Fossil Fuel Subsidy Reform in Indonesia and Mexico

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International Energy Agency

International Energy Agency
9 rue de la Fédération
75739 Paris Cedex 15, France

www.iea.org

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Executive summary

Fossil fuel subsidies have been employed by most countries around the globe at some point in time to lower the cost of energy in order to support energy-intensive industries, the transport of people and goods, and the electrification of households, especially the poor. However, numerous studies have found that the economic and environmental costs of fossil fuel subsidies far outweigh any social benefits, which can be obtained by other more effective means. In particular, fossil fuel subsidies become a major drain on government budgets and often undermine to the decarbonisation of the power sector. Drawing on the International Energy Agency´s (IEA) global experience and extensive analysis of fossil fuel subsidies, this study provides an in-depth look at fossil fuel subsidy reform in Mexico and Indonesia and formulates policy recommendations to enhance sustainable fossil subsidy reform in both countries.

The review of international experience of fossil fuel subsidy reform renders a mixed picture: in regard to policy design, governments often focus on short-term issues for pricing, while the significance of longer-term aspects is underestimated. However, the questions of institutional linking of national fuel prices to international oil prices and more fundamental issues such as general market structure and ownership should also be included in overall reform strategies. With regard to public consultation and impact assessment, governments tend to underestimate the need for detailed preparatory work in these areas, neglecting a crucial component for sound decisions on policy design. In addition, a lack of impact analysis also affects the final element of a basic strategy: communication. Again, without a well-targeted communications campaign, the chances for sustainable reform success are significantly reduced.

The two case studies of Indonesia and Mexico take stock of fossil fuel subsidies in each country and then focus on one particular sector per country – transport fuels in Indonesia and electricity in Mexico. As measured with the IEA price gap approach, in Indonesia the economic value of fossil fuel subsidies in 2014 amounted to USD 27.7 billion (USD 19.3 billion for oil products and USD 8.4 billion for electricity). This estimate is quite close to the 2014 budget allocation for fossil fuel subsidies, amounting to a record IDR 240 trillion (USD 22 billion). Policy measures, such as the “big bang” removal in early 2015, and the recent low oil price have since been successful in reducing the amount of subsidy significantly. However, the study shows that the partial removal of fossil fuel subsidies has not yet been sufficiently cemented; Indonesia now needs to move to a credible system of price setting that does not allow the accumulation of large gaps between domestic and international prices and hence a renewed growth in subsidies in the future. Experience from other countries indicates that market-based energy prices are the best option, but this is politically not viable in the Indonesian context. As such, a move to a rules-based formula administered by an independent governmental body with a mechanism for dampening price volatility would be highly desirable. At the same time, drawing on Mexican and other experience, a review of market structure and the extent of competition in both the fuels and power sector would also be sensible.

In Mexico, the IEA estimate of fossil fuel subsidies in 2014 amounted to USD 5.3 billion (USD 3.1 billion for oil products, USD 1.4 billion for electricity and USD 0.6 billion for gas). In contrast to Indonesia, until recently Mexico did not have a formal budget appropriation for fossil fuel subsidies, rather the cost was absorbed by the state directly (through lower tax receipts) or indirectly through the state-owned enterprises Petróleos Mexicanos (PEMEX) and the Federal Electricity Commission (CFE). Since then, progress on gasoline and diesel subsidies has been made thanks to the fall in oil prices and gradual increases in the transport fuel price in Mexico. Again, the creation of a credible pricing mechanism will be crucial to securing subsidy removal in the longer term. In the electricity sector, Mexican energy reform introduced the requirement for the electricity subsidy to be explicitly recorded on the federal budget, contributing to

transparency; in 2015, the first budget appropriation for electricity subsidies amounted to MXN 30 billion (USD 1.6 billion). In the power sector, the emphasis is on lowering costs by facilitating the entry of private firms in the context of the ongoing energy reform, thus also reducing the need for subsidies. This study presents possible options for revisions to the structure of electricity tariffs with a view to reducing the subsidy, with assessments indicating their impact on different income deciles. Complementary policies that can help limit demand include energy conservation programmes and incentives.

What is striking in both Mexico and Indonesia, despite their obvious differences, is the strong influence of political economy[1] on the problem. Opposition to change on the part of entrenched interests – regional consumers, especially households and agriculture in the northern part of Mexico, and a mix of household consumers, industry and trade lobbies in Indonesia – as well as difficulties in creating consensus out of complex, coalitional politics have hampered progress. The study hence shows the importance for governments in both countries to develop convincing political narratives and has found positive evidence of the emergence of comprehensive political narratives for reform in the course of the project.

Overall, the study recommends that both governments articulate a comprehensive political strategy towards fossil fuel pricing that is based on conscious policy design and in-depth public consultation, and is accompanied by a well-targeted communication strategy. In regard to consultation, impact assessment and communications, both countries have so far shied away from broad public consultation, which has resulted in a limited understanding of how citizens and others perceive subsidies, the relative value they place on receiving them, and their associated preferences for reform. Similarly, communications have lacked coherence and sophistication as they failed to develop nuanced and targeted messages addressed to specific constituencies. This inadequate communication could backfire once fuel input prices rise again, as populations are still not sufficiently informed about the inefficiencies and regressive nature of the subsidies. More persuasive and strategic communications would make an important contribution to sustaining the reform progress to date and to taking further steps.

[1] Political economy in this paper is understood as the interplay between politics and markets with regard to fossil fuel subsidy reform.

1. Introduction

The International Energy Agency (IEA) has been highlighting the issue of fossil fuel subsidies since 1999, publishing global estimates of their economic value since 2009. The latest IEA estimates indicate that fossil fuel consumption subsidies worldwide amounted to USD 493 billion in 2014 (IEA, 2015a). As part of its In-Depth Energy Policy Review methodology, the IEA also systematically analyses energy pricing and reforms in both member and non-member countries, focusing on one of the IEA basic shared goals, namely undistorted energy prices. This study builds on these longstanding efforts, adding an element of close, country-specific policy dialogue, in order to develop even more specific recommendations for subsidy reform.

Focus is put on Indonesia and Mexico, two countries which have both had recent fossil fuel subsidy reform successes as well as continued challenges, and which have undergone an IEA In-Depth Review of Energy Policy (Mexico is currently in the process). This study analyses the two countries' actions on reform in order to understand lessons learned. It serves as an instrument of dialogue in support of further reforms, understanding that fossil fuel subsidies touch upon each of a nation's development and energy challenges: enhancing economic growth, reducing poverty and favouring an environmentally friendly path to development by reducing greenhouse gas (GHG) emissions and adopting cleaner sources of energy (Mourougane, 2010).

The study is based on close policy dialogue between the two countries and the IEA since 2014. This included workshops at the IEA (September 2014), in Jakarta (April 2015) and Mexico City (February 2016), which served to discuss the findings and recommendations. As a basis for the country case studies, the study provides a synopsis of global reform experiences, highlighting three main components of a fossil fuel subsidy reform approach: 1) strategic policy design; 2) public consultation and impact assessment; and 3) strategic communication.

The IEA defines fossil fuel subsidies as government actions that result in prices paid by end users being below the full cost of supply based on international benchmarks (consumer subsidies). For fuels, this is measured by the gap between national prices and an international reference price. For electricity, the measurement is based on an average-cost pricing for electricity, weighted according to output levels from each generating option, with an allowance for transmission and distribution.

This chapter starts by explaining the rationale for fossil fuel subsidies and the need for reform. Chapter 2 provides an estimate of the value of global fossil fuel subsidies and an analysis of energy subsidy reform experiences globally, including motivations for, consequences of, and constraints upon, reform. Chapter 3 provides an analysis of instruments for a generic energy subsidy reform strategy considering three components: the strategic considerations for policy design, the importance of public consultation and the impact of communication strategy. In Chapter 4, the cases of Indonesia and Mexico are explained in detail, considering past episodes and current actions, and performing an analysis of market structure and strategies for implementing reform. The final chapter contains a summary and conclusions.

1.1 Rationale for fossil fuel subsidies and the need for reform

The IEA defines fossil fuel subsidies as government actions that result in prices paid by end users being below the full cost of supply based on international benchmarks (consumer subsidies). For fuels, this is measured by the gap between national prices and an international reference price. For electricity, the measurement is based on an average-cost pricing for electricity, weighted according to output levels from each generating option, with an allowance for transmission and distribution. These subsidies take many forms. The most common type of energy subsidy is price

controls and direct financial transfers (such as grants) to artificially lower the effective price to end users or to reduce the costs paid by producers. Other forms of subsidy include: transfers of risk from the private sector to the government (such as through soft loans or loan guarantees); tax concessions (for both consumption and production); purchase mandates and other market guarantees; the public funding of research and development; and trade instruments to protect domestic producers.

How governments choose to go about subsidising a given form of energy depends on a number of factors, including the overall cost of the programme, the transaction and administration costs it involves, how the cost of the subsidy affects different social groups and how transparent the subsidy is. In many cases, governments prefer to keep subsidies "off-budget" for political and financial reasons: the true financial cost is less apparent, they do not require explicit government spending or higher taxes, and accountability is accordingly reduced.

Historically, the rationale for the introduction of fossil fuel subsidies has been to advance particular political, economic, social and environmental objectives, or to address problems in the way markets operate. The most common justifications for fossil fuel subsidies are alleviating energy poverty, boosting domestic supply, redistributing national resource wealth, protecting employment and environmental protection.

Subsidies make sense if overall social welfare is increased. But experience around the world shows that, in many instances, the net effects of fossil fuel subsidies are negative. Even where the net benefits are judged to be positive, an energy subsidy may not be the most efficient way of achieving policy goals. In practice, many subsidies that were introduced for social reasons, such as price controls on household fuels or support for coal mining to protect jobs, carry large financial, economic and environmental costs.

The case for subsidy is very different depending on the type of energy being targeted. Subsidies to support renewables and energy-efficient technologies, if well designed and properly targeted, can be an effective way of overcoming market barriers to their development and deployment, and helping to reduce GHG emissions. In principle, taxing carbon-intensive fuels and activities can be a more economically efficient and practical approach to internalising external environmental costs than subsidising low- or zero-carbon fuels, but may be difficult politically. In practice, targeted subsidies for clean energy can play an important role in mitigating emissions as part of a portfolio of market-based and regulatory measures.

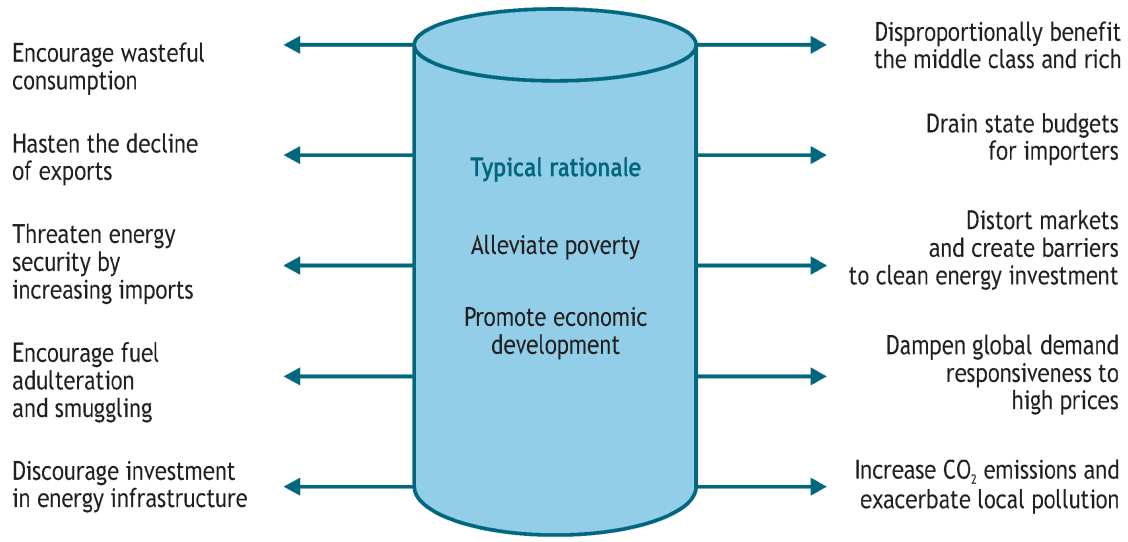
Subsidies for fossil fuels are hard to justify because the economic and environmental costs far outweigh any social benefits. Critically, the market distortions created by fossil fuel subsidies lead to a misallocation of resources, which results in a longer-term economic cost. These costs are manifested in a variety of ways (Figure 1):

1. **Aggravation of fiscal imbalances:** Where they involve grants or tax benefits, fossil fuel subsidies aggravate fiscal imbalances, crowd out more productive and meritorious government spending and depress private investment, including in the energy sector itself.
2. **Underinvestment:** Where energy suppliers suffer financial losses because of underpricing, subsidies can create a vicious cycle of underinvestment, poor maintenance and undersupply, particularly in the oil-refining and electricity sectors.
3. **Wasteful use of fossil fuels:** Subsidies also encourage excessive fossil energy consumption, artificially promote energy-intensive industries, accelerate the depletion of natural resources and reduce incentives for investment in renewable energy and improving energy efficiency. A strong empirical link exists between low energy prices and excessive consumption. Extremely high rates of electricity consumption in parts of the

Middle East and North Africa, for instance, can be shown to derive from cheap electricity tariffs (or even free electricity in some cases) rather than demography or healthy economic growth. The resulting subsidy, in certain cases, has overburdened government resources at the expense of social and economic expenditure.

4. **Increased price volatility:** Fossil fuel subsidies also exacerbate energy price volatility on global markets, by dampening normal demand responses to changes in international prices.
5. **Black marketeering, smuggling and adulteration:** Fossil fuel subsidies may also encourage black marketeering, smuggling and fuel adulteration, in the case of oil products, which are easy to transport and store. Fuel shortages and flourishing black markets with high prices are common in countries with where low official prices constrain supply. In certain countries, subsidised kerosene intended for household cooking and lighting is diverted as a diesel substitute due to wide price differentials. Smuggling can also arise, since an incentive is created to sell subsidised products in neighbouring countries where prices are unsubsidised and, therefore, higher. This has been an issue for years in many parts of the world, particularly in Southeast Asia, Africa and the Middle East. The effect in subsidising countries is a substantial financial transfer to smugglers, while recipient countries experience losses from uncollected taxes and excise duties, due to reduced sales in the legitimate market. Removing subsidies would eliminate incentives both to adulterate fuels and to smuggle them across borders. In exporting countries, subsidies reduce the availability of fuels for export by driving up domestic demand. In all countries, fossil fuel subsidies ultimately undermine economic competitiveness and growth.
6. **Environmental effects:** Fossil fuel subsidies can have varying environmental effects. In some instances, for example where subsidies enable poor communities to switch from the traditional use of biomass to modern fuels, they can have positive implications for the local environment by minimising deforestation and household air pollution. In the vast majority of cases, however, fossil fuel subsidies are counterproductive in reaching local and global environmental goals. Subsidised energy prices dampen incentives for consumers to use energy more efficiently, resulting in higher consumption and GHG emissions than would otherwise occur.
7. **Barriers for clean energy investments:** Fossil fuel subsidies undermine the development and commercialisation of renewable energy and other technologies that could become more economically attractive. Even marginal shifts from fossil fuels to renewable energy could help to accelerate the learning effect for renewables and cause unit production costs to decline.

Figure 1 • Potential unintended effects of fossil fuel subsidies



Note: CO_2 = carbon dioxide.

Source: IEA (2010), *World Energy Outlook 2010*, www.worldenergyoutlook.org/media/weo2010.pdf.

Fossil fuel subsidies often fail to bring significant benefit to the people for whom they are intended. The impacts of phase-out policies on different consumer groups depend on their characteristics, in particular on their expenditure structures, their sources of income and their ability to adjust their demand to changes in income and prices. For instance, the higher a household's share of total budget spent on energy products and the lower its energy demand reaction to price, the more a household may suffer from the effects of the phase-out, unless their income is sufficiently increased by compensatory measures (Durand-Lasserve et al., 2015). In practice, a large share of the subsidies aimed at helping the poor often ends up going to higher-income households, as they can afford to consume more of the subsidised fuels, aggravating the very inequality they are meant to reduce. IEA analysis indicates that only 8% of the money spent on fossil fuel subsidies reaches the poorest 20% of the population (IEA, 2011). In Mexico, the lowest three income deciles account for around 16% of electricity subsidies, while the top three deciles account for nearly 40% (Komives et al., 2009).[2]

1.2 Rationale for choice of two case studies

Mexico and Indonesia are both sizeable middle-income countries, which, as part of the G20, Asia-Pacific Economic Cooperation (APEC) and other multilateral fora, are of increasing importance for energy governance. The two emerging countries are rich in natural resources and, as oil and gas producers, chose to heavily subsidise transport fuels and electricity tariffs in their development pathway.

Dwindling production, rising demand, exchange rate devaluations and large fluctuations in the price of fossil fuels led to increasingly unsustainable subsidy budgets and the realisation that the funds could be invested more productively.

[2] See Chapter 4.8 for further discussion on who benefits from electricity subsidies.

Pairing these two countries for this study was interesting, as both have made substantial progress on subsidy reform but in different sectors. While Mexico made efforts to remove subsidies for transport fuels, Indonesia has decisively restructured its electricity tariffs.

Given the similarities between the countries, the successes and failures of each in reforming fossil fuel subsidies holds lessons for the other. Therefore, the aim of this report is to build and promote a constructive dialogue based on the analysis of both countries' regulations, strategies, measures and challenges of phasing out and reforming fossil fuel subsidies, and to enable other countries considering such steps to learn as well.

2. Value of global fossil fuel subsidies

Measuring the exact quantity of fossil fuel subsidies worldwide is difficult, whatever the definition or estimation method used. The IEA uses a price-gap approach. The price gap is the amount by which the average final consumer price for a given fuel falls short of its reference price, which corresponds to the full cost of supply or, where appropriate, the international market price, adjusted for the costs of transport and distribution and value-added tax (VAT). For a given country, the total value of fossil fuel subsidies is the aggregate of the price gap for each fuel in each sector, multiplied by the volume consumed. The IEA estimates encompass subsidy of fossil fuels consumed by end users (households and businesses) and subsidy of fossil fuel inputs to electric power generation. The latter are calculated by estimating the price gap between the annual average cost of fossil-fuelled electricity generation and the price that end users pay.

The principal advantage of the price-gap approach is that it avoids the need to compile detailed information on different types of government intervention by focusing on the combined net effects on prices. The principal drawback is that it only captures interventions that collectively result in final prices lower than those that would prevail in a competitive market (Koplow, 2009). Others, such as undercollection of bills, tax concessions, fuel vouchers or other payments made directly to low-income households and many producer subsidies, are not captured by the analysis of price gaps. However, the approach has proved to be the most practical available for estimating the general magnitude of subsidies across a number of countries; more detailed analysis of subsidies at the national level may also warrant the use of other approaches, such as a bottom-up inventory of government interventions (ADB, 2015).

For countries that import a given product, subsidy estimates derived through the price-gap approach are explicit. In other words, they represent net expenditure resulting from the domestic sale of imported energy (purchased at world prices in hard currency), at lower, regulated prices. In contrast, for countries that export a given product — and therefore do not pay world prices — subsidy estimates are implicit and have no direct budgetary impact. Rather, they represent the opportunity cost of pricing domestic energy below market levels, i.e. the rent that could be recovered by the supplier if domestic consumers paid world prices. For countries that produce a portion of their consumption themselves and import the rest, the estimates presented represent a combination of opportunity cost and direct government expenditure.

A large amount of data is required to calculate the price gaps for each fuel in each sector and in each country. End-user price and consumption data are drawn from IEA databases and, where necessary, other secondary sources. For oil products, natural gas and coal, reference prices are calculated on the basis of international prices. Electricity reference prices are estimated on the basis of annual average costs (Box 1). Some governments and analysts regard this method of determining reference prices as inappropriate. In particular, as mentioned above, a number of energy-resource-rich economies are of the opinion that the reference price in their markets

should be based on their costs of production, rather than prices on international markets as applied within this analysis. The basis for their view, typically, is that natural resources are being used to promote the nation's general economic development and that the resultant economic gain more than offsets the notional loss of value by selling the resource domestically at a price below the international price. A counter-argument is that there is an opportunity cost associated with not pricing on the basis of what the fuel would fetch in the international market, which results in an economically inefficient allocation of domestic economic resources and reduces economic growth in the longer term.

Box 1 • How we calculate the reference, or "right", price of a fossil fuel

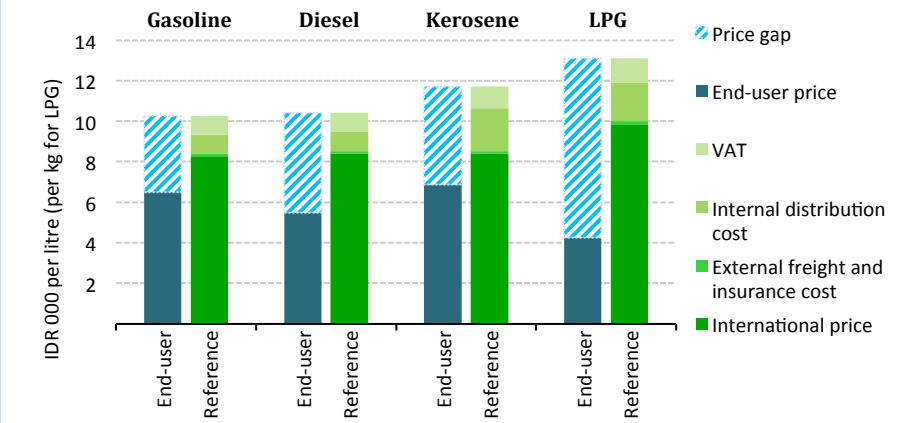
For net importers, reference prices are based on the import parity price – i.e. the price of a product at the nearest international hub, adjusted for quality differences if necessary, plus the cost of freight and insurance to the net importer, plus the cost of internal distribution and marketing and any VAT that is applied. VAT is added to the reference price where the tax is levied on final energy sales as a proxy for the general rate of tax on all economic activities needed to fund public services. If a lower or zero rate of VAT is applied to a particular fuel, it would represent a subsidy. Other taxes, including excise duties, are not included in the reference price. This means that there is no net subsidy where excise duties are larger than the gap between the reference price and the pre-tax retail price. As an illustration, the breakdown of 2013 reference prices for oil products in Indonesia, a net importer, is shown in Figure 2.

For net exporters, reference prices are based on the export-parity price; i.e. the price of a product at the nearest international hub, adjusted for any quality differences, minus the cost of freight and insurance from the exporting country, plus the cost of internal distribution and marketing and any VAT. All calculations are carried out using local prices and the results are converted to US dollars at market exchange rates.

Assumed costs for transporting oil products vary according to the distance of the country from its nearest hub; they are taken from average costs, as reported in industry data. Average internal distribution and marketing costs for oil products are estimated based on available data. For natural gas and coal, transport and internal distribution costs are estimated on the basis of available shipping data. Reference prices are adjusted for quality differences, which affect the market value of a fuel. As a result, reference prices are below observed import prices in some cases, such as in countries that rely on low-quality domestic coal but import small volumes of higher quality coal.

Unlike oil, gas and coal, electricity is not extensively traded over national borders, so no international price upon which the reference price can be based exists in most cases. Therefore, reference prices for electricity generated from fossil fuels are based on annual average cost pricing of electricity in each country, which depends on the makeup of generating capacity, the unsubsidised cost of fossil-fuel inputs, and estimates of transmission and distribution costs. No other costs, such as allowances for building new capacity, are taken into account in the electricity reference prices.

Figure 2 • Example of the calculation of subsidies for oil products in Indonesia, 2014



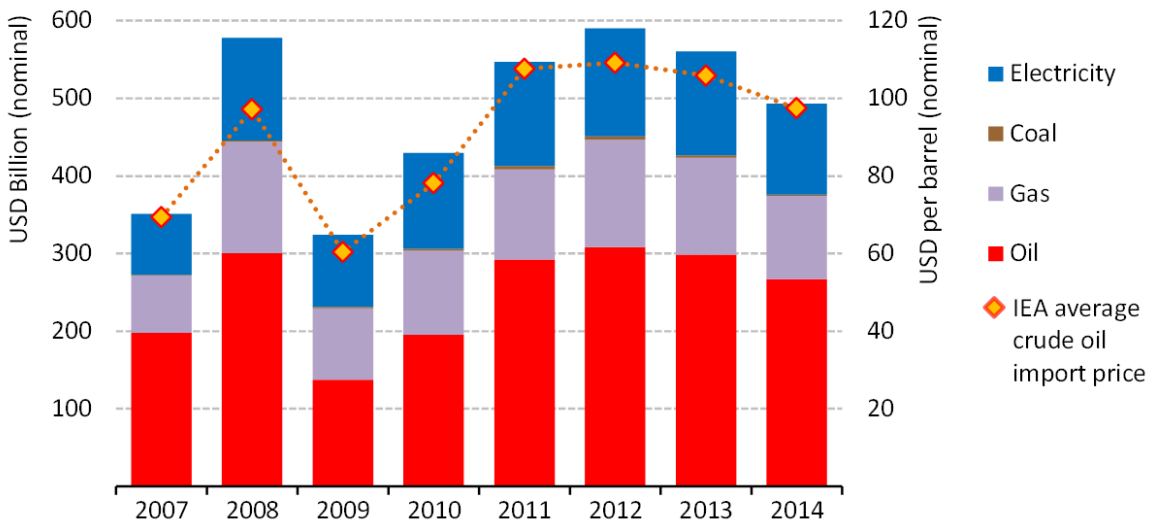
Notes: kg = kilogram; LPG = liquefied petroleum gas.

Source: IEA (2015a), *World Energy Outlook*.

2.1 Global estimates for 2014

The value of fossil fuel subsidies, for consumption and fuel inputs to power generation, totalled USD 493 billion worldwide in 2014, some USD 67 billion lower than in 2013, according to the latest IEA survey published in the 2015 edition of the IEA *World Energy Outlook* (*WEO*) (IEA, 2015a).[3] Oil products account for over half of the total, with oil subsidies concentrated in the oil- and gas-exporting countries. Subsidies in 2014 were USD 32 billion lower than in 2013, in part due to the drop in international energy prices (Figure 3). Subsidies remain strongly correlated with oil prices, as many countries – especially the oil exporters – set domestic oil, gas and electricity prices without regard to international market levels; as a result, a rise in international prices automatically increases the amount of subsidy, unless regulated domestic prices are increased by at least the same amount. Subsidy estimates also fluctuate from year to year in line with changes in exchange rates and demand.

Figure 3 • Value of fossil fuel subsidies worldwide by fuel



Source: IEA (2015a), *World Energy Outlook*.

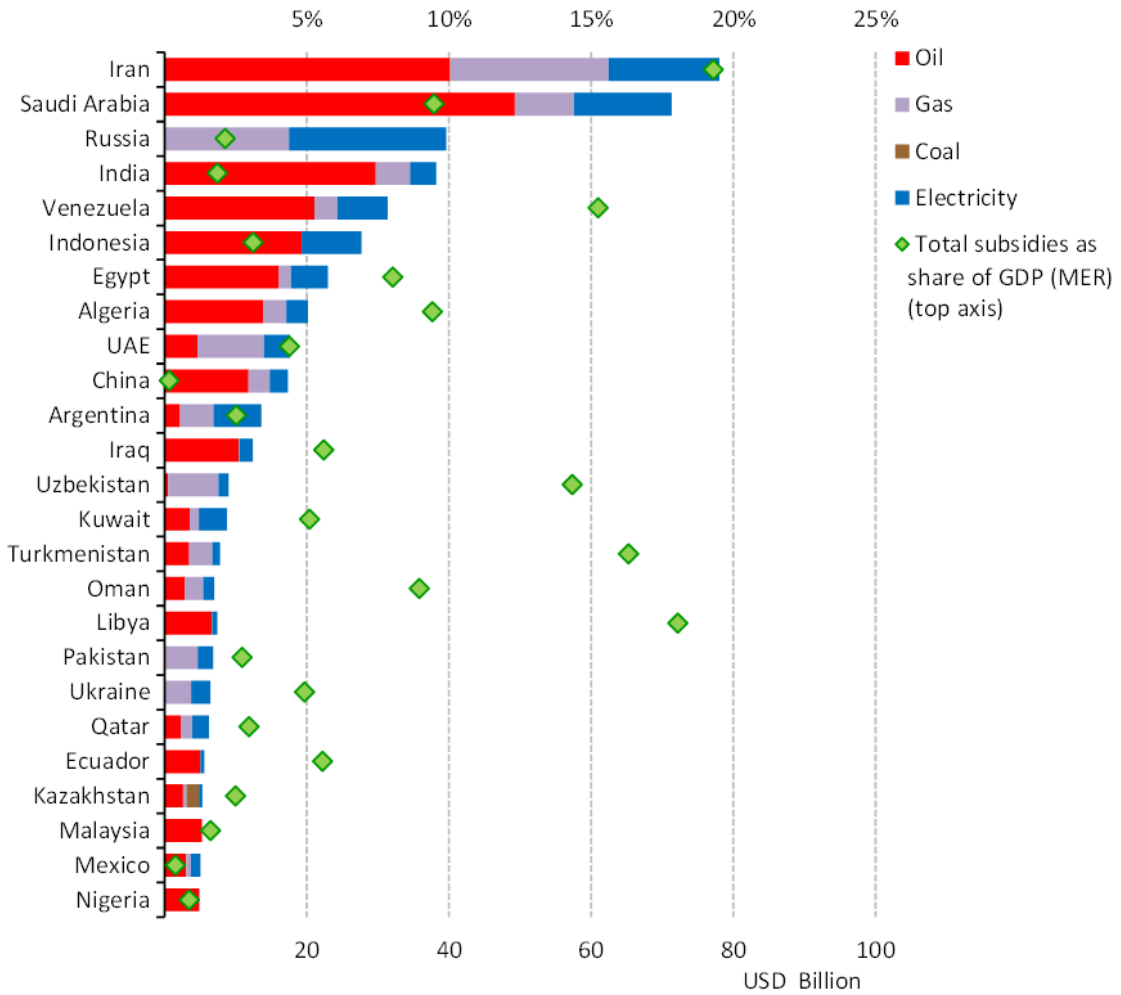
The survey of 2014 identified a total of 40 countries where at least one fossil fuel was found to be subsidised. Those countries account for well over half of world fossil energy consumption.[4] Iran remains the single largest subsidising country, with total consumption subsidies topping USD 78 billion – around 50% of them going to oil products (Figure 4). The total subsidy figure for Iran is very close to that in 2013: end-user prices were increased sharply for some products, but this

[3] The IEA first measured subsidies in the *WEO* in 1999 and has been measuring them systematically on an annual basis since 2007. The IEA estimates are derived using a price-gap approach, whereby the subsidy is measured as the amount by which the average final consumer price for a given fuel falls short of its reference price, which corresponds to the full cost of supply or, where appropriate, the international market price, adjusted for the costs of transport and distribution and VAT. For a given country, the total value of fossil-fuel subsidies is the aggregated size of the price gap for each fuel in each sector, multiplied by the volume consumed. The IEA estimates cover subsidies of fossil fuels consumed by end users (households and businesses) and subsidies to fossil-fuel inputs to electric power generation.

[4] While additional countries are known to subsidise fossil fuel consumption, only those for which adequate energy pricing and consumption data are available are included in this estimate. Energy use in the countries that have been excluded is relatively small, so their subsidies would not make a sizeable difference to the global total, but may still represent a significant financial burden for the countries themselves.

move was more than offset by a sharp depreciation of the local currency against the US dollar. Saudi Arabia and Russia are behind Iran, their energy consumption subsidies being worth about USD 71 billion and USD 40 billion respectively.

Figure 4 • Value of fossil fuel subsidies by fuel in the top 25 countries, 2014



Notes: GDP = gross domestic product; MER = market exchange rates; UAE = United Arab Emirates.
Source: IEA (2015a), *World Energy Outlook*.

The average rate of subsidisation, i.e. the ratio of the subsidy to the international reference price, also varies significantly from country to country. The total subsidisation rate among the countries identified as subsidising fossil fuel consumption is 21%, with the maximum being in Venezuela at 93%.

Fossil fuel subsidies in ten countries account for USD 364 billion or around three-quarters of the world total. Of the 25 countries with the largest subsidies, 10 are in the Middle East or North Africa – and almost all of them are oil or gas exporters. In fact IEA estimates reveal that fossil fuel subsidies are becoming increasingly concentrated in the major oil and gas exporting countries. For example, the share of Middle East oil exporters in the world total has risen from 35% to 40% over the last four years. (IEA, 2015a)

3. Energy subsidy reform revisited

This chapter focuses on the design and implementation of policies to reform fossil fuel subsidies in the light of accumulated country experience. A specific focus is on identifying the principal constraints on reform and the possible ways by which those constraints may be addressed. Although the multiple country experiences that have been well chronicled in the literature on fossil fuel subsidies certainly include examples of successful enactment of price adjustments, the success of many examples has been highly qualified or very partial. And in some instances reforms have outright failed. Moreover, many reforms, even if successful in the immediate term, have failed to be durable as a variety of factors have subsequently led to the reintroduction of subsidies.

International experience shows that few governments have pursued any systematic approach to reform. In particular, most have been woefully inadequate both in their diagnosis and in their implementation. A striking and pervasive weakness has been the inability to identify in a suitably disaggregated, and politically useful, way the attitudes of different constituencies to energy subsidy reform. Additionally, most reforming governments have inadequately communicated the intention and reasoning behind their actions to the population at large, as well as to specific groups and interests. There are signs that this is changing, albeit gradually, as a result of the seeming intractability of reform in many countries.

To address these realities and disparate experiences, this chapter has taken a more normative approach by providing a roadmap that a reforming government might wish to follow. That roadmap has three main components: 1) the setting of strategic priorities and objectives; 2) the matching of those priorities with real-world constraints and political economy factors; and, finally, 3) the successful communication of those priorities and their associated implications to specific groups of citizens and/or interested parties.

3.1 Introduction

Magnitude of fossil fuel subsidies

Fossil fuel subsidies have long been a feature of many economies at very different levels of income and local circumstance. Their pervasive nature has been complemented by their persistence. As indicated earlier, the IEA estimate puts the value of global pre-tax subsidies at USD 493 billion.[5] And although the bulk of these subsidies is now concentrated in developing and emerging economies, many advanced economies continue to subsidise energy – and fossil fuels in particular – on both the production and consumption sides. For example, in the European Union in 2012 total support for energy was nearly USD 125 billion, of which around 27% was in support of energy demand, mainly petroleum products, predominantly in the form of tax exemptions and, to a lesser extent, price guarantees (Alberici et al., 2014).

The current magnitude of fossil fuel subsidies, and the associated inefficiencies and other costs that they impose, make their reform a pressing concern. Yet despite a growing and common perception that fossil fuel subsidies, in particular, need to be addressed urgently, progress has at best been patchy and often inconsistent, whether in relatively poor countries or in advanced economies. A further common feature is that, irrespective of region and endowment, attempts at reduction or elimination – broadly interpreted as movement towards pricing regimes that adequately reflect costs – have sometimes resulted in success, but often abandonment or, at best,

[5] See Chapter 1 of this report and IEA (2015a).

partial progress. In a significant number of countries, it might be concluded that once fossil fuel subsidies have been introduced they have tended to become a persistent part of the economic landscape.

Beneath these broad common features and a pattern of persistence, closer inspection of the large body of country or case study literature reveals considerable heterogeneity.[6] This extends not only to the reasons for using fossil fuel subsidies, but also to the combinations of policies and instruments used when attempting to reduce or eliminate subsidies. In order to make sense of a wide range of experiences that have many local or idiosyncratic features, the chapter takes a more normative approach in trying to identify best practice. It identifies a series of steps or stages that reforming governments will normally take if they are to move beyond episodic – and often inconsistent – attempts at reform.

International experience of subsidy reform

When reviewing these many episodes of subsidy reform, similar features stand out. In the first place, most reforms have been perceived – and often presented – as only creating losers, other than government with its fiscal savings. Particularly when the government lacks credibility or legitimacy, this perception is, not surprisingly, largely counterproductive. Second, most attempts at reform have been presented almost as "technical" fixes and have ignored the need to gather popular support for change through consultation and the political process. Needless to say, the willingness even to try to mobilise popular support has always been more problematic in autocratic regimes. Third, attention has increasingly had to be paid to addressing income losses through compensatory payments. In particular, this involves recognition that eliciting support from non-poor households, as well as other vested interests, including in industry, may require transitional income transfers. Fourth, it is striking that in the great majority of reform episodes, policy towards subsidy reduction or removal has largely been opportunistic or driven by crisis, largely lacking any clear strategic direction. Even when there has been a strategy in place, this has not, for the most part, been able to command consensus. Given that one of the major constraints on reform has been the possible impact of subsidy reduction or withdrawal on poverty, the general absence of a strategic vision – and allied funding plan – in the realm of social policy and assistance is particularly notable.

Most generally, there have been few, if any, instances where political leadership has been able to enunciate a different economic strategy or vision into which energy pricing reform has been fitted. As fossil fuel subsidies are mostly linked to other components of policy – including ownership and management of natural resources – this may raise questions of an almost systemic nature that governments generally seek to avoid. However, the pathology of fossil fuel subsidies may itself be a product of those systemic conditions. There is evidence that this is being more widely appreciated by reformers. For example, changes to energy policy and legislation in Mexico in 2014 are based on a strategic – yet incremental – approach involving an encompassing reappraisal of the role of government and the public sector in the energy sector (see Chapter 4 for further discussion).

In this light, the chapter is mainly concerned with summarising experience with reforming fossil fuel subsidies. The aim is to extract a number of the core themes relating to both design principles and implementation, with particular regard to consumer subsidies for both fuels and electricity. The focus is on the combination of policies that have been used, thereby embracing institutional, technological and political economy dimensions.

[6] Examples of country studies are: IMF (2013b); Nikoloski (2012); Vagliasindi (2013); World Bank (2011).

What stand outs, however, is that no single path of best practice is readily identifiable. Local conditions – economic, political, institutional and cultural – have tended to militate against a common set of practices, even if parts of the reform policy menu have overlapped across countries. Consequently, while much reform experience is unique, certain common, underlying patterns in design do exist – not least due to the influence of external organisations such as the World Bank – as well as approaches that could in the future be better exploited. It is on these features that the bulk of this chapter concentrates. Chapter 4 subsequently turns attention to two important examples – Indonesia and Mexico – where both fuel and electricity subsidies have been, and are, large and costly and where attempts at reform have proved difficult to implement or sustain.

3.2 Fossil fuel subsidies – motivations and consequences

Fossil fuel subsidies are commonly grouped under producer and consumer subsidies, and take a variety of formats and degrees of transparency. Similarly, the instruments for delivering subsidies are quite diverse and include price caps, tax reductions and exemptions, and direct cash transfers, as well as limits on market access and cross-subsidies to consumers. For consumer subsidies – the concern of this chapter – price wedges, taxation and non-collection of energy bills have been the main channels. Using administered pricing to drive a gap between market and actual energy prices facing consumers has, however, been the dominant mechanism, including in the two countries – Indonesia and Mexico – that are the focus of Chapter 4.

Motivations

The motivations behind the use of fossil fuel subsidies are far from uniform, even if their use results in similar outcomes. The motivations include: providing income support or buffering – notionally of a temporary nature – to parts of the population when a country is faced with a price shock; lobbying and specific interest group activity; national patrimony or resource sharing; reducing poverty and/or enhancing equity; diversifying energy supply; and motives relating to external competitiveness and/or industrial policy.[7]

Table 1 provides an assessment of the main motivations behind the use of fossil fuel subsidies for 20 countries. In many instances, multiple objectives have been at play, but what is most striking from the table is the relative importance of lobbies and special interests, as well as their justification on the grounds of poverty reduction and/or equity considerations. However, as will become clear, the poverty/equity motivations are sharply at odds with the highly regressive nature of most systems of fossil fuel subsidy. Yet the fact that the rhetoric is at odds with the reality may not diminish the role of the former in sustaining fossil fuel subsidies and hence of the need to provide a compelling narrative for addressing this issue in any attempt at reform.

Table 1 • Motivations behind use of energy subsidies

	Notional temporary income buffering	Lobbies and specific interest groups	National patrimony resource sharing	Component of industrial policy	Improving external competiti-veness	Development of alternative energy supply	Poverty/ equity justification
Algeria			X	X		X	X

[7] For a more detailed discussion of the motivation behind energy subsidies and the various constituencies, see Commander (2012).

Argentina				X									X
Bolivia				X									X
Chile													X
China				X				X		X			X
Dominican Republic													X
Egypt				X				X					X
Ghana		X		X								X	X
India				X									X
Indonesia						X		X				X	X
Iran				X		X		X				X	X
Jordan				X									X
Lebanon													
Malaysia			X										
Mexico			X		X		X				X		
Morocco			X								X		
Pakistan			X										
Syria	X		X										
Tunisia													
Yemen													

Source: Nikoloski, Z. (2012), *The Political Economy of Energy Subsidies: Country Narratives*.

Consequences

The consequences of fossil fuel subsidies are well understood.[8] They impose fiscal, allocative, distributional and environmental costs. Aside from the macroeconomic effects of large fiscal spending on fossil fuel subsidies, they can crowd out other expenditure with higher social returns. They tend to promote capital- and energy-intensive activity and choices of technology. These tend to be radically at odds with the need to generate employment that is a characteristic of most developing and emerging economies. Low prices also promote excessive levels of energy consumption, as well as distorting consumption patterns across fuels.

From a distributional perspective, fossil fuel subsidies are almost always highly regressive, as the main beneficiaries are either higher income households or specific industries. Diesel and gasoline subsidies are particularly regressive, as they are used primarily for private transport.[9] Even so, fossil fuel subsidies can often reduce poverty, albeit at a high cost. Even when the poor are small direct consumers of energy, they can benefit indirectly, such as through lower transport costs which will influence food and household goods prices.

The environmental costs of underpricing energy are increasingly being appreciated and measured. Congestion, pollution and other productivity-reducing effects can indeed be significant (see, for example, Commander, Nikoloski and Vagliasindi, 2014). Similarly, CO_2 emissions in both residential and corporate sectors tend to be far larger in economies with subsidised energy than in economies at similar levels of income but with lower or absent subsidies (Global Subsidies Initiative-IISD, 2011). The size of these external effects can be large with very tangible consequences for

[8] See, inter alia: IMF (2013a); IEA, OPEC, OECD and World Bank (2010); World Bank (2010); IEA (2014); World Bank (2014).

[9] Those on the lowest incomes often do benefit from fuel subsidies as a large number are employed in sectors that use energy, such as farming, while the urban poor may benefit from lower public transport fares. However, these absolute gains are small relative to the benefits received by those with private transport.

productivity and growth, including through their impact on health indicators, such as excess mortality and morbidity.

Pricing energy low has also commonly had negative consequences on the supply side. In most countries with fuel subsidies, fuel suppliers tend to bear some of the direct costs of subsidies, as reimbursements are seldom settled promptly while fuel price increases are often postponed or implemented on an irregular basis. These factors tend to combine to have a negative impact on balance sheets, forcing integrated – often publicly owned – oil companies to use upstream profits to cross-subsidise downstream losses. Supply shortfalls can also result in the power sector, the consequences of which have often included the adoption of highly inefficient ways of privately generating power, such as the use of diesel generators.

Lack of investment in domestic refineries – mostly by the public sector – has also sometimes led to falling or flat production of refined fuels and increasing imports even in major oil exporting countries (Kojima, 2013). Investment in refinery capacity has frequently stalled not only as a consequence of lack of funding, but also because of the incentives and governance structures facing publicly owned companies, as well as the mispricing of energy. Private companies have commonly been excluded or limited in their operations because of explicit restrictions on their ability to invest and function. In short, while administered and low energy prices may have been associated with protection of suppliers of petroleum products from competition, they also help promote chronic inefficiencies in those suppliers. As a result, the subsidy bill tends to expand.

3.3 The persistence of fossil fuel subsidies and constraints on their reform

Despite this array of adverse properties, at a political level fossil fuel subsidies have proven consistently attractive to governments. However, most governments now recognise fossil fuel subsidies to be costly, regressive and inefficient, as repeatedly expressed by G7 and G20 countries in the ongoing political process of increasing the momentum behind phasing out subsidies (OECD, 2015). There is now a large, accumulated history of attempts at reform and, depending on the metric applied, a significant number have been deemed successful, at least to some degree.[10] But relatively few countries have succeeded in making those reforms binding and lasting. Consequently, episodic decreases in fossil fuel subsidies have later been undone, partly or wholly, by subsequent developments in international energy prices and/or reinstatement of subsidies because of political backlash or other pressures. For example, even when attempts have been made to install clear pricing rules and mechanisms that link domestic to international fuel prices, this has not always proven durable. In 2005 domestic fuel prices in Ghana were allowed to track international prices through frequent adjustments. Three years later, this mechanism was *de facto* suspended and the adjustment of domestic prices periodically frozen with the result that fossil fuel subsidies re-emerged while the integrity of the pricing relationship was undermined.

Intriguingly, the ability to enact reforms seems as problematic in settings where fossil fuel subsidies are relatively small in scale, as they are in contexts where fossil fuel subsidies have swollen to substantial magnitudes. And because of the underlying political sensitivities, governments have mostly had little appetite for rapid reform or “big bang” approaches to energy price liberalisation.

[10] IMF (2013b) asserts that out of 28 reform attempts that they examined in detail, 12 were successful and 11 were partially successful. In the context of Chapter 4, the Indonesian reform efforts of 2005 and 2008 were deemed partially successful, while the Mexican attempts at power sector reform in 1999, 2001 and 2002 were all deemed unsuccessful.

This inability to install lasting reforms to energy pricing cannot simply be traced to the absence of information or a lack of adequate technical solutions.

Persistence of fossil fuel subsidies

A robust, stylised fact is thus that once introduced, a strong *status quo* bias for fossil fuel subsidies emerges. The copious case study evidence now available identifies several factors behind this bias. Governments have commonly failed to develop a convincing political narrative for reform, let alone communicate it with citizens and other interested parties. In addition, they often lack credibility when promising improvements in either incomes or efficiency contingent on reform of subsidies. There has been a widespread inability to convince citizens that subsidy reform is either in their own or their country's interest. This has been true not only in countries where the political system is autocratic, but also in democracies irrespective of whether they have presidential or parliamentary systems. Institutional capacity has also commonly been a factor impeding reform, not least because it has limited the application of alternative delivery mechanisms, such as targeted transfers or other components of social assistance.

At the same time, governments across income levels and regions have insufficiently undertaken systematic analysis of likely winners and losers from proposed reforms, or the identification of specific interest groups. Not surprisingly, these deficiencies have mostly been accompanied by negligible or ineffectual consultation with groups of citizens and other constituencies that could in principle help identify better options and trade-offs that particular groups might support or accept. Sometimes this inability has been a predictable function of the political system, notably in autocracies, but lack of effective consultation has also been a feature of many more open and democratic countries.

Factors behind opposition to reform

Opposition to energy pricing reform by citizens and/or interest groups can be traced to a mix of reasons.[11] Self-interest on the part of households, particularly if they are active and/or significant beneficiaries of subsidies, may be a factor. But this can also be true for industries and sectors that have relied on low energy prices. Indeed, claims of loss of competiveness have also been factors in limiting reform. These impediments may also be enhanced by a sense of entitlement if subsidies have been in place for protracted periods of time. But wider and more complex motivations may be at work. Perceptions of inequity in the distribution of gains from growth or natural resource incomes may also motivate opposition to change. Significant numbers of citizens may view fossil fuel subsidies as a way of clawing back some benefits in contexts where it is widely perceived that most economic benefits accrue to only a small proportion of the population. This sort of concern will be amplified if – as in Egypt, for example – a substantial share of the population has low incomes and compensation levels are generally low.

In many contexts, it also appears that a pervasive lack of trust and even legitimacy between governments and citizens makes subsidy reform politically very difficult. Corruption and inefficiency in government can also deepen opposition to change. An implication is that some governments have been unable to portray themselves as impartial or uninterested arbiters. Any likely fiscal savings then get viewed as some form of windfall for an undeserving government and the credibility of revised spending plans becomes a contentious issue. Other factors that stand out from country studies include an inability to perceive how alternative or compensatory programmes of social transfers may work and/or a perception that reform is something being foisted on a

[11] Consumer subsidies have been estimated to account for nearly 80% of total subsidies, although this excludes non-fossil fuel energy sources and taxes on energy users; see IEA, OPEC, OECD and World Bank (2010).

country by outside interests or organisations. Indeed, increases in subsidised prices have frequently been an outcome of negotiations with the International Monetary Fund and World Bank.

3.4 Instruments for energy subsidy reform

The strategies that governments have adopted for reducing or eliminating subsidies feature a number of common elements. Among the instruments that have been widely used are self-targeting, rationing, price adjustments by stealth, linking energy pricing reforms to compensatory payments and adopting other demand-side measures aimed at conserving energy consumption.[12] Cash transfers, in particular, have comprised an increasingly central component of the policy menu for lowering subsidies. Cash transfers are normally targeted at specific groups of poorer consumers for whom withdrawal or diminution of fossil fuel subsidies would have a serious adverse impact on their income. These various instruments are reviewed briefly below.

Self-targeting

Self-targeting normally involves subsidising only those products purchased disproportionately by the poor, for example, particular types of fuels, such as kerosene or LPG. The aim is to shift or concentrate subsidies on specific products that induce richer households to shun receipt of the benefit. A risk with this approach is that grey markets can arise, trading in these subsidised products meant only to be consumed by the poor, such as specific LPG cylinder sizes. However, this approach has proven particularly attractive when switching to cash transfers has been institutionally and/or politically not feasible.

Rationing

Rationing access to subsidised products has also been tried, although generally with limited success. Use of vouchers and/or smart cards can provide an administrative mechanism for rationing. In the case of vouchers, the main challenges surround establishing an adequate distribution network as well as the calibration of their amount. Additionally, there is the matter of whether vouchers should be tradeable or redeemable for cash. Smart cards have only just begun to be rolled out in a number of countries, including India, but may represent a promising way of providing access to benefits.

Gradual price adjustment

Gradual price adjustments – as in through small price or quantity adjustments – have also been widely used, sometimes successfully. For example, in Mexico small monthly fuel price adjustments have allowed a gradual elimination of the fuel subsidy. Part of the objective was to allow consumers to adjust their consumption and spending plans over a pre-announced time frame. Elsewhere, the use of gradual adjustments has been more an attempt to introduce increases by stealth. However, the scope for using this sort of approach has generally been limited, as consumers have proven adept at understanding what is going on and, in some instances, this has triggered a backlash. In addition, when the size of the subsidy is large, whether for fuels or power, as in Egypt or Iran, small adjustments may not be sufficient, particularly if wage and income levels are low. However, as Indonesian experience shows, when there is no clear way of relating domestic

[12] A good overview can be found in World Bank (2014).

energy prices to international prices, small adjustments may be preferable to periodic, large jumps in prices.

Compensation

Providing explicit compensation for loss of benefits from a reduction in subsidies has become an increasingly common practice.[13] The motivation is normally presented in terms of preventing increases in poverty, but has also generally being used as a means for securing the consent of the non-poor and warding off popular discontent. Compensatory transfers to parts of the population thus have two distinct components analytically and practically: one relating to income deficiency; the other to building support for subsidy reduction. The first has normally been addressed through cash transfers directed, with varying degrees of accuracy, to poorer households. The IMF's study of 28 reform episodes found that in just over a third of cases targeted cash transfers were applied. However, on account of the institutional and informational limitations existing in most developing and emerging economies, such programmes have normally had large errors of inclusion and exclusion. Transfers made for the purpose of securing wider support for reform have, as in Indonesia, been explicitly directed to wider bands of recipients.

In the case of electricity pricing reform, distributional considerations have generally been handled through price discrimination, notably the use of what are termed "lifeline tariffs". These normally involve pricing small amounts of electricity consumption at relatively low or preferential prices and have been adopted in a very wide range of countries. The aim is to ensure that poorer households with power connections – in many countries, the poorest households actually have no access to power supply – can afford a minimum or basic level of consumption. However, as the detailed discussion of Mexico in Chapter 4 shows, the design of pricing rules is key, in particular the size of the lifeline block and the pricing differential with respect to any other pricing blocks that are applied. Other instruments that have been used to achieve relatively low priced supply to poorer consumers include use of dual meters, as in Armenia where the goal was to provide access to discounted night tariffs (IMF, 2013b).

Restraining demand for energy

Methods of limiting demand for subsidised fuels through efficiency improvements and/or diversification away from petroleum products have all been variously used. For example, China has been tightening fuel economy standards for vehicles. More commonly, governments and/or power companies have tried to raise energy efficiency standards including for lighting, refrigeration, air-conditioning and other popular uses of energy. To be effective, these normally require making adequate funding available for the purpose of energy conservation as well as energy use audits. Other facilitating measures include allowing on-bill financing of energy conservation spending by both households and firms, particularly small and medium-sized enterprises. This was pioneered in California and is now widely used in North America, but has also partly been adopted in other countries, such as Mexico. On-bill financing allows circumvention of possible cost barriers to improving energy efficiency by providing up-front financing with payments made over time through supplementary charges on customers' utility bills. In design terms, a common criterion that is applied to ensure efficiency and limit defaults is that energy efficiency savings on monthly bills must be greater than or equal to a customer's loan payments. When satisfied, this implies that efficiency savings are met with no additional cost, as the value of the savings from efficiency improvements exceeds the on-bill costs of financing.

[13] This is a central recommendation of World Bank (2014).

Regarding diversification, options have commonly included shifting to natural gas or coal – as in Indonesia – and renewables. In addition, attempts to reduce energy consumption have also focused on inducing modal switching in transport as in, for example, from road to rail and/or from gasoline and diesel to compressed natural gas. Interest is also growing in liquid biofuels, such as ethanol and biodiesel as transport fuels, although stimulating wider adoption of such fuels has normally itself required subsidies.

Complements to tariff reforms for electricity

Tariff adjustments without such complementary reforms have tended to be problematic. As such, power sector reforms have, increasingly and widely, involved changes to industry structure through unbundling different functions, notably generation from distribution and transmission, alongside permitting greater private-sector involvement. The taxonomy of reform runs from maintenance of a vertically integrated monopolist, through some degree of vertical and/or horizontal unbundling, to the creation of a power market with competitive trading supported by a transmission entity, a power system operator and administrator. In Kenya, for example, power sector reform took well over a decade to mature and involved not only changes to tariffs, but also to industry structure and incentives, as well as the creation of a regulatory authority. These wider changes proved essential in improving efficiency and ultimately to validating tariff increases through improvements in the quality of service, as well as access (IMF, 2013b). And even when – as in Turkey – unbundling and some privatisation occurs with growth in the number of participants in the power market and the establishment of an independent regulator, this may still co-exist with significant amounts of cross-subsidy and continued government involvement with notionally independent agencies (Vagliasindi, 2013).

Company profitability

Finally, subsidy withdrawal can often carry serious implications for firms or sectors that are intensive users of energy and have configured their production and technology mix on the basis of distorted prices. Industry sectors such as chemicals, fertilisers or metallurgy are cases in point. In these instances, higher energy input costs may have serious implications for profitability or even viability and ultimately for employment. Policy options that have been tried include maintaining sector or industry-specific subsidies, but these have proven a weak instrument, not least because of the risk of creating new demands for subsidies by an ever-broader range of sectors. More promising are programmes for energy conservation and conversion using financial support from the budget. These generally involve maintaining transitional fossil fuel subsidies for selected industries, linked to the monitored adoption of or conversion to productive and technological practices that economise on energy use. But for these to be effective requires competence in the design of support programmes, including clear and credible decision rules regarding threshold values for gaining access to finance for conversion and allied mitigation measures. These, in turn, require a degree of probity and transparency in the decision-making process for the allocation of resources. This precondition is often absent, particularly if recipients are already acting as well-organised lobbies around energy pricing.

3.5 Components in the reform of fossil fuel subsidies

This section now turns to distilling the components of a well-designed and durable package of reforms. It draws widely on the body of documented reform experience. As such, the objective is to identify the steps that a government aiming to lower or eliminate fossil fuel subsidies should seek to take. In doing so, it identifies three main and related stages.

Reform options

The first stage that a reforming administration needs to take is of a strategic nature. It involves the detailed elaboration – and costing – of various reform options, speeds and scenarios. A distinction normally needs to be drawn between relatively near-term measures that involve changes to energy pricing, and longer-term challenges, such as providing an institutional context whereby domestic energy prices can be linked effectively to international prices.

This is conducted at the government level and initially may only partially reflect the obstacles or constraints on reform that likely exist. Aside from the pricing of energy products, scenario building will sometimes have to include structural considerations, such as the ownership of the energy sector and market structure, notably for fuel refining and distribution, as well as electricity generation, transmission and distribution.

Impact and incidence

The second stage concerns the way in which the possible reforms would affect specific groups and interests in a society, and the ways in which preferences are identified and used as components in developing strategic direction. This is a critical element as it involves a degree of analysis and understanding that most governments lack. The aim, however, is to coax out the enabling measures and actions that governments may take in order to gain acceptability for reforms. These may include measures to compensate households and other interests for energy price adjustments that reduce purchasing power, the absence of which may entrench opposition to change and/or exacerbate poverty among lower-income households.

Communication

A third stage concerns the ways in which governments communicate their policy message or messages to citizens and industry and the granularity of those messages. Emphasis is placed on the importance of communicating specific messages to specific groups, particularly those that may be able to tip the balance of support.

3.5.1 Strategic policy design

Much of what is deemed successful reform of fossil fuel subsidies has occurred under the pressure of a rising fiscal deficit and/or current account deficit. While concentrating the policy mind, such pressures do not necessarily address the durability of reform, nor are they necessarily effective in a context of widespread opposition among citizens and political entities. This is why a more strategic approach is preferable. But for that to take place requires several – and sometimes time-consuming – preparatory steps to be taken.

The preparation of different policy scenarios is central, alongside quantitative and, if appropriate, qualitative benchmarks. Scenarios should commonly include scales of proposed decreases in subsidy and any other changes concerning market structure, competition and regulation. The quantitative indicators that are relevant will include the fiscal parameters, including likely savings and resources available for reallocation if required or deemed desirable. Study of distributional outcomes, involving an incidence analysis of households and sectors, allows for the identification of potential winners and losers from the different policy change scenarios. Three main elements in the preparation of such scenarios are generally present. These are now discussed in turn.

Adjusting domestic energy prices in the short term

This stage provides the raw or naïve set of near-term benchmarks to test for probable feasibility and resilience, including in fiscal and financial terms. These tend mostly to concentrate on the pricing of energy and changes to subsidy rates for specific types of energy consumption. Many governments – often under rising fiscal pressures – tend to focus on large one-off increases in energy prices. This has, for example, been the recent experience in Indonesia. While these may hold the promise of short-term fiscal gain, they often run into problems of acceptability as well as requiring offsetting payments to stabilise incomes. Smaller, and sometimes more frequent, price adjustments may be a more desirable scenario, as the recent experience of Mexico with its policy towards fuel pricing suggests (see Chapter 4). In addition, a focus only on short-run adaptations often only partially addresses the source of subsidies. The Indonesian experience discussed at length in Chapter 4 shows the perils of a subsidy strategy driven primarily by short-term priorities and reactions.

Linking domestic to international energy prices

Given the volatility of energy prices, coupled to a rising trend over the past decade, attempts at curbing fossil fuel subsidies through discrete and substantial increments in domestic prices can subsequently be undone. This underlines the importance of trying to establish a credible and durable rule linking domestic to international price movements.

Liberalisation of energy prices – as has occurred in most advanced economies – offers a clear option, but one that has not proven attractive or feasible to many developing and emerging economies. This has meant consideration being given to intermediate formats. One option has been the establishment of an independent pricing agency. For example, Ghana established a National Petroleum Agency (NPA) in 2005 whose role was to review fuel prices twice a month with recommendations to the Minister of Energy on desirable adjustments to cost recovery levels. A backward-looking pricing formula reflecting changes in international prices over the past two weeks was due to be applied. However, the NPA has been unable to adjust prices itself as the final decision on pricing has still lain with the Executive, meaning that political involvement in pricing has remained.[14]

In the power sector, a similar approach has been adopted in the Philippines with the creation of an Energy Regulatory Commission (ERC) in 2001, an independent body tasked with regulating electricity tariffs as well as other market oversight. However, while this has led to less political interference in price setting, it has been a slow process and, on balance, the privatisation of much of the power sector has probably been a more important contributory factor. In short, trying to establish a completely independent pricing authority with full discretion on energy pricing has been a problematic strategy. The reasons are various but include reluctance on the part of politicians to lose this policy instrument, as well as recognition that even if constitutionally validated, independence would be hard – if not impossible – to ensure if politicians wanted otherwise.

Using a predetermined set of pricing rules or relationships has been widely tried. Such rules can be automatic in relating international price changes to domestic ones, or can be qualified as through some – preferably symmetric – smoothing rule. The latter aims to limit the size of movements in prices so that large increases (or decreases) in prices may be spun out over a more protracted period. A number of countries have established price bands with specific ceilings. For example, in Chile excise taxes on fuels have been varied relative to a reference price. Other countries, including

[14] Indeed, in both 2008 and 2012 price adjustments were suspended for political reasons (IMF, 2013b; Global Subsidies Initiative-IISD, 2010).

South Africa, Turkey and the Philippines, have also successfully adopted rules-based approaches (IMF, 2013b; Coady et al., 2012). However, such models tend to come under strain when international prices trend upwards over protracted periods of time. While they are normally superior to systems based on administered pricing, it is naïve to suppose that they can remove the political tensions that surround energy costs, especially at times of rising prices.

Market structure and ownership

Energy subsidy reform will often have a structural dimension relating to the way in which energy markets are organised, including ownership, governance, levels of competition and their impact on incentives. These factors, as suggested above, can affect materially the efficiency of energy suppliers and hence the level of costs. This, for example, is a major component of the reform strategy currently being implemented in Mexico (see Chapter 4).

Although reviews of experience with reforms of market structure highlight the heterogeneity of the approaches taken, a common theme for the power sector is the need to introduce vertical and horizontal unbundling while restructuring power markets. Experience suggests that the need is particularly acute for power generation,[15] although the benefits to liberalising distribution can also be important. The critical objective is to improve performance, balancing the net gains from introducing greater competition (and hence including the additional transactions costs that unbundling implies) against any gains from co-ordination across integrated systems. Empirical studies of performance indicate that the gains from introducing competition and associated features, such a wholesale power market, can be positive and significant but that this also depends on complementary policy changes, particularly the introduction of an independent regulatory agency. This latter requirement will be particularly important when the market size is small and unable to sustain a multiplicity of players.[16]

Trying to change market structure and organisation can be challenging, not only at a technical and institutional level, but also in terms of political acceptability. Opposition to change may originate from incumbent players – such as integrated monopolists – as well as political parties and the general public, whether on account of ideological tastes or fear of increased tariffs. Indonesia, for example, as yet shows little apparent appetite for reform despite the clear inefficiencies in both the fuel and power sectors that can be traced to the largely non-competitive nature of both markets and the incentives for the dominant incumbents to resist change. Yet, as experience from other countries illustrates, such reforms can over time drive down costs. Combining policies to limit demand through price adjustments with measures to lower supply costs can be fiscally attractive, although difficult to achieve on both technical and political grounds.

3.5.2 Public consultation and impact assessment

This stage requires the development of a clear understanding of citizens' and other key constituencies' preferences and points of convergence, while also taking into account institutional or administrative limitations that may affect implementation. In the following, a key focus is put on the general public, as this is where the following stage, a strategic communication campaign, has the greatest impact.

[15] For a review of developing country experiences see Vagliasindi and Besant-Jones (2013). For a general overview, see Newbery (2000).

[16] For a detailed analytical overview, as well as case studies, see Vagliasindi and Besant-Jones (2013).

Consultation and perceptions

Governments embarking on reform can benefit from extensive consultation with interested parties and institutions – political groups, trade unions, employers' associations, non-governmental organisations and so on – when developing a strategy. This is sometimes referred to as stakeholder analysis and has been increasingly promoted and applied (World Bank, 2008; Holland, 2007). Such analysis tries to identify specific interest groups at the level of the private sector, civil society and government itself.

However, stakeholder and citizen interests are not necessarily congruent or overlapping. Particularly when large numbers of consumers are the beneficiaries of fossil fuel subsidies, opening up the black box of perceptions and preferences among citizens is a requirement. This can be done in a variety of ways that have been well tested in many different contexts. They include focus groups and opinion polling based on properly designed sampling frames and sampling units.[17] These can be complemented with selective, qualitative interviews as well as by use of experimental evidence.

These techniques can be applied to address several, related issues. The first concerns perceptions regarding receipt of subsidies and their estimated value. Even when subsidies have been in place for protracted periods of time, consumers often not only have great difficulty in attaching a monetary value to the subsidies they receive, but also lack specific knowledge about even which of the products they consume are actually subsidised. Such misperceptions are not always a strict correlate of income (and implicitly education). For example, in Morocco it was found that the majority of households that were interviewed were simply unaware that butane gas attracted any subsidy. Further, when asked what increase in price would have to occur if the subsidy was removed, the average response was a 40% increase as against an actual gap of 250%. In addition, the indirect benefits of fossil fuel subsidies – as, for example, through lower transport prices – tend rarely, if ever, to be quantified.

Information gaps

These profound information gaps suggest that governments have a great deal of scope for improving the amount and quality of information about subsidies in the public domain. Given that subsidies also often flow to richer households and/or vested interested or connected parties, it can make sense in a democratic setting to publicise actively the available information not just on grounds of greater transparency, but also as part of setting the case for reform. In the case of autocracies, the lack of information and transparency tends to be a correlate of the political system itself. Having said this, it is not always simply incompetence or lack of habit that can account for such information gaps, but also a political calculus. Spelling out likely losses may be viewed as counterproductive, given that behavioural evidence suggests that people tend to value losses greater than they do gains. However, to the extent that this fear has foundations, it principally underlines the need to link the provision of greater information, and hence possible losses, to arguments about the opportunity costs, as well as options for reallocation that subsidy withdrawal offers.

Preferences

In addition, attitudes towards the strengths and limitations of energy subsidy policy can be explored through these techniques. This allows for an understanding of the relative weight of equity, living standards, attitudes of entitlement and other factors across a range of different social

[17] For an insightful application to Morocco, see Chen, Liverani and Krauss (2014).

and economic groups. But the principal aim of this exercise is to try and line up this information to uncover the trade-offs and policy actions that different types of individuals or households can accept or reject. As such, this involves identifying the relative weight of factors such as self-interest as against others, such as altruism or social preferences. Focus groups can also provide a good context for implementing choice experiments to pin down possible trade-offs (such as subsidy withdrawal for different types of compensation) and/or equity considerations in structuring reallocation of resources. This is a way of exploring systematically reactions to different policy models or scenarios, and should allow evaluation and ranking according to the disaggregated social and economic categories that have been used in selecting the focus groups. Several iterations of feedback from focus groups on different policy options should inform the definition of the reform package, which maximises acceptance while observing fiscal and other financing constraints. Finally, the policies that emerge from this process need to be clearly enunciated and effectively communicated.

Designing compensation

Any identified opposition to reform – whether in the population as a whole or among specific interest groups – has increasingly been addressed through compensatory payments. Fiscal savings realised by reform have often been used to finance these compensatory payments. Indonesia was an early adopter of this approach (see Chapter 4) in 2005 when providing unconditional cash transfers to a significant number of households prior to a large price increase for fuels. Although the idea was to target transfers on poorer households, whether by design or because of administrative limitations, coverage was far broader. The government also allocated fiscal savings to several social development programmes and used an extensive publicity campaign to explain its actions. Other countries, such as Jordan in 2008, have chosen to apply a variety of instruments to address the income effects of subsidy reform, particularly when nominal price increases have been large. Instruments include raising wages and pensions for public sector workers, as well as targeted transfers to poorer households.

Distributional considerations

International data suggest that poor households tend to allocate anywhere between 3% and 8% of their income to energy, whether fuels or power. Depending on the size of subsidy and its type, subsidy reform can imply a meaningfully adverse shock to poorer households' income. [18] But targeting only the poor is often beyond local, institutional and informational capacity. Additionally, there may be a lack of appetite for making targeted transfers, believing that wider receipt of compensatory payments is a way of raising the wider political acceptability of reform. This reasoning is often with foundation in that, in the majority of cases, the principal beneficiaries of fossil fuel subsidies are not the poor, but from other, richer parts of the income distribution.

Governments therefore have to grapple with the fact that opposition to reform may come principally from non-poor income groups. There may, in addition, be relatively little appetite for a redistribution that favours poorer households. The technocratic assumption that targeting transfers to the poor is a policy objective that commands wide support in most economies where fossil fuel subsidies are prevalent may have broad validity, but this acceptance can be – and probably is – more nuanced or qualified. The non-poor may support transfers to the poor, but that may be perfectly consistent with *not* supporting transfers in lieu of fossil fuel subsidies, the receipt

[18] For example, in Egypt where the bottom income deciles spent around 5% of total spending on energy, a mooted subsidy reduction in 2010 was estimated to decrease income for the lowest decile by at least 4%.

of which tends largely to be to their benefit. These tensions – and underlying beliefs – can be best addressed through the type of preparatory analysis indicated in this chapter.

These factors may explain – at least in part – why although the principle of compensation is now well embedded in the policy lexicon, the practice of compensation has mostly been weakly targeted or even almost universal, as in the case of Iran (Guillaume, Zytek and Farzin, 2011). This is testimony to the highly political nature of reform and the perceived need by governments to provide significant numbers of citizens with incentives for accepting reform. Indeed, the evidence suggests that these can be a valuable precondition for reform, particularly if implemented in advance or *ex ante*. However, there should be caution in assuming that they are always a necessary element of reform. Paradoxically, although weakly targeted transfers may be popular, the dynamics may be more complex. They can give rise to expectations of future payments in the case of further price adjustments, while recipients may still prefer the stream of benefits from low energy prices relative to highly discretionary – and often transitory – transfers.

Use of other policy instruments that are not explicitly linked to energy policy changes may be warranted. In Egypt, for example, it is unlikely that any future attempt at limiting fossil fuel subsidies can be implemented without raising the low levels of compensation that exist.

Costs of compensation

An additional note of caution is that compensatory schemes can be both costly and even counter-productive, as the Iranians have discovered in recent years. Since 2010, Iran has sought to address energy subsidy costs that reached in excess of 15% of GDP. Implying the need for very large adjustments to prices, Iranian governments have at various times rationed access to subsidised fuels, directly raised fuel prices and, in addition, committed to use the greater part of any fiscal savings to compensate households *prior* to any increase in prices. But because the level of compensation has been set relatively high and transfers have been made to the great majority of households, the strategy has been costly. Although compensation has been successfully organised and paid out – mostly through bank transfers – subsidy reduction has only been partially achieved, requiring a further round of sharp price increases in 2014.

Finally, in any discussion of compensation it is important to distinguish between, on the one hand, relatively short-run and politically charged objectives aimed at facilitating changes in energy pricing with, on the other hand, the longer-run distributive and social objectives of addressing poverty and income deficiency. While compensation as a tactical tool for lowering subsidies may help promote longer-run goals of providing assistance to the poor, it is also possible that they can be inefficient vehicles for achieving those goals.

3.5.3 Communication strategy

The sequence outlined above leads naturally to a dimension that has been increasingly highlighted in recent years, namely the importance of communications. Country studies have identified how inept – or uninterested – in communicating the detail of energy reform many governments are. Effective communications are, in almost all instances, a prerequisite of successful reform. The main challenge in many developing and emerging countries is initially to persuade governments that communication is essential and that effective communication involves combining convincing messages with appropriate media.

Although most governments that attempt to reform energy subsidies practice some form of public communication over its content, the available experience provides surprisingly little evidence of governments practising nuanced or targeted strategies aimed at persuading specific constituencies or groups of citizens of the merits of specific policy prescriptions. The evidence suggests that

effective communications is not simply about a binary response to an overarching policy proposal. Perhaps most damagingly, there seems to be relatively little practical attention being paid to identifying strategic groups whose support might be critical. Given that many of the countries running fossil fuel subsidies are active democracies whose political parties are well aware of the need for building constituencies of support, this omission is hard to explain.

A review of recent Indonesian government communications linked to an episode of subsidy reform in 2012 found a serious – and well-managed – campaign. It worked with a wide range of partners, including non-governmental organisations and local community leaders, and used a range of media (principally but not exclusively television) to get over a broad message of the need for reform. Even so, major shortcomings were identified (IISD, 2013). These included a lack of clarity in objectives and a lack of co-ordinated messaging at the ministerial level. As pointed out above, a lack of granularity in messages led to an inability to tailor messages to specific audiences. Among other consequences, this meant that government was unable to identify possible "swing constituencies" or groups that might be persuaded to support reform.

Energy subsidy reform case studies do suggest that more governments are waking up to the need for better communications. This has been the case in places as diverse as Ghana, Iran, Niger, Peru, the Philippines and Uganda (IMF, 2013b). Some have deployed a range of popular media, including non-traditional channels such as electronic media and text messaging, to try to communicate their message. However, the over-riding impression is that most governments have made limited efforts to persuade citizens of the case for subsidy reform and, where they have tried to initiate greater debate, it has not always been successful.

4. Analysis of current subsidy mechanisms and reform plans in Indonesia and Mexico

This chapter turns to a more detailed examination of energy subsidy reform in two countries – Indonesia and Mexico – that have struggled over many years to make a durable dent in their subsidy bills and where many of the issues that have been covered in the previous chapter are still being grappled with by both policy makers and society at large.

4.1 Context

Both Indonesia and Mexico have in common significant endowments of natural resources and a history of public sector control over those resources. Indeed, state control over energy has been explicitly set out in both the Indonesian and Mexican constitutions. As a consequence, two companies – PEMEX in Mexico and Pertamina in Indonesia – dominate the domestic fuel sectors, while electricity provision is still mainly the preserve of the publicly owned utilities, the Federal Electricity Commission (CFE) in Mexico and the State Electricity Company (PLN) in Indonesia.

The analogue of public-sector control over natural resources is the common and resonant perception among the population that natural resources are a national patrimony to be somehow shared among citizens. This has, over time, spilt into a widely held view that energy should be priced at below market rates. Subsidies, in effect, have become the fiscal or quasi-fiscal mechanism for sharing the resource patrimony. As a consequence, the aggregate value of fossil fuel subsidies for both countries in 2014 was around USD 32 billion, equivalent to around 6.5% of total worldwide fossil fuel consumption subsidies. One consequence of these policies and patterns of control – allied to the powerful, combined forces of demographic and income growth – has been an accelerated depletion of natural resources, alongside a lack of investment in energy infrastructure and capacity, including at refineries. This has resulted in both countries becoming net importers of refined oil products. The more recent decline of the oil price, in combination with reforms in both countries, has allowed a significant reduction in the amount of subsidies (Table 2), as discussed further below.

Both economies have also in recent decades experienced considerable macroeconomic volatility, most dramatically in the deep and destructive financial crises of the late 1990s. Since then, policy makers in both countries have sought to limit their vulnerabilities through prudent macroeconomic and financial sector policy, as well as through attempts at better management of natural resources and capital inflows.

Table 2• Indonesia and Mexico: Recent comparative statistics

Mexico	2011	2012	2013	2014	2015e
GDP growth (%)	4	3.6	1.1	2.5	2.5
GDP per capita (USD PPP)	15 748	16 287	16 244	17 352	17 338
Fiscal deficit/GDP	-2.5	-2.6	-2.4	-4.1	-3.5
Current account/GDP	-1	-1.2	-1.7	-1.1	-2.6
Inflation (%)	3.4	4.1	3.6	3.1	2.7
Fossil fuel subsidies/GDP*	1.6	1.5	1.0	0.4	..
Electricity subsidies/GDP**	0.1	0.1	0.2	0.1	..

Indonesia	2011	2012	2013	2014	2015
GDP growth (%)	6.5	6.3	5.8	5.0	4.8
GDP per capita (USD PPP)	8 841	9 443	10 037	10 588	11 137
Fiscal deficit/GDP	-1.1	-1.5	-2.3	-2.3	-2.0
Current account/GDP	0	-2.8	-3.3	-3.5	-2.5
Inflation (%)	3.9	3.8	8.2	4.9	6.4
Fossil fuel subsidies/GDP*	3.0	3.6	3.2	3.1	..
Electricity subsidies/GDP**	0.7	0.7	0.9	0.9	..

* = Total subsidy on fossil fuels as share of GDP (%).

** = Total subsidy according to budget allocation only on electricity as share of GDP (%).

Notes: In Mexico, the fiscal cost of electricity subsidies is higher than the estimate based on the price gap approach; the budget appropriation for electricity subsidies in the 2015 budget was MXN 30 billion, i.e. 0.2% of GDP or 0.6% of total government expenditure; PPP = purchasing power parity; e = data estimated; .. = not available.

Sources: IEA (2015a), *World Energy Outlook*, www.worldenergyoutlook.org/weo2015/; IMF (2013b), Case Studies on Energy Subsidy Reform: Lessons and Implications, www.imf.org/external/np/pp/eng/2013/012813a.pdf; World Bank (2011), *Implementing Energy Subsidy Reforms: Evidence from Developing Countries*, www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2012/11/08/000386194_20121108024913/Rendered/PDF/735180PUB0EPI00200pub0date010031012.pdf.

The results have in many respects been successful, and both countries have placed reforms to the energy sector at the heart of current political debate and strategy. In Mexico this has, for the moment, mainly crystallised around changes to the institutional structure and framework for competition in the energy sector, with the aim of reversing the decline in oil production and reducing the costs of energy supply, notably in the electricity sector. While fossil fuel subsidies have successfully been phased out gradually, so far there is no progress towards the politically sensitive reduction or elimination of electricity subsidies to households that are still orchestrated through a highly complex tariff structure.

In Indonesia, the 2014 presidential campaign focused on different approaches to lowering energy – notably fuel – subsidies, with disagreement mainly about the pace of change. Following the election of Joko Widodo, increases to fuel prices were implemented in November 2014. Subsequent declines in the international oil price allowed for an elimination of the subsidy on gasoline and an attempt to fix an upper bound on diesel and kerosene subsidies in January 2015. As a consequence, the level of total fossil fuel subsidies in the 2016 budget is projected to be just 30% of the peak level reached in 2014. There has been far less discussion of possible changes in market structure and competition, whether for fuels or electricity. The emphasis continues to be placed on limiting demand for subsidised fuels, including through raising consumer energy prices.

The two countries presently subsidise energy products and services, but in different ways and to differing degrees. The following section provides a rapid overview of the main subsidy mechanisms that are being used.

4.2 Political institutions

Reducing or eliminating fossil fuel subsidies cannot be reduced to technocratic considerations: in both countries reforms have a prominent place in political dialogue and popular discussion.

Consequently, reforms need to be grounded in the political and institutional system as well as elicit sufficient support among voters and citizens.

Although the political arrangements and practices in each country vary substantially, they have a number of institutional features in common. Both countries have presidential systems. In addition, Mexico has a bicameral legislature with an elected Chamber of Deputies and a Senate. Indonesia has a unicameral House of Representatives (DPR) elected every five years. It forms the principal legislative institution and is tasked with overseeing the direction of government, as well as having involvement in drafting laws and regulations. The countries have differing degrees of decentralisation and institutional arrangements below federal level. Indonesia has a Regional Representatives Assembly (DPD) that is mandated to deal with regional affairs.

What is common in both countries is that, although the principal locus of executive power remains concentrated in the presidency, in both locations the executive has increasingly had to engage with, and consult, the elected legislatures. One consequence is that forging policy in strategic and politically sensitive areas requires building coalitions of support, whether across parties and/or other interested groups. This growing coalitional nature of politics has had the benefit of inducing a search for consensus, but has also sometimes been a constraint on reform. Indeed, the challenge in the future in both countries is to forge greater consensus out of disparate interests. This may require changes not only in behaviour but also in the manner in which some of the key institutions relate to, and bargain with, each other. Perhaps symptomatic of this is the fact that shortly after taking office, the current President of Mexico reached an agreement with the main opposition parties on the direction of policy, called the "Pacto por Mexico". While a detailed discussion of the specifics of each political system is not required in this context, some understanding of how political decisions are made and the political institutions that exist, as well as the attitudes of citizens toward government, is necessary given the politically charged nature of fossil fuel subsidies in both countries.

Classifying political systems

A starting point is the broad classification of political systems with a further disaggregation by components. Such classifications have been undertaken by a wide range of evaluating institutions and most concur in characterising both Indonesia and Mexico as broadly democratic countries.[19]

The Polity IV dataset allows deeper analysis by providing judgements on individual components of the political system. Table 3 provides the scoring for a number of the key components, notably relating to political participation, political competition and constraints on the executive. Scores are given for both countries, as well as for a benchmark, the United Kingdom. A further indicator – Durability – gives the number of years since a regime change, that is, the number of years since the last substantive change in authority characteristics (defined as a three-point change in the overall Polity score in any period of three or fewer years). It can be seen that the scores for Indonesia and Mexico are actually very similar.

Table 3• Indonesia and Mexico democracy indicators, 2013

Variable	Indonesia	Mexico	United Kingdom
Democracy	8	8	10

[19] See, for example, the Economist Intelligence Unit (EIU) Democracy index (www.eiu.com/public/topical_report.aspx?campaignid=DemocracyIndex2015) or that compiled by Freedom House (www.heritage.org/index/about).

Polity*	8	8	10
Durability (years)	14	16	133
Political competition	9	9	10
Competitiveness of political participation	4	4	5
Regulation of participation	2	2	5
Constraints on Chief Executive	6	6	7
Openness of executive recruitment	4	4	4

* = Polity score ranges from +10 (strongly democratic) to -10 (strongly autocratic).
Source: Marshall, M., T. Gurr and K. Jaggers (2013), "Polity IV: Political regime characteristics and transitions", Center for Systemic Peace (database), www.systemicpeace.org/polity/polity4.htm.

While both countries can presently be characterised as democratic in most critical dimensions, in the case of Indonesia this has involved a sharp break with the recent past and the prior system of autocratic government. This break occurred within the last 20 years. The same break has not been present in Mexico, although the level of political competition and participation has significantly improved in the same broad period as the longtime dominant party (Institutional Revolutionary Party [PRI]) lost its pre-eminent position at the end of the 1990s and political competition increased.

The legacy of autocratic government in the case of Indonesia, and the earlier system of one-party dominance in Mexico, has been reflected in the manner in which citizens have engaged with the main political institutions and actors. Specifically, the legacy has been important in conditioning the extent of trust between citizens and government. This is a factor of central importance when considering the political viability of reforms – such as to energy prices – that affect large numbers of citizens and where attitudes to government, including with regard to its integrity and/or competence, are going to be relevant.

Perceptions of citizens

To explore these dimensions further for both countries, the World Values Survey (WVS) provides a suitable instrument (based on a common questionnaire) for assessing the way in which citizens judge or view their governments, as well as indicating prevalent attitudes to particular broad policy directions. Figure 1 gives responses to a series of questions about citizens' degree of confidence in the government, political parties, parliament and the civil service for both Indonesia and Mexico.[20] The figure gives responses scaled by the self-reported income level of the respondent (measured over deciles). These are grouped into three brackets; lower income (deciles 1-3); middle income (deciles 4-7); and higher income (deciles 8-10).

The broad picture that emerges in both countries is that many, and often most, citizens have limited or no confidence in their executives, parliaments, political parties and civil servants. In Indonesia, for the sample as a whole, nearly half of respondents had little or no confidence in government and this share rose to 60-70% for parliament and political parties. Confidence in civil servants was rather higher with over 55% expressing general confidence in them. In Mexico, the responses tended to be even more negative. Between 60% and 77% of respondents had little or no confidence in any of the four institutions. When looking at responses by self-reported income, the

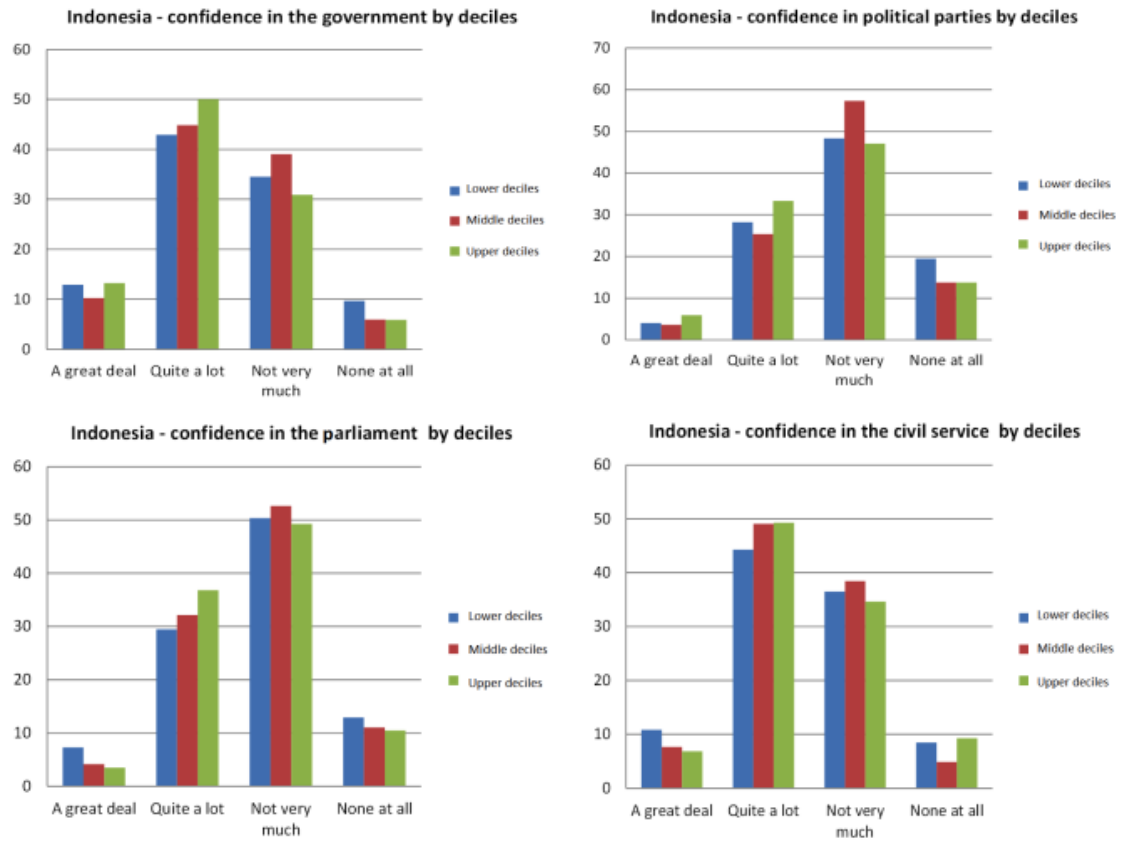
[20] The survey was carried out with Wave 5 in Indonesia in 2006 and with Wave 6 in 2012 in Mexico.

variation between the brackets in Figure 6 is actually quite small. This indicates that these perceptions are widely shared across the income distribution in the two countries.

While these questions about attitudes to government and political institutions are couched in general terms and are for particular points in time, they suggest that one of the reasons both Indonesian and Mexican governments may have had difficulty in implementing energy sector reforms is that citizens mostly lack confidence in their governments and public institutions. Lack of trust and credibility is an impediment that will have to be addressed in the future.

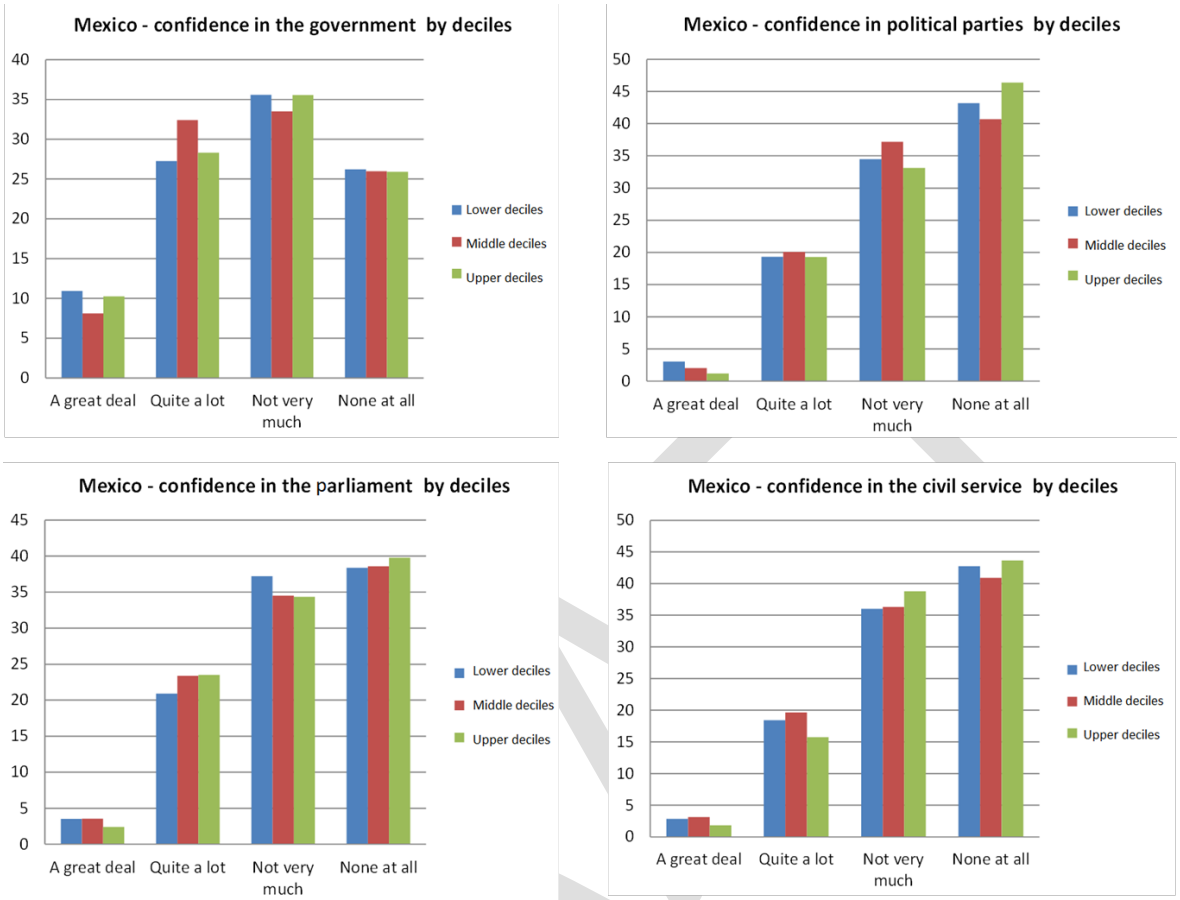
The next sections now turn to a more detailed examination of the current situation in each country. In particular, they appraise current attempts at energy subsidy reform as well as suggesting further avenues for policy and strategy. In the case of Mexico, the focus is primarily on the power sector, while for Indonesia the focus is primarily on fuels.

Figure 5 • Confidence in public institutions in Indonesia



Source: World Values Survey (2006), Wave 5 – Indonesia, www.worldvaluessurvey.org/WVSDocumentationWV5.jsp.

Figure 6• Confidence in public institutions in Mexico



Source: World Values Survey (2012), Wave 6 – Mexico, www.worldvaluessurvey.org/WVSDocumentationWV6.jsp.

MEXICO

4.3 Context

Mexico's recent economic performance has been weak, averaging just over 2% annual growth in the last three years. At the same time, the fiscal deficit has been creeping upwards and was in excess of 3.5% of GDP in 2015. The current account deficit – a novel feature for Mexico – reached 2.6% of GDP in the same year.

Although Mexico's sluggish growth in recent years can, in part, be attributed to the impact of slow growth in its neighbour and major trading partner, the United States, it can also be related to structural and policy constraints. One constraint that has been identified by the current administration is lack of competition in a variety of key sectors, among them the important energy sector. Here, two large public-sector enterprises – PEMEX and CFE – have been dominant players for a very protracted period of time. In 2013 PEMEX accounted for around 35% of federal budget revenues. However, oil output has fallen by around 30% since the mid-2000s and any further decline will have significant fiscal implications. Associated with the fall in domestic production, imports of energy have increased sharply in the past decade and remain on a rising trend. By 2013, the level of imports was almost half of domestic gasoline consumption and about a third of diesel consumption.

The picture has been more qualified in the case of CFE. Indeed, in recent years, the company's financial losses that have not been compensated by the Treasury have eroded its capital base. And while fuel subsidies have been largely eliminated through a system of small but regular upward price adjustments, electricity subsidies – particularly to households, but also to agriculture – have remained high. The fiscal costs of the subsidy in 2015 amounted to 0.6% of government spending or 0.2% of GDP. According to the IEA price gap approach, the subsidy amounts to 0.1% of GDP, indicating that part of the subsidy is covering for above-average losses and inefficiencies in transmission and distribution. Total fossil fuel subsidies amounted to USD 5 billion in 2014, making Mexico's subsidy bill the 24th largest in the world in absolute terms.[21] The country has since made progress in phasing out the subsidy of transport fuels through a gradual increase in prices and thanks to the fall in oil prices.

4.4 Past episodes of fossil fuel subsidy reform

Historically, the Mexican constitution has given the state monopoly rights for energy production. This resulted in the dominance of PEMEX. Private-sector participation has mainly been handled through service contracts. In electricity, CFE has been a vertically integrated entity with, however, private companies being allowed to sell power to CFE. Reform of fossil fuel subsidies and the organisation of the energy sector have been attempted on several occasions by previous Mexican administrations (Table 4). For example, in 1999 the government proposed a package of reforms involving both vertical and horizontal unbundling of the sector, alongside privatisation of incumbents, the creation of a wholesale power market and a revised and strengthened role for the regulatory authority. These were a foretaste of what was finally agreed in 2014. However, at that time, these proposals ran into a brick wall of legal impediments – primarily the constitutional

[21] Indonesia's subsidy bill exceeded USD 23 billion in 2014, making it the 10th largest country in absolute terms.

impediments to private-sector participation in the energy sector – as well as widespread opposition from trade unions and other vested interests.

There was also widespread opposition from consumer lobbies, not least because of the expectation that the reforms would lead to rising prices for electricity. Public opinion was not entirely against greater private-sector participation in the power sector, but the largest share of opinion was hostile.[22] The proposals were also launched close to the end of the presidency and ran into wider opposition linked to the next election. As a consequence, they failed to command consensus and lapsed. President Ernesto Zedillo's successor, Vicente Fox, launched a similar but diluted reform initiative in 2002, but without such a prominent privatisation component.

As regards the pricing of electricity, the 2002 reforms tried to eliminate the subsidy for all residential consumers who consumed more than 280 kilowatt hours (kWh) on a bi-monthly basis. It was argued that this would leave 75% of consumers with a subsidy as they consumed less than 140 kWh/month. The stated goals of the reform were to generate resources for CFE to invest, as well as reduce regressivity in the distribution of subsidies, although the proposals were immediately criticised for introducing higher levels of cross-subsidy. The main opposition came from middle-class households, especially in relatively rich – and hot – northern parts of the country, as well as from farmers intensively using electricity for irrigation pumping, again in the north of the country. In addition, there was opposition from the Bank of Mexico, which argued that the electricity price increases would be inflationary. In contrast, certain commercial entities and local governments supported the proposed reforms because they would have reduced the tariffs that they faced (Hernández, 2007; SHCP, 2007; SIA, 2002).

The approval rating of the President immediately fell sharply to its lowest rate in his presidency (47%), while the Senate issued a decision asking the government to reinstate previous subsidy levels. This opposition led to the changes being significantly diluted and instead of proposed savings of MXN 10 billion, only MXN 2 billion were finally agreed. However, even that outcome was further eroded as subsequent measures adopted by the Congress raised subsidies again. For example, in 2003 the "Iniciativa Pérez de Alva" was passed that benefited defaulting customers in northern states, while the later "Iniciativa Luebbert II" also further reclassified customers in hot zones into lower tariff groups.

The 2002 reforms did succeed, however, in making the tariff structure very slightly less regressive than before. Perhaps the most notable change was the introduction of high tariffs for large household consumers (DAC), but the coverage achieved with this change is fairly limited. Further, the subsequent proliferation of other tariffs conditioned on local climatic factors, as well as the widespread reclassification of households across tariff classes, only served to complicate the tariff system yet further, while also increasing the share of households benefiting from low-priced electricity. Subsequently, broad and bold reforms aimed at changing the landscape of the sector were discarded and the focus shifted to more marginal changes, notably to tariff structure.

There have also been limited attempts at putting in place transfer programmes designed to limit the impact of possible price rises. Building on the "Prospera" (formerly "Oportunidades") programme that started in the late 1990s, a complementary programme named "Oportunidades Energéticas" was started in 2007 with an overall budget of USD 400 million and a small (USD 4.8 million) cash transfer component designed to provide resources for the energy expenses of poor households in rural areas. However, it did not replace or modify existing electricity subsidies. In addition, a small (USD 4.40 million) untargeted monthly payment was instituted in 2008 in response to energy rising prices.

[22] Opinion poll results cited in IMF (2013b)

Table 4• Chronology of Mexico's subsidy reforms (and attempted reforms) since 1999

Year	Fuel	Pricing reform
1999	Energy sector overall	Failed energy sector reform attempt under President Zedillo.
2001	Energy sector overall	Second failed energy sector reform attempt under President Fox.
2002	Electricity	Introduction of DAC tariff which exceeds the long-run marginal cost for customers with high consumption volumes. Succeeded in reducing electricity subsidies by MXN 2 billion and in making the tariff structure very slightly less regressive than before.
2008	Energy sector overall	Failed energy sector reform attempt under President Calderón.
2010	Fuels and LPG	Initiated monthly increases in fuel prices (ca. 1% per month) and annual increases in LPG retail prices of 7-8%.
2013	Energy sector reform	Energy sector reform approved, including constitutional reform under President Peña Nieto. Liberalisation of fuel market by 2018; partial unbundling of utility; electricity tariffs defined by regulator (but Finance Ministry retains the right to override economic tariffs).
2014	Fuels	Inflation and carbon tax incorporated into fuel price formula.
2015	Fuels	Fuel subsidy turns into tax, in part thanks to low oil price.
2016	Fuels	Liberalisation of fuel imports.
2018	Fuels	Full fuel price liberalisation (planned).

Sources: IMF (2013b), *Case Studies of Energy Subsidy Reform: Lessons and Implications*, www.imf.org/external/np/pp/eng/2013/012813a.pdf; Toft, Beaton and Lontoh (2016), *International Experiences with LPG Subsidy Reform*, www.iisd.org/sites/default/files/publications/international-experiences-with-LPG-subsidy-reform.pdf.

4.5 Current reforms to the energy sector

Despite the earlier failures, energy policy has been a major plank in the political and economic reform strategy of the current administration. The energy reforms centred on improving the efficiency of the two state-owned energy firms (oil and electricity) and increasing private (including foreign) firms' participation in energy generation. They passed through the Mexican Congress and became law in the summer of 2014.

The legislation also explicitly addresses the issues of energy pricing, particularly with respect to transport fuels. It allows for a temporary maximum price regime for gasoline and diesel until 2017, including margins for transport and distribution costs. It also provides for inflation adjustment and adjustment of the local price to international prices in the case of high volatility. In 2016, changes to both excise taxes and the system of price determination have been approved by the Congress. As such, the excise tax will be fixed at a specific amount per litre. Consumer prices will vary in line with international prices, adjusted for average costs of transport, profit margins and taxes. In addition, a price band will be applied limiting monthly price changes to a range of +/-3% relative to prices in December 2015. From 2018, it stipulates that prices will be set in accordance with international prices, although without mention of any specific mechanism.

In the case of LPG, there is explicit mention of the need for a targeted support scheme for users of LPG to be put in place by end of 2016 at the latest. Until then, the Finance Ministry will continue to set the LPG price. However, according to the Hydrocarbons Law, pricing will be liberalised from the beginning of 2017. Changes to the way in which politically sensitive electricity prices will be set in

the future are also specified, with the main thrust of the reform being to shift away from price setting by the executive branch to market determination with an independent regulator (Energy Regulatory Commission, CRE). However, there is some continuing ambiguity over the respective roles of the regulator and the executive branch in the determination of subsidised tariffs.

One of the main motivations for the reform is to address projected shortfalls in supply and the perceived inefficiencies of the incumbent utility. By introducing greater competition, alongside more effective regulation, the aim has been to provide greater transparency of cost. Although the reform has not explicitly addressed the matter of the persistent and costly system of subsidies in the electricity sector, this greater transparency reveals the extent to which subsidies are a result of the incumbent utility's inefficiencies. In 2016, Congress for the first time has had to approve the amount of subsidies in a dedicated line of the federal budget, exposing the measure to potential political debate in the future. However, any changes to the current system have been made more complicated by the current President's promise to voters in the election campaign that electricity prices would fall during his incumbency. This suggests that in the medium term (i.e. over the remaining years of the current administration) marginal changes to tariff structures and rates will probably be the primary instruments for the diminution of electricity subsidies. The discussion returns to these design issues later.

Market structure

The previous structure of the power sector was marked by the dominance – constitutionally mandated – of the public-sector operator, CFE. More recently, this vertically integrated entity has co-existed with independent power producers (IPPs) from whom it has been buying power. At present, up to 40% of generation is accounted for by these IPPs. The dominant business model in the existing system has been for IPPs to set up captive generating plants linked to major industrial consumers.

A central aim of the energy sector reform is to accelerate further the entry of private investors and to create a wholesale power market. Initially, the point of entry for private operators will remain generation, although there are plans for some unbundling of distribution. Transmission will remain a regulated monopoly.

The clear objective is to stimulate the role of private companies in the electricity sector while also forcing the incumbent – CFE – to shift its behaviour towards operating as a commercial company with financial targets.[23] In addition, the fiscal arrangements between the incumbent and the government are being redrawn. The system of *aprovechamiento,* whereby CFE was in principle reimbursed (albeit, to varying degrees) by the fiscal authority for the cost of subsidies through writing down taxes and dividends owed to government, is to be replaced with a system that is meant to be more transparent. The company will be required to pay taxes, and any subsidies from the budget will need to be made explicit. Market rules, including for the wholesale market and critical issues, such as dispatch in the system, as well as specification of the role and powers of the independent regulator (CRE) were issued in September 2015 and the wholesale market was launched in February 2016.

Likely beneficiaries of reform

The main initial beneficiaries of the reform strategy are likely to be industrial consumers, particularly larger firms, whose competitiveness could be expected to improve. A study by CONCAMIN (the Mexican Confederation of Industrial Chambers) indicated that in the first quarter

[23] The actual terminology specifies that CFE will become a "productive state enterprise".

of 2014 the cost of energy for large Mexican industrial consumers, who pay tariffs above cost recovery level (see Table 5), was over 50% higher than for firms operating across the border in the United States. Reducing this gap could be expected to improve further export performance. In addition, it is expected that small and medium-sized enterprises (SMEs) will also benefit in due course from lower prices, although the heterogeneous – and sometime informal – nature of smaller firms will make cost reductions more difficult to achieve. Clearly, a driving motivation behind the reform has been the scale of the cost differential between Mexico and the United States, there being an average price gap for power in favour of the USA of around 20%.

The response of CFE to the reforms will be critical. The market rules specify that CFE will acquire power for basic supply through long-term auctions. Yet, it is not clear whether the company will be able to compete effectively given its current management and staffing, as well as its high labour costs. Nor is it clear how its obligations to the large subsidised components of the power market are to be squared with it operating as a "productive enterprise" with profit-maximising objectives.[24] It is not implausible that CFE may lose market share to more efficient private power-generating companies. With regard to the loss-making household and agricultural sector customer base, any subsidy is now required to be transparent and financed directly from the state budget. But large accumulated obligations – such as those relating to pension obligations which now exceed MXN 0.5 billion – will weigh on its balance sheet. Although these could be treated as legacy costs and assumed by the state, the situation has yet to be clarified.

4.6 Electricity subsidies and tariffs

Subsidies

Electricity subsidies have been present since the 1970s and their origin appears to have been less the result of explicit policy than a failure to index electricity prices to inflation. Subsequently, however, the evolution of electricity subsidies has been very much the consequence of political decisions and has been conditioned by the role and weight of consumer groups, political parties and other vested interests.

Electricity subsidies are measured in Mexico as the difference between the price of electricity paid by consumers and the average cost of supply. This means that the size of the subsidy bill is explicitly related to the cost of supply and hence to the efficiency of the, until now, vertically integrated utility, CFE. The Mexican subsidy estimate is therefore higher than the IEA estimate, which considers the difference between the actual end-user price and an international reference price with an average allowance for transmission and distribution (USD 15 per megawatt hour [MWh] for the industrial sector and USD 40/MWh for the residential sector). A number of studies have found that CFE's efficiency has remained poor, compromised by a wide variety of factors including high operating costs, low investment in new generating plant and inadequacies in management. In addition, billing arrears to CFE and the overall collection rate have been adversely affected by widespread theft and non-compliance.

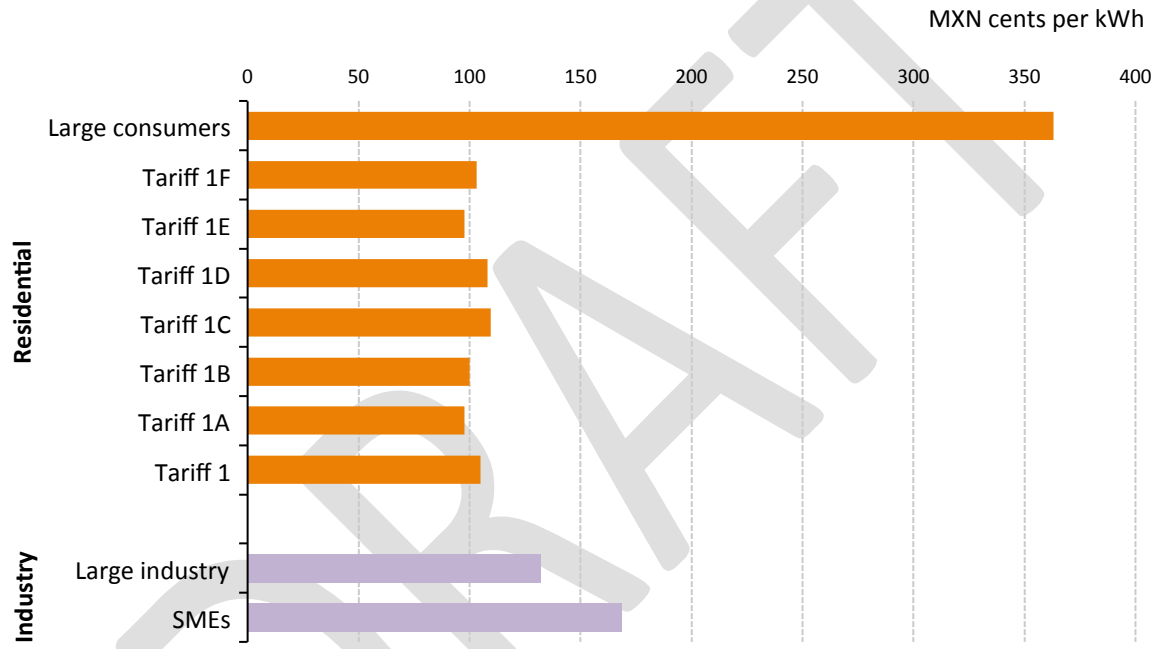
Currently, subsidies are concentrated on domestic households and the agricultural sector or, more exactly, large farmers in the north of the country. Combined, these two constituencies account for just over 30% of total electricity consumed in Mexico. But the way in which these groups receive subsidies has become extraordinarily complex in calibration and incidence, lacking clear design

[24] The Energy Law specifies that the most efficiently generated power should be allocated to households by CFE. If the utility were to allocate less efficient generation to industrial and commercial users, this would likely put them under considerable pricing pressure.

from a perspective of achieving public policy goals. Indeed, as will be discussed below, the evidence suggests that the benefits of subsidies largely accrue to households and farmers who do not need them, at least from an income or expenditure perspective.

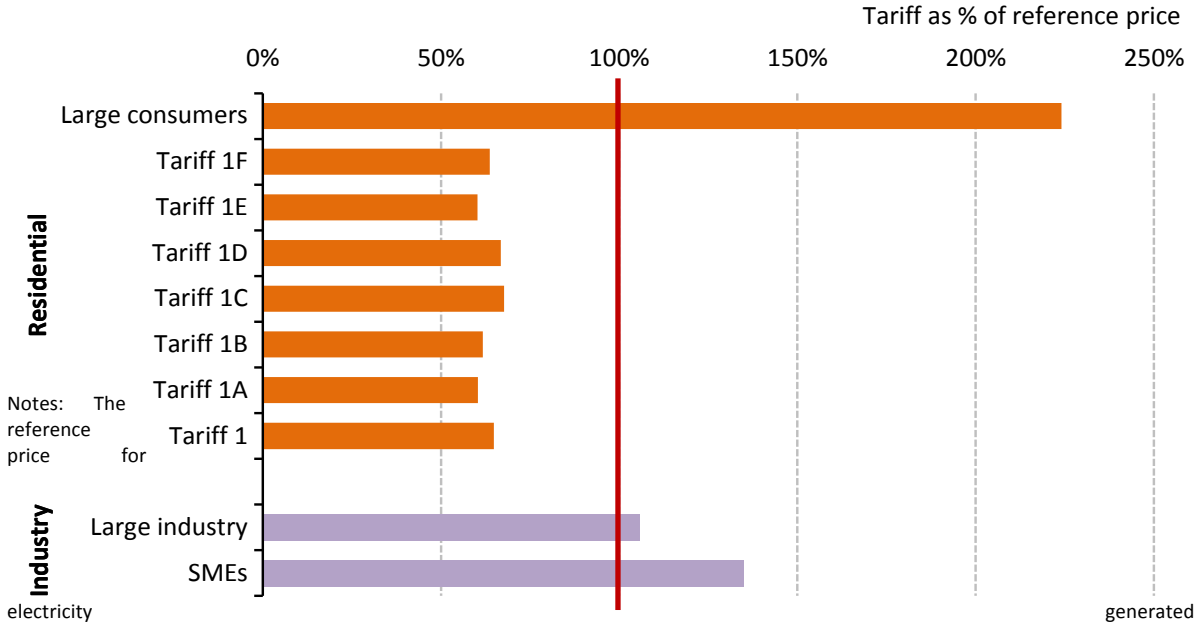
Presently, the system also has a significant amount of cross-subsidy. Given that the current round of energy sector reforms is likely to lower tariffs for industrial and commercial users in the coming years, some of this cross-subsidy can be expected to shrink. This will affect the size of the gap between net and gross subsidies. Following the Mexican methodology, that gap is currently in the region of 0.25% of GDP, implying that if the present level and volume of subsidies are sustained, the net electricity subsidy will climb towards 1% of GDP as some of the benefits of cross-subsidy are lost by government.

Figure 7• Average tariffs in the residential and industrial sectors, 2013



Note: Residential electricity tariffs are categorised according to consumption levels and temperatures during the summer.
Sources: SENER (2014b), Internal information note, mimeo; IEA analysis.

Figure 8• Average tariffs in residential and industrial sectors as a percentage of their reference prices, 2013



Notes: The reference price for electricity generated from fossil fuels is based on annual average cost pricing for electricity (weighted according to output levels from each generating option); residential electricity tariffs are categorised according to consumption levels and temperatures during the summer.
Sources: SENER (2014b), Internal information note, mimeo; IEA analysis.

With a highly complex tariff structure, the subsidy rate varies significantly across consumer/tariff categories. These are defined by the tariff bands, as well as by the regional and seasonal variations in pricing that have been introduced. This complexity reflects the incremental and, at times, idiosyncratic way in which subsidies have been rolled out over time. To give a sense of how complex this has become, over 100 tariffs are currently available for household consumers.

Tariffs

Table 5 provides a breakdown of the tariff rates and the relationship between each band and the cost of supply. A casual glance gives a good sense of the proliferation of tariffs. For households, the relevant bands are 1-1F and DAC. Tariffs with the prefix 9 are for agricultural irrigation, tariff 6 is for the pumping of drinking water as well as sewage, tariffs with the prefix 5 are for public lighting while 2, 3 and 7 are for commercial users. The bottom part of the tariff panel is for industrial consumers and is related to the level of tension – medium and high – as well as the amount of usage.

Table 5• Subsidies and price/cost ratios, 2013

CFE							
Subsidies and price/cost ratio 2013							
Tariff	Sales (GWh)	Products (MXN million)	Average price (MXN/MWh)	Costs (MXN million)	Average cost (MXN / MWh)	Subsidy (million MXN)	Price / cost ratio
1	19 299.3	20 274.10	1 050.50	64 104.00	3 321.60	43 272.90	0.30
1A	2 179.00	2 129.40	977.20	7 094.80	3 256.00	4 965.20	0.30

1B	5 304.00	5 289.30	997.20	15 650.50	2 950.70	10 360.30	0.30
1C	11 007.40	11 861.10	1 077.60	29 923.10	2 718.40	18 093.30	0.40
1D	2 796.70	2 957.10	1 057.40	7 513.30	2 686.50	4 555.50	0.40
1E	3 420.10	3 100.10	906.40	8 987.60	2 627.90	5 887.70	0.30
1F	5 817.90	5 271.10	906.00	14 775.90	2 539.70	9 509.50	0.40
DAC	2 545.30	9 238.80	3 629.70	6 433.10	2 527.40	0	1.40
2	11 932.90	35 779.70	2 998.40	31 439.80	2 634.70	0	1.10
3	1 786.40	4 606.00	2 578.40	4 226.40	2 365.90	0	1.10
5	1 828.60	5 322.90	2 910.90	3 586.70	1 961.40	0	1.50
5A	3 951.10	9 873.80	2 499.00	9 548.00	2 416.50	0	1.00
7	24.00	101.00	4 205.60	74.30	3 094.10	0	1.40
9	41.90	115.40	2 752.00	154.20	3 678.90	72.60	0.70
6	3 481.10	5 866.20	1 685.10	7 451.80	2 140.60	2 151.90	0.80
9CU and 9N	9 596.10	4 651.70	484.70	16 978.20	1 769.30	12 478.90	0.30
9M	644.10	879.20	1 365.10	1 197.90	1 859.80	426.10	0.70
OM	13 497.50	27 023.60	2 002.10	23 867.90	1 768.30	0	1.10
HM	62 880.90	101 611.70	1 615.90	98 560.60	1 567.40	0	1.00
HS	26 349.60	36 989.10	1 403.80	33 812.4	1 283.20	0	1.10
HT	17 745.90	21 221.80	1 195.90	20 175.40	1 136.90	0	1.10
TOTAL	206 130.00	314 163.00	1 524.10	405 556.00	1 967.50	111 773.70	0.80

Notes: GWh = gigawatt hour.

Tariff legend: 1-1F = household tariffs; DAC = household high energy consumption tariff; 2, 3 and 7 = commercial users' tariffs; 5, 5A, 6 = public services tariff; 9, 9CU, 9M and 9N = agricultural tariffs; OM and HM = medium-voltage tariffs; HS and HT = high-voltage tariffs.
Source: SENER (2014b), Internal information note, mimeo.

Table 5 also shows that the ratio of prices to costs – the operative indicator used to measure subsidies – was, on average, 0.8. The lowest tariffs have a ratio of prices to costs of 0.3. In contrast, a relatively small group of households – around 13% of consumers – with high levels of electricity consumption face a tariff (DAC) that is significantly higher than the cost of production.[25] In general, nearly 30% of electricity sales were conducted at price/cost ratios of less than 0.4 and these accounted for nearly 98% of total electricity subsidies. Further, of that group, around 85% of both sales and subsidies were concentrated on household consumers grouped in tariff bands 1-1F.[26] Indeed, over 95% of household energy consumption was at heavily subsidised rates.[27]

4.7 Who benefits from electricity subsidies?

As in most other countries running fossil fuel subsidies, those in Mexico are highly regressive and disproportionately benefit higher-income groups, who consume the most energy. This regressivity has been present for an extended period of time. In the mid-2000s, the lowest three income deciles accounted for around 16% of electricity subsidies, while the top three deciles accounted for nearly 40%. These shares have remained broadly constant to the present day. The perverse – and

[25] Tariffs do not include a fixed charge; see Section 4.9 for discussion.

[26] The remaining component was for agricultural consumers.

[27] Households paying non-subsidised or DAC tariffs accounted for less than 5% of total household consumption.

inequitable – nature of the tariff structure is well identified by the fact that over 25% of households paying the lowest tariff (1F) actually belong to the top decile of the income distribution (Scott, 2011).

Current arrangements mean that even if the highest unit subsidy flows to lower-income households, the total value of the subsidy received by connection each month is smallest in the low-income groups (Komives et al., 2009). Although no highly detailed analyses has been done, it appears that the incremental and complicated sets of changes to tariffs that have occurred over the last decade – notably the proliferation of seasonal or climatic adjustments – have further worsened the regressivity of the current system.[28] The interaction of political economy and design has resulted in electricity subsidies mainly benefiting people who live in relatively warm parts of the country (primarily in the north of the country) and who consume significant amounts of electricity. Evidence from a number of countries also suggests that a reliance on block tariffs – a feature of the Mexican tariff system, as indicated in Table 5 – will tend to be regressive by design (Komives et al., 2009, p. 21).

One apparent paradox is that the regressive nature of electricity subsidies remains a feature that is not as widely appreciated among the general population as might be expected, despite a number of detailed studies and some public discussion in mainstream media. Indeed, a popular, and sometimes explicitly political, narrative is that subsidies are actually pro-poor. In large part, this is nothing more than a fiction. Overlaying a map of subsidy incidence with that for poverty incidence shows a very weak overlap (SENER, 2014a, 2014b). Yet, surprisingly little has been made of the fact that subsidies are highly inequitable. This might be interpreted in several ways: as testimony to a failure of political strategy and underlying analysis or, possibly, as testimony to a weak or ambiguous interest in improving equity among the population.

4.8 Impact of possible electricity pricing reform on the poor

When considering possible reform to electricity subsidies, it has to be recognised that, with the exception of a small proportion of households (less than 1%) which lack access to the grid, poorer households do actively benefit from electricity subsidies, particularly in the warmer parts of the country. How large might the impact of a withdrawal of electricity subsidy be on poorer households?

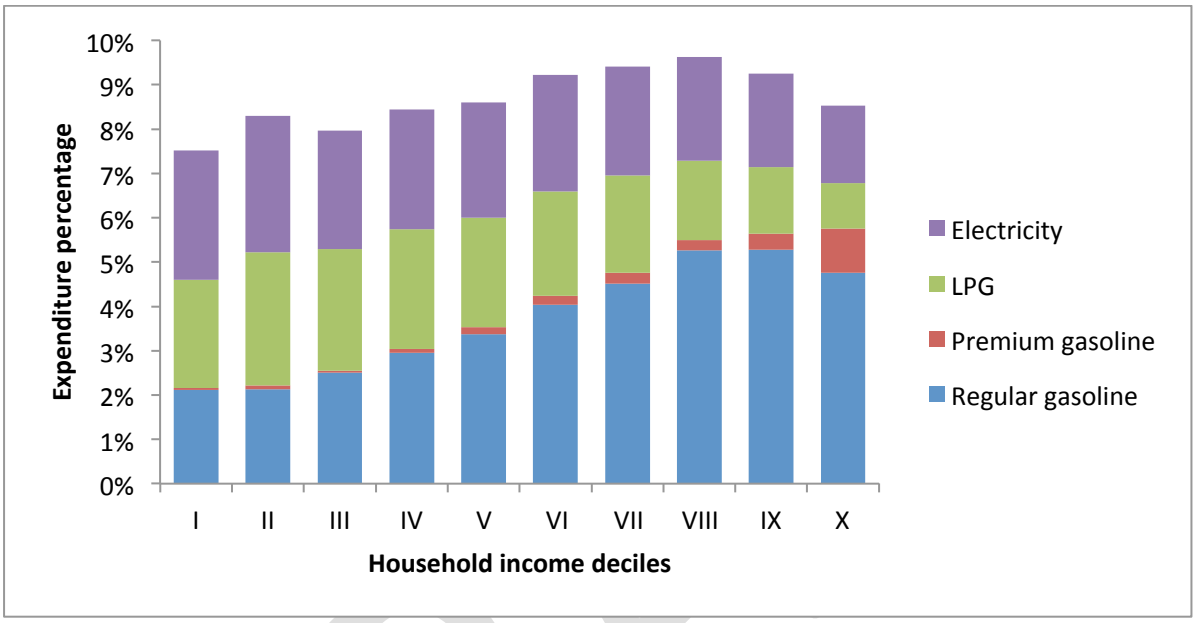
Data for 2006/07 indicated that electricity subsidies comprised around 5% of total income for the lowest quintile of household incomes (Komives et al., 2009). At the mid-point of the income distribution, this share was around 3.5%, while for the top quintile it was only 1%. Recent data show the lowest to the middle-income deciles spending roughly 8% of their total expenditure on energy, not far short of that spent by the top decile. For electricity alone, the poorer deciles spend around 3% on electricity. At the midpoint this falls to around 2.6%, while the top two deciles devote around 2%. The table also shows that the energy composition of spending changes with income, as fuels account for the largest part in the upper income deciles.

Although for low-income households – many below the poverty line – the loss of subsidy would unambiguously be an adverse income shock, it should be emphasised that these expenditure shares for electricity are relatively low. Indeed, an earlier World Bank estimate of the impact of doubling tariffs indicated that in Mexico the impact on the poverty headcount would be trivial (Komives et al., 2009). Further, it is obvious that consumption levels of electricity have been boosted over time by their systematic underpricing. A decrease in the subsidy rate could be

[28] The current system of electricity subsidies is often referred to as a subsidy for air conditioning.

expected to induce a contraction in demand that could be further consolidated through the provision of effective energy conservation programmes. Earlier estimates of the short-run price elasticity of demand for electricity services are in the range of -0.14 to -0.16. The relatively small share of electricity expenditure to income among low-income households suggests that designing income compensation ought to be feasible and certainly superior to the current system if sufficiently well directed.

Figure 9• Spending on energy as a share of total expenditures by decile, 2014



Source: INEGI (2014), *Nueva Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH)* [New National Survey of Household Incomes and Expenditure], Instituto Nacional de Estadística y Geografía, Mexico.

The idea of shifting towards a system of transfers targeted at low-income households has already been advanced by many researchers and policy makers in the past decades. Indeed, experimentation started in 2007/08 with the Oportunidades Energéticas programme. This took the form of an additional transfer supplement, but was not linked in any way to a change (increase) in energy prices. But it begs the obvious question of why such a shift in strategy has not been possible? To answer that question also requires explicit consideration of wider political and economic interests.

4.9 A strategy for reform

With respect to subsidies, the reform of electricity pricing remains the major issue facing Mexican policy makers after the successful elimination of fuel subsidies. This section addresses the main issues with tariff reform and looks at the possible options. In addition, it reports the results of detailed simulation of the impact of specific changes in tariff design and implementation both on levels of subsidy as well as prices faced by consumers.

Tariff overhaul

Electricity tariffs in Mexico, as indicated above, are excessively complex and are in urgent need of reform. The present structure of tariffs primarily reflects considerations – political and regional –

that have been applied over time without any particular guiding or design principles. The maze of tariffs now comprises a motley assortment of regional/climatic and/or seasonal adjustments. Much of the current electricity subsidy is effectively a subsidy to users of air conditioning in the north of the country. As a result, most households – but also certain other favoured consumers, notably farmers – face tariffs that do not cover the marginal cost of electricity service. And the present setup is not an effective vehicle for addressing distributional concerns, being highly regressive in its incidence. The tariff structure also does not contain a fixed monthly charge (see section below on the two-part tariff reform option for details).

The three main challenges for policy concerning electricity tariffs are to:

- Increase electricity tariffs and address the systematic underpricing of electricity for households to help reduce aggregate spending on subsidies.
- Simplify the excessively complex tariff structure to reduce its highly regressive nature, while also dealing effectively with affordability issues through better targeting of subsidies.
- Create a pathway to liberalisation of prices in a more competitive market where, in principle, prices would be determined by marginal costs with tariffs adjusted to meet allowed revenue requirements. While, in aggregate, prices are presently estimated to be at around 80% of cost,[29] from an economic perspective, electricity tariffs will ultimately need to cover long-run marginal costs.[30]

"Big bang" liberalisation with compensation and targeting

One option for tariff overhaul would be a rapid and complete liberalisation of electricity prices accompanied by an extensive system of compensatory payments, probably of a monthly frequency, for a transitional and limited period. This is the type of approach taken in Indonesia in recent reform episodes (see Section 4.14 below). In addition, measures would have to be put in place to address the needs of poor households specifically, which would involve direct and non-temporary cash transfers. However, the size of the required price adjustment (given present tariff levels, many household tariffs would have to triple in size), as well as the lack of an apparent consensus on the need for a large and rapid reform, indicates that this path would run into credibility, as well as acceptability, issues in the current political and economic context.

All the evidence suggests that Mexican citizens place considerable value on electricity subsidies, while the promise of falling prices was one of the bargaining points that allowed recent enactment of the Energy Law. In addition, Mexican politicians and political institutions have done relatively little to explore in detail attitudes to possible reform of electricity pricing and the possible policy trade-offs that might be accepted. In other words, the preparatory political economy groundwork has not been done. This indicates that a more gradual process of change is likely to be more feasible, even if a rapid liberalisation with compensation and targeted transfers would, in many respects, be a more effective model.

[29] Subsidies are currently measured as the difference between the prices paid by consumers and the average cost of supply. The latter does not cover the economic cost of electricity.

[30] The energy regulator, CRE, is currently working on a tariff structure that will strive to fulfil this goal. However as indicated above, the Finance Ministry retains the right to override the tariff decisions by CRE for certain tariff categories, including residential tariffs.

Gradual reform and its components

Gradual reform can imply a range of relatively slow adjustments to tariffs with or without compensatory payments and/or targeted transfers to specific groups, such as the poor. The design of any package will depend not only on the speed of repricing, but also on the associated set of distributional objectives that a repricing scenario should meet. However, while there might be broad agreement among analysts and policy makers that retargeting electricity subsidies towards poor households would be desirable, it is not at all clear that this proposition is widely accepted in the population, notably among those significant groups of non-poor consumers who would face a lowering of their subsidy rates. Gradual reform could be expected to be a more attractive option when the scale of required tariff subsidies is large and the political opposition to change is likely to be significant. Both factors are present in Mexico.

Previous proposals

Proposals for the gradual reform of the tariff structure and levels are not novel. A number of strategies have been identified that focus primarily – but not exclusively – on changing the tariff structure. (Komives et al., 2009) The menu of options included lowering supply costs, extending the coverage of the top and unsubsidised tariff (DAC), the unification of rates around flat volumetric tariffs and the institutionally more demanding option of means testing,[31] allied to discounts. Simulations using just three tariffs with 20%, 30% and 50% subsidy rates respectively found that this could lower the aggregate level of electricity subsidies by over 50% (Komives et al., 2009; Scott, 2009). The average subsidy received by smaller consumers would be roughly stable but would decline for larger consumers. Lower-income deciles would also receive a higher share of total subsidies (from 25% to 32%). Further, when combined with 20% cost reductions in the electricity utility's operating costs, it was estimated that total subsidies could have fallen by over 80% with a progressive distributional effect. In short, changes at three margins – tariffs, consumption thresholds and supply costs – were proposed as the most effective ways of lowering the electricity subsidy bill. Subsequently none of these have, as yet, been achieved or, in the case of tariffs, even tried.

A further study commissioned in 2010 by the regulatory agency (CRE) – also explored several alternatives for gradual tariff reform (Mercados Energéticos Consultores, 2010). These options included: targeting specific low-income and other disadvantaged groups through direct transfers; targeted transfers based on specific thresholds of electricity consumption; targeting based on specific thresholds for consumption, but relying on differences in tariffs along with cross-subsidies, as well as specific reliance on cross-subsidies during a transitional period. The analysis started by maintaining a current assumption of public policy, namely that the climatic zone in which a household is located can be a sufficient indicator of the right to preferential pricing to offset any adverse impact of temperature on the quality of life etc. This assumption is highly questionable, of course, from both an efficiency and practical perspective.

The principal objective of the analysis was to explore how better targeting could be achieved so as to limit regressivity and induce fiscal savings. The main recommendation was that government should implement a scheme of direct subsidies to poorer consumers that was funded and administered outside of the tariff regime. The report also recommended that the direct subsidy be accompanied by gradual increases in current tariffs that would allow a progressive replacement of the tariff-based subsidy mechanism by direct and targeted subsidies. In these respects, the thrust

[31] Means testing is institutionally more demanding as it requires detailed information on household or individual income, as well as the ability to implement targeted solutions.

of the analysis was to favour, first, a delinking of transfers from energy pricing and, second, a narrower receipt of subsidies with a view to limiting benefits flowing to non-poor households.

Current constraints

Turning to the current context, dealing with the challenges outlined above is severely complicated by the political pledge of lower electricity prices made by the President prior to his election.[32] Although the increase in efficiency in power generation as a result of the current energy reforms (shift from fuel oil to cheaper gas, tapping low-cost renewables) should indeed lead to lower costs that will feed through to prices, these benefits are likely to flow mainly to non-household consumers initially, while the timing of these reductions could reasonably be expected to occur only over a number of years and may be quite protracted. Savings from the current low oil price environment can also be expected to shrink in the future due to a possible rebalancing of the global oil market. Any additional fall in electricity prices to households, in particular, would then have to come from passing on fiscally part of the savings made in other tariff categories as a result of a projected fall in energy supply costs. Assuming that this is the political strategy to be followed, it implies that in the near term (as seen in 2015) subsidies to households may actually rise.

The political pledge, and the associated compromises made to ensure passage of the Energy Law, have limited options and effectively rule out the possibility of a frontal attack on electricity subsidies. However, as electricity subsidies rise in the future, through the combined forces of growth stimulating demand for power, the loss of cross-subsidies and demographic changes, it can be expected that the need to lower electricity subsidies will remain a persistent challenge. As such, the sections below focus on possible ways that a repricing and rebalancing of tariffs could contribute in the future, even if not in the immediate future.

Rationalising tariff blocks while addressing distributional considerations

Mexico has used block tariffs [33]since the 1970s. But their design has grown steadily more complex and is overlaid with a multiplicity of objectives, including subsidised pricing aimed at consumers in particular regions or in particular seasons. Thus, climate-based tariffs have sanctioned lower tariffs to consumers in particular – mostly hot – regions, allowing an inverse relationship between the volume of consumption and the price.[34] Annex 1 provides information on the structure of the blocks and the differences that exist in the two periods of time used to calculate tariffs – namely the six-month periods covering summer and winter respectively. Not only are there large differences across tariffs in the price of the blocks, but also large differences in the size of the blocks. Further, there are large differences across seasons. In the six summer months, the cost of tariff blocks generally falls sharply. For example, for the lowest tariff category – 1F – electricity consumption up to 2 500 kWh per month in summer is charged at between MXN 0.6 and MXN 1.8, with nearly half of that potential consumption attracting a tariff of less than MXM 0.8. In winter, by contrast, over 90% of potential consumption attracts a tariff of MXN 2.8 per kWh.

The need now is to focus tariffs better on the twin objectives of providing relatively low-cost electricity to poorer consumers while limiting the ways in which subsidies are provided to a wide

[32] Interpretation of this pledge is not meant to give rise to ambiguity, as it appears that the promise to reduce prices was intended for all consumers. The ambiguity lies more with the timing of such decreases.

[33] Block tariffs define an increasing price in accordance with the amount of electricity used, i.e. the first block of *x* kWh of electricity is charged at an initial rate, the next block of *y* kWh of consumption is charged at a slightly higher rate, and so on. See Annex 1 for the Mexican example.

[34] Limits on the volume of subsidised electricity consumption have been set but these are generous, particularly in the six summer months.

swathe of households, including on the basis of location and/or climate. To achieve this, the focus needs again to be placed on reforming and radically simplifying the tariff blocks, with tariffs rising with consumption levels in a stepwise fashion (World Bank, 2014). The tariff structure should, in turn, be shifted more onto a pan-territorial or national basis. Although it would be preferable to deal with the problem of affordability for poor households outside the tariff regime using explicit and separate transfers, a transitional approach could still rely on specific tariffs for low-income consumers.

Behind the use of block tariffs is the assumption that volume of consumption is a reasonable proxy for income.[35] Although certainly imperfect, the volume of consumption is probably the best proxy available at present. With that in mind, the obvious inference is that an upward-sloping price/volume schedule would be appropriate. The detail then concerns the shape of the slope and the threshold values that will be used. For dealing with poor consumers, a common approach is to impose a low-tariff initial or lifeline block. However, if a single lifeline tariff is applied, the risk is that the band would either be too broad – hence capturing many non-poor consumers – or that there would be too sharp a discontinuity above the lifeline. In order to smooth possible sharp discontinuities in prices, experience in a multiplicity of countries has involved the adoption of a number of stepwise blocks. An important and allied consideration is whether tariffs for blocks rise sufficiently steeply to allow recovery of costs from consumers of higher volumes. In a significant number of settings where such tariff structures have been introduced, cost-reflective pricing has fallen on a relatively small share of the household consumer base and this, as in Mexico with the current DAC tariff, has not been sufficient.[36]

Block pricing also potentially introduces a trade-off between efficiency and distributional goals.[37] The available evidence is not conclusive, but a recent study matching consumption and income distribution data for California found that sharply increasing block utility pricing in the residential sector achieved modest redistribution to lower-income consumers, but with similarly modest efficiency costs, primarily because consumers were relatively unresponsive to changes in marginal price (Borenstein, 2008). However, given both the possible trade-off, as well as the longer-run objective of moving towards liberalised price setting, it would be very desirable in Mexico to limit the extent of cross-subsidisation within and between consumer categories.

Reforming block pricing

How might a reformed system of block pricing be applied for households in Mexico? The first consideration, as mentioned already, is simplicity. For that reason alone, a maximum of two or three increasing blocks should be applied and these should be applied ideally on a pan-territorial or national basis. The system of atomised, climate- or region-related tariffs should be drastically curtailed or eliminated. The first – or lifeline – block would carry an explicit subsidy element. The cut-off point for the critical first block needs to be derived from analysis of current electricity consumption data, bearing in mind that consumption levels will have been boosted by the low tariffs that have been in place.[38] The funding or fiscal implications would need to be simulated under a range of possible cut-off points. While the tariff level in the second or third block needs to

[35] This association may be qualified once adjustment for the number of household members is made.

[36] For example, in Egypt 5% of total household energy consumption is priced at a level that is cost reflective and this accounts for only 23% of total revenues from electricity sales. The rest is sold at prices that are – often significantly – below cost recovery levels.

[37] The efficiency cost may arise due to different marginal price signals for different consumer groups when the cost of serving them is basically the same.

[38] In rural areas, particularly, pooling of electricity by multiple households may obscure the correlation between income and consumption.

be significantly higher than in the first block, and closer to cost recovery levels, the extent to which it can be increased will be mainly determined by what is deemed politically feasible. That feasibility, in turn, will have to be based on a prior and detailed exploration of options and acceptability among citizens. Over time, there would be an expectation that tariffs in the second and third blocks would increase faster in order to close in on cost recovery levels.

An alternative approach would be to provide significantly subsidised electricity only to low-volume household consumers. If operated nationally, such a volume-differentiated tariff (VDT) would have the merit of providing low-cost energy to poorer consumers (discriminated by volume of consumption) but not to others.[39] The main limitations on such a policy would not be fiscal – as it would clearly allow significant fiscal savings compared with the current regime – but political. This is because the bulk of current beneficiaries of fossil fuel subsidies are not from low-income households and there is clearly opposition to withdrawal. Addressing this opposition might imply a subsidised volume of electricity that is relatively high. Even so, it would make sense in the simulation exercises to apply different VDT tariff structures, which can also involve the use of different ratios of prices to costs, and to see under what assumptions it could conform to the constraint imposed by political economy considerations.

In short, under current constraints, policy is likely to maintain or even raise the subsidy rate. However, this will not be sustainable over a longer duration, as electricity subsidies will become increasingly onerous in both efficiency and fiscal terms. The broad approach signalled above suggests a number of possible gradual reform options that involve maintaining – or even raising – the subsidy component for low amounts of electricity consumption. However, consumption above that threshold, whether priced in one or more additional tariff bands, will need to be charged at rates with lower and much-reduced levels of subsidy. There should also be a periodic adjustment mechanism with, as in the case of fuels, small but regular increments being applied to limit any remaining subsidy component. Pricing rules that are heavily conditioned on location or other criteria should be removed or minimised.

Two-part tariffs and peak pricing

A rethinking of the components of the tariff structure is also required. Most utilities levy a fixed charge for provision of service, although its incidence may vary by type of consumer. This fixed component of a two-part tariff can also be varied depending on considerations such as location or load. At present, CFE does not explicitly submit households to a two-part tariff, although it does so for other consumers. However, the utility does currently levy a fixed charge for minimum consumption of 25 kWh. The incidence of this charge falls particularly heavily on low-consumption households and hence largely on low-income households. This leaves scope for the introduction of better-designed fixed charges. This would have merit on efficiency grounds, as fixed charges could reflect supply costs as well as other considerations, including connection type, load and demand. As in many jurisdictions, the fixed component of the tariff could include a standard monthly charge for service, complemented by an adjustment for the volume consumed. This could also permit shifting some of the charging from the variable component of billing to the fixed component. This could potentially help in improving acceptability among consumers.

A complementary approach that has been applied elsewhere and which could be relevant in the Mexican context is time-of-consumption, or time-of-use, pricing that permits discrimination by specific hour slots and/or seasons. Such pricing rules can help motivate a more efficient use of the network. Among other effects, this would involve levying additional charges for peak-time users. As

[39] This is the central recommendation in Komives et al. (2009).

is well understood, peak demand is a major consideration in the electricity sector because it affects directly the amount of installed and network capacity that a system requires.

Purely from a perspective of pricing, peak pricing could potentially affect both the level of demand as well as lowering the size of the pricing subsidy.[40] For example, a recent study has found that time-of-use rates can induce a drop in peak demand ranging between 3% and 6%, and critical-peak pricing (CPP) tariffs can induce a drop in peak demand that ranges between 13% and 20%. If accompanied by enabling technologies, the latter set of tariffs can lead to a reduction in peak demand in the 27-44% range (Faruqui and Sergici, 2010).

Directly targeting the poor

Block tariffs would allow pricing that addressed some of the issues relating to income deficiency. But, for a variety of reasons, it would ultimately be preferable to address income deficiency directly, rather than through energy pricing. The benefits would potentially be twofold: greater efficiency in the identification and implementation of the transfer, and second, the dissociation of energy pricing from social policy.

In principle, cash transfers are likely to be the most effective way of providing compensation to poorer households. Moreover, means testing is likely to be a superior mechanism for identification than simple reliance on consumption volumes. However, there may be information and institutional constraints to this approach. Means testing – however simplified the metrics – requires significant administrative capacity and integrity to organise effectively and can also be relatively costly. While proxies – such as spatial targeting – can reduce the informational requirements, they remain institutionally intensive while generally supporting a greater number of errors of inclusion and exclusion. Although identification of poor households has been well advanced under Prospera (Oportunidades), it is also now the case that around 40% of the programme's recipients are in urban areas.[41] While this can certainly help identify the urban poor, it would not provide a suitable programmatic basis for such transfers.

Given these institutional and other limitations, a more feasible near-term solution in Mexico is likely to be through tariff differentiation, with income considerations handled through the proxy consumption measure indicated above. In the future, however, there would be much merit in de-linking distributional objectives from energy pricing and, to that extent, separate and targeted transfers directed at the poor would be preferable. Shifting to targeted subsidies, while more efficient, would still be likely to encounter opposition from households close to poverty who might be excluded.

Policy options: Testing through simulations

The options outlined above stand as broad lines of enquiry rather than refined proposals. To make that jump requires a more detailed and empirical approach based on available data and extensive simulations. The following analysis uses disaggregated data from CFE on electricity consumption for all months of 2013. The CFE billing data provide information on electricity consumption and expenditure. It is assumed that the expenditure indicator is a proxy for income. One aim of the analysis is to quantify both the overall effect of any reform on the subsidy bill, as well as the impact using consumption/income correlates. The following indicators have been used:

[40] The incorporation of peak pricing also requires that the metering and billing system will be adaptable.

[41] A relevant consideration is that appending an energy-related component would only complicate Prospera's existing mission and possibly undermine the sources of its success.

1. Aggregate subsidy level (in MXN) associated with each scenario alongside the base case defined as the situation existing in 2013.
2. Average resulting tariff for all households and by expenditure decile under each scenario.
3. Average resulting tariff for each tariff group (1-1F) under each scenario.

The specific scenarios that have been used in the analysis are now described briefly and the results are summarised in Table 6 below.

Instant liberalisation

A complete and instantaneous elimination of subsidies is simulated with and without elimination of the high consumption/high tariff band, DAC. While this approach would clearly be inconsistent with the pledge to maintain stable or reducing prices, the exercise is useful because it gives some magnitude to the scale of shock to household consumer prices that would result from subsidy elimination.

Introduction of two-part tariff

This scenario simulates the introduction of a two-part tariff or fixed charge for households, as is currently the case for industrial consumers. Two levels of fixed charge are used. The first is fixed at the same level as currently levied on industrial consumers (MXN 52). The second is set at a lower level (MXN 20).

Duration of summer tariffs

This scenario applies reductions in the length of summer months for those tariffs where summer tariffs exist. Most households eligible for summer tariffs currently have six summer months. This is reduced to three to four months, as well as for different periods/months.

Tariff simplification

At present, there are seven household tariff regimes, as well as the DAC tariff.[42] These are reduced to three or four tariffs by merging or eliminating smaller tariff categories. The specific permutations that are applied in terms of existing tariff categories are:

1. Four tariffs: 1; 1A+1B; 1C+1D; 1E+1F
2. Three tariffs: 1; 1A+1B; Rest
3. Three tariffs: 1+1A+1B; 1C+1D; 1E+1F.

Extending coverage of the DAC tariff

Specifically, DAC coverage is extended to the top 20% of consumers in each tariff category by applying the present DAC tariff. In addition, expanding DAC coverage to the top 50% but reducing DAC tariffs so that they are set at a zero subsidy or cost recovery level is also applied.

VDT

This involves the application of VDTs instead of the multiple block tariffs used at present.[43] In the first case, the tariff for a household consuming 0-30 kWh per month is set at 0.60 of cost recovery level; for those consuming 30-150 kWh the price is set at 0.75 of cost recovery level; and any household consuming over 150 kWh faces a full cost recovery tariff. In the second case, the only change is that the 0-30 kWh consumption range is provided gratis.

[42] Note that those paying DAC prices in *each* month are only 0.4% or n=130 000.

[43] Komives et al. (2009) also considered in detail the desirability and consequences of introducing a national VDT.

Table 6 provides a summary of the main results for these scenarios. It shows the impact of each scenario on the level of the total subsidy, the impact on the average tariff as well as the tariffs for different consumption (expenditure) deciles. It is clear that application of a VDT can significantly reduce subsidy levels and, if so designed, lower the cost to poorer households (implied to mean those with low consumption levels). But with the bands used here, there is also a significant impact on average tariffs as well as on middle and higher consumption deciles. Similar effects result from applying DAC to the top 20% or 50% of consumers. Introducing a two-part tariff similar to that for industrial consumers does succeed in lowering the total cost of the subsidy but does also raise average tariffs. Changing the duration of summer tariffs or simplifying tariff groups has relatively little impact.

These simulations suggest a number of promising angles for further exploration. However, they do not deal in detail with certain important distributional issues. In addition, it is clear that electricity repricing has a strong political dimension, so issues of acceptability – and hence the effective communication of the objectives of reform to the population – would need to be considered.

Table 6• Summary of Mexico simulation results

	Impact				
Tariff reform option	***Aggregate subsidy***	***Mean tariff***	***Tariffs for low deciles***	***Tariffs for middle deciles***	***Tariffs for upper deciles***
Instant liberalisation	↓↓↓↓	↑↑↑↑	+/–	↑↑↑↑	↑↑↑
Two-part tariff for all (MXN 52)	↓↓	↑↑	+/–	↑↑	↑
Two-part tariff for all (MXN 20)	↓	↑	+/–	↑	↑
Two-part tariff – large consumers	↓	+/–	+/–	↑	↑
Summer month changes	↓	+/–	+/–	+/–	↑
Simplified tariff groups	↓	+/–	+/–	+/–	+/–
VDT	↓↓↓↓	↑↑↑	↑↑↑	↑↑↑	↑↑↑
VDT with low consumption gratis	↓↓↓↓	↑↑	↓↓	↑↑↑	↑↑↑
DAC to top 20%	↓↓↓	↑	+/–	+/–	↑↑↑
DAC to top 50%	↓↓↓↓	↑↑	+/–	↑↑↑	↑↑↑

Legend

↑ to ↑↑↑↑	Slight increase (1) to very high increase (4)
↓ to ↓↓↓↓	Slight reduction (1) to very high reduction (4)
+/–	Insignificant impact

Source: IEA elaboration based on 2013 electricity consumption data provided by CFE.

Complementary reforms

The transparency of price setting in the power sector, generally speaking, will clearly be improved by moving primary responsibility away from the executive branch – notably the Ministry of Finance – to the independent regulatory authority (CRE), as specified in the Energy Law. However, ambiguity remains over how subsidised tariffs will be set in the future and the respective roles of the Executive and the regulator. Aside from the role of tariff determination, one reason that electricity subsidies have grown is because of pervasive reclassifications of customers into relatively low tariff groups. It is this type of gaming of the system that might be better avoided by using a more independent agency. However, because the application of fossil fuel subsidies and their configuration will retain *de facto* a significant political dimension, it could be unwise to shift decisions regarding subsidy rates and financing to a body that in the longer run is expected to be independent of government.

To improve the acceptability of possible reforms, complementary measures directed at low-income consumers could include the greater use of prepayment meters and payment plans that permit smoothing, as well as adoption of different behaviour or technology. A possible option could include on-bill financing for energy efficiency measures, although robust cost-benefit analysis would need to be done in advance. In addition, net metering could allow those residential customers with distributed generation systems to sell the excess power back to the utility at full retail rates, at least for a transitional period. This could, in principle, help reduce bills in the northern regions and might be attractive to some relatively intensive consumers of electricity.

Political economy dimensions

The preceding discussion has highlighted two features: the extent to which the electricity subsidy has persisted and that little real reform has actually been implemented. More positively, the current energy reforms can be expected to lead to falling supply costs, but the beneficial consequences will neither be instantaneous nor will they will be sufficient to erode the subsidy bill. When asked why complementary technocratic solutions – such as those discussed in the section immediately above – have not been adopted, the casual response is almost invariably summarised by one word: “politics”. But what does this actually mean?

Vested interests

In most countries where fossil fuel subsidies are significant, specific or vested interests or lobbies are influential (see Chapter 3). In the Mexican context, agricultural subsidies conform to this broad model of interest groups leveraging public resources, including subsidies, for their benefit. Electricity subsidies to agricultural producers are indeed concentrated on large farmers in the north of the country who use electrically powered pumps for irrigation. Even for households the regional dimension is important and this is explicitly reflected in the tariff structure. As noted above, consumers in the hotter, northern states are the principal beneficiaries, particularly in the summer months. Even if the origins of regional and seasonal pricing may not exclusively be attributed to regional lobbying, it is evident that regional politicians have subsequently sought to ensure that their constituents continue to receive relatively favourable pricing regimes. Evidently, this dimension will need to be addressed within the ambit of Mexican party political bargaining and dialogue.

Households and their preferences

What fits less well into the envelope of specific, identifiable interest groups working to secure or maintain preferentially priced electricity is the fact that the great majority of dispersed and heterogeneous Mexican households are directly on the receiving end of electricity subsidies (the connection rate in Mexico is over 98%). Additionally, and in the light of previous and largely unsuccessful attempts at reform, policy makers have come to believe that receipt of subsidies is keenly prized so that trying to introduce changes imposes political costs.

Yet despite this view, it seems that political organisations have paid relatively little attention to understanding quite how much weight different types of households attach to receipt of electricity subsidies and what sorts of changes – and, as importantly, associated choices or trade-offs – they would be prepared to stomach. This is the type of analysis – conducted through intensive opinion polling and focus groups – has been used increasingly around the world and, as argued in Chapter 3, should become essential practice by all reform minded governments. In Mexico, rather, the focus has been on enacting reforms – sometimes successfully, as in the case of current fuel price adjustments – through technocratic solutions. Yet this is not an option for electricity subsidies.

For a sense of why this lack of in-depth exploration of preferences is important, consider the matter of equity in the distribution of benefits from subsidies. It is almost axiomatic among analysts and observers of Mexico's fossil fuel subsidies that a desirable outcome would be their elimination for better-off households, alongside a targeted transfer or discount to those with low incomes and in poverty. What form that transfer should take is more debatable, as indeed is whether it should, or should not, be explicitly tied to the reduction or elimination of the electricity subsidy. However, all of this implicitly assumes that the majority of citizens will accept some diminution of benefits if specific measures are taken to address the income needs of the poor, however defined. Those measures might in turn be financed from the fiscal savings realised by reducing the aggregate subsidy bill.

Yet, the evidential basis for supposing an acceptance, or latent appetite, for redistribution is actually weak, if non-existent. Similarly, there appears to be limited understanding of what sorts of trade-offs for subsidy reductions specific types of households or citizens would accept or desire. Given the fact that household incomes around the midpoint of the distribution are actually quite close to the poverty line, one basic issue concerns an acceptable specification of the deserving – in other words the poor – let alone the scale of any transfer. Similarly, little is known about what different types of households would consider acceptable use of resources saved by any reduction in subsidies. For instance, would provision of financing for energy-saving interventions be considered relevant? The lack of exploration of these issues can – and should be – addressed urgently, if only to understand better what package of measures could be prepared and presented to citizens when proposing a package of policies that involves some reduction in subsidies.

Communicating policy

Lack of consultation and information on citizens' preferences and attitudes is clearly an impediment to reform. But the fact remains that even if these lacunae were satisfactorily addressed, government and politicians would need to do a far better job at communicating policy to citizens. Although the government has actively taken out advertising using a variety of media to present the Energy Law reforms to the population, the impression is that the earlier debates about subsidy reform have largely been within the political classes and a limited group of interested parties, rather than with the wider population. Given that electricity subsidies affect so many, this is an obvious failing that needs to be rectified. As argued in Chapter 3, this does not simply involve projecting a general message about the broad need for reform – these have already been tried by government using a variety of media – but developing group or constituency-specific messages and

then selecting appropriate media to reach those target audiences. The nature of the current tariffing regime – with its regional and sector bias – indicates very clearly why such targeting is essential.

Complementary policies

To this point, the discussion has focused mainly on the pricing of electricity. Other complementary policies aimed at limiting demand will also be relevant. These include measures to promote greater energy efficiency that, so far, are in their infancy in Mexico. The main vehicle for achieving efficiency savings has been the National Programme for Sustainable Energy Use (PRONASE). This programme aims to maintain energy intensity at a maximum of 2012 levels until 2030. Certain initiatives have already been started, such as the replacement of refrigerators, the provision of incentives for using energy-saving light bulbs, appliance labelling and minimum energy standards. Until recently, no robust evaluation of the benefits of these programmes, nor a high profile campaign pushing for sustained energy savings, have been in place. However, the House of Representatives has now adopted the Energy Transition Law which tries to address these shortcomings as well as establish a financing strategy aimed at accelerating adoption. Until now, financing options have been scarce and most banks have shunned these types of projects. Yet, in the north of the country where much of the energy subsidy is swallowed up by the costs of air conditioning, the scope for efficiency gains is very large. Many air-conditioning units are imported from across the border and use antiquated and energy-intensive technology. Similarly, lack of adequate insulation in the housing stock leads to further inefficiencies.

Other countries have relevant experience with energy conservation, often using public resources. In Germany, a not-for-profit publicly funded bank (KfW) supports the improvement of household energy efficiency and the construction of new low-energy buildings. Similarly, in the United Kingdom public funds have been available to support householders installing energy-saving technology, including insulation, access to renewable energy and other measures.

Energy efficiency programmes targeted at industry have focused mainly on larger consumers, but the scope for energy savings is substantial among SMEs and these have, as yet, received relatively little attention. There is one relatively small-scale example: FIDE (Trust for Electrical Energy Savings) offers on-bill financing for energy conservation measures taken by SMEs in the formal sector. These measures include a range of technologies from solar water heaters to air-conditioning units. However, the programme has remained small in scale, reaching under 8 000 SMEs in the last 5 years. One of the constraints has been funding, as projects to date have been limited by the size of the revolving fund that was set up. In principle, this sort of initiative with better funding and directed at a wider target audience, including households, could help accelerate adoption of energy conservation measures.

An additional and significant source of inefficiency is that CFE continues to sustain very large losses from the system, in the order of 18-23% of power generated. Much of this is attributable to diversion and/or theft, particularly in Mexico City and central Mexico. As in other countries – for example, India – the issue is mainly about enforcement and this is primarily a political, rather than technical, decision.

Institutional factors

Experience from a broad group of countries that have tried to reform fossil fuel subsidies suggests that effective policy comes not only from good design, but also appropriate systems for delivery. The current approach to reform envisages changes to the way in which energy policy is formed and managed. The Secretariat of Energy (SENER) will remain largely responsible for energy policy, and implementation will continue to rely heavily on the state-owned power and oil companies, CFE and

PEMEX. However, the regulatory agencies – the National Hydrocarbons Commission (CNH) and CRE – will change from being only technical arms of SENER into fully independent regulators with their own budgets and revised mandates.

One important shift will be that electricity tariffs will be set by CRE, "except those set by the Federal Executive" (Art. 121 Ley de la Industria Eléctrica). Some imprecision remains over future arrangements, which still needs to be clarified. However, what is proposed is different from the previous system where tariffs were set by the Secretariat of Finance (SHCP) based on "proposals" by CRE, with the "participation" of SENER and the Secretariat of the Economy (SE) (Art. 31 Ley del Servicio Público de Electricidad). The new arrangements should, in principle, offer a way to a less discretionary pricing regime, particularly if clear rules are developed.

In the case of fuels, prior to the current reforms, price-setting responsibility lay exclusively with the SHCP with no formal involvement of other actors. In practice, SHCP consulted with the so-called Committee of Petroleum Product, Natural Gas and Petrochemical Product Prices (Comité de Precios de Productos Petrolíferos, Gas Natural y Productos Petroquímicos), which involved SHCP, SE, SENER, PEMEX, as well as CRE in an advisory role. With the energy reform, fuel prices are to be fully liberalised, with SHCP losing its price-setting competence by 2020. In the transition period, SHCP will only adjust prices for inflation.

As regards co-ordination within government, the current energy reforms will create an Energy Sector Co-ordination Council (Consejo Coordinador del Sector Energético), presided over by the Secretary of Energy with the Undersecretaries of Planning, Electricity and Hydrocarbons, the President-Commissioners of CRE and CNH, as well as the heads of the gas and electricity network operators, CENACE and CENAGAS. The council can invite further relevant institutions, such as the ministries of finance, economy and environment, to participate in its meetings. Its principal objective is to ensure that the work plans of regulators and network operators are in line with overall energy policy. Furthermore, the new body is supposed to "analyse specific cases that may affect the energy policy making of the Federal Executive and propose co-ordination measures" (Art. 21 VI Ley de los Órganos Reguladores Coordinados en Materia Energética). Certainly, better co-ordination in government is an important objective that may be addressed by this new council. However, the composition of the council reflects a relatively narrow view of the interested parties. Given the highly political nature of energy pricing and policy, a wider scope of participation could be preferable.

4.10 Recommendations for reform

The previous sections have outlined a series of changes that could be adopted when reforming electricity subsidies in Mexico. These changes encompass a range of dimensions, including both the technocratic and the political. What is clear, however, is that insufficient preparatory work has been done. Although the pledge of falling electricity prices makes reform a hard, if not impossible, option in the near term, structural factors will tend to expand the cost of these subsidies. Without reform, the already non-trivial cost of electricity subsidies risks ballooning. Looking ahead, it will be essential to prepare further analysis and scenario testing in order to identify the likely features of future reform packages. This, in turn, will require explicit attention to both political economy and technical facets, as outlined below.

1. Prepare detailed scenarios for electricity consumption and subsidies, factoring in expected rates of consumption growth and demographic factors, as well as costs of supply and other relevant variables, to provide both a baseline "no reform" case as well as other target scenarios.

2. Adopt a sustained and immediate communications campaign addressed at closing specific information gaps concerning the scale and consequences of fossil fuel subsidies. The aim should be to highlight the costs and unequal benefits of the current system of subsidies.
3. Undertake detailed technical and empirical studies of different pricing options for electricity supply, refining the results of the simulations that have been summarised above. These should include modifications to the current tariff structure with greater targeting, direct transfers to poorer consumers and other scenarios including those that will be identified in (4) and (5).
4. Commission opinion surveys, focus groups and other discussion forums aimed at better identification of attitudes to subsidies among the population. This should identify preferences of specific groups of citizens, and help identify public policies that could command support.
5. Initiate an in-depth and extensive stakeholder consultation process aimed at the identification of the specific concerns about reform in the population and among particular organised constituencies, including political parties, trade unions and consumer organisations.
6. Ultimately, based on the insights from the surveys, design a coherent and nuanced communications strategy with targeted constituencies and messages, using a variety of appropriate media.
7. Identify options for accelerated adoption of energy saving and renewable energy technologies in a manner that supports subsidy reform (generating incentives through a variety of additional funding options, e.g. on-bill financing for energy efficiency improvements).

INDONESIA

4.12 Context

Macroeconomic situation

As already indicated in Section 4.1, in 2014 Indonesia appeared to be facing a potentially perilous economic outlook, with the fiscal and current account deficits rising, inflation accelerating and a degree of uncertainty over the direction of future policy as a result of 2014 being an election year. These factors, along with the more generalised flight of assets from emerging market since mid-2013, were associated with a substantial depreciation of the currency against the US dollar. Since then, the combination of falling energy prices and specific policy measures adopted by the government has reigned back the size of both the fiscal and current account deficits, not least through a large decline in the cost of fossil fuel subsidies.

Part of the wider uncertainty regarding the shape of future economic policy concerns fiscal policy and, in particular, the significant share of current spending allocated to fossil fuel subsidies. Until recently, such subsidies comprised the largest component of the fiscal deficit. With these magnitudes, energy spending had in effect become the main fiscal policy lever. The policy response by government for most of 2014 was largely to emphasise enhancements to energy supply. After the installation of the new President and government in November 2014, there was a clear shift to managing energy demand, whether through pricing adjustments or greater efficiency in energy use (IEA, 2015b). This was aided by the sharp fall in energy prices that started in the third quarter of 2014, which permitted reductions not only in subsidy, but also in fuel prices in 2015 and early 2016. The total amount allocated to fuel subsidies in the 2016 budget has been set at just under IDR 64 trillion (USD 5 billion), as compared to IDR 240 trillion (USD 19.3 billion) in 2014. The volume of fuels to be subsidised has also declined dramatically in 2015 and 2016 as compared to 2014, although LPG volumes have actually increased. Electricity subsidies are also projected to decline substantially from around IDR 101 trillion (USD 8.4 billion) in 2014 to IDR 73 trillion (USD 6 billion) in 2015, and only IDR 38 trillion (USD 3 billion) in 2016. In sum, fossil fuel subsidies accounted for 3.1% of GDP in 2014, and are projected to account for just 1% in 2016. This sharp continuing fall reflects the government's aim of significantly lowering the number of consumers receiving subsidies, with the aim being to concentrate remaining subsidies on low-income households.

At the same time that fossil fuel subsidies have been falling, the government has also made new spending commitments. These included the launch of a universal health coverage component in 2014,[44] and also significant capital injections into state-owned enterprises, notably as a means for recycling the fiscal savings resulting from lower energy prices. Such transfers amounted to around USD 5.5 billion and this spending was directed at 40 state-owned enterprises.

Impact of subsidies on consumption

The consequences of persistent underpricing of energy are, of course, not just fiscal. Fossil fuels now account for around half of Indonesia's energy consumption and this share will rise further without changes in policy and pricing. Primed by low energy prices, rising incomes and low interest rates for vehicle loans, the demand for vehicles – mainly cars and motorcycles – has grown rapidly over the past decade. Transport as a whole now comprises over 96% of subsidised fossil fuel consumption. At present, roughly two-thirds of oil consumption is for passenger and freight

[44] IISD (2014b) provides a very good overview of the current situation.

transport. The stock of both cars and motorcycles has more than doubled in a five-year period, as has the intensity of vehicle use. At the same time, in a context of a relative lack of alternative transport options, commercial road transport use has also grown sharply. Most oil used in transport is consumed by passenger transport (56%). Within passenger transport, nearly 90% is for private vehicles where gasoline is the dominant fuel. Significantly, motorcycles account for over 85% of total transport fuels used by private vehicles (Gumilang Dewi, 2014), indicating the rapid diffusion of this mode of transport across the population as compared to cars (12%).

One consequence – immediately visible in Jakarta – is chronic congestion. The external costs of congestion and its associated effects, notably pollution, have not been precisely identified but are clearly large, whether in terms of lost output, dissipation of energy, negative health effects and reduced productivity. These costs also have adverse implications for CO_2 emissions and undermine progress towards the ambitious carbon emission goals set by the government.

Underpricing of energy, coupled with the structure of energy markets, has also adversely affected the financial performance of the main public sector actors, the national oil company, Pertamina, and the state electricity utility, PLN. For the former, investment in new plant has stalled so that refinery capacity has severely lagged, both as a result of inadequate investment but also low utilisation rates for existing capacity. This has prompted the import of energy products, notably gasoline. In the power sector, domestic output and demand are broadly in balance but transmission networks remain quite underdeveloped and inadequately connected, resulting in six separate grids. There are also serious questions regarding the efficiency of the utility, not least the incentives that it faces for improving performance. At present, households comprise the largest component of electricity demand (over 40%) and a significant proportion of that demand is satisfied at subsidised prices, which are in effect largely beyond the control of the company itself. In addition, the vertically integrated public utility operates with a high cost structure.

There is broad consensus in the political system that fossil fuel subsidies are undesirable and most of the main political actors aver to be in favour of their curtailment or even their elimination, although there is disagreement over the speed of withdrawal. Concern is also widespread over the availability of fuel in further-flung locations, such as Papua, where distribution costs remain very high and where the actual availability of subsidised fuel is limited.

To date, Indonesian governments have addressed the problem through large, periodic nominal price increases along with limited compensation. In addition, and due to the difficulty in securing public acceptance of price increases, technological solutions have been tried, such as encouraging fuel switching. However, given the size of fuel subsidies, in particular, attempts to address the problem through marginal measures have been inadequate. If the cost of subsidies is to be reduced in a permanent and sustainable way, it will require more radical steps on pricing and access, as well as supply-side measures aimed at limiting costs over the longer run. Mechanisms exist as to how to target priority groups and regions, as do lessons from other countries. In short, substantial scope remains for reform through the use of policy instruments that go beyond mere periodical price adjustments. Much of the later discussion about strategic policy options in this chapter starts from this recognition.

4.13 Scale of subsidies and their components

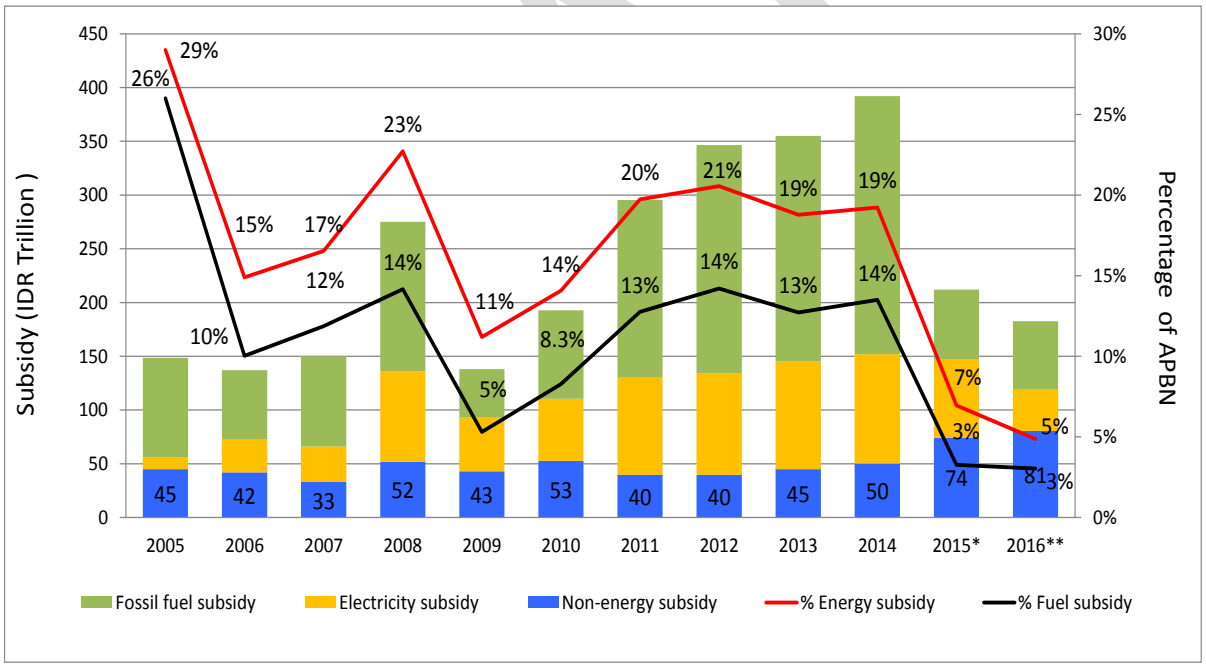
Fossil fuel subsidies are not new in Indonesia. Subsidies were introduced around the time of independence in 1949 and by the 1960s accounted for nearly 20% of fiscal expenditure. The sharp devaluation of the currency in the midst of the Asian crisis of the late 1990s further ratcheted up their cost. And as the country shifted to becoming a net importer of oil products after 2004, the exposure to international price movements has become more accentuated. In 2013 oil imports

accounted for over 33% of consumption on a rising trend, while gasoline imports approached two-thirds of total demand due to a shortage of domestic refining capacity.[45] Indonesia has been keen to upgrade its ageing refining capacity. Spending on fossil fuel subsidies in 2016 is projected to amount to less than 1% of GDP as against over 3% of GDP in 2014.[46]

Combined fuel and electricity subsidies accounted for over 25% of total government spending by 2014. To put this spending on subsidies into perspective, the combined energy subsidy bill was over 350% of spending on social assistance and some 50% higher than the total capital or investment budget. This spending structure has subsequently been radically revised. For example, in 2016 the education and health budgets combined were around IDR 500 trillion, as against spending on fossil fuel subsidies of just over IDR 100 trillion. Higher spending was also projected for infrastructure.

Figure 10 provides information on energy subsidy spending, both in total and as a proportion of budgetary spending, for the period from 2005 to 2014. Although fossil fuel subsidies peaked as a share of total spending in 2005 and then reached a trough in 2009 (largely as a result of falling international prices), in subsequent years the share rose again. Approved spending on fossil fuel subsidies in the 2014 revised budget amounted to over IDR 340 trillion, equivalent to around USD 27.7 billion, of which over 70% was for fuels and LPG and 30% for electricity subsidies (IISD, 2014a). As noted above, this was reversed in 2015 and 2016 with falling energy prices. In 2016 fuel subsidies were projected to be barely 25% of their peak 2014 level, with electricity subsidies at around 45%.

Figure 10• Fossil fuel subsidies and their components in Indonesia, 2005-16



* = APBN-P

** = APBN

Notes: APBN = Actual State Budget Plan after spending; APBN-P = Planned Budget before spending; Non-energy subsidy = food, fertiliser, seeds, public service obligations, credit programme, tax, etc.

[45] Oil, gas and mining accounted for 11% of GDP and 19% of exports in 2013. However, the value of oil imports had reached over 85% of the value of gas and coal exports in that year, basically due to refining shortages.

[46] Through the 2000s energy subsidies averaged nearly 3% of GDP, albeit with large fluctuations across years, the range being between 1.5% and 4.3% of GDP.

Source: Kementerian Keuangan (Indonesian Ministry of Finance) (2016), State budget data, website, www.kemenkeu.go.id/katalogdata.

For a sense of disaggregated spending on subsidies, detailed figures are given in Table 7 for 2012, currently the only year for which data are available in final form. The largest component of oil subsidies at that time was the below-market pricing of low-grade gasoline (RON88). The table also underlines the fact that subsidies to electricity consumers were substantial, amounting to around a third of total subsidies. Much of that subsidy has flowed to industry (although subsidies to large consumers have subsequently been cut), but households have also benefited. It should, in addition, be noted that the table underestimates the aggregate size of consumer subsidies, as measurement of tax concessions on fuel product sales by Pertamina, as well as the cost of the domestic market obligation for oil, are not included. Similarly the cost of various market support measures for gas and coal are excluded.

Table 7• Consumer fossil fuel subsidies in Indonesia, 2012

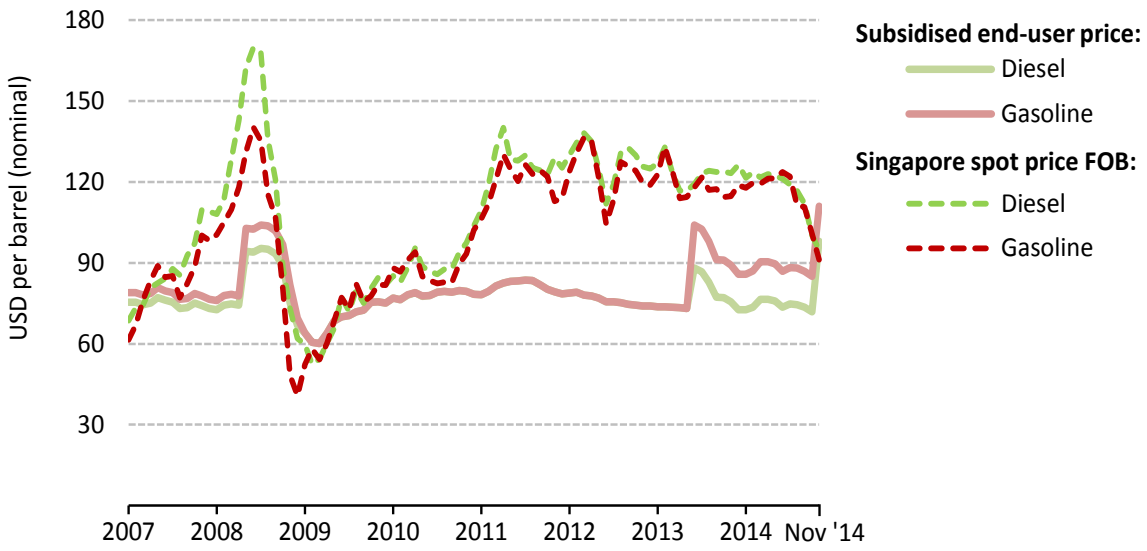
Subsidy channel	IDR billions	USD millions	Share of total consumer subsidies (%)
Oil			
Below-market pricing of:			
Low-grade gasoline (RON88)	107 200	11 447	31.8
Kerosene	7 100	758	2.1
Auto diesel oil	64 700	6 909	19.2
3 kg LPG cylinders	32 800	3 502	9.7
Kerosene to oil conversion programme	621	66	0.2
Import duty exemption for crude oil and fuel products	17 906	1 912	5.3
Subtotal	230 327	24 595	68.3
Gas			
Subsidies for infrastructure for autogas fuel	3 500	374	1
Subtotal	3 500	374	1
Electricity			
Subsidies	103 330	11 034	30.7
Subtotal	103 330	11 034	30.7
Total	337 157	36 002	100

Source: IEA calculations based on ADB (2015), *Fossil Fuel Subsidies in Indonesia: Trends, Impacts, and Reforms*, www.adb.org/sites/default/files/publication/175444/fossil-fuel-subsidies-indonesia.pdf.

Budgetary calculations use estimates based on the difference between the international market price (adjusted by the USD /IDR exchange rate) and the cost based on the volume of fuels to be subsidised domestically. Compensation is paid to Pertamina – the national oil company and unique distributor of subsidised fuels in the country – based on sales of subsidised fuels in a given period.

Variations from approved spending need to be approved by Parliament or absorbed by Pertamina, either on its balance sheet or by other means, such as rationing.

Figure 11• Gasoline and diesel pump prices in Indonesia and spot prices in Singapore



Notes: FOB = free on board; monthly prices are shown for the period from January 2007 to November 2014.
Sources: CEIC (Indonesia Economic and Industry Database), www.ceicdata.com/en/countries/indonesia, and IEA analysis.

Periodic price increases, principally in 2005, 2008 and 2013, have at times narrowed the difference between regulated prices and market prices but, in the recent past, the main factor affecting subsidies has been international prices, notably in the wake of the global economic crisis of 2007/08. But as international prices recovered up to 2014, so too did the size of the subsidy element.

For the largest component of fuel subsidies, gasoline, attempts were made to limit access. Since 2013 restrictions on consumption have been imposed, with government-owned public transport and other vehicles excluded. In 2014 further attempts to limit demand, such as reductions in the number of subsidised fuel dispensers at gasoline stations in Jakarta, were tried but these were rapidly rescinded once anticipation of shortages led to queuing.[47] However, the government still did not have detailed and accurate information on the consumption of subsidised fuel, as data are not systematically collected at either distribution points or pumps. This meant that access to subsidised gasoline was effectively unrestricted, at least for private vehicles. There was also anecdotal evidence that subsidised fuel (possibly as much as 15%) was diverted to industrial producers.

As pointed out above, so-called "Premium" or RON88 petrol, accounting notionally for over 95% of total gasoline sales, attracted the largest subsidy. Yet, perversely, the bulk of the fuel that is sold under this title is actually imported higher-octane (RON92) fuel. Due to a shortage of refining capacity in the country, currently over 70% of gasoline consumption is satisfied by imports and

[47] In a similar vein, in mid-2014 the opening hours for petrol stations selling subsidised fuel in areas deemed prone to illegal sales have been reduced. See IISD (2014b).

these are either RON92 or 95 octane fuels.[48] This undermines the notion of using fuel quality discrimination to whittle down the consumption of subsidised fuel, as does the fact that the fleet of vehicles – mostly with either Euro 2 or 3 engine technology – can function adequately on low-grade fuel.

Power sector

With respect to electricity, the system is dominated by a vertically integrated monopolist, PLN, along with a limited number of IPPs selling power to PLN. Power consumption has been growing rapidly, in part because of income growth but also higher connection rates,[49] and the utility has found it difficult to meet increased demand reliably.

Electricity tariffs were fixed in nominal terms between 2000 and 2006, at which point they were more than trebled. In 2008 subsidies to industrial consumers were significantly cut. Even so, by 2010 revenues were no more than 50% of the costs of production. Subsequently, prices have been gradually raised and in 2014/15 prices for industrial consumers were further increased. In 2015 the Ministry of Energy and Mineral Resources instituted a system of monthly tariff adjustments based on movements in oil prices, the exchange rate and inflation. However, the great bulk of consumers – those with low power connections – continued to face stable nominal prices and to receive a significant subsidy. In 2016 and 2017, however, it is planned that subsidies to non-poor households will be eliminated along with further simplification of the number of tariffs.

The main feature of the tariff system is the use of block tariffs. Although by no means as baroque as in Mexico, different tariffs exist for five separate categories of consumers and these are in turn sub-divided by volume of consumption and by type of power connection. For households, therefore, nine tariff blocks exist with widely divergent pricing. Small consumers (0-30 kWh) face tariffs that are only 11% of the utility company's non-subsidised rate, with the next block facing a tariff of 25-33%. Tariffs for large-volume consumers are now being adjusted on a quarterly basis.

As in Mexico, Indonesia's electricity sector faces the need to lower costs of supply and improve efficiency, while also addressing the price at which electricity services are charged. The steps to limit subsidy to low-income residential users are welcome, as is the move to a system of automatic tariff adjustment with a minimum 7% margin. However, there is still an absence of a wholesale market and questions remain outstanding regarding the efficiency in dispatch of least-cost generation. The transmission framework also remains inadequate. No independent regulator exists, although a revised oil and gas bill in 2016 is expected to include the creation of two new public entities to regulate upstream and downstream activities. In the longer run, improving supply and its efficiency will require structural reforms and the development of a power market.

In short, although Indonesian policy makers have struggled to introduce periodic upward adjustments to regulated prices, the recent fall in international prices has radically diminished the subsidy bill. The principal challenge is to introduce a tariff system that can effectively link energy – particularly fuel – prices to international prices in the future. In late 2015, the government announced that fuel prices would be adjusted every three months in the future, but a lack of clarity remains concerning the adjustment mechanism.

[48] It is widely known that a significant share (over 60%) of RON88 is imported, but it is not widely understood that what is imported is actually higher-grade fuel.

[49] Access to electricity jumped from 65% of the population in 2008 to 81% in 2013.

4.14 Who benefits from fossil fuel subsidies?

A corpus of empirical analysis now exists that unambiguously identifies the strongly regressive nature of fossil fuel subsidies in Indonesia. For the principal subsidised fuel that is consumed – gasoline – the top third of households in income terms account for around 70% of total household consumption of gasoline used in cars and motorcycles. The poorest third, in contrast, consume around 5%. In other words, richer households consume far larger amounts of subsidised fuel than poorer households. Furthermore, most poor households actually directly consume *no* gasoline or diesel at all. The Indonesian National Social Economic Survey (SUSENAS) data show that barely 50% of Indonesia's households actually directly consume gasoline or diesel. Only around a third of the poorest half of the income distribution consumes gasoline and this falls below 20% for households in the bottom decile. And in terms of total subsidised gasoline consumption, commercial transport operators account for over 50% of total consumption, as well as nearly 100% of subsidised diesel.

A study from 2008 found that fuel subsidies transferred nearly six times more per month to the richest 10% of households than to the poorest 10%. For gasoline, in particular, the inequality was even more striking as the average transfer to the top 10% was over 30 times larger than to the poorest 10%. SUSENAS for 2010 also shows that the top expenditure decile receives nearly 30% of the benefits from fuel subsidies, as against 2-5% for the bottom three deciles.[50] But what these data also show is that expenditure deciles 4-7, which can broadly be classed as the middle class, receive a third of all benefits, large enough to consider them a significant beneficiary of the present system.

Although fossil fuel subsidies may be regressive, they may nevertheless have a significant impact on the incomes of the poor. Indonesia's poverty rate has fallen sharply – between 1999 and 2013 it went from 23% to 11%[51] – but nearly half of these remain in chronic poverty. Further, many households – approaching two-fifth of all households – lie relatively close to the poverty line, with short-term movements in and out of poverty being commonplace.[52]

Fossil fuel subsidies have sometimes been presented as one way of addressing poverty. Survey data show that the share of expenditure on subsidised fuels in total expenditure for the bottom quintile of households has been around 5%, with an additional 1.2% being spent on transport (Bacon, Bhattacharya and Kojima, 2010).[53] These shares rise to around 6% and 1.7% for the next quintile. Although lower transport and communications costs, as well as lower costs for direct use of energy, may thus benefit the poor, the evidence suggests that these benefits have been achieved in a very inefficient manner. The expenditure shares also suggest that moderating the shock of upward price adjustments should be fiscally feasible using reallocation from reductions in subsidy. However, that would also assume that such reallocation could be effectively targeted (Perdana, 2014a, 2014b). In addition, it may not address the salient political economy constraints, particularly opposition from households lying near poverty or outside the poverty zone.

[50] This inequality has been further accentuated in some regions. In addition, different regions have benefited unequally from energy subsidies, with Java and Bali gaining disproportionately.

[51] 11% is calculated using the national poverty line of around IDR 273 000 per month. If a USD 1.25 per day is used, the rate increases to 16.2%

[52] Poverty is higher in rural areas where the rate approaches 15%, and significant regional variation also exists.

[53] These shares relate to 2005.

4.15 Previous experience with reforms to fossil fuel subsidies

Since the Asian crisis of 1997, the Indonesian government has tried on numerous occasions, with varying success, to limit fossil fuel subsidies – in 1997, 2000/01, 2003, 2005, 2008 and 2013. The 1997 fuel price increases proved to be part of the death-knell of Suharto's regime. In 2000/01 further increases were introduced although, as in 1997, these were met with strong opposition. In 2003 fuel prices were more than doubled. This provoked a powerful backlash. The government backed down and rescinded the price changes. At that point, discontent against both the military regime of Suharto and the democratic Presidency of Megawati Sukanoputri appeared to have crystallised around the issue of fossil fuel subsidies, setting precedents that have made their successors very wary of embarking on sustained, let alone wholesale, reform.

Despite this, in Yudhoyano's first term in 2005 a 90% increase in the price of gasoline, more than doubling of diesel prices and 185% increase in kerosene prices were successfully applied (Table 8). These jumps in domestic prices brought them nearly to 90% of international prices by 2006. Fuel subsidies for industrial consumers were curtailed and an active programme for the replacement of kerosene by LPG was started. Prices were also raised in 2008 and explicitly linked to the creation of a temporary cash transfer programme (BLT) intended for poorer households. The recipience rate among poorer households for this was fairly high (over 34%) and the scheme is considered in hindsight to have been politically positive for an incumbent president seeking re-election in the following year. However, the fuel price increases of 2008 proved only partly successful as prices were subsequently reset to reflect falling international prices in the wake of the financial crisis.

Most recently, in 2013 gasoline and diesel prices were raised by 44% and 22% respectively. To soften the blow, the government provided a temporary cash transfer programme (BLSM) with a monthly payment being funded, to a total cost of USD 0.8 billion, over a period of four months. The BLSM transfer was designed to reach 15.5 million households, providing them with a monthly income supplement equivalent to USD 13-14. Additional programmes variously focused on infrastructure, schooling and food (rice) were also introduced, swelling the total cost of compensatory measures to USD 2.6 billion.

In this protracted experience with subsidy reform, that of 2005 stands out, both because it managed to be accepted, but also because of the design principles that were applied and which, to varying degrees, have been subsequently mimicked in later attempts. In particular, the reform attempted to address the poverty issue by setting up a new unconditional cash transfer programme for the poor funded by savings from cuts in subsidies. That programme was put in place *prior* to the price increases and was accompanied by an extensive publicity campaign. Using proxy means-testing, smart cards and with transfers set initially higher than the increase in energy costs, it achieved a reasonably high coverage of the targeted groups. The poorest income decile received over 20% of benefits with deciles 2-4 receiving a further 40%. The government also pre-committed to several social development programmes, including block grants for public schools, expansion of free healthcare services and public clinics, and enhanced spending on rural infrastructure.

In fact, the design of the 2005 reform was held up as a model to other countries and certain elements – notably the provision of compensation prior to reform – were copied elsewhere (as, for example, in Iran). However, with the benefit of hindsight, the 2005 reforms also had major limitations, prime amongst which was the fact that energy prices continued to be administered by government. Sustaining the momentum of reform also proved largely impossible. Indeed, between 2005 and 2008 energy prices in Indonesia remained stable as international energy prices soared. By 2008 the energy subsidy bill had reached 2.8% of GDP and subsidies had climbed to a level 60% higher than health and education spending combined. In addition, the compensation package's

targeting of poorer households was far from complete, while the duration of the principal transfer was relatively short.

Table 8• Chronology of Indonesia's subsidy reforms since 2005

Year	Fuel	Pricing reform
2005	Gasoline and diesel	Price increases of 29% in March and 114% in October. Industry no longer eligible to access subsidised diesel.
2006	LPG	Price increase for industrial users.
2007	LPG and kerosene	Introduction of the kerosene-to-LPG-conversion programme to encourage replacement of kerosene for cooking with LPG.
2008	Gasoline, diesel, and kerosene	Price increases of 33% for gasoline in May, 28% for diesel, and 25% for kerosene. Gasoline and diesel prices were lowered by 20% and 15%, respectively, in December, as international oil prices eased.
2009	Gasoline and diesel	Prices decreased by 11% and 7% respectively in January leaving gasoline prices the same as diesel prices (that is, close to 2005 levels).
2013	Gasoline and diesel	One-off price increases averaging 40%.
2013	Electricity	Base tariff increased 15% over 2013 (households consuming 450-900 volt-amperes not included). Large residential customers, business and government excluded from subsidy.
2014	LPG	Attempt to raise prices of 12 kg cylinders, but the price increase was rolled back.
2014	Gasoline and diesel	Price increases of 31% and 36%, respectively.
2015	Gasoline and diesel	Subsidies for gasoline entirely removed, but low oil prices see this result in a price decline of about 12%. Diesel subsidies reduced to IDR 1 000 per litre.
2015	Electricity	Exclusion of another four classes of customers from subsidy and tariff adjustment.
2016	Diesel	Removal of diesel subsidy.
2016	Electricity	900 volt-ampere classes excluded from subsidy. Tariff adjustment applied to eight additional classes

Sources: Beaton and Lontoh (2010), *Lessons Learned from Indonesia's Attempts to Reform Fossil-Fuel Subsidies*, www.iisd.org/pdf/2010/lessons_indonesia_fossil_fuel_reform.pdf; ADB (2015), *Fossil Fuel Subsidies in Indonesia: Trends, Impacts, and Reforms*, www.adb.org/sites/default/files/publication/175444/fossil-fuel-subsidies-indonesia.pdf; Jarman (2016), "Electricity subsidy reform in Indonesia", Presentation at Workshop on Fossil Fuel Subsidy Reform in Mexico City, February.

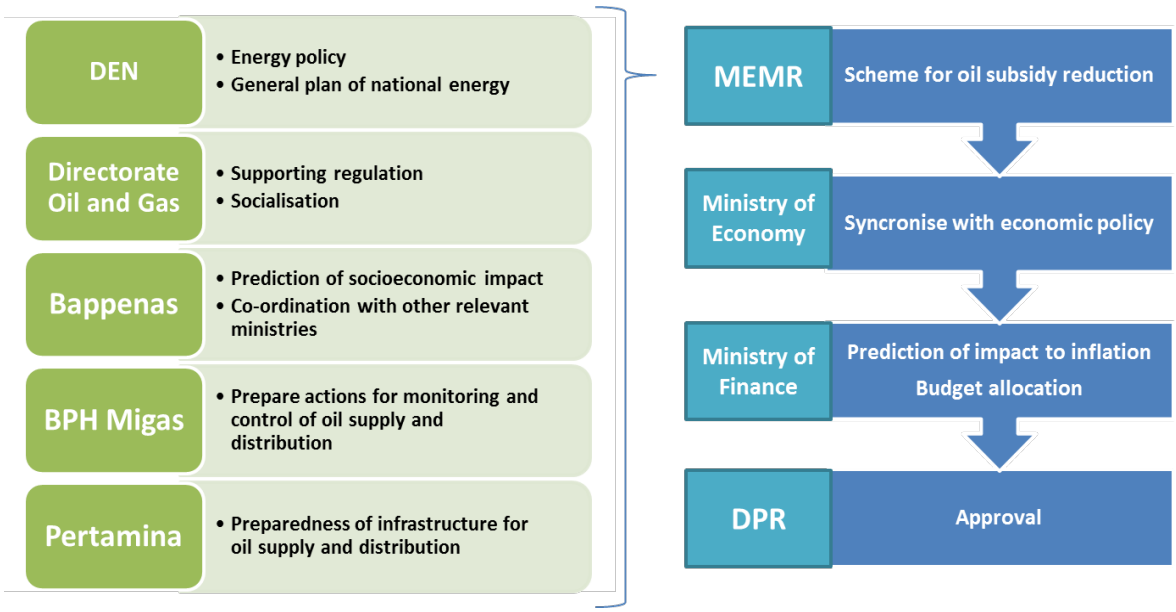
In short, Indonesia has a long history of administered pricing of energy that persists to this day. Changes to prices still require a presidential or government decree. The current Energy Law gives the parliament wide-ranging powers, including the right to be consulted on each proposed price increase, although there is some discretion for policy within the budget year. While promoting greater consultation, it has also introduced a degree of dysfunctionality as consensus has been difficult to achieve. It has also meant that governments have tried to limit the number of proposed changes resulting in a pattern of large price increases rather than pursuit of different timings for pricing changes. Consequently, prices have been adjusted on a periodic basis, mostly by substantial magnitudes. These increases have sometimes stuck; other times they have been rescinded. More commonly, they have subsequently been eroded by developments in international prices and the inability to link domestic to market prices. To address political and civic opposition to price

increases, recent governments have offered compensatory transfer programmes addressed to lower-income segments of the population, alongside a series of parallel policy steps designed to lower energy consumption or induce switching in the use of fuels, notably the substitution of LPG for kerosene.

4.16 Institutional features

The Indonesian energy policy landscape has a multiplicity of players – ministries, agencies and other organisations – that are explicitly involved in energy policy.[54] Aside from the Presidency, a significant number of government institutions are involved in the process of setting and delivering fossil fuel subsidies. Figure 12 provides a schematic outline of the main players. While this complexity partly reflects the evolving democratic context – this particularly relates to the way in which Parliament has become central to the policy-making framework – it is also true that part of this complexity simply reflects an apparent lack of policy focus within government and the rather wide diffusion of interests that has occurred over time. Although the weight of different institutions in decision-making on subsidies has varied over time, simplification would be desirable if greater focus is to be achieved. In particular, the diffusion of responsibilities that has occurred needs to be counteracted by a far clearer and narrower specification of responsibilities with priority accorded to a far smaller number of public institutions. The current complexity has promoted gridlock.

Figure 12• Main public institutions involved in energy subsidy policy



Note: Bappenas = Ministry of National Development Planning; BPH Migas = Body for oil and gas downstream activity; DEN = National Energy Council; DPR= People's Representative Council; MEMR = Ministry of Energy and Mineral Resources of Indonesia.

Source: Figure recreated from Gumilang Dewi, R. (2014), "Current subsidy mechanisms and reform plans", Internal IEA Paper on Subsidies in Indonesia.

[54] In addition, certain interests or lobbies – whether of a sectoral or trade nature – have operated less overtly in trying to exercise influence on policy.

4.17 Macroeconomic impact of energy pricing reform

Aside from the political factors relating to energy pricing reform – such as the *de facto* coalitional nature of politics and the extent of wider opposition to price increases – an obvious consideration is what impact price changes would have on macroeconomic variables. Notable among these are inflation and the fiscal deficit, as well as household incomes. Earlier episodes of price adjustment have been associated with acceleration in inflation alongside a fall in fiscal spending. This is not surprising given their nominal magnitudes. The World Bank estimated, using data for 2011, that a 10% increase in gasoline and diesel prices would raise inflation by 1 percentage point and lower fiscal spending by IDR 17 trillion, or around 6% of total spending on consumer fossil fuel subsidies in that year. At the same time, the price increase could raise the poverty rate by 0.3 percentage points, an increase that could be entirely (but temporarily) offset by a limited duration compensatory spending programme using fiscal resources released by raising prices.

In 2014, the Asian Development Bank used a social accounting matrix (SAM) and a market allocation or supply framework to model the impact of pricing reform. They simulated a fast, complete and gradual reform with and without reallocation of released resources. Using the SAM, without reallocation they predictably find large magnitude declines in GDP and fiscal spending. In the short run (first year), GDP would fall by over 3% in a rapid reform scenario and by 0.6% in a gradual reform. The negative sectoral effects would be concentrated on petroleum refining and electricity, water and gas supply, construction and mining. Industry would be weakly affected given the potential for switching to coal. Employment would decline by around 1.5%. However, a general reallocation or one targeted to the bottom 40% of households, as expected, softens the blow to GDP, employment and household income.[55]

Although the available studies offer indications of the size of effects for critical variables in various pricing scenarios, data and other shortcomings mean that the estimated magnitudes should be treated with considerable caution. In the longer run, the impact of energy subsidy withdrawal could be expected to be positive.

4.18 From fossil fuel subsidies to social assistance?

Since 2005 the government has explicitly linked changes in energy prices to the deployment of policy interventions that have elements of social assistance. The main innovation was the use in 2005, and subsequently in 2008, of unconditional but time-bound cash transfers (BLT) that reached around 19 million households. Again, following the 2013 energy price increases, a set of transfer programmes was put in place or extended that included the subsidised rice programme (RASKIN), a supplement for poor students (BSM), as well as another temporary programme, the BLSM. Other interventions have been put in place, including the conditional transfer programme, PKH, and the Hopeful Family Programme, as well as an unfolding system of health insurance (Jamkesmas). Although the objective in most instances has been to target poorer households, coverage has generally been far wider and available evidence points to large errors of exclusion.[56] To put these interventions in context, combined spending on these programmes in 2013 (including the four-

[55] The incidence across different types of households cannot be well handled in their framework as the categories that are available are too aggregate.

[56] The World Bank found that the BLT programme had exclusion errors of around 50% and that this was probably greater for some of the other interventions.

month BLSM but excluding Jamkesmas) amounted to nearly IDR 22 trillion. This was equivalent to 8% of total spending on energy consumer subsidies in 2013. In addition, over 40% of that spending was on BLSM and hence of very limited duration.

What is clear is that Indonesia has begun to develop a wider arc of social assistance policies and interventions. In 2014 a national-level social security system, SJSN, began to be introduced gradually. In addition, in late 2014 a new social assistance programme was launched called the Productive Family Programme. Using smart cards, the programme has several dimensions including education, health insurance and cash transfers. None of these components was funded by reallocation of subsidy reduction, although part of the motivation for the timing of their introduction was to provide compensation for expected price increases.

On balance and positively, the challenge of revising energy prices has provided a significant stimulus to the development of social assistance programmes since 2005. But conditioning policy on energy pricing is clearly not a robust way for designing a broad system of social assistance.

Addressing structural needs rather than short-term compensation measures remains the priority. Since 2014, boosting investment in a range of state-owned enterprises has been a main policy instrument for reallocating the fiscal savings from falling fossil fuel subsidies – in 2015 the total capital injection was around USD 5.5 billion. Funds have also been allocated to much-needed public transport infrastructure in Jakarta, with discussion of investment in a high-speed rail network. Clearly, infrastructure spending should be a priority in the future, in order to provide tangible benefits to end-consumers while moving away from subsidised fossil fuel-consuming modes of transport.

4.19 Political economy considerations

Although experience unequivocally shows that pricing and other energy sector reforms are hard to achieve, paradoxically in recent years, the main players in the political system – namely the Presidency and the political parties populating the Parliament – have been broadly supportive of changes. A 2012 study found a large degree of consensus that subsidy reform was necessary (Braithwaite et al., 2012). Indeed, an agreement was reached between the government and the Parliament in that same year to limit the use of subsidised fuels by private cars. But that apparent consensus did not in the end translate into action, a discrepancy that has proven an abiding characteristic of recent years.

Outside the political parties, the available evidence paints a varied picture of views regarding subsidy reform. It is certainly true that specific industries, mostly linked to the energy complex and/or energy intensive, remained opposed or equivocal. For example, Pertamina's management has indicated that liberalisation of the fuels market would probably need to be accompanied by some protection for the company. In other words, a clear timeframe for reform would have to be accompanied by greater public investment in upgrading Pertamina's refining capacity, thereby enabling it to compete effectively in the downstream market. Such a move could also help address the government's concerns over energy security in the refined products sector. The same considerations have applied to the company's network of dealers. There have been suggestions that the politically connected oil-trading lobby has been an important behind-the-scenes voice for the status quo. Sectors that are relatively energy intensive, such as freight transport, public transport, fishing, palm oil producers and vehicle manufacturers and distributors, have also been broadly opposed to reform and have lobbied intensively to represent their views.

As regards vested interests, the automotive industry – primarily comprising large multinational companies such as motorcycle and car manufacturers – has engaged closely with the Ministry of Industry. The latter has pursued an activist industrial policy in concert with the industry, including

the recent Indonesian small car initiative that has involved the automobile companies setting up plants in the country. But aside from the impact of subsidies on the size of the stock of vehicles and the associated demand for subsidised fuels, the engine and emissions technology that has been widely adopted is of vintages that are not only outdated, but also able to function adequately with low-octane fuel. In short, despite an announced government strategy of promoting new vehicles that require higher quality fuels than subsidised RON88, this has not been achieved. Other measures – such as promoting hybrid vehicles – have not been pursued energetically, in part because of electricity supply limitations. Consequently, public policy for the automotive sector has actually resulted in boosting demand for subsidised fuels.

4.20 Attitudes to subsidies among citizens

Since independence, Indonesian governments of differing political complexions have all maintained a common, broad policy of resource nationalism, involving public ownership or control. This has been matched with a widespread perception that these resources are a national patrimony for the benefit of citizens. Once regulated fuel prices were introduced, this attitude over time converted into a view that resources should be deliberately priced low. However, it is likely that a major information gap remains as to the financial size of the subsidy that Indonesian consumers receive. In the last decade, awareness of subsidies has risen substantially, but the impression is that although many citizens view proposals for reform as imposing undesired costs, they do not necessarily have a good understanding of the size of any proposed loss that repricing of energy would imply. What is absolutely clear is that breaking free of attitudes to energy that have been formed over long periods of time has proven difficult and largely unsuccessful.

Given this legacy and the fact that the main consumers of subsidised fuels and electricity are households, a critical issue concerns the attitudes of citizens and non-governmental (or civil society) organisations to subsidies. Here, however, the picture is far from clear. Many of the political actors have portrayed opposition on the part of civil society to be the main constraint; others have argued that this is both a misperception and misleading.

Anecdotal and other evidence suggests that Indonesian citizens still strongly support an interventionist state with natural resources remaining largely in the hands of the state and prices also being regulated.[57] A survey by the Indonesian Survey Circle in mid-2013 found that nearly 80% of respondents rejected a cut in fuel subsidies, although other studies have been less conclusive (Sembiring and Kenawas, 2013). A survey of nearly 2 900 households conducted throughout the country in mid-2014 had some nuance in its findings[58] (IISD, 2014b). Although the majority of respondents favoured retention of fossil fuel subsidies – mostly because of the impact on prices and the incomes of poorer households that would result from price increases – there was a willingness to countenance gradual withdrawal. Interestingly, the survey revealed large information gaps or misperceptions. It was quite widely appreciated that subsidies benefit the non-poor disproportionately, but the extent to which this is the case was significantly underestimated, as was the scale of government spending on fossil fuel subsidies. The survey also indicated a widespread lack of trust in government, not least because of a perception of rampant corruption. In that light, when asked about possible redirection of public spending through fiscal savings from subsidy reduction, it emerged that allocations to health and education spending would meet with most approval. A small quasi-experiment has also found that respondents generally favoured gradual rather than rapid elimination of fossil fuel subsidies and that this preference was stronger

[57] Responses to the World Values Survey (2006).

[58] According to a survey performed by Lembaga Survei Indonesia (LSI)

among individuals who benefit more from the current system (e.g. car owners). The same exercise also found that when presented with several choices about how fiscal savings from subsidy withdrawal should be allocated, individuals mostly favoured earmarked reallocations, principally to vaccination programmes, rather than paying down the country's debt or boosting government revenues (Sahadewo and Pradiptyo, 2014).

For civil society or non-governmental organisations – a large and at times influential grouping of institutions – a survey in 2011/12 found a high awareness of, and interest in, the issue with most respondents reporting strong opposition to the current subsidy regimes (Braithwaite et al., 2012). But, tellingly, most respondents were actually opposed to the government's approach to reform. The reasons ranged from a lack of clarity about policy to lack of consultation, as well as the perceived adverse impact of changes on the poor. There was an almost universal view that the government had been very ineffective at communicating its proposals for reform to the population. Finally, the same survey found that the type of compensation for subsidy withdrawal that respondents preferred was not cash transfers or investment in transport infrastructure but, rather, investment in education and health. Cash transfers as applied so far in Indonesia were considered to be too inadequate in scale, as well as being transitory.

Despite these pieces of evidence, it is striking that relatively little is known in depth about attitudes and preferences among different segments of the population, whether differentiated by income, location or other characteristics. This is an area where further understanding and analysis will be essential for the formulation of future strategy (see Section 4.21 below).

4.21 A strategy for reform

Two approaches have been used so far to address demand for subsidised fuels – periodic price adjustments and access exclusions. They have often been accompanied by measures for compensation. In recent times, proposals have continued in this vein with, for example, stress on establishing closed distribution systems and/or a constant flat rate subsidy for specific fuels linked to some form of cash payments to significant numbers of households (IISD, 2014b). But experience shows that neither broad approach has worked sufficiently. In addition, the country remains far from establishing price-setting rules and practices that are not administered and that link movements in international energy markets more directly to domestic prices. Without establishing such linkage, the problem of trying to engineer periodic increases in administered prices will remain, while the danger of eroding nominal price increases through a combination of inflation and movements in international prices and the exchange rate will persist.

This section discusses what combination of approaches can help break this cycle and inability to scale back subsidies permanently. It is organised in two main parts. The first concerns measures to phase out subsidies on the demand side. Emphasis is placed on repricing energy. However, attention is also paid to possible measures for further limiting access. There is also discussion of complementary policies, whether of a compensatory or demand-reducing nature, that will be required to address the shocks to income that repricing will entail. In addition, the critical issue of communicating the content and purposes of reform effectively is addressed. The second part moves on to discuss possible steps to reduce supply costs, although the timing of such effects is unlikely to be rapid.

Repricing energy: Short- and longer-term strategies

This chapter has already documented the very substantial scale of fuel subsidy that has existed in Indonesia until very recently. In early November 2014, subsidised gasoline prices at the pump were just under 60% of unsubsidised prices and around 43% for diesel. The total energy subsidy bill for

2014 exceeded USD 27 billion. When also put into international context, Indonesia's fuel prices were 75-80% of the level in most South East Asian countries. Among other things, this suggests that tax rates on fuels are still relatively low.

In the context of lower international prices, the immediate challenge of adjusting prices that began in mid-November 2014 and has continued in 2015/16 needs to be matched by the strategic rethinking of the price-setting system and a move away from the pattern of large ad hoc adjustments that have dominated fuel pricing policy over the last decade and more. The sharp fall in international prices has allowed a temporary elimination of subsidies, at least on gasoline. However, this price fall cannot be taken as permanent; hence the need to move towards a robust longer-term framework for price setting to guard against any possible reflation of subsidies in the event of international prices rising. Ultimately, it would be desirable to have domestic energy prices automatically follow international prices, but this is constrained by legal-cum-constitutional considerations, as well as a likely lack of political consensus.

An additional component would be, over time, to introduce an appropriate level of taxation on fuels. This would be desirable for a number of reasons, including efficiency of revenue raising, as well as to correct for the adverse externalities associated with fuel consumption – such as lower productivity due to congestion and the negative impact on morbidity and mortality. For a sense of how large those externalities might be, studies using data for Cairo in Egypt – a country where fuel subsidies are large and where congestion levels rival those of Jakarta – have found that the estimated cost of total pollution in the Greater Cairo area alone amounts to around 0.2 per cent of GDP (Commander, Nikoloski and Vagliasindi, 2014). And a recent study for Indonesia has suggested that phasing out energy consumption subsidies could contribute a 10-12% decrease in energy-related CO_2 emissions by 2020 that would be mainly due to a decrease in household energy consumption (Durand-Lasserve et al., 2015).

Phase 1: Immediate and significant adjustments to subsidised fuel price levels

The new government implemented a large, one-off revaluation of fuel prices in November 2014. Fuel prices were increased by IDR 2 000 per litre. This still left a IDR 2 000 gap between subsidised and unsubsidised gasoline and a IDR 5 500 gap for diesel. The estimated reduction in the current-account deficit from this increment was put at around USD 2 billion.

In January 2015, as international oil prices fell below USD 50 per barrel, the remaining subsidy on gasoline was effectively eliminated. By mid-January RON88 gasoline was declared free of subsidy. Prices for diesel were also cut with a fixed subsidy of IDR 1 000 per litre being put on diesel. Between January 2015 and January 2016, subsidised prices for gasoline and diesel declined by nearly 10% and over 20% respectively in nominal terms. By early 2016, the gap between RON90 gasoline and RON88 gasoline was below IDR 1 000 (USD 0.07) per litre. For diesel, the gap in price between regular and premium diesel was IDR 2 650 (USD 0.17) per litre. Over the same period, kerosene prices were largely unchanged. LPG prices for larger (12 kg) cylinders were raised by over 40% in January 2015 but subsequently adjusted downwards, while the price of a 3 kg cylinder remained heavily subsidised at under 50% of the 12 kg cylinder price on a per unit weight basis.

Ambitiously, the government has also announced the phasing out of subsidised (RON88) fuel within two years and switching explicitly to higher priced, higher octane (RON92 Pertamax and Super) fuel with an accelerated switch in local refining capacity. After initially adjusting fuel prices every month, it was announced in late 2015 that domestic fuel prices would be adjusted on a

three-monthly basis.[59] The formula used for price setting takes MOPS – Mid-Oil Platt's Singapore prices – as the reference, qualified by the USD/IDR exchange rate, storage and distribution costs, 10% VAT, 5% Fuel Vehicle Tax, as well as a margin for distributors. For any fuel that is subsidised, the retail price is set administratively in relation to the reference price, and that price multiplied by the volume offered under the subsidy programme gives the total subsidy bill.

Phase 2: Relating domestic to international energy prices

Relying on good timing and falling international energy prices also brings risks. Those risks are that temporary movements will induce complacency and/or that any subsequent increase in international prices will not be transmitted through to domestic energy prices, thereby reviving once again fossil fuel subsidies. In addition, there is the related policy matter of whether to tax energy and, if so, at what rate. Presently, the fuel vehicle tax is set at 5%. In other words, even if international prices fall further or remain in the current range, this will still require the establishment of a transparent and robust mechanism for relating domestic to international price movements in the future. Without such a mechanism, it is likely that ultimately Indonesia will simply repeat the cycle of episodic and incomplete adjustments to energy price changes in international markets.

As noted above, a mechanism is in place for quarterly adjustments of prices in broad line with international prices. With the constraints imposed by existing laws and the constitution, this is an attempt to introduce a more explicit relationship between domestic and international prices. However, the new mechanism has not been tested by any significant upward movement in international prices. Given Indonesia's history of fuel pricing, it might reasonably be expected that a period of rising prices would lead to renewed clamour for subsidies. As such, a relevant question hangs over the credibility of the price adjustment mechanism in the face of significant price increases in the future.

Although most advanced economies have energy prices set by market forces, with the volatility that that implies, many countries have experimented with price setting that does not automatically impose market values. The motives range from reducing volatility and/or a greater emphasis on distributional as opposed to efficiency objectives. In considering, however, what format should be adopted, both analytical and practical factors have to be taken into account. The discussion that follows consequently combines simple design principles with experience from other jurisdictions.

Pricing formulae

When relating domestic to international prices, while balancing volatility and fiscal considerations, the price of domestic fuels will depend on import prices, domestic wholesale and retail distribution margins and taxes levied on fuels, commonly comprising VAT and excise taxes. This implies that, in the first instance, an explicit relationship between international and domestic prices is established. Secondly, it requires an agreed level of taxes and distribution margins to be implemented. Thirdly, it requires agreement on the timing and regularity of price adjustments.

In seeking to establish a mechanism or formula, design needs to strike a balance between price smoothing objectives and fiscal risk or exposure.[60] For example, experience suggests an inverse relationship between the two from a volatility perspective. In addition, given the long history of

[59] Note that with oil prices below USD 55 per barrel in early January 2015, the issue of the level of fuel taxation has come more to the surface.

[60] It is important to note that while price smoothing may have merits – particularly in a transitional context – the distributional argument for smoothing is relatively weak as poorer households consume little energy either directly or indirectly.

fossil fuel subsidies in Indonesia, there is a need to adopt a design that limits the opportunities for imposing ad hoc or asymmetric patterns of adjustment. In particular, the risk is clear that any period of sustained price increases on international markets will lead to politicians overriding the mechanism and thereby deferring, or simply not passing on, increases to domestic prices.

A number of possible design principles can be applied when price smoothing is an explicit objective.[61] Using a price band is one option. Normally, this involves establishing a limit on the extent to which retail prices can change in a given period. Price caps can be set either in relation to the current retail price or in absolute amounts. The advantage of a price band approach is that even if in one period the international price increase exceeds the band, catch-up increases can be implemented in a subsequent period. While the obvious aim is to avoid sharp movements in domestic fuel prices, sustained periods of above-band price increases in international markets can, however, undermine this objective, particularly if the cap is set in absolute terms. An alternative approach is to use moving averages to relate retail price changes to changes in past import prices. If the moving average is calculated using relatively few, recent observations, then retail price adjustments may be larger than if a more extended moving average is constructed. Moving average rules are more effective for periods of sustained price increases on international markets.[62]

Although a range of countries have made a significant number of attempts at introducing rule-based pricing, no unequivocal best practice exists.[63] Many attempts have been abandoned, particularly in periods of sustained price increases. Political pressures have been important in determining whether rules-based price mechanisms survive or are rescinded and this is likely to be a consideration in the future in Indonesia. Even with a broad political consensus around the pricing rule, design has proven difficult, as the case of Chile demonstrates (see Box 2, and also IEA, 2012).

Given Indonesia's reliance on fuel imports – a reliance that is likely to remain even if greater efficiency in production and refining is achieved in future years – any pricing rules that are adopted should explicitly relate domestic retail prices to international prices. As with recent Chilean practice, the primary instrument for smoothing could be through varying the tax rate and hence the fiscal yield.

Proposed pricing framework

The starting point of a revised formula that moves away from administered price setting will again be to associate explicitly domestic retail prices and international or import prices. The domestic retail price (*Rp*) can be related to an average of past oil prices (*Op*) and expected future prices, as well as the difference between refined and crude oil (*CO-RO*), as indicated below. The parameter, α, ranges between 0 and 0.5, and *n* gives the intervals used for both the backward and forward averages.

$$Rp_t = (1-\alpha)\, Op_{t-n} + \alpha Op_{t+n} + (CO_t - RO_t)$$

[61] For a detailed discussion of options see, Coady et al. (2012).

[62] Coady et al. (2012) argue using simulations that price bands perform better and may have the advantage of being easier to implement and explain to the public.

[63] For a review of experience see, Kojima (2013).

A price band is then established either side of the retail price. In the event of the international price increasing more than the specified band, a countervailing reduction in the excise tax rate on fuel would be imposed. This means that the domestic retail price for fuel would be given by:

$$Rp_t = \left(Op_t^{int} + Dm\right)(1 + VAT) + Excise$$

The domestic price is thus a function of the international price adjusted by the permitted distributors' margin (*Dm*) and the tax rates on fuel that comprise VAT and specific excise duties. For example, in Chile, the tax rate that adapts is only the excise tax. That tax has two components:

$$Excise_t^{Tot} = Excise_t^{base} + Excise_t^{var}$$

The variable component is the one that fluctuates depending on the difference between international and domestic prices as calculated. Before setting the base and variable components, detailed simulations of desired and expected tax yields need to be undertaken. Indeed, looking forward it would be desirable if the current rate of excise taxation were evaluated. At its current 5% rate, it would not be sufficient to allow for any significant modification in prices. Taxation of fuel consumption is not only an efficient revenue-raising instrument, but is also important for helping consumers internalise the wider costs of energy use. Clearly, tax rates depend on specific jurisdictions, but the important point to note is that the pricing formula should leave some scope for intervention by separating out the base and variable components.

Institutional setting

A further dimension that is important concerns the institutional set-up for operating a rules-based pricing system. Although international experience is again very varied, in the Indonesian context placing the formulation and administration of the pricing rule at arm's length from government may be desirable. In this respect, establishing an agency or authority for fuel pricing independent of government and Parliament could help improve transparency and overall trust in the process. The hope would be that, over time, any independent authority would acquire a reputation for competence and probity that would impede interference by politicians and the executive branch. This would make the process more technical in nature than political. Even so, it is unlikely that an independent authority would be able to withstand strong political pressure, making it essential that an underlying political consensus on pricing strategy and implementation is achieved prior to the establishment of any separate authority.

Box 2 • Chile's experience with price smoothing and subsidies for remote regions

In Chile the desire to limit volatility has led to the adoption of various price stabilisation mechanisms. In the early 1990s a fund was created based on use of a price band implemented on a moving average of past and projected prices. The band was initially +/-12.5% but was reduced to +/-5% in the mid-2000s. Since 2010 the band has again varied between +/-5 to 12.5%. Originally, when the import parity price lay outside the price band, a tax or credit was paid depending on the relationship between the import parity price and the price band's upper and lower limits, respectively. The aim was to make the fund self-financing, but this proved not feasible in the face of rising oil prices. As such, the fund acted mostly as a continual instrument of subsidy rather than as a mechanism for price stability. After running large deficits, in 2010 the system was changed so that movement in prices above or below the specified price band induced changes in taxation, specifically in excise taxes on fuels. In its current format, the fund (MEPCO) targets local (CLP) prices, not USD values, and uses a price band of +/-5% related to an extended number of weeks' prices (up to 104). Fiscal expenditure has in addition been capped at USD 600 million per annum. In its design, the fund can be effective at limiting transitory price fluctuations and their impact on inflation, but would still have problems in addressing any permanent shocks to prices. The fund's operations depend critically on varying excise taxes on fuels to achieve the stabilisation objectives. The Chileans have tried to limit the downside fiscal exposure, but the cap on spending ultimately depends on political factors and acceptability.

A direct subsidy also applied to natural gas, but only for the region of Magallanes in the far south of Chile. This region enjoys a special status, since it is considered an "extreme zone", due to its distant location and low average temperature. The aim is to ensure a minimum level of settlement in this remote area. Implementation is through discounted gas sales by the national oil company, ENAP, as the only company serving the 116 000 inhabitants of the region. In recent times, the gas price in the region stood at around 11% of that in the capital city, Santiago de Chile. Discussions are now underway on reforming the subsidy. Consideration is being given to introducing an inflation-indexed gas tariff that would be set every five years by presidential decree based on an independent study. This study would furnish the evidence for establishing an economically efficient tariff calculated on the basis of cost estimates for an efficient firm, allowing for a net profit of 10-15%.

Limiting access to subsidised products

Despite recent changes, limited scope may still exist for measures that provide access only to certain targeted groups. This presently remains relevant for both diesel and kerosene. Few restrictions are placed on access to subsidised fuel for private consumers and, in addition, there is evidence of some diversion to industry. However, operating a comprehensive database of consumers and using that information to discriminate or ration consumption of specific energy products has not proven possible. In addition, the introduction of radio frequency identification tagging appears to be a very costly solution that cannot be rolled out nationwide in the foreseeable future.

An alternative is a voucher system. Indeed, in January 2015 a limited voucher system was established targeted at fishermen, entitling holders to a specified discount on a given volume of fuels that could be redeemed at particular outlets only for specific types of fuel.[64] More generally, a voucher system could motivate greater efficiency in consumption if it were decided that there is need for wider coverage now or in the future. For example, a voucher system could focus on the more distant provinces, not least to help ensure better availability of fuel in these areas. It would, however, need to be accompanied by significantly improved monitoring and supervision of fuel distribution to address the large variations in pricing across jurisdictions and the widespread matter of large discrepancies between depot and final consumer prices. BPH Migas' oversight role would have to expand substantially and Pertamina would need to be mandated and reimbursed for providing any subsidised fuel. To address the needs of the relatively poor – and often geographically far-flung – locations, a public service obligation could be considered for all operators in the downstream market to ensure that they provided coverage and services in isolated regions of the country. Chile's experience with fuel subsidies in Patagonia could potentially serve as a model for implementing such limited subsidies in distant and sparsely populated localities.

Although vouchers may have a transitional role to play, they still leave the pricing of energy very much subject to bargaining between political institutions, civil society and other parties.

Complementary policies: Wage adjustment

Resistance to repricing energy in recent years has come from many quarters. One dominant consideration, as stressed in this chapter, has been the fear that lowering incomes could be disruptive, hence the use of compensatory payments. And although fossil fuel subsidies are currently not the main problem, any future rise in international prices could rekindle demand for

[64] In 2010, the World Bank proposed just such a convertible fuel voucher system with the value of the voucher explicitly linked to oil prices. One advantage, they considered, was that the size of the discount could be reduced over time.

subsidies. However, looking ahead, any future energy price shock that led to income deficiency could be addressed directly by targeting wages.

While it is certainly true that mandated wage increments – whether to public-sector wages or to minimum wages – may not materially affect lower-income groups whose work is either in the rural or urban informal economies, wage adjustments may help address the concerns of non-poor groups who might otherwise oppose repricing of energy products. Yet, use of wage policy has been resisted for a variety of reasons. The first is the fear that changes to administered prices can translate into persistence in inflation if wages are highly responsive to prices. But there is little evidence that this has been the case in Indonesia. Wage growth in the formal economy has not accelerated in the aftermath of previous energy price increases. The second concerns the impact of wage growth on production costs and, in particular, the possible implications for the competitiveness of labour-intensive manufacturing sectors that have been seen as crucial to the creation of jobs. While it is acknowledged that wage levels are low, it has also been argued that wages in Indonesian manufacturing are already higher than in some other Asian economies, although not those in China. Maintaining relatively low wages has been seen as a precondition for the sort of export-led, labour-intensive growth in manufacturing that occurred in the 1990s (Papanek et al., 2014).

From a policy perspective, two levers can be manipulated for influencing wages. The first is government and public-sector wages that are administratively determined. The second is the minimum wage. Minimum wages in Indonesia are also set by government and have been adjusted on an irregular, but reasonably frequent, basis. In 2013 the minimum wage was around 60% of the average wage, a ratio that in a comparative context is high. Minimum wages tend to affect wages of unskilled and low-skilled workers and have probably played a part in driving up unit labour costs in manufacturing over the past decade (IMF, 2013c). But it is important to note that other features of the labour market, notably high hiring and separation costs, particularly since 2003, have also played a part. Even so – and despite the presence of trade unions in some sectors and industries – wage growth has been relatively subdued in the recent past and the labour factor share has also stayed quite low. While wage increases are likely to be strongly opposed by employers, available evidence suggests that, at least in the formal sector, Indonesian companies tend to be profitable and that the capacity to fund wage increases is not a major issue.

There are some obvious dangers, not least that of expectations that workers could come to view wage adjustments as a required palliative for future price rises. This might be avoided by the timing of the wage increase. Any signs of a wage-price spiral could be addressed by the Central Bank using conventional monetary tools.

Targeting poorer households

When it comes to better targeting subsidies, it is useful to distinguish between short- and longer-run objectives. Indonesia has already been one of the leaders in providing compensation linked to the timing of energy price increases. Those transfers have mostly been in cash, unconditional and

time-bound. Although a declared intention has been to target lower-income households, coverage has been far broader. Given that the main beneficiaries of fossil fuel subsidies are not the poor, from a political economy perspective this may be hardly surprising. Transfer programmes, such as BLT and BLSM (described in Section 4.17 above) have proven to be a weak way of addressing income deficiency. Time consistency is also an issue. When transfers are simply short-run payments to facilitate price increases, this results in the expectation that future adjustments will be accompanied by similar actions. Maintaining the link between the two will be counterproductive. Even so, the question remains of how best to treat poorer households?

A desirable longer-run objective is to establish transfer programmes that are well targeted and are driven primarily by the country's plans for social assistance, irrespective of the level of fossil fuel subsidies. This appears to be an approach increasingly adopted by the Indonesian government. Indeed, the launch of the Productive Family Programme in late 2014 was not funded by reallocation from subsidy spending. In the medium term, the main constraints remain fiscal, as well as the ability to target effectively. Progress is being made with the introduction in the coming years of a unified database covering around 96 million households in the bottom 40% of the population (Perdana, 2014a). Despite these changes, it seems likely that significant exclusion errors will remain.

Communications

A common criticism of government has been its inability to communicate its strategy for subsidies, as well as the content of its policies, effectively to the population. This message, for example, stands out in the GSI survey of civil society organisations. A review of the government's communications strategy in 2012 by the same organisation found good intent but lack of nuance in the policy messages and insufficient attention paid to specific audiences, particularly those that might be important in shifting opinion, so-called swing constituencies (IISD, 2013).

Yet, ironically, in the wider international literature on subsidy reduction, the Indonesian government's efforts in 2005 have been held up as an exemplar, particularly concerning popularisation of the cash transfer programme that was funded from some of the fiscal savings (Vagliasindi, 2012). What seems to have happened is that by design the topic attracted a great deal of sustained discussion in various media including television, print and other. Recent Indonesian governments have also run informational programmes about the cost of subsidies. Some emphasis has been put on highlighting the inequitable incidence of fossil fuel subsidies, but this aspect has attracted less attention than the overall cost of subsidies and their affordability at aggregate level. As such, these campaigns have doubtless contributed to the relatively widely held view that subsidies are undesirable. But they do not seem to have translated into convincing people of the policies to be pursued for reform.

One line of argument is that an effective communications strategy requires being able to link reform with improvements in desirable outcomes, whether of an income- or poverty-related nature or in terms of improvements in infrastructure and public services. The idea is that citizens

do not accept that fiscal savings alone are sufficient, but want to see government provide tangible benefits in exchange. An additional argument is that such benefits have to be observable either prior to, or contemporaneous with, reform. While both are rational arguments, they have their own limitations, not least the difficulty in implementing in a timely way. Experience so far shows that it has only been cash transfer payments that have been mobilised on a contemporaneous basis when energy price changes have been introduced.

But there is a more substantive underlying problem with this diagnosis. Evidence that is available so far suggests that the authorities have not identified with any adequate degree of granularity what different groups and individuals' opinions are and, second, have not been able to tailor their strategic response to address the main concerns of a necessarily heterogeneous set. These limitations can be readily addressed. What, however, is more positive is that the new government was able to exploit a favourable conjuncture for both political and business cycles to engineer a removal of most of the fuel subsidy by early 2015.

Complementary measures: Energy conservation and substitution

Considerable scope exists for reducing energy use. This includes not only improvements in fuel efficiency for motor vehicles and other transport, but also other measures such as substitution of fuels, such as natural gas, in place of gasoline and diesel.

With rapidly increasing private ownership of vehicles, congestion has, of course, become a major problem in Indonesia's rapidly urbanising economy. It has been estimated that as much as a third of Indonesian fuel consumption may be accounted for by vehicles held up in traffic. Adoption of start-stop technology could save a significant amount of fuel, certainly in excess of 10% and conceivably much higher. However, for that to happen would require relatively expensive conversion of existing vehicles. Yet experience from a recent programme to reduce demand for low-subsidised fuels by encouraging switching to gas-based fuels (compressed natural gas and LPG for vehicles) has been disappointing. This programme has included supplying conversion kits to allow vehicles to switch to using these alternative fuels, as well as augmenting the capacity to supply these fuels through retail outlets, principally of Pertamina. But the programme has been largely ineffective. Moreover, even if the pace of conversion had been faster, its scale would nevertheless remain small with limited impact on the composition of fuel demand. The government should focus its conversion programme on public transport, including switching to higher-grade fuels and engine standards for public transport vehicles.

A constant refrain in the discussion of energy pricing is the inadequacy of the existing systems of public transport in Indonesia. A symptom of this is that motorcycles now account for 80% of transport and their modal share has been increasing rapidly at the expense of public transport. Although Jakarta has a system of bus lanes, segregation is poorly enforced, undermining the potential for a high-capacity, bus-based, rapid transit system. The main issue here is not the desirability or otherwise of better public transport: that is pretty much a given and agreed to be so across a wide range of political players as well as civil society. The limiting factor is that such

investments tend to be relatively long in gestation and execution and, as a recent survey of non-governmental organisations showed, has resulted in low priority or credibility being attached to this type of spending by government. Even so, it is quite obvious that large and sustained investment in public transport will be essential. In addition, the government at both central and local levels urgently needs to develop an integrated framework for public transport that ensures interconnected public transport services alongside possible subsidisation of low density, but socially important, routes.

Establishing a programme to promote urban solar energy generation for households could also help demonstrate that savings from subsidies can be effectively used for cleaner energy. Further, any additional electricity generated could be used to help lower adopting households' electricity bills.

Electricity tariffs

Electricity subsidies have fallen sharply since 2014. However, a significant share of current subsidies still accrues to richer households, in part because they have higher access rates than poorer households, and also because they are more intensive users. But announced policy is to remove up to 23 million non-poor households from receipt of subsidy in 2016 and subsequent years.

Indonesia has already introduced lifeline or social tariffs in an attempt to ensure that low-usage – and by implication, poorer – consumers can purchase power at relatively low rates. A criticism of this sort of approach is that it sends different marginal price signals to different consumers when the cost of service is the same.[65] Further, the distributional impact will depend on how wide the tariff blocks are and the number of blocks, bearing in mind all customers will benefit from the lower tariff block(s). Thus, if the low tariff bands are broad then relatively high-volume consumers will also benefit significantly, thereby diluting the aim of supporting low-income consumers. Tariff levels on higher consumption blocks will have to rise sufficiently to recover foregone revenues for lower-volume consumers. Although there is a clear, raw association between income and usage,[66] it is made more complex by the presence of large households and other factors that may disturb this relationship.

From a policy perspective, there are a number of issues. The first concerns access and affordability for poorer consumers. The second concerns the design of the tariff structure that best achieves these distributional objectives. The third concerns the financial performance of the utility and its ability to invest adequately in the future.

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[65] This may impose relatively small costs if consumers are not that responsive to changes in marginal prices. See Borenstein, 2008.

[66] Use of electricity is mainly due to the use of appliances and poorer households tend to have fewer appliances than better-off households. Things become more complicated if poorer households live together but are billed as a single entity.

A measure of whether households – particularly low-income ones – can afford electricity is to calculate a minimum basket of electricity consumption for a typical poor household and then to relate the cost of that minimum consumption as a share of expenditure or income.[67] An earlier World Bank estimate of the impact of doubling tariffs indicated that in Indonesia, it would have resulted in an increase of around 1% in poverty (Foster and Yepes, 2006). However, although direct tariff increases may have only a limited impact on poverty, the overall magnitude may be greater through indirect or second-round effects as price increases influence other prices and wages in the economy. Further, any fixed-charge component of a two-part tariff will weigh particularly heavily on low-usage consumers.

Although lifeline tariffs may preserve low-cost access for low-usage consumers, and presently the initial consumption block is relatively small in size, other tariff rules could be considered. For example, a VDT can address the limitation that higher-income consumers will benefit from a block system. But the gains of better targeting have to be set against the fact that the marginal effects may be very large, so crossing a threshold in terms of volume of consumption may impose a significant and discontinuous price increase. Using moving averages of consumption can reduce this risk.

As regards the financial implications of subsidies for the utility, the main issue concerns the ability to recover operating and capital costs. From an economic rather than a financial standpoint, average tariffs also need to cover long-run marginal costs. These will be a function of the technology that is used and its vintage, as well as demand. Additionally, hidden costs – as through transmission and distribution losses and direct theft of power by consumers and/or non-collection of payables – need to be addressed.

In Indonesia, with current costs and pricing, PLN is only able to cover operating costs and a share of capital costs. Yet it is also recognised that there is an urgent need for additional generating capacity, for investment in network upgrades, expansion and operational practices, and to ensure stability of supply. Changes to market structure that move the power sector towards a more liberalised, wholesale market with unbundling (as in Mexico) and an independent regulatory agency will be desirable. Presently, the dominant position of PLN limits private investment and compromises the ability of the system to meet future demand.

Addressing supply costs

There is a strong and common belief among the political parties and in the country as a whole that natural resources should largely remain in state hands. As in quite a few other resource-rich countries, this has led to large publicly owned companies dominating the energy landscape. And although there have been attempts in recent years to improve the quality of management and

[67] Household survey database for 11 countries showed that poorer households (bottom quintile) on average spend around 5% of income on electricity. See Vagliasindi (2012).

oversight, particularly at Pertamina where the links between the company and political interests has been reduced, it is still the case that the company holds a massively dominant market position. In electricity, PLN is also the dominant player.

Yet there are changes in both the fuels and power markets that could maintain a major element of public control but that could enhance performance and accountability with implications for subsidies. For fuels, other players have been allowed into the retail fuel market, but Pertamina remains the unique supplier of subsidised fuel. Part of the reason for this is that it *de facto* allows the government to treat the company as a quasi-budgetary entity. Snapping this link and using a mix of distributors, include private-sector companies, paid on commercial terms would force a more transparent set of dealings and further motivate government to reduce its exposure to loss-making activity.

Lack of refinery capacity and low utilisation rates – particularly for Pertamina – have also emerged as major constraints. The country's ten existing refineries operate at less than 70% utilisation rate. This has necessitated larger imports of refined fuels but capacity constraints also hold back the ability to switch consumption towards higher-grade fuel. Supply has been identified as a significant constraint in inducing a switch to higher-grade fuel or alternative – principally gas-based – fuels. Yet, investment at both the production (refinery) and retail ends has been slower than planned. This has undermined the strategy of inducing a fall in demand for subsidised fuel.

Although, lack of capacity is supposed to be addressed in the future investment plans of Pertamina, it raises the broader issue of whether maintaining the dominance of a single company is an appropriate strategy. While part of the problem may indeed be linked to the pricing of different types of fuels, it is also the case that the current shortfall in capacity may be due to the incentives facing Pertamina, as well as the quality of management and governance.

4.22 Recommendations for reform

The previous section has laid out the main components of a strategy for energy pricing in Indonesia. While many of the core objectives of subsidy reform have been widely shared, even among political parties and actors, there has been far less agreement on the speed at which reform should be undertaken, as well as considerable imprecision as to the policy instruments and vehicles that should be employed. This is particularly true when considering how to escape from the trap of large, ad hoc adjustments to energy prices commonly induced by the build-up of macroeconomic tensions. What might be termed the "pressure-cooker model" of decision making (i.e. postpone until the vessel threatens to explode) is clearly counterproductive, not least by making each subsequent round of reform more problematic.

The fall in international prices since late 2014 has given Indonesian policy makers a lifeline to eliminating or severely curtailing subsidies. Even so, the urgent need remains for a longer-term vision and strategy to be put into place not only for energy pricing, but also for a model of more

productive public spending. To those ends, the elements of that strategy should comprise efforts to:

1. Undertake an urgent review of energy taxation, and the scope and scale of fuel excise taxes in particular.
2. Formalise a new rules-based system for setting fuel prices that builds on the current formula for relating domestic to international prices, but also addresses issues of possible, future volatility by applying a price band to ensure limits in times of both rising and falling international prices.
3. Link changes in prices to a fully-fledged political and communications strategy that sets out what have been the costs of subsidies and the benefits of redirecting fiscal savings to other sectors that will directly benefit citizens.
4. Urgently commission extensive opinion surveys, focus groups and other discussion forums that allow better identification of the preferences of citizens and help identify changes to government expenditure that can command popular support and address the pervasive problem of lack of trust in government.
5. Regularly demonstrate where fiscal savings are being reinvested and the benefits that such investment can bring to citizens.
6. Address the costs of energy supply by conducting an in-depth review of market structure and incentives in both fuels and the power sector, factoring in experience from other countries that have embarked on, or recently completed, major changes to market organisation, such as Mexico.
7. Press forward with proposals for establishing new regulatory agencies for both upstream and downstream activities in the oil and gas sector.
8. Delink social assistance programmes from energy pricing and policy. Continue developing the informational and institutional infrastructure for targeted social programmes throughout the country.

5. Conclusion

This paper has focused in detail on two countries with long histories of fossil fuel subsidies, and which have pursued different technical and political pathways to reform. In sum, the conclusions from this report are:

1. Both countries have undertaken substantial energy subsidy reforms. Along the lines of the general elements of reform defined in this paper (Chapter 2), the results have been as follows:

- Policy design: Mexico and Indonesia have pursued different general approaches to reform. In the fuels sector, Mexico applied a gradual approach, while Indonesia opted for large one-off price increases. As regards electricity, in Mexico emphasis has been placed on structural changes, whereas in Indonesia these have been largely avoided.
- Public consultation: In both cases this has been done in a very incomplete fashion and with a limited range of methods. There has been a lack of effort to understand how citizens and others perceive subsidies and the relative values they place on them as well as their associated preferences for reform.
- Communications policy: Although both countries have used media campaigns to address issues around subsidy reform, communications policy as a whole has lacked coherence and sophistication. In both places, little or no attempt has been made to develop nuanced and targeted messages addressed to specific constituencies.

2. The two countries' different approaches have been determined by the political economy and the opportunity afforded by changes in international oil prices.

- Mexico is focused on market reform for both the power sector and fuels. The emphasis is on lowering costs by facilitating entry of private firms, at least in the generation of power. Relying on small, staggered changes to transport fuel prices, fiscal subsidies were eliminated by early 2015, and by 2017 fuel prices are planned to be liberalised. In the power sector, for reasons of a largely political economy nature, the focus is on lowering the costs of supply.
- Indonesia, despite a variety of attempts to curb demand and having initiated some innovative efforts at greater consultation with citizens and other interested parties, the political apparatus was not able to find a politically viable way through the thicket of fossil fuel subsidies. Joko Widodo's election as President opened the way to substantive reform. Energy prices were increased significantly and a large fall in international prices has allowed elimination of most of the fuel subsidy.
- But beyond the immediate situation in Indonesia and, in particular, the feature of falling international prices, lies the pressing need to move to a credible system of price setting that does not allow the accumulation of large gaps between domestic and international prices and hence a growth in subsidies in the future. Experience from other countries

indicates that market-based energy prices are the best option, but this is probably not politically viable in the Indonesian context. As such, moves to a rules-based formula administered by an independent body with a mechanism for dampening price volatility would be highly desirable. At the same time, drawing on Mexican and other experience, a review of market structure and the extent of competition in both the fuels and power sector would be sensible.

3. Reforms in Indonesia and Mexico have made good progress over the past years, with a remarkable reduction in governmental expenditure allocated to subsidies, supported by policy design and regulatory frameworks; however, the phase-out of subsidies has not yet been completed.

- In Mexico, electricity tariffs are excessively complex and are in urgent need of reform. The maze of tariffs now comprises a motley assortment of regional/climatic and/or seasonal adjustments. The present set-up is not effective for addressing distributional concerns being, as it is, highly regressive. Several options for reforming pricing are addressed in this report, analysing their impact: instant liberalisation, two-part tariffs, tariff simplification, changes to duration of summer tariffs, and volume-differentiated tariffs.
- In Indonesia, two approaches have been used so far for addressing demand for subsidised fuels – periodic price adjustments and access exclusions. The country remains far from establishing price-setting rules and practices that are not administered and that link more directly movements in international energy markets to domestic prices. This report discusses complementary policies focused on pricing formulae, a proposed pricing framework, along with an institutional setting for operating a rules-based pricing system, limited access to subsidised products, making wage adjustments and targeting poorer households' strategies.
- The restructuring of tariffs in both countries is principally concerned with increasing access to and the affordability of energy for poorer consumers. Further analysis is needed to inform the design of a tariff structure that best achieves distributional objectives and improves the financial performance of utilities and their ability to invest adequately in infrastructure.

Table 9• Summary of energy subsidy and sector reforms

Dimension	Mexico	Indonesia
Fuel subsidies	Measured by price gap approach: USD 5.3 billion in 2014 representing 0.4% of GDP (USD 3.1 billion for oil products, USD 1.4 billion for electricity, USD 0.6 billion for gas).	Measured by price gap approach: USD 27.7 billion in 2014 representing 3.1% of GDP (USD 19.3 billion for oil products and USD 8.4 billion for electricity). According to national budget: declining to

	Fiscal fuel subsidies eliminated by 2015 through regular, small price adjustments. Prices to be liberalised in 2017.	USD 5 billion in 2015/16. Prices to be adjusted quarterly in line with international prices.
Electricity subsidies	Measured by price gap approach: USD 1.4 billion (0.1% of GDP) in 2014 with plans for gradual reform through tariff simplification and rationalisation. First budget appropriation for electricity subsidies amounted to USD 1.6 billion.	Measured by price gap approach: USD 8.4 billion (0.9% of GDP) in 2014. According to national budget: USD 5.2 billion (0.58% of GDP) in 2015, expected to fall to USD 2.6 billion in 2016. Non-poor households progressively to lose subsidies.
Fuel sector	2014 Energy Law permits upstream and downstream competition to incumbent PEMEX, liberalising imports by 2017 and fuel price by 2018.	Pertamina remains *de facto* monopolist in downstream. Some upstream competition present.
Electricity sector	Energy Law sanctions extensive vertical and horizontal unbundling in generation and distribution with creation of wholesale market. Incumbent utility (CFE) being commercialised and relationship with fiscal authority made more transparent; regulator (CRE) to acquire additional functions as power market regulator.	Vertically integrated PLN with some independent power producers.

Finally, what is striking in both instances, despite the differences, is the strong political economy nature of the problem. Opposition to change on the part of entrenched interests – regional consumers and producers in Mexico and a mix of household consumers, industry and trade lobbies in Indonesia – as well as difficulties in creating consensus out of complex, coalitional politics have hampered progress. In addition, governments in both countries have, until recently, struggled to develop convincing political narratives for reform, although this may now be changing very much for the better.

Annex: Tariff structures in Mexico

Household tariff complexity and unit costs

The current rate structure is differentiated by geographical or climatic factors. The average minimum temperature in each location is calculated during the summer months. If that average in three out of the last five years reaches a particular threshold temperature, consumers in that locality qualify for a specific tariff. For example, consumers in a locality with an average temperature greater than 25°C in summer qualify for tariff 1. This rises with temperature thresholds so that those in a locality with an average of 33°C or more qualify for tariff 1F.

Table 10 provides detail on the current complexity of the tariff structure, looking specifically at electricity rates charged for the summer period. For example, a consumer on tariff band 1 in a less warm region faces a four-part tariff. They would be charged MXN 0.77 for the first 75 kWh of consumption, and MXN 0.94 for the next 65 kWh. At that point, they would be charged MXN 2.76 up to 250 kWh, at which point they would be switched to the unsubsidised DAC tariff. In the hottest, northern states, by contrast, a consumer on tariff 1F would pay MXN 0.57 for the first 300 kWh, MXN 0.72 for the next 900 kWh, MXN 1.74 for a further 1 300 kWh. Up to 2500 kWh, they would be charged MXN 2.76, at this point they would be switched to DAC tariff. Using data from ENIGH compiled by Scott (2009), it appears that the average consumption of the lowest three deciles in tariff band 1 was 130 kWh per month, as against 600 kWh for the same deciles facing tariff band 1F. Assuming that these consumption levels were maintained, this would imply at 2013 prices that an average low-income household on tariff 1 would face a monthly bill of MXN 109.5 as against a monthly bill of MXN 387 for an average low-income household on tariff 1F. These translate into unit prices per kWh of MXN 0.84 for tariff 1 consumers as against MXN 0.64 for tariff 1F consumers, a gap in excess of 30%.

Table 10• Domestic tariffs in summer, 2013

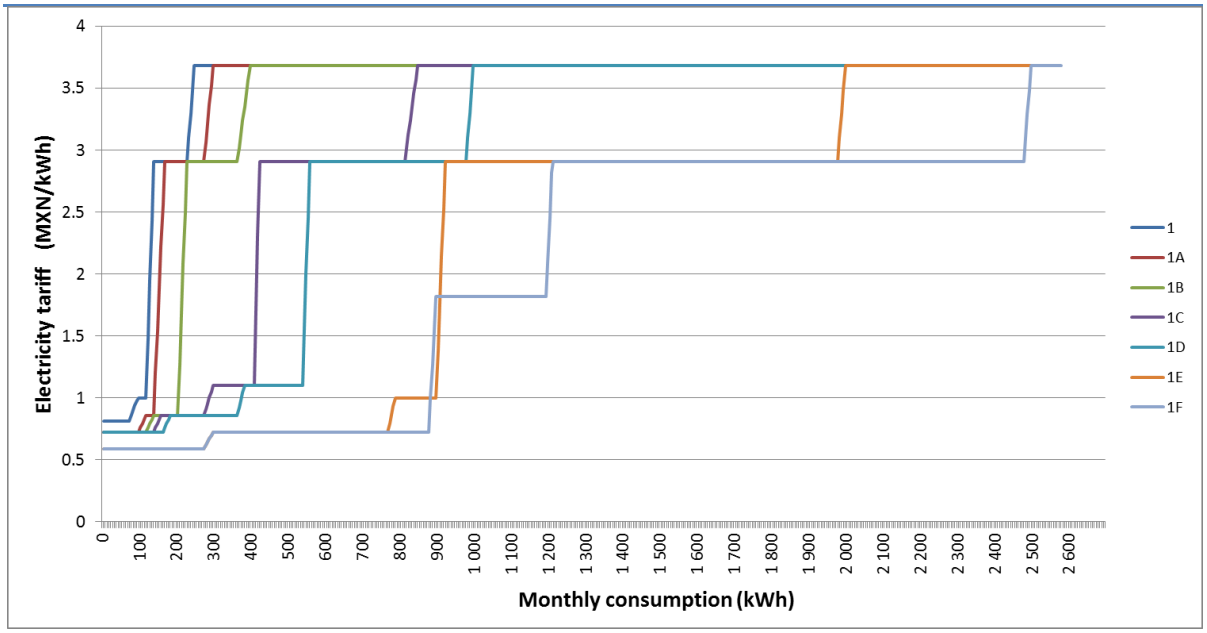
Domestic tariff	1	1A	1B	1C	1D	1E	1F
Temperature (°C)	x	25	28	30	31	32	33
Limit for DAC	250 kWh	300 kWh	400 kWh	850 kWh	1 000 kWh	2 000 kWh	2 500 kWh
Basic	MXN 0.77	MXN 0.69	MXN 0.69	MXN 0.69	MXN 0.69	MXN 0.57	MXN 0.57
	75 kWh	100 kWh	125 kWh	150 kWh	175 kWh	300 kWh	300 kWh
Intermediate	MXN 0.94	MXN 0.80	MXN 0.80	MXN 0.80	MXN 0.80	MXN 0.72	MXN 0.72
	65 kWh	50 kWh	100 kWh	150 kWh	225 kWh	450 kWh	900 kWh
High intermediate	x	x	x	MXN 1.04	MXN 1.04	MXN 0.93	MXN 1.74
				150 kWh	200 kWh	150 kWh	1300 kWh
Excess	MXN 2.76	MXN 2.76	MXN 2.76	MXN 2.76	MXN 2.76	MXN 2.76	MXN 2.76

Note: x = not applicable. Source: SENER (2014b), Internal information note, mimeo.

Tariff blocks

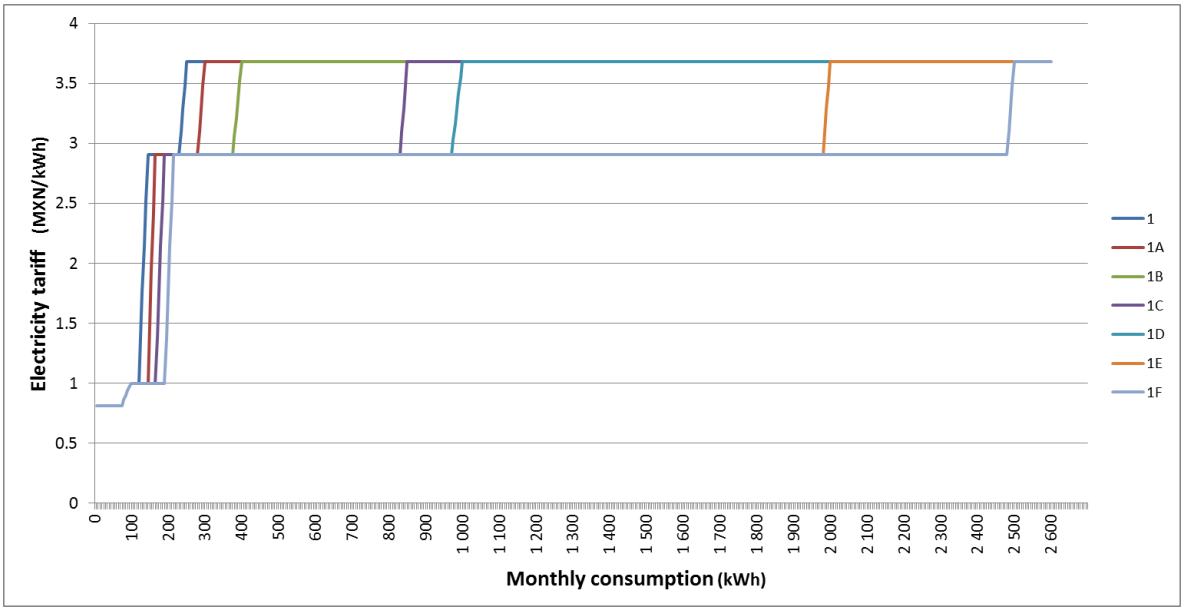
Tariffs are also varied depending on the volume of consumption, with consumers grouped into three broad ranges: basic, intermediate and high intermediate. Once a consumer reaches the limit for that bracket, electricity consumed above that will be charged at the next rate and so on. For very large volumes of consumption, consumers switch into a further and much higher tariff (DAC). Figures 13 and 14 below give tariff blocks for both summer and non-summer periods that were operative in September 2014. They show that summer pricing is not only very different from other periods of the year but that tariff rates and bands are significantly lower and broader.

Figure 13• Domestic electricity tariffs structure (summer), 2014



Source: SENER (2014b), Internal information note, mimeo.

Figure 14• Domestic electricity tariffs structure (winter), 2014



Source: SENER (2014b), Internal information note, mimeo.

Acronyms, abbreviations and units of measure

Acronyms and abbreviations

APBN	Actual State Budget Plan after spending (Indonesia)
APBN-P	Planned Budget before spending (Indonesia)
APEC	Asia-Pacific Economic Cooperation
Bappenas	Ministry of National Development Planning (Indonesia)
BLSM	Temporary cash transfer programme (Indonesia)
BLT	Unconditional but time-bound cash transfer programme (Indonesia)
BPH Migas	Body for oil and gas downstream activity (Indonesia)
BSM	Supplement for poor students (Indonesia)
CENACE	Electricity network operator (Mexico)
CENAGAS	Gas network operator (Mexico)
CFE	Federal Electricity Commission (Mexico)
CNH	National Hydrocarbons Commission (Mexico)
CO_2	Carbon dioxide
CONCAMIN	Confederation of Industrial Chambers (Mexico)
CPP	Critical-peak pricing
CRE	Energy Regulatory Commission (Mexico)
DAC	Household high-consumption tariff (Mexico)
DEN	National Energy Council (Indonesia)
DPD	Indonesian Regional Representatives Assembly
DPR	Indonesian House of Representatives
ENIGH	National Survey of Income and Expenditure in Households (Mexico)
ERC	Energy Regulatory Commission (Philippines)
FIDE	Trust for Electrical Energy Savings (Mexico)
GDP	Gross domestic product
GHG	Greenhouse gas
GSI	Global Subsidies Initiative
IDR	Indonesian rupiah
IEA	International Energy Agency
IMF	International Monetary Fund
IPP	Independent power producer
KfW	German Development Bank
LPG	Liquefied petroleum gas
MEMR	Ministry of Energy and Mineral Resources (Indonesia)
MEPCO	Mechanism for the stabilisation of fuel prices (Chile)

MER	Market exchange rates
MOPS	Mid-Oil Platt's Singapore
MXN	Mexican peso
NPA	National Petroleum Agency (Ghana)
OECD	Organisation for Economic Co-operation and Development
PEMEX	Petróleos Mexicanos
PKH	Conditional transfer programme (Indonesia)
PLN	State electricity company (Indonesia)
PPP	Purchasing power parity
PRI	Institutional Revolutionary Party (Mexico)
PRONASE	National Programme for Sustainable Energy Use (Mexico)
RASKIN	Subsidised rice programme (Indonesia)
RON88	Lower-octane gasoline (known as "Premium" in Indonesia)
RON92	Higher-octane gasoline
SAM	Social accounting matrix
SE	Mexican Secretariat of Economy
SENER	Mexican Secretariat of Energy
SHCP	Mexican Secretariat of Finance
SJSN	National social security system (Indonesia)
SME	Small and medium-sized enterprise
SUSENAS	National Socio-Economic Survey (Indonesia)
UAE	United Arab Emirates
UK	United Kingdom
USA	United States of America
USD	United States dollar
VAT	Value-added tax
VDT	Volume-differentiated tariff
WEO	World Energy Outlook
WVS	World Values Survey

Units of measure

GWh	Gigawatt hour
kg	Kilogram
kWh	Kilowatt hour
MWh	Megawatt hour

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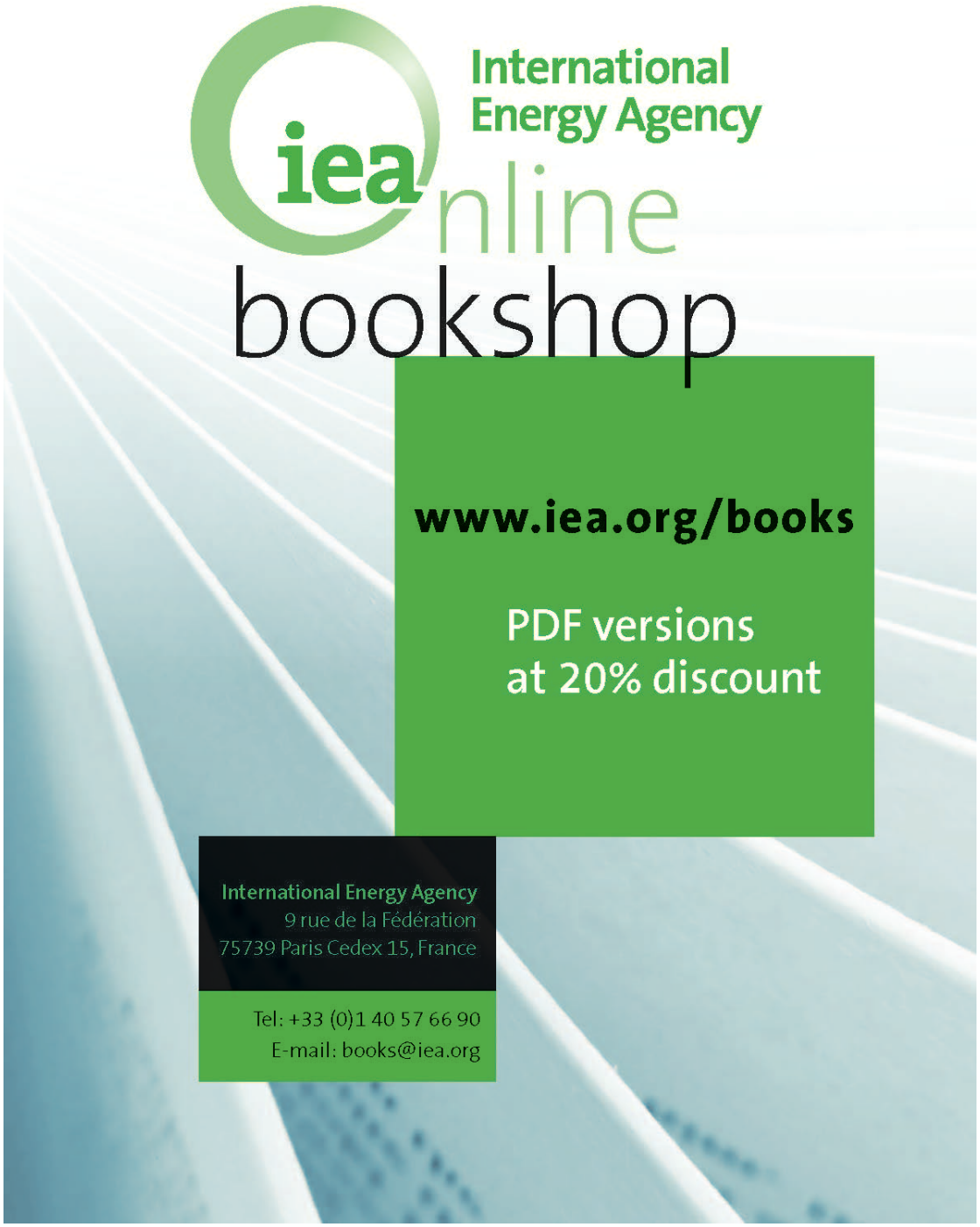

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