to switch to biomass than to kerosene if LPG prices were to increase (Table 51).

Table 51. **Consumer perception of availability and problems with kerosene purchase (%)**

Availability	Percentage	Problems	Percentage
Always available	4.6	Long queuing time	12
Most of the time	9.1	Have to pay more	49
Occasionally	44	Lack of supply	13
Seldom	38	Others	4.6
Never available	3.4	None	21
Prefer not to answer	1.1		

Source: LSI Social Issues Survey, 2014

6.1.1.2 Electricity

As noted above, the Dewan Energi Nasional (National Energy Council) estimated that the average electrification rate was 88 per cent in 2015 (Table 10). The International Energy Agency (2016) quotes a slightly lower national average of 84 per cent average (96 per cent urban and 71 per cent rural) for 2016. These figures mask major differences among regions and welfare levels. Rates of electrification vary from 66 per cent in Maluku and Papua to 100 per cent in Java in 2015 (National Energy Council, n.d.) (Table 10). The poor have the lowest access to electricity in any given province (Table 11).

6.1.1.3 Biomass

The distribution of biomass was not available in survey data. In general, engagement in agriculture is broadly associated with biomass availability (Kojima, 2011). Agriculture is the main source of employment in rural areas, indicating a likely high incidence of biomass in these areas. A study in peri-urban Yogyakarta found that of the households that use a biomass stove, 77 per cent collected biomass, 10 per cent purchased it and the remainder both purchased and collected biomass (Tuntivate, 2015).

6.1.1.4 Biogas

By 2016 the Indonesia Domestic Biogas Programme, called the BIRU program in Indonesia,[17] had constructed 23,693 biodigesters in the 10 provinces since starting the program in 2009 (Biru, 2017).[18] The BIRU program has a long-term objective of installing 41,500 units by 2020. A biogas digester converts the dung into biogas that can be used for cooking and lighting.

6.2 Price and Household Expenditure on Subsidized Fuel

6.2.1 LPG

The Ministry of Energy and Mineral Resources set the maximum retail price for 3-kg LPG cylinders at IDR 4,250 per kilogram in 2016 (12,750 for a 3kg cylinder) at the agent level. This price consists of an IDR 3,463 retail price, IDR 400 of margin and IDR 386 of value added tax.

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[17] BIRU means "blue" and is an acronym of Biogas Rumah, which translates as "biogas for the home" (HIVOS, n.d.).

[18] The provinces are Bali, Banten, West Java, D.I. Yogyakarta, Central Java, East Java, Lampung, West Nusa Tenggara, East Nusa Tenggara and South Sulawesi.

The market price of LPG per kilogram on average is IDR 8,479 (personal communication, Ministry of Energy and Mineral Resources and TNP2K, December 18, 2016). This figure may rise or fall due to the world commodity price fluctuations and exchange rates. Government subsidies are imposed to meet the difference between the market price and the subsidized price for 3-kg LPG cylinders.

As mentioned in Section 6.1, prices paid by households depend on the distribution chain before the point of purchase. The price of IDR 12,750 is effectively the wholesale price that is largely only accessed by sub-agents. As an example, sub-agent prices were found to vary from IDR 12,750 to IDR 20,000 in different regions in data gathered from 2010 to 2015 (Appendix Table A9). Most households purchase 3-kg LPG cylinders from small retailers at higher prices and unofficial prices (which were not available).

The 2014 LSI survey included a question related to consumer's knowledge of subsidized official fuel prices. Most consumers did not answer the question (for unknown reasons). Of those that did answer, most did not know the official price, with many guessing higher prices. This indicates that most consumers are not paying official prices for 3-kg LPG cylinders.

Expenditures on 3-kg LPG cylinders are fairly consistent across welfare groups at around IDR 20,000 per month with the non-poor spending slightly more than the poor groups (LSI Social Issues Survey, 2014; Table 52). Data from SUSENAS (2015) show higher expenditure on LPG, although this survey does not differentiate between subsidized and non-subsidized LPG (Table 52).

Table 52. **Monthly average expenditure for a 3-kg LPG cylinder per household based on income group (IDR)**

	Expenditure (IDR)
3kg LPG only (LSI)	
All households	21,216
Poor	20,161
Near-Poor	18,429
Non-Poor	21,330
Poor & Near-Poor	19,905
All LPG (SUSENAS)	
Urban	53,023
Rural	45,838

Sources: 3-kg LPG: LSI Social Issues Survey, 2014

All LPG: SUSENAS, 2015 (The survey categorized the type of fuels used as main cooking fuels into LPG, kerosene, charcoal/coal/briquettes and wood/other).

6.2.2 Kerosene

The official retail price of kerosene fuel is set at IDR 2,500 per litre (Ministry of Energy and Mineral Resources, 2016b). As with LPG, very few consumers were aware of the correct official price of subsidized kerosene when surveyed in LSI (2014). Expenditure on kerosene as a cooking fuel was highest in Maluku and Papua, where LPG consumption is lowest, although Java and Kalimantan reported the second and third highest expenditure on kerosene despite better access to LPG and electricity (Table 53). Urban households spent significantly more on kerosene than rural households.

As with LPG, SUSENAS reported higher expenditure on kerosene than the LSI survey. The LSI survey does show that the non-poor spent almost a third more on kerosene than the poor (Table 54).

Table 53. Household expenditure for kerosene as the main cooking fuel by region, 2014 (IDR)

Region	IDR
Urban	67,013
Rural	39,932
Main Islands	
Sumatera	43,985
Java	56,179
Bali and Nusa Tenggara	38,219
Kalimantan	54,518
Sulawesi	42,321
Maluku and Papua	60,652

Note: The survey categorized the type of fuels used as main cooking fuels into LPG, kerosene, charcoal/coal/briquettes and wood/other.

Source: SUSENAS, 2015

Table 54. Monthly average kerosene expenditure per household based on income group (IDR)

Income Group	Average Expenditure
Poor	20,826
Near-Poor	26,214
Non-Poor	30,379
Poor & Near-Poor	21,322
All	28,354

Source: LSI Social Issues Survey, 2014

6.2.3 Biomass

Most households that use biomass collect it for free. Of those that purchase biomass, household survey data indicate that expenditure on wood for cooking is highest in Maluku and Papua (Table 55). Expenditure was higher in rural areas than urban areas.

Table 55. Household expenditure on wood as the main cooking fuel by region, 2014 (IDR)

Region	IDR
Urban	47,136
Rural	57,853
Main Islands	
Maluku and Papua	93,514
Bali and Nusa Tenggara	71,559
Sumatera	50,270
Java	49,335
Kalimantan	45,516
Sulawesi	43,662

Note: The survey categorized the type of fuels used as main cooking fuels into LPG, kerosene, charcoal/coal/briquettes and wood/other.

Source: SUSENAS, 2015

A study in peri-urban Yogyakarta estimated the value of collected biomass using an average price for purchased biomass as a proxy price for collected biomass (Tuntivate, 2015). Based on the reported quantity of collected biomass from a survey in 2013, its average value per month per household was approximately IDR 90,500. Households that only purchased biomass spent about IDR 79,400. Biomass for households that both collect and purchase it was valued at IDR 65,700. Poorer households tended to collect more biomass, while the purchase of biomass increased with income (Table 56).

Table 56. Collection, purchase and expenditure on biomass in peri-urban Yogyakarta, by income quintile

Quintile	Proportion collecting biomass	Proportion purchasing biomass	Monthly expenditure on biomass (IDR)
1	26	8	58,937
2	21	19	57,794
3	19	28	75,362
4	18	17	84,631
5	15	29	125,896

Source: Tuntivate, 2015

6.2.4 Charcoal

Expenditure on charcoal for cooking was highest in Maluku and Papua (Table 57). Rural households spent more on charcoal than urban households.

Table 57. Household expenditure on wood as the main cooking fuel by region, 2014 (IDR)

Region	IDR
Urban	31,429
Rural	46,206
Main Islands	
Sumatera	46,896
Java	43,148
Bali and Nusa Tenggara	23,378
Kalimantan	22,199
Sulawesi	42,320
Maluku and Papua	68,922

Note: The survey categorized the type of fuels used as main cooking fuels into LPG, kerosene, charcoal/coal/briquettes and wood/other.
Source: SUSENAS, 2015

6.2.5 Electricity

Subsidized electricity has been under reform since 2012 in accordance with Presidential Regulation No. 8/2011. Beginning in 2017, only households using less than 450 volt-ampere (VA) are eligible for subsidized electricity; all other households must pay economic price of electricity (Table 58).

Table 58. Official price of electricity (in IDR per kWh)

Year	Basic Tariff (kWh)						Regulation
	450 VA	900 VA	1300 VA	2200 VA	3500 VA	6600 VA	
2011	415	605	790	795	890	1330	President Regulation No. 8/2011
2012	415	605	790	795	890	1330	President Regulation No. 8/2012
2013	415	605	833	843	948	1336	Minister of Energy and Mineral Resources Regulation No. 30/2012
2014	415	605	1496	1496	1496	1496	Minister of Energy and Mineral Resources Regulation No. 30/2013
2015	415	605	1496	1496	1496	1496	Minister of Energy and Mineral Resources Regulation No. 9/2015
2016	415	605	1409	1409	1409	1409	Minister of Energy and Mineral Resources Regulation No. 28/2016
2017	415	791	1467	1467	1467	1467	Minister of Energy and Mineral Resources Regulation No. 31/2016

Source: PLN, 2017

Household expenditure on electricity in urban areas was more than double than in rural areas (Table 59) Households in Kalimantan, Sumatra, Maluku and Papua spent the highest average amount on electricity.

Table 59. Household expenditure for electricity, urban and rural, 2014 (IDR)

Region	Expenditure (IDR)
Urban	121,454
Rural	56,019
Main Islands	
Sumatera	91,367
Java	87,828
Bali and Nusa Tenggara	59,823
Kalimantan	99,580
Sulawesi	68,869
Maluku and Papua	96,909

Note: The question asked whether household have access to electricity without specifying the purpose of use.
Source: SUSENAS, 2015

6.2.6 Biogas

The price of biogas as an energy source for household is not well documented at this point.

6.3 Influence of Retail Price on Household Fuel Choice

The impact of price changes on household fuel choice depends on the relative importance of the energy type in the household's consumption basket, the availability of substitutes, and the price and desirability of those substitutes to the consumer (Renner, Lay, & Schleicher, 2017). Kojima (2011) found that income and relative fuel prices were the two most important factors determining fuel choice by households. In six countries, including Indonesia, LPG selection increased when prices increased for firewood and kerosene, substitutes for LPG. In the case of firewood, a very large increase in the price was required before a household would consider consuming more LPG in response.

Andadari, Mulder and Rietveld (2014) found that the Zero Kero Program successfully encouraged people to shift from kerosene to LPG but that LPG was a complement to traditional energy sources rather than a substitute.[19] Indeed, the conversion program was associated with increased consumption of electricity and traditional biomass. This is contrary to the energy-ladder model that predicts fuel-switching behaviour as a linear model.

Economic modelling predicted that a price increase in domestically used LPG would be slightly regressive, but the magnitude is small due to assumed low usage rates (Renner et al., 2017). They considered that this would change if more households began using LPG instead of firewood, particularly in rural areas. While the absolute magnitude of the impact was small, price increases for LPG had a considerable effect on the poverty rate. LPG price increases resulted in higher energy poverty levels than kerosene price increases. For all modern fuels, the increase in energy poverty was greater in rural areas, despite the higher urban usage rates.

Renner, Ray and Schleicher (2017) also found some evidence that households are very likely to increase the use of traditional fuels when prices rise for modern energy sources used domestically. Households may not reduce domestically used energy as strongly as energy poverty indices suggest but instead move towards traditional fuels.

Regression analysis on LPG price and the quantity of sales found a negative relationship between the two variables (Wibisaputra, 2011). Seftarita et al. (2015) noticed that there is a different price elasticity of LPG use between rural and urban households. Rural households are more elastic in responding to LPG price changes due to smaller purchasing power relative to urban households and the availability of biomass for substitution.

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[19] Traditional fuels for cooking includes fuel wood, charcoal, animal dung, agricultural residues.

7.0 IMPACTS OF FUEL USE ON WOMEN: LITERATURE REVIEW

A quantitative assessment of the impact of LPG policies on women in Indonesia is outside the scope of this report. There is little existing quantitative research in this area for Indonesia. Such an assessment would require a dedicated research program conducted before and after changes in subsidy policy (or only afterwards if using baseline data on welfare, productivity and empowerment, such as those collected in this report). For this reason, the potential impacts of LPG subsidy policies on women were assessed as a literature review of secondary data.

Studies regarding other fuels and in other countries indicate that the most likely impact of LPG use on poor women relates to time usage, air pollution, income generation and expense. Modern fuels can reduce time spent collecting fuel wood (Gurung & Setyowati, 2015), although travel to distribution centres, unreliable supply and queuing for LPG can erode these benefits. LPG is a cleaner cooking fuel than traditional biomass and kerosene, thus it reduces the negative health impacts of indoor air pollution to which women and children are particularly vulnerable. Women and children are much more likely to report cough symptoms if they live in households that primarily use firewood for cooking (Silwal & McKay, 2015). Modern fuels also create home income-generating opportunities for women by providing more effective heating and lighting. Finally, modern fuels can cost more than traditional biomass, which can have a negative impact on household budgets, affecting the money available for food and other necessities.

7.1 Welfare

7.1.1 Drudgery and Hardship

The *World Development Report 2012* recognizes the role played by energy in combating poverty (Clancy, Matinga, Oparaocha, & Winther, 2012). It suggested that access to modern technology would affect men and women differently, mainly due to differences in time use and drudgery in each group.

Andadari, Mulder and Rietveld (2014) found that the LPG conversion program failed to substantially reduce the number of energy-poor people, but it effectively alleviated extreme energy poverty. The study found that the LPG conversion program tended to benefit medium- and higher-income households in suburban areas more than the rest of the sample.

Budya and Yasir Arofat (2011) found that, from the perspective of end users, the Zero Kero Program allowed them to cook faster, have a cleaner kitchen and reduce their cooking fuel expenditure by approximately 30 per cent.

Significant time savings can be made from not having to collect fuel wood. Studies from Ethiopia, Madagascar, India, Nepal, Vietnam and Indonesia found that both men and women collect fuel wood, and on some occasions men are the primary collectors (Cooke, Köhlin, & Hyde, 2008). The authors found that women remain responsible as the managers of household energy and appliance use when modern fuels were adopted. Men become involved when fuel has to be collected over long distances, where fuel is purchased, or when there are social restrictions on women leaving their homes.

A project in West Nusa Tenggara and East Java found a net time saving of 61 minutes per day for cooking when households converted to biogas (Gurung & Setyowati, 2015). Time was previously spent collecting fuel

wood, cooking and other activities. Almost all respondents (sample size of 122) converted to biogas to meet household cooking needs but kept their other stoves and energy sources (LPG, kerosene and fuel wood) for community cooking events. Women reported using the saved time for domestic activities such as cooking and caring for children as well as community activities (Gurung & Setyowati, 2015). Some women reported that the biogas installation increases the men's willingness to prepare their own meals, which implies an additional time saving for women.

An evaluation of the effect of the Zero Kero Program on women's livelihoods in Indonesia found that replacing kerosene with LPG saved 15 minutes per day, while a similar study in India found that 8 minutes were saved (Barnes & Sen, 2004; Saptyani, 2010 in Clancy et al., 2011). The time saving for women arising from the adoption of improved stoves or modern fuels may be overestimated if households do not abandon the use of firewood entirely and if firewood collection is the responsibility of women (Clancy, Matinga, Oparaocha, & Winther, 2012).

The burden of collecting biomass will clearly vary from area to area depending on its availability. A survey in peri-urban Java found that around 70 per cent of households disagreed that preparing wood for cooking is a burden for the family. Most households disagreed that firewood is hard to obtain in the market and that cooking with firewood is inconvenient. Putti, Kammila, and Mehta (2015) found that in Indonesia, men are mainly responsible for collecting biomass, although both men and women spend time on fuel collection. Children were found to have participated in biomass collection in only a handful of surveyed households.

Other uses of modern energy have been found to reduce drudgery. Average households in sub-Saharan Africa were estimated to spend 134 minutes per day on water collection, and electrified water pumping in villages in Zanzibar saved women three hours per day (Rosen & Vincent, 1999; Winther, 2008; Clancy et al., 2012). A study undertaken by Porcaro and Takada in 2005 reported 30 minutes per day saved on processing grains after replacing traditional hand milling with a diesel-driven mill in Mali (Clancy, et al., 2012).

7.1.2 Time Spent on Leisure

A focus group study found that women were considered to have less free time than men in four selected communities in Indonesia (Fillaili, Mawardi, & Akhmadi, 2011).[20] Women in rural and urban areas generally spend their free time for doing housework, part-time jobs to get additional income or for socializing (Fillaili et al., 2011). Comments from the focus groups included:

- "If women have free time, then they will do the laundry, cook, and play with children."
- "All those women also work on the field, so their free time is used to do household chores. Normally, their free time is only in the morning and it's used to cook meals."
- "I usually only have one hour free time in a day. I use it to sleep or chat with neighbours."

Other studies report that women allocate 2.4 hours for leisure activities, which includes watching TV and socializing (Gurung & Setyowati, 2015). Women in rural areas explained that they must prepare food, search for firewood, collect water, do laundry and other household chores. The authors concluded that the imbalanced work share between men and women, especially around the house, influences the availability of free time for women.

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[20] The study conducted in two urban communities in Java Island (Jakarta and Tangerang) and in two rural communities in Sumatra Island (Kabupaten Agam and West Sumatra). In each location, the researchers conducted four focus group discussions, the adult male, adult female, teenage male and teenage female (total of sixteen).

7.1.3 Health Impacts

Households using biomass for cooking, particularly those that cook indoors, are at risk of lung problems due to pollution. The number of people relying on traditional biomass for cooking in Indonesia has decreased in recent years (Table 4). But the majority (59 per cent) of rural households and one fifth of urban households still rely on biomass for cooking (Table 5). Both urban and rural households mostly cook inside the house (93 per cent and 89 per cent respectively).

Zhang and Wu (2005) found that indoor air pollution resulted in 45,000 premature deaths in Indonesia annually. The major contributor was chronic obstructive lung disease. The practice of bringing children into the kitchen and a lack of ventilation were found to increase the risk that children and women would present with acute respiratory infections and pneumonia. A survey in peri-urban Yogyakarta found that many households are not aware of the health risks of exposure to indoor air pollution (Tuntivate, 2015).

Silwal and McKay (2015) found that Indonesian households who use firewood have 9.4 per cent lower lung capacity than those who cook with cleaner fuels (based on IFLS 5 2014–15 data). The impact is larger for women and children than for men. Women and children are also more likely to report cough symptoms if they live in a household that primarily uses firewood for cooking (Silwal & McKay, 2015). Another study found that the use of wood compared to LPG or kerosene resulted in higher risk of asthma by 5.8 times and tuberculosis by 8 times (Anon, 2004 in Zhang & Wu, 2005).

Table 60. **Average lung capacity (in litres per minute)**

	Rural + Urban		Rural		Urban	
Category	**All**	**Poor + Near-Poor**	**All**	**Poor + Near-Poor**	**All**	**Poor + Near-Poor**
Male						
Modern stove	249	235	248	230	250	237
Traditional stove	226	217	225	214	229	225
T-test (p-value)	0.00	0.0	0.00	0.08	0.000	0.016
Female						
Modern stove	164	157	163	153	165	158
Traditional stove	149	146	150	148	145	142
T-test (p-value)	0.00	0.028	0.000	0.014	0.000	0.241

Note: Lung capacity in IFLS 5 (2014–15) is measured by peak expiratory flow (PEF)

Other data showed no difference in the prevalence of tuberculosis, asthma and other lung illnesses for men and women living in households with modern or traditional stoves (Table 61). The only significant difference observed found that asthma was higher in households with modern stoves. But this was only observed at the aggregate level and did not persist when the data were disaggregated by welfare group or location.

Table 61. Prevalence of respiratory illness of males and females among households using modern and traditional stove across welfare status and locations (%)

Category	Rural + Urban		Rural		Urban	
	All	Poor + Near-Poor	All	Poor+ Near-Poor	All	Poor + Near-Poor
Male						
Tuberculosis						
Modern stove	1.35	2.05	1.61	2.48	0.98	1.10
Traditional stove	0.88	1.42	1.34	0.97	0.76	1.60
T-test (p-value)	0.02	0.34	0.53	0.58	0.21	0.94
Asthma						
Modern stove	2.61	4.10	3.00	5.45	2.04	1.10
Traditional stove	2.47	1.42	1.85	1.94	2.62	1.20
T-test (p-value)	0.13	0.54	0.20	0.31	0.87	0.29
Other Lung Illness						
Modern stove	2.33	1.37	2.65	0.99	1.87	2.20
Traditional stove	2.13	2.55	3.52	5.83	1.78	1.20
T-test (p-value)	0.07	0.44	0.92	0.17	0.21	0.91
Female						
Tuberculosis						
Modern stove	0.97	1.52	1.00	1.33	0.94	1.90
Traditional stove	0.70	0.47	0.47	0.00	0.75	0.64
T-test (p-value)	0.58	0.56	0.43	0.44	0.65	0.67
Asthma						
Modern stove	3.22	3.94	3.22	4.44	2.81	2.86
Traditional stove	2.03	2.61	2.03	1.82	2.55	2.88
T-test (p-value)	0.01	0.16	0.11	0.34	0.10	0.75
Other Lung Illness						
Modern stove	1.69	2.12	1.81	3.11	1.52	0.00
Traditional stove	1.39	1.66	1.56	1.82	1.35	1.60
T-test (p-value)	0.13	0.29	0.68	0.55	0.23	0.12

Source: Calculated from IFLS 5, 2014–15

The Ministry of Health released Regulation No.1077/2011 to provide guidance on improving indoor air quality. The regulation addresses the impact of cooking practices using biomass on health and suggests alternative technology for cleaner cooking, such as the smokeless stove furnace (*tungku tanpa asap*) (Zhang et al., 2013).

7.1.4 Enrollment Levels in School

Regarding the linkage between fuel use and education, one study found that better educated households were more likely to adopt modern energy sources (Lee et al., 2015). The study used focus group discussions and households surveys to examine the energy choices of rural households in forest margin communities on the island of Lombok. Households who are recipients of social assistance programs (e.g., providing rice, health service services assistance for education and microloans) are more likely use mixed energy sources than LPG alone.

Firewood collection was observed to negatively affect child education in a biogas program, given that the burden of collecting firewood generally falls to children and women (TRANSrisk Project, 2016) .

7.2 Productivity

7.2.1 Impacts of Modern Fuel Supply on Productivity and Economic Opportunities

A Food and Agriculture Organization working paper found that women's unpaid activities—including cooking and collecting fuel—made them less competitive than their male counterparts (Doss et al., 2011). In most cases, these responsibilities were a major factor in hindering women from participating in productive economic work and receiving decent pay. The study also highlighted that women have to spend long hours for water and fuel collection, as well as for overall food preparation and other child bearing activities, especially those of who are living in areas with poor infrastructure and facilities.

The use of modern fuel can reduce time spent on domestic chores and has been shown to increase the opportunity for women to engage in paid work (Budya & Yasir Arofat, 2011; WLPGA & ENERGIA, 2014). Modern fuels have been observed to improve the opportunity for education and income-generating work for girls and young women in particular (Modi, McDade, Lallement, & Saghir, 2005).

Matly (2003) found that women in households with access to electricity were more likely to do paid activities at home such as processing clove nuts, wrapping local cigarettes, making joysticks or weaving. [21] However, these productive activities were often low paid and, hence, not all women spent their extra time for paid work and instead chose to use the time for household chores, social activities (including among family members) and leisure. Another study also found that access to electricity enables women to do paid work at home and children to study in the evening due to better lighting (Hivos, 2012 in Utomo, 2015).

A study in Indonesia found that women benefited more than men from access to electricity by using liberated time to engage in small business activities (Ramani & Heijndermans, 2003) (Table 62). The same study found that 12 per cent of electrified households had a small business at home with about 60 per cent of them using electricity to support it. Thus, about 7 percent of households relied on electricity for their business. Electricity was used by enterprises in case study village, mostly for lighting and for operating tools and machines (Ramani & Heijndermans, 2003).

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[21] The study compared villages with and without access to electricity in Indonesia and Sri Lanka through qualitative participatory surveys and interviews, and quantitative structure surveys.

Table 62. How time saved by electrification was used for income-generating activities in Indonesia (%)

Time of Day	Gender	Small Business	Agricultural Product Processing	Animal Breeding
Morning	Women	13	18	10
	Men	5	17	10
Evening	Women	12	2	3
	Men	7	2	3

Source: Ramani & Heijndermans, 2003

Even though additional income generated from small business activities was modest, the amount was significant for the poorest households (Table 63). Home-based paid work comprised 32 per cent of total household income compared to 4 per cent for better-off households.

Table 63. Estimated income generation from home-based enterprises with electricity in Indonesia case study area (IDR per month)

	Very Poor	Poor	Near-Poor	Middle	Better-Off
Additional Income	87,611	111,607	82,333	145,000	121,672
Average Total Income	276,167	457,633	629,292	563,214	3,335,002
Impact on Total income	32%	24%	13%	26%	4%
Number of Households	9	15	12	28	32

Source: Ramani & Heijndermans, 2003

Several women who converted to using biogas for cooking had a greater willingness to gain economic independence and start a small business (although this information was drawn from a limited number of individual interviews) (Gurung & Setyowati, 2015). However the time liberated by conversion to biogas may not necessarily lead to increased income generation due to the traditionally determined domestic role of women in these communities (Gurung & Setyowati, 2015). Women often use the extra time to perform unpaid domestic work.

Another study found there was almost no change in responsibility for domestic work before and after the adoption of new technology (Gagliardone, 2015; Hermawati, & Saari 2011). Women remained dominant in almost all household responsibilities, such as cooking, shopping and cleaning (Table 64).

Table 64. Gender division of labour in domestic work in Indonesia

Type of Domestic Work	Before the Project				After the Project			
	M %	W %	M&W %	Total %	M %	W %	M&W %	Total 23
Child caring	O	57	43	23	O	65	35	24
Cooking	O	88	12	24	O	92	8	24
Cloth washing	O	71	29	24	O	71	29	24
Cleaning house	O	80	20	24	O	88	12	24
Fetching water	O	38	62	24	O	37	63	24
Going to market	O	38	62	24	O	67	33	24
Cleaning garden	O	4	96	24	O	17	83	24
Animal caring	O	50	42	24	O	58	42	24

Note: n= 24 respondents (M= Man/Husband;W=Woman/Wife)

Source: Hermawati, & Saari, 2011 (Field survey conducted by PAPPIPTEK-LIPI Team in July 2004)

7.3 Empowerment

7.3.1 Impact of Changes in Time Use on Empowerment

No specific data was found relating to women's empowerment and energy use in Indonesia.

7.3.2 Fertility

There have been no studies linking cooking fuel (specifically LPG) and fertility rates in Indonesia. However, other studies link electricity and television access with fertility rates in Indonesia.

Based on a study using an Indonesian dataset, connection to electricity was observed to reduce fertility primarily due to increased access to modern media that generates a cultural shift in fertility preferences (Grimm, Sparrow, & Tasciotti, 2015). Exposure to television affects fertility preferences and increases the adoption of contraception. Shifting the share of population coverage with television from 78 per cent to universal coverage is expected by one study to reduce the birth rate by 6.2 per cent (Dewi, Suryadarma, & Suryahadi, 2014). This study suggests that television increases the awareness of modern contraception, which leads to behavioural changes related to family planning.

8.0 NEXT STEPS: DATA GAPS AND IMPLICATIONS FOR POLICY

The audit found that ample data were available on the status of women in Indonesia in the areas of education, employment and income. In addition, existing surveys provide reasonable data on energy use by region, incomes and, in some cases, gender. However, there were considerable gaps in national survey data including:

- The proportion of different types of cooking fuel used simultaneously by households (current surveys only ask about the main fuel used)
- Types of biomass cook stoves used
- Time use by men and women on cooking
- Purchase and collection of biomass including by gender
- Any data related to energy use and empowerment of women

Although unlikely to be taken up in national surveys, there are several specific areas of data gaps that, if addressed, would help evaluate the impacts of LPG subsidy reform on women. They are mostly behavioural and might best be achieved with targeted surveys. They include:

- Household likeliness to switch fuels if prices increase (including if cash transfers replace the LPG subsidy)
- The likely impact of switching from LPG to biomass fuels on household time usage
- Why electricity is not used more widely for cooking
- The likely impact of rising LPG prices on small businesses run by women
- What influences decisions about cooking fuel choices
- Awareness of indoor air pollution as a health issue by men and women

Implications for LPG Subsidy Policy?

While policy implications are beyond the scope of this data audit, some preliminary findings are discussed. The audit demonstrates a strong case for the consideration of women in the design of LPG subsidy policy. This may have practical relevance in the following areas:

- If LPG prices increase, income and energy access impacts may be clustered on women. This suggests that any mitigation measures used to target LPG subsidies to low-income consumers or to provide non-energy forms of compensation may want to target women as principal beneficiaries.
- Many women and men in low-income households do not receive any benefit from the current subsidy program. Those purchasing subsidized LPG are paying much more than the official price. This indicates a need to reform the current distribution and pricing system. If LPG subsidy reforms result in savings, a share of these savings should be dedicated to extending the reach and fairness of LPG distribution.
- If LPG prices increase, households need to be educated about the impact of switching to lower-quality energy sources. Both men and women need to be targeted in communication materials, noting that men often play a dominant role in financial decisions.

9.0 CONCLUSIONS

The data audit found no quantitative studies dedicated to gender and LPG use in Indonesia. National survey data was available on energy usage and a range of gender issues. Gender has been included in aspects of studies relating to LPG and energy poverty (Kojima, 2011) and clean cooking (Tuntivate, 2015; World Bank, 2015). Other studies provide data on related issues including health, time use, cookstoves and male–female relations.

Analysis of these data reveals that, while LPG subsidies are regressive, subsidized LPG is nonetheless an important energy source for many poor and near-poor households. Only 12 per cent of subsidy benefits reach the poorest quintile of the population and 18 per cent reach the near-poor. The remaining 70 per cent of subsidy spending benefits the non-poor. In some provinces LPG consumption was negligible. And wood remains the primary cooking fuel for the majority of rural households. In addition, data also reveal major problems with distribution, availability and price. Subsidized LPG is only sometimes available and almost always at inflated prices. The current LPG subsidy is failing many poor and near-poor women: many do not use it at all and those that do pay up to 200 per cent of the official price when they can get it at all.

Many poor households nonetheless rely on subsidized LPG as their primary cooking fuel or as part of a mix of fuels (with kerosene, electricity, biomass and kerosene). Wood is the most commonly used alternative for the poor and near-poor, particularly in rural areas. LPG demand is elastic. When prices rise, household consumption of LPG falls and other fuels are used as substitutes (although there was a lack of specific quantitative estimates of how much LPG consumption will fall with rising prices). The availability of collectable biomass makes this a common alternative.

Women in poor and near-poor households are responsible for household management, including doing all the cooking. They are most vulnerable to higher LPG prices eroding household budgets and to the health impacts of indoor air pollution (most cooking is done indoors using inefficient stoves). Indoor air pollution causes premature deaths in Indonesia. Men and women in households using traditional stoves had a significantly lower lung capacity than those using modern stoves. The data on other lung conditions was inconclusive, with one study finding that use of biomass increased the risk of tuberculosis and asthma, but this was not supported in the survey data analyzed here. Firewood collection does not appear to be a burdensome activity based on the data reviewed here. Men and women share the task.

Poor and near-poor women, particularly those in rural areas, are the least able to cope with higher energy prices. These women are more economically vulnerable than their male counterparts. They have lower rates of employment, earn less income and have fewer working hours.

These findings make a strong case for LPG reform to better target poor and near-poor women. But this must be carefully done to avoid fuel switching and ensure that poor and near-poor beneficiaries of the current subsidy regime are not disadvantaged by reforms.

Impacts of targeted fuel subsidies depend on: (1) how the targeting system functions and (2) the accuracy of the targeting.

There are several ways the targeting system can function. Households could:

a)   Have some kind of card or special code that allows them to purchase LPG at a subsidized price from special vendors.

b)   Receive a cash payment in a bank or mobile account upon proof that they have purchased market-priced LPG (i.e., it is an after-sale transfer for a product purchased at full market price).

c)   Receive cash that is equivalent to the income loss from higher-priced LPG, and they are free to use this how they want.

In cases (a) and (b), there ought not to be fuel switching, as poor households can still access cheap LPG. In case (c), there is no guarantee that households will choose to use their cash on LPG. This is less paternalistic but may also divert households from clean energy.

Regarding accuracy, a well-targeted social protection scheme tends to reach only a share of intended beneficiaries. Exact data on exclusion rates are not easy to identify because they require a good estimate of the total population of eligible beneficiaries. In a review of evaluations of 22 policies across five OECD countries, Hernanz, Maherbet and Pellizzari (2004) found that, typically, take-up rates for entitlement programs were between 40 per cent to 80 per cent of eligible beneficiaries. While the low end of this range is not impressive, it remains better than many non-targeted subsidy-based systems. And subsidy programs typically have a high "inclusion" rate: that is, the provision of benefits to ineligible beneficiaries, particularly from higher-income households. In Indonesia, it is estimated that roughly 70 per cent of beneficiaries of the Raskin rice subsidy, for example, are non-poor (Alatas, Wai-Poi, & Purnamasari, 2012). Targeting therefore comes at a price: money saved on subsidies can be used to fund other social protection schemes. But inadvertently some households that previously benefited from subsidy schemes may be missed in the social protection schemes. Thus it is important to make sure that targeting has been done as well as possible, and that there are plans to keep expanding access to vulnerable populations who are no longer receiving assistance. A badly targeted system can be as bad as a bad subsidy. The government needs to thoroughly pilot whatever new policy it intends to introduce—otherwise, it could create major energy access problems.

A better-designed and targeted subsidy program with improved distribution channels could improve energy choices and standards of living, particularly for women, given their greater household responsibilities. Cash transfers to replace subsidized LPG would need to be accompanied by an education campaign—for men and women—to educate the poor about the risks of switching to biomass for cooking. Studies revealed that most men and women were not aware of the risks of indoor air pollution. Poor and near-poor women are also more likely to be less educated and have the lowest access to media. Information campaigns should use television—the most widely viewed form of media. Media material to promote the value of modern fuel and cooking appliances should target men as well as women, given their role in making decisions about household expenditures.

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APPENDIX: ADDITIONAL DATA TABLES

Table A1. Main cooking fuel used by households by province (%), 2015

	Electricity	LPG	Kerosene	Charcoal/ briquette	Wood	Other
Aceh	1	74	3	0	21	1
North Sumatera	1	72	5	0	21	1
West Sumatera	1	42	16	0	40	1
Riau	1	77	7	3	11	1
Jambi	1	64	7	2	26	0
South Sumatera	0	82	1	0	17	0
Bengkulu	0	72	1	0	26	0
Lampung	1	64	0	0	35	0
Bangka Belitung Islands	0	74	17	0	9	0
Kepulauan Riau	1	71	20	0	4	5
DKI Jakarta	1	89	2	0	0	8
West Java	1	81	0	0	16	2
West Java	0	71	0	0	27	1
DI Yogyakarta	2	63	0	0	27	7
East Java	1	71	0	0	27	1
Banten	1	81	0	0	16	1
Bali	2	67	1	0	26	4
West Nusa Tenggara	1	43	17	0	39	1
East Nusa Tenggara	0	0	21	0	78	0
West Kalimantan	1	74	1	0	24	0
Central Kalimantan	0	34	35	0	30	0
South Kalimantan	0	52	19	0	28	1
East Kalimantan	1	92	2	0	5	1
North Kalimantan	1	54	24	0	21	0
North Sulawesi	1	57	11	0	30	1
Central Sulawesi	0	13	24	5	56	0
South Sulawesi Selatan	1	79	0	1	19	0
South East Sulawesi	1	33	22	2	43	0
Gorontalo	0	56	6	0	37	1
West Sulawesi	0	53	1	2	44	0
Maluku	0	1	52	0	47	0
North Maluku Utara	1	1	39	0	59	1
West Papua	0	3	60	0	36	1
Papua	0	1	31	0	68	1
Indonesia	**1**	**69**	**4**	**0**	**24**	**2**

Source: Indonesian Bureau of Statistics, 2017

Table A2. Education attainment across welfare groups by gender in Indonesia (%)

Category	IFLS 5				Susenas			
	All	Poor	Near-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Poor & Near-Poor
Unschooled								
Men	5	11	11	11	13	22	18	20
Women	11	17	19	18	15	25	21	23
T–test (p–value)	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.00
Elementary								
Men	38	58	52	55	28	40	37	38
Women	42	57	48	52	30	41	38	39
T–test (p–value)	0.00	0.12	0.42	0.11	0.00	0.00	0.00	0.00
Junior school								
Men	18	17	18	18	20	21	22	22
Women	16	15	13	14	20	20	21	21
T–test (p–value)	0.60	0.84	0.03	0.08	0.00	0.01	0.97	0.08
High school								
Men	28	13	16	15	30	15	21	18
Women	20	9	17	14	26	13	18	16
T–test (p–value)	0.00	0.17	0.88	0.44	0.00	0.00	0.00	0.00
University/ college								
Men	11	1	2	2	8	1	2	2
Women	10	2	3	2	9	1	2	2
T–test (p–value)	0.80	0.13	0.43	0.13	0.00	0.69	0.00	0.01
Master/ doctorate degree								
Men	1	0	0	0	1	0	0	0
Women	1	0	0	0	0	0	0	0
T–test (p–value)	0.00	0.31	0.37	0.69	0.00	0.31	0.37	0.69

Source: Calculated from IFLS 5, 2014–15 and SUSENAS, 2015

Table A3. Educational attainment across welfare groups by gender in rural Indonesia (%)

Category	IFLS 5				Susenas			
	All	Poor	Near-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Poor & Near-Poor
Unschooled								
Men	7	15	16	15	18	25	22	23
Women	17	23	25	24	21	27	24	26
T-test (p-value)	0.00	0.01	0.01	0.00	0.00	0.05	0.20	0.02
Elementary								
Men	48	61	58	59	37	43	42	43
Women	51	59	53	56	38	44	43	43
T-test (p-value)	0.64	0.02	0.15	0.01	0.00	0.00	0.00	0.00
Junior school								
Men	18	11	13	12	21	20	21	20
Women	16	12	13	13	20	19	20	19
T-test (p-value)	0.22	0.29	0.96	0.44	0.00	0.00	0.90	0.01
High school								
Men	20	12	9	10	20	12	14	13
Women	12	5	7	6	16	10	12	11
T-test (p-value)	0.00	0.33	0.45	0.23	0.00	0.00	0.00	0.00
University/college								
Men	6	1	3	2	4	1	1	1
Women	5	1	2	2	5	1	1	1
T-test (p-value)	0.16	0.39	0.91	0.51	0.00	0.42	0.43	0.94
Master/doctorate degree								
Men	0	0	0	0	0	0	0	0
Women	0	0	0	0	0	0	0	0
T-test (p-value)	0.00	0.31	0.37	0.69	0.00	0.56	0.58	0.98

Source: Calculated from IFLS 5, 2014–15 and SUSENAS, 2015

Table A4. Education attainment across welfare groups by gender in urban Indonesia (%)

Category	IFLS 5				Susenas			
	All	Poor	Near-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Poor & Near-Poor
Unschooled								
Men	2	6	5	6	8	18	13	15
Women	6	10	12	11	11	21	16	18
T-test (p-value)	0.00	0.02	0.07	0.00	0.00	0.02	0.42	0.03
Elementary								
Men	28	55	46	49	20	36	31	33
Women	33	53	42	47	22	37	33	34
T-test (p-value)	0.00	0.99	1.00	0.92	0.00	0.11	0.00	0.00
Junior school								
Men	17	24	23	24	19	23	24	24
Women	17	19	14	16	19	23	23	23
T-test (p-value)	0.75	0.22	0.01	0.00	0.03	0.89	0.91	0.87
High school								
Men	36	14	24	20	39	21	30	26
Women	28	14	29	23	34	17	25	22
T-test (p-value)	0.00	0.33	0.37	0.94	0.00	0.00	0.00	0.00
University/ college								
Men	16	1	1	1	12	1	3	2
Women	15	3	3	3	13	1	3	2
T-test (p-value)	0.76	0.20	0.35	0.16	0.00	0.12	0.00	0.00
Higher degree								
Men	1	0	0	0	1	0	0	0
Women	1	0	0	0	1	0	0	0
T-test (p-value)	0.01	N/A	N/A	N/A	0.00	0.32	0.45	0.62

Source: Calculated from IFLS 5, 2014–15 and SUSENAS, 2015

Table A5. Working sector across welfare groups by gender in Indonesia (%)

Category	IFLS 5				Susenas			
	All	**Poor**	**Near-Poor**	**Poor & Near-Poor**	**All**	**Poor**	**Near-Poor**	**Poor & Near-Poor**
Agricultural								
Men	31	35	37	36	36	57	48	52
Women	23	26	21	23	35	60	50	55
T-test (p-value)	0.00	0.08	0.00	0.08	0.00	0.00	0.23	0.00
Manufacturing								
Men	23	21	23	22	22	19	22	20
Women	25	23	20	21	13	11	13	12
T-test (p-value)	0.20	0.92	0.59	0.92	0.00	0.00	0.00	0.00
Services								
Men	42	41	37	39	40	23	29	26
Women	47	48	54	51	51	27	36	32
T-test (p-value)	0.00	0.20	0.00	0.20	0.00	0.00	0.00	0.00
Others								
Men	3	4	2	3	1	2	1	1
Women	4	3	6	5	1	2	1	1
T-test (p-value)	0.00	0.38	0.03	0.38	0.00	0.11	0.04	0.11

Source: Calculated from IFLS 5, 2014–15 & SUSENAS, 2015

Table A6. Working sector across welfare groups by gender – Urban (%)

Category	Urban (IFLS 5)				Urban (SUSENAS)			
	All	Poor	Near-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Poor & Near-Poor
Agricultural								
Men	19	20	27	24	13	28	21	24
Women	16	18	10	13	9	27	17	21
T-test (p-value)	0.00	0.49	0.00	0.49	0.00	0.00	0.00	0.00
Manufacturing								
Men	25	19	23	22	28	28	31	30
Women	26	18	24	22	17	18	19	19
T-test (p-value)	0.26	0.60	0.82	0.60	0.00	0.00	0.00	0.00
Services								
Men	52	55	47	50	57	42	46	44
Women	54	57	55	56	72	54	62	59
T-test (p-value)	0.00	0.47	0.03	0.47	0.00	0.00	0.00	0.00
Others								
Men	4	6	3	4	2	2	2	2
Women	5	6	11	9	1	2	2	2
T-test (p-value)	0.23	0.50	0.02	0.50	0.00	0.09	0.11	0.09

Source: Calculated from IFLS 5, 2014–15 and SUSENAS, 2015

Table A7. **Working sector across welfare groups by gender – Rural (%)**

	IFLS 5				Susenas			
Category	All	Poor	Near-Poor	Poor & Near-Poor	All	Poor	Near-Poor	Poor & Near-Poor
Agricultural								
Men	43	48	47	48	58	73	66	69
Women	31	33	33	33	58	75	70	72
T-test (p-value)	0.00	0.13	0.02	0.13	0.00	0.00	0.00	0.00
Manufacturing								
Men	21	22	24	23	16	13	16	15
Women	25	27	15	20	9	8	9	8
T-test (p-value)	0.52	0.43	0.57	0.43	0.00	0.00	0.00	0.00
Services								
Men	33	28	28	28	24	13	17	15
Women	40	40	52	47	32	16	20	18
T-test (p-value)	0.00	0.43	0.00	0.43	0.00	0.00	0.00	0.00
Others								
Men	3	2	1	1	1	1	1	1
Women	4	0	0	0	1	1	1	1
T-test (p-value)	0.00	0.70	0.33	0.70	0.03	0.81	0.28	0.81

Source: Calculated from IFLS 5, 2014–15 & SUSENAS, 2015

Table A8. **Working sector by gender and location (%)**

Category	Urban+Rural	Urban	Rural
Men			
Agricultural	35	13	59
Manufacturing	24	30	18
Services	41	57	24
Women			
Agricultural	32	8	57
Manufacturing	15	19	11
Services	53	73	32

Source: Calculated from SAKERNAS, 2015

Table A9. Examples of agent and sub-agent 3-kg LPG cylinder prices

Province/City	Agent	Sub-Agent	YEAR	Regulation Title/Source
West Sumatera	12,750	17,000	2014	Governor of West Sumatera Regulation No. 95/2014
Jakarta (inland)	12,750	16,000	2015	Governor of DKI Jakarta Regulation No. 4/2015
Jakarta (island, south)	12,750	18,500	2015	Governor of DKI Jakarta Regulation No. 4/2015
Jakarta (island, north)	12,750	19,500	2015	Governor of DKI Jakarta Regulation No. 4/2015
Bali (<60km from agent)	-	12,750	2010	Governor of Bali Regulation No. 17/2010
Bali (60km > 90km from agent)	-	13,335	2010	Governor of Bali Regulation No. 17/2010
Majalengka (West Java)	12,750	13,650	2011	Regent of Majalengka Regulation No. 5/2011
Payakumbuh (West Sumatera)	12,750	17,000	2015	Mayor of Payakumbuh Regulation No. 17/2015
Sumedang (West Java)	-	16,500	2015	Regent of Sumedang Decree No. 510/KEP.250-HUK/2015
Sidenreng Rappang (South Sulawesi)	13,500	15,000	2014	Regent of Sidenreng Rappang RegulationNo. 12/2014
Cilacap (Central Java, <60km from agent)	12,750	15,500	2015	Regent of Cilacap Regulation No. 39/2015
Cilacap (Central Java, >60km from agent)	12,750	15,800	2015	Regent of Cilacap Regulation No. 39/2015
Demak (Central Java, Normal)	12,750	14,000	2014	Regent of Demak Regulation No. 41/2014
Demak (Central Java, Specific Villages)	12,750	14,500	2014	Regent of Demak Regulation No. 41/2014
East Luwu (South Sulawesi, Zone I)	16,250	18,000	2015	Regent of East Luwu Regulation No. 5/2015
East Luwu (South Sulawesi, Zone II)	17,150	18,900	2015	Regent of East Luwu Regulation No. 5/2015
East Luwu (South Sulawesi, Zone III)	18,250	20,000	2015	Regent of East Luwu Regulation No. 5/2015
Polewali Mandar (West Sulawesi)	14,000	15,500	2013	Regent of Polewali Mandar Decree No. KPTS/542/842/HUK

Note: Agent prices above IDR 12,750 indicates that the supply comes from an agent or sub-agent in anther region.

Source: Indonesia, 2015a, 2015b; Terkini, 2015