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Energy Subsidies in Latin America and the Caribbean: Stocktaking and Policy Challenges

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Western Hemisphere Department

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Abstract

The oil price decline creates an opportunity to dismantle energy subsidies, which escalated with high oil prices. This paper assesses energy subsidies in Latin America and the Caribbean—about 1.8 percent of GDP in 2011–13 (approximately evenly split between fuel and electricity), and about 3.8 percent of GDP including negative externalities. Countries with poorer institutions subsidize more. Energy-rich countries subsidize fuel more, but low-income countries are more likely to subsidize electricity, as are Central America and the Caribbean. Energy subsidies impose fiscal costs, hurting SOEs, competitiveness, and distribution. The paper overviews country experience with subsidy reform, drawing lessons.

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EXECUTIVE SUMMARY

High oil prices since the second half of the 2000s have increased pressures on countries to provide energy subsidies—despite their fiscal costs and non-transparent effects on efficiency and distribution. Their negative implications for macroeconomic management, fiscal sustainability, and the environment have heightened policymakers’ interest in this issue.

A new dataset compiled for this paper suggests that energy subsidies in Latin America and the Caribbean (LAC) amounted to about 1.8 percent of GDP, on average, in 2011–13, with fuel subsidies representing about 1 percent of GDP, and those for electricity about 0.8 percent of GDP.¹ This level of subsidies is somewhat larger than that reported for the region in IMF (2013a), a difference mainly explained by increased coverage, in particular of electricity subsidies. This measure of subsidies constitutes a lower bound, as it does not include forgone tax revenues or the cost of negative externalities. Inclusion of (broad brush) estimates of these costs would bring the LAC energy subsidy bill to about 3.8 percent of GDP.²

There is considerable variation in the size and types of energy subsidies across the LAC region. Subsidies are larger in energy rich countries and in those that rank lower on measures of institutional and policy quality, such as budget transparency, rule of law, competitiveness, or the ease of doing business. In some cases energy

subsidies are permanent rules-based policy choices (e.g., to provide below-cost energy to targeted users), but in many others they arise as a discretionary response to events.

	Permanent	Temporary
Rules	Access to energy at below cost for targeted users (low income households, promoted industries, strategic regions)	Price stabilization funds Automatic price formulas with built-in buffers
Discretion	Pump prices below cost as a form of blanket wealth transfer Transfers resulting from weak enforcement/capacity (e.g. electricity theft)	Price freezes (after shocks, devaluations, or other reasons) Ad-hoc suspension of market pricing or other rules-based mechanism

- **Fuel subsidies** tend to be larger and more entrenched in oil-rich countries, where they are seen as a way of sharing resource wealth with the public, despite their benefits accruing mostly to richer households. In these countries, fuel subsidies originate from administered pump prices that do not cover opportunity costs. In other countries (particularly those that rank higher in measures of institutional quality), they result from price stabilization mechanisms that may impose fiscal costs at times of price volatility.
- In contrast to fuel subsidies, **electricity subsidies** are more common in low-income countries and particularly in Central America and in the Caribbean. These subsidies

¹ The regional average decreases to 1 percent of GDP when excluding oil producer countries that ranked lower than the regional median in measures of institutional quality.

² Data compiled for this paper focus largely on consumers, although data for some countries include subsidies provided to energy producers.

originate from unbalanced cross tariff subsidization (i.e., whenever average tariffs are lower than generation and distribution costs), but are often exacerbated by fraud and non-payment, where enforcement is weak due to capacity and political constraints. In particular, capacity constraints and weak enforcement constitute important factors behind relatively large electricity subsidies in many low-income countries.

Energy subsidies were an important driver of fiscal deficits in many LAC countries in 2011–13. In oil-producer countries that rank lower on measures of institutional quality, energy subsidies contributed to larger-than-average fiscal deficits, represented a high share of fiscal revenues, and their cost was comparable to that of education and health combined. In these countries, energy subsidies significantly constrained fiscal space and were generally not targeted to the poorest and most vulnerable. Energy subsidies were at times financed off-budget via losses at state-owned enterprises (SOEs), hampering transparency, increasing uncertainty, constraining energy sector investment, and reducing economic efficiency.

Energy subsidies are a drag on countries' long-term growth and competitiveness, both by diverting resources away from other spending priorities and by discouraging efficiency-enhancing investment in the energy sector. In a number of LAC countries (particularly in Central America and the Caribbean) higher electricity costs can be traced back to the negative impact of high subsidies on investment in the sector. Subsidies distort market signals, are regressive, contribute to income inequality and, by encouraging energy overconsumption, deteriorate the trade balance. Overconsumption also results in negative externalities, including for the environment. A recent study concluded that fuel taxes in the region were below levels that would correct for negative externalities (IMF, 2014a).

The context for reform in LAC has been broadly favorable in recent years, as the region has seen generally solid growth and progress in poverty reduction. Moreover, episodes such as the 2008 energy price shock have highlighted how unsustainable energy subsidy policies are in several countries. This has prompted some authorities to develop strategies to reduce subsidies and to target them to the most vulnerable. However, energy subsidy reform is often difficult as it can be associated with adverse near-term economic and social consequences. Vested interests that capture most benefits from subsidies further complicate reform. Reform is most difficult when subsidies have existed so long as to be perceived as a *de facto* entitlement. As a result, most countries that have embarked on reform recently have not yet finished their efforts. Electricity subsidy reform has proved particularly challenging; in part because its cost is often less evident.

Experience in reforming energy subsidies in the LAC region suggests that efforts are more likely to be successful if they take country circumstances into account, including the business and oil price cycles and the political calendar. Reform should aim to depoliticize price setting, though this objective can be difficult to achieve. Against this backdrop, the adoption of automatic price formulas, including with built-in buffer mechanisms, is better than pure discretion. Successful reform of subsidy policy is easier in periods of falling international oil prices. Reforms should be implemented gradually and in tandem with mitigating measures. Strengthening SOE governance must often be a major focus of reforms. The formulation of a communication strategy (emphasizing the costs of subsidies and the benefits of reform) can boost support for reform and help reduce resistance from some stakeholders.

I. INTRODUCTION³

Like the rest of the world, Latin America and the Caribbean (LAC) countries have seen pressures to subsidize energy since oil prices began to rise in the second half of the 2000s. This paper takes stock of current energy subsidies in the region, examines their economic impact, reviews energy subsidy policy in a number of LAC countries (including efforts to contain them), and suggests lessons from these experiences.

Energy subsidies, if large and persistent, can have serious economic costs. They can exacerbate budget deficits, add to public debt, give rise to payment arrears, and compromise fiscal and external sustainability. When used to smooth volatile energy prices, subsidies can drive large swings in the fiscal balance, complicating efforts to meet fiscal targets. Subsidies may take the form of outright fiscal transfers, but also of forgone fiscal revenues or weaker balance sheets of companies in the energy value chain, including state-owned enterprises. They are often non-transparently financed, and in practice are usually regressive. The price distortions they create lead to inefficiencies and negative environmental effects and may negatively impact growth.⁴

A recent study (*Energy Subsidy Reform: Lessons and Implications*; IMF, 2013a) found that energy subsidies cost the world around 0.7 percent to 2.5 percent of global GDP in 2011, with oil exporters accounting for two-thirds of pre-tax subsidies.⁵ In particular, IMF (2013a) found that, depending on how they are measured, fuel and electricity subsidies amounted to between 0.7 and 2.2 percent of GDP in the average LAC country during 2011. This is similar to what was observed in the Asia-Pacific and sub-Saharan Africa regions, and somewhat higher than in Europe. These figures, however, masked much variety in the size of subsidies across countries. International Energy Agency (IEA) data for 2012 suggests that in LAC as elsewhere, energy subsidies tend to be highest in energy-rich countries (Figure 1).

³ We are grateful to Adrienne Cheasty, David Coady, Przemek Gajdeczka, Luca Ricci, Baoping Shang, Alejandro Werner and participants at an internal IMF seminar in which a draft of the paper was presented, for useful comments and suggestions. We would also like to thank Daniela Cortez for outstanding research assistance and data management, and Danica Owczar and Alexandra Martinez for helping formatting a number of versions of the paper. The usual disclaimer applies.

⁴ The literature on energy subsidies is extensive and includes analyses on their economic impact (IMF, 2013a; Plante, 2013; Global Subsidies Initiative, 2009, 2010), their prevalence in a specific country or region (IMF, 2013b; IMF, 2014b), or their implementation following specific events (e.g., large oil price increases or strong price fluctuations; ECLAC, 2009). A number of studies analyze specific types of subsidies (e.g. for fuel or electricity), while others offer recommendations on subsidy reform, including appropriate pricing policies (Anand et al, 2013; World Bank, 2006, 2010; Morgan, 2007; IMF, 2013a, 2014a).

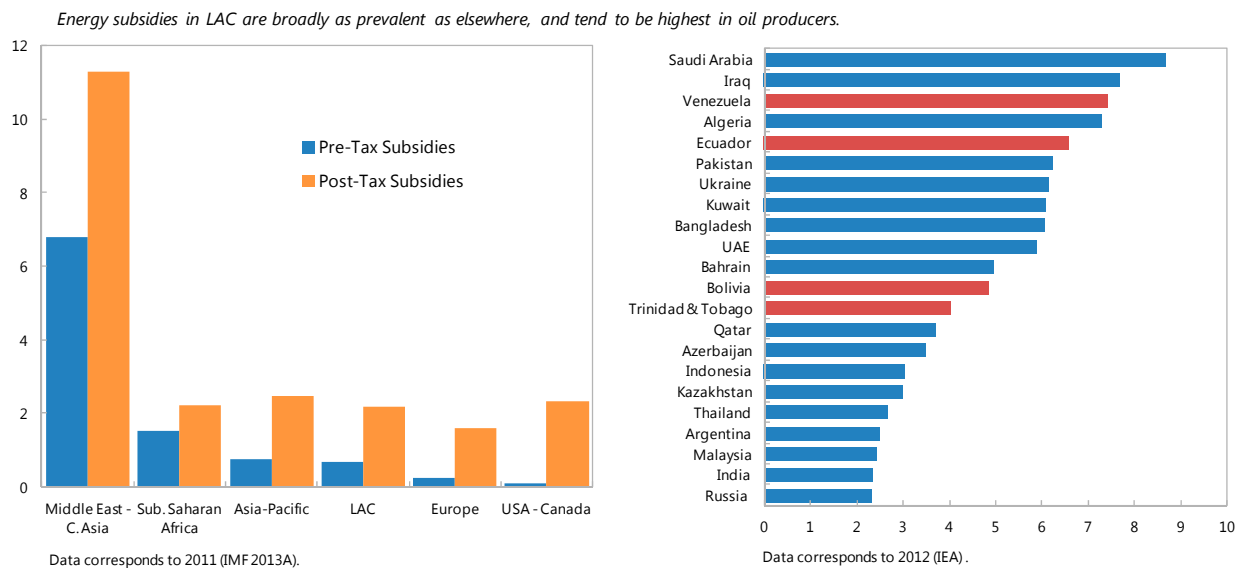
⁵ The lower number refers to “pre-tax” subsidies (that is, transfers to bridge the gap between domestic and international prices); the higher number also includes an estimate of forgone revenues and negative externalities (or “post-tax” subsidies). Measuring electricity subsidies also requires an evaluation of whether all costs and losses (including theft) are reflected in the tariffs set for the public. See Boxes 1 and 2.

While, in general, subsidy reform prescriptions are comparable across regions, it is useful to examine more closely the size and characteristics of subsidies at the regional level. This makes it possible to identify why certain types of subsidies are more common in a specific region, and analyze within-region sources of variation across different country groupings. Most importantly, within-region reform efforts are likely to provide the most applicable lessons to neighboring countries.

Building on IMF (2013a), and following on the example of studies focused at the regional level (IMF 2013b, 2014b), this paper takes stock of energy subsidies in the LAC region. By making use of a number of alternative data sources and methods, it offers a more comprehensive picture of energy subsidies in LAC, in particular for electricity subsidies (which pose significant challenges for many countries).

The paper is organized as follows. Section II gives an overview of energy subsidies in LAC in recent years (2011–13), including by exploring their association with specific country characteristics (such as institutional quality, energy richness, or income per capita), and in the case of electricity subsidies, with measures of electricity costs and performance. Section III discusses the main policy challenges posed by energy subsidies in LAC, while Section IV presents some strategies for reforming subsidy policy based on the experience with energy subsidies in a number of LAC countries, and supported by existing literature on best practices.⁶

Figure 1. Energy Subsidies: A Global Perspective (Percent of GDP)



Source: IMF (2013), International Energy Agency (IEA); and Fund staff estimates.

⁶ Annexes define country groupings, provide data sources, and give country descriptions of fuel and electricity pricing policies and subsidies.

II. TAKING STOCK OF ENERGY SUBSIDIES IN LAC COUNTRIES

Energy subsidies for the average LAC country cost about 1.8 percent of GDP annually in 2011–13, about 1 percent of GDP for fuel and 0.8 percent of GDP for electricity (Tables 1 and 2).⁷ Subsidies, as estimated here, are higher than reported in IMF (2013a), mainly because of a fuller accounting of electricity subsidies. This finding should not materially change LAC’s ranking among global subsidy providers. However it makes it more likely that the region could improve its public finances, efficiency, and potential growth if subsidies were reformed to be targeted at the most vulnerable.

Though there are wide variations across countries, patterns can be identified for different country groupings. In particular, energy subsidies appear correlated to a country’s degree of institutional quality and oil-richness. These characteristics can be used to assign LAC countries in four groups, depending on whether they were oil producers (or importers), and on whether they ranked above (or below) the regional median in measures of institutional quality. In addition to these categories, the analysis will focus on specific groups based on income per capita (low-income countries, LICs), and geography (Central America and the Caribbean).⁸

- Energy subsidies (as a percent of GDP) were largest in oil producer countries that ranked lower in measures of institutional quality, and were lowest in oil importing countries than ranked higher in measures of institutional quality. Among the former, energy subsidies were large for Argentina, Bolivia, Ecuador and Venezuela. Among the latter, they were very low in Chile, Costa Rica, and Uruguay.⁹

⁷ Data in this paper were compiled through surveys and from other sources including country authorities, international financial institutions, and national and international energy agencies (See Appendix II). To provide as comprehensive a picture as possible, estimates based on the price gap approach (as in IMF, 2013a; see Boxes 1 and 2) were complemented with information from national budgets and financial statements of energy sector companies. Estimates, however, are not available for all countries, years, and energy products, and may not be comparable across years and countries. Price-gap approach estimates are on a pre-tax basis, unless otherwise noted. Whenever price gap estimates were not available, the highest of available alternative estimates was used.

⁸ These groupings reflect economic size, measures of institutional quality, energy wealth and income per capita, among other (see Box 3 and Appendix I).

⁹ The size of energy subsidies in Venezuela is related to the exchange rate used, so figures reported in this paper need to be taken as approximations. Moreover, energy subsidies for Venezuela do not include concessional loans linked to oil exports in the context of the Petrocaribe initiative. In this regard, see Box 4.

Table 1. Pre-tax Energy Subsidies */
(Percent of GDP, average 2011-13)

	Total	Of which:	
		Fuel	Electricity
<i>Low-ranked & Producers (LR-OIL):</i>			
Venezuela	8.9	7.1	1.8
Ecuador	7.5	7.0	0.4
Bolivia ^{1/}	6.2	6.1	0.0
Argentina	3.9	2.1	1.8
Belize ^{3/}	2.7	0.0	2.7
Suriname ^{3/}	1.7	0.0	1.7
<i>Low-ranked & Importers (LR-NOIL):</i>			
Guyana ^{1/ 3/}	3.0	1.7	1.3
Haiti ^{1/ 3/}	2.9	0.2	2.7
El Salvador ^{2/}	2.2	0.7	1.5
Nicaragua ^{1/ 2/}	2.1	0.0	2.1
Dominican Republic ^{2/}	2.0	0.1	1.9
Honduras ^{1/ 2/}	0.9	0.0	0.9
Grenada ^{3/}	0.9	0.4	0.5
Guatemala ^{2/}	0.4	0.0	0.4
Jamaica ^{3/}	0.1	0.0	0.1
Paraguay	0.1	0.0	0.1
<i>High-ranked & Producers (HR-OIL):</i>			
Trinidad and Tobago ^{3/}	2.7	2.0	0.6
Mexico	1.8	1.1	0.7
Brazil	1.2	1.2	0.1
Colombia	0.4	0.2	0.2
Peru	0.2	0.2	0.0
<i>High-ranked & Importers (HR-NOIL):</i>			
Antigua and Barbuda ^{3/}	1.2	0.5	0.8
Bahamas ^{3/}	1.0	0.4	0.5
Panama ^{2/}	0.8	0.3	0.5
Barbados ^{3/}	0.8	0.6	0.2
St. Kitts and Nevis ^{3/}	0.6	0.1	0.5
St. Lucia ^{3/}	0.3	0.3	0.0
Dominica ^{3/}	0.1	0.0	0.1
Uruguay	0.0	0.0	0.0
Chile	0.0	0.0	0.0
Costa Rica ^{2/}	0.0	0.0	0.0
St. Vincent and the Grenadines ^{3/}	0.0	0.0	0.0
Total Latin America and the Caribbean (LAC)	1.8	1.0	0.8
Excluding Low-ranked & Producers (LR-OIL)	1.0	0.4	0.6

Source: National authorities; International Energy Agency; and Fund staff estimates.

*/ Countries are classified according to whether they are oil producer (or importers), and whether they ranked above (or below) the LAC median in measures of institutional quality. The analysis also focuses on certain country groupings. Countries identified with 1/ refer to low income countries, 2/ refer to countries in DR-CAFTA; and 3/ refer to countries in the Caribbean.

Table 2. Pre-tax Energy Subsidies
(Percent of GDP, average 2011-13)

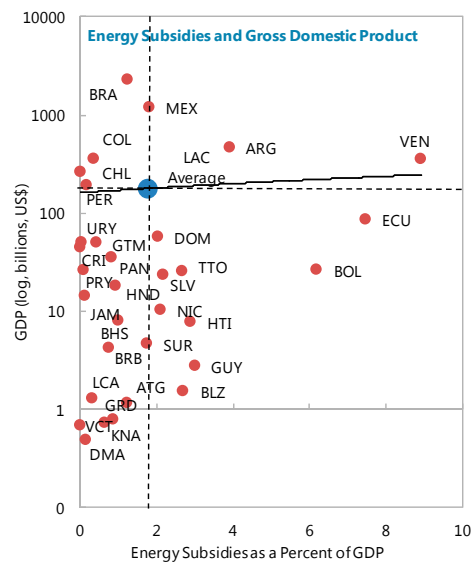
	Total	Of which:	
		Fuel	Electricity
<i>Institutions and Oil-richness:</i>			
Low-ranked & Producers (LR-OIL)	5.1	3.7	1.4
Low-ranked & Importers (LR-NOIL)	1.5	0.3	1.1
High-ranked & Producers (HR-OIL)	1.2	0.9	0.3
High-ranked & Importers (HR-NOIL)	0.4	0.2	0.2
<i>Geography:</i>			
Caribbean Countries (CAR)	1.3	0.4	0.8
Central American Countries (CADR)	1.2	0.2	1.1
<i>Income:</i>			
Low-income Countries (LICs)	2.2	0.5	1.7
Total Latin America and the Caribbean (LAC)	1.8	1.0	0.8
Excluding Low-ranked & Producers (LR-OIL)	1.0	0.4	0.6

Source: National authorities; International Energy Agency; and Fund staff estimates.

- Institutional quality appears to be a more important determinant than oil richness in determining the size of subsidies. Indeed, oil-importer countries than ranked lower in measures of institutional quality subsidized more, on average, than oil-producer countries that ranked higher in institutional quality. Among the latter, energy subsidies in Mexico were in line with the regional average, while in Brazil and especially Colombia, energy subsidies were positive, but lower than average.
- Low-income countries (which constitute a subset of countries that ranked lower in measures of institutional quality), provided relatively high subsidies as a share of GDP. In particular, capacity constraints and weak enforcement constituted important factors behind relatively large electricity subsidies for this group of countries (as in Haiti, Honduras, and Nicaragua.)

Figure 2. Energy Subsidies and Economic Size (Average 2011-13)

Energy subsidies are found in large and small economies alike, as a number of larger economies subsidize fuel and some smaller economies subsidize electricity.



Source: Country Authorities; World Bank World Development Indicators (WDI); UN Economic Commission for Latin American and the Caribbean (ECLAC); UN Comtrade; US Energy Information Administration.

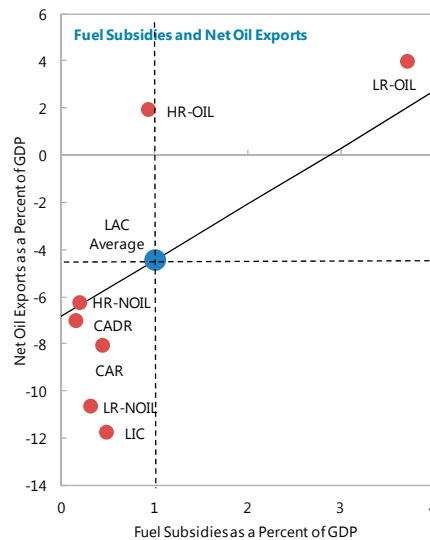
- Energy subsidies in both the Central America and the Caribbean were predominantly provided for electricity.
- Energy subsidies in LAC were not related to economic size. This result is explained by a split between fuel subsidies—found in a number of larger economies—and electricity subsidies, which were provided by many smaller economies (Figure 2).

A. Fuel Subsidies in LAC

Fuel subsidies in LAC cost, on average, around 1 percent of GDP annually in 2011–13 (Tables 1 and 2). These subsidies were very concentrated: a handful of countries provided relatively large fuel subsidies, but most countries provided little or no fuel subsidies at all. In particular, oil-producer countries that ranked lower in measures of institutional quality had the largest subsidies (Figure 3). In contrast, oil-importer countries that ranked higher in institutional quality subsidized relatively little. Most countries in Central America and the Caribbean (where oil bills have significantly increased since the second half of the 2000s) also subsidized little. Low income countries (with the exception of Bolivia) provided fuel subsidies that were lower than the regional average.¹⁰ The distribution and magnitude of fuel subsidies among different LAC countries can be explained by how and why these subsidies originate (Table 3).

Figure 3. Fuel Subsidies and Energy Richness (Average 2011-13) 1/

Oil producer countries that ranked lower on measures of institutional quality subsidized the most. Oil producers subsidized more than oil importers.



Source: Country Authorities; World Bank World Development Indicators (WDI); ECLAC; UN Comtrade; and US Energy Information Administration.
1/ The regression line was obtained by considering all countries individually in a cross-section analysis.

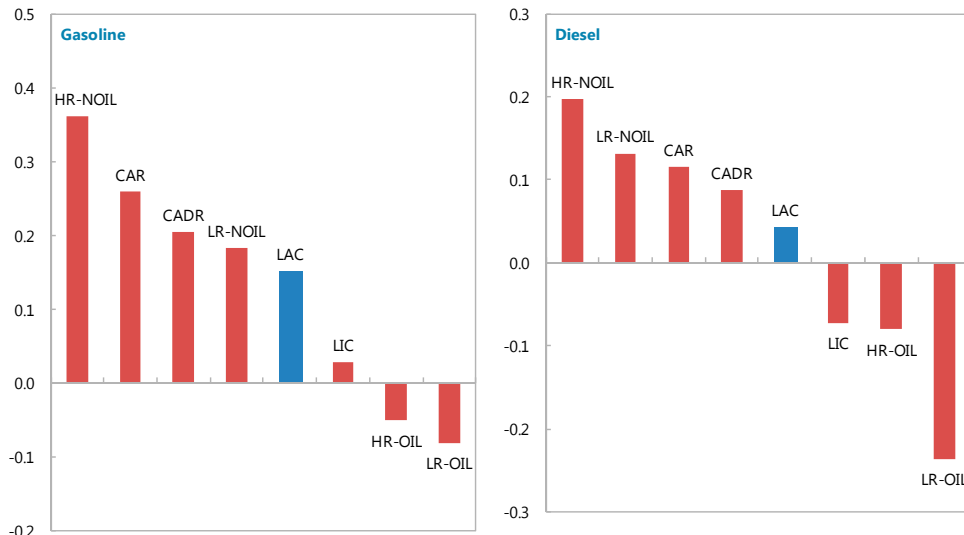
¹⁰ The size of fuel subsidies is influenced by per-capita consumption of fuel products. This ratio is higher in countries with higher energy subsidies, and lower in those with pump prices reflecting opportunity costs. For instance, according to the World Bank's World Development Indicators, per capita consumption of oil equivalents is about 2,500 kg per year in Venezuela versus 1,500 kg in Mexico and Brazil (countries with similar per capita income).

Resource wealth transfer

In energy-rich countries, nominal domestic fuel prices remain unchanged for long periods, at significantly below world prices. This gives rise to large and increasing fuel subsidies which these countries use as a lasting form of social policy to transfer natural resource wealth to the public. To the extent that subsidies reflect production cost below world prices, they do not need financing. The breakdown between current and future costs of subsidies in energy-rich countries is less apparent than in oil importers, where the cost must be borne immediately. The gap between domestic and international prices was particularly large for oil-producer countries that ranked lower in measures of institutional quality (as Bolivia, Ecuador, and Venezuela; Figure 4).

Figure 4. Gasoline and Diesel Prices Including Taxes
(Pump Prices minus US Price, US\$/Liter, Average 2011-13)

Blanket fuel subsidies are largest in oil-rich countries, in particular those that ranked lower on measures of institutional quality.



Source: Country Authorities; World Bank World Development Indicators (WDI); ECLAC; UN Comtrade; and US Energy Information Administration.

Table 3. Selected Fuel Price Practices and Financing Regimes in LAC

	Fuel Price-Setting Mechanism	Financing
<i>High (pre-tax) Subsidy Countries</i>		
<i>Argentina</i>	<i>Ad hoc</i> : government indirectly fixes fuel prices through moral suasion, export taxes, and by selling imported crude to refineries at subsidized prices.	Subsidies of over 2% of GDP are recognized in the budget as well as losses and underinvestment at the national oil company.
<i>Bolivia</i>	<i>Ad hoc</i> : state-fixed fuel prices unchanged since 2000. Attempt to raise prices in December 2010 abandoned in face of popular protests.	Subsidies mostly covered on state budget; some costs also born by state oil company.
<i>Brazil</i>	<i>Ad hoc</i> : Board of the State Oil Company (where the Government holds the majority of votes) sets the price without following a pre-determined formula.	Heavy losses at state company that are partly covered by subsidized state bank loans.
<i>Ecuador</i>	<i>Ad hoc</i> : State-fixed prices essentially unchanged since 2002. Government considering phase-out of blanket subsidy regime with quota-based debit card.	Fuel subsidies are recorded in the state budget, but some are also absorbed by state companies.
<i>Haiti</i>	<i>Ad hoc</i> : fixed domestic pump prices in nominal local currency terms unchanged since 2011. Gradual increase currently being considered.	Uncovered costs financed through reduction in customs duties and elimination of excises, and through direct transfers to oil distributors
<i>Trinidad and Tobago</i>	<i>Ad hoc</i> : State-set retail prices below cost; reduction in subsidies of premium gasoline increased use of other fuels; authorities considering plan to encourage compressed natural gas (CNG) vehicles.	A levy on cruder producers pays for a small part of the subsidy, which is mostly covered on budget and by government arrears to the state oil company.
<i>Venezuela</i>	<i>Ad hoc</i> : The government has fixed domestic pump prices in nominal local currency terms since 1997 (currently about \$0.01/liter for gasoline)	State oil firm sells oil to domestic refineries at steep discounts and is heavily indebted. Some subsidy also recorded in budget.
<i>Low (pre-tax) Subsidy Countries</i>		
<i>Colombia</i>	<i>Formula</i> : Stabilization fund smooths prices each month by financing difference between export parity price and a 60-day moving average; lower prices set in border regions.	Intended to be self-sustaining but imposes fiscal costs at times of price volatility.
<i>Costa Rica</i>	<i>Ad hoc</i> : Government-set prices. A price formula exists based on import prices, distribution costs, and tax but is subject to discretionary implementation.	Discretionary price-setting by government has reduced the tax applied to fuel products, leading to forgone revenue.
<i>Dominican Republic</i>	<i>Ad hoc</i> : Government fixes prices weekly, with a protection system for poor households	Uncovered costs financed by reducing VAT taxes; Cash transfer scheme to poor households financed through the budget
<i>Mexico</i>	<i>Ad hoc</i> : Government adjusts fuel excises to compensate for price volatility.	Negative excises resulted in outright subsidization in the past, financed on budget. More recently the excise rate has been positive but resulted in forgone revenue.
<i>Nicaragua</i>	<i>Market</i> (mostly): The government does not regulate fuel prices except for LPG, but does heavily subsidize fuel purchases for public transport (buses and taxis)	LPG policies compress margins at firms and lead to forgone revenue; transport subsidies are financed through Petrocaribe off-budget.
<i>Panama</i>	<i>Formula</i> : Maximum prices based on import & transport costs, domestic value-added. Public transport subsidy through lower diesel prices via special coupons.	Automatic formula achieves cost recovery, targeted subsidies (to public transport, also to LPG) paid through state budget.
<i>Peru</i>	<i>Formula</i> : Government influences market prices (now only diesel, LPG) through stabilization fund transfers to refineries when reference prices exceed price bands.	Stabilization fund generated significant fiscal costs in past but fewer products now subject to bands, which are also more aligned with market.
<i>Uruguay</i>	<i>Ad hoc</i> : Committee members of regulator vote on fuel price adjustments on the basis of movements in international prices; no limit to number of adjustments	Taxes are a large part of the pump price; state oil firm runs losses that are financed in the budget; the government subsidizes diesel for public buses.

Sources: Fund staff estimates; World Bank; IDB; National Governmental and Regulatory Authorities.

Attempts to cushion price shocks

In some cases, fuel subsidies began as a temporary measure following increases in world energy prices. Subsidies emerge when domestic prices are cushioned from rising with world prices, either by price fixing to prevent pass-through or by cutting tax rates on petroleum products. Price-fixing can apply not only directly to fuel but also to public transportation, which is subsidized in some LAC countries (e.g., Argentina, Nicaragua, and Panama), usually in cities, either by subsidizing companies directly or by giving them access to lower fuel prices.¹¹ The costs of these policies can be very significant, either as outright transfers (if domestic prices are kept below international prices), or forgone tax revenue (if fuel taxes are cut to offset higher import prices, as in El Salvador, Haiti and Mexico).¹²

Other countries have resorted to price-smoothing mechanisms to cushion against external shocks. These are intended to be permanent, self-correcting systems for avoiding sharp changes in domestic pump prices following increases in international prices. Fuel price stabilization mechanisms were implemented, for instance, by Chile, Colombia and Peru, which incurred larger subsidies after the 2008 oil price shock; these countries provided very low fuel subsidies during 2011–13. While a system of this type is attractive, as it conveys a clear message that subsidies are temporary as stabilization funds can be depleted, it does not prevent subsidies from becoming sizable if oil prices consistently rise and pump prices are excessively smoothed out. While subsidies should eventually be reversed (provided price mechanisms are well designed), they may succumb to political pressures to immediately pass through decreases in international prices, resulting in a net cost for the state, as in Peru in 2009. Moreover, to the extent that some of the oil price increase is structural, the replenishment of stabilization funds may require further government transfers. For these reasons, even price-smoothing mechanisms pose significant risks. While depoliticizing price setting (so prices fully reflect market signals) should be the policy benchmark, this is at times difficult to implement. Automatic price formulas, including with built-in buffer mechanisms, can be easier to justify from a social political perspective (see the discussion in Section IV below).

B. Electricity Subsidies in LAC

Electricity subsidies in LAC were almost as large as direct fuel subsidies—on average around 0.8 percent of GDP in 2011–13 (Tables 1 and 2). While being lower on average than

¹¹ Price shocks can occur not only from oil market developments, but also, for instance, from exchange rate depreciations, as was the case in Argentina which began to provide subsidies in 2002. Subsidies for public transportation are included in the database when possible. Fuel at below cost for electricity generation (as in Argentina) is included within electricity subsidies.

¹² The cost of forgone tax revenues is in addition to that reported in Tables 1 and 2 and can be estimated by applying uniform tax rates to reference prices (as explained in Box 1). Calculations using uniform tax rates (equivalent to the LAC average of 9.5 percent for gasoline, 9.3 percent for diesel and 7.9 percent for kerosene), result in estimated forgone tax revenues of about 0.7 percent of GDP for the average LAC country in 2011-13.

fuel subsidies, electricity subsidies were also far less concentrated. Unlike the relatively rich countries that subsidized fuel, countries that subsidized electricity the most were generally low-income (LICs) (as Haiti, Nicaragua, and to a lesser extent, Honduras). Oil-importing countries that were ranked lower on measures of institutional quality subsidized more than the regional average, and conversely, those better ranked subsidized the least. Central American and Caribbean countries subsidized more than the regional average. Among oil-producing countries, those that ranked better in measures of institutional quality subsidized less.

Electricity subsidies can materialize as direct budgetary costs, losses at electricity companies, or as off-budget costs, including as arrears. “Gross” electricity subsidies may be greater than those reported in Tables 1 and 2 (which are presented in net terms and do not reflect cross subsidies) as tariff policies usually result in the provision of below-cost electricity to poor households or small firms, at the expense of large consumers, or wealthier households. A net subsidy only arises when average tariffs are not sufficient to compensate costs.

As with fuel subsidies, the cross-country variation in LAC can be explained by how and why these subsidies originate (Table 4).

Social or industrial policy

Some electricity subsidies arise as part of social or industrial policy. They usually reflect the objective of giving specific groups (low income consumers or disadvantaged or ‘strategic’ producers) cheaper access to energy. Such subsidization of segments of energy users usually, but not necessarily, leads to net energy sector subsidization. For instance in Mexico, household and small agricultural tariffs are set at below-market rates that are not fully offset by cross-subsidization, with the state ultimately filling the gap. In Nicaragua, the subsidized tariff for low-income consumers (below 150 kWh/month) and pensioners is financed through a direct budgetary transfer. Ecuador and Honduras also provide social tariffs as net subsidies. In particular, Honduras significantly subsidized household electricity use, particularly small users, but commercial and industrial users pay higher prices than average. In contrast, Peru has a cross-subsidy scheme to extend low-cost power to small users to promote rural electrification that is fully financed, and thus does not result in a net fiscal cost. Under the *Fondo de Compensacion Social Electrica* (FOSE), small users consuming less than 100 kWh/month as well as all users of off-grid rural power systems under 20MW pay subsidized tariffs that are compensated by a surcharge on large consumers (Vagliasindi, 2013). The fund serves the goal of social protection but is also intended to foster private investment in rural energy. Colombia has a similar scheme of targeting subsidies to defined socioeconomic groups and imposing surcharges on the better off, with almost no net cost for the state.¹³

¹³ The percentage of households that are reached by electricity subsidies varies; for instance, in Colombia, almost 90 percent of households benefit from cross-subsidization, versus 60 percent in Peru (Vagliasindi 2013).

Table 4: Selected Electricity Price Practices and Financing Regimes in LAC

	Electricity Price-Setting Mechanism	Financing
<i>High (pre-tax) Subsidy Countries</i>		
<i>Argentina</i>	<i>Ad hoc</i> : formula based on generation and transmission costs and distribution values not applied in Greater Buenos Aires, where tariffs remain subject to political discretion.	Government transfers to generators (on-budget, 2% of GDP in recent years), rationing, and underinvestment in electricity sector.
<i>Belize</i>	<i>Formula</i> : Annual tariffs set by regulator on on estimated fixed & variable costs and a surcharge/ rebate to cover gap with actual costs. A rebate was set in 2012 as costs surged, leading to large losses.	Losses in 2012 were absorbed by "Cost of Power Rate Stabilization Account," which had generated surpluses in prior years. No subsidies on budget.
<i>Dominican Republic</i>	<i>Ad hoc</i> : Monthly tariff-setting by regulator subject to political involvement. There are both cross- and targeted subsidies; global tariffs do not cover costs due to expensive imported fuel and theft.	Targeted subsidies accounted for in the budget; off-budget financing (using Petrocaribe resources); arrears to generators accumulated by state distribution companies.
<i>El Salvador</i>	<i>Ad hoc</i> : Headline tariffs would achieve cost recovery, but up to 80% of households (in a 2012 expansion that was intended to be temporary) are eligible for subsidized prices.	Subsidies are absorbed by the state-owned hydro generator, which is included in the non-financial public sector budget.
<i>Haiti</i>	<i>Ad hoc</i> : Unchanged prices since 2008; No outside regulator. Low billing and collection rates, widespread theft, poor infrastructure; technical and non-technical losses near 70%.	On-budget and off-budget (using Petrocaribe resources) transfers to electricity utility, arrears to power generators by electricity utility.
<i>Honduras</i>	<i>Ad hoc</i> : State-fixed prices involve some cross-subsidization of consumers by industry and commercial, but high production costs and theft generate large losses.	Losses are absorbed by state electricity utility, whose debts are state-guaranteed. Government considering break-up of utility in 2015.
<i>Nicaragua</i>	<i>Ad hoc</i> : Formula not applied, creating subsidy based on difference between "notional" and "effective" tariff rates; also targeted subsidies to small consumers and pensioners.	Subsidies financed on-budget, off-budget via Petrocaribe, through losses at state electricity company, and via arrears from public institutions.
<i>Suriname</i>	<i>Ad hoc</i> : Government-set tariffs do not achieve cost recovery, resulting in blanket subsidies and losses at the state utility (which has a monopoly in transmission and distribution).	Subsidies are not recorded in the fiscal accounts; but are financed via arrears and transfers between the electricity utility, government, and the state oil firm.
<i>Low (pre-tax) Subsidy Countries</i>		
<i>Brazil</i>	<i>Market</i> : Long-term supply contracts set by competitive auctions by market participants. Government reduced taxes to contain costs, and state hydro facility operates at a loss.	Small transfers to state utility recorded in budget; some forgone revenue.
<i>Colombia</i>	<i>Formula</i> : Liberalized wholesale market; regulated retail market with tariffs set according to global cost recovery but with cross-subsidization between socioeconomic strata.	Solidarity fund largely self-financed by 20% surcharge on upper strata and commercial users, fund runs small deficit financed on-budget.
<i>Ecuador</i>	<i>Ad hoc</i> : Tariffs are low but near cost-recovery given low costs. Progressive tariff structure, with smaller users paying a "dignity tariff" compensated by high charges on large users.	Systemwide losses of 0.4% of GDP were paid on the budget in 2013, and to reduce losses the authorities raised overall rates while maintaining the dignity tariff.
<i>Panama</i>	<i>Ad hoc</i> : application of pricing formula subject to political discretion, but fiscal costs have been small. Social tariffs to small users and to pensioners.	Tariff stabilization fund used to smooth tariffs and compensation fund to effect transfers to distributors, both entail budget costs along with social tariffs.
<i>Peru</i>	<i>Market</i> : Regulated tariffs set after auction and bidding process among market participants. Tariffs achieve cost recovery but involve cross-subsidization.	There are no fiscal costs as a surcharge on large users pays for social tariffs for small electricity users as well as for promoting rural electrification.

Sources: Fund staff estimates; World Bank; IDB; National Governmental and Regulatory Authorities.

Cushioning price shocks

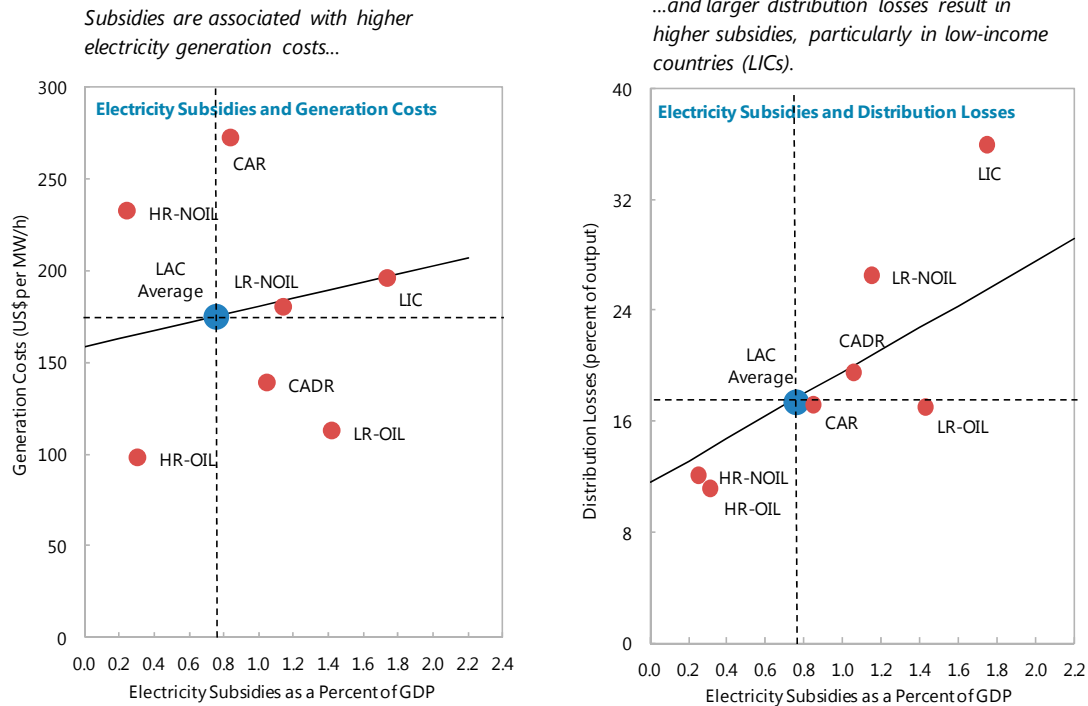
As with fuel subsidies, electricity subsidies can arise as a temporary policy response to shocks to cushion the public from tariff increases following exchange rate devaluations, bad weather, or increases in world energy prices. In Brazil, below-average rainfall since 2013 prompted the government to bear part of the cost of substituting more expensive thermal energy for hydroelectricity. Where there is no expectation of a reversal of the adverse shock, it can be difficult to avoid these subsidies becoming entrenched. For instance, electricity tariffs still lag generation costs in some cities of Argentina more than a decade after the exchange rate devaluation of 2002.

Performance-related losses

In a number of LAC countries (in particular LICs, but also in the Dominican Republic) electricity subsidies arise not out of a policy decisions to cushion prices, but because governments cannot raise tariffs sufficiently to cover losses—especially when these arise because of capacity constraints. In other words, while electricity subsidies arise at times due to tariffs below cost-recovery (including generation and distribution costs), they often also result, *de facto*, from network inefficiency or low billing and collection rates. The latter, in particular, could reflect weak or politically influenced law enforcement. Performance in the sector and subsidies are then closely related.

- Countries with higher losses (due to an inefficient network or electricity theft) subsidize more, as governments must transfer resources to fill the gap caused by those who do not pay their bill. Electricity losses are generally largest in countries that ranked lower on measures of institutional quality (Figure 5). In this regard, losses were highest in LICs, partly due to the very large electricity theft rates in Haiti, and to a lower extent, in Nicaragua, but are also high in some middle-income countries (as in the Dominican Republic). Although generation costs are in part related to resource availability (countries with abundant, e.g., hydro or natural gas resources, among other, are in a position to generate electricity at a lower cost), high generation costs can also be a consequence of cash recovery uncertainty, with negative spillovers for investment (World Bank, 2009b).
- Countries with higher generation costs tend to provide larger electricity subsidies. High generation costs make subsidizing more expensive per unit of consumption. Also, they make setting tariffs high enough to achieve cost recovery more difficult from a social perspective (including due to their possible impact on competitiveness). Several countries in the region, particularly in Central America and the Caribbean, had both relatively higher generation costs and levels of subsidization. Countries fitting this description include Belize, Guyana, Haiti, and Nicaragua. In turn, electricity generation costs and subsidies were lower than the regional average in oil exporters.

Figure 5. Electricity Subsidies and Measures of Electricity Performance (Average 2011-13) 1/2/



Source: Country Authorities; World Bank World Development Indicators (WDI); ECLAC; UN Comtrade; and US Energy Information Administration.

1/ LIC excludes Bolivia.

2/ The regression line was obtained by considering all countries individually in a cross-section analysis.

III. POLICY CHALLENGES FOR LAC ARISING FROM ENERGY SUBSIDIES

Energy subsidies pose challenges for economic policy both at the aggregate level (through their effects on fiscal and external stability, fiscal transparency, and competitiveness) and at the microeconomic level, both for firms and households.

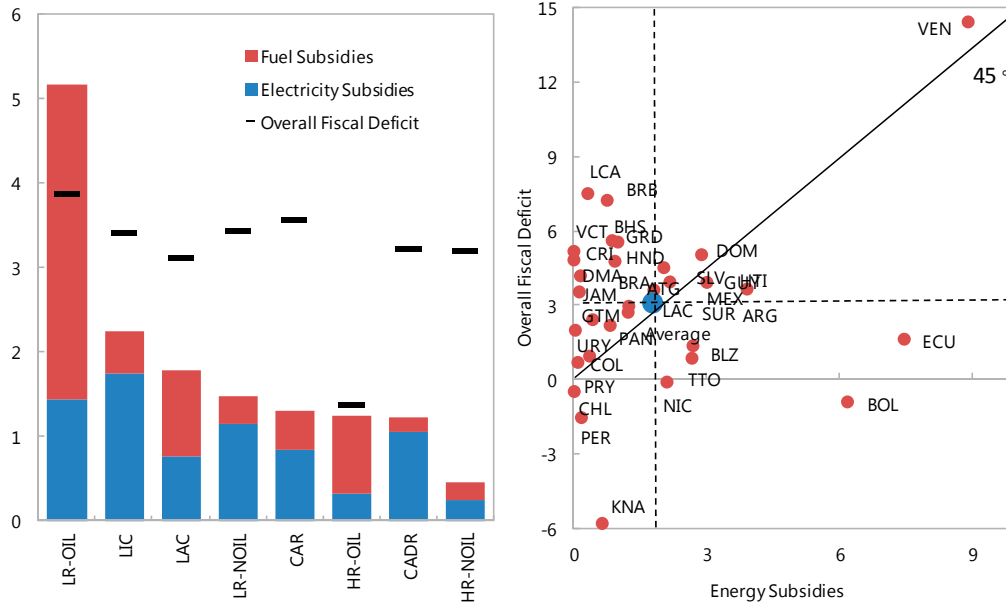
A. Fiscal Costs

Energy subsidies can impose significant fiscal costs, either through outright transfers or forgone fiscal revenues. They complicate fiscal management as they increase budget deficits, and can result in large swings in the fiscal balance, complicating efforts to meet fiscal targets. In cases where they are the main reason behind deficits, they drive debt accumulation, may give rise to payment arrears and contingent liabilities, compromising fiscal sustainability. Energy subsidies limit fiscal space and increase vulnerabilities, particularly in countries with a lower revenue base. These considerations clearly apply to a number of countries in the LAC region, as energy subsidies weakened their fiscal positions and posed more general fiscal challenges (Figure 6).

Figure 6. Energy Subsidies and Fiscal Deficits (Percent of GDP, Average 2011-13) 1/

Subsidies drove fiscal deficits in oil producer countries that ranked lower in measures of institutional quality.

In particular, a number of countries had both higher subsidies and a worse fiscal position than the LAC average.



Source: Country Authorities; World Bank World Development Indicators (WDI); ECLAC; UN Comtrade; and US Energy Information Administration.
1/ LIC excludes Bolivia.

Impact on the deficit

- The size of energy subsidies during 2011–13 exceeded that of overall fiscal deficits for oil-producer countries that ranked lower in measures of institutional quality. For other oil producers, they also contributed to fiscal deficits, but at significantly lower magnitudes. Subsidies also added to overall fiscal deficits in LICs. For these country groupings, energy subsidies contributed to a larger portion of fiscal imbalances than for the regional average.
- For oil importer countries and those in Central America and the Caribbean, the size of energy subsidies were lower than fiscal deficits and represented a lower share of deficits than the LAC average.
- In particular, fuel subsidies contributed more to overall fiscal deficits in oil-producer countries that ranked lower in measures of institutional quality. In turn, electricity subsidies contributed more to deficits in LICs, and in Central American and Caribbean countries and in oil importers.
- A number of countries had both weaker-than-average fiscal positions and larger-than average energy subsidies (as Argentina, Dominican Republic, Grenada, Guyana, Haiti, and Venezuela). But energy subsidies imposed serious fiscal costs even in countries with

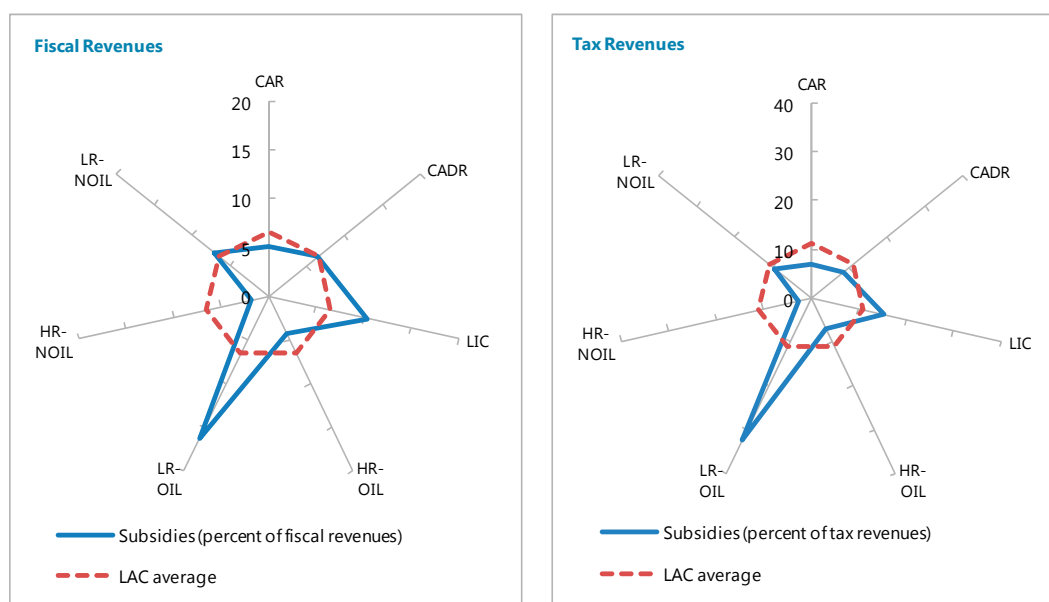
stronger fiscal positions than the LAC average—as in Bolivia, Ecuador, Nicaragua, and Trinidad and Tobago.

Impact on revenues

Energy subsidies constrain fiscal policy and weaken sustainability when they become large *vis-à-vis* government revenues, in particular tax receipts. In this regard, while energy subsidies represented about 7 percent of government revenues (on average) for the region, they were twice as high in oil-producer countries that ranked lower in measures of institutional quality and over 10 percent in LICs. This situation becomes more conspicuous when considering tax revenues. While energy subsidies represented about 11 percent of tax revenues (on average) for the region during 2011–13, they were equivalent to about 32 percent of tax revenues for countries that ranked lower on measures of institutional quality, and just over 15 percent for LICs (Figure 7). Looking at specific country examples, energy subsidies in 2011–13 represented a large share of tax revenues in Argentina (14 percent), Bolivia (20 percent), Haiti (23 percent), Ecuador (55 percent), and Venezuela (85 percent).

Figure 7. Energy Subsidies and Fiscal Revenues (Average 2011-13)

Energy subsidies represented a large share of fiscal and tax revenues in oil producer countries that ranked lower on measures of institutional quality, and in low-income countries.



Source: Country Authorities; World Bank World Development Indicators (WDI); ECLAC; UN Comtrade; and US Energy Information Administration.

B. Fiscal Transparency

Energy subsidies are often not transparently accounted for. When subsidies are not fully recorded in government accounts, public resources are allocated without a full discussion of

spending priorities. This raises the question of whether society would have chosen such a level of subsidies when faced with limited revenue, social spending, and other tradeoffs.

Foregone revenue

When countries undercharge for fuel, they sometimes transfer the subsidy directly to consumers without recording the expenditure (or associated forgone revenue) in the budget, or they present them in the budget but on a netted basis. For instance in Haiti, a fuel price freeze in early 2011 reduced tax revenues, as excise taxes and custom duties on fuel products were compressed to accommodate oil price increases and exchange rate depreciation. The resulting foregone revenues were not transparently disclosed in the budget. In Nicaragua, social electricity tariffs are financed, since 2005, from gross VAT receipts which are then presented in net terms for budget purposes. In Mexico, state-set retail prices that did not keep up with rising oil prices resulted in subsidies starting in 2006 that are expected to be fully unwound only in 2015; although the cost of foregone revenues was disclosed in the budget, it did not describe how subsidies were distributed across the population.

The cost of energy subsidies is more apparent when they are managed through stabilization funds. In this case, whenever reference prices are not fully reflected in domestic prices, the stabilization fund's balance will be affected accordingly. Chile, Colombia, and Peru are some LAC countries that use stabilization funds to manage fuel price volatility.

Contingent liabilities

The fiscal impact of subsidies may not be direct, but occur through government commitments to cover the losses of utilities. These and other guarantees create contingent liabilities which are often untransparent and poorly understood. For example, in Honduras large losses at the state-owned electricity company, ENEC are guaranteed by the state. Similarly, in Haiti, the state guarantees the payment (out of international reserves) of electricity purchased, but not paid, by the state-owned electricity distribution company, EDH. When tariff-setting policy is constrained from covering costs, the probability of the contingency materializing is very large—but the cost of the subsidy may not be paid for several years after it is incurred. Even when there is no explicit guarantee, underfunding of utilities creates an implicit contingent liability—in the sense that government will most likely have to make good the cost of providing essential public services. The problems created by underfunded utilities are discussed further below.

Quasi-fiscal operations

In general, subsidies provided through quasi-fiscal operations tend to be less transparent.

- As discussed above, some governments squeeze the margins of SOEs, private oil distributors, or electricity companies along the value chain, to prevent full pass-through to domestic prices—with consequences that may not be apparent for some years (see discussion below).
- Off-budget financing of energy subsidies raises another set of transparency issues. For instance, Brazil's state oil company, PETROBRAS, has access to loans at below-market

interest rates through the National Development Bank (BNDES), as one way to compensate for domestic fuel prices below reference prices.¹⁴ The true impact of this type of practice on public finances is difficult to quantify.

- In particular, the operations of Petrocaribe have also raised some transparency issues in the region. This is the case as the resources freed by subsidized financing for energy imports are sometimes managed off-budget—including, at times, by private entities. This makes it difficult to track the extent to which the financing is used to subsidize energy products. For instance, Petrocaribe resources have been managed off-budget in Dominica, Grenada, Haiti, and Nicaragua (See Box 4).

C. The Energy Value Chain, SOEs, and Competitiveness

Energy subsidies can create a vicious cycle when financed by squeezing the margins of energy sector SOEs and private firms. This practice can impair energy companies' abilities to sustain adequate investment, make them less profitable and more indebted, and ultimately raise the cost of energy supply.

Subsidies and the oil sector

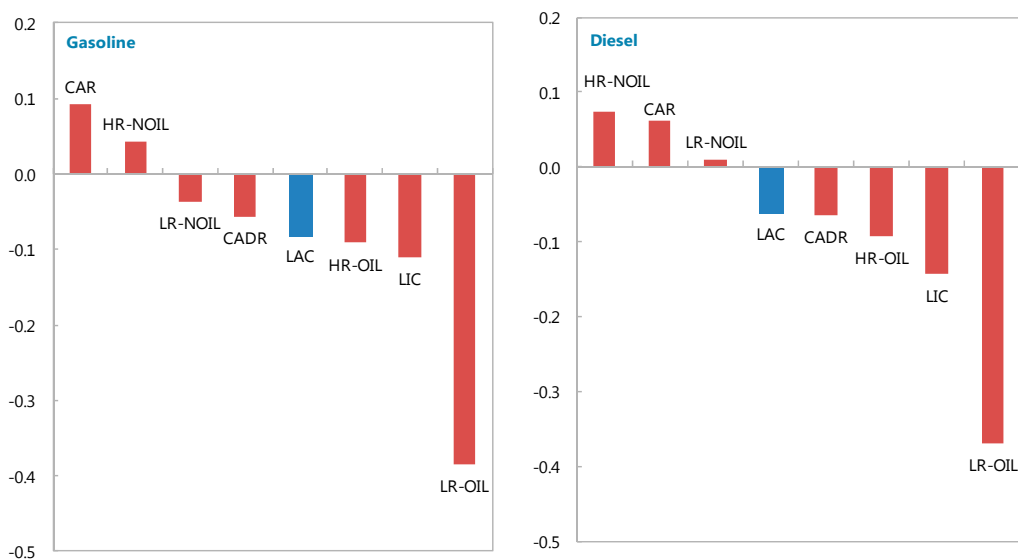
In many cases it is possible that the compensation received by domestic oil companies is below their opportunity cost, even if prices at the pump reflect international prices. This may happen when taxes constitute an important share of fuel prices paid by consumers. In these cases revenues, profits, and thus investment (including on prospection and exploration) of domestic oil companies will be lower than warranted, and may cause decrease in oil supply in the long-run. The impact on profitability would be largest for companies in which the domestic market is the main revenue source. As Figure 8 shows, in oil-producer countries (in particular those that ranked lower in measures of institutional quality) and in low-income countries, prices of gasoline and diesel (excluding taxes) were lower than opportunity costs.

¹⁴ BNDES has increased loans to PETROBRAS also in the context of investment related to pre-salt discoveries. Lack of transparency not only complicates assessing the budgetary impact of energy subsidies but also raises governance issues, which may affect minority shareholders and bondholders.

Figure 8. Gasoline and Diesel Prices Net of Taxes

(Pump Prices excluding taxes, minus US price, US\$/Liter, Average 2011-13)

In oil producer countries that ranked lower on measures of institutional quality, compensation received by domestic oil companies is well below opportunity cost. Compensation is also below in LICs and other oil-rich countries.



Source: Country Authorities; World Bank World Development Indicators (WDI); ECLAC; UN Comtrade; and US Energy Information Administration.

In Venezuela, the state oil company, PDVSA, has long sustained forgone revenues on its domestic operations (which have come to represent a larger share of sales during the last decade). Oil exports in the context of the Petrocaribe initiative have also added to foregone revenues, as participants finance oil imports on concessional terms. These subsidies (together with non-energy subsidies to social programs) have caused PDVSA's capital base to deteriorate and increasing debt levels.

While Venezuela is an extreme case, state enterprise losses are widespread. In Brazil, PETROBRAS, the state-owned oil company, has reported losses, especially after the 2008 fuel price shocks, as the company's board set domestic gasoline and diesel fuel prices below international levels.¹⁵ In Trinidad and Tobago, the government has run arrears with the national oil company, PETROTRIN, related to fuel subsidies (which peaked at nearly 5 percent of GDP in mid-2013).¹⁶ In Paraguay, the state-owned oil company, PETROPAR, bears the cost of blanket subsidies on diesel as current prices carry a negative margin. In Bolivia and Ecuador, fuel subsidies are financed both through the budget and through revenue losses at state oil companies. The decrease in international oil prices in the second

¹⁵ The government holds the majority of votes in PETROBRAS' board.

¹⁶ The bulk of these arrears are thought to have been ultimately cleared through budgetary cash payments in FY2014, among other.

half of 2014 reduced the cost of fuel subsidies for countries that left their domestic fuel prices unchanged.

Large levels of subsidies (that squeeze profits in the energy sector), or the intention to distribute resources as a form of social policy have led to the nationalization of some firms in the energy sector during the last decade. For instance, the Dominican Republic re-nationalized electricity distribution companies in 2003 that had been privatized in the 1990s. Bolivia re-nationalized the oil and gas company in 2008, and Argentina followed suit in 2012. Although it is difficult to establish a clear link between energy subsidies and ownership of energy companies, these nationalizations suggest that governments ultimately cannot avoid assuming the true economic costs of energy supply. Also, anecdotal evidence suggests that SOEs are more frequently used to provide subsidies than private sector firms. This in turn affects the efficiency of the sector and the incentives with which it operates.

Subsidies and the electricity sector value chain

The impact of energy subsidies may be felt not only by the utility directly affected by the subsidy, but also in other links of the energy value chain. For the electricity sector, if tariffs do not fully cover costs, the cash flow generated by distribution companies may be insufficient to fully pay for generation and transmission (Varangu and Morgan, 2002; Morgan, 2007; and (World Bank, 2009a, 2009b). Even if the sector may be able to temporarily absorb the losses caused by subsidies, in the medium-to-long term it ends up affecting incentives to invest, and makes the sector dependent on government transfers. Underinvestment and uncertainty end up draining the sector's capital and creating a vicious circle of poor service, high technical and non-technical losses, and higher *de facto* subsidies. Experience suggests that this is more likely when some of the firms in the chain are SOEs, since the state may be in a position, and have more political incentive, to sustain a financially unsound utility for longer periods of time. A less competitive and reliable electricity sector is a constraint for economic growth and poverty reduction. Moreover, while in some countries the rationale for below-cost tariffs may be to support economic activity, the resulting inefficiency (including high generation costs and unreliable supply –including shortages) end up negatively affecting firms' competitiveness.

When impaired profitability leads to under-investment in the electricity sector, the measured cost of subsidies understates their true economic cost. In Argentina, below-cost electricity tariffs for more than a decade have resulted in underinvestment in electricity distribution in large urban areas, and eroded the capital of energy companies. Black-outs have become more common in moments of peak demand, with implications for production and incentives to invest. In Honduras, large losses at the state electricity utility have slowed investment in the sector, while below-cost electricity tariffs in Suriname and the Dominican Republic have resulted in the accumulation of arrears to electricity generation companies by state-owned distribution companies. Although it is difficult to disentangle to what extent higher generation costs are associated with the uncertainty brought about by energy subsidies, anecdotal evidence suggests that a more predictable framework (including for subsidies) results in increased investment in (cheaper) electricity generation, as was the case in Nicaragua over the past few years. In contrast, Haiti appears to be in a circle of high

generation costs, low investment, poor service, and high levels of theft and of *de facto* subsidy.

Subsidies and their impact on the rest of the economy

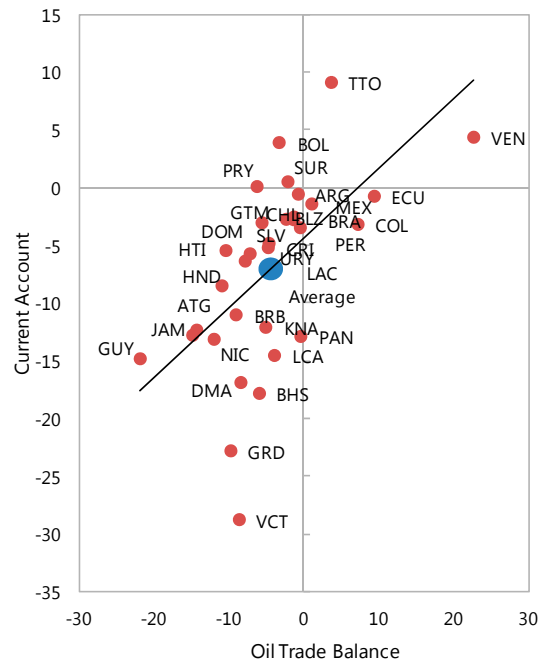
Energy subsidies cushion the pass-through of higher international prices or exchange rate depreciations to domestic energy prices. In this way, they mitigate the effects of these ‘shocks’ on domestic demand. By artificially reducing the relative price of energy, subsidies can distort investment decisions across the economy, negatively affecting capital accumulation and growth. Temporary subsidies (in the form of price smoothing mechanisms) can help reduce cost uncertainty; in the presence of adjustment costs, which may support investment (Caballero, 1997). However, if kept for long periods, by lowering energy costs they discourage firms from undertaking investments in energy-efficient productive capacity or in renewable energy (Arze del Granado et al, 2010).

D. External Vulnerabilities

Energy subsidies can erode external sustainability both through their effect on fiscal deficits and debt and by distorting demand and supply. If sustained for long periods, they may damage energy supply (as discussed above) while inducing over-consumption of energy products. If demand for energy products has to be met by imports, the oil-trade balance will worsen—and more so to the extent that the subsidies result in smuggling.

In Argentina, energy subsidies as large as the fiscal deficit contributed to shifting the oil trade balance from a surplus in the early 2000s, to a deficit in 2011. In Venezuela, subsidies have boosted domestic consumption even as production has stagnated (with the surplus in the oil trade balance shrinking from about 30 percent of GDP in the mid 2000s, to about 20 percent of GDP in 2013). Oil trade deficits in Antigua and Barbuda, the Dominican Republic, Grenada, Haiti, and Nicaragua, form the lion’s share of the current account deficit, in part due to over-consumption of energy supported by energy subsidies (Figure 9). Smuggling of fuel products into Colombia (from Venezuela and Ecuador), and into the Dominican Republic (from Haiti) is widespread, as highlighted in IMF (2013a), and supported by anecdotal evidence (Interpol, 2014).

Figure 9. Current Account and Oil Trade Balances
(Percent of GDP, Average 2011-13)



Source: World Economic Outlook (WEO).

Participation in the Petrocaribe initiative has allowed recipient countries to finance external deficits and energy subsidies. In some cases, this has provided time for the implementation of reforms in the electricity sector (as in Nicaragua), but in other countries has facilitated postponing adjustment to higher prices, i.e., by maintaining a *status quo* of high energy subsidies and energy sector deficits (as in the Dominican Republic and Haiti). Consequently, Petrocaribe-related financing has contributed to (larger-than-warranted) current account deficits and debt accumulation.

A sudden stop of these inflows would represent a significant shock to beneficiary countries, notably Antigua and Barbuda, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, and Nicaragua. Lower external financing in countries with unfinished structural reforms in the energy sector could lower energy production and the reliability of supply, hampering private investment and growth. While countries without access to international credit markets (as Haiti or Nicaragua) would need to compress domestic absorption, countries with market access (as the Dominican Republic) could attempt to cushion the shock by borrowing, but likely at less favorable financing conditions.

E. Household Welfare and Income Distribution

Energy subsidies affect household welfare in a number of different ways.

Income support for households

Untargeted price subsidies for fuel, electricity, or public transportation alleviate all households' budget constraints. But blanket transfers do not affect all households equally: as is well-documented globally, the richest households, which consume the most energy, benefit the most from price subsidies.¹⁷ In Venezuela, the richest 20 percent of the population received six times more fuel subsidies per person than the poorest third of the population. In Bolivia, the poorest 40 percent of households received about 15 percent of total fuel subsidies (World Bank, 2006). In Haiti, recent estimates suggest that about 90 percent of fuel subsidies accrue to the richest 20 percent of households (World Bank, 2014). Somewhat conversely, to the extent that subsidies attenuate energy price volatility, they benefit credit-constrained consumers disproportionately; these tend to be low-income households.¹⁸

¹⁷ Coady et al. (2010) find that the benefits of gasoline subsidies are the most regressively distributed, with over 80 percent of total benefits accruing to the richest 40 percent of households in a sample of OECD countries. IEA (2011) shows that the poorest 20 percent of households benefits only from about 10 percent of total subsidies on natural gas and 9 percent of total subsidies on electricity. Arze del Granado, et al (2010) show that on average, the top income quintile receives about 6 times more in energy subsidies than the bottom quintile.

¹⁸ High-income households usually have access to credit markets, and thus, the marginal improvement in welfare provided by price smoothing mechanisms is relatively minor. See Federico et al (2001).

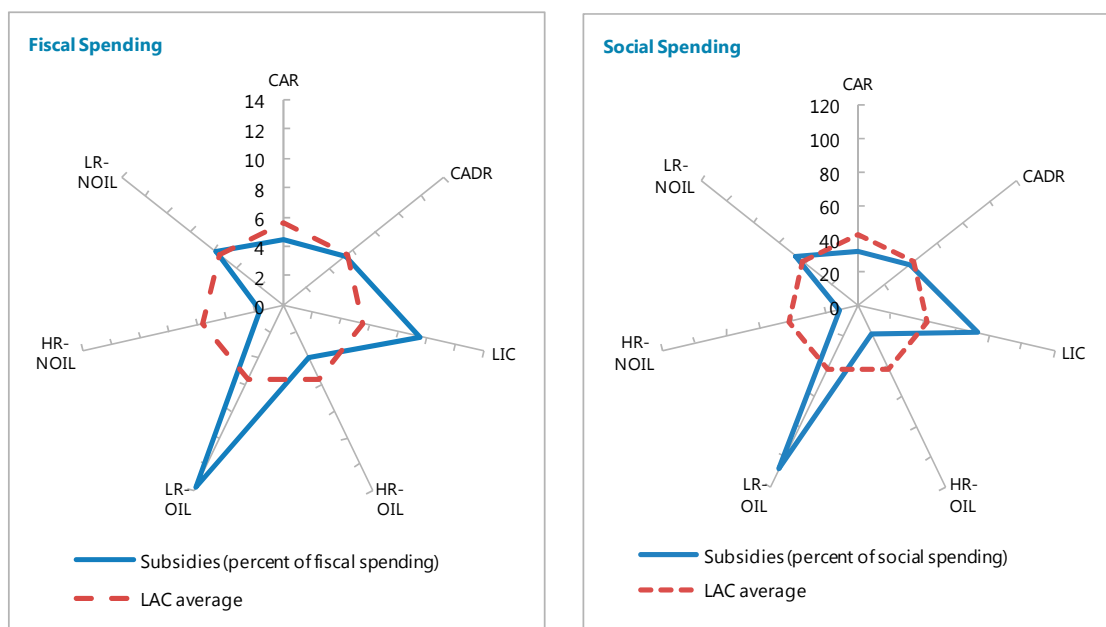
Diversion of resources from social spending

Spending on subsidies reduces the availability of public resources for other purposes, which might have more positive distributional impacts—for instance, social spending.

For a number of LAC countries, spending on energy subsidies significantly crowded out other types of expenditures, with welfare implications. In particular, while energy subsidies were equal to about 45 percent of spending in education and health for the average LAC country, they were about 80 percent for the average LIC country, and about 110 percent for oil producer-countries that ranked lower in measures of institutional quality (or about 15 percent of total government spending). In contrast, energy subsidies were very low compared with spending in health and education for oil importer countries that ranked higher in measures of institutional quality (Figure 10).

Figure 10. Energy Subsidies and Fiscal Spending (Average 2011-13)

Energy subsidies represented a larger than average share of spending in oil-producer countries that ranked lower on measures of institutional quality, and in low-income countries.



Source: Country Authorities; World Bank World Development Indicators (WDI); ECLAC; UN Comtrade; and US Energy Information Administration.

Other differential effects on households

Energy subsidies may also worsen income distribution more indirectly. For instance, they favor investment in sectors and technologies that are capital- (rather than labor) intensive, benefitting capital owners at the expense of labor.

More broadly, whenever electricity subsidies result in shortages, these end up affecting low-income households disproportionately. Unreliable service frequently results in households

providing their own electricity (e.g., through purchase of batteries or small electricity generators, as in the Dominican Republic, Haiti and Nicaragua), which increases the average cost of electricity and the share of households' budget spent on it. Low-income households are most affected by shortages as they have no means to hedge against energy rationing.

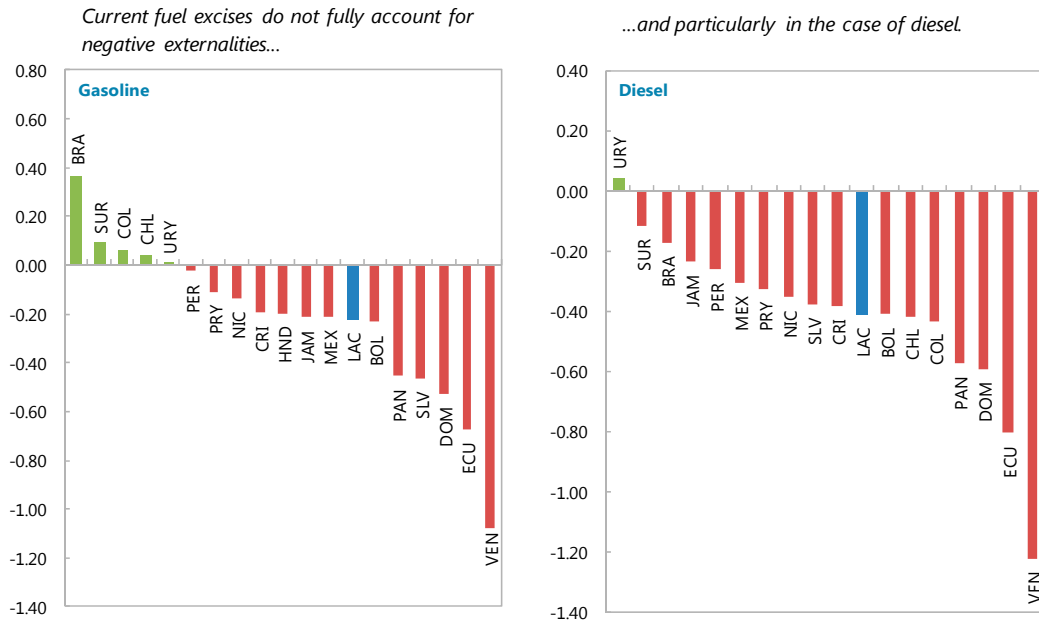
F. Environmental and other Negative Externalities

Even when energy products are taxed, prices are often not high enough to stop overconsumption of energy relative to its socially-optimal level. In other words, prices charged to consumers are typically not high enough to compensate for adverse externalities associated with energy use—environmental damage (by air pollution, landscape destruction and water contamination), traffic congestion (resulting in time loss and higher road maintenance costs), and health problems (due to pollution and traffic accidents). Moreover, these adverse externalities can impede investment in renewable energy, and worsen income distribution—for instance, if environmental damages are concentrated in low-income rural areas.¹⁹ Socially optimal (Pigouvian) corrective taxes are defined as those designed to correct those negative externalities.

A recent study (IMF, 2014a) suggests that pricing of fuel products is below optimal levels in most LAC countries, i.e., that actual excise taxes do not fully charge for the negative externalities caused by the consumption of energy products. In particular for gasoline, the shortfall of actual from optimal (Pigouvian) taxes is important not only for pre-tax subsidizers but also for the Dominican Republic, El Salvador, Panama, and to a lesser extent, Mexico. For diesel, the list also includes Chile, Colombia, and to a lesser extent, Peru and Brazil. The corrective taxes estimated in IMF (2014a) for gasoline and diesel can be used to calculate a (preliminary) measure of fiscal revenue losses linked with the gap between taxes and their optimal levels for LAC (Figure 11). These amounted to about 1 percent of GDP on average, for these two products alone.

¹⁹ For example, see IMF (2014a) and Morgan (2007). IEA (2011) estimated that if world fossil fuel subsidies were completely phased out by 2020, CO₂ emission would be cut by about 6 percent. It is sometimes argued that removal of subsidies on kerosene could *worsen* environmental damage, as it could increase the use of charcoal and associated deforestation. However, Coady et al. (2010) find that low-income households in South and Central America consume less kerosene as they have greater access to LPG and electricity. Moreover, proper pricing would generate savings that could be better targeted to protect low-income kerosene users from switching to charcoal. Finally, there are leaks in in-kind kerosene subsidy schemes, as kerosene is often mixed with diesel used by the higher-income groups (Anand et al, 2013; Haiti Libre 2012)

Figure 11. Fuel Taxation and Negative Externalities
(Current Excise Tax Minus Corrective Tax, US\$/Liter, 2010)



Source: Fund staff estimates (2014).

IV. HOW AND WHEN TO REFORM SUBSIDY POLICY? EXPERIENCE FROM LAC COUNTRIES

The 2008 energy price shock (when WTI reached \$138/barrel) and other subsequent price movements highlighted how unsustainable energy subsidy policies are in some LAC countries. It prompted many governments to develop strategies to reduce subsidies and to focus them on the most vulnerable. Despite a favorable context for reform—generally solid growth and progress in poverty reduction—energy subsidies remain significant throughout the region, and most countries that embarked on reform have not yet concluded it in full.

Reducing subsidies is challenging everywhere, as it can be associated with adverse near-term economic and social consequences (Ellis, 2010). Domestic price increases can impact competitiveness, slow down growth, and reduce employment in the short term. Electricity subsidy reform is particularly challenging, partly because its true cost is less transparent. High energy costs could limit poor households' access to energy. These effects are a barrier to reform, particularly during economic downturns or periods of high international oil prices. Public understanding of subsidies and an awareness of the tradeoffs involved in maintaining them are crucial to building public support for reform. In particular, lack of information about the size and true cost of subsidies can make it difficult to establish the link between subsidies, fiscal exposure to international fuel prices, and their economic effects. A history of failed reforms can also undermine efforts to rationalize subsidy policy, as it can fuel doubts about the authorities' ability to carry out reform, particularly if past attempts were

characterized by poor governance and transparency. There is also a time lag between the immediate fiscal and social costs of subsidy reforms and their longer-term benefits.

Political pressures will be largely in favor of subsidy retention. Another challenge is that the largest beneficiaries of subsidies are likely to be well-organized and have a strong interest in maintaining the *status quo*. In turn, lack of organizational capacity to design appropriate mitigating measures may constrain the authorities' ability and resolve to undertake reforms, on the fear that the elimination of subsidies will result in harmful social and economic impacts on the most vulnerable households.

This section discusses appropriate strategies for reforming energy subsidies. It starts from best practice but refers also to the reform experience of LAC countries over the last decade. LAC's experience is a combination of successes and failures, which illustrate lessons about workable reforms.

A. How to Rationalize Subsidies?

A main goal of subsidy reform is to reinstate the role of market prices in guiding the decisions of economic agents. If successful, such a reform would make production and consumption decisions be based on opportunity costs. Moreover, it would result in the economy as a whole bearing the costs of energy, rather than the public finances. These objectives require extracting the government from a perceived responsibility to manage energy prices—even when a justified objective would be for the government to mitigate the effect of the reform on the most vulnerable. Hence, the main focus of the reform should be to depoliticize the price setting of the subsidized product, either by allowing the market to set prices or by adopting an automatic adjustment mechanism. This mechanism could pass through international price changes to domestic prices contemporaneously, or gradually to cushion the impact of volatility. SOE management reform is often a vital supporting measure. International experience, including from LAC, underscores the importance of dismantling subsidies pragmatically—gradually, and with well-targeted mitigating measures to the most vulnerable and to groups most affected by the reform. A communication strategy to garner support should complement policy implementation.²⁰

1. Reforms should aim to establish a price setting mechanism that reflects market signals

Successful and durable energy subsidy reforms should aim to depoliticize price setting. Pricing policy should reflect market signals so as to convey the appropriate incentives to

²⁰ Jordan began to gradually decrease fuel subsidies in 2005, culminating in a full price pass-through in 2008; the government simultaneously increased the minimum wage, maintained an electricity lifeline tariff, and provided cash transfers to low-income households. Mitigating measures were also implemented together with fuel price increases in 2008 in both Indonesia and Mozambique. IMF (2013a) refers to some successful historical reform episodes.

economic agents. Automatic pricing mechanisms (as in Colombia) or allowing state intervention only under clearly defined circumstances (as in Peru) can limit reform reversal, make discretionary government intervention more difficult, reinforce institutions, and increase the credibility of the system. Conversely, leaving price setting subject to administrative discretion can increase pressures to maintain subsidies. Failure to implement existing automatic pricing mechanisms for petroleum products (or their suspension) has resulted in large level of subsidies (as in Haiti). The incorporation of a smoothing rule into the automatic pricing policy could help buffer the effect of sharp price increases (Coady et al., 2012). In other words, this mechanism could pass through international price changes to domestic prices contemporaneously, or gradually to cushion the impact of volatility (e.g., in Grenada, electricity tariffs are adjusted monthly based on changes in the average fuel price during the previous three months).

Example: The benefits and limitations of fuel price stabilization funds

After the 2008 oil shock, **Colombia** set up a fuel price stabilization fund (FEPC) as a vehicle to phase out subsidies, which had escalated to about 1 percent of GDP. The pricing formula was intended to smooth price changes symmetrically and make the FEPC self-sustaining (Garcia Romero and Calderon Etter, 2013). Despite being funded by an initial transfer of US\$170 million, the FEPC ran out of resources in 2010 partly because prices continued to rise (i.e., the smoothing mechanism resulted in continuous subsidies and almost no replenishments of the fund), and because the authorities retained discretion in price-setting by fixing producer income (gasoline prices were frozen for several months in 2009–10). A more transparent formula was introduced in late 2011, tying the domestic price each month to a moving 60-day average of the export parity price, but limiting price changes to 3 percent per month (Government of Colombia, 2001; Central Bank of Colombia, 2012). Also, in 2013 the government introduced a fixed fuel excise tax to replace the variable tax which had been used to influence end-user prices. However, the government has retained discretion to set diesel prices and in 2013 briefly froze prices in response to a transport strike. Hence, the fund continues to run deficits.

Example: Getting pricing right by phasing out variable excises

In **Mexico**, excises on gasoline and diesel (*Impuesto especial sobre produccion y servicios, IEPS*) vary to compensate for oil price volatility (offsetting the difference between international prices and the price set by the Mexican formula). Since 2006, this system has resulted in negative excises (net subsidies) which peaked in 2008 at about 1.8 percent of GDP and remained large in 2009 when fuel prices were frozen. In 2010, the government adjusted the formula so as to increase retail prices by about 1 percent a month, to phase out subsidies. The 2014 reform made a further step adjustment to prices by imposing a carbon tax on fossil fuels and changed the formula again so that prices will reflect inflation. This sequence of policies has significantly reduced subsidies and left Mexico on track to eliminating them by 2015. However, if oil prices were to increase more than inflation, the existing formula would not prevent a reappearance of a subsidy.

These experiences suggest that while a stabilization fund can be a useful mechanism for rationalizing pricing policy and an attractive concept for mobilizing support to change the

pricing mechanism, it cannot compensate for a pricing formula which fails to achieve savings within a reasonable time frame, or for political pressures to prolong subsidies. In addition, a pricing formula intended only to smooth volatility and be revenue-neutral can generate subsidies for long periods if oil prices trend upward. Adjustments to the formula to phase out the subsidy may be the most pragmatic way to contain costs to the government. However, unless these adjustments are designed to allow a full pass-through of international oil price changes to local prices, they may leave a country vulnerable to the reemergence of subsidies.

2. Reforms need to take into consideration the socio-political context

Country experiences have shown that when subsidy reform is undertaken in a broader reform agenda it is more likely to be more successful. This is the case as policy makers would be in a better position to justify the intended reform on the need to increase, e.g., social or infrastructure spending, or on other socially desired objective. Most importantly a number of elements that are essential to successfully reform subsidy policy (namely the design and implementation of appropriate mitigating measures, the need for gradualism and for an effective communication strategy, all which will be discussed at greater length below), are needed because they make reforms implementable and more sustainable from a socio-political perspective.

3. Mitigating measures should be implemented together with reforms.

Assessing the social impact of the proposed policy change, including through the analysis of household expenditure data, is essential prior to undertaking a reform. Although higher income groups frequently bear the largest burden of the removal of subsidies, their removal might be regressive, if the burden borne by low-income groups is higher than their share of total income (Coady et al., 2006). Mitigating measures could include conditional cash transfers, and when this is not feasible (e.g., due to limited capacity), other measures could be explored while developing capacity (including subsidized school meals, public transportation, water, or electricity consumption below a specific threshold, etc.).²¹ A large number of countries also have some form of subsidized electricity lifeline tariffs for small consumers, including in Belize, Bolivia, Costa Rica, Ecuador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, and Peru. Credibly reallocating some budgetary savings to crucial public investments (education, health, and infrastructure) or even tax reform could then be more efficient. A medium-term strategy could be to search, finance, and provide an affordable alternative source of energy. For example, given that diesel fuel, heating oil, jet fuel, and gasoline are generally consumed by different income groups, price increase of the reform could be larger for products that are consumed by high-income groups

²¹ The size of the mitigating measures would be guided by a decision involving a trade-off between fiscal savings, administrative capacity, and the need to achieve public support for the reform.

Examples: Efforts to shift from blanket to targeted subsidies

El Salvador moved from a blanket subsidy on LPG to a transfer system for designated households, although most households are still eligible for subsidized purchases. Until April 2011, the government fixed the price of a tank of LPG at subsidized rates and the government subsidized the gap with the market. The subsidy was large (only 35–40 percent of recovery prices were charged), relatively untargeted, and created smuggling problems. Since 2011 the authorities give the subsidy directly to consumers, either through the electricity bill for small consumers or via for a special card for businesses and households with no electricity. ECLAC reports that this reform helped lower LPG consumption by 15.4 percent in 2011–13. In 2013–14 the government tightened the subsidy by requiring advance registration and presentation of a special permit at the time of sale (to prevent leakage). Nevertheless LPG subsidies still accounted for about 0.6 percent of GDP in 2013.

During 2005–08, the **Dominican Republic** launched a reform aimed at progressively eliminating subsidies on gasoline, diesel and LPG. Part of the savings was used to target subsidies in the form of cash transfers to poor households (to offset the increased cost of monthly consumption of LPG and public transportation). Cash transfers were made through a solidarity bank credit card and covered the difference between the market price and the below-market price for the targeted consumption.

Other examples concern the electricity sector. **Ecuador** recently raised most tariffs but left the “dignity tariff” for users consuming less than 100 kWh/month unchanged. In **El Salvador**, most consumers are charged cost-recovery tariffs but targeted groups have access to a preferential tariff that is financed via a fiscal transfer. In **Nicaragua**, the size of blanket subsidies varied with energy prices (i.e., these resulted in 2011–13 from two different tariff schedules, one “notional” reflecting the best available annual forecast for electricity generation costs, and the other “effective” to be applied to clients), but even with blanket subsidies decreased, focused subsidies were maintained for users consuming less than 150 kWh/month, and for pensioners.

These experiences suggest that in many countries, existing social protection schemes provide a ready starting point for moving towards cost-recovery while still protecting the most vulnerable. While cross-subsidies are not ideal from an efficiency or transparency perspective, they can help achieve distributional goals of governments while containing costs. Mechanisms to channel subsidies to targeted groups have improved greatly with the spread of computerization and inclusive banking. These developments remove one of governments’ main reservations about shifting away from blanket subsidies—the administrative complexity of more focused alternatives. Capacity can constrain focusing subsidies in some settings, in particular in low income countries.

4. Subsidy reforms tend to be more successful when gradual

Reforms should be appropriately phased and sequenced. A gradual approach improves the chances of success by providing time to households and enterprises to adjust costs and savings and helps fiscal authorities build credibility. Taking into consideration the social and

political context will support the credibility of reforms. A gradual approach also smoothes the price effect of subsidy rationalization and provides time to implement social safety net programs. In addition, sequencing of the reforms, particularly across products, is critical, as inappropriate sequencing could distort consumption patterns and encourage cross-border smuggling. The timing of reforms typically imposes a tradeoff. The longer it takes to phase-down subsidies, the lower the social resistance tends to be; but at the same time, the less the positive impact on the budget and thus, the higher vulnerability to fuel price shocks. In the cases of Chile, Colombia, and Peru, the progressive reduction of fuel subsidies was achieved through fuel stabilization funds.

Example: Diversifying—over time—to cheaper energy sources

In **Nicaragua**, there has been progress in diversifying the electricity matrix into renewable sources (including wind, geothermal, hydro and biomass). Despite some problems, reforms (including in the regulatory framework) in the sector advanced and the sector's performance improved during the past few years, while Petrocaribe resources were partly used to continue financing energy subsidies, giving the authorities time to implement such reforms. Moreover, and despite improvements, high non-technical losses continue to be a source of *de facto* subsidies. Electricity subsidies have been significantly reduced and were just over 1 percent of GDP in 2013 (from 3 percent of GDP in 2011).

Electricity tariffs in **Haiti** have remained unchanged since 2008. At the same time, production and distribution costs are high, due to the large share of fossil fuels in the production mix and very large technical and commercial losses (67 percent in 2013). As a result, subsidies are significant (around 3 percent of GDP in 2013, in excess of 20 percent of tax revenue), which were largely financed with Petrocaribe resources. Electricity subsidies have become a concern for fiscal and debt sustainability. Attempts to reform subsidies in the sector have failed due to the entrenched interests and the lack of a comprehensive reform strategy able to address the existing structural inefficiencies.

These examples suggest that external financing (or appropriate macroeconomic conditions, such as a period of economic expansion or low international prices), could provide a buffer that allows for a gradual implementation of reforms. If these opportunities are not taken, subsidies can become more entrenched by keeping unchanged the *status quo* of high subsidies and high energy losses.

5. Changes should be properly communicated

A communication strategy is essential to build support and should complement policy implementation. Graham (1998) and Gupta et al. (2000) show that an consultation with stakeholders and other interest groups to develop a strategy to address their concerns in the formulation of the subsidy reform strategy has proven to be successful.

Example: The role of a communications strategy

While the success of **Ecuador's** ongoing efforts to reform fuel prices remains to be seen, the authorities have highlighted the need for change since 2013, stressed that the largest

benefits of blanket subsidies accrue to richer households, and are already implementing mitigating measures.

B. When to Rationalize Subsidies?

Although subsidies frequently start as a short-term government response to unanticipated shocks, they create a set of incentives that make them difficult to reverse or rationalize. Thus, reform efforts should begin, if possible, before energy subsidies have become entrenched, since a population accustomed to subsidies often result in political pressures for reform reversals (including abandonment of automatic pricing formulas). The timing of the reform should also be considered in a broader context. For example, governments often have the greatest mandate for reform soon after elections, and the timing should not coincide with reforms on other socially sensitive issues so as not to galvanize public resistance. The strategic timing, phasing, and sequencing of subsidy reform are all key elements of success. Reforms should occur:

1. Prior to subsidies becoming a *de facto* entitlement.

The longer subsidies exist, the more likely the possibility that they will be perceived as an entitlement by households, and as a permanent policy by firms. This may result in powerful forces to resist change, making them more difficult to reduce. One explanation for Bolivia's failure in 2010 to reform fuel prices, for example, was the fact that prices there had been fixed since 2000. The violence that occurred after Venezuela's 1989 price reforms is a particularly tragic example, and fears of public resistance have complicated reform efforts elsewhere, including in Haiti and in the Dominican Republic.

2. Before subsidy levels are so large so as to threaten fiscal sustainability.

This would allow for a gradual reduction of subsidies, which is likely to have a better chance of success. When subsidies are large and persistent (or when it is likely that they will become large under unchanged policies), a targeted phase-out is preferable. Excessive delay in launching reform could force a resort to abrupt and drastic changes. A rapid elimination of subsidies may exacerbate the political and social costs, and cost government public support for the reform.

Example: The perils of abandoning a pricing mechanism

Haiti stopped implementing an automatic fuel pricing mechanism, and fuel prices (fixed in nominal, local-currency terms) were unchanged from early 2011 until late 2014, leading to an erosion of the tax base. The authorities have maintained the fixed prices by lowering customs and excise taxes, implying annual foregone revenue of almost 2 percent of GDP in 2013 (15 percent of total government revenue). During 2014, domestic pump prices turned lower than international prices, and the cash-constrained Treasury accumulated some arrears to oil distribution companies. Debt sustainability considerations prompted the government to raise prices in late 2014 and use part of the proceeds to finance poverty reduction programs. The reform however faces challenges, as subsidies have become entrenched.

This experience suggests that governments should fight to maintain pricing mechanisms, since—even if inadequate—they put boundaries on the growth of subsidies. It is less costly to amend a pricing mechanism if necessary to reflect political realities, than to reintroduce it once officially abandoned.

3. Considering the business cycle and taking advantage of decreases in international oil prices, while focusing on the medium-term

Although real-time policy-making poses its own challenges, subsidy rationalization should ideally occur during a period of economic expansion. Reducing subsidies during a recession could compound resistance and exacerbate the economic downturn worse. Similarly, a downturn in international oil prices provides an ideal opportunity to reduce subsidies and converge (e.g. in the case of fuel prices), to an automatic price adjustment mechanism.

Example: Reducing subsidies during an economic downturn

Energy subsidies in **Argentina** grew significantly over the last decade, a period characterized by large export prices that supported the country's recovery and large increases in aggregate consumption. More recently, a worsening in the terms of trade and a deceleration of economic activity increased fiscal imbalances and resulted in attempts to reduce energy subsidies. Reductions of subsidies (although warranted in a medium-term perspective) are likely to result in downward pressures to domestic absorption, in a moment of below-trend growth, risking reinforcing the downturn.

This experience suggests that dismantling blanket subsidies should proceed before fiscal constraints take preeminence. Reforms are easier to implement during economic expansions, where fiscal space can be regained, at a lower social cost.

4. Ahead of subsidies affecting the efficiency of the energy sector.

If large subsidies are sustained over an extended period, they will affect the efficiency of the energy sector (including of SOEs), leading to constrained supply and overconsumption (as in many Central American countries). In the electricity sector, a vicious cycle of non-payment and underinvestment can emerge that seriously constrains the sector's development, a phenomenon seen in Honduras, Haiti, and elsewhere. On the contrary, supply and demand will adjust faster, and equilibrium in the sector will be easier regained, if subsidies are perceived only as a temporary measure. Waiting too long could also have negative environmental consequences. Strengthening the governance structure of SOEs and improving their fiscal position can help improve SOE efficiency and reduce the likelihood that they will be used a vehicle for generating subsidies.

Example: Improving efficiency may be a prerequisite for reducing subsidies

Electricity sector reform (including of energy subsidies) is ongoing in the **Dominican Republic**, and continues to face important challenges, including from the political front. The three distribution companies, which had been privatized in 1999, were re-nationalized in 2003. Despite the narrowing of subsidy coverage described above, untargeted subsidies persist: in fear of repeating riots that followed price increases of the early 2000s,

electricity tariffs are set at levels that do not reflect actual production and distribution costs. The high cost structure reflects the high fossil fuel content in the production mix, sizeable electricity theft despite a 2007 law criminalizing electricity theft, and technical losses in public distribution and transmission companies. Subsidies to the electricity sector are estimated at about 2 percent of GDP in 2011–13. Public sector distribution companies have also accumulated arrears to generation companies.

This experience suggests that electricity subsidies are more likely to coexist with higher costs and non-technical losses. Improving efficiency and strengthening regulatory frameworks and its enforcement are avenues to eliminating subsidies. Strengthening regulatory frameworks and improving enforcement positively influence investment in generation, which ultimately reduces the cost of electricity. Better enforcement and lower generation costs reduce the cost of subsidies. A better functioning system could build social support for reform.

ANNEX I: COUNTRY GROUPINGS

The analysis in the paper makes use of a number of country groupings, each of which has more homogeneous policies regarding energy subsidies. Country groupings are defined according to specific characteristics, as described below:

Oil-richness and Institutions. Countries were divided according to whether they were oil producers or importers, and were ranked according to an index averaging countries' positions in a number of measures of indicators and surveys of institutional quality and policies. These indicators include the Institutional Investor "Country Credit" survey for 2014, the World Bank's "Doing Business" survey for 2014, the World Economic Forum's "Global Competitiveness Report" for 2014, the International Budget Partnership "Open Budget" survey for 2012, Transparency International's "Corruption perception" index for 2014, and the "Rule of Law" and "Government Effectiveness" dimensions from the World Bank's "Worldwide Governance Indicators" for 2013. Countries were thus divided in four groups depending on whether a country was oil producer (or importer), or whether they ranked above (or below) the regional median in the average measure of institutional quality.

- **Oil producer countries that ranked lower in measures of institutional quality (LR-OIL)** This group includes Argentina (ARG), Belize (BLZ), Bolivia (BOL), Ecuador (ECU), Suriname (SUR), and Venezuela (VEN).²²
- **Oil producer countries that ranked higher in measures of institutional quality (HR-OIL).** This group includes Brazil (BRA), Colombia (COL), Mexico (MEX), Peru (PER), and Trinidad and Tobago (TTO).
- **Oil importer countries that ranked lower in measures of institutional quality (LR-NOIL).** This group includes Dominican Republic (DOM), El Salvador (SLV), Grenada (GRD), Guatemala (GTM), Guyana (GUY), Haiti (HTI), Honduras (HND), Jamaica (JAM), Nicaragua (NIC) and Paraguay (PRY).
- **Oil importer countries that ranked higher in measures of institutional quality (HR-NOIL).** This group includes Antigua and Barbuda (ATG), Bahamas (BHS), Barbados (BRB), Chile (CHL), Costa Rica (CRI), Dominica (DMA), Panama (PAN), St. Kitts and Nevis (KNV), Saint Lucia (LCA), Saint Vincent and the Grenadines (VCT), and Uruguay (URY).

Low-income countries (LICs) are countries that are defined as IDA-eligible (including IDA-blend), excluding small island countries. The group includes Bolivia, Guyana, Haiti, Honduras, and Nicaragua.

²² Net oil exporters (OIL-NX) is a subset of oil exporters and includes those countries with a positive oil trade balance. It includes Bolivia, Colombia, Ecuador, Mexico, Trinidad and Tobago, and Venezuela.

Geography-based. Two groupings were defined according to their geographical position. These include

- **Caribbean countries (CAR)** are those in the Caribbean region, excluding the Dominican Republic and Trinidad and Tobago (a net oil exporter). The group includes Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, Suriname, and St. Vincent and the Grenadines.
- **Central American countries (CADR)** are those that are members in CAFTA-DR. The group includes Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

ANNEX II: DATA SOURCES

This appendix describes the data sources used for the estimation of pre-tax subsidies for fuel and electricity. For the methodologies, see Boxes 1 and 2.

Fuel

Primary source of data is survey with the authorities, which covered gasoline, diesel, kerosene, LPG and any other relevant petroleum products or natural gas. The survey asked information on the retail prices, CIF price for importers, domestic transport and distribution costs, margin, and consumption volumes. For fuel exporters, international price and freight and insurance costs were asked in addition. In some instances, the IEA database “Fossil-fuel consumption subsidy rates as a proportion of the full cost of supply” was used. The following data sources were used to fill data gaps:

- *Retail prices* – World Development Indicators by World Bank, UN Economic Commission for Latin America and the Caribbean (ECLAC), and estimates based on data from state oil companies.
- *Reference prices and consumption volume* – UN Comtrade database. Import volume was used as a proxy for the volume of consumption when national data is not available.

Electricity

Primary source of data is survey with the authorities, which requested information on electricity production, technical and non-technical losses, cost of generation and distribution, collection rate and electricity price. Following data sources were used to fill the data gaps:

- *Electricity prices* – (1) Latin American Energy Organization (OLADE), UN ECLAC, Inter-American Development Bank (IDB), and electricity company reports. (2) Caribbean Electric Utility Services Corporation (CARILEC): <http://www.carilec.com/>
- *Electricity production* – (1) UN ECLAC, World Development Indicators, and statistics from electricity regulators and companies. (2) National Renewable Energy Laboratory (NREL), Energy Policy and Sector Analysis in the Caribbean, 2010–11
- *Technical and non-technical losses* – UN ECLAC, World Development Indicators, and statistics from electricity regulators and companies.
- *Cost of generation and distribution* – UN ECLAC and statistics from electricity regulators and companies.
- *Collection rate* – Statistics from national electricity companies.
- *Modes of Generation, background information on regulatory bodies* – Renewable Energy and Energy Efficiency Partnership Database (www.reegle.info)

ANNEX III: A SUMMARY OF ENERGY POLICIES IN LAC COUNTRIES

Antigua and Barbuda

Antigua and Barbuda is a net energy importer with no fossil resources. It spends just over 12 percent of GDP on energy, or about 27 percent of imports of goods (on average) in 2004–13, among the highest shares in the Caribbean. The government of Antigua and Barbuda participates in the Petrocaribe initiative, through a state-owned company (PDV Caribe Antigua and Barbuda Ltd–PDVCAB)²³ and domestic fuel prices are regulated by the government. To offset rising international oil prices and reduce the high fiscal costs of oil subsidies, the authorities established in August 2009 a partial pass-through price-setting mechanism whereby retail fuel prices are adjusted several times per year.²⁴ In addition, the authorities have lowered consumption taxes in periods of high international oil prices. Nevertheless, forgone taxes have been reduced from about 0.7 percent of GDP in 2008 to 0.4 percent of GDP at end-2013 as domestic fuel prices have gradually increased.²⁵

Electricity tariff policy and subsidies

Electricity tariffs in Antigua and Barbuda are among the highest in the Caribbean, and generation exclusively uses diesel fuel. The office of the Prime Minister is responsible for electricity policy and in 2010 established a National Energy Task Force to develop a National Sustainable Energy Policy. The Antigua Public Utilities Authority (APUA), a public utility under the responsibility of the Minister of Works, Transportation and Environment, is responsible for electricity production, transmission, and distribution. Electricity is also produced by the Antigua Power Company Ltd, a private power producer, which owns and operates five of the country's eight power plants. Independent power producers are allowed by contract with APUA. APUA also serves as the sectoral regulator, including price setting, defining performance standards, and the allocation of generation licenses to private firms. The tariff structure includes general purpose, consumer-specific tariffs (residential, commercial, industrial, etc.), as well as fuel surcharges. There is a partial pass-through mechanism in place whereby higher international oil prices are passed on to consumers with adjustments (on an ad hoc basis) to consumption taxes. Implicit subsidies were around 0.8

²³ Since 2006, about 20 percent of the country's oil demand has been met under the Petrocaribe arrangement, at favorable financing terms. The country's financing from Venezuela amounts to 1.6 percent of GDP per year.

²⁴ The price of LPG or cooking gas continues to be directly subsidized by government as part of its social safety net policy. When international oil prices are high (or high imported oil price), the Government reduces consumption tax so as to maintain relative low retail prices. Such adjustment is done through the price setting-mechanism on ad hoc basis. While the office of the Prime Minister of the country's energy policy, the government's involvement in the price-setting mechanism is generally on tax adjustment.

²⁵ The forgone tax is obtained by the gap between the new tax set by the government and a benchmark consumption tax. The benchmark consumption tax is set the average of consumption tax on fuel during 2002-06.

percent of GDP in 2011-13. While APUA receives budgeted transfers from government, it is not clear whether they fully compensate APUA's losses.

Argentina

Fuel and gas price policy and subsidies

Argentina is a significant producer of oil and natural gas, but is a small net importer of both products. The *Ministerio de Planificación Federal, Inversión Pública y Servicios* (MINPLAN) is responsible for broader sectoral policies, with the *Secretaría de Energía* (SENER) regulating upstream oil and natural gas production and the *Ente Nacional Regulador de Gas* (ENARGAS) responsible for natural gas transportation and distribution regulation. Gasoline and diesel prices at the pump are market-determined and rose significantly (in peso terms) during 2014. Residential and industrial natural gas tariffs are fixed by the government at subsidized prices. Current policies were affected by the response to the 2002 currency devaluation. Export taxes have been a key tool to manage domestic gasoline (and other fuel) prices, and are a source of fiscal revenues. Export taxes are designed to vary with the international oil price and are calculated based on a reference and a series of cut-off prices on crude and refined oil products. The purpose of the policy is to isolate the country from international prices, preserve competitiveness, and capture rents from the exploitation of an exhaustible resource. The tax structure was updated in 2013 and reduced the minimum export tax from 45 to about 14 percent. It was updated again in 2014 to decrease rates in case the oil price falls below US\$80/barrel. Fiscal revenues derived from these taxes are now very low. As export taxes cap prices below international prices for crude oil and refined oil products, this policy would imply a type of cross subsidy from oil producers to consumers. However, domestic prices of refined products at the pump are not as low as those implied by the cut-off price for the oil price, as the government collects VAT and a number of specific taxes on the domestic sale of refined oil products

The government's price-setting policies boosted domestic demand for energy products and were a factor in shifting Argentina into a net energy importer. To maintain the subsidy policy, the government began to import natural gas and LNG directly through a state-owned enterprise, *Energía Argentina Sociedad Anónima* (ENARSA, created in 2004), which in turn sells at subsidized prices (mostly to power generators) with the government paying the difference.

Electricity tariff policy and subsidies

SENER is responsible for sector policies, and the *Ente Nacional Regulador de la Electricidad* (ENRE) and a series of provincial regulators set electricity prices for Greater Buenos Aires and the rest of the country, respectively. Most generation is in private hands (by law, no operator can account for more than 10 percent of the market), with the state focused on nuclear power and two binational hydro plants with Paraguay and Uruguay. The generation market is competitive and includes a wholesale market operated by the *Compañía Administradora del Mercado Mayorista Eléctrico* (CAMMESA). Distribution is more regulated and is dominated by three regional firms. In principle, legislation establishes that tariffs should reflect generation and transmission costs, plus an aggregate value of

distribution (AVD). However, as mentioned above, electricity tariffs were frozen (in peso terms) in 2002. Tariffs for residential clients in the Greater Buenos Aires area (one-third of the country's population) were kept frozen until 2008. Since then, some increases were allowed, in particular for medium and large residential clients. At end-2013, the government announced its intention to more thoroughly phase out electricity and natural gas subsidies, as price adjustments in recent years had had lagged electricity generation and transmission costs, with the difference has been financed by government transfers to CAMMESA, which in turn pays electricity generators. Electricity prices in the rest of the country are more aligned to costs. CAMMESA has built a debt with power generators in recent years; in some cases, debt has been collected through the pledging of funds for the construction of new plants. The pace at which electricity demand has grown has exceeded that of supply. In the last few years, some electricity rationing was needed at times of peak demand. Electricity subsidies amounted to almost 2 percent of GDP in recent years.

Transport and other subsidies

Argentina also subsidizes public transportation (mostly in urban areas), including railways, subways, and buses. There are also subsidies to water consumption, among others. Transport subsidies represented about 1 percent of GDP in 2013. Other subsidies, (including for water consumption), were about 0.5 percent of GDP in 2013.

Bahamas

Fuel and gas price policy and subsidies

The Bahamas is an energy importer, with oil-related imports comprising about 23 percent of total imports in (2013).²⁶ Fuel and natural gas service and pricing are regulated under the Energy Sector Framework, which outlines the governance framework for energy in the country. The Ministry of the Environment (MOTE) is in charge of the energy sector in the Bahamas, including regulation and pricing policy.²⁷ The price-setting mechanism for all fuel products entails some ad-hoc adjustments in consumption taxes for price smoothing. The implied subsidies (based on the price-gap approach) suggest that they have remained around 0.4 percent of GDP in 2011–13. Moreover, these figures exclude preferential access to fuel afforded to the state-owned Bahamas Electricity Company (BEC), which can import fuel at a 10 percent custom duty and a 7 percent stamp duty (much lower than the regulatory tax).²⁸

²⁶ The Bahamas signed the first PetroCaribe agreement in 2005, but is not a signatory to the 2010 final agreement. The Bahamas imports fuel mostly from Barbados, and the country's own production is 320 b/d.

²⁷ It is also helped by the Bahamas Environment, Science & Technology Commission (BEST) which assesses the environmental impact of energy and electricity sector projects.

²⁸ This post-tax subsidy is not included in the estimates because of the lack of basis to fully estimate the size of such waivers/concessions.

Electricity tariff policy and subsidies

With support of the Bahamas Environment, Science & Technology Commission (BEST), the MOTE is in charge of energy sector regulation. BEC is the national electricity utility. With a total capacity of 438 MW (80 percent of electricity), The BEC supplies 93,000 customers on all major islands except Grand Bahamas, where the Grand Bahamas Power Company supplies about 18,000 customers (20 percent of electricity production). BEC is tasked with the secure supply of electricity at a reasonable price and is mandated to “purchase, generate, transmit, transform, distribute and sell energy to all consumers.” Tariffs include a generation cost component (or fuel charge, based on the cost of fuel purchased to generate electricity), a minimum charge (irrespective of customer, to represent the cost of meter rental), and other adjustments.²⁹ Estimations based on the price-gap approach indicate subsidies in the range of 0.5 percent of GDP in 2011–13, which are partially financed by fiscal transfers to partially compensate for financial losses at BEC. Losses due to inefficient energy consumption and operating system/transmission and distribution averaged 10–12 percent in 2011–13. To lower electricity costs and improve the efficiency of the electricity companies, the authorities plan to split the BEC into two new entities (one in charge of electricity transmission and distribution and the other in charge of electricity generation).

Barbados

Fuel and gas price policy and subsidies

Barbados is a net energy importer. Imports of oil-related products were around 20 percent its import bill during 2009–13. Locally-produced crude oil by the Barbados National Oil Company (BNOC), whose operations are governed by a statutory board, is shipped to Trinidad and Tobago for refining. The BNOC is responsible for the drilling and exploration of crude oil. The Ministry of Finance, Economic Affairs and Energy is in charge of defining broader strategies for natural resources, public utilities, the National Petroleum Corporation and the BNOC. It is also responsible for monitoring and regulating energy supply, including advising on petroleum product prices and issuing licenses and leases for all exploration and production. The regulation of fuel and gas services and pricing involves some ad-hoc adjustment in consumption taxes to help smooth high retail prices. Government and intermediaries have agreed that fuel prices are automatically set in relation to international prices.³⁰ Retail prices consist of the cost of imported fuel plus consumption, plus marginal profit of key intermediaries. The price-gap approach indicates almost no pre-

²⁹ The consumer types include residential, small Commercial, large commercial, and temporary service. There are no social tariffs or cross subsidization in the tariff structure.

³⁰ To the best of our knowledge, this pricing setting mechanism has been in place since the establishment of the Fair Trading Commission (FTC) in 2001.

tax subsidy but implied forgone taxes (post-tax subsidies) are estimated at 0.6 percent of GDP in the last three years (2011–13).³¹

Electricity tariff policy and subsidies

More than 95 percent of the country's electricity produced is generated from fossil fuels. The Barbados Light & Power (BL&P) is the sole provider of electricity (generation, transmission, and distribution), which is 80 percent owned by the Canadian company Emera. The Fair Trading Commission serves as regulator, including setting maximum rates, establishing principles for arriving at the rates to be charged, carrying out periodic reviews of the rates and principles for setting rates and standards of service. These involve ad-hoc tax adjustment to avoid high end-consumer prices. Electricity subsidies estimated using the price-gap approach average 1.2 percent of GDP in 2011–13.³² Energy distribution losses averaged 6 percent in 2011–13. The authorities have put greater effort in renewable energy policy with the introduction of tax incentives (some are zero VAT on renewable energy and income tax holiday of 10 years for developers, etc.)

Belize

Fuel and gas price policy and subsidies

Belize is a net importer of fuel, as domestic oil production has declined considerably; three private companies supply oil-related products to the domestic market. The Ministry of Finance regulates retail pump prices, which include relatively high taxes. To limit the impact of higher international prices on domestic prices, the authorities reduced import duties on fuel products in 2013, although forgone revenue was offset by an increase in the VAT.

Electricity tariff policy and subsidies

The Public Utilities Commission (PUC) regulates the electricity sector. Belize Electricity Limited (BEL), a state-owned enterprise (in June 2011, the government took over 70 percent of BEL) is the primary generator, transmitter, and distributor of electricity. There are also several small independent generators, and 43 percent of electricity consumed in 2012 was imported from Mexico's *Comisión Federal de Electricidad*. About 70 percent of electricity production is from hydropower and renewable sources, reducing oil dependency. Belize Cogeneration Energy Limited (Belcogen), which contributed about 9 percent of total electricity supply in 2012 using a by-product of sugarcane, known as bargasse, has the potential to reduce power generation costs and imports. All major load centers are connected to the country's national electricity system, which is also interconnected to the Mexican

³¹ The forgone tax is obtained by the gap between the new tax set by the government and the previous tax defined under the FCT's responsibility.

³² This figure includes direct budgetary transfers to BLP through transfers under a subsidy program scheme (Fuel Clause Adjustment, FCA) which amounted about 0.9 percent of GDP in 2013.

electricity grid since 1998. Technical and non-technical losses are relatively low and the effective collection rate is high (around 12 and 90 percent in 2012, respectively).

The electricity tariff is set by the PUC and includes a fixed component (to cover overhead expenses and a reasonable rate of return); a variable component (to reflect the electricity costs); and a deferred cost of power recovery or rebate to consumers related to the tariff stabilization program. There are subsidized tariffs applied to consumers of less than 125 kWh per month. Tariffs are adjusted annually, and every four years there is a full review of the tariffs' components. BEL created the "Cost of Power Rate Stabilization Account" (CPRSA), to stabilize electricity tariffs in the face of fluctuating fuel costs. Between 2008 and 2011 there was a significant buildup in the CPRSA, as actual generation costs were lower than projected under the tariff. To rebate consumers for this overcharge, electricity tariffs were reduced in 2012; however, this reduction was made at a time when generation costs increased well above PUC's regulated cost of power. This resulted in losses for BEL of about BZ\$16 million (0.5 percent of GDP). PUC later compensated for this loss through increased tariffs during the first half of 2013. Energy subsidies are not present in the government budget.

Bolivia

Fuel and gas price policy and subsidies

While Bolivia imports some petroleum products (mainly diesel), it exports natural gas to Brazil and Argentina. Retail fuel prices in Bolivia are administered by *Agencia Nacional de Hidrocarburos* (ANH), including gasoline, diesel, kerosene, LPG, jet fuel and fuel oil. Prices have been kept unchanged since 2000, and the subsidies recorded in the budget rose along with the rise in international energy prices to 3 percent of GDP in 2013 from just above 1 percent in 2006. The cost of fuel subsidies estimated by staff reaches around 4 percent of GDP, suggesting that some of the cost of subsidies may be implicitly borne by the national oil company *Yacimientos Petroliferos Fiscales Bolivianos* (YPFB). The authorities attempted to remove fuel subsidies in December 2010, but the policy was withdrawn after widespread protests. The price of natural gas for domestic consumption is also kept at a lower level than export prices (the appropriate opportunity cost), resulting in estimated subsidies of about 3.5 percent of GDP in 2012. The authorities have recently completed a plant to separate LPG from natural gas and are constructing another plant to help the country become self-sufficient in LPG. This may reduce the fiscal cost of energy subsidies, but may lead to larger implicit subsidies if domestic prices are kept at levels lower than their respective opportunity cost.

Electricity tariff policy and subsidies

There are two systems of electricity generation and distribution in Bolivia: the national network (*Sistema Interconectado Nacional*, SIN) consisting of 12 generators and seven distributors, both private and public; and regional operators (*Sistemas Aislados*, SA). The sector is regulated by the *Autoridad de Fiscalización y Control Social de Electricidad* (AE). Lower tariffs are applied to low-income households consuming up to 70 kWh/month (*tarifa dignidad*). The cost is borne by the generators and distributors, but it is relatively small (equivalent to less than 0.1 percent of GDP in 2012). While there are no subsidies reported in the budget, the price of natural gas for electricity generations is set at a price below export

prices. This implies that part of the fuel subsidies benefits the electricity users by lowering the electricity generation cost. Natural Gas-fired electricity generation accounts for about 60 percent of total capacity; hydroelectricity accounts for about 40 percent of supply.

Brazil

Fuel and gas price policy and subsidies

Brazil remains a net fuel importer despite increased domestic exploration and production. Large offshore oil and gas discoveries have raised the country's status as one of the world's foremost oil and gas producer countries. Oil output has leveled off since 2010 (at just above 2 million barrels/day), and further growth will be needed to attain the objective of net self-sufficiency. State-controlled PETROBRAS is the dominant participant in Brazil's oil sector, holding important positions in upstream, midstream, and downstream activities. The company held a monopoly on oil-related activities in the country until 1997, when the government opened the sector to competition. Since then, other foreign and domestic companies have entered the market. The government provides incentives to the production and exploration of fuel through different channels. For instance, the "pre-salt" (oil reserves situated deep under thick layers of rock and salt and requiring substantial investment to extract) discoveries in 2007 prompted a change in upstream regulation, granting PETROBRAS a greater role in strategic exploration and production. Biofuels currently account for around 15 percent of demand in the transport sector, where flex-fuel technologies account for around 90 percent of new passenger vehicle sales.

The institution responsible for energy issues is the *Ministerio de Minas e Energia*, (MME). This Ministry, through the Secretary of Energy (*Secretaria de Energia*, SEN) formulates national energy policies and supervises their execution. The principal government agency charged with regulating the oil sector is the *Agência Nacional do Petróleo* (ANP), which is responsible for exploration and production licensing and regulatory compliance. The government subsidizes fuel consumption through PETROBRAS, taking advantage of its dominant position in the domestic market. The government also adjusts a tax (or subsidy) on gasoline and diesel to further stabilize retail prices. For instance, fuel prices charged by PETROBRAS were not increased together with international prices after the 2008 price shock, giving rise to subsidies that were absorbed by the company. Domestic prices for gasoline and diesel remain lower than export prices, resulting in estimated subsidies of around 1 percent of GDP in recent years. Moreover, fuel excises were reduced to zero in mid-2012; although this is a temporary measure, it does not have a specified end-date. In part to make up for these losses, the government indirectly subsidizes PETROBRAS through the Brazilian Development Bank (BNDES), which lends at below market rates. Estimating the cost of these subsidies is difficult, and they are likely reflected in the budget below the line. The authorities plan to introduce a new pricing mechanism, but it is unclear whether this will close the gap with international prices.

Electricity tariff policy and subsidies

Hydroelectricity accounts for around 80 percent of domestic electricity generation (and 70 percent of capacity), and energy policy since the mid-2000s has aimed to increase the share

of alternative sources, including wind power, biomass, small hydropower systems. Continued expansion of hydropower is constrained by the remoteness and environmental sensitivity of a large part of the remaining resources, although 20 gW of hydropower capacity is under construction in the Amazon region. Brazil initiated an electricity sector privatization process in 1996 that led to the establishment of the National Electric Energy Agency (ANEEL), which regulates prices and electricity generation. Long-term electricity prices are set through a system of contract auctions, in which total long-term demand from the various distribution companies is matched, in a bidding process, to different combinations of potential supply, with the most competitive bids receiving long-term power supply contracts. Despite rounds of privatization, most generation remains under government control. ELECTROBRAS is the dominant generator in the electricity market, with a 40 percent share. The government also owns almost the entire electricity transmission network.

According to IEA (2013), electricity tariffs in Brazil have increased in recent years and, by 2012 the average price paid by industrial and residential clients reached US\$178/mWh and US\$237/MWh, higher than most comparators. Concerns about the impact of higher prices on the economy led the government to reduce some taxes and to renew large power generation concessions, in exchange for reduced power costs; this was expected to result in lower tariffs for industrial clients of up to 28 percent in 2013. Direct subsidies from the government to the electricity sector take mostly the form of transfers to the public hydroelectric facility Itaipu, part of ELECTROBRAS, which operates at a loss. The cost of this subsidy in 2013 was reflected in the budget as the *Conta de Desenvolvimento Energético* (CDE) and as revenue receivables from Itaipu, totaling about 0.2 percent of GDP. As of early January 2015, the CDE had a negative balance of about U.S. \$2 billion (0.1 percent of GDP) related to 2014 spending but for which transfers to the energy sector were delayed until 2015.

Chile

Fuel and gas price policy and subsidies

Chile is a net importer of fuel and natural gas. Although the National Petroleum Company (ENAP), a state-owned enterprise, has a monopoly over the production of refined products, the private sector freely imports refined fuel products and gas. The distribution of oil-related products in the domestic market is liberalized. Chile has had fuel price stabilization mechanisms in place for gasoline, diesel, and kerosene since 1991, when the *Fondo de Estabilización de los Precios del Petróleo* (FEPP) was created. The FEPP was complemented with the *Fondo de Estabilización de Precio de Combustibles* (FEPCO) in 2005, under which domestic fuel prices fluctuated within a 5 percent band (versus 12.5 percent under the FEPP) around a reference price determined by weekly import parity prices established by the Ministry of Mines and the National Energy Commission (CNE). When the import parity price exceeded the upper limit of the band, there was a tax credit to fuel distribution companies and a subsidy to the consumer; on the other hand, when the import parity price was lower than the lower limit of the band, the consumer paid an implicit tax. While the scheme performed well when the import parity price did not deviate significantly from the reference price, at times the stabilization fund generated significant fiscal costs, especially in 2008 and 2010-2011. In 2011 the authorities replaced the FEPCO with the *Sistema de Protección a los Contribuyentes ante las Variaciones de los Precios Internacionales de los*

Combustibles (SIPCO). Unlike previous mechanisms, the SIPCO relied on adjustments in fuel excise taxes to cushion prices, which still resulted in forgone revenue. The SIPCO was in turn replaced by the *Mecanismo Estabilización del Precio Combustibles* (MEPCO) in July 2014. Under the MEPCO, there are two bands: a 5 percent band around the reference price, and a second band of 5.1 Chilean pesos around the first band. According to the OECD (2013), fuel and gas subsidies (including foregone revenue) have however been relatively low, even in 2008 when they reached 0.8 percent of GDP.

Electricity tariff policy and subsidies

The CNE under the Ministry of Mines sets policies, while the *Superintendencia de Electricidad y Combustibles* (SEC) serves as regulator. Electricity production and distribution are conducted by private firms. Hydroelectricity is the main generation source. Chile exports hydroelectricity to Argentina in summer and imports thermal electricity from Argentina in winter. Electricity is mainly transmitted through the central interconnected grid, which provides electric power to 93 percent of Chile's customers. To mitigate the impact of rising electricity tariffs, the authorities established an electricity subsidy in 2005 for poor Chilean families whenever electricity tariffs increase 5 percent during a six-month period. This temporary subsidy takes the form of a discount on the energy bill. Electricity tariffs, which are published by CNE on a monthly basis, entail cross subsidies in favor of smaller users consuming up to 500kwh. The government has also used subsidies to private distributors to promote rural electrification (Vagliasindi, 2013).

Colombia

Fuel and gas price policy and subsidies

Colombia is a net energy exporter, including oil, gas, and coal (little of the latter is consumed domestically). The *Empresa Colombiana de Petróleos* (ECOPETROL), a state-controlled company, is the largest producer, but Colombia also has significant private sector participation. Retail fuel prices, which are set by the Ministry of Mines and Energy, have historically been subsidized. However, following the market price shock in 2008 that generated subsidies of about 1 percent of GDP, the government created a fuel stabilization fund for gasoline and diesel (*Fondo de Estabilización de Precios de los Combustibles*, FEPC) to phase out subsidies. Funded with an initial transfer of US\$170 million, the FEPC was created at end-2008, the purpose of which was to facilitate the elimination of previous fuel price subsidies (Garcia Romero and Calderon Etter, 2013). The government uses the FEPC to smooth price changes by financing (or saving) the difference between the export parity price and the moving average price of the previous 60 days. While intended to be self-sustaining, the fund reached a deficit of about US\$1.2 billion by end-2011 (0.4 percent of GDP), necessitating a loan from the Treasury (Kojima, 2013). Considering the deficit of the FEPC as a measure of fuel subsidies, these subsidies declined from 0.4 percent of GDP in 2011 to 0.1 percent of GDP in 2013, as the fund has reduced its yearly deficit (Government of Colombia, 2014).

Electricity tariff policy and subsidies

Hydropower is the dominant form of production followed by thermal production (mostly gas) which account for 64 and 31 percent of electricity capacity, respectively (Government of Colombia, 2013). There are 48 electricity producers but total production capacity is concentrated at six large firms, three of which are state-owned and account for over half of total capacity. However, the government however is considering a sale of the state hydropower producer Isagen, which would put most production into private hands. There are 11 transmission firms but state-owned *Interconexión Eléctrica S.A. (ISA)* controls most of the national network. There are a large number of electricity distributors and retailers, but the largest three serves most final consumers, with the two largest private distributors accounting for over half the market. From a demand perspective, the electricity sector is divided into a wholesale market that is open to registered power companies and large consumers (above 0.55 MWh/month or peak use of over 100 KW) and a regulated market. The regulated market is supervised by the regulatory agency *Comisión de Regulación de Energía y Gas (CREG)*. Tariffs are set to achieve global cost recovery and maintain margins at the production, transmission, and distribution stages, but (as with certain other public utilities) there is cross-subsidization by socioeconomic strata. Under this system (the *Fondo de Solidaridad para Subsidios y Redistribución de Ingresos*, FSSRI), users in the lowest three socioeconomic strata pay discounted electricity prices, and users in the top two strata and commercial users pay a 20 percent surcharge. The FSSRI runs a small deficit that is financed by state budget, but the budgetary costs of the electricity sector have been small in recent years (0.1–0.2 percent of GDP).

Costa Rica

Fuel and gas price policy and subsidies

Costa Rica is a net importer of fuel products. The import of petroleum products is performed by RECOPE (*Refinadora Costarricense de Petroleo*), a state-owned company, mainly from the U.S. Domestic fuel prices are regulated and set on a regular basis by ARESEP (*Autoridad Reguladora de Servicios Públicos*), a government body in charge of regulation of public services. Although an automatic price mechanism exists, it is subject to discretionary implementation. The price formula includes a distribution margin, and a single tax (*Impuesto único ó conglobado*) from the merger of the excise tax and the VAT (law 8114 of 2001). Fuel prices are set for RECOPE campus and for distribution services. Fuel taxes amounted to 1.6 percent of GDP in 2012. No subsidies are recorded in government accounts.

Electricity tariff policy and subsidies

The electricity sector is regulated by ARESEP, which sets prices for the purchase and distribution of electricity. The public sector controls all electricity distribution and transmission, as well as most generation. Almost all electricity generation is from renewable sources, notably hydroelectricity and geothermal generation (more than 70 percent and 13 percent of total supply in 2012, respectively). Distribution and transmission are carried out by the state-owned ICE (*Instituto Costarricense de Electricidad*). Technical and non-technical losses are also among the lowest in LAC (6.8 percent in 2000 and 10.8 percent in 2011). However, due to inadequate infrastructure, an even larger potential for hydro power remains untapped. Prices are set on a quarterly basis by ARESEP for residential and non-

residential clients, and for public lighting. Price adjustments are based on a formula based on fixed and variable costs, as well as climatic conditions, as generation costs increase during the dry season. ARESEP estimates that changes in the electricity price generally reflect the cost of fuel (49 percent), the electricity company (27 percent), demand for energy (12 percent) and climatic conditions (11 percent). Electricity tariffs are among the lowest in Central America (US\$255/MWh in 2013). No electricity subsidies are reported in budget documents. Residential consumption of electricity is subject to a reduced VAT/GST rate of 5 percent and monthly residential electricity consumption equal to or less than 250 kWh is tax exempt. The tariff entails cross subsidies in favor of smaller consumers (up to 200 kWh).

Dominica

Fuel and gas price policy and subsidies

Dominica is a net fuel importer country and transportation and other fuel consumption demand is mostly derived from fossil fuels. A large fraction of import of diesel and petroleum derivatives (over 30 percent in 2013) are accessed under the Petrocaribe agreement with Venezuela, under which the petroleum derivatives are purchased at market prices. The Ministry of Housing, Lands, Telecommunications, Energy and Ports is responsible for formulating energy policies. The government does not impose smoothing rules on prices, which are set on a market basis.

Electricity tariff policy and subsidies

The Energy Unit of the Ministry of Housing, Lands, Telecommunications, Energy and Ports sets policy on electricity generation and distribution and has an office coordinating Dominica's Renewable Energy Program. The electricity generation and distribution is in the hand of a single private company, Dominica Electricity Services (DOMLEC). Production is on average about two-thirds from fossil fuels and about one-third from hydropower, and the country is currently exploring geothermal generation. The first geothermal plant is expected to become operative in 2015/16. In 2010, the Project Management Unit (PMU) was established within the Energy Unit to oversight the geothermal generation. Operative costs of distribution are relatively high, given the high cost of labor, but technical and non-technical losses are low, at 8 percent in 2012. Billing efficiency is high, at 99 percent. There are no subsidies, as tariffs more than compensate for operational, distribution and generation costs.

Dominican Republic

Fuel and gas price policy and subsidies

The Ministry of Energy and Mining and the National Energy Commission (*Comisión Nacional de la Energía*, CNE) are responsible for energy policies. The government plays an important role in the supply of fuel products, including imports, transportation and distribution. Crude oil and refined petroleum products are imported largely from Mexico and Venezuela under favorable intergovernmental agreements while liquefied natural gas used for electricity generation is imported from Trinidad and Tobago. The Ministry of Industry and Commerce (MIC) regulates the sector and sets fuel prices on a weekly basis. The government holds 51% of the national refinery REFIDOMSA, which supplies about 25% of

the domestic fuel market. Private companies control transport and marketing. In face of fiscal pressures, the country progressively eliminated subsidies on gasoline, diesel and LPG during 2005–08. As a mitigating measure, part of the increased revenue was used as cash transfers to poor households and to drivers of public transportation. Transfer payments are made through a solidarity bank credit card (*Bonogas* cards). Subsidies cover the difference between the market price and the below-market price for consumption below a threshold established by MIC. Fuel prices are among the highest in LAC, and have led to smuggling from Haiti. Fuel subsidies have been reduced to modest levels (0.1 percent of GDP in 2013). However, until the automatic pricing mechanism ensures the pass-through of changes in international prices without foregone revenue, the reform remains incomplete. The resort to VAT tax reductions to smooth prices in recent years has affected negatively budgetary revenue. Fuel taxes amounted to 2 percent of GDP in 2012.

Electricity tariff policy and subsidies

The sectoral regulator is the Superintendence of Electricity (SIE), which sets tariffs each month. The public sector controls all distribution and transmission. The state plays an important role in the market through the Dominican Corporation of State Electricity Companies (*Corporación Dominicana de Empresas Eléctricas Estatales*, CDEEE), which includes the only transmission company (ETED), the three distribution companies (re-nationalized in 2003 after being privatized in 1999), and a monopoly on hydropower generation (EGEHID). Electricity also is generated by private and mixed companies, and is sold to distributors and large end-users through long-term contracts. Generation costs are high, as production is based on oil-derivatives (about 40 percent), natural gas (30 percent) and coal (15 percent); hydroelectricity represents only about 15 percent of total production. Electricity tariffs were near the average for LAC countries in 2013. In addition to cross subsidies, a reform in 2009 targeted subsidies to poor households replacing subsidies that had been provided on a regional basis. The sector is politicized and characterized by blackouts despite a large generation capacity. It faces financial difficulties due to (i) technical and non-technical losses (33 percent in 2013) owing to widespread theft notwithstanding a 2007 law criminalizing illegal connections; (ii) high generation and distribution costs; and (iii) the capping of electricity tariffs at levels that do not reflect actual production and distribution costs (price increases in the early 2000s led to riots). Distribution companies have accumulated arrears to generation companies, which constitute contingent liabilities for the government. Total electricity subsidies are estimated at about 2 percent of GDP in 2013.

Ecuador

Fuel and gas price policy and subsidies

Ecuador is an OPEC member and oil exporter. The prices of gasoline, diesel, and LPG are fixed by the *Agencia de Regulación y Control Hidrocarburífero* (ARCH). Fuel prices have remained essentially unchanged since 2002 and remain at very low levels, generating large subsidies. Smuggling of fuel into neighboring Peru and Colombia is a problem despite close cooperation between the three countries (Interpol, 2014). However, the authorities are considering replacing blanket subsidies with a fuel debit card that would be used to assign fuel quotas to vehicle owners (Ecuador Times, 2014). As of mid-2014 ARCH was

developing a database to enable it to develop a quota system sometime in 2015. The authorities are also considering phasing out the propane stoves commonly used in Ecuador with electric stoves. Consumers would be able to purchase these stoves (at an average cost of US\$ 300–400) by late-2014, taking advantage of special financing by the government. Total fuel subsidies (both the cash subsidy incurred by the government and indirect subsidies incurred via the state-owned fuel companies) were around 7 percent of GDP in 2011-2013.

Electricity tariff policy and subsidies

Electricity production in Ecuador is evenly split between hydropower and oil-fired thermal plants. Ecuador's state-owned power generation holding company *Corporación Eléctrica del Ecuador* (CELEC, created in 2010), accounts for most production and national transmission. The *Corporación Nacional de Electricidad* (CNEL, also state-owned) and its regional affiliates are the large distributor distributors of electricity. Electricity rates are set by the *Consejo Nacional de Electricidad* (CONELEC), and tariff rates include a subsidized “dignity tariff” of 4 cents per kWh for users who consume less than about 100 kilowatts per month (the exact cut-off varies by region and season. Heavier users (particularly those consuming more than 500 kilowatts per month) face significantly higher tariffs. In 2014 CONELEC raised tariffs by 1 to 2 cents/kWh on heavier residential and commercial users (while preserving the dignity tariff) to partially compensate for system-wide losses that generated a subsidy of about 0.4 percent of GDP in 2011-2013.

El Salvador

Fuel and gas price policy and subsidies

El Salvador is a fuel importer. The Ministry of Economy, through the *Dirección Reguladora de Hidrocarburos y Minas* (DRHM), is responsible for regulation in the hydrocarbon sector. The DRHM does not regulate fuel prices, which are freely set in the market. However, the authorities have in the past suspended excise taxes on fuel to cushion volatility; most recently for a six-month period in 2011 (this measure cost about 0.2 percent of 2011 GDP). El Salvador subsidizes LPG consumption via fixed monthly transfers to small consumers. Until April 2011 the price of a tank of LPGs was fixed and the government subsidized the difference of the market price and reference price. To better target the subsidy, the authorities began in 2011 to give the subsidy directly to the consumers with monthly consumption of electricity below 200 kWh. Small businesses and households with no electricity would be handed a special card to access these subsidies. The authorities have recently tightened eligibility and now require beneficiaries to officially register at the government agency *Centros de Atención por Demanda* (CENADE) to access the benefits under the subsidy program; there beneficiaries receive a card (*tarjeta solidaria*) that allows them to purchase LPG at subsidized prices from retail outlets. According to official budgetary calculations, the cost of the subsidy in 2013 was US\$ 134 million (0.6 percent of GDP).

Electricity tariff policy and subsidies

Major electricity generation sources in El Salvador are thermal (40 percent), hydroelectric (32 percent), and geothermal (24 percent, the largest share in the region) (ECLAC, 2012).

Hydroelectric production is owned by the state firm CEL (*Comisión Hidroeléctrica del Río Lempa*), with most other generation privately-owned. Electricity production is sold into an unregulated contractual market (serving larger consumers) and a regulated retail market. Transmission is controlled by the state company Etesal (*Empresa Transmisora de El Salvador*), whereas distribution is privately-owned (Reegle, 2014). Electricity prices are regulated by the *Superintendencia General de Electricidad y Telecomunicaciones*, (SIGET). Retail market prices are set according to costs and vary by provider and the level of service. The *Fondo de Inversion Nacional en Electricidad y Telefonía* (FINET, created in 1998) is the agency responsible of setting electricity subsidies. Households that have electricity consumption below 100 kWh per month (about 60 percent of households) are subsidized and receive a subsidy equal to about 89.5 percent of the difference between the market price and the reference price set by FINET. A new subsidy was established in mid-2012 for households consuming between 100 – 200 kWh/month (another 20 percent of households). While this program was intended to be temporary and expire after three months, it has continued to date. The government also subsidizes electricity consumption to the state-owned water company (*Administración Nacional de Acueductos y Alcantarillados*, ANDA) and other water pumping systems in rural areas. Electricity subsidies as reported in the budget have been around 0.8 percent of GDP in recent years, although the level of subsidization found by the IEA has been somewhat higher (IEA, 2014). Subsidies are delivered through preferential prices charged by the state-owned company CEL (*Comisión Hidroeléctrica del Río Lempa*), which is included within the account of the nonfinancial public sector budget.

Grenada

Fuel and gas price policy and subsidies

Grenada is a net fuel importer. Oil imports were about 25 percent of total exports in 2004–13, or 6.4 percent of GDP. The country purchases 30-40 percent of its fuel from Venezuela via Petrocaribe. The Ministry of Finance, Planning, Economy, Energy & Cooperatives, has a broad mandate for energy regulation and sets domestic fuel prices. The regulation of fuel and gas services and pricing allows for monthly domestic price adjustments to pass through international price and consumption taxes adjust when domestic prices reach a threshold (set by Act.). Retail prices consist of the cost of imported fuel plus consumption taxes, plus marginal profit of key intermediaries. The calculated level of subsidization was about 0.4 percent of GDP compared with 1.2 percent of GDP during the 2008 fuel price shock.³³

Electricity tariff policy and subsidies

³³ The forgone tax is obtained by the gap between the new tax set (monthly review) by the government and a benchmark consumption tax. The benchmark consumption tax is defined as the previous three months average consumption tax (prior to current month during which the consumption tax is reviewed). The subsidy of 1.2 percent in 2008 is due to the decision by the government to remit 50 percent of petroleum tax to oil importers (to compensate high cost of incomplete pass through supported by importers).

Grenada's electricity is mostly diesel based. The electricity market is dominated by a public-private company (private sector holding majority of share), Grenada Electricity Services Limited (GRENLEC) which has a monopoly in generation, transmission and distribution.³⁴ Reform efforts intend to raise renewable energy to a 20 percent share of domestic consumption by 2020. The country has nearly complete electrification. Electricity pricing is regulated by the "Electricity Supply Act" which provides for monthly tariff adjustments based on changes in the average fuel price during the previous three months.³⁵ The tariff structure in Grenada consists of a fuel charge, a non-fuel charge, value-added tax (VAT) and an environmental levy paid only by the residential sector. The price-gap approach based suggests estimated subsidies of about 2.3 percent of GDP in 2013 from 1.2 percent of GDP in 2011. Distribution losses are not high, at 8 percent on average for 2011–13.

Guatemala

Fuel and gas price policy and subsidies

Guatemala is net fuel importer, although it is also a small oil producer, and currently has no domestic refining capacity. Retail fuel prices reflect import prices, and the Ministry of Energy and Mines monitors the prices to ensure they stay within reasonable range, taking into account both international and external factors. Staff calculation based on retail prices suggests that there are no pre-tax subsidies.

Electricity tariff policy and subsidies

Generation in Guatemala is conducted by a number of firms, both public and private, and there are three private distributors. While about 60 percent of capacity is thermal, a majority of generation is renewable (hydro, biomass and geothermal). Guatemala is part of the regional Central America electricity market (*Mercado Eléctrico Regional*, MER), and is a net exporter of electricity through this network. Electricity tariffs are administered and published by the *Comisión Nacional de Energía Eléctrica* (CNEE). The authorities maintain a social tariff for households with a monthly consumption below 300Kwh, and electricity subsidies in the budget accounted for around 0.3 percent of GDP in 2013. Anecdotal evidence of large electricity thefts, especially in urban areas, suggest the presence of cross-subsidy between the paying and non-paying electricity users, which yields slightly higher implicit subsidies under the price-gap approach of about 0.5 percent of GDP.

Guyana

³⁴ WRB Enterprises (USA-based) owns 50 percent of its share, the Government of Grenada and the National Insurance Scheme together own 21 percent, employees 4.5 percent and the remaining 24.5 percent is owned by approximately 1600 Grenadian and Caribbean investors. <http://grenlec.com/OurCompany/Profile.aspx>

³⁵ To the best of our knowledge, there is no other regulator beside GRENLEC's responsibility. With technical assistance from the World Bank, the authorities plan to amend the Electricity Supply Act to establish an independent regulatory authority, which will set the price of electricity under a revised tariff-setting mechanism.

Fuel and gas price policy and subsidies

Guyana is a fuel importer, and while it has some oil reserves in the Takutu Basin, it never engaged in production at a commercial level. The Office of the Prime Minister is the principal policy-maker and together with the Guyana Energy Agency (GEA) implements the regulatory framework, including the granting of licenses to public utilities and independent power producers and approval of development and expansion plans. The authorities attempt to cushion the impact of fuel price changes on consumers by allowing the excise tax to vary while adjusting the price at the pump with a lag.

Electricity tariff policy and subsidies

The state-owned utility Guyana Power and Light (GPL) dominates the domestic market with a monopoly position on transmission and distribution, and a 55 percent share of generation. Generation of electricity is entirely fossil-fuel based and the majority of generation capacity comes from plants utilizing heavy fuel oil or diesel. The authorities are planning construction of a 165 mW hydropower plant at Amaila Falls, although the completion date will depend on private investment interest. The government provides direct subsidies aimed at supporting the company's investment and operational obligations and containing tariff increases. In this regard, the budget for 2014 envisaged US\$18 million for transfers to GPL (0.6 percent of GDP). In addition the budget included US\$15.5 million to meet the cost of maintaining the electricity subsidy of other electricity suppliers in Linden and Kwakwani (0.5 percent of GDP); and around US\$1.5 million (or about 0.1 percent of GDP) was allocated to assist old age pensioners to pay their electricity bills, for a total budgetary cost of 1.2 percent of GDP. Even with government assistance, GPL faces challenges due to technical losses of around 14 percent and non-technical losses of around 20 percent in 2011. The Office of the Prime Minister supervises the operating standards and performance targets for GPL but does not regulate tariffs. GPL tariffs are determined by a formula prescribed in its licensing agreement, which is reviewed by the Public Utilities Commission. In recent years, the full price derived from the formula has not been charged to consumers. An analysis of the electricity sector flows (including e.g. company financial statements) suggests that implicit electricity subsidies were about 1.3 percent of GDP, as the government has been directly subsidizing the company and not providing incentives to optimize operational costs.

Haiti

Fuel and gas price policy and subsidies

Haiti is a fuel importer, and petroleum products are purchased mainly from Venezuela under the Petrocaribe Agreement. Distribution of oil products in the domestic market is done by private companies. Haiti ceased implementing an automatic price adjustment mechanism in late 2010, prices on gasoline, diesel, and kerosene were frozen in nominal local currency terms until end-2014. When the difference between the fixed pump price and the import price is not sufficient to cover charges and fees, excise taxes and customs duties are progressively eliminated. As a result, forgone fiscal revenues are estimated to have risen from 0.2 percent of GDP in 2010 to 1.6 percent of GDP in 2013, and the government collected just 0.3 percent of GDP in fuel taxes in 2013. Moreover, diesel and kerosene prices at the pump were lower

than import prices, at an estimated cost of 0.2 percent of GDP in 2013. The government recently embarked on a fuel subsidy reform aimed at eliminating forgone revenue while implementing targeted mitigating measures, and putting in place an automatic price adjustment mechanism that will avoid subsidies.

Electricity tariff policy and subsidies

Electricity generation is carried out by private independent power producers (IPPs) and by the state-owned company (*Electricité d'Haïti*, EDH). Electricity is produced largely from oil-derivatives (about 85 percent in 2013), with EDH owning the only hydropower plant, which is currently being rehabilitated. EDH has a monopoly over electricity transmission and distribution. There is no independent regulator of the sector, which is instead supervised by the Ministry of Public Works, Transport and Communication, which has administrative oversight over EDH, and by the Ministry of Finance, for its financing role. The Prime Minister's office is also involved in the sector, through the Minister-delegate in charge of energy security. Tariff adjustments are proposed by EDH and approved by the council of ministers, although there has been no tariff adjustment since 2008. Subsidies in the electricity sector are significant (about 3 percent of GDP in 2013, a large part financed by Petrocaribe resources) and are a concern for fiscal sustainability. They stem mainly from the large share of electricity produced using fossil sources, high technical and commercial losses (67 percent in 2013), a low recovery rate (30 percent) and by high distribution costs. Subsidies are large even though the electricity price is among the highest in LAC.

Honduras

Fuel and gas price policy and subsidies

Honduras imports all of its fossil fuels, and no longer has any domestic refining capacity. Fuel prices are regulated by the Comisión Administradora del Petróleo (CAP). Uniform fuel prices are maintained in each of the country's two largest cities, with regular updates published CAP's website. CAP updates fuel prices on a weekly basis, with the formula based on CIF prices, taxes, and margins for distributors and retailers, which are privately-owned. Fuel prices in Honduras are relatively high, and the price-gap approach suggests that there is no subsidization.

Electricity tariff policy and subsidies

Electricity in Honduras is about two-thirds generated from fossil fuels (mostly heavy fuel oil) and one-third hydropower. The sector features a dominant role for the state-owned utility *Empresa Nacional de Energía Eléctrica* (ENEE), which is responsible for transmission, distribution, and a large share of production (including all hydropower). Private sector involvement in the sector has been limited to private investment in thermal production, which is then sold to ENEE under power purchase agreements. Tariffs are set by the Comisión Nacional de Energía, which has not changed the tariff schedule since 2009 (Honduras Comisión Nacional de Energía, 2014). The tariff schedule assigns very low prices to residential users, but charges much higher prices to commercial and industrial users. While average tariffs are not particularly low by regional standards, high production costs and in

particular large non-technical losses (theft, fraud, and illegal connections) have resulted in large losses for ENEE (El Herald, 2014). The overall result is a subsidy of around 1 percent of GDP in 2013. To stem further losses at ENEE, Honduras' parliament approved a breakup of the utility, which would separate the generation, transmission, and distribution functions and open the components up to private investment. This reform is expected to be carried out in 2015 (Reuters, 2014).

Jamaica

Fuel and gas price policy and subsidies

Jamaica is a net fuel importer, and petroleum consumption is high given its use in bauxite/alumina production, power generation and transportation. The Ministry of Science, Technology, Energy and Mining has overall responsibility for the formulation and review of energy policy. The Energy Division within the Ministry implements policy and monitors the functioning of the energy sector, in cooperation with the Petroleum Corporation of Jamaica (PCJ) for the fuel segment and the Jamaica Public Service Company (JPSC), for the electricity. Energy policies have recently centered on how to diversify sources and move towards renewable energies, especially in electricity generation. The country does not appear to have any implicit or explicit subsidies on fuels, and prices are set by the market.

Electricity tariff policy and subsidies

Jamaica's electricity sector is highly dependent on fossil fuels for generation (88 percent), mainly fuel oil and diesel. The remaining 12 percent is provided through renewable sources, including hydropower and wind (IADB, 2012). JPSC is the sole distributor of electricity and is majority privately-owned with government participation of 19 percent. JPSC is also engaged in generation (through a combination of hydroelectric and fossil fuel sources), and transmission. It also purchases power from five independent power producers, which amounts to a bit less of 40 percent of total electricity consumed in 2012. Despite high technical and non-technical losses of about 24 percent, tariffs appear to be covering costs and the price-gap approach does not estimate any pre-tax subsidy.

Mexico

Fuel and gas price policy and subsidies

Mexico is a net exporter of petroleum, although oil production has fallen by a quarter over the past 10 years, and about one-third of refined oil products are imported. Mexico also produces natural gas but is a net importer. The state firm *Petróleos Mexicanos* (PEMEX) has had a monopoly on production, refining, and distribution, although a constitutional amendment was approved in December 2013 that will allow private firms to produce oil for the first time (Plante, 2014). Fuel prices (gasoline and diesel) are determined on a monthly basis by the Secretary of Finance and Public Credit (SHCP). In order to establish prices the SHCP is served by a committee composed of the Secretary of the Economy (SE), Secretary of Energy (SENER), and advised by the Energy Regulation Commission (CRE). While a pricing formula exists based on PEMEX's production, distribution and retail costs, the government is able to set prices on an ad hoc basis. This can result in consumers paying a tax

(*Impuesto especial de productos y servicios*), or can generate a subsidy that is born by the state. Fuel subsidies peaked in 2008, at about 1.8 percent of GDP, and remained large in 2009 during a period where fuel prices were frozen. Since then subsidies have declined, but fuel subsidies in 2013 still represented about 0.7 percent of GDP. In 2014, the domestic price of gasoline was already high enough to result in fiscal revenues for the government, while the price of diesel continues to require a budgetary subsidy.

Electricity tariff policy and subsidies

Most generation is thermal (including natural gas, oil, and coal), with relatively small shares of hydro, nuclear, and other renewables. Most generation, as well as all transmission and distribution, is controlled by the state-owned *Comisión Federal de Electricidad* (CFE). Electricity tariffs are proposed by CFE and approved by SHCP, SENER, SE, and CRE (similar to fuel price-setting approval process, above). There are currently 43 different electricity tariffs. Tariffs to commercial and industrial users are higher than marginal costs and closely track production costs and inflation. Tariffs applied to small agriculture producers and regular domestic consumers (excluding high consumption), are lower, however, and are indexed only according to inflation expectations. While the tariff structure involves some cross-subsidization, the higher rates charged to commercial and industrial users are not sufficient to cover CFE's costs, and the federal government and CFE itself each cover part of the gap (the latter in part through a weaker net worth). SENER and CFE calculate subsidies by comparing the (weighted) average tariff *vis-à-vis* CFE costs (in pesos/kWh). More than 80 percent of electricity subsidies as of 2013 are received by domestic consumers. Electricity subsidies in the budget averaged about 0.7 percent of GDP in 2011–13. However, this may be an underestimate as budgetary subsidies (and data on consumption more generally), exclude federal government electricity use, and the costs borne by CFE may impact its ability to maintain and expand infrastructure.

Nicaragua

Fuel and gas price policy and subsidies

Nicaragua is an oil importer, largely from Venezuela under the Petrocaribe agreement, and has no domestic production. There is a privately-owned refinery, but most refined oil products are also imported. The *Instituto Nicaraguense de Energía* (INE), an autonomous state entity, regulates and controls the energy market in Nicaragua. The prices of gasoline, diesel and kerosene are established freely by the private distribution companies operating in the country. INE monitors weekly these prices and publishes in its webpage, but does not subsidize consumption. INE does set official prices for LPG, and while there is no outright subsidization according to the price-gap approach, commercialization margins have been compressed somewhat. There are also some foregone fiscal revenues as some LPG distributors are exonerated from paying the VAT. The government does not provide any blanket fuel subsidies, but does subsidize fuel purchases for public transportation (taxis and buses), financed off-budget through Petrocaribe resources.

Electricity tariff policy and subsidies

Nicaragua's electricity matrix relies mainly on fossil fuels, although there has been progress in diversifying into wind, geothermal, hydro and biomass sources. Electricity is produced by IPPs, a state-owned company (*Empresa Nicaraguense de Electricidad*, ENEL), and by ALBANISA (majority-owned by Venezuela). Transmission is done by a state-owned company (*Empresa Nacional de Transmision Electrica*, ENATREL), whereas distribution is privately-owned. INE is in charge of setting electricity tariffs (including the cost of electricity transmission), which are set as a weighted average of those applied to different consumption blocks involving an estimation of the composition of the client base. If, *ex post*, the client composition was different than estimated, the regulator compensates either consumers or the distribution company through the tariff. In 2008–10 tariffs broadly matched costs, but in 2011–13, INE established two different tariff schedules, one “notional” reflecting the best available annual forecast for electricity generation costs, and the other “effective” to be applied to clients. The difference between the two schedules is financed with Petrocaribe resources, peaking at about 1.5 percent of GDP in 2011 before falling to about 1 percent of GDP and further in 2013. In addition to this blanket subsidy, Nicaragua subsidizes specific groups, in particular households with electricity consumption lower than 150 kWh/month and pensioners. High non-technical losses are another source of subsidies, and while the situation has improved, large unrecognized distribution losses (as well as, at times, payment arrears in the electricity bill of public sector institutions, including SOEs), have caused the distribution company to run arrears with some electricity generators. Total subsidies estimated under the price gap approach remain significant at over 1 percent of GDP in 2013, albeit down from 3 percent of GDP in 2011.

Panama

Fuel and gas price policy and subsidies

Panama is a net fuel importer. The Secretary of Energy establishes maximum prices for oil-related products using a formula based on U.S. prices, transportation costs, and domestic value-added. Maximum prices are above cost, and here are no pre-tax blanket fuel subsidies. However, the government subsidizes via the state budget cooking gas and public transportation, the latter through preferential prices on diesel. The latter are targeted through the distribution of special coupons that can be redeemed at participating service stations. The total cost of fuel subsidies has averaged about 0.3 percent of GDP in 2011–13.

Electricity tariff policy and subsidies

Electricity capacity in Panama is about evenly split between hydropower and thermal sources, although the split in generation depends on rainfall. Most generation and distribution has been privatized, but the *Empresa de Transmisi3n El3ctrica Panameña* (ETESA) retains a state monopoly on transmission. Tariffs are regulated determined by the *Autoridad Nacional de los Servicios P3blicos* (ASEP), and the government retains the authority to set tariffs on an ad hoc basis, as seen in 2014 when it decided to freeze tariffs for the remainder of the year. To absorb these costs, the government maintain a tariff stabilization fund (FET, since 2004), which was intended to smooth out tariff increases but which has imposed fiscal costs since its inception. The authorities, in 2011, also created a compensation fund (FCE), to transfer to distributor forgone revenues arising from the fact that electricity tariffs were not

adjusted with generation costs. There are two types of electricity subsidies, one universal, and the other one is targeted at users with consumption below a threshold. The universal subsidy represents the bulk of the total electricity subsidies. Until 2013, targeted subsidies benefitted households with electricity consumption of 500 kWh per month and less. In 2013, the government began reducing subsidies, starting with households with consumption between 400 – 500 kWh per month. These measures have reduced budgetary subsidies from about 0.8 percent of GDP in 2011 to 0.3 percent of GDP in 2013. The government plans to further target subsidies by limiting them to households with consumption below 300 kWh per month by 2016. Pensioners also receive a subsidy of 25 percent of their bill, regardless of their income. Some households receive multiple benefits. During 2014, the government announced measures to reduce electricity consumption following a reduction in supply coming from hydroelectricity, and thus an increase in generation costs.

Paraguay

Fuel and gas price policy and subsidies

Paraguay is a net importer of fuel, and the Ministry of Industry and Commerce is in charge of regulating fuel prices. Price controls on gasoline were eliminated in the early 2000s, while slight subsidy on diesel remains which mostly benefits the agricultural sector. The state-owned oil company (*Petróleos Paraguayos*, PETROPAR) currently supplies diesel to distributors at a negative margin. Based on the diesel consumption volume in 2013 and the price structure for December 2013, related annual cost is estimated at around 0.1 percent of GDP. The budget does not report the fuel subsidies separately, and staff calculation based on retail prices does not suggest the presence of pre-tax subsidies for other oil-related products.

Electricity tariff policy and subsidies

Electricity generation in Paraguay is almost fully based on hydropower by two binational public companies (*Yacyreta*, together with Argentina; and *Itaipu*, together with Brazil). Surplus electricity is exported to Argentina and Brazil. There is no electricity regulator, but the *Administración Nacional de Electricidad* (ANDE) is in charge of administering the sector. Paraguay has low generation costs and the price gap approach does not indicate subsidization despite relatively high losses and low collection. The authorities are currently considering raising tariffs (which have been fixed for over 10 years), however, to allow for greater investment in the sector. ANDE also maintains social tariffs (last expanded in 2011) that subsidizes up to 75 percent of electricity consumption. The efficiency in the sector is hindered by the lack of infrastructure especially in electricity distribution, resulting in constant outages and high technical and non-technical losses. The fiscal cost of electricity subsidies reported in the budget outturn is low at less than 0.1 percent of GDP.

Peru

Fuel and gas price policy and subsidies

Peru is a net fuel importer, and the national fuel regulator is the *Organismo Supervisor de la Inversión en Energía y Minería* (OSINERGMIN). The state oil company, *Petróleos del Perú* (PETROPERU) is involved in refining and distribution along with private sector players, but

production is performed by the private sector. Peru does not directly set fuel prices, but in the past has adjusted excise taxes to smooth prices and maintains a stabilization fund (the *Fondo de Estabilización de Precios de Combustibles*, FEPC) to prevent full domestic pass-through from changes in international market prices. When reference prices exceed price bands (published on the OSINGERGMIN website), the fund provides transfers to refineries to compensate them for higher costs. FEPC has generated large fiscal costs, which peaked in 2008 at over 1.4 percent of GDP, including both direct costs and lost revenue (Vagliasindi, 2013). In recent years the authorities have progressively narrowed the range of products that are subject to these bands and have since 2012 only maintained price bands on diesel and LPG. Moreover, the authorities have recently aligned the price bands closer to market prices: from August 2013 through June 2014 the weighted-average reference price for diesel (the source of most subsidies in the past) never exceeded the price band in effect at the time.

Electricity tariff policy and subsidies

Electricity capacity is about evenly divided between hydropower and thermal sources, but hydropower account for most generation. There are 18 electricity producers and about 70 percent of production is private-owned, although majority state-owned Electroperu remains significant with about 25 percent of the market (Vagliasindi and Bresant-Jones, 2013). Transmission is divided between nine private producers, and most distribution (70 percent) is in private hands as well. Electricity tariffs are set by the *Organismo Supervisor de Inversión en Energía y Minería* (OSINERGMIN) on an annual basis. Tariffs for generation, transmission, and distribution are set after public consultation and auction and bidding processes among market participants that are designed to achieve cost recovery on a global basis. However, the authorities also apply social tariffs through the *Fondo de Compensación Social Eléctrica* (FOSE) for users below 100 kWh/month, which is financed by a surcharge on larger users and which does not generate a fiscal cost.

St. Kitts and Nevis

Fuel and gas price policy and subsidies

St. Kitts and Nevis is a net fuel importer. Publicly utilized petroleum products (mainly for power generation and governmental transport) in St. Kitts are imported under the PetroCaribe agreement with Venezuela at market prices. Private sector consumers are served by other private importers, also at market prices. The Ministry of Public Works, Housing, Energy and Utilities as well as the Ministry of Finance, Sustainable Development and Human Resource Development are responsible for the development and implementation of energy policy. The 1954 Petroleum Ordinance regulates the importation, storage and sale of petroleum products. Liquefied Petroleum Gas (LPG) price is regulated, given that is used mainly for cooking purposes at both residential and commercial level. Other fuel prices are not regulated. Total fuel subsidies included in the budget are low, with the latest available disaggregated information from the authorities reporting subsidies at 0.2 percent of GDP, in 2012.

Electricity tariff policy and subsidies

Electricity is mostly generated using imported diesel fuel. Since 2011 a small wind farm (2.2MW), the first in the eastern Caribbean, provides limited amounts of electricity on Nevis. The island of Nevis has significant geothermal potential and is currently pursuing options to construct a geothermal power plant on the island. Electricity in the country is produced by two main state enterprises, St. Kitts Electricity Company (SKELEC) on St. Kitts, and Nevis Electricity Company Limited (NEVLEC) on Nevis. Technical and non-technical losses are at around 17 percent, among the highest in the Caribbean. Despite a relatively consistent supply of electricity, self-production by private generators for self-production is still relatively high especially at hotels and resorts. Despite an 80 percent tariff hike in 2011, SKELEC and NEVLEC operate with subsidized tariffs that do not fully cover the cost of the service. Subsidies are now extended off-budget by the Sugar Industry Diversification Foundation (SIDF). Regulation and policy design are the responsibility of the Ministry of Public Works, Housing, Energy and Utilities, and the authorities intend to create an independent regulatory body, the National Energy Commission. The country is currently implementing an agenda foster energy source diversification and to promote renewable energy. The 2008 Nevis Geothermal Resources Development Ordinance allows for the exploration, drilling, production and use of geothermal resources, with the purpose of generating options to use cost-efficient approaches to electricity generation from renewable resources.

St. Lucia

Fuel and gas price policy and subsidies

St. Lucia is a net fuel importer. All refined petroleum products are imported and are mainly supplied by a single company. The Ministry of Physical Development, Environment and Housing as well as the Ministry of Public Service, Sustainable Development, Energy, Science and Technology are responsible for designing and implementing energy policies. During the 2000s, the authorities started to introduce mechanisms to smooth LPG and kerosene prices mainly through negative excise taxes at the pump. Gasoline prices have been also smoothed to some extent but prices are adjusted more frequently. The impact on the budget was estimated at about 0.3 percent of GDP (on average) for 2011–13. The subsidies on kerosene were repealed at the beginning of 2013 but the LPG subsidy is still in place. The authorities are considering further reform, including proposals to shift to a targeted subsidy regime, and are discussing energy diversification with a greater focus on renewable energy.

Electricity tariff policy and subsidies

Electricity is generated exclusively from imported fossil fuel at high costs. The sole electricity producer, transmitter, and distributor, LUCELEC, is partly controlled by the government with a share of 15 percent. LUCELEC enjoys monopoly rents (the government guarantees a consistent profit), and tariffs more than cover for fairly low technical and non-technical losses. Billing efficiency is very high. An Independent Regulatory Commission is responsible for the issuing of licenses, sets tariffs, and rates and approves investments in the energy sector. De facto, however, LUCELEC is largely self-regulating in setting its own electricity tariffs and self-monitoring that its standards are being met (IADB, 2012). Subsidies in the electricity sector are estimated to be zero.

St. Vincent and the Grenadines

Fuel and gas price policy and subsidies

St. Vincent and the Grenadines is a net energy importer. The Ministry of Finance is in charge of regulating fuel prices. Domestic fuel prices are adjusted based on a three-month rolling average pricing rule, which enables automatic pass-through of international prices but with a smoothing of volatility. Staff calculations based on retail fuel prices suggest that there is no pre-tax subsidies.

Electricity tariff policy and subsidies

Electricity generation and distribution are conducted by a single company, the St. Vincent Electricity Services Limited (VINLEC), which is a fully state-owned by the Government of St. Vincent and the Grenadines. Generation is primarily based on diesel, with about 20 percent of total production from hydroelectric generation. The Ministry of Energy is responsible for regulating the electricity sector. Electricity prices are regulated and consist of two components: a fixed rate determined by the Cabinet and a variable rate (or surcharge) that is adjusted automatically as stipulated by law. Staff calculations indicate that there are no electricity subsidies, which is consistent with surcharges that help pass through changes in input fuel prices.

Suriname

Fuel and gas price policy and subsidies

Suriname produces and exports crude oil but is a net importer and has limited refining capacity. The state-owned oil company (*Staatsolie*) is expanding its refinery capacity (planned to be completed by end-2014), which would contribute to reducing the fuel imports. The Ministry of Natural Resources regulates production of carbon fuel and electricity, and the Ministry of Trade and Industry regulates retail fuel prices and the import of fuel. Retail fuel prices were liberalized in 2005 and vary with international prices. The authorities raised the fuel tax by about 70 percent in January 2011 which, along with the 20 percent devaluation of official exchange rate, led to an increase in domestic fuel prices at pump by about 40 percent.

Electricity tariff policy and subsidies

Electricity generation is based mainly on hydropower. The Ministry of Natural Resources oversees the energy sector and sets electricity tariffs. SURALCO (a private alumina and bauxite producer), owns about half of the country's generation capacity and sells excess electricity to the state-owned electricity company, *Energiebedrijven Suriname* (EBS), through the government. EBS has not reimbursed the government for electricity purchases over the past few years, which resulted in the accumulation of arrears (which in 2011 alone were equivalent to 1 percent of GDP). There are also cross subsidies and transfers between the state-owned oil company (*Staatsolie*), EBS and the government for thermal generations: EBS's purchases of oil from *Staatsolie* for thermal generation is covered indirectly by the government by netting out the cost with *Staatsolie's* dividend payments to the government.

In addition, *Staatsolie* sells excess electricity from its own thermal generation plant to EBS, for which EBS does not make payment. Below-cost electricity tariffs are resulting in EBS's loss-making operations and these payment arrears. While the subsidies are not reported explicitly in the fiscal accounts, these cross subsidies are estimated at 1.5–2 percent of GDP on average in 2011–13.

Trinidad and Tobago

Fuel and gas price policy and subsidies

Trinidad and Tobago is an exporter of crude and refined petroleum, natural gas, and petrochemical products (which together account for most exports). Retail prices are set by the Ministry of Finance at subsidized levels for gasoline, diesel, kerosene, and LPG. A portion of the subsidy is paid for by a special levy on large crude oil produces equivalent to 4 percent of the value of crude oil produced, but this covers less than 20 percent of total fuel subsidy costs. The budget allocation for fuel subsidies amounted to about 2.7 percent of GDP in FY2012/13. In addition, the government has payment arrears resulting from fuel subsidies to PETROTRIN, the state-owned oil company, amounting to around 2.9 percent of GDP in FY2011/12. Subsidies on premium gasoline was lowered in October 2012, but the measure is estimated to have led to limited fiscal saving as consumers switched to super gasoline that is more heavily subsidized. The authorities intend to develop a national strategy to encourage conversion to motor vehicles based on compressed natural gas (CNG). As CNG is subsidized, a successful conversion may contribute to reducing the fiscal cost of subsidies.

Electricity tariff policy and subsidies

Electricity generation is primarily based on natural gas. There are two major generators in the country, POWERGEN and Trinity Power. The Trinidad and Tobago Electricity Commission (T&TEC), a state-owned enterprise, is the majority shareholder of POWERGEN, while Trinity Power is owned by a U.S. consortium. T&TEC also manages and maintains the transmission and distribution network. The Regulated Industries Commission (RIC) regulates the sector, developing and monitoring the standard of service and approving tariff rates. Residential tariffs consist of a three-tiered system depending on usage (higher prices are charged for the two monthly usages exceeding 400kwh and 1000kwh). The Ministry of Public Utilities manages the Utilities Assistance Program (UAP) for low-income pensioners, disabled and households, introduced in 2010, that provide subsidies on electricity consumption below 500kwh up to a maximum of \$870 per year.

Uruguay

Fuel and gas price policy and subsidies

Uruguay is a net fuel importer. The Ministry of Industry, Energy and Mining (MIEM) is the policy and regulatory authority in the sector. The state-owned company *Administración Nacional de Combustibles, Alcoholes y Portland* (ANCAP) has a predominate role in the sector and has a monopoly in refining and wholesale marketing operations within Uruguay. ANCAP also implements and helps design regulatory policies, as wholesale fuel prices are set by the government on the basis of proposals by ANCAP. There are no legal limits on how

often fuel prices can be adjusted, and price changes are closely aligned with international trends. Fuel prices in Uruguay are the highest in Latin America with taxes being the main components of fuel prices at the pump. Over the recent years ANCAP has been running losses that are covered by the budget (about 0.1 percent of GDP in 2013). Separately, the government reportedly subsidizes diesel for use in public buses at a cost of about 0.2 percent of GDP in 2014 (LaRed21, 2014).

Electricity tariff policy and subsidies

The electricity sector in Uruguay is dominated by the state-owned utility company *Administración Nacional de Usinas y Trasmisiones Eléctricas* (UTE), which controls about 60 percent of generation capacity. The remaining capacity corresponds to a hydroelectric power plant (*Salto Grande*, jointly owned with Argentina) and a few small private companies that generate electricity for their own consumption and sell their surplus to the grid. Both transmission and distribution activities are fully under the control of UTE, as established by the law. Hydropower generation, determined by rainfall, is the main source of electricity in Uruguay. Any shortfalls need to be covered by either electricity imports or alternative energy source, consisting mainly of thermal electricity generation. Limited availability of electricity imports from Argentina and high oil prices have made electricity generation in times of drought very costly.

UTE finances itself through user tariffs, which are set by MIEM and which are designed to achieve cost recovery. On average between 2000 and 2011, 96 percent of UTE's revenue came from sales of goods and services. Transfers from the federal government have only contributed marginally to UTE's financing, averaging 3 percent of total revenue between 2000 and 2005, and came to a halt in 2006 (World Bank, 2013). The electricity tariffs are set by the government, and the level of tariffs is expected to cover company's operating costs that widely vary with the amount of rainfall and oil prices, as well as depreciation of fixed assets, and to ensure a reasonable profit over the medium term. There are no legal limits on how often the tariffs can be adjusted. The lags in tariff adjustments, however, create temporary inter-temporal subsidies for electricity and could result in a lower surplus or a deficit for UTE during drought years.

Venezuela

Fuel and gas price policy and subsidies

Venezuela is major exporter, OPEC member, and possesses one of the world's largest oil and natural gas reserves. However, some problems at the state-owned oil company (*Petroleos de Venezuela*, PDVSA) in recent years have led the country to import refined oil products from the United States. The Ministry of the Popular Power for Energy and Petroleum and Ministry of the Popular Power for the Environment are in charge of regulating the domestic price of fuels. Consumption of all oil-related products is steeply subsidized, particularly gasoline (pump prices are the lowest in the world and have been unchanged since 1997). Fuel subsidies have been around 7 percent of GDP in recent years, a level that has led to overconsumption, inefficiency, and smuggling to neighboring countries.

Electricity tariff policy and subsidies

More than 70 percent of Venezuela's electricity generation uses hydroelectricity. The state-owned company, the National Electricity Corporation (CORPOELEC), dominates the electricity sector in Venezuela (controlling all major electricity companies including *Electrificacion del Caroni*, EDELCA)—which supplies around three-quarters of the country's total electricity supply. The Ministry for the Power of the People for the Electric Energy (recently created in 2009) is in charge of formulating and following up of energy policies; the planning, realization, and auditing of the activities related to electricity; the pricing, and the control and use of the power industry. FUNDELEC (*Fundación para el Desarrollo del Servicio Eléctrico*, created in 1992) became the regulatory body of the sector in 2007. Electricity tariffs are adjusted on an ad hoc basis (August 1th, 2014 the latest Electricity is also subsidized, mostly through the subsidized lower cost of fuel-based generation costs). Electricity subsidies appear to have increased in recent years to about 2 percent of GDP.³⁶

³⁶ There are also cross-subsidies among statutory bodies. For example, CORPOELEC, which is one of the country's largest domestic consumers of diesel and fuel, purchases it inputs from PDVSA at subsidized price to produce electricity.

Box 1. Measuring Fuel Subsidies by the Price-Gap Approach

One way to measure fuel subsidies (per unit of consumption) is to apply the price-gap approach, which is defined as the difference between the (average) price of fuel paid by end or intermediate goods consumers, and a benchmark price.¹ Depending on the price used as the reference or benchmark, the price-gap approach allows defining pre-tax and post-tax subsidies. Pre-tax subsidies (S_t^{PRE}) are defined as,

$$S_t^{PRE} = (BP_t - PP_t) \cdot UC_t$$

where BP_t is the benchmark price (usually a pure market price, including transport and distribution costs) at time t , PP_t is the end-user paid price, and UC_t represents total consumption (by households, or intermediate goods or service consumers, in physical units). Pre-tax subsidies are thus positive when the price paid by consumers is below production and distribution costs. In turn, post-tax subsidies are defined as,

$$S_t^{POST} = (BP_t^* - PP_t) \cdot UC_t \equiv S_t^{PRE} + T_t^* \cdot UC_t$$

where, $BP_t^* = BP_t + T_t^*$ is the reference price including optimal taxes. $T_t^* \cdot UC_t$ reflects forgone revenue at the prevailing tax plus a correction for negative (fuel) consumption externalities. The efficient tax ($T_t^* > 0$) includes the prevailing tax (T_t), and the Pigou corrective tax ($\tau_t > 0$) that accounts for the cost of negative environmental and other negative externalities related to fuel consumption.² Post-tax subsidies will be larger than pre-tax subsidies by an amount equivalent of optimal tax per unit of consumption times total consumption.

Pre-tax subsidies

Calculating pre-tax subsidies is generally straightforward, in particular for net fuel importers. In this case, reference prices are set at import prices (if necessary adjusted for quality differences), plus the cost of freight and insurance, and the cost of internal distribution and marketing.

¹ The price-gap approach results in better subsidy estimates than government budget data, mainly because subsidies may be channeled off-budget (quasi-fiscal operations). While the price-gap approach is widely used, it has several limitations (Koplow (2009)). By capturing only on the goods or services on which government intervenes, the approach misses other goods and services (i.e., research and development, subsidies on fuel production, etc.).

² While τ is not directly estimated, T is used as a proxy for T^* (generally an underestimation).

Box 1. Measuring Fuel Subsidies by the price-gap approach (Concluded)

For net fuel exporters, prices paid by the end-users may be higher than the cost of production and internal distribution, but there could still be implicit subsidies with limited budgetary impact. The subsidy, in this case, could be captured as the opportunity cost of domestic consumption at prices instead of exporting at international market levels. Reference prices are then set at the export prices (adjusted for quality differences if necessary), plus the cost of internal distribution and marketing. Local prices are converted to U.S. dollars at market exchange rates.¹ The energy exporting countries in the region include Bolivia (natural gas), Ecuador (crude oil), Trinidad and Tobago (crude and refined oil, natural gas), and Venezuela (crude oil).

Post-tax subsidies

Calculating post-tax subsidies is more challenging, as it requires assessing optimal taxes, including applying non-distortionary taxes and calculating the Pigou corrective taxes. This information is not available for all countries, which limits the accuracy of post-tax subsidies. For example, IMF (2013a) estimates post-tax subsidies by considering the VAT as the prevailing tax for all countries and by applying the same cost for the damages from global warming (\$25 per ton of CO₂ emissions) as a rough measure for the Pigou taxes.

Irrespective of the level of optimal taxes, it is possible to calculate foregone revenues vis-à-vis a given reference tax rate; this is particularly helpful when governments decrease taxes on oil-related products so as to stabilize their market value after a price shock. Foregone tax revenues can also be calculated using tax rate (or excises) generally included in other products but not applied to oil-related products.

¹ See Appendix II for data sources.

Box 2. Measuring Electricity Subsidies

Measuring subsidies originated in the electricity sector is relatively more complex. These subsidies (S_t^E) arise not only when tariffs do not fully cover costs, but also when they do not fully compensate for non-technical losses (including electricity theft). These losses can be sizable. Tariffs high enough to cover all losses imply a cross-subsidy between the users that pay for the service and those who do not. When tariffs do not cover the bill, the public sector has to pay, either directly or indirectly (Antmann (2009)). In more formal terms, subsidies originated in the electricity sector can be defined as,

$$S_t^E = \left[(P_t^G + AVD_t + OF_t) - P_t^S \cdot (1 - \lambda_t) \right] \cdot UC_t$$

In the expression above, P_t^S corresponds to the average electricity price (in, e.g., US\$/MWh) charged to electricity consumers; ($\lambda_t > 0$), is a “loss factor” denoting technical and non-technical losses of distribution, including unpaid bills (i.e., $\lambda_t > 0$ implies that the volume of electricity paid by consumers is a fraction $0 < 1 - \lambda_t < 1$ of the electricity purchased to generators); $P_t^G = P_t^E + P_t^T$, is the (average) electricity cost (in US\$/MWh), composed by a transmission fee, P_t^T , and the (average) electricity price charged by electricity generators, P_t^E . Importantly, $P_t^E = P^E(M_t)$, i.e., the average electricity price charged by generators will depend on the electricity matrix, M_t ; the more dependent the electricity generation is to fossil fuels, the more vulnerable the economy will be to oil price shocks. In turn, AVD_t corresponds to electricity distribution costs (in US\$/MWh); while OF_t corresponds to other factors that may be determined by the regulator (also in US\$/MWh). Finally, UC_t represents electricity produced (in MWh). This expression suggests that subsidies will be positive when tariffs do not fully reflect technical and non-technical losses in distribution, electricity transmission and generation costs, or distribution costs.

Box 3. Energy Subsidies and Country Characteristics

LAC countries that rank lower in measures of institutional quality generally provide larger energy subsidies. Simple regression analysis suggest that countries that were ranked lower in surveys and indicators tracking the quality of institutions and policies (as rule of law, government effectiveness, market access, budget transparency, corruption perceptions, competitiveness and ease of doing business), generally provided higher energy subsidies (on average) during 2011–13. The coefficient remains positive and statistically significant when considering fuel or electricity subsidies separately, and including a number of control variables, including energy richness. In particular, the latter (as proxied by whether a country is and oil producer or an oil importer), is also significant, with subsidies more likely to be found in energy rich countries.

Fuel subsidies are generally higher in LAC countries that are energy rich. Countries are more or less energy rich depending on the sign and magnitude of their oil trade balance. The coefficient of net exports of oil and derivatives (as percent of GDP) in a cross country regression is positive and statistically significant, after controlling for institutional quality.

The size of electricity subsidies in LAC appear to be related to measures of efficiency and cost. In particular, countries with larger electricity losses (technical and non-technical) and generation costs provided larger electricity subsidies, after controlling for institutional quality and the level of electricity tariffs. In turn, the coefficient on electricity tariffs was negative, i.e., given levels of electricity losses and costs, countries with larger tariffs provided lower electricity subsidies.

These results allow dividing countries in groups with more homogeneous energy subsidy policies. This allows simplifying the presentation of the results and the analysis. Accordingly, the description in the paper will make use of country groupings that assign countries according to their energy richness (separating oil producers and importers) and the quality of their institutions (identifying higher and lower ranked countries). In addition, the paper will focus in a number of specific groups, namely low income countries, Caribbean and Central America countries. Country size (as measured by GDP) and energy subsidies appear unrelated in LAC.

Caution is needed when interpreting the results for alternative country groupings. Although policies within these groups will be more homogenous with respect to the average size of subsidies, it is possible to still observe significant intra-group variation. This is the case as a number of countries within each group may be different with respect a different characteristic. For instance, Mexico and Brazil are both oil producers and ranked relatively higher in measures of institutional quality. It is then possible (and indeed the case) that these countries will provide larger energy subsidies when compared with countries in one grouping (institutional quality) and lower when compared with countries in a different grouping (oil exporters), increasing the within-group standard deviation. Appendix I describes the country groupings used in this paper.

Box 4. The Petrocaribe Arrangement

Petrocaribe is a multilateral agreement through which member countries have access to concessional financing when purchasing oil from Venezuela.¹ In addition to Venezuela (the creditor and exporter of oil and derivatives), current members include Antigua and Barbuda, Bahamas, Belize, Cuba, Dominica, Dominican Republic, El Salvador, Grenada, Guyana, Haiti, Honduras, Jamaica, Nicaragua, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, and Suriname, all oil importers.² Bilateral agreements between Venezuela and each member country regulate maximum importing quotas (in barrels per day) and specific financing terms, which in most cases include long repayment periods (17 – 25 years) and low interest rates (1 – 2 percent).³ The financed portion varies with oil market prices, (50 – 60 percent of the oil bill at current prices), while the remaining portion is paid in cash on commercial conditions. The agreement does not call for members to sell fuel domestically at below market prices. Indeed, the financing available depends crucially on domestic prices reflecting importing prices.

Members have used financing under Petrocaribe for a number of purposes, including for providing energy subsidies. Bilateral agreements include a clause specifying that members must use a portion of the financing for social purposes, but without tying it to any specific project. Accordingly members have used Petrocaribe flows to finance current and capital spending alike, sometimes off budget, as well as to build financial buffers. A number of countries (including the Dominican Republic, Haiti and Nicaragua) have used the financing to provide fuel and electricity subsidies.

Petrocaribe financing has at times funded off-budget spending, raising some transparency concerns. Although some members record Petrocaribe flows within the budget (as in the Dominican Republic), some others have used these flows off-budget, using different reporting and procurement rules (as in Dominica, Haiti, Nicaragua). This has raised some transparency concerns, as off-budget spending (including on energy subsidies) is more difficult to track.

Petrocaribe flows have been essential for member countries to withstand the increase in long-term in oil prices, at the cost of mounting debt ratios. The agreement allowed members to sustain non-oil imports despite the deterioration in their trade balances, without having to use central bank reserves. As a result, Petrocaribe-linked external debt has increased in particular in Nicaragua (where it represented 21 percent of GDP at end-2013), Haiti (17 percent of GDP), Jamaica (17 percent of GDP), Guyana (7 percent of GDP), and the Dominican Republic (5 percent of GDP).

¹ See IMF 2014c, Box 2.2.

² Guatemala left the arrangement in late 2013.

³ Importing quotas are binding, as they are below importing needs by members.

Box 4. The Petrocaribe Arrangement (Concluded)

Some member countries are particularly vulnerable to a discontinuation of Petrocaribe financing. Countries that would be most affected are those with no alternative financing sources and that have made little progress in reducing structural vulnerabilities in the energy sector, as in Haiti. Countries like the Dominican Republic (with a still-vulnerable electricity sector but with access to alternative financing sources), and Nicaragua (with a less-vulnerable electricity sector than a few years ago, but with no alternative financing sources), will be also affected, but less so.

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