# COLOMBIA

## TECHNICAL ASSISTANT REPORT—REFORMING ENERGY PRICING

November 2019

This paper on Colombia was prepared by a staff team of the International Monetary Fund. It is based on the information available at the time it was completed on July 2019.

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# Colombia
# Reforming Energy Pricing

Chadi Abdallah, Fernanda Brollo, Ayal Frank, and Delphine Prady

**Technical Report**

**July 2019**

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# GLOSSARY

ANH      Agencia Nacional de Hidrocarburos, ANH

CREG      Comision de Regulacion de Energia y Gas

FEPC      Fondo de Estabilización de Precios de los Combustibles

IP      Ingreso del productor

MME      Ministry of Mines and Energy

SCU      Strategic Communications Unit

SOE      SOE State Owned Enterprises

# PREFACE

In response to a request from the Minister of Finance, Mr. Alberto Carrasquilla Barrera, a Fiscal Affairs Department (FAD) technical assistance mission comprising of Chadi Abdallah (head), Fernanda Brollo, Ayal Frank, and Delphine Prady visited Bogota from March 27 to April 9, 2019 to provide technical assistance on energy subsidy reform.

The mission met with Mr. Alberto Carrasquilla Barrera, Minister of Finance, Ms. María Fernanda Suárez Londoño, Minister of Mines and Energy, Mr. Juan Alberto Londoño, Deputy General Minister of Finance, Mr. Diego Mesa Puyo, Deputy Minister of Energy, Mr. Juan Camilo Ostos Romero, Deputy Minister of Transportation, Mr. Rafael Puyana, Deputy Sectorial Director at the National Planning Department, Mr. Carlos Enrique Moreno, Presidential Advisor and Director of the Delivery unit, Mr. Andres Pardo, Chief Economic Advisor for the President, Mr. Ricardo Ramirez, Director of the Mining and Energy Planning Unit (UPME), Mr. Christian Jaramillo, Executive Director of the energy regulatory agency (CREG), Mr. Jose Moreno, Director of Hydrocarbons at the Ministry of Mines and Energy, Ms. Catalina Rueda, Deputy Director Mines and Energy at the National Planning Department, members of their staff and of other public entities in Colombia. The mission also benefited from discussions with private sector representatives and experts at Fedesarollo.

The mission team wishes to thank the government and other entities with whom it met for their excellent cooperation. The mission would like to express special thanks to Ms. Karen Rodriquez, Advisor to the Deputy General of Finance for the very warm hospitality and the logistical and technical support of all the staff at the Ministry of Finance.

# EXECUTIVE SUMMARY

**Energy Subsidy Reform is a key pillar of Colombia's national development plan.** Rising fiscal challenges in Colombia—which have been exacerbated by the adjustment costs associated with recent large migration flows from Venezuela—can risk derailing the government from their commitment to meet both its headline deficit target of 2.4 percent in 2019 and its structural deficit target by 2022, under the existing fiscal rule. The government is committed to embark on a reform strategy that aims at safeguarding the fiscal framework. Energy subsidy reform is one element of the government's strategy to address fiscal pressures. It is also consistent with efforts to enhance spending efficiency and free up additional fiscal resources for development needs, in line with the recommendations made by the expert commission on spending.

**The fiscal cost of fuel subsidies is estimated at around 0.35 percent of GDP in 2018.** Automatic pricing mechanisms for gasoline and diesel exist in Colombia, linking the evolution of the retail prices for these fuels to international prices. Monthly price adjustments are capped at 3 percent and 2.8 percent, for gasoline and diesel, respectively. Price smoothing is achieved through a fuel stabilization fund (FEPC). However, discretionary interventions have often led to the price smoothing mechanisms not being consistently applied, leading to pass-throughs—from international fuel prices—that are smaller than otherwise prescribed under the smoothing rules. This effectively implies the prevalence of subsidies. Furthermore, while domestic fuel demand is met through both imports and local production of refined products, the pricing mechanisms—for example, in the case of gasoline—incorrectly use a lower reference price, based solely on the export parity price (FOB), instead of a reference price that is based on the average of the export parity price (FOB) and the import parity price (CIF). This also implies the prevalence of subsidies. Finally, a direct subsidy scheme targeted specifically at the border regions also exists. Overall, we estimate the fiscal cost of fuel subsidies at around 0.35 percent of GDP in 2018.

**The fiscal cost of electricity subsidies is estimated at around 0.3 percent of GDP in 2018.** Electricity price subsidies apply only to residential consumption levels that are below a "subsistence" threshold.[1] They are financed through: (i) a Solidarity Fund by a cross-subsidization scheme—under which residential consumers in stratas 5 and 6 and commercial and industrial consumers pay a 20 percent surcharge on electricity tariffs; and (ii) direct budget transfers. The

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[1] The strata system categorizes dwellings according to quality—strata 1 being the lowest and strata 6 the highest—in order to target subsidies related to public utilities.

use of budget transfers is necessary since the surcharges paid by consumers in strata 5 and 6 and commercial and industrial consumers do not fully cover the total cost of electricity subsidies.[2]

**Carefully designed reforms entail a gradual phasing out of subsidies in the case of fuel products and, in the case of electricity, an improvement in the targeting over the medium-term.** Illustrative simulations presented in this report highlight the fiscal and distributional impacts of different reform options. Simulations show that net fiscal gains could be achieved both for electricity and fuel products, while reducing distortions. Over the long-term, any removal of subsidies—especially in the case of electricity—should be accompanied with an improvement in the social safety net. The simulations presented in the report do not constitute an exhaustive list of reform options.

**The mission identified several key issues in the fuel and electricity sectors.**

**The Fuel Sector**

- Discretionary political interventions continue to disrupt the full implementation of the automatic fuel pricing mechanism (AFPM) in the case of both gasoline and diesel. These mostly occur during times of high international oil prices, leading to subsidies when the increase in the retail price is less than what is implied by the AFPM. Subsidies arising from these interventions are estimated at around 0.33 percent of GDP over 2016-2018, on a cumulative basis. Discretionary interventions have largely contributed to an accumulation in the deficit of the FEPC over the years, which has reach around 1.3 percent of GDP as of end-2018 (this includes a total interest expense—on a cumulative basis—of around 0.2 percent of GDP over the same period).

- The supply cost currently used for setting retail prices of fuel products—the export parity price (FOB)— is not the appropriate reference price for Colombia. Using the export parity price as a reference price effectively constitutes a subsidy, especially when the demand for the refined fuel product is met through both imports and local production.

- Drastic differences in the price of fuel products between regions (border and non-border) have created large distortions. These price differences generate incentives for large-scale smuggling activities within the country, from border regions—which benefit not only from direct subsidies through lower reference prices in their pricing formulas, but also from large tax exemptions—to other non-border regions.

- The current approach to price smoothing through the stabilization fund is somewhat complex and often involves a multiple-step approach (e.g., in the case of diesel). It also involves a fuel stabilization fund which is extra-budgetary. The latter has two major implications: (i) it reinforces the perception—by the Colombian public—that fuel

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[2] In the rest of the report, electricity surcharges paid by consumers in strata 5 and commercial and industrial consumers are defined as "contributions".

subsidies do not exist since, by construction, they do not appear in the budget; and (ii) it unnecessarily exacerbates concerns about transparency which can be key for the public acceptance of price reforms (including more frequent adjustments in retail prices, in line with international price movements).

**The Electricity Sector**

- Market concentration generates large systemic players with potentially large fiscal risks.

- The regulatory process of tariff setting is complex and could be simplified. The current institutional setup involves a back-and-forth between the regulator CREG (*Comision de Regulacion de Energia y Gas*) and its Executive Committee, effectively slowing down the process for the issuance of tariff decisions by the former.

- Subsidies arising from electricity pricing lead to significant leakages to the top of the income distribution due to an outdated targeting system that relies on a strata system—categorizing dwelling units according to their main characteristics (e.g., quality of the roof, floor, presence of a garage or a yard)—that does not map well the household income distribution of the country. Currently, about one-third of these subsidies benefit households in the top four income deciles, while households in the bottom four income deciles receive only about half of total subsidies.

- However, a complete removal of electricity subsidies without appropriate mitigating measures in place would generate a significant welfare loss among poor households.

**Communication**

- Insufficient internal coordination is hampering the design and the delivery of a persuasive national communication campaign on the need to implement energy price reforms.

- A fully-fledged plan by the government to engage external stakeholders to serve as advocates for its energy reform policies has yet to be devised. The public opinion in Colombia holds a somewhat dim view of a potential increase in energy prices. There is also a debate about whether energy subsidies even exist. Consequently, the public may well be in a position to oppose price increases, absent any clear communication by the government on the need for energy price reforms in Colombia.

**The mission identified reform options to reduce energy subsidies while at the same time improve their targeting. The approach differs across sectors.**

**The Fuel Sector**

- *Depoliticize the price setting mechanism.* The application of the automatic pricing mechanism should be administered by an independent body that is immune from political pressures and requests for discretionary interventions.

- *Use the weighted-average of export parity and import parity prices in the fuel pricing formula for both gasoline and diesel.* This would imply increases in retail prices.

- *Reduce the existing disparities in the price structure of fuel products between the border regions and the non-border regions.* This would reduce distortions and may alleviate smuggling activities within the country (from the border to the non-border regions).

- *Switch to a price-band (PB) mechanism, of 3 or 5 percent, that directly smooths retail fuel prices at the pump.* The main advantage of smoothing through a price band approach—relative to the current smoothing mechanism through the fuel stabilization fund— is twofold: (i) it is more transparent and easier to understand from the public's perspective; and (ii) it is easier to implement and does not require extraordinary financing operations by the Ministry of Finance as is the case with the current smoothing mechanism in place. Under a PB smoothing mechanism, the excise tax (or subsidy) is the adjustor.

**The Electricity Sector**

- *Audit the distribution and retailers' declarations of contributions—i.e., the surcharges (see footnote 2)—*in order to ensure that they correspond to municipal strata records. This due diligence by the government will help reduce the fiscal exposure to systemic distributors' potential mismanagement. This is because the government compensates the difference between subsidies and contributions that are self-declared by distribution companies.

- *Simplify the regulatory process for the tariff-setting mechanism by giving CREG's Executive Committee a consultative role.*

- *Complement the current targeting mechanism through the strata system with the use of a socio-economic score.* The use of the socio-economic score (SISBEN4)—the Sistema de Selección de Beneficiarios Para Programas Sociales—in combination with the current targeting under the strata system will help reduce leakages at the top of the income distribution, while at the same time protect poor households.

- *Move to a targeting system that is solely on the socio-economic score (SISBEN4) and then, gradually, to an electricity ear-marked cash transfer scheme.* The adoption of a pilot experiment in a few representative regions or departments is highly recommended before fully rolling-out the targeting system at the national level. Eventually, electricity subsidies should be integrated into a well targeted social safety net.

**Communication**

- *Create a dedicated communication unit, tasked with leading the government's energy reform campaign.* Organizing internally around such unit is key to building an effective strategic operation. The unit—whose mandate should be given by the president and his cabinet—should achieve three important objectives: (i) organize and manage all communication campaigns that are related to government reforms; (ii) build the government's communication capacity; and (iii) develop messages and facilitates their dissemination to the public.

- *Develop and secure a public-private network of external stakeholders to help in winning the public support for the reforms in Colombia.* Such partnership between the government and key external stakeholders will be key to successfully designing and implementing the reforms. Its cooperative role would significantly advance the government's agenda for the reforms mainly through its ability to reach out to (and better inform) target audiences. This would significantly help in carefully shaping the national debate on energy price reforms in a way that can ensure winning the public's support for them.

**Finally, other considerations are equally important and should be taken into account when designing a successful reform strategy.** First, the fiscal adjustment efforts should be accompanied with measures that strengthen the social safety net and shield vulnerable households from the negative impact of the reforms. Second, a gradual (or a phasing-in) approach to price increases is highly desirable and is key to ensuring the success of the reforms and prevent price-reversals—with evidence suggesting that sharp increases in energy prices often generate intense opposition from the public. Third, coordination with the Central Bank can be key to avert potential negative macroeconomic consequences, especially in the context of the timing and the size of the required price increases under the reform. For instance, wage bargaining discussions in Colombia—between firms and unions or trade associations—generally occur in December of each year and tend to be centered around the annual headline inflation (i.e., the last month's annual or year-on-year inflation). The importance of taking into account the cycle of these wage bargaining discussions should not be underestimated when designing and implementing energy price increases under the reforms. More specifically, timing is crucial for how inflation responds to the increase in energy prices in terms of both magnitude and persistence. For example, a discretionary increase in energy prices that occur during the first six months of the year may induce very different impacts on inflation dynamics than a discretionary increase that occurs in the second half of the year. This is because the former would ensure that any inflationary impact due to energy price increases has already faded away in December, consequently weighing less (if at all) during wage negotiations. Therefore, in Colombia, reforming energy prices during the first half of the year would constitute a more prudent approach as it would avoid transforming a transitory supply-side shock—whose impact on inflation is a priori eventually set to dissipate in the short-run—into a demand-side shock whose impact on inflation becomes persistent and can exert wage spiral effects that may have direct implications for monetary policy.

# I. FUEL SECTOR

## A. Background

**1.        Oil production in Colombia has grown significantly over the last 15 years, making Colombia the third largest oil producer in South America after Venezuela and Brazil.** A series of regulatory reforms introduced since 2003 have attracted foreign investment in the oil and gas sector, leading to a surge in explorations, reserves, and production. Foreign oil companies were able to obtain full ownership in the upstream industry, effectively competing with *Ecopetrol*, the state-owned oil company. The creation of a regulatory agency ANH (*Agencia Nacional de Hidrocarburos*) released *Ecopetrol* from its administrative and regulatory responsibilities, thus increasing its autonomy. Planning and oversight for upstream and downstream activities were also consolidated in the Ministry of Mines and Energy in 2012. Crude oil production roughly doubled between 2007 and 2015.[3] More recently, crude oil production has started to decline, reaching 851,000 barrels per day in 2017, reflecting both a depletion of existing oil fields and a lack of new discoveries.[4]

**2.        Production, transportation, and refining activities in the oil sector are dominated by the national oil company, while the markets for wholesale distribution and retail are more fragmented.**  The national oil company—*Ecopetrol*— is an integrated company that holds over 60 percent of the country's reserves. It is the leading oil and natural gas producer in Colombia, accounting for around 64 and 68 percent of crude oil and natural gas production, respectively. *Ecopetrol* indirectly owns—through its subsidiary *Cenit*—roughly 80 percent of the crude oil pipeline capacity and most of the existing refineries in Colombia. It is also the country's largest petrochemical producer, with a production capacity of 475,000 tons per year. The company was partly privatized in 2007 through an initial public offering in the Colombian Stock Exchange, which raised around US$2.8 billion in exchange of a 10 percent stake in its ownership. Currently, the government owns about 85 percent of the total outstanding shares. On the downstream side, the market is characterized by: (i) 19 wholesale distributors—albeit the market is effectively dominated by three major distributors—*Terpel*, *Distribuidora Andina*, and *Chevron*—that jointly control 80 percent of the market; and (ii) more than 6,000 retail distributors (mostly gas stations).

**3.        Domestic demand for refined fuel products—gasoline and diesel—is met through both imports and local production.** While Colombia is a net exporter of crude oil, it has historically relied on importing refined fuel products in order to meet its domestic demand. However, the reliance on imports in the case of diesel has diminished markedly in recent years,

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[3] Currently, around 60 percent of the country's crude oil production is exported (mostly to the United States), making the country a net exporter for crude oil.

[4] Proven crude oil reserves have deceased in recent years, reaching 1.7 billion barrels in 2017—a 17 percent decline relative to 2016,

following the significant expansion of *Ecopetrol*'s refining capacity. Currently, imports of refined products amount to around 5 and 25 percent of total domestic demand for diesel and gasoline, respectively (data for year 2018). Gasoline consumption increased significantly over the last decade, growing by almost 50 percent, while diesel consumption remained relatively more stable over the same period, increasing by only 15 percent (Figure 1).

**4.      Fuel prices in Colombia have historically been regulated by the government, with the Ministry of Mines and Energy (MME) determining monthly prices for diesel and gasoline.**[5] Starting in the mid-1970s, the MME started to set fuel prices in an ad-hoc manner in response to changes in international fuel prices and domestic conditions. In 1998, the government—through new regulations—introduced pricing formulas that explicitly take into account the supply cost, for the purpose of establishing the price to be paid to refineries and to importers (*ingreso del productor "IP"*, or producer's income).[6] The new regulations also established the prices for the wholesalers, retailers, and final consumers, taking into account all margins, transportation costs, and other costs. While the new formulas initially allowed for some pass-through from changes in international fuel prices to retail prices, they were only applied consistently for a short period of time—from January to July 1999—after which the application of the price setting mechanisms by the MME was undermined by political interventions. Since then, these discretionary interventions have effectively precluded the MME from setting the supply costs in a way that is always consistent with their respective formulas. As a result, the period from year 1998 to year 2006 was marked by the emergence of fuel subsidies, since fuel was being sold below cost.

**5.      A fuel price stabilization fund was created in 2007 as a framework for smoothing fuel prices.**[7] The stabilization fund—*Fondo de Estabilización de Precios de los Combustibles (FEPC)*— is extra budgetary and is the framework for smoothing fuel prices in Colombia. Between 2011 and 2012 the MME introduced a procedure for setting producer incomes for gasoline and diesel, which is still in force, linking their evolution to international fuel prices. This mechanism was intended to contain price volatility in the face of large fluctuations of prices on the international markets.[8]  Price smoothing under the stabilization fund is implemented using a multi-step procedure, as follows:

i.      First, the daily trend in (the log of) international reference prices over the previous 60 days is estimated.

ii.      Second, the estimate from step (i) is converted into an equivalent monthly change.

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[5] Some of the responsibilities of the MME in regulating liquids fuel (except for setting prices for gasoline, diesel, and biofuels) have been reassigned to the Gas and Energy Regulatory Commission (*Comision de Regulacion de Energia y Gas*, CREG) in recent years (Decreto 4130 from 2011 and Decreto 1260 from 2013).

[6] Resoluciones 82438 (gasoline) and 82439 (diesel) of 1998.

[7] Law 1151 of 2007 created FEPC. Its structure and operational aspects were later established by regulations in the context of decree 4939 of 2008.

[8] Resoluciones MME 181602 from 2011 (gasoline) and 181491 from 2012 (diesel).

iii.   Third, the monthly estimate from step (ii) is used by the MME to set the supply cost for the following month as follows: If the international reference price is above (below) the supply cost and the corresponding monthly change estimated in step (ii) is positive (negative), then the supply cost increases (decreases) by the estimated monthly change. Changes are capped at $\pm 3$ percent for gasoline, and at $\pm 2.8$ percent for diesel.[9]

Fuel subsidies in Colombia are not explicitly recorded in the national budget, as the price smoothing mechanisms in Colombia as explained above—for both gasoline and diesel—operate through the fuel stabilization fund which, by construction, is extra-budgetary.

**6.      The fuel stabilization fund's deficit reached around 1.1 percent of GDP as of end-2018, due to several factors that have resulted in recurrent financial shortfalls in recent years.** The fund was established in 2008 with an initial capital of about US$277 million—all of which were rapidly exhausted by end-2010—mostly due to the fact that domestic prices, as set by the government, lagged behind the recovery in international fuel prices between 2009 and 2010. Figure 2 shows that the period that followed—between years 2011 and 2018—was marked by a swift increase in the deficit of the FEPC, which reached,10.6 trillion Colombian pesos at the end of year 2018. Deficits were initially financed from budgetary resources up until year 2011 when the government eliminated all budgetary financing operations that are related to the fuel stabilization fund, effectively requiring that its deficit financing will have to be met through extraordinary credit operations (for example, direct borrowing from the treasury).[10] A subsequent reform in 2016 reestablished budgetary financing.[11]

## B.  Key Issues

**7.      The gap between the reference price as set by the MME and the one implied by the pricing smoothing formula has increased in recent years.** The widening gap between the two reference prices is a direct implication of failures to consistently apply the price smoothing formula, which has resulted in the fuel price pass-through—from international prices to retail prices—being lower than its true value under the existing pricing rule. We estimate the reference price under the existing price smoothing rule over the period from June 2015 to February 2019, using the multi-step procedure described above. This estimate represents the true supply cost under the existing smoothing rule—which is the smoothed supply cost that should have prevailed absent any discretionary political interventions. We compare this estimate of to the observed supply cost—which is the actual supply cost as set by the MME. Figure 3 presents the two series and suggests that that deviations from the existing smoothing rule are evident and

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[9] These procedures only establish how changes to the producer's income should be set based on changes in international reference prices. However, it does not set the level of the producer's income.

[10] Ley 1450 from 2011. Decreto 4863 from 2011 established that the extraordinary loans form Treasury could have a maturity of up to one year, renewable for up to an additional year.

[11] Ley 1819 from 2016.

sizeable. These deviations are more prevalent in the case of diesel and tend to occur during periods of rising international prices.

**Figure 1. Consumption of Fuel Products and the Relative Share of Imports, 2010–2018 (in million gallons)**

*Consumption of Diesel*

*Consumption of Gasoline*

*Diesel: Share of Imports in Consumption*

*Gasoline: Share of Imports in Consumption*
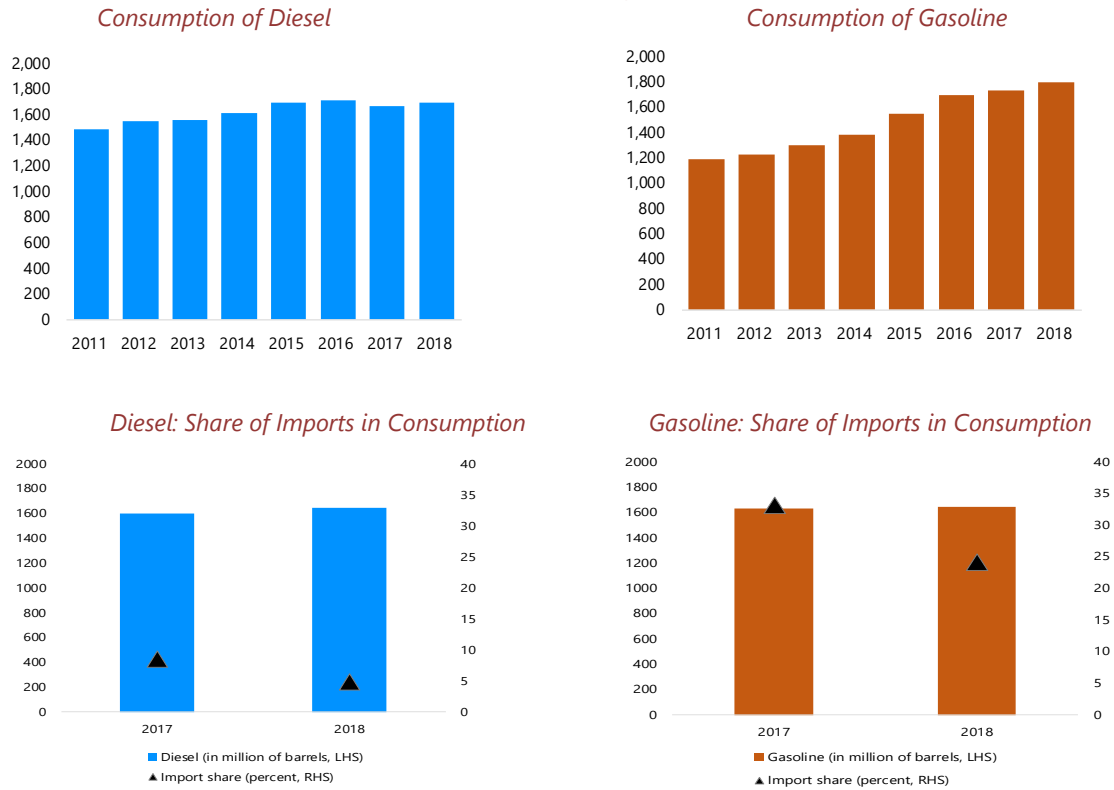
Source: IMF Staff calculations based on data provided by the authorities.

**Figure 2. Cumulative Deficit of the Fuel Stabilization Fund (FEPC) (Quarterly, in trillion of Colombian Pesos)**
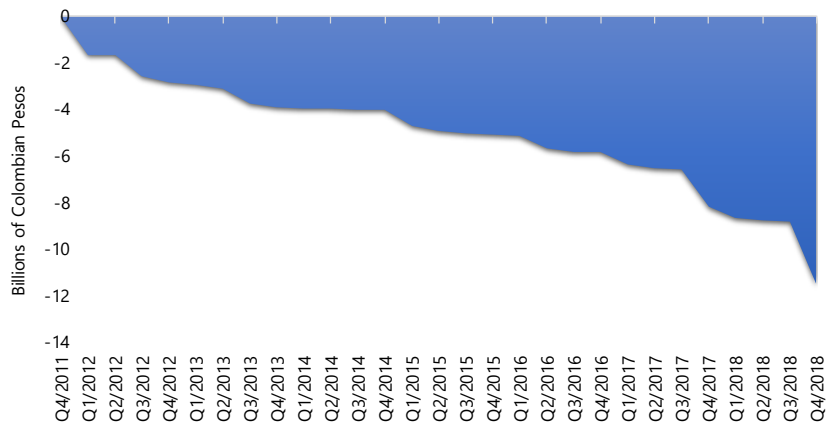
Source: IMF calculations based on data provided by the authorities.

**Figure 3. Reference Prices: Actual and Simulated**
**(July 2015–February 2019)**

*Diesel*



*Gasoline*
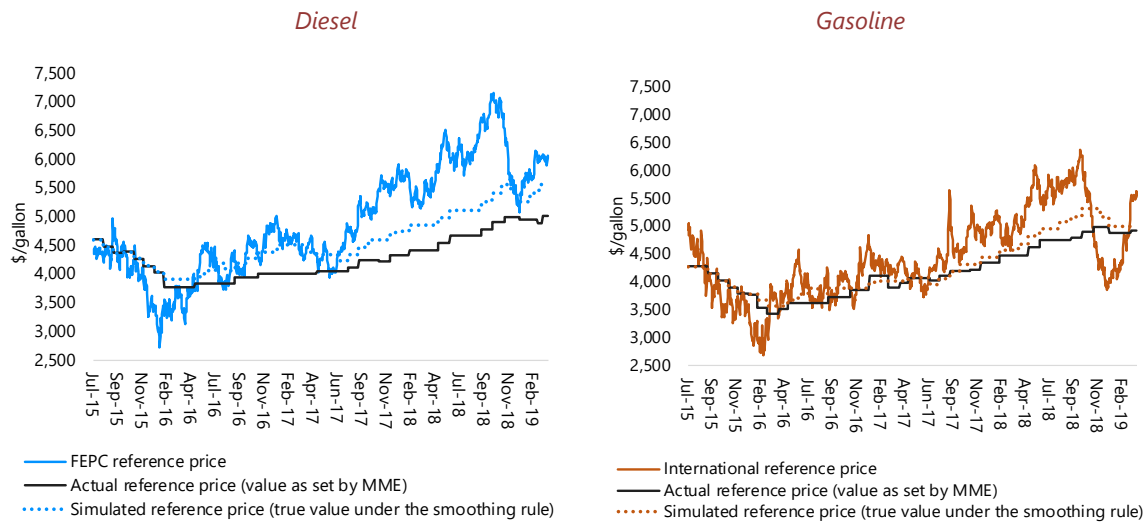


Source: IMF calculations based on data provided by the authorities.

**8.      Failures to consistently apply the price smoothing rule have generated a fiscal cost of 0.33 percent of GDP over 2016–2018 (on a cumulative basis), exerting pressures on the FEPC's deficit.** Discretionary interventions that have undermined the full application of the smoothing rule have resulted in a fiscal cost of 0.33 percent over the period from 2016 to 2018 (on a cumulative basis). Roughly 70 percent of this fiscal cost is attributed to the application of the price smoothing mechanism for diesel. Overall, deviations from price smoothing rules, as specified under the law, imply the prevalence of subsidies.[12] This has played an important role in the accumulation of the fuel stabilization fund's deficit which, as of December 2018, reached around 1.3 percent of GDP, on a cumulative basis—including an associated interest expense of around 0.2 percent of GDP.

**9.      Other factors have also contributed to the accumulation of the deficit of the FEPC.** Deviations from the smoothing rule as described above—the fact that the producer price as set by MME did not always follow the evolution of international prices over time as prescribed under the price smoothing formula—are not the sole factors behind the recurrent deficit of the FEPC. Other factors have also contributed to such deficit, including: (i) a direct subsidy scheme that is targeted at border regions is also a culprit—as it essentially specified a supply cost in the retail pricing formula that is lower than the actual cost—for pre-approved fuel volumes that reflect the

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[12] It is important to note that even if the pricing formula is applied correctly, smoothing (by construction) implies that there will be no full-pass through from changes in international fuel prices. However, since international fuel prices increase and decrease over time, retail prices tend to catch up in the medium to long-run and there will be no subsidies resulting from smoothing prices. In the case of Colombia, smoothing is not applied consistently as prescribed by the rule due to political interventions, a phenomenon that has led to the emergence of subsidies.

level of fuel consumption in municipalities. Overall, this policy is perceived primarily by the government as a measure that limits the smuggling of fuel from Venezuela to Colombia[13]; and (ii) other institutional factors, such as the inability of the fuel stabilization fund to receive inflows between mid-2014 and early 2016—when international prices were lower than the supply cost under the formula—as these were deemed unconstitutional by a 2013 Supreme Court ruling.[14]

**10.     Retail fuel prices in Colombia are low relative to a group of emerging economies, reflecting both, the lack of full pass-through from international fuel prices and the low taxation of fuel products.** Figures 4 and 5 suggest that retail prices for both diesel and gasoline are well below the average of prices across peers. Repeating the exercise using countries in the Latin American and Caribbean (LAC) yields similar conclusions. Low fuel prices are a result of two factors: (i) the lack of full pass-through from international price changes—which is mostly due to the fact that the price smoothing formulas for gasoline and diesel have been undermined over the years by discretionary interventions that limited the required price increase under the rules; and (ii) the relatively low taxation of fuel products in Colombia compared to other countries as shown in Figure 6, which suggests that—based on OECD data—total taxation paid on one liter of diesel in Colombia is equal to around 13 cents (average for the country) which is well below the average across countries (around 60 cents per liter).

**11.     The export parity price (FOB), which is currently being used to set the producer's income and retail prices, is not the appropriate reference price in the case of Colombia.** Under the current pricing regime, the formula for gasoline incorrectly use the export parity price as the reference price. A more appropriate reference price is a weighted average of the export parity (FOB) price and the import parity (CIF) price, where the weights correspond to the relative shares of imports and local production in domestic consumption. Using the export parity price as a measure for the reference price implies a subsidy, since Colombia's demand for fuel products is met through both imports and local production of refined products. The difference is not negligible and can vary by region.[15]

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[13] Resolucion 40727 from 2016. The amount of the subsidy is set as a fraction of the ingreso del productor established by MME. Resolucion 40266 from 2017 establishes the methodology to determine the subsidized fuel volumes assigned to each municipality, which is based on population and GDP. In addition to the direct subsidy scheme, fuel sales in all border regions are exempt from VAT and the national tax on fuels (Ley 1819 from 2016). Overall, fuel subsidies that are targeted at the border regions aim primarily at reducing price disparities with the bordering regions in neighboring Venezuela.

[14] In 2013 the Supreme Court ruled that these contributions were unconstitutional, as they constituted a tax that had not been created through a law as constitutionally required (Sentencia C-621/2013). In 2014 a tax reform law reestablished the contributions to FEPC, but they were declared unconstitutional again in 2015, due to concerns about legal procedures (Ley 1739; Sentencia C-726/15). In 2016 the contributions from refiners and importers to FEPC were reestablished as a parafiscal contribution (Ley 1819), which implies that FEPC can now collect them.

[15] In principle, from an efficiency standpoint, the import parity price should instead be used as a measure for the reference price.

**Figure 4. Retail Diesel Prices, 2018 (or latest available)**
**(US Dollars per liter)**
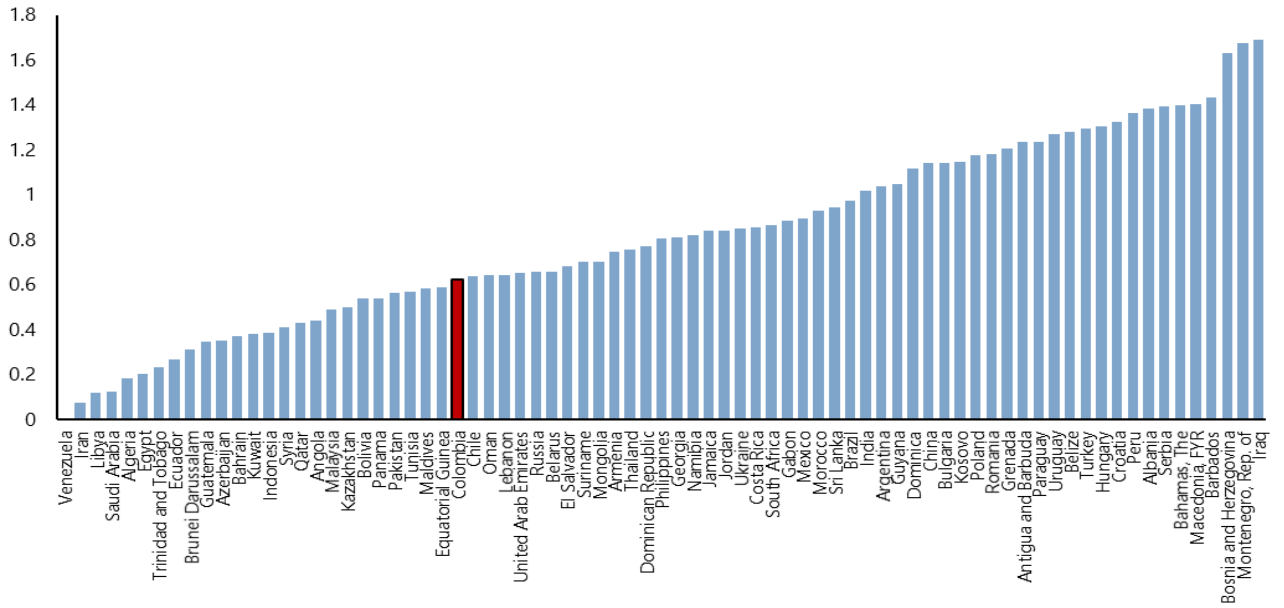


Source: IMF staff calculations.

**Figure 5. Retail Gasoline Prices, 2018 (or latest available)**
**(US Dollars per liter)**
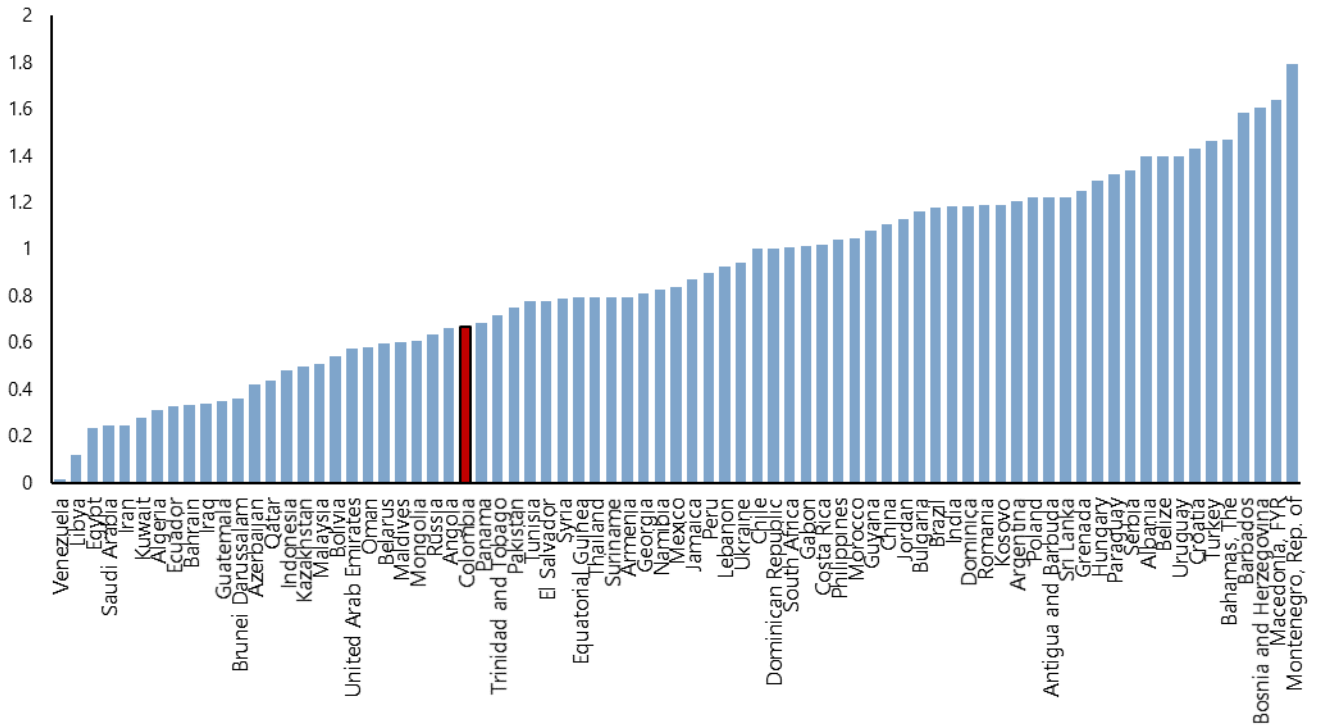


Source: IMF staff calculations.

**Figure 6. Total Taxes Paid on One Liter of Diesel, 2018 (or latest available)**
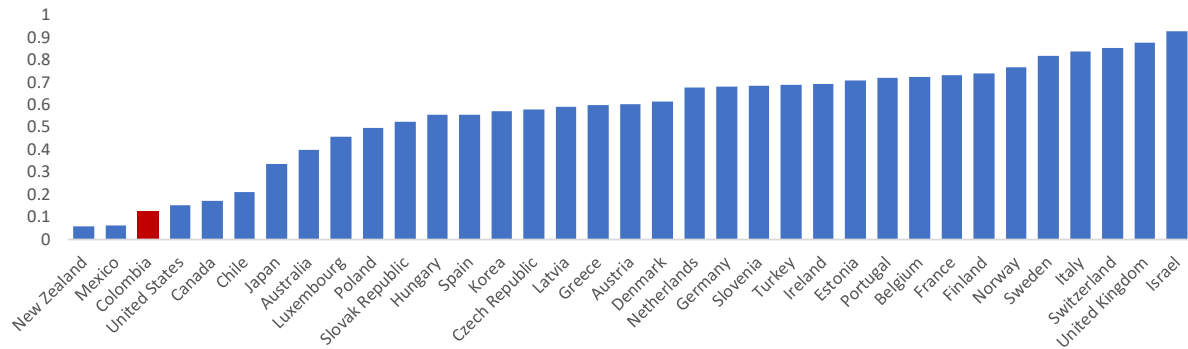


Source: IMF staff calculations based on OECD data.

**12.      Drastic differences in the prices of fuel products across regions in the country (border and non-border regions) create large distortions.** Border regions tend to benefit not only from direct subsidies through a lower reference price in their fuel pricing formulas, but also from large tax exemptions (Figure 7). Aside from being perceived as an effective tool for preventing smuggling activities from Venezuela to Colombia, the special regimes for the border regions is—to a certain extent—also considered as a channel that provides them with much needed economic support.[16] Nevertheless, it is important to note that price disparities generate incentives for large-scale smuggling activities from the border regions to the rest of the country. These smuggling activities from the border to the non-border regions can have large negative consequences that may well outweigh the perceived positive impact on limiting the smuggling of fuel from Venezuela to Colombia. Overall, special taxation regimes for fuel products may not be the proper approach for addressing issues pertaining to the redistribution of income, and thus should be carefully revisited in the context of the overall tax policy framework.

**13.      Consumer price subsidies are calculated using the price-gap approach, as the difference between the full pass-through price and the regulated price.** The full pass-through price is the weighted average of the export and import parity prices as discussed above, in addition to transport costs, margins and taxes. This is the price that would prevail if there were no subsidies. The fiscal cost of fuel subsidies is estimated at around 0.35 percent of GDP in 2018 and is expected to stabilize over the medium term after slightly declining in 2019 (Figure 8), mainly due to dynamics in the forecast of international oil prices.

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[16] A large number od the bordering regions is considered less developed relative to other regions in the country.

**Figure 7. Price Structure of Fuel Products – Border vs. Non-Border Regions, 2018**
(**COB per gallon**)
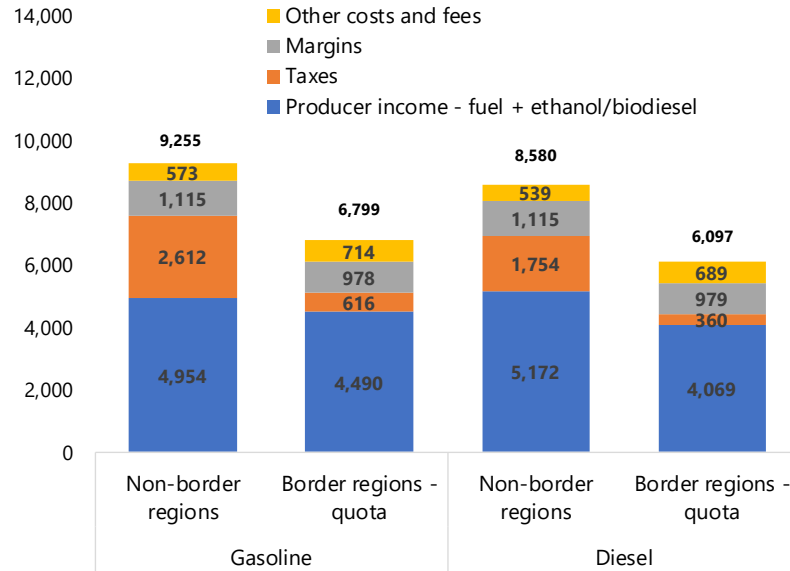


Source: IMF staff calculations based on OECD data.

**Figure 8. Fiscal Cost of Subsidies, 2016-2022  (US Dollars per liter)**
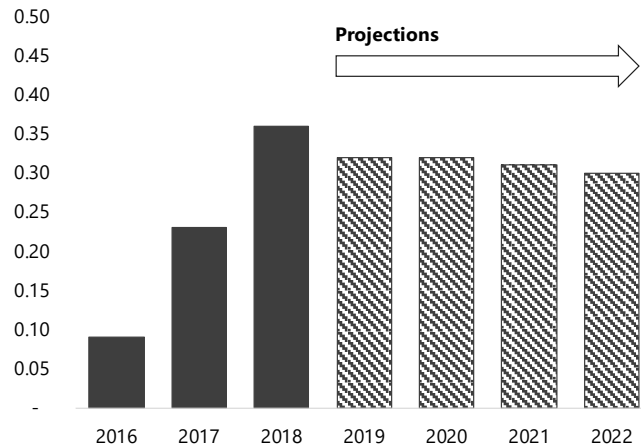


Source: IMF staff calculations based on data from the authorities.
Estimates for 2019-2022 are projections.

## C.   Reform Options

**14.      Carefully designed reforms entail a gradual phasing out of subsidies in the case of fuel products.** Reform options should aim at reducing the incidence of energy subsidies while at the same time improve their targeting. The approach may differ across sectors.

**15.    Depoliticize the price setting mechanism would eradicate discretionary interventions and their fiscal costs.** The application of the automatic pricing mechanism should be administered by an independent body that is fully immune from political pressures and discretionary interventions.

**16.    Use the appropriate reference price in the pricing formula**. Using the weighted-average of export parity and import parity prices in the fuel pricing formulas for both gasoline and diesel is a more appropriate approach in the case of Colombia. Table 1 presents the proposed price structure for diesel and gasoline in 2018, using the weighted overage of export and import parity prices in the case of both, gasoline and diesel. These data are based on monthly estimates that are weighted by the consumption shares of border and non-border regions.

**17.    We simulate the fiscal impact of a set of illustrative scenarios and their implications on fuel taxation**. A reduction in fuel taxation may be an option to initially offset the effect of the price increase faced by consumers, which will result from using the appropriate reference prices in the formulas. However, given that Colombia's total fuel taxation is well below the average across countries, a further reduction in fuel taxation will only worsen Colombia's position in this regard. From that perspective, it is important that any reduction in fuel taxation in the short-run (as a mitigating measure for the reform) is addressed in the context of a strategy that aims at increasing Colombia's target fuel taxation going forward. For example, a short-run reduction in the national excise tax on fuel should at least be reversed gradually in medium term—or be offset by a gradual increase in the current relatively low rate of the carbon tax—an increase that is normally easier to get public support for due to its positive environmental implications. Table 2 shows how, for Bogota, using the appropriate reference price in the formulas can be potentially be offset by reductions in taxation under different assumptions. Overall, fully shielding the consumer from any implied increase in prices under the reform may entail a reduction in the VAT rate on fuel products from 19 percent to around 9 percent in the case of gasoline and from 19 percent to 1 percent in the case of diesel (Table 3).

### Table 1. Proposed Price Structure for Gasoline and Diesel Under the Reform, 2018 (COB per Gallon)

|  | Gasoline | Diesel |
|---|---|---|
| Supply cost - fuel | 4842.4 | 5321.8 |
| Supply cost - ethanol/biodiesel | 690.4 | 932.6 |
| Taxes | 2577.6 | 1829.2 |
| Margins | 1105.7 | 1103.2 |
| Other costs and fees | 582.7 | 552.7 |
|  |  |  |
| Proposed Retail Price (no subsidy) | 9798.8 | 9739.5 |
| Difference Relative to the Current Retail Price (subsidy amount in COB) | 715.1 | 1367.7 |
| Required Price Increase to Eliminate the Subsidy (percent) | 7.9 | 16.3 |

Source: IMF staff calculations based on data from the authorities.

## Table 2. Alternative Scenarios for Fuel Tax Reductions to Offset the Increase in Retail Fuel Prices Under the Reform

| | Gasoline | | | Diesel | | |
|---|---|---|---|---|---|---|
| Scenarios | Retail price increase (in percent) | VAT (rate) | Excise Tax (Impuesto nacional, COB) | Retail price increase (in percent) | VAT (rate) | Excise Tax (Impuesto nacional, COB) |
| 1. Consumers pay 100 percent of implied retail price increase | 8 | 19 | 459.1 | 16 | 19 | 438.8 |
| 2. Consumers pay 75 percent of implied retail price increase | 6 | 19 | 283.9 | 12 | 19 | 97.2 |
| 3. Consumers pay 50 percent of implied retail price increase | 4 | 19 | 108.6 | 8 | 15 | 0 |
| 4. Consumers pay 25 percent of implied retail price increase | 2 | 18 | 0 | 4 | 9 | 0 |
| 5. Consumers pay 10 percent of implied retail price increase | 1 | 16 | 0 | 2 | 5 | 0 |

Source: IMF staff calculations based on the new proposed price structure for Gasoline in Bogota (data for 2018).

## Table 3. Alternative Scenarios for VAT Tax Reductions to Offset the Increase in Retail Fuel Prices Under the Reform

| | Gasoline | | Diesel | |
|---|---|---|---|---|
| Scenarios | Retail price increase (in percent) | VAT (rate) | Retail price increase (in percent) | VAT (rate) |
| 1. Consumers pay 100 percent of implied retail price increase | 8 | 19 | 16 | 19 |
| 2. Consumers pay 75 percent of implied retail price increase | 6 | 16 | 12 | 13 |
| 3. Consumers pay 50 percent of implied retail price increase | 4 | 12 | 8 | 7 |
| 4. Consumers pay 25 percent of implied retail price increase | 2 | 9 | 4 | 1 |
| 5. Consumers pay 10 percent of implied retail price increase | 1 | 7 | 2 | -2 |

Source: IMF staff calculations based on the new proposed price structure for Gasoline in Bogota (data for 2018).

**18.      Increases in diesel prices under the proposed reform should be managed carefully, especially in the context of the energy intensive sectors, such as the public and cargo transport sectors.** Reform options that aim at initially offsetting the price increase can be pursued in the short-term, then gradually phased out over the medium-term. These may include electronic rebate programs or reductions in excise taxes, as in the case of the Turkish energy subsidy reform (Box 2). Annex 2 presents the experience of Morocco under which reforming diesel prices was particularly carefully managed by the government.

**19.      Fuel subsidies accrue predominantly to the non-poor.** The richest 20 percent of households receive almost half of the total subsidies on gasoline and diesel, whereas the poorest 20 percent receive only 7 percent of these subsidies (Figure 9). This largely reflects the consumption patterns, as households in the richest decile allocate a much higher fraction of their spending to fuel products (considering both direct and indirect consumption) than those in the poorest decile.

**Figure 9. Colombia: Distribution of Fuel Subsidies
(by Income Decile)**
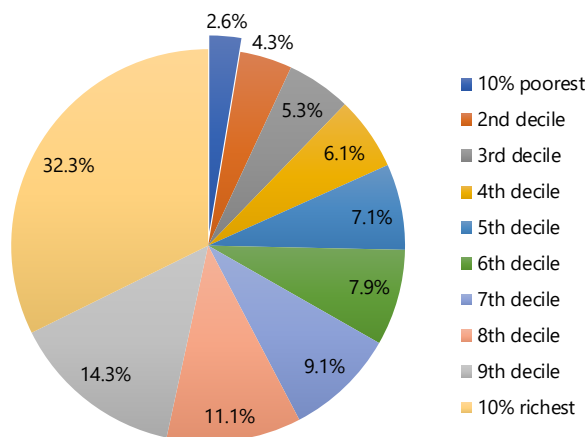


| | |
|---|---|
| ■ | 10% poorest |
| ■ | 2nd decile |
| ■ | 3rd decile |
| ■ | 4th decile |
| ■ | 5th decile |
| ■ | 6th decile |
| ■ | 7th decile |
| ■ | 8th decile |
| ■ | 9th decile |
| ■ | 10% richest |

Source: 2017 ENPH expenditure and income survey, 2010 input-output table prepared by the National Administrative Department of Statistics (DANE) and IMF calculations.

**20.     The proposed reforms have an impact equivalent to a reduction of around 0.6 percent in the real purchasing power of household on average, with most of this effect being accounted for by diesel price reforms.** Using the appropriate measure of supply cost for gasoline would lead to an 8 percent increase in gasoline prices, which would have a welfare effect equivalent to a reduction of 0.1 percent in household consumption on average. In the case of diesel, the welfare effect of reforms is almost five times larger, averaging around 0.5 percent. This reflects both the larger subsidy for diesel—with an increase equivalent to 16 percent under the reform compared to gasoline (8 percent increase under the reform)—and the fact that diesel consumption (both direct and indirect) accounts for a larger fraction of household spending than gasoline. Most of the welfare effect of the increase in diesel prices is indirect, being induced by increases in the prices of other goods whose production depend on diesel as an input. Shielding the transportation sector from the increase in diesel prices would reduce the welfare impact by almost two thirds.

**21.     Switch to a price-band (PB) mechanism, of 3 or 5 percent, that directly smooths retail fuel prices at the pump.** The price band sets a limit on the magnitude of retail price changes in a given adjustment period. Caps are set as a proportion of the current retail price (for instance 3 percent, 5 percent or 10 percent). For illustration, assume that at the start of each quarter, the retail price is determined according to a formula that incorporates a price band smoother of 5 percent. Under such mechanism, If the required retail price change under the formula—based on the evolution of international fuel prices—is, for example, 8 percent, then only the maximum (i.e., the 5 percent) is allowed to be passed to retail prices during that quarter. The remaining 3 percent will be passed to retail prices in the following quarter. This mechanism, for transparency and credibility purposes, should operate symmetrically (i.e., for both price increases and decreases on the international market. This mechanism has several advantages relative to the current smoothing mechanism through the stabilization fund: (i) it is more

transparent and easier to understand from the public's perspective; and (ii) it is easier to implement and does not require extraordinary financing operations by the ministry of finance.[17]

**22.     Despite being more transparent and easier to understand, smoothing using the price band approach should be carefully evaluated in the context of the fiscal rule.** Moving away from smoothing under the current extra-budgetary fund (FPEC) may entail some risks that should be carefully evaluated. It may add to the challenges of meeting the short-term yearly headline deficit target under the fiscal rule, since subsidies and/or windfalls would be recorded in the budget under this mechanism (contrary to recording practices under the smoothing through the stabilization fund).

### Figure 10. Colombia: Welfare Impact of Using Appropriate Supply Costs
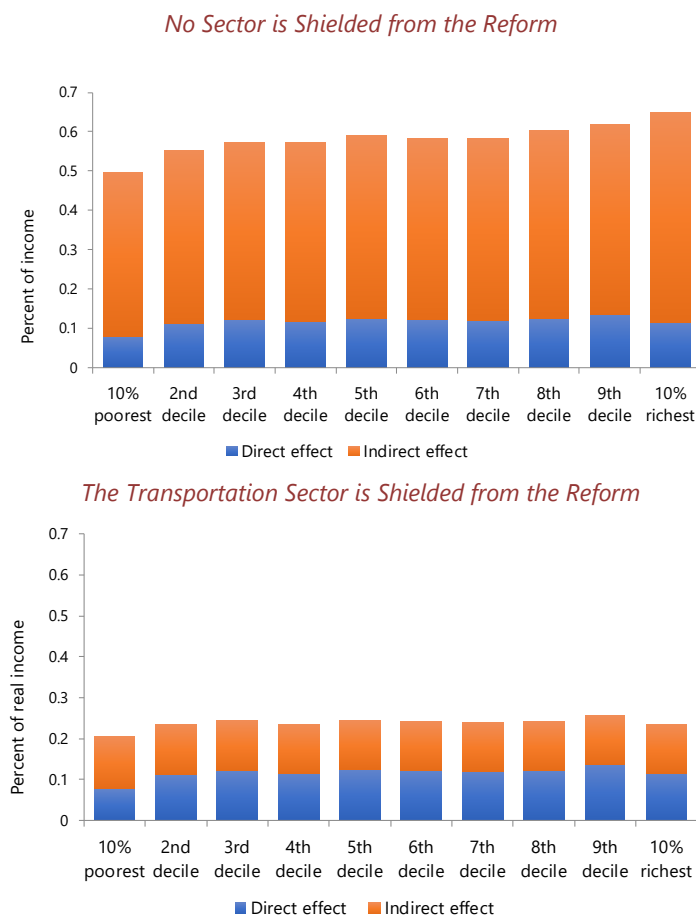
*No Sector is Shielded from the Reform*



*The Transportation Sector is Shielded from the Reform*



Source: 2017 ENPH expenditure and income survey, 2010 input-output table prepared by the National Administrative Department of Statistics (DANE) and IMF calculations.

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[17] This approach to smoothing may alleviate smuggling activities since it eradicates altogether the mechanism (the certification) through which the middle agent (the "Mayorista") is compensated and thus potentially reduces the incentives for the "detour" from regions at the border to the inside regions.

**23.     An automatic fuel pricing mechanism (AFPM) does not necessarily deliver sustained reform of energy subsidies and should be embedded in a broader reform context.** A number of countries have abandoned their AFPMs shortly after adopting them, partly due to their unwillingness to pass sharp international price increases on to consumers. The sustainability of these mechanisms can be enhanced if they are accompanied by other reforms, including the expansion of targeted social safety nets and social spending programs, among other mitigating measures that shield vulnerable households from the negative impact of the reforms (Box 1). Using price smoothing in the context of an AFPM is one approach that can help shield consumers from large price increases at the international markets. When applied consistently and symmetrically (i.e., for both increases and decreases), smoothing rules imply that, on average—over the medium to long-term—there will be no subsidies. However, in the short-run, they involve a clear trade-off between the volatility of the fiscal cost and that of retail fuel prices.

**24.     Finally, other elements are equally important when moving forward with a reform strategy.** First, a gradual approach to increasing prices is highly desirable. Sharp increases can generate intense opposition to reforms. Second, coordination with the Central Bank can be key to avert potential negative macroeconomic consequences—in the context of the "timing" and the "size" of the increase. For instance, wage bargaining discussions in Colombia—between firms and unions or trade associations—generally occur in December and tend to be centered around annual inflation (i.e., year-on-year inflation). Therefore, in Colombia, reforming energy prices during the first half of the year is more prudent, as it would avoid transforming a transitory supply-side shock—whose impact on inflation is a priori set to dissipate in the short-run—into a demand-side shock whose impact on inflation becomes persistent and can exert wage spiral effects that may have direct implications for monetary policy. Annex 3 presents the details from a dynamic cross-country analysis that supports our advice.

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**Box 1. Turkey Case Study: Fuel Subsidy Reform and Mitigating Measures**

Turkey undertook a long reform process towards the liberalization of fuel prices. Prior to the reform, fuel prices were largely set by the government. In the late1980s, the government embarked on a series of energy price reforms—as part of broader economy-wide reforms. In 1998, the government adopted an automatic pricing mechanism that sets a ceiling on the prices of fuel products based on international oil prices and the exchange rate. After the reforms, refining companies and importers were able to set prices freely, provided that they did not exceed specified ceilings. Starting in 2005, fuel prices were fully liberalized, and currently rank among the highest across OECD countries, owing to the relatively high excise taxes.

The Turkish government adopted several measures to mitigate the impact of the fuel pricing reforms, including tax exemptions and tax rebates across specific sectors. First, according to a corporate tax law passed in 2006, public transport companies—owned and managed by municipalities, villages, or special provincial administrations—were exempted from the value added tax and the excise tax, essentially alleviating the impact of the liberalization of fuel prices under the reform on the transportation sector. This has consequently helped in mitigating the indirect effects of higher diesel prices on lower-income households. Second, the Ministry of Agriculture introduced in 2007 a tax rebate program for diesel used in agriculture. There are three different types of crops defined by the ministry, which correspond to different aid levels. The value of the rebates received by farmers depends on the area used to grow specific crops.

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# II. ELECTRICITY SECTOR

## A. Background

**25. Though between 2010 and 2018, increasing domestic demand for electricity has been met by installed capacity, new investments are needed to keep pace with the demand and meet Colombia's target share of renewables in electricity generation.** The electric power system consists of an interconnected grid—the National Interconnected System (SIN)—which supplies about 97 percent of the overall demand; the remaining demand in Non-Interconnected Zones is supplied by local small electricity generation plants running mainly on liquid fuels such as diesel. In the SIN, electricity coverage is about 99 percent; residential demand represents 42 percent of total electricity consumption in 2018 and has increased steadily over the period of 2010-2018; non-residential demand represents 58 percent of total electricity consumption in 2018 with a faster increase path (Figure 11). In its median scenario, the Planning Unit for Mines and Energy—UPME—is expecting annual demand to increase by an average of 2.9 percent between 2018 and 2025. Installed generation capacity in the SIN is 17.3 GW in 2019 and is dominated by hydro power which represents about 70 percent of total installed capacity and 86 percent of total electricity consumption (Figure 12). Hydro power is very vulnerable to weather phenomena, especially El Nino severe droughts that require mobilizing alternative sources of electricity—mostly coal, gas and fuel products, which represent each about 10 percent of total installed capacity—and importing electricity from Ecuador. Imports, however, are low and represented only 0.3 of total generated electricity in 2018. Still, diversification away from hydro power to other renewable sources is not progressing because recent projects have focused instead on increasing hydro and thermal capacities. Success has been limited because the largest hydroelectric project, *Hydroituango*, has been delayed after massive flooding at the dam in mid-2018.

**Figure 11. Electricity Generation and Consumption in 2010–2018 by Consumer Type**
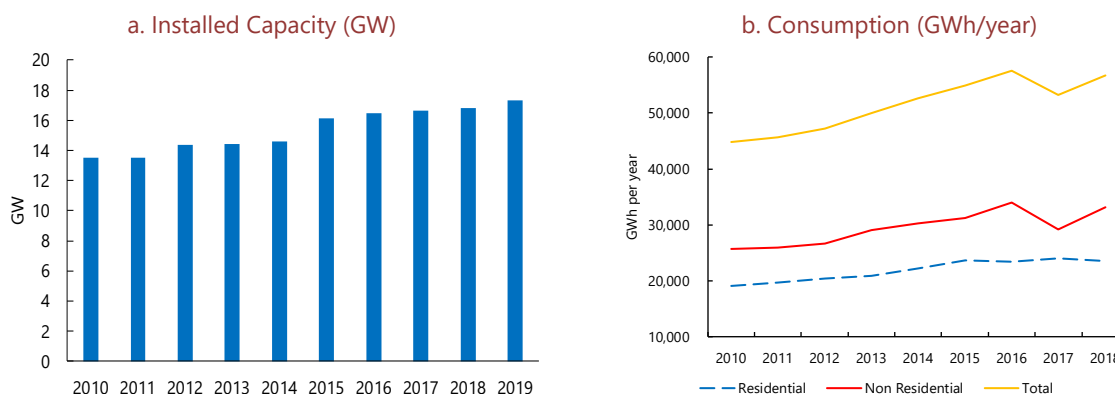


Source: Ministry of Mines and Energy.
Note: 2012 and 2015 non-residential consumption levels have been smoothed using the annual average rate of consumption growth due to errors in reporting consumption levels in the Unique Information System (SUI) of public utilities in 2012 and 2015.

**Figure 12. Composition of Installed Capacity between 2010–2019, by Energy Type (in percent)**
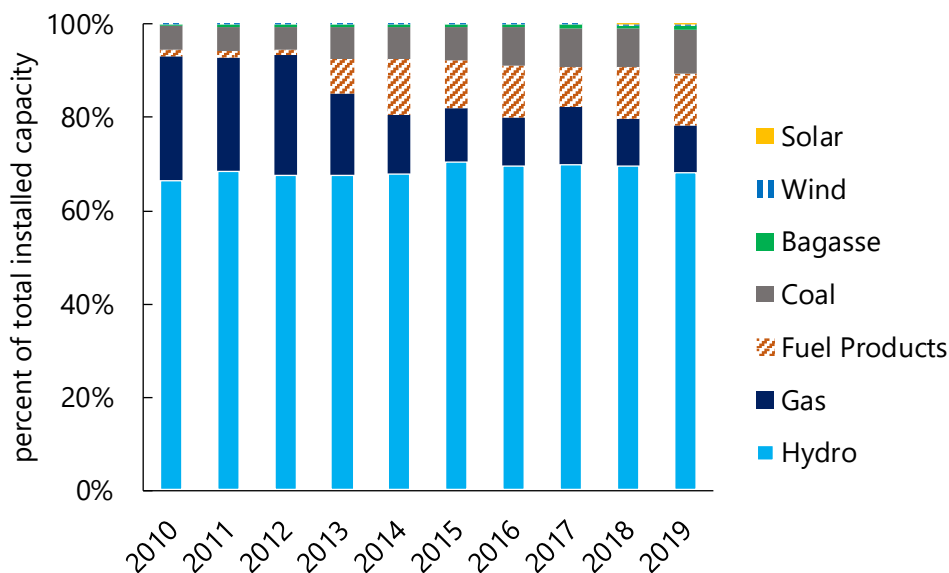


Source: Ministry of Mines and Energy.

**26.     Electricity supply from generation to commercialization is dominated by only 4 main actors.[18]** Nowadays, there are 72 generators, 16 transmission operators, 37 distributors and 120 retailers in the market. Generation is dominated by 3 companies which represented about 60 percent of generated electricity in 2018: EMGESA (21 percent), EPM (20 percent) and ISAGEN (17 percent). Distribution and commercialization—i.e., retail—are dominated by 4 companies, 2 of which are the same companies as in generation. They made up about 62 percent of total commercialization in 2018: Electricaribe (21 percent), EPM (17 percent), Codensa (16 percent) and EMGESA (6 percent). This horizontal and vertical integration is possible because the Laws 142 and 143 of 1994 provide a de facto "incumbent premium" to companies existing prior to the electricity market's liberalization: i) on vertical integration, companies existing before 1994 can develop more than one activity under separated accounts while companies entering the market after 1994 are allowed to combine the following two activities  generation-retailing or distribution-retailing but are forbidden to simultaneously perform activities of generation-transmission, generation-distribution, transmission-distribution and transmission-retailing; ii) on horizontal integration, a single company may not own more than 25 percent of the generation, retailing and distribution activities (1996 CREG Resolution 128).

**27.     The regulatory framework of the electricity sector is complex; final tariffs are decided by the Executive Committee of the Comision de Regulacion de Energia y Gas**

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[18] Ownership structure is balanced between mainly public/mainly public and mixed ownership along the electricity supply chain. Detailed information of ownership structure by production chain segment can be found here.

**(CREG) (Figure 10).** All electricity agents from generation to final consumers are subject to CREG's regulation. Established in 1994 by Law 143, CREG's mission is to set rules that ensure reliability—i.e., service continuity—efficiency and universal coverage of electricity supply. Among other functions, CREG develops the methodologies used to establish rates for access to the electricity grid and to calculate electricity tariffs faced by final regulated consumers.[19] CREG does not alone decide whether to implement a new tariff methodology. This decision is taken by the CREG Executive Committee—through a simple majority vote—with at least one governmental vote (Figure 13). In the CREG Executive Committee, Mines and Energy (MME) and Finance Ministries (MHCP) are represented at the ministerial or deputy-ministerial level, the National Department of Planning (DNP) at the directorial level, and MME has de facto veto power by non-participation.

**Figure 13. Institutional Framework of the Electricity Sector**
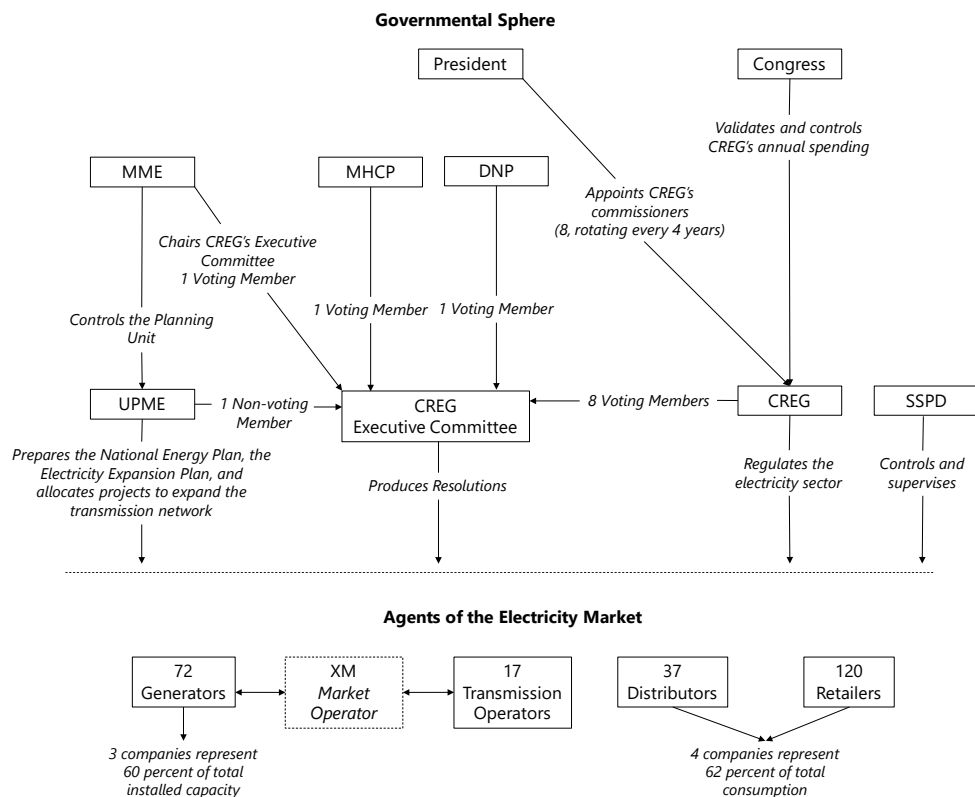


Source: Colombian Authorities.

**28.      According to law 142 of 1994, the housing stratification—i.e., strata system—is the main mechanism to target subsidies for public utilities, including electricity.** The methodology to attribute stratas to dwellings in different regions of the country was established by the National Council for Socio-Economic policy—CONPES—in 1997. Municipal head towns

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[19] Final consumers are either regulated, i.e., subject to CREG's electricity tariff set for final consumers, or non-regulated. Nonregulated users are large consumers who can sign bilateral contracts with retailers.

were classified into three groups according to their economic and social development—a different methodology was developed for the city of Bogotá. Irrespective of the municipality, the final unit of stratification is always the dwelling and not the household who inhabits it. For dwellings in urban areas, the stratification results obtained on each of the sides of one block were averaged, from a form that contained between 8 and 11 variables describing the exterior of the dwellings—e.g., type of garage, the size of garden, type of road. As the economic and social complexity of the city decreased, the number of factors used to determine the stratum was also reduced. For dwellings in rural areas, two methodologies were designed, one for small city centers and another one applicable to farms and dispersed dwellings. In total, dwellings are classified in 6 stratas, strata 1 being attributed to lowest socio-economic dwellings, strata 6 being attributed to highest socio-economic dwelling.

29.     **Electricity subsidies are either direct subsidies to producers and residential consumers or price subsidies to residential consumers of stratas 1 to 3.** The provision of electricity subsidies has two objectives: i) encouraging producers to install capacity in non-interconnected zones—i.e., outside the SIN—and invest in renewable energies; and (ii) helping households in stratas 1 to 3 through a price subsidy directly deducted from their electricity bill:

- Direct producer and user subsidies. These subsidies are channeled through five Funds—FAER, FAZNI, PRONE, SGR and FENOGE. FAER, FAZNI, PRONE and SGR provide support to electricity producers in order to provide electricity to final users of non-interconnected zones and zones with below-standard service; FENOGE was created by the law 1715 of 2014. It provides support to both producers and end-users to promote investments in renewable energy generation capacity and increase energy efficiency of consumption. Direct financial support to producers can take the form of i) direct transfer for capital expenditure investment, ii) subsidized financial tools—e.g., subsidized loans—and iii) tax reduction and exemptions. Direct financial support to final consumers takes the form of ear-marked cash transfer to purchase efficient appliances.

- Price subsidies to residential consumers. All households classified in strata 1, 2 and 3 are entitled to a price subsidy for the provision of electricity service of 60, 40 and 15 percent of the cost-recovery tariff (Box 1). This price subsidy only applies to consumption levels below a "subsistence" threshold, which is set according to the altitude of the residence—the subsistence threshold is 130 kWh in municipalities that are 1,000 meters above sea level or more, and 170 kWh in municipalities located below 1,000 meters above the level of the sea. Consumption above this threshold is priced at cost recovery of electricity supply (Figure 14 and Table 4). Households classified in strata 4 pay the cost-recovery tariff; households in strata 5 and 6, along with commercial users, pay a contribution of 20

percent of the cost-recovery tariff over their entire consumption.[20] This targeting of electricity price subsidy aims at achieving a social objective—help vulnerable households afford electricity—through progressive cross-subsidization. All contributions are collected in a sixth Fund, *the Fundo de Solidariead* (Solidarity Fund), and are then allocated to retailers according to their subsidy-contribution balance.[21]

**Figure 14. Price Subsidies for Residential Consumers in strata 1-3**
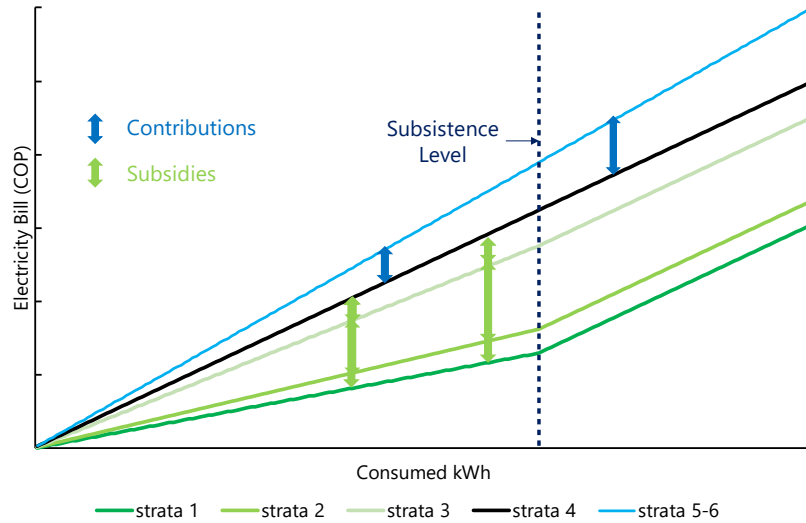


Source: Colombian Authorities.

Note: The black slope indicates billing at cost-recovery level: above, consumers in strata 5 and 6 pay an extra contribution; below, consumers in strata 1, 2 and 3 receive a bill discount.

**Table 4. Electricity Price Gaps (COP/kWh), by Consumer Type**

| | Residential Consumers | | | | | | Non-residential Consumers | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Strata 1 | Strata 2 | Strata 3 | Strata 4 | Strata 5 | Strata 6 | Industrial | Commercial | Government Entities |
| Cost recovery price | 512 | 505 | 505 | 490 | 483 | 479 | 366 | 416 | 440 |
| Final consumer price | 205 | 252 | 429 | 490 | 580 | 575 | 439 | 499 | 440 |
| **Contribution (+) / Subsidy(-)** | **-307** | **-252** | **-76** | **0** | **97** | **96** | **73** | **83** | **0** |

Source: Ministry of Mines and Energy.

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[20] In 2012, industrial consumers' contribution to the Solidarity Fund was removed for certain categories of industries—the majority of them. A minority of industrial consumers whose activity does not fall under the exempted categories still pay the contribution.

[21] There is a seventh Fund—Fundo de Energia Social (FOES)—that provides an additional flat support of 46 COP/kWH to residential consumers in strata 1 and 2 in areas with sub-standard electricity service.

**30.      The fiscal cost of electricity price subsidies is on average was relatively constant at about 0.3 percent of GDP per year over 2016-2018.**[22] This cost is the sum of fiscal cost of annual subsidies distributed to stratas 1, 2 and 3, and the cost of subsidies that is carried over from previous years—on an accrual basis. Total price subsidies are financed by cross-subsidization and direct budget transfers (Figure 15). These transfers are necessary because contributions only cover about 43 percent of total subsidies. Estimates of the fiscal cost of electricity price subsidies are based on a price-gap approach given aggregate consumption data by consumer types and data on average cost-recovery prices and final tariffs.[23] If the price subsidy scheme remains unchanged over the next four years, their annual fiscal cost is projected to represent about 0.3 percent of GDP (Figure 16).

### Figure 15. Financing of Electricity Subsidies

| | | |
|---|---|---|
| - Extra fees on final consumers' bill:<br>   - 1.5 COP/kWh for FAZNI<br>   - 1.9 COP/kWh for PRONE<br>   - 2.1 COP/kWh for FAER<br>- **Royalties from extracting sector for SGR** | | 4 Funds to encourage investment outside the SIN: FAER, FAZNI, PRONE, SGR |
| - Extra fees on final consumers' bill of 0.4 COP/kWh for FENOGE<br>- **Tax expenditure** | *Finances* | 1 Fund to encourage investment in renewables: FENOGE |
| - Cross-subsidization by residential consumers in strata 5 and 6 and commercial consumers<br>- **Direct budget transfers** | | 1 Fund to finance price subsidies: Solidarity Fund |

Source: Colombian Authorities.
Note: In red, financing mechanisms with fiscal impact. Tax expenditure include: income tax deductions up to 50 percent of investment value, accelerated depreciation, VAT and custom duties exemptions.

## B.   Key Issues

**31.      Electricity market concentration generates large systemic players which can represent a fiscal risk.** Currently, four companies represent more than 60 percent of generated and consumed electricity. If one of these large actors faces difficulties in supplying electricity to final consumers, by law the government has to step in to ensure energy provision, potentially generating fiscal costs. In this respect, the recent case of Electricaribe—which is the biggest electricity distributor and retailer in the region with 21 percent of total consumption—illustrates

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[22] By law, electricity consumption is exempted from other taxation that normally applies to other goods and services in the economy.

[23] Our estimates for 2017 subsidies are slightly different than those provided by the authorities. One explanation, based on our understanding from discussions during the mission, is that this could be due to differences in how we reconstruct the subsidized and contributing consumption levels.

the "too big to fail" situation of the electricity market in Colombia. Electricaribe's mismanagement and financial difficulties have made it difficult for the company to purchase and supply electricity to final consumers, leading Electricaribe to impose always greater supply restrictions on final users, up to the point where the company was unable to provide electricity at all. The government, through SSPD (Figure 13), had to take over the company and recently decided that all residential consumers in Strata 4 to 6, and all industrial and commercial consumers would pay an extra 4 COP/kWh to start bailing out Electricaribe. Going forward, other measures are being considered by the government: i) measures with potential fiscal costs such as taking over the debt of Electricaribe's pension scheme and ii) measures potentially reducing the electricity market competitivity such as raising the cap on horizontal integration to attract potential investors—thus fueling the "too big to fail" risk.

**Figure 16. Projection of Electricity Price Subsidy's Fiscal Cost over 2019-2022 (percent of GDP)**
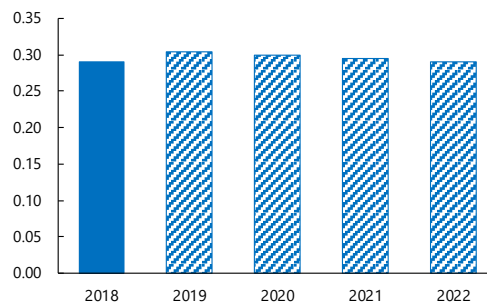


Source: IMF staff calculations.
Note: Electricity consumption is assumed to grow at the same rate as real GDP over 2019-2022; electricity unit costs' growth is set at the average unit cost's growth observed over 2014-2018. Similar fiscal cost projections are obtained when unit costs are assumed to grow at half the inflation rate projected for 2019-2022.

**32.      Though the tariff setting mechanism, as currently applied, appears to cover the full supply cost of electricity CREG's autonomy in setting tariffs could be strengthened and the regulatory process could be simplified as part of a broader reform of the energy regulatory framework.** Once a general tariff methodology is approved by the CREG Executive Committee, CREG cannot apply it to each electricity company without prior approval of the Executive Committee. This process slows down considerably CREG's issuance of particular resolutions—i.e., pertaining to a particular company—and puts the entire tariff setting process at risk of capture.

**Box 2. The Electricity Tariff Setting Mechanism**

The electricity tariff, $CU$, is the sum of two terms: i) the fixed costs of commercializing electricity, $C_f$, set to 0 by CREG's Executive Committee, and ii) the cost of generating, transmitting and distributing electricity, $CU_v$, which is decomposed as follows:

$$CU_v = G + T + D + C_v + PR + R$$

$G$ is the electricity generation cost that depends on two main components: i) the spot market price and ii) the "reliability charge", i.e., long-term generation price pre-determined during auctions and that covers the fact that generators winning the auction are "on call" and have to generate a certain quantity of energy to cover demand,

$T$ is the transmission cost that accounts for UPME's plan to maintain and upgrade the grid to meet projected demand

$D$ is the distribution cost that accounts for all operating expenditure and a five-year expansion plan of the distribution grid.

$C_v$ is the commercialization variable cost that accounts for operations such as metering, billing and collecting

$PR$ are the recognized losses, capped per day and per segment of the electricity supply chain

$R$ are the "restrictions", i.e., the recognition that the grid may be insufficiently developed in certain areas to allow the dispatching of all installed generation potential

The regulator CREG puts to the vote of CREG's Executive Committee general tariff methodologies for each component of $CU_v$. Once tariff methodologies are adopted, they remain valid for 5 years and must be translated into tariffs for each electricity agents—translations which are also submitted to the vote of CREG's Executive Committee. Tariffs are currently set at full cost-recovery levels, i.e., enabling electricity companies to cover all their OPEX (i.e., costs of operation and maintenance, power purchases, debt obligations, taxes, insurance) and all past and future capital expenditure. By law, electricity is exempted from VAT. At 0.15 USD/kWh in June, Colombian electricity tariffs were on par with the world average of 0.14 USD/kWh and below the average of 0.16 USD/kWh across comparable regional countries (Figure 17).

**Figure 17. Comparison of Electricity Prices Across Countries, June 2018 (USD/kWh)**
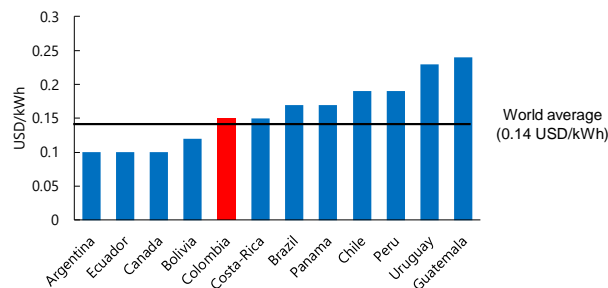


Source: Global Petrol Prices. Price differences may reflect different cost-recovery levels driven by different energy mixes.

Residential consumers in stratas 1, 2 and 3 are entitled to electricity price subsidies through a reduction of the unit cost applied to the part of their consumption that falls below a subsistence level $S$:

$$UC_1 = CU_v \times 0.4, \qquad if\ Strata = 1\ and\ consumption < S$$
$$UC_2 = CU_v \times 0.5, \qquad if\ Strata = 2\ and\ consumption < S$$
$$UC_3 = CU_v \times 0.85, \qquad if\ Strata = 3\ and\ consumption < S$$

Where $S$ is set at 173 kWh/month in low-altitude areas and 130 kWh/month in high altitude areas.

**33.      About one third of total electricity price subsidies currently benefit households in the top 4 income deciles (Figure 18) due to an outdated targeting system based on stratas that do not map income distribution (Figure 19).** More than 90 percent of all households receive electricity price subsidies and one third of them belongs to top 4 income deciles; 70 percent of households in strata 3 belong to top 4 income deciles. Law 142 of 1994 establishes that the strata system is the mechanism to target public utilities price subsidies, including electricity. strata allocation is based solely on the exterior characteristics of a household dwelling and does not take into account variables associated with the household income. Furthermore, municipalities are responsible to update the strata system. However, many municipalities fail to do so, either because they do not have the capacity, or because they do not have sufficient incentives to graduate households from subsidized stratas to unsubsidized ones. Therefore, there are municipalities whose Strata allocation dates back to 1997. Finally, the government does not audit electricity retailer clientele's mapping to the strata system—to ensure that it correctly maps a municipality strata allocation as reported in its cadaster—before compensating distributors and retailers.

**Figure 18. Distribution of Electricity Subsidies across Income Deciles (percent of total subsidies, 2017)**
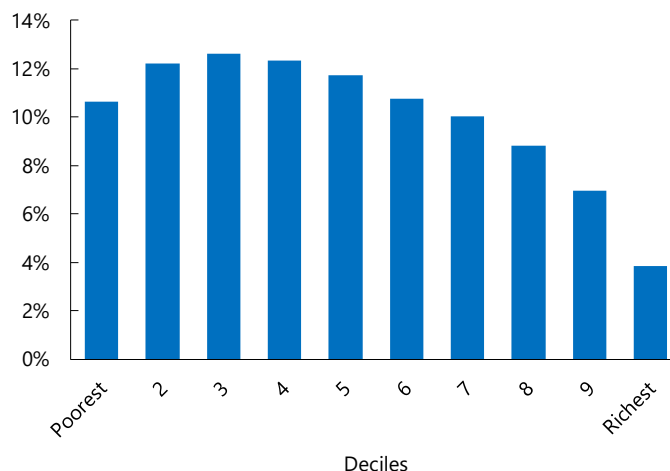


Source: IMF staff calculations based on 2017 ENPH.

**34.      Electricity price subsidies are distortive, with economic costs larger than their fiscal costs.** Low electricity tariffs encourage over-consumption by households and decrease incentives to adopt energy saving behaviors. Indeed, current subsistence levels—above which electricity consumption is not subsidized for household in strata 1, 2 and 3—are set too high to actually binds on household consumption (Figure 20 a, b). Furthermore, cross-subsidies from non-residential consumers to households may also affect the competitiveness of the commercial sector and a some industrial companies still subject to contributions.[24] Finally, delayed

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[24] In 2018, about 75 percent of all industrial consumers, representing only 20 percent of total industrial consumption of electricity, were still subject to the contribution.

governmental payments to electricity distributors generates additional financial costs—equal to the interests paid on distributors' outstanding balance and regulated by CREG—eventually borne by final consumers because distribution companies can pass through these costs to electricity tariffs. These delays also weaken distributors who may face important cash-flow constraints.

**Figure 19. Distribution of Stratas across Income Deciles
(percent of total strata, 2017)**
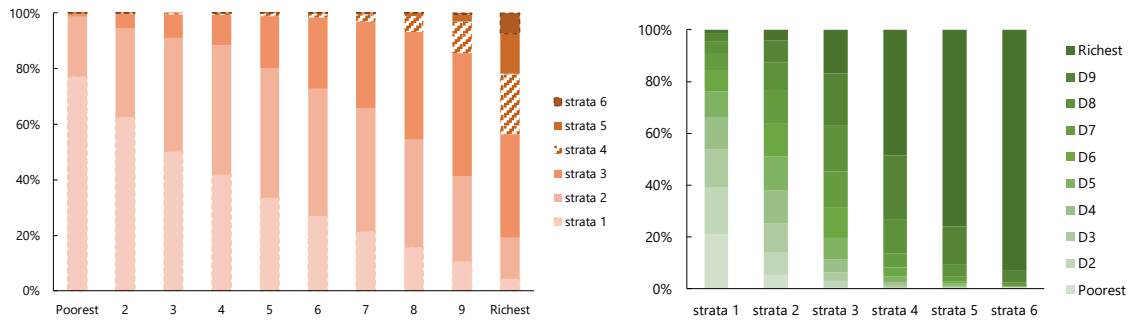


Source: IMF staff calculations based on 2017 ENPH.

**Figure 20. Average Electricity Consumption (kWh/month), by Income Decile**

a) Low-altitude Households (173 kWh)

b) High-altitude Households (130 kWh)
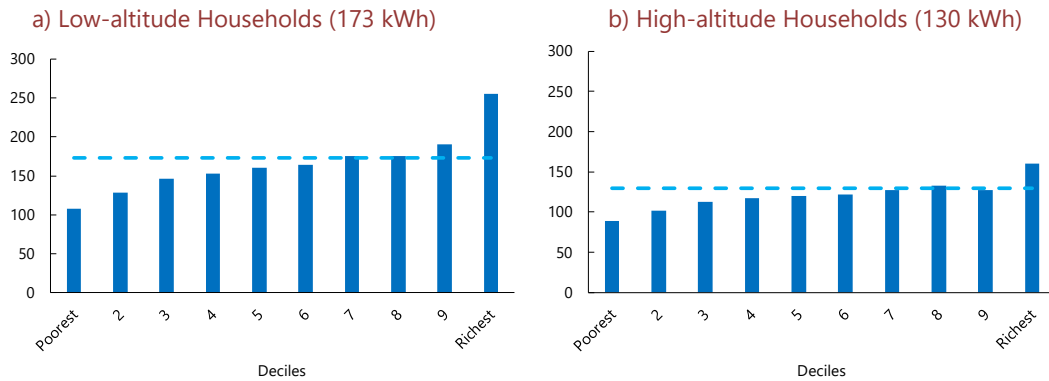


Source: IMF staff calculations based on 2017 ENPH.

**35.     Eliminating electricity subsidies would have a substantial adverse impact on the welfare of vulnerable households (Figure 21).** Increasing electricity prices to full cost recovery in strata 1, 2 and 3 would generate an average welfare loss of about 2 percent. However, poor households in the bottom income decile would be disproportionately more affected due to the poor proxy strata have for socio-economic status described above, suffering an average welfare loss of more than 4 percent (Figure 21).

**Figure 21. Direct Effects of Removing Electricity Price Subsidies
(percent of household total expenditure and COP per month)**
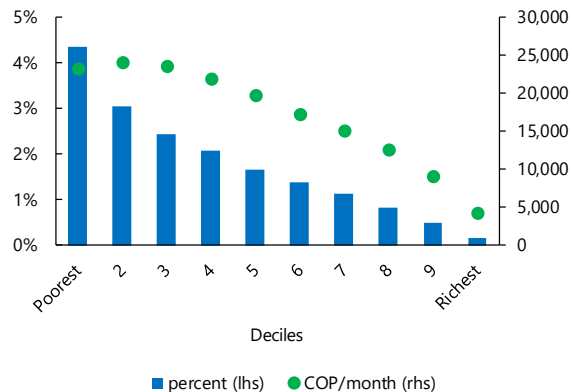


Source: IMF staff calculations based on 2017 ENPH.

## C.  Options to Reform Electricity Price Subsidies

**36.      Reforming electricity subsidies to reduce their fiscal cost and economic distortions will be challenging and will require a well-designed and sequenced reform given the large impact a complete removal would have on poor households.** This section of the report presents scenarios that highlight the fiscal and distributional tradeoffs that policymakers are facing given the current context of the electricity market and of the existing social safety net. The analysis of each scenario relies on identical metrics that illustrate their fiscal and distributional characteristics (Figures 22 and 23): a fiscal metric (amount of fiscal savings generated by the reform) and three distributional metrics (coverage of the bottom three income deciles, progressivity proxied as the share of total subsidies redistributed to the bottom three income deciles, and generosity of the subsidy relative to household income—average in the bottom three income deciles). The scenarios presented below are not to be considered an exhaustive list, but more as relevant examples of the type of policy options.

**37.      Four scenarios are considered, each one gradually departing from the current targeting mechanism of the stratas.** The first three scenarios have in common to keeping the electricity bill reduction as the form of the household income support and to complement the strata targeting with another targeting criterion. The fourth scenario relies on the coverage of existing cash transfer programs to target the electricity subsidy recipients and complements their cash transfer with a dedicated voucher. Appendix 1 presents a detailed description of the four reform scenarios: scenario 1 (Government) corresponds to the government's current proposal to remove electricity subsidies from households in strata 3 and to reduce the subsidy rates from 60 and 50 percent to 50 and 40 percent in stratas 1 and 2 respectively;[25] scenario 2 (Consumption) lowers existing subsistence levels to better reflect average consumption levels of households in

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[25] After the IMF mission had ended, the government tried to introduce this reduction of subsidy rates for strata 1, 2 and 3 in its National Development Plan. However, the proposal failed in Parliament.

the bottom four income deciles and removes all subsidy from households in strata 1, 2 and 3 whose consumption is above the new subsistence levels; scenario 3 (SISBEN) complements the strata targeting system with household SISBEN4 so that only households in stratas 1, 2, and 3 with SISBEN4 score below 16 are eligible to electricity subsidies;[26] scenario 4 (Safety Net) targets current beneficiaries of at least one of three social assistance programs—i.e., Familias en Accion, Juvenes en Accion and Colombia Mayor[27]—and complements their cash transfers with a voucher to pay electricity bills or investments in energy efficiency.

**38.    The Government scenario generates a small fiscal saving of 0.04 percent of GDP without improving the progressivity of electricity subsidies while the Consumption scenario generates higher fiscal savings and improves a little the subsidies progressivity** (Figure 22 and Table 5). The Government scenario does not improve on the current targeting scheme through the stratas and only a small proportion of electricity subsidies benefits strata 3—by design of the subsidy rates. In contrast, the Consumption scenario adds a consumption component to the subsidy eligibility formula. This component reflects the fact that the majority of households currently consume less than existing subsistence levels (Figure 16 a, b) and that despite higher budget shares, lower-income households tend to consume less electricity on average than households in top deciles. This reform is neutral for the majority of current electricity subsidy recipients (Annex 1). However, a quarter of households in the bottom decile and one third of households in the bottom second decile would face a significant welfare loss (Annex 1). In this respect, complementary policies to facilitate more efficient energy consumption by households in the bottom two income deciles—e.g., total compensation for old appliances replacement *before* stricter consumption thresholds are introduced—can reinforce behavioral change to help further reduce the welfare impact on all households, including the poor. Such complementary policies would decrease fiscal savings but would increase the chance of reform success, especially if low-income households can reduce their consumption before electricity tariffs increase.

**39.    The SISBEN scenario could generate fiscal savings of up to 0.13 percent of GDP and greatly improve the progressivity of electricity subsidies (Figure 22 and Table 5)**. The additional targeting layer through the proxy-means-test score SISBEN4 allows to better exclude rich households in stratas 1, 2 and 3 from the benefit of electricity subsidies. This improves the progressivity of subsidies to the extent that our simulation assumes all households have a SISBEN

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[26] SISBEN4 is the fourth update of the social assistance targeting instrument SISBEN. SISBEN is the main instrument for targeting social assistance programs since 1995 and is based on a socioeconomic survey conducted at the household level. The guidelines for the process of updating the instrument are defined by CONPES and are based on a quantitative and qualitative evaluation of SISBEN3, as well as on technological advances in the process of data collection. The model for calculating SISBEN 4 scores takes into account among other things labor market variables, characteristics of housing and public utilities, asset ownership, health and sociodemographic variables.

[27] These three programs are the main social assistance means-tested transfer that currently use SISBEN to identify eligible households.

score. However, there are important caveats to this simulation: i) not all families have a SISBEN score because they need to proactively ask their municipality for such a socio-economic score;[28] ii) our simulations are based on theoretical SISBEN4 scores—computed by the authorities through a proxy-means-test formula—and not actual SISBEN scores produced through the last wave of household surveys and still being collected and processed by the authorities. Finally, our analysis assumes that electricity distributors are able to correctly map households' strata and SISBEN4 score. However, distributors today cannot match stratas, SISBEN score with their billing units: they would have to modify their current invoice system in order to apply a price subsidy on the bill of eligible households. In this respect, a pilot experiment in several departments that are representative of the electricity market diversity could help identify issues with the superposition of SISBEN4 to the strata eligibility criterion. It would also give time to distributors to modify their information and billing systems, and to final consumers to move away from an automatic subsidy mechanism to a more proactive scheme.[29] In the short run, and as in the Consumption scenario, part of the fiscal savings could finance complementary policies to facilitate more efficient energy consumption by households in the bottom two income deciles.

**40.      Using the existing social safety net to move away from price subsidies would yield fiscal savings of 0.18 percent of GDP but at the expense of households in the bottom four income deciles** (Figure 22 and Table 5). If the compensation for higher electricity tariffs in stratas 1, 2 and 3 were to take place using the current safety net—i.e., complementing current cash transfers received by beneficiaries of *Familias en Accion, Juvenes en Accion* and Colombia Mayor—by a voucher corresponding to the average subsidy received by households in the bottom three deciles, then fiscal savings would be 0.18 percent of GPD. These relatively high savings reflect the low coverage of existing social assistance programs, which are mainly categorical. Electricity subsidies would be more progressive but many households in the bottom two income deciles would bear significant losses of about 2 to 3 percent of their income (Annex 1). This suggests that a redesign of these social assistance programs away from specific categories could improve the effectiveness of the safety net. Finally, there should be dedicated promotion campaigns and actions—e.g., involving partnerships between social services, electricity distributors and commercial partners—to increase the electricity voucher's take up either through an electricity bill reduction or the purchase of more energy efficient appliances (Box 2). In this respect, the electricity voucher could complement other initiatives financed by FENOGE, helping consumers improve their energy efficiency.[30]

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[28] This increases the risk of non-take-up of electricity subsidies if households lack information and municipalities lack the necessary capacity to do the proxy-means-test.

[29] In this respect, the Ministry of Mines and Energy is currently running a pilot program to complement the strata system with household SISBEN4 socio-economic score to attribute LPG subsidies. An application has been developed allowing LPG wholesalers and retailers to demand the SISBEN4 score of a client and match it with the client's strata to grant him/her the subsidy.

[30] In 2019, FENOGE has launched a small-scaled pilot program to help replace inefficient fridges of households in Stratas 1 and 2 on the Atlantic coast, with an objective of 50,000 replacement fridges at a cost of about 150 USD/replacement.

**41.      Mitigating the negative impact of price electricity reform for losing households in the bottom three deciles would increase the probability of reform success but reduce fiscal savings.** The cost of compensating losing households at the bottom three deciles of the income distribution would be contained and varies across scenarios, from quasi-null cost in the case of the SISBEN scenario to 0.05 percent of GDP in the case of the Safety Net scenario (Table 5). In each scenario, losing households in deciles 1 to 3 receive a compensation amount set at the average household loss within its own decile. Total mitigation costs then differ depending on the average household loss—highest in the Safety Net scenario and lowest in the Government scenario—and the number of losing households—highest in the Government scenario and lowest in the SISBEN scenario.

**Figure 22. Scenarios Mapping with Respect to Fiscal Savings, Coverage and Progressivity**
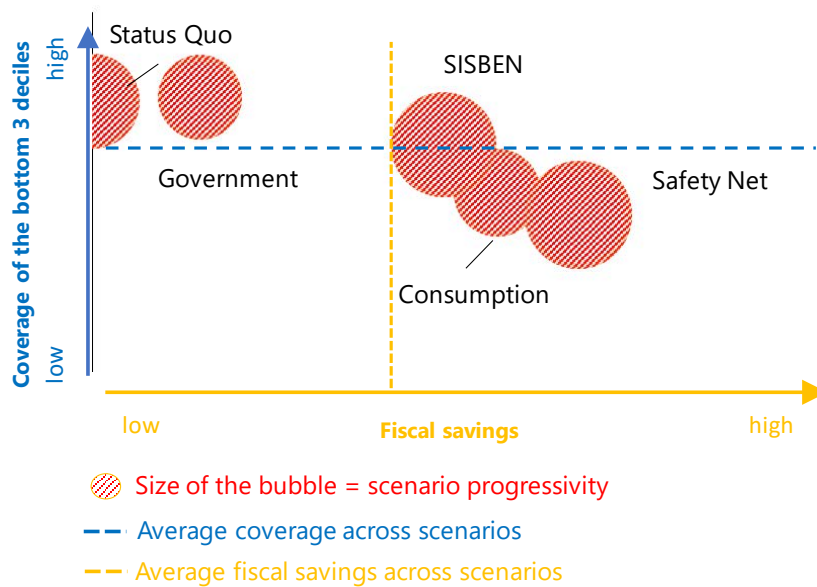


Source: IMF staff calculations based on 2017 ENPH.

**Figure 23. Average Household Subsidy across Income Deciles, by Reform Scenario (COP/month)**
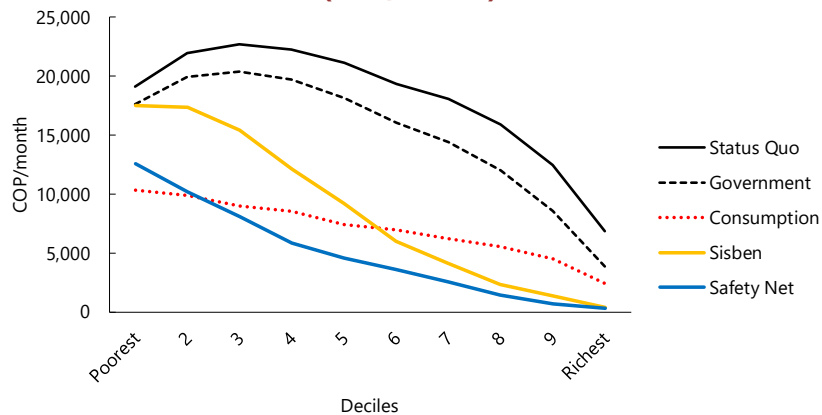


Source: IMF staff calculations based on 2017 ENPH.

### Table 5. Fiscal and Distributional Impacts by Reform Scenario

| | Scenarios | | | | |
|---|---|---|---|---|---|
| | Status Quo | Government | Consumption | Sisben | Safety Net |
| **Gross Fiscal Gains** *(percent of GDP)* | 0 | 0.04 | 0.15 | 0.13 | 0.18 |
| **Mitigating Measures Costs** *(percent of GDP)* | 0 | 0.01 | 0.02 | 0.00 | 0.05 |
| **Progressivity** *(percent of total transfer to bottom 3 deciles)* | 48 | 38 | 41 | 59 | 62 |
| **Coverage** *(percent of bottom 3 deciles covered average)* | 76 | 77 | 51 | 64 | 45 |
| **Generosity** *(percent of total expenditure - bottom 3 deciles average)* | 2.9 | 2.6 | 1.5 | 2.2 | 1.6 |

Source: IMF staff calculations based on 2017 ENPH.

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**Box 3. From Electricity Price Subsidy to Targeted Cash Transfer: The Case of the French "Cheque Energie"**

Before 2012 in France, households could benefit from reductions in their gas and electricity bill if i) they were eligible to a subsidized healthcare plan, or if ii) their taxable income was below a certain threshold. Thus, eligibility was based on a mix of categorical and means-tested criteria. Importantly, eligible households needed to signal their status to their electricity and gas supplier in order to benefit from the tariff reduction. Take-up of these gas and electricity was low, in part due to lack of information about the scheme, as well as low take-up of the subsidized healthcare plan.

In 2012, automatic attribution of bill reduction was introduced to increase the take-up of gas and electricity subsidies. Social and tax services were asked to signal which household was eligible for bill reduction to gas and electricity companies. This greatly improved the subsidy coverage among eligible households. However, the difference in treatment between energy sources—e.g., wood was not subsidized—and the limited public awareness of this program led the French government to start transitioning from automatic gas and electricity price subsidies to a targeted voucher helping households pay their energy bill irrespective of the energy source or invest in energy efficiency.

Between 2016 and 2017, a voucher scheme called "Cheque Energie" was experimented in four departments in replacement of gas and electricity price subsidy. Eligibility was simplified and based only on a means-test checked by the tax administration. The latter gave social services a list of eligible households who then received a voucher by mail. The voucher amount was progressive and could not get cashed in and could only be used to pay energy bills or investment in energy efficiency such as replacement of old appliances. In 2018, the "Cheque Energie" was generalized and gas and electricity price subsidies removed. It is financed through a fixed fee on gas and electricity consumption, as were price subsidies.

The experiment highlighted several ingredients crucial to the voucher's success:

- Information and understandability of the mechanism by recipients are key. Therefore, mailing should be complemented by social services interventions and communication campaigns targeted at current recipients of other social assistance programs;

- Simplicity of the voucher's usage increases take-up upon reception, in particular online and mobile usage;

- Generosity of the voucher increases its take-up and its real value should be closely monitored, maintained and/or increased;

- Partnership with energy companies and energy efficiency actors—public and private—is key to help eligible households use their voucher in the most efficient way.

# III. EFFECTIVE COMMUNICATION

## A. Objectives

**42.     For decades, countries have recognized the importance of reforming energy subsidies, but at the same time they have struggled with the significant challenges that are associated with reforms.** While best practices suggest that a carefully designed comprehensive strategy is needed to ensure success and sustainability, country experiences have shown that there is no single recipe for addressing these challenges. This is because energy subsidies serve a mix of legitimate social and special interest groups with different political power. This affects the political dynamics of reform efforts, which need to be designed to internalize these interests. It is then essential for policymakers to carefully embed in their energy subsidy reform strategy a deep understanding of political barriers. From this perspective, the government must be able to identify which stakeholders are impacted by—and interested in—the reform, and which stakeholders have enough influence that can affect the extent to which the reform will succeed (or not).

**43.     Reform experiences of countries over the years have shown that overcoming political economy constraints is often a tough task for governments, and almost always implies that it is not about reforming "right away", it is rather about reforming the "right way".** Mobilizing public support is a key element for ensuring a successful energy subsidy reform and preempting reform reversals. Such a task primarily hinges on strengthening the public interest in energy sector policies and their implications. For example, it is important that the government relays to the public and to key stakeholders' messages that make the reform compelling—for example, by highlighting drawbacks of existing energy subsidies, including their negative fiscal, economic and distributional consequences. A well-designed communication strategy can help overcome political economy constraints and vested interests.

**44.     From that perspective, policymakers ought to design communication strategies that allow them to build and maximize support for the reforms.** An effective communication strategy can be a crucial element in achieving that goal, especially through its ability to overcome political economy constraints and vested interests. Simply put, any comprehensive reform strategy in general—and one that pertains to energy subsidies in particular—must carefully manage two important aspects of the reform strategy: (i) whether interest groups will organize for or against the reforms; and (ii) how institutions, and prices will effectively shape energy subsidy reform policies.

**45.     An effective communication strategy must ensure that messages that are delivered to the public are coherent, consistent, and follow a certain discipline.** This in turn can shape the national dialogue on energy subsidy reform and raise awareness of its objectives. A coherent approach will help align the interests of the different stakeholders with the objectives of the government and build confidence in them. Recent experience from Colombia suggests that

introducing energy subsidy reforms and gaining both their support from key segments of society and their approval in Congress may well be challenging to maneuver. For example, the recent government's proposal to increase the VAT by 2 percentage points did not pass Congress and was widely disapproved despite compensation measures targeting vulnerable households. Middle-class households largely opposed the measure that would have raised taxes on the formal sector, while compensating poor households that most likely do not pay the tax, because they tend to buy goods and services from the informal sector. One communication lesson learned from that experience is that understanding the views of the target audiences and anticipating their reactions before launching a reform initiative is key.

46. **Overall, there are three distinct steps that are involved in the design and conduct of a successful communication campaign strategy and, ultimately, a successful energy subsidy reform (Figure 24).** The three steps are as follows: (i) raise greater awareness of—and support from—the public for the reforms; (ii) offset any potential feelings of mistrust by the public that may be the result of communications deficiencies—e.g., contradictory or mixed messages; and (iii) build the capacity to clearly and effectively relay energy reform policies to the public across the country.

**Figure 24. Sequencing a Successful Communication Campaign**



| Step 1 Embark on a Reform | Step 2 Organize and Plan | Step 3 Campaign and Measure |
|---|---|---|

1. **Decide on a reform and a communication campaign**
   - At the highest executive level
2. **Target your audience**
   - Research and analysis

1. **Organize yourself**
   - Campaign Organization and Capacity
2. **Engage external stakeholders**
   - Identify, consult and bring on board
3. **Develop a communication strategy**
   - Dictate the narrative

1. **Develop and launch Campaign**
   - Create communication strategy action plan
2. **Measure campaign's impact**
   - Create metrics

Source: IMF staff.

47. **A national communication campaign should include a series of objectives and messages that are well sequenced.** These key communication objectives and messages are typically based on a series of research tools that will guide the government on the following issues: (i) who to engage with and reach out to; (ii) what to say, and (iii) what platforms to use to reach targeted audiences. The government will then need to develop its capacity to package and disseminate compelling messages effectively. An effective communication campaign will need to be well-targeted and should have a brand that designed and recognized by the public based on key research findings. Box 4 presents the key elements of a successful communication campaign.

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**Box 4. Key Elements of an Effective Communication Campaign**

A communication campaign (also known as a communication strategy or plan) consists of the following components:

- Educate Colombian public opinion on the functions of the energy sector, on ongoing reforms to improve the sector, on the consequences of government subsidies in the energy sector and on justifications of price increases. Help build confidence in the government's intentions, including to improve Colombian public services.

- Engage key stakeholders and build consensus among various stakeholder groups.

- Establish consistent government communication channels and consistent messaging across government agencies.

- Create channels for relevant citizen feedback and build two-way public dialogue to help share the national debate on energy reforms.

- Raise public awareness of the ultimate goals of energy reforms through a strategic campaign.

- Establish a set of reliable and observable reform targets, so that the public can verify improvements in the energy sector and the government can demonstrate accountability and transparency.

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## B. Energy Subsidy Reform Policy Recommendations

**48.     Given the main policy reform recommendations in this report, the government may need to intensify its efforts to overcome challenges related to communication.** These challenges include**:** (i) the level of political will to execute the communications campaign; (ii) the capacity of the government to organize and fully coordinate to execute an effective communication campaign—for instance, electricity price reforms require strong and broad social networks to encourage citizens to ask for their SISBEN4 score and interact with electricity distributors; (iii) the possibility that not all government entities would support all reforms; and (iv) potential inconsistency in some messages across government sectors, absent coordination—for example, insulating the cargo transportation sector from the diesel price increase could be perceived as protecting the wealthy corporate sector and reneging on environmental policy. It is therefore important that it is explained in the context of a mitigating measure—as truly intended by the government—to protect the real purchasing power of households.
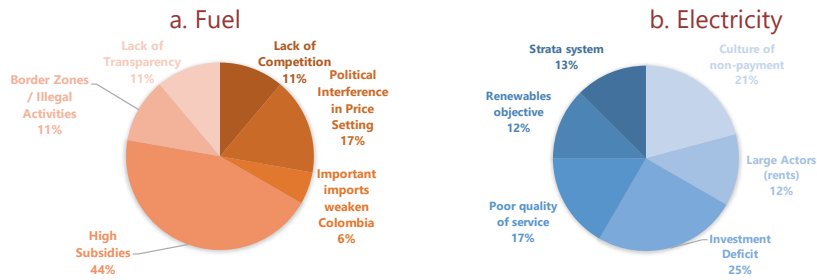
**49.     Prior to implementing the reforms, a series of quantitative and qualitative research analyses should be undertaken in order to collect data for understanding the public sentiment towards the reforms.** The research phase of the communication campaign is intended to: (i) expand the understanding of the public knowledge about—and attitude towards—the reforms; (ii) identify challenges and hurdles that may impede a successful implementation of the reforms; and (iii) provide information that can be key to forming the key messages that will help ensure the success of the campaign. The research phase includes the following tools (Table 6): (i) a political-economy analysis; ii) in-depth interviews (IDIs) with those who have insights into the energy sector (Box 5); (iii) focus group discussions; and (iv) public

opinion surveys. During this technical assistance mission, a series of In-Depth Interviews (IDI) with government and a other external stakeholders were conducted by IMF staff (Figure 25).
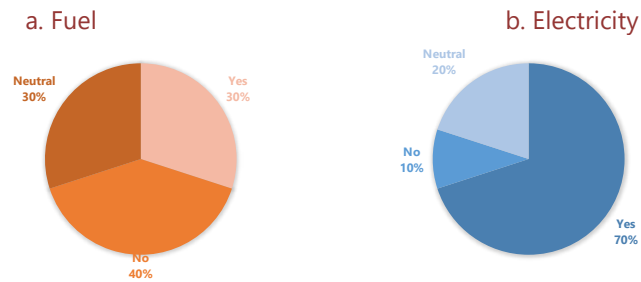
**Box 5. In-depth Interviews Trends**

**Figure 25. Results from the In-depth Interviews**

1. What Are the Main Energy Sector Challenges?

a. Fuel

- Lack of Transparency 11%
- Lack of Competition 11%
- Political Interference in Price Setting 17%
- Border Zones / Illegal Activities 11%
- Important imports weaken Colombia 6%
- High Subsidies 44%

b. Electricity

- Strata system 13%
- Culture of non-payment 21%
- Renewables objective 12%
- Large Actors (rents) 12%
- Poor quality of service 17%
- Investment Deficit 25%

2. Is the Energy Sector Performing Well?

a. Fuel

- Neutral 30%
- Yes 30%
- No 40%

b. Electricity

- Neutral 20%
- No 10%
- Yes 70%

3. What are the key energy sector reform political risks?

a. Fuel

- Investment Deficit 18%
- Resistence by Large Incumbents 46%
- Resistance to Transpancy by Interest Groups 36%

b. Electricity

- Resistance to Renewables 36%
- Resistance by Large Incumbents 46%
- Investment Deficit 18%
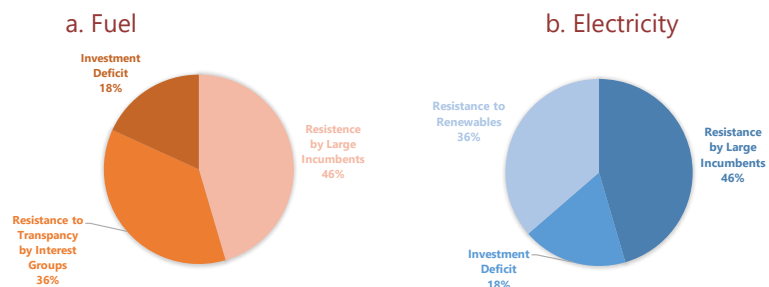
4. Is the government aligned with utilities to ensure consistent messaging?

- Neutral 10%
- Yes 50%
- No 40%
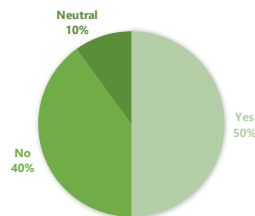
## Box 5. In-depth Interviews Trends (Concluded)

### 5. Is the government effectively coordinated internally on energy sector issues?

Yes 30%
Neutral 40%
No 30%
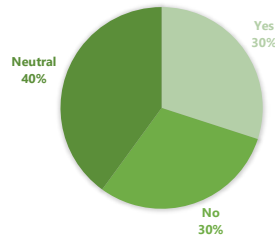
### 6. Is government energy sector policy fair and transparent?

#### a. Fuel

Neutral 30%
Yes 40%
No 30%

#### b. Electricity

Neutral 30%
Yes 60%
No 10%
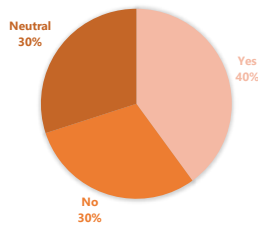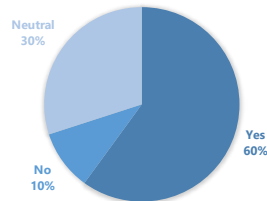
### 7. Is government communications effective on energy sector issues?

#### a. Fuel

Yes
Neutral
No

#### b. Electricity

Yes 30%
Neutral 40%
No 30%
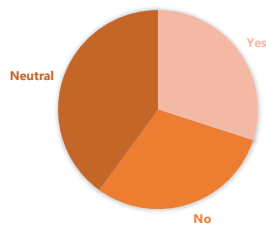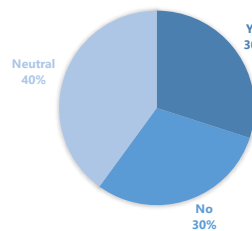
### 8. Does the government manage energy sector political risk well?

#### a. Fuel

Yes
Neutral
No

#### b. Electricity

Yes 20%
No 10%
Neutral 70%
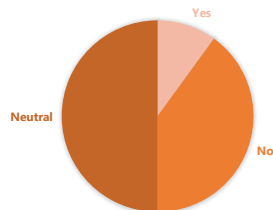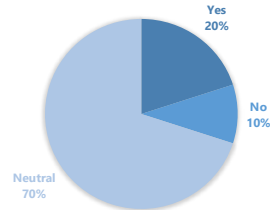
Source: IMF staff.

**50.     Typically, local public relations agencies support governments in undertaking the research phase of their communication campaigns, including public opinion surveys.** It is the IMF's understanding that Colombia's Department of National Planning (DNP) has undertaken surveys to understand the public's view on government policies, and hence has the capacity and resources to undertake a perception survey on energy subsidy reforms—which would allow the government to initiate the research phase, effectively gaining preliminary insights on the public's knowledge about energy sector issues and its views about potential reforms. Such preliminary analysis would be very valuable, until a Colombian public relations agency is involved, and is hired to conduct a formal public opinion survey.

<div align="center"><strong>Table 6. Communication Research Tools</strong></div>

| Method | Description |
|---|---|
| **Political Economy Analysis** | In many countries around the world, political economy constraints represent key challenges to reforms. Different stakeholders act to advance their own interests in the context of power relationships that are associated with resource allocations. Understanding political economy constraints helps policymakers in their assessment of the influences and interests of different stakeholders with respect to the reform. A political economy analysis aims at closing knowledge gaps about processes and players that can potentially affect the design and implementation of policies and programmatic interventions. |
| **In-depth interviews (IDIs)** | These pertain to qualitative one-on-one interviews with individuals. Interviews can be structured with formal written guidance or with semi-formal guidance, with the latter (being more flexible) allowing new issues that arise during an interview to also be pursued. They can also be unstructured, but organized around specific topics. Such interviews provide in-depth views of influential individuals with respect to a particular issue. Generally, 10 to15 in-depth interviews wih individuals from both, the government and non-government sectors, are sufficient to inititate a communication campaign process. |
| **Focus Group** | These pertain to semi-structured qualitative discussions with small groups (generally 6–12 participants per group). They mostly aim at informing large public opinion polls, as they mainly seek to obtain broad views on a particular issue. Focus group discussions can be used together with in-depth interviews to inform a reform process as it progresess. They can also be used before rolling out a communication campaign to "pretest" messages with a small group of people before delivering them on mass media. |
| **Opinion Survey** | It uses a structured survey questionnaire and is conducted face-to-face or by phone. Public opinion surveys should be conducted using appropriate sampling techniques. The surveys provide large scale data points that can be very informative for campaign messages. They are particularly useful when considering broad reforms that have the potential to significantly affect a large portion of the population. Their main advantage is that they provide very rich information for an in-depth empirical analysis that can be very valuable for communication campaigns. |

Source: World Bank Good Practice
Note 10: Designing Communication Campaigns for Energy Subsidy Reform.

## C.  Communication Campaign Organization

### Internal Government Organization

**51.     A strategic communications unit is key to an effective internal organization of all the government entities that are involved in the reform**. The Strategic Communication Unit (SCU)

should be tasked to design and lead energy reform campaigns, as well as establish an inter-ministerial communications group (MCG) that helps in improving coordination across different government entities and sectors  (Figure 26).

- The SCU should aim at building a sophisticated strategic operation whose mandate will be given by the president and his cabinet to form and sustain a network of external stakeholders that can serve as effective advocates of the reforms among the public. The coordination with the leadership teams at the presidency (and across key ministries) helps in organizing and managing all communication matters that are related to the reforms. The key objectives of the SCU are: (i) designing an action plan to execute the government's communications strategy; (ii) improving the government's communication capacity to disseminate messages in clear and effective ways; (ii) developing the content, the branding, and the core messaging in the communication campaign; and (iv) facilitating the dissemination of messages to the public through various channels. The effectiveness of the SCU in achieving its key objectives is often improved with support from a local public relation agency.

- The MCG's role in helping with coordination across different sectors and ministries is crucial for the ability of the strategic unit to effectively perform its mandate given the large number of stakeholders within the government that are involved—whether directly or indirectly—in matters related to the energy sector.

### Figure 26. Internal Government Communication Organization
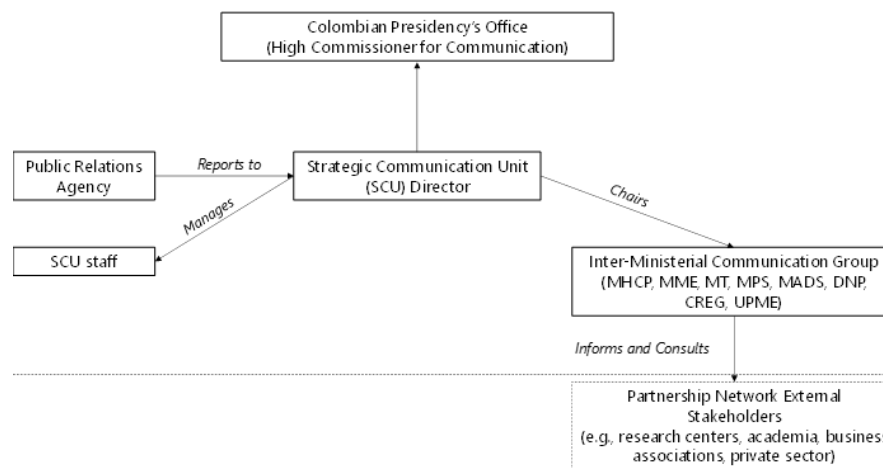


Source: IMF staff.

**52.** **The SCU director should also be the principal government interlocutor with a local public relations agency that the government may consider hiring to support it in developing and executing its communications campaign.** It is expected that the director will (i) work closely with local public relations agency; (ii) receive from the agency content and messaging materials for review on behalf of the government, (iii) and approve all materials

created by the agency. In addition to the director, the SCU should consist of creative and digital experts, traditional/social media relations strategists and external relations managers that engage external stakeholders.

## External Organization

**53.      One of the main tasks of an effective communication strategy is to create and sustain a public-private "Partnership Network", which includes external stakeholders or partners of the Government.** The partnership network is crucial to informing target audiences in the public and shaping the national debate about the reform—both of which are crucial to wining the public's support for the government's reform plan. External stakeholders in Colombia may include: (i) research centers such as Fedesarrollo; (ii) sector experts and academics; (iii) business associations such as Andesco, ANDI and Fenilco; and (iv) private sector entities, including companies such as Enel-Codensa. Members of the Partnership Network should meet regularly to exchange information, thoughts and concepts that may prove useful for advancing the reform plan. In-Depth-Interviews (IDIs) that were conducted with various stakeholders by the IMF technical assistance team during the mission, suggest that at least some influential stakeholders may well be favorably positioned to play constructive roles—as opinion leaders—in advocating the government's energy reforms. From this perspective, it is important that stakeholders are carefully selected from different segments of the Colombian society, including the private sector, academia, think tanks, business and trade associations, as well as labor unions and the media.

**54.      The engagement process with external stakeholders is key to an effective external organization that may well determine the success (or failure) of the government's communication campaign in general and the reforms in particular.** The process of engaging external stakeholders can be executed in various ways: (i) Reaching out to those who have indicated interest and/or support for the reforms; (ii) conducting bilateral senior-level dialogues with those who are critical to the success of the campaign—but may have not yet expressed their support for the reforms; (iii) seeking support from individuals, organizations and groups who—despite their interest in the Partnership Network—may not want to be perceived as being active members in an advocacy group. Engaging with those entities—especially if they are perceived to determine, at least to some extent, the communications campaign's success or failure—is essential and can be done in the context of attending or participating in conferences, public debates and other public events. Overall, the objective is to form a Partnership Network that can become a forum that helps in: (i) building consensus among external stakeholders; and (ii) gaining stakeholders' commitment to serve as opinion leaders and advocates for the government's reform plan. Programs that aim at improving the collaborative role of stakeholders may include: (i) Policy and research dialogues; (ii) conferences and round-tables with government participants; and (iii) capacity building training sessions and workshops on communication matters (Table 7).

### Communication Strategy

**55.      The design of an effective communication strategy should build on information obtained from research and analysis that have already assessed the public's opinion regarding the reforms.** The communication strategy of the government should have three main objectives: (i) raise awareness about the current status quo regarding energy subsidies (their fiscal cost, targeting, negative economic and environmental implications, among others); (ii) explain the reforms in a very factual manner; and (iii) empower citizens to make optimal energy consumption decisions for their household. The communication strategy may also consider the government's positioning by: (i) determining whether the government has the appropriate internal organization to conduct an effective campaign; and (ii) ascertaining whether—and to which extent—the government has credibility with the public. Box 6 briefly describes the Ukrainian example of a successful communication campaign that pertained to energy sector reforms.

**Table 7. Key Players in a Communication Campaign: Roles, Participants, and Objectives**

| Structure | Role | Participants | Objective |
|---|---|---|---|
| SCU | Organizes and leads the government's energy sector communication campaign | SCU director and staff | Build government communication capacity, develop content and messaging, facilitate its dissemination to public directly or through Partnership Network external stakeholders |
| MCG | Works closely with SCU Meets on regular basis to support government's energy reform campaign | Chaired by the SCU director and includes senior communications officials from relevant ministries and agencies that play a key role in the energy sector | Keep the Partnership Network's external stakeholders informed about government reforms and campaigns, and build upon their analysis and insights in a collaborative way |
| Partnership Network | Exchange information and ideas during regularly held meetings (e.g., round-table discussions) | Various government and external stakeholders | Evaluate external stakeholders' communication requirements and help build their capacities; build a consensus with stakeholders and gain their commitment to serve as opinion leaders and advocates of government reforms. |

Source: IMF staff.

**56.      The communication strategy should engage key target audiences across the civil society with adapted messaging.** Adapted messaging includes categories within the following main attributes: (i) geographical distribution; (ii) education levels; (iii) media consumption habits; (iv) age; (v) income levels; and (v) gender.  Additional information derived from household opinion surveys may enable the identification of other groups and/or overlaps with the ones listed above. The above-mentioned main attributes apply to the case of Colombia—with overlaps between attributes as is the case with the Strata system which, at least in principle, applies to both geographical distribution and income levels. Overall, the communication strategy should target a series of sequenced messages including: (i) One suggested "big" message; and (ii)

several "core" messages.[31] Such messages—which need to be compelling and evidence-based—should focus on the need to reform energy subsidies and on the efforts by the government to mitigate any negative impact from the reform on lower-income households.

## D. Action Plan

**57.    The communication action plan should include a series of campaign activities that are executed in the context of a clear and well-defined timeline.** Campaign activities include: (i) the campaign's brand creation and design; (ii) the set-up of the campaign website and social media accounts; (iii) the development of content, including concepts for the website; infographics; publications; documentaries; and (iv) content targeting through both traditional media platforms (e.g., TV, radio and print) as well as social media platforms (e.g., Facebook, Twitter, and YouTube). In addition, the action plan may also rely on: (i) media relations, such as pitching and placing features, op-eds and interviews; (ii) advocacy and outreach, such as engaging and leveraging influencers and opinion leaders; (iii) event concepts and the scheduling of events; (iv) capacity building that includes media and public speaking training; and (v) a preemptive advisory and media response—also known as crisis communications. It is important that all activities in the campaign should be defined and executed according to a clear timeline that is fully consistent with the communication strategy of the government.

**58.    Governments that undertake national communications campaigns tend to hire local public relations agencies to support their efforts.** An effective support from local public relation agencies includes: (i) the conduct of the initial research and analysis phase; (ii) the development of a communications strategy based on the research and analysis; and (iii) the development of the action plan of activities that are driven by the campaign strategy. A local agency is generally preferable because it easily navigates through language and cultural considerations that are unique to the country. It also has the ability and experience to take on campaign tasks across the country without necessarily being identified as a government institution or a foreign entity.

**59.    The action plan must develop measurable goals under the communication strategy, in order to track progress and ensure that the campaign is achieving its objectives.** The measurable goals will be developed based on the objectives of the communication campaign. To develop these goals, the campaign's measurement framework should take into account, for each objective, the following: (i) the target audience; (ii) the number of individuals that were reached during the campaign and the frequency at which they were reached; and (iii) metrics that can be used to determine the impact of the campaign on public opinion.

**60.    While some groups will always be deeply opposed to the reforms, the success of a communication's campaign does not necessarily entail winning the full support of the**

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[31] The suggested Big and Core messages will be developed based on research and analysis and will be driven by reform policy options and communications objectives.

**entire country.** Often, no amount of communication effort will persuade a certain group of individuals or stakeholders to be supportive of the reforms, in which case the government should refrain from spending additional resources to gain their backing. Communication campaigns often aim at building coalitions that can facilitate the reform process and convince neutral or undecided stakeholders about the benefits of the reforms, and not necessarily gain the support of everyone in the country.

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**Box 6. Case-Study: Ukraine's Successful Communication Campaign**

In 2015, energy subsidies in Ukraine amounted to around 5 percent of GDP. In order to alleviate fiscal pressures, the government decided to undertake energy subsidy reform. Public opinion research and a series of focus groups were conducted across the country and constituted the basis for a public awareness campaign that reached out to citizens using compelling, evidence-based messaging about the need to reform energy subsidies. The campaign also focused on the government's effort to mitigate the impacts of price increases on poor households under the reforms, as well as on other efficiency measures that potentially help citizens in coping with higher prices.

The communication campaign was designed to better engage citizens in the reform process, mainly by improving—through effective messaging—their understanding the country's energy consumption and its unsustainability. It also provided potential solutions, including the need for energy efficiency measures to be adopted by Ukrainian citizens. This, for example, was achieved through the airing of a TV commercial—developed by an advertising agency in Ukraine—that highlighted: (i) the waste resulting from energy subsidies and discussed ways that citizens could pursue reduce such waster through energy efficiency measures; and (ii) explained the improvements being made to social assistance programs by the government. The TV commercial aired 400 times per week on 19 different channels across Ukraine in 2016. All while the process of enrolling applicants in the social assistance programs was being simplified and welfare officers were being trained in new procedures, effectively leading to a sizeable increase in enrollment in the Housing and Utilities Subsidy Program over a short-period of time.



Three key lessons can be learned from the experience of Ukraine: (i) a high level of government commitment is needed for consistent communication regarding energy subsidy reform; (ii) an understanding of citizens' perceptions of reforms is crucial to gaining support for the reforms; and (iii) a prioritization for the channels that citizens follow (and trust), is crucial to increasing trust and credibility in the reform process.
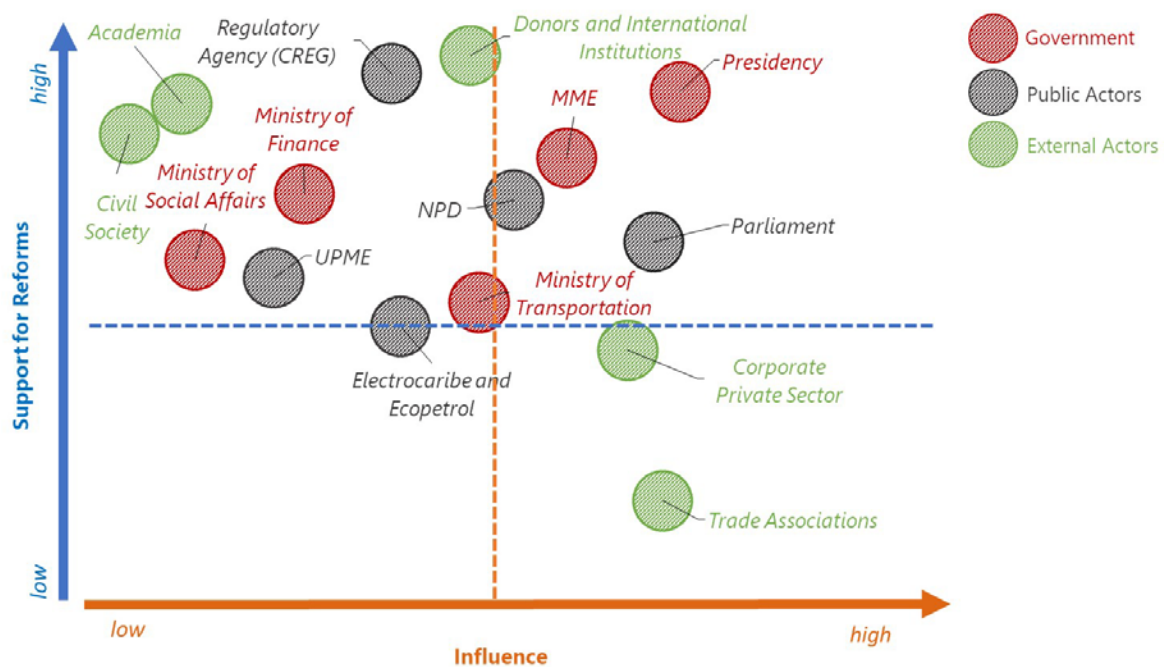
Source: IMF staff.

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**61. Mapping the interest and the influence of stakeholders in Colombia helps in better understanding where the support for—or resistance to—the reforms is likely to be the strongest.** Ultimately, the main goal is to understand the extent of the alignment of the interest of stakeholders with the incentives of the government as it embarks on adopting policies that would move the country towards a new steady state. Hence, the government would benefit from mapping the interest and influence of different stakeholders for better identifying and

addressing political economy constraints. This would significantly improve the ability of policymakers to choose their political allies and to blunt the political influence of groups that can potentially block the reforms or reverse their implementation. Figure 27 provides a mapping of stakeholders in Colombia based on the extent of their support for the reforms and their ability to influence the reform process, which can be explained in terms of a framework that considers both interest and influence as key inputs. The levels of interest and influence of stakeholders can be explained and assessed as follows:

- The level of Interest: how likely a stakeholder is to welcome the prospect of energy subsidy reform, owing to both material and ideological factors? Experiences from several countries suggest that for some stakeholders, the reaction towards the reforms may be less based on the issue itself than on the potential that it offers to mobilize and pursue other goals.

- The level of influence: the extent of political influence, access to means of mass communication, financial resources, perceived credibility, propensity to engage in political protest, and numbers (e.g., followers that they are able to mobilize).

This mapping is—for most stakeholders—based on In-Depth-Interviews (IDIs) that were conducted during the mission. For the remaining few stakeholders, the mapping was based on interactions between IMF staff and entities (or individuals) at meetings that were held during the mission. Overall, an analysis of the political economy of energy subsidy reform in Colombia would involve a deep understanding of this map, which suggests a significant variation across the relative powers of groups or entities.

**Figure 27: Mapping Stakeholders by Interest and Influence in Colombia**



Source: IMF staff.

# Annex I. Electricity Price Subsidy Reform Options

**Scenarios differ with respect to the way they target households eligible to electricity subsidy.** In particular, the following alternatives are considered:

**Government Option**: This scenario relies only on the strata system to target households eligible to electricity price subsidies. Compared to the status quo, households in strata 3 stop receiving price subsidies and subsidy rates are lowered to 50 and 40 percent for households in Strata 1 and 2 respectively.

**Consumption Option**: This scenario relies on both the strata system and household consumption levels to target households eligible to electricity subsidy. Compared to the status quo, the subsistence levels are set at the average household consumption levels observed in the bottom four income decile, i.e., 153 kWh/month in low altitude areas and 118 kWh/month in high altitude areas. Only households in stratas 1, 2 and 3 *and* consuming below these thresholds receive electricity price subsidies. Subsidy rates on electricity tariffs per Strata are unchanged.[32]

**SISBEN Option:** This scenario relies on both the Strata system and household SISBEN4 socio-economic score to target households eligible to electricity subsidy. Compared to the status quo, households in stratas 1, 2 and 3 receive an electricity price subsidy if and only if their SISBEN4 socio-economic score is below the average SISBEN4 score of households in income decile 4 (i.e., 16.3). Subsidy rates on electricity tariffs per Strata are unchanged. In practice, households have to require a SISBEN score and should then claim a price subsidy by signaling this score to their electricity retailer.

**Safety Net Option:** This scenario moves away from the strata system and targets households already receiving social assistance transfers from three existing programs Familias en Accion, Juvenes en Accion and Colombia Mayor. These households receive a flat transfer of 21,531 COP/month, equal to the average subsidy received by households in the bottom four income deciles in the status quo. This transfer can then be used either to pay electricity bills, or to improve energy efficiency of recipients' home. Annex Table 1 below summarizes the distributional impacts of each scenario.

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[32] Current subsistence levels are set by law and could be difficult to change in the short term.

## Distributional Impacts of Electricity Price Reform, by Reform Option

| | | Government | Consumption | Sisben | Safety Net |
|---|---|---|---|---|---|
| Percent of Household Income | average loss in bottom decile | -0.3% | -1.5% | -0.3% | -1.7% |
| | average loss in top decile | -0.1% | -0.1% | -0.1% | -0.1% |
| | average gain in bottom decile | 0.0% | 0.0% | 0.0% | 1.8% |
| | average gain in top decile | 0.0% | 0.0% | 0.0% | 0.0% |
| Percent of Total Decile | share of losers in bottom decile | 85% | 24% | 8% | 62% |
| | share of losers in top decile | 89% | 46% | 87% | 88% |
| | share of winners in bottom decile | 0% | 0% | 0% | 30% |
| | share of winners in top decile | 0% | 0% | 0% | 1% |
| | share of neutral in bottom decile | 15% | 76% | 92% | 8% |
| | share of neutral in top decile | 11% | 54% | 13% | 10% |

Source: IMF staff calculations based on 2017 ENPH.

# Annex II. Morocco: Overcoming the Challenges of Fuel Subsidy Reform

Prices of fuel products in Morocco were administratively set by the government over a long period of time, with price adjustments being somewhat infrequent between 2000 and 2012. However, the decision to embark in fuel subsidy reform was taken towards the end of year 2012.

The reform strategy focused in the first phase on gasoline and diesel subsidies, since they are consumed mostly by relatively higher income households. The process started with a gradual approach that consisted first in a partial phasing out of subsidies by putting in place, starting in September 2013, ceilings on unit subsidies. The aim was to limit budgetary costs. The ceiling was set higher in the case of diesel, since it is used heavily as an input in the production process of goods and services in the economy. This reflected the government's objective to limit any potential indirect effects stemming from significantly raising diesel prices, and thus to contain any potential significant impact on inflation. Ceilings on unit subsidies were then gradually reduced over time. In fact, in January 2014, unit subsidies were fully eliminated for mid-grade gasoline and fuel oil, while automotive diesel subsidies were progressively reduced throughout the year, and then eventually eliminated on December 31, 2014.  During this period, price revisions started to occur on a regular basis in the context of automatic pricing mechanisms. Initially, adjustment occurred monthly. Price adjustments then became more frequent, occurring twice a month until November 30, 2015. Eventually, the government – in an unprecedented and courageous move— fully liberalized the prices of fuel products. And it continues to successfully maintain this pricing regime as of September 30, 2018. To alleviate the impact of fuel price increases, the government has implemented several accompanying measures during the reform period.

1) It has established the *Fund for Social Cohesion* under the Finance Act of 2012. The Fund aimed at: (i) contributing to the financing of medical assistance for the most vulnerable; (ii) providing conditional cash transfers that require poor families who receive them to send their children to school; and (iii) providing direct unconditional support to vulnerable households.

2) It has taken measures to reduce the impact on the transport sector after consultation with stakeholders, which enabled the government to identify the concerns of the sector and how to best address them.

It is important to note that social protection measures in Morocco still need to be improved.

The reform process is still ongoing, especially that LPG subsidies remain on the budget. As part of the efforts to address LPG subsidies, efforts are currently ongoing to design a unified social register with support from the World Bank. The system will rely on biometric data (drawing

lessons from the experience in India), and will aim at improving the targeting of social safety nets. The Moroccan reform experience provides several insights and policy lessons:

1) The importance of consultation with all stakeholders during the first stages of reform.

2) The importance of a gradual approach to reforming fuel prices, first by focusing on products that may have less impact on lower income households, and second by controlling the pace of raising fuel prices so that the government can carefully design and implement mitigating measures.

3) The importance of continuing efforts to improve the targeting of social safety nets, especially in preparation for the removal of subsidies on products that can have a greater impact on lower income households (e.g., LPG).

# Annex III. The Macroeconomic Impacts of Retail Fuel Price Shocks on Inflation: Results from a Cross-Country Analysis

We estimate the impact of retail fuel price shocks (average for diesel and gasoline) following the flexible local projection approach (Jorda, 2005). Within this framework, we identify shocks to retail domestic fuel prices by relying on the common assumption in the literature that innovations to the fuel price series—measured in local currency—are predetermined with respect to macroeconomic aggregates. The unbalanced panel data contains around 12600 observations.

We present the impulse response functions (IRFs) for two country groups, according to their wage flexibility. To determine a country's wage flexibility, we construct an index that captures the extent to which centralized collective bargaining is used in the wage setting process. Data are from the 2014 Global Competitiveness Report published by the World Economic Forum (WEF). This indicator, ranging from 1 (centralized) to 7 (decentralized) provides a score reflecting the flexibly of wage determination. We classify a country as having relatively more flexible wages if the score on this indicator falls above the median of the cross-country distribution. Otherwise, a country is classified as having relatively less flexible wages. We find compelling evidence that wage flexibility matters for the impacts of shocks to domestic (measured in local currency) retail fuel prices on inflation: The effects on inflation are:

a) Higher in the country group where wage flexibility is an issue (i.e., where more centralized collective bargaining is used in the wage setting process).

b) More persistent or long lasting in the country group with lower wage flexibility.
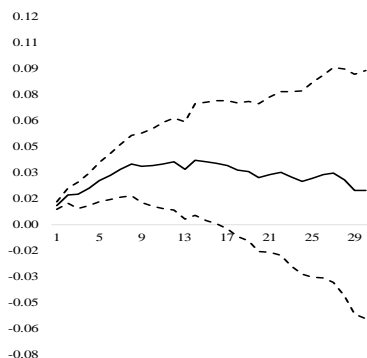
*A. More flexible wages*     *B.  Less flexible wages*
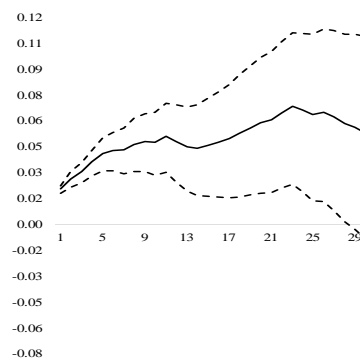


We use monthly data over the period 2000:1 to 2014:6 for a sample of 110 countries—of which 31 are high income countries, 42 are emerging countries and 37 are low income countries. The multivariate dynamic model accounts for the dynamic relations among the following variables:

retail fuel prices (average for diesel and gasoline) measured in local currency, the nominal effective exchange rate (NEER), the consumer price index (CPI), and a measure of the short-term interest rate (the lending rate). The 16th and 84th percentiles (dashed lines), obtained from the bootstrap procedure, are shown on both sides of the point estimate. The size of the shock is normalized so that it raises the price of gasoline by 1 percent on impact in all country groups, for comparability.