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RESEARCH BRIEF

Fuel Subsidy Reforms: Lessons Learned from Indonesia's Experiences

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Fuel subsidy is a common phenomenon in many countries, including Indonesia. Fuel subsidies are generally implemented to protect consumers, especially poor households, from high and volatile fuel costs for lighting, cooking, and transportation. However, fuel subsidies are both inefficient and inequitable (IMF, 2013; del Granado, Coady, & Gillingham, 2012). They encourage excessive fuel use, delay the implementation of energy-saving technologies, and can be designated as high priority public spending that can in turn result in reduced spending on physical infrastructure, education, health, and social protection. Most of the benefits of fuel subsidies also go to high-income groups who tend to consume more fuel (Dartanto, 2013; del Granado et al., 2012).

The Government of Indonesia has had significant influence over domestic fuel prices over many decades. Indonesia has likewise no longer been a net-oil exporting country, owing to decreasing oil productions and uncontrolled consumption. Hence, oil revenues and fuel subsidies consistently dominate Indonesia's economic and budgetary agenda especially when international oil prices fluctuate sharply (Dartanto, 2013). Despite prices of industrial diesel oil (IDO) and fuel oil following the international market since 2005, the government continues to control retail prices for gasoline, automotive diesel oil (ADO), and kerosene. Given the pressure on fiscal space and increase in oil prices, the government has been carrying out irregular and ad hoc adjustments to domestic fuel prices.

Though, many studies, such as those of Dartanto (2013), Agustina, del Granado, Bulman, Fengler, and Ikhsan (2008), and Ikhsan, Dartanto, Usman, and Sulistyo (2005), have suggested the importance of retail fuel subsidies' reform, past governments in Indonesia have remained reluctant to pursue significant reform due to the fear of adverse socio-economic impacts and public discontent. Fortunately, the new administration of Joko Widodo through Presidential Regulation No. 191/2014 (Republic of Indonesia, 2014) has mandated the deregulation and full pass-through of gasoline prices (Premium RON [Research Octane Number] 88) to follow international prices; however, the government still continues to provide a fixed subsidy of IDR1,000/litre for diesel oil price. The Ministry of Energy and Mineral Resources is regularly reviewing and deciding the retail gasoline price (Premium RON 88) every two weeks. Later the price will be reviewed every six months. Reducing fuel subsidies enables the government to have more fiscal space to boost the economy through investments on infrastructures, human capital and social programs.

This study aims at evaluating the current situation of fuel subsidy reforms in Indonesia, and to provide evidence of the challenges and opportunities in reforming fuel subsidy. What are the key elements of

success story of fuel subsidy reforms in Indonesia? Despite differences in socio-economic and political situation with other countries, Indonesia's experience on fuel subsidy reform would provide valuable insight for developing countries how to smoothly reform their energy sectors with less social and political objections. As most of other net oil-importing countries, the most challenges of cutting fuel subsidies (fuel subsidy reforms) are not on economic rationale, but more on social and political challenges. The reforms promote more environment friendly development as well as correct distortive resource allocation to more productive activities. The structure of the paper is as follows: the second section provides a brief review on the current conditions of fuel subsidy reforms in Indonesia. The third section discusses the future of energy reforms in Indonesia as a challenge and an opportunity. Finally, the last section deals with key findings and conclusions.

Review on Fuel Subsidy Reforms in Indonesia

Why We Need Reforms: Fuel Consumptions and State Budget

A rapidly growing middle class has significantly increased the energy consumption in Indonesia by an average of 4.7% per annum (3.4% per year without biomass). Even though the energy intensity has decreased over the last decade, the growth elasticity to energy consumption is still high. A 1% increase in economic growth is perceived to increase energy consumption by almost 0.78%. As a consequence to the rapidly growing fuel consumption coupled with highly regulated retail fuel prices, Pertamina-state owned enterprise that has a mandate from the government to provide and distribute gasoline (*BBM-Bahan Bakar Minyak*) needs to import fuels at international price and to sell it at the subsidised price to fulfill domestic demand. The losses incurred by Pertamina is then financed by the Government.

This has caused twin deficits in terms of trade and budget, in which oil's trade balance deficit reached USD27.65 billion in 2013 (Dartanto, 2015). Moreover, this twin deficits have pressured the Indonesian Rupiah (IDR)'s depreciation hence, leading to a circular trap. Depreciation makes imported oil more expensive, which in turn means higher subsidies and more budget deficit. The fluctuation of oil and gas revenues follows the fluctuation of crude oil prices. Unfortunately, due to underpriced gasoline retail prices, oil revenue deficits (revenue minus subdies) have continously increased since 2011 (see Figure 1). A plunge in the price of oil will reduce the fiscal pressure caused by fuel subsidies. As of 2015, the costs of fuel subsidies take only one-third of the cost of fuel subsidies in 2014.

Energy subsidies have always ranked high in Indonesia's economic agenda. Energy subsidies have constantly been a burden to the government budget. As an example, energy subsidies comprised 3.8% of GDP in 2005, which was followed by an increase of 4.5% in 2008, and 3.9% in 2014 (Ikhsan, 2014). This increase was due to the decline in the country's oil production and the increase of domestic oil consumption. The government, for almost four decades, has pursued series of reforms. President Soeharto adjusted retail fuel prices 19 times. Under President Wahid and President Megawati's administrations, fuel prices were increased twice. And, under President Yudhoyono's administration, fuel prices were increased four times.

From a historical perspective, Indonesia has benefited from former President Abdurrahman Wahid's initiation of domestic fuel price deregulation during his three-year term from 1999. Wahid began by setting fuel prices for large industries at 50% of the international price with the intention of eventually moving to a fully deregulated market. President Megawati Sukarnoputri continued Wahid's efforts and, by 2003, successfully deregulated industry fuel prices so that the domestic prices were in accordance with the international market. Both presidents had regularly tried to deregulate retail fuel prices; but, when Megawati left office in 2004, the deregulation policies remained unfinished (Dartanto, 2014).

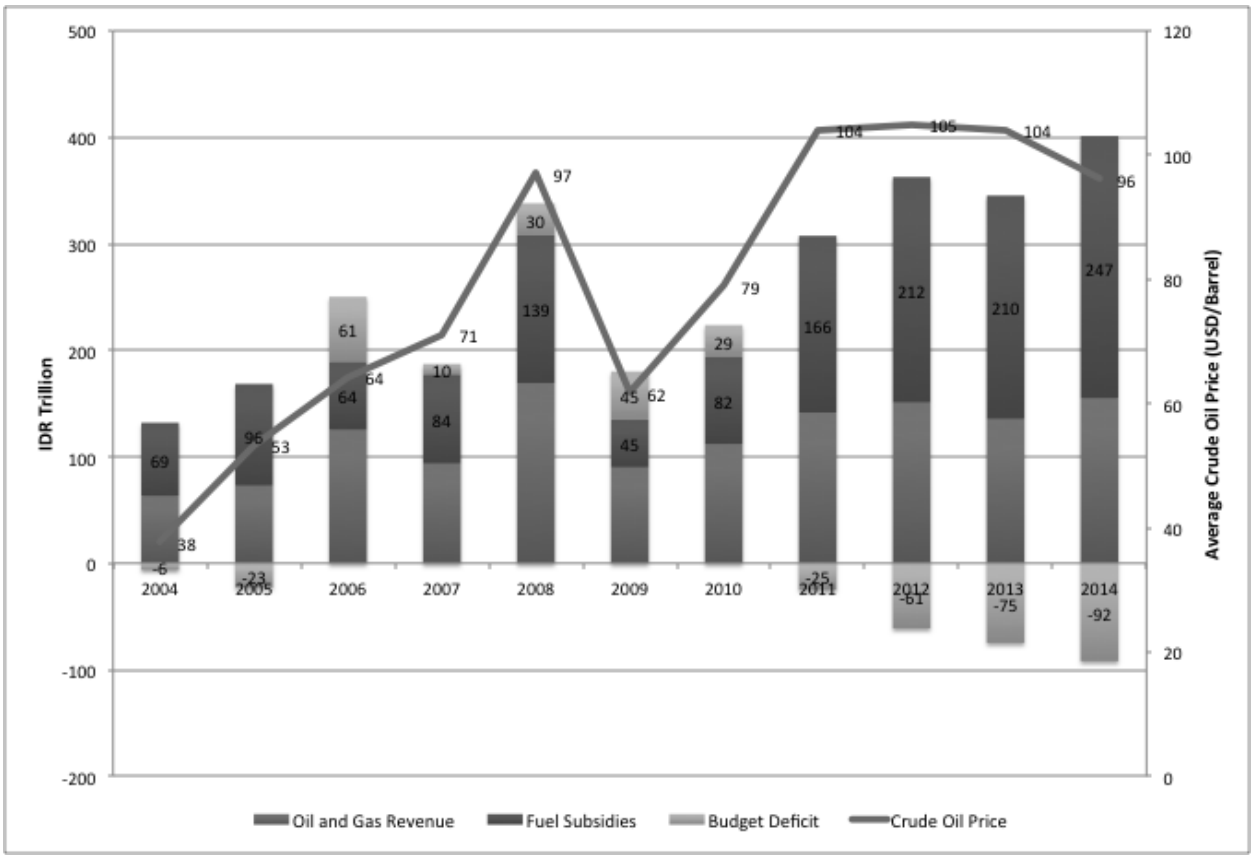

Figure 1. Oil and gas revenue and deficit (in IDR trillion).

Sources: *Author's compilation based on the data from Dartanto (2013), Ministry of Finance (2015) and Ministry of Energy and Mineral Resources (2015)*

The Government of Indonesia also had significant influence over domestic fuel prices for many decades. Over the years, the government has carried out irregular and ad hoc adjustments to the domestic fuel prices to achieve some development agenda. The most significant fuel adjustments were in October 2005, when the gasoline price increased more than 85%, and in May 2008, during the fiscal crisis when the government again increased the fuel price to almost 33%. Even when the prices were decreased three times between December 2008 and January 2009, the high oil price, budget, and trade deficit problems, and then a tight fiscal space forced the government to once again raise the fuel prices in June 2013. This study finds a repeating pattern—if fuel subsidies cost around 3.5% of GDP then the government would adjust the retail fuel prices in the following period.

Worth noting is that a high international oil price does not only increase fuel subsidies but also electricity subsidies. The higher the international oil price the higher will be the cost of electricity production since *Perusahaan Listrik Negara* (PLN), the state-owned electricity company, still relies on diesel oil to generate electricity in many of its power plants though the share is decreasing from 25% in 2005 to 15% in 2012 due to the substitution of coal-based power generation. Similar to the fuel subsidy paid to Pertamina, the government has to finance the price gap between the production cost and selling price for electricity subsidy. Under-priced electricity and a growing demand from middle class have led to a massive 33% increase of electricity consumption in the span of four years. International Energy Agency reported that the consumption increased from 127.4 Billion KWh in

2008 to 167.5 Billion KWh in 2012. However, the government has gradually reduced the electricity subsidy by increasing the tariff equal to production costs of electricity (over 450 Watts), especially for middle and high-income subscribers. Both the low price of electricity and fuel consequently encourage overconsumption in energy use.

Past Fuel Subsidy Reforms and Their Impacts

Fuel Subsidy Reforms and their impacts on Macroeconomic, Poverty, and Inequality

Fossil fuel consumption subsidies need to be phased out since they tend to discourage individuals and households to consume less energy and invest in clean energy technology. It is important to phase out fuel subsidies in order to correct their distortive resource allocation and their effects that increase inequality since fuel subsidies tend to be regressive. Regressive subsidy means that, given the fuel consumption structure, the poorer households enjoy fewer benefits than richer households. Dartanto (2013) showed that the top 10% of rich people enjoy a fuel subsidy of around IDR111,533 per capita per month while the bottom 10% of poor people enjoy around IDR10,787 per capita per month. Richer households are often those who can afford to purchase a vehicle. Moreover, Ikhsan (2014) showed that the owners of vehicles, who consume an average of 200 litres per month, receive a monthly subsidy of around IDR1,000,000 while motorcycle owners receive a monthly subsidy of IDR100,000. In contrast, the poorest groups receive only around IDR10,000 per month. For this reason, fuel subsidies are one of sources of increasing inequality in Indonesia.

However, during the very important "Big Bang" of fuel subsidy reform in 2005, the government launched measures or compensation policies to alleviate the potentially negative impacts on economic growth and inequality. In 2005, the government adjusted fuel prices twice at a significant level and initially launched direct cash transfer as one of their mitigation policies. The macroeconomic impacts of this reform were temporary, irresolute, and still manageable. Some economic indicators such as economic growth and inflation had been affected but the economic recovery process took only 3–4 quarters of the year (Ikhsan, 2014). The 2005 reform faced massive social objection and political challenges due to lack of socialization.

The increase of fuel prices in 2008, combined with the global financial crisis, led to a temporary rise in inflation and declining economic growth. Fortunately, these impacts did not considerably increase the poverty incidence in Indonesia because of two important reasons. Firstly, compared with 2005, the economy was more resilient to the increases in fuel prices since the social protection system for protecting low and vulnerable income groups was already developed. Secondly, the compensation policies put in place were more efficient. The same pattern was also observed in 2013. With appropriate compensation mechanisms, such as cash transfers, scholarships for the poor, food subsidies, and other policies, the adverse impacts of removing fuel subsidies can be minimized. Looking at the fuel subsidy reforms in Indonesia in the last decade, this study observed that the main reason of reforms in Indonesia are most likely dominated by fiscal pressures instead of an environmental reason or a correction to distortive allocation.

Compensation Policies for Protecting Low Income Groups: The Past Experience

The fuel subsidy reforms were accompanied with redistribution schemes to alleviate adverse effect on the poor and vulnerable group. Figure 2 presents the budget allocation for compensation policies for fuel subsidy reforms since 2005. In 2005, the government first introduced the unconditional cash transfer—called *Bantuan Langsung Tunai* (BLT) —to mitigate the adverse impacts of the Big Bang of fuel subsidy reform. This cash transfer costs around IDR4.62 Trillion (US$ 0.5B). Since this policy was first launched, there are several problems with the distribution of the cash transfers, especially with regard to families who were eligible to the payment but did not receive it while some who were not eligible did. The low quality of data and statistical records resulted on both exclusion and inclusion errors. However, in any respect, this policy had still properly mitigated the adverse impacts of the fuel subsidy reform.

2005, 2008

BLT
2005 : 4.62 trillion rupiah
2008 : 14.1 trillion rupiah
(source: tempo)

PROGRAM KELUARGA HARAPAN
Meraih Keluarga Sejahtera

2011, 2013, 2014

BLSM
2013 : 9,7 trillion rupiah
2014 : 5 trillion rupiah
2015 : 5 trillion rupiah
(source : jawapos)

RASKIN
2011 : 15.27 trillion rupiah
2012 : 15.7 trillion rupiah
2013 : 17.1 trillion rupiah
2014 : 18.8 trillion rupiah

PKH
2013 : 5.7 trillion rupiah
2014 : 7.6 trillion rupiah

BSM
2014 : 6,59 trillion rupiah

INFRASTRUCTURE DEVELOPMENT
2013 : 188.4 trillion rupiah

Figure 2. Compensation policies of reducing fuel subsidies

Note: BLT = unconditional cash transfer; BLSM = unconditional cash transfer; RASKIN (Beras Miskin) = cheap rice for the poor (food subsidies); PKH (Program Keluarga Harapan) = Conditional Cash Transfer; BSM = Scholarship for the poor. Both BLT and BLSM are exactly the same just a difference in name.

Source: *Dartanto, 2015*

Based on the 2005 experience, the mitigation policies of the 2008 reform were better prepared by allocating more resources and covering more poor and vulnerable households. In addition, in response to the 2013 fuel subsidy reform, the government distributed almost IDR 9.7 trillion of unconditional cash transfer (*Bantuan Langsung Sementara Mandiri* [BLSM]), previously so called as BLT), IDR5.7 trillion of conditional cash transfer (PKH), and IDR17.1 trillion of Raskin (cheap rice for the poor) to affected households, especially the poor and near-poor groups (around 40% of the lowest income group). In the most recent reform (2014), the government allocated around IDR18.68 trillion for Raskin, IDR7.6 trillion for conditional cash transfer, IDR5 trillion for unconditional cash transfer, and IDR6.59 trillion for *Bantuan Siswa Miskin* program (scholarship for poor students). Comparing to the 2005 and 2008 reforms, compensation policies in the 2013, 2014, and 2015 reforms were better targeted to low and vulnerable income groups due to the unified and credible database that could minimize exclusion and inclusion errors.

The Current Fuel Subsidy Reforms

Falling of Crude Oil Prices and Opportunity for the Reform in Indonesia

The inefficiency of fuel subsidy needs to be addressed by every ruling government as it causes severe budget deficits and worsen inequality. In the beginning of Joko Widodo administration (November 2014), the government, through the Ministerial Regulatory No. 34/2014 (Ministry of Energy and Mineral Resources, 2014a), raised the fuel price from IDR6,500/litre to IDR8,500/litre due to the lack of fiscal space to finance many social programs promised during presidential campaign. However, the fall of global oil

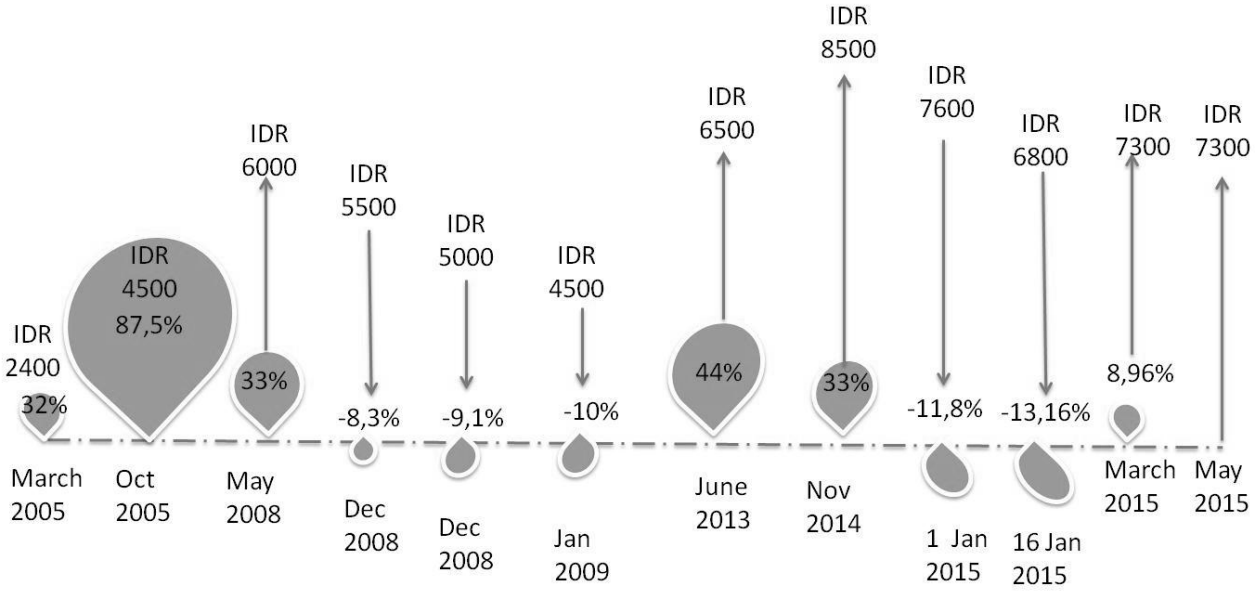

Figure 3. *Trend of gasoline oil price*

Source: *Dartanto (2015)*

prices from USD100/barrel to USD50–US$60/barrel later expedited fuel subsidy reforms in Indonesia. In early January 2015, the government announced to decrease the fuel price from the initial IDR 8,500/litre to IDR 7,600/litre. Later on 5 January 2016, the fuel price was set at IDR6,950/litre. The price of IDR 6,950/litre then is very close to its actual economic price in the world market. In terms of diesel oil price, as it is mostly used for transportation, the government provided a fix subsidy of around IDR1,000/litre. However, diesel oil price also fluctuates overtime.

Unlike the previous fuel price adjustment, the increase in fuel prices in November 2014 was because the allocation of fuel subsidies have exceeded the budget and the new administration also needed additional budget to increase social assistance programs such as *Kartu Indonesia Sehat* (Indonesia Healthy Card) and *Kartu Indonesia Pintar* (Indonesia Smart Card) that were promised during the campaigns. Moreover, the decline in the world oil prices became a blessing to the Indonesian government to smoothly reform fuel prices without any objection from politicians and the community because the adverse socio-economic impacts of the reforms were relatively small.

The Indonesian Ministry of Energy and Mineral Resources reviewed the retail fuel prices every two weeks to follow the international market price until April 2015. In the early stage, this policy was not smoothly implemented due to many protests from society. The formula used for this review is as follows:

$$HP_i = HIP_i + \alpha_i$$

Where HP is the benchmark price; HIP is the average market price index; α is the profit margin and transportation costs; and i is the type of fuel (gasoline, kerosene and diesel oil). HIP follows the price of MOPS (Mean of Platts Singapore). The Ministry of Energy and Mineral Resources, through regulatory No. 0219 K/12/MEM/2010 (Ministry of Energy and Mineral Resources, 2010) and No. 3784 K/12/MEM/2014 (Ministry of Energy and Mineral Resources, 2014b), regulates the formula of HIP as follows:

$$HIP_{gasoline} = 0.9842 x MOPS_{mogas92}$$

$$HIP_{diesel\ oil} = 0.9967 x MOPS_{gasoil\ 0.25\%\ sulphur}$$

$$HIP_{kerosene} = MOPS_{jet\ kerosene}$$

To speed up the reform in the oil and gas sector, the Government has formed a special taskforce called "Oil and Gas Reform Team *(Satuan Tugas Mafia Migas)*" that have worked between December 2014 and May 2015. The creation of the taskforce was aimed at improving transparency in the oil and gas sectors. The Oil and Gas Reform Team recommended some policies to the Government such as: 1) simplifying of determining fuel subsidies; 2) proposing a fixed subsidy of fuel; and 3) upgrading the domestic refinery to produce RON 92.

Indonesia has now almost fully phasing-out fuel subsidies. This is carried out faster than predicted or expected. The sharp drop in oil prices from US$100/barrel in June 2014 to US$50/barrel in January 2015 offered a window of opportunity to fully reform the energy subsidy. However, there are questions concerning the future of the fuel subsidy reform because there has been no signal from the government to make a regular adjustment of fuel prices despite its promise to review the fuel price every six months to reduce uncertainty in society. The government still takes control in deciding the price for gasoline of RON 88. However, the decision to control gasoline prices for RON 92 and RON 95 is given to Pertamina-State Owned Enterprise. Pertamina now gradually reduces the distribution of RON 88, especially in big cities, and substitutes it with Pertalite (RON 90). As Pertamina fully controls the price of Pertalite, the government's control over domestic fuel prices lessens.

Reducing Fuel Subsidies and Reallocation Policies in the 2015 Revised Budget

The fuel subsidy reform in 2014–2015 has substantially increased the budgetary savings by almost IDR207 trillion (USD15.9 billion). In the 2015 budget, the allocation of energy subsidies has shrunk to 7% of total expenditure (Figure 4). The government reallocated substantial budget savings into more productivity enhancing allocation, including four main components (Ministry of Finance, 2015): 1) infrastructure development, 2) social policies such as health expenditure, 3) food security, and 4) a village transfer fund. Almost half of budget savings were allocated into infrastructure development. Infrastructure expenditure in the 2015 revised budget increased by almost IDR99 trillion compared to the 2015 proposed budget. The government can reallocate the significant amount to be used for developing a new highway (125 KM), a new national road (616.75 KM), a cross-border road (390.66 KM), and improve at least eight airports. The infrastructure expenditure in the 2015 budget is the highest recorded expenditure in the last decade.

The second largest increase of reallocation is in food security where the government increased its allocation to IDR34 trillion compared to the 2015 proposed budget. This amount will be disbursed for fertilizer subsidies, intensification of agriculture land, mechanization of agriculture activities, rehabilitation of irrigation, and the increase in fisheries production. The other substantial change in the 2015-revised budget is the doubling of the village transfer fund. The village transfer fund is a block grant distributed to all villages for rural development and empowerment. Ministry of Finance (2015) reported that the village transfer fund increased from IDR9.1 trillion to IDR20.8 trillion. In addition, the rest of the budget savings are intended to reduce the budget deficit to support a sound macroeconomic stability and fiscal sustainability. With the revised budget, the budget deficit can now be reduced from 2.21% to 1.90%.

Fuel subsidies in the revised 2015 budget are worth around IDR64.7 trillion (US$5.02 billion)—around 47% of fuel subsidies, which is one-third of the amount spent in 2014. Since 2015, there has been a significant change in the pattern of energy subsidies in which the domination of fuel subsidies over the electricity subsidies has ended. The government has also cut the volume of subsidised fuel consumption from 46 million kilolitres to 17.95 million kiloliters for keresone and diesel oil (Ministry of Finance, 2015). The government now focuses on several issues: 1) implementing a fix subsidy for diesel oil, 2) reviewing the gasoline price every two weeks (later six months), 3) promoting the conversion program of fuels to LNG in public transportations, 4) promoting renewable fuels, and 5) expanding natural gas distribution infrastructure in cities.

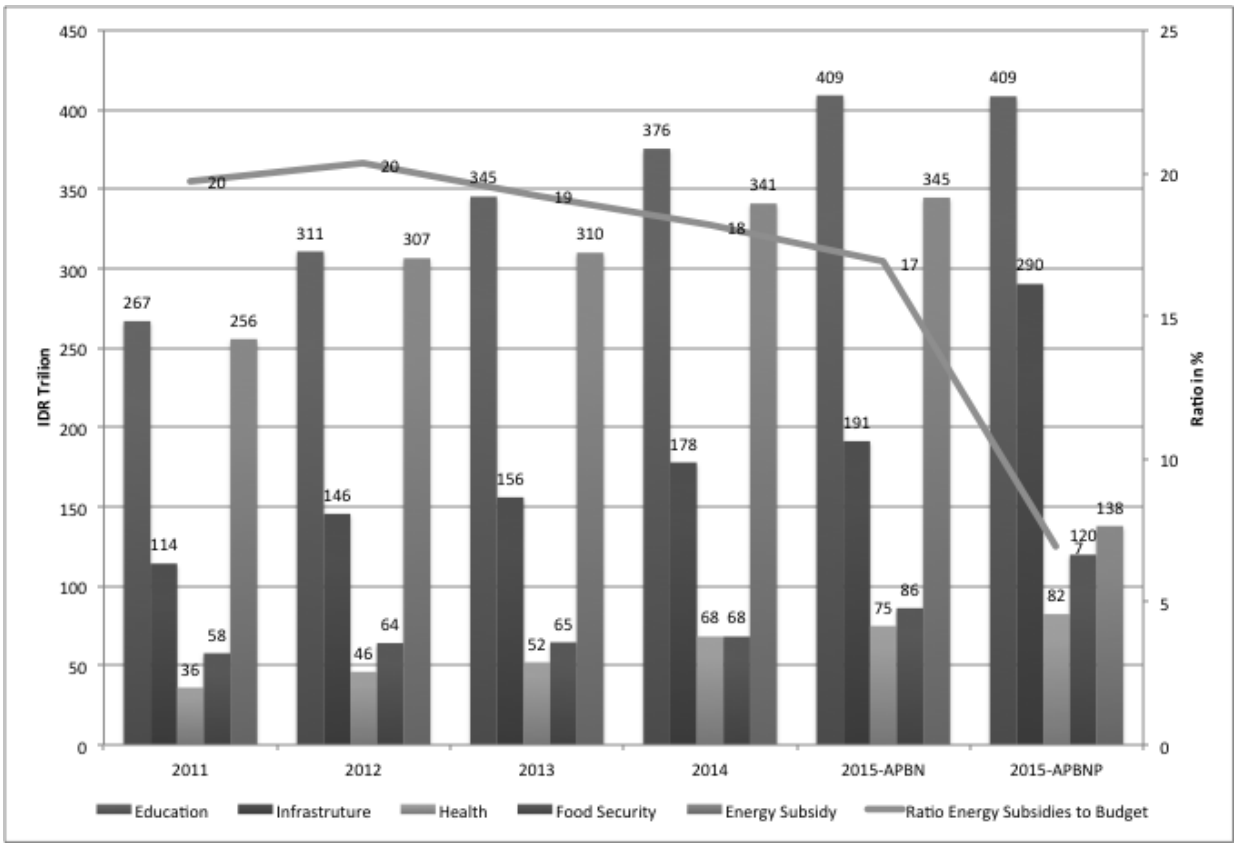

Figure 4. Trends of energy and non-energy subsidies.

Note: *APBN is the proposed budget, while APBNP is the revised budget*

Source: *Ministry of Finance (2015)*

The complete removal of fuel subsidies enables the government to allocate more resources to more efficient policies and programs. Improvements in infrastructure (a physical capital) and human capital (health and education), rural empowerment, and food security will boost socio-economic development in Indonesia, while social assistance or direct transfer can ensure that low-income groups maintain their consumption. These policies will not only improve the income distribution but also promote long term and sustainable economic growth.

The Socio-Economic Impacts of Reallocation of Fuel Subsidies

This section surveys the possible impacts of the 2014–2015 fuel subsidy reform and the effect of its reallocation policies on economic growth, environmental pressure, and poverty-inequality. This study surveys three main studies (Fathurrahman, Kat, & Soytas, 2015; LPEM FEB UI, 2014; & Dartanto, 2013) related to the impacts of reducing fuel subsidies and its reallocation policies. All studies confirm that the 2014–2015 fuel subsidy reforms will result less adverse impacts on macroeconomic condition as well as household welfare.

Fathurrahman et al. (2015) showed that cutting 50% fuel subsidy and reallocating to several key sectors (i.e., Agriculture, Hunting, Forestry, and Fishing; food, beverages, and tobacco; and government, defense, and education) is showing the most desired results. It can increase the sectoral output as well as GDP, increase employment, decrease energy demand, and has very little effect on the increase in CO2 emissions. The results of the simulation clearly suggest that the

reallocation of fuel subsidy can "correct" sectors where low-income groups work and can achieve the objectives of protecting the poor without hampering the environment. The reallocation of fuel subsidies to these sectors can improve economic and social development and at the same time bring less harm to the environment.

LPEM FEB UI (2014) found that reallocating 15% of fuel subsidies into Universal Health Coverage (UHC) program will promote higher economic growth and will not raise inflation as many observers and politicians believe. Reducing fuel subsidies will in fact shrink the economic growth and raise the price level while reallocating the same amount from fuel subsidies into the UHC program will promote economic growth as a result of construction activities and reduced health costs. In terms of distributional impacts, reallocating 15% of fuel subsidies for the UHC program will also benefit most low-income groups. Therefore, this policy will not only provide better access to health services but will also reduce inequality. Reallocating fuel subsidies into financing UHC will not only promote better resource allocation but also promote sustainable economic growth through investing in human capital.

Dartanto (2013) found that a decrease in fuel subsidies is followed by a decrease in macro-economic indicators such as private consumption, imports, and gross domestic product (GDP), while other indicators such as consumer price index (CPI) increases. The simulation results show that a 100% decrease in fuel subsidies increases the CPI by 0.77%. An increase in CPI will be detrimental to household welfare, which ultimately decreases household (private) consumption, as well as GDP. The direct effect of reducing fuel subsidies is theoretically an intensification of poverty, since the purchasing power of the poor decreases due to an increase in the price of fuel products and other products using fuels as production inputs. A decrease in fuel subsidies by 25%, 50%, 75%, and 100%, increases the headcount index by 0.259, 0.392, 0.67, and 1.057 respectively (in percentage points). Meanwhile, cutting 25% of fuel subsidies and reallocating it to government spending (60%) and government transfers to households (40%) can perfectly absorb the adverse effects of reducing fuel subsidies while also reducing the number of poor people by 565,770 (0.27 percentage points). The 100% removal of fuel subsidies and the reallocation of 50% of the amount to government spending, transfers, and other subsidies could decrease the incidence of poverty by 0.277 percentage points.

The Future of Energy Reforms in Indonesia – Challenges and Opportunities

The recent plunge in oil prices will contribute to the significant change in energy policies both in importing and exporting countries. A sharp plunge in oil prices of almost 40% since mid-2014 will generate income shifts from oil-exporting to oil-importing countries. A lower oil price will contribute to economic growth and lower domestic retail fuel prices in oil-importing countries. Oil-exporting countries will face fiscal distress due to fiscal revenue losses. This condition forces these countries to cut their public expenditure that can lead investors to reassess the growth prospects of oil-exporting countries. The World Bank (2015) estimated that a 10% decrease in oil prices could raise growth in oil-importing economies by some 0.1–0.5 percentage points, depending on the share of oil imports in GDP. At the same time, the economic growth in some oil-exporting countries could contract by 0.8–2.5 percentage points in the year following a 10% decline in the annual average oil price.

The impacts of the plunge in the price of oil on the Indonesian economy will be ambiguous. As a net-oil importing country, the central government of Indonesia will benefit due to a decrease in fuel subsidies, but some of its oil-producing provinces such as Riau, South Sumatera, East Kalimantan, and Bojonegoro will suffer due to lost revenues. In the decentralized context of Indonesia, the oil revenue will be shared between the central government and sub-national government through the scheme of natural revenue sharing. The central government can use the saved money from fuel subsidies to boost the economy, while some sub-national governments have to adjust spending as a response to a decrease in natural resource rent sharing. Shrinking of sub-national governments' budget can lessen regional economic activities. Therefore, this study predicts that the net impacts of a plunge in oil price in the Indonesian economy will be neutral since

the positive impacts on the national economy will be offset by a shrinking regional economy.

Declining oil prices present an opportunity to reform energy taxes and fuel subsidies. Fiscal resources released by lower fuel subsidies could either be saved for fiscal space or be reallocated towards better-targeted programs to assist poor households, critical infrastructure, and human capital investments. However, declining oil prices provide incentives for increased oil consumption; thus, policymakers could modify tax policies on the use of energy, especially in countries where fuel taxes are low such as Indonesia. Moreover, lower oil prices represent a potential opportunity for developed countries to implement a price on carbon. The current discussions on energy policy now focuses on: 1) how to reallocate the fuel subsidies into more productive activities; and 2) in the case of oil price continuously decreasing, should government develop the sovereignty fund of fuel taxes?

A Future Possibility of Sovereign Wealth Fund from Fuel Tax Revenues

Fossil fuels are considered non-renewable energy and deplete over time. Therefore, the current generation should take into consideration the fact that the consumption of these resources affects future generations. If oil prices are continuously declining over the next period, then the retail fuel prices in Indonesia will decline below the existing price (before the reform price). This induces a high oil consumption that creates disincentives in investing in clean and energy saving technologies and encourages an overconsumption in energy. Both of these will most likely increase GHG emissions.

One possible policy for Indonesia to control overconsumption of energy while preserving the environment is to impose or increase fuel taxes as done in many other countries. The collected tax money can be managed under a national sovereignty fund, though a national sovereignty fund still does not exist in Indonesia. This fund can be utilized for preserving the environment as well as investment in human capital, clean technology, and research and development.

A Sovereign Wealth Fund for oil or gas is a government-owned investment fund generated from the surplus of natural resources exports such as oil, natural gas, and copper. In Indonesia's case, the fund is earned from the difference between the global oil prices and the benchmark price, which is set higher than the global price. The surplus is saved in the sovereign wealth fund to avoid the volatility of global oil prices. If the global oil prices spike at a latter date, the government can use the fund from the sovereign fund to finance the difference between the global prices and the benchmark price. Thus, the funds' objectives are to soften the impact of volatile global oil prices, manage wisely the petroleum resources that will benefit the current and the future generations, and prevent the undesired greenhouse gas emissions caused by fossil fuel combustions. Several countries have already established sovereign wealth funds based on oil and gas. For instance, Norway has the world's largest sovereign wealth fund funded by oil revenue with assets that amount to USD882 billion (The world's biggest sovereign funds, 2015). Timor Leste also has its sovereign wealth fund based on oil, which is named Timor Leste Petroleum Fund, since 2005. Its assets have reached almost USD16.6 billion (Petroleum Fund Administration Unit, 2015).

Conclusion

Most developing countries, including Indonesia, have heavily controlled domestic fuel price, even though this policy is inefficient, inequitable, and not environment friendly. The recent plunge in oil prices will be a blessing for net-oil importing countries to smoothly and significantly reform their energy policies. The most obstacles to reform fuel subsidies are not about the economic rationale, but more on socio-political challenges and objections. In the case of Indonesia, the new administration of Joko Widodo, through the Presidential Regulation No. 191/2014, has initiated to deregulate and fully pass-through gasoline prices (Premium RON 88) to follow the international price and to introduce a fixed subsidy for diesel oil price. The retail fuel prices will be evaluated every two weeks and later will be evaluated every six months. The lessons learned of a successful strategy to fuel subsidy reforms in Indonesia include: 1) combining reductions in fuel subsidies with measures to protect

the poorest (compensation policies) that Indonesia has experienced implementing compensation policies since 2005; 2) credible database for compensation targeting; 3) using the resulting saving in productivity enhancing activities such as infrastructure, education, and health; 4) making fuel pricing mechanisms more robust and transparent; 5) strong and credible leadership; 6) right moment. Furthermore, this study observes that the main reason of reforms in Indonesia is most likely dominated by fiscal pressures instead of an environmental reason or a correction to distortive allocation.

The fuel subsidy reform has created substantial budgetary savings. In the revised 2015 budget, the fuel subsidy is projected to cost around IDR64.7 trillion (US$ 5.02 billion), which is one-third of the amount spent in 2014. With approximately IDR207 trillion additional funds (USD15.9 billion), the government can allocate the amount to infrastructure projects as well as social policies to ensure sustainable economic growth. Moreover, the reallocation of fuel subsidies can also lower budget deficits to support fiscal sustainability. Reducing fuel subsidies coupled with several reallocation policies will not only protect the poor but also will promote a clean environment.

If the world crude oil price are continuously declining over the next period, then the pass-through domestic fuel price following the international price will lead the retail fuel prices in Indonesia declining below the existing price (before the reform). This will induce a high consumption and also provide disincentives for investing in clean and energy saving technologies. Therefore, Indonesia should consider a Sovereign Wealth Fund for Oil that could be earned from the difference between the global prices and the benchmark price, which is set either higher than the global price or as same as pre-reform prices. The objectives of this fund are to soften the impact of volatile global oil prices, to manage wisely the petroleum resources that will benefit the current and the future generations, and to prevent the undesired greenhouse gas emissions caused by fossil fuel combustions.

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