Subnational electricity taxes and federal subsidies: The case of Argentina

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Abstract

Argentina has long been recognized as a country that devotes a significant share of public resources to energy subsidies, with such policies persisting across several decades and political cycles. We study a status quo in which the Argentine federal government provides electricity subsidies to a group of households by reducing wholesale energy prices, while subnational governments impose heavy taxes on all households with no differentiation. Thus, distortions arise from both precluding efficient wholesale pricing and allowing free taxation at the subnational level, with heavy burden and incidence effects. We contribute to the characterization and measurement of this status quo, and then evaluate a reform scheme that eliminates wholesale market price subsidies, which generates a rise in tax revenues (a recovery of previously foregone revenues due to subsidies). These revenues are used to reduce the tax burden on vulnerable households, along with some conditional transfers from the federal government. The reform evaluated amounts to moving from wholesale price subsidies, which fall on the national government, to tax expenditure subsidies, which are shared in a coordinated fashion among all levels of government.

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1 Introduction

End-user or excise electricity taxes represent a relatively minor component of overall energy taxation, as measured by OECD (2019), and should be considered part of a broader reform toward more effective taxation based on the carbon content of energy-an issue that also applies to Latin American (LAC) countries (Ahumada et al., 2023, 2024). Evidence from OECD estimates shows that end-user or excise taxation of electricity in most EU countries is mainly concentrated on residential and commercial users, with significant heterogeneity across countries and in subnational (e.g., city-level) tax rates (Eurostat, 2025). In Latin America, OECD (2025) estimates highlight Brazil as a clear case of end-user household electricity taxation, while evidence for other countries in the region (Navajas, 2018) indicates significant taxation in Argentina, Bolivia, Ecuador, and Peru. In the case of Argentina, subnational taxes constitute a substantial component of total electricity taxation and have been a source of concern due to the distortions they create in price signals and the resulting increase in household bills—this in a context of substantial fiscal subsidies provided by the federal government to households.

A recent study (FIEL, 2025) aimed to systematize the magnitude of the residential electricity tax burden in Argentina, measure its magnitude along the value chain or in households' final bills, and estimate its impact on households of different income levels. This approach to estimation yields results that demonstrate the magnitude and heterogeneity of the tax burden across provinces and municipalities, using comprehensive samples of jurisdictions, one across provinces and another covering different jurisdictions in the Province of Buenos Aires. The three levels of government are analyzed. This paper uses this background to model the underlying fiscal setting, provide estimates of the tax burden and household income incidence at the statu quo based on a microdata set across jurisdictions and households and then move to simulate a reform based on a rebalancing, that reduces the tax burden on vulnerable households after the elimination of electricity subsidies based on the current household segmentation pricing of electricity at the wholesale market observed in Argentina. The logic of studying an electricity tax reform following the elimination of subsidies is very obvious and simple. Argentina has a tariff segmentation of households into three groups (so called L1, L2, and L3) corresponding to wealthy, vulnerable, and middle-income households. The former group pay full rates and the latter and third receive subsidies through lower wholesale electricity prices, a federal-level mechanism with an impact on the national budget that has oscilated between 1.5% and 0.5% of GDP in recent years. This results in lower pre-tax household expenditures on electricity for these two household groups (vulnerable and middle-income, L2 and L3), but also, given the ad valorem structure of federal, provincial

and municipal taxes, leads to lower tax revenues due to subsidies through lower prices, generating an effect that generates what is called "foregone revenues" for the treasury, something that is not always recognized in the breakdown of energy subsidies (Di Bella et al., 2015; Navajas, 2015; Cont and Navajas, 2019).

The reform explored in this paper estimates tax reductions in federal, provincial, and municipal jurisdictions for vulnerable households (L2) that, following a widespread elimination of price-based subsidies, uses the recovery of lost tax revenues provided by the elimination of subsidies and the fiscal gains of the reduction in federal subsidies to cushion the impact on the spending of vulnerable households. The simulation requires using, for each jurisdiction in our sample, information for each segmented household group, referring to quantities consumed, fixed and variable charges, pre-tax expenditures, and tax rates at the three levels of government. The results allow for an evaluation selected for its conceptual clarity, given that it aligns with a line of subsidy reform, such as concentrating subsidies on vulnerable households, over which there is broad consensus in the last years. This is tax and subsidy reform does not alter the status quo on many dimensions such as the tariff structure across jurisdictions, and the tax structure (except for rate reductions for vulnerable groups. It is revenue neutral for tax collection, significantly improves allocative efficiency at the wholesale market pricing and has income and distributive impacts that are sought to dilute by reducing taxes for vulnerable groups. In sum it is a tax reform that collaborates with a rebalancing that goes from federal energy subsidies via wholesale prices to subsidies via lower taxes (or tax spending). This is important because tax reform when there are pre-existing price distortions that result in lost tax revenue requires that both determinants of the tax burden (tax rates and tariffs) be resolved in a coordinated manner.

The structure of the paper is as follows. Section 2 analytically characterizes the status quo regarding residential electricity taxes in a context where wholesale prices are subsidized and the direction of reform studied. Section 3 presents the data and measurement and estimation methodology used in the paper. Section 4 measures estimates the the tax burden across jurisdictions and type of taxes within the value chain of final outlay of households, and evaluates the incidence of electricity taxes on households of different income deciles. Section 5 defines and simulates, based on the parameters and data of the status quo, a reform that reduces electricity taxes in all levels of government for vulnerable households coupled with a reduction in wholesale price subsidies. The tax reduction (shared by the three levels of government), is financed by the recovery of foregone revenues (at all level of government) that come from the elimination of wholesale price subsidies and with federal transfers that come from the elimination of fiscal subsidies. To this end, we estimate the magnitudes of the tax relief for L2 households and the complementary transfers that the federal government

can make after eliminating subsidies, in order to accommodate the impacts that this type of reform has on L2 and L3 households, as well as the changes in tax incidence. Finally, Section 6 draws conclusions and proposes extensions.

2 Statu quo setting

In this section, we examine the institutional setting of electricity taxation and subsidies in Argentina. The country has three levels of government (federal, provincial and municipal) that levy taxes on goods, including electricity. A centralized value-added tax (VAT) is collected federally and subsequently shared between the federal government and the provinces. As described in our dataset section below, we have $i = 1, \ldots, I$ territorial and political jurisdictions, each represented by one province and one main municipality per province. In addition to VAT, households face both provincial and municipal taxes on electricity consumption, which are mainly in ad valorem format as VAT, and are applied to outlays determined by tariff structures that vary across jurisdictions.

Argentina has a long history of using energy prices as a redistributive tool (Hancevic et al., 2016; Cont et al., 2020), with the energy subsidies increasing from 1.1 percent of GDP in 2019 to 2.1 percent in 2021 (1.5 for electricity and 0.6 for natural gas). In 2022, with the goal of reducing energy subsidies the federal government implemented an administrative segmentation[1] of households based on socioeconomic self-reported factors[2] (mainly income level) into three groups: high income, Level 1 (L1), low income, Level 2 (L2), and middle income, Level 3 (L3), establishing differentiated prices for electricity tariffs for each group. Households classified as high income face a full unsubsidized tariff reflecting costs, while those classified as middle and low income face lower (below cost) wholesale electricity prices only for L2 and N3 groups. This regime remains in effect and applies in all I jurisdiction.

As wholesale pricing in Argentina's interconnected system generates few differences in prices across jurisdictions, differences in the electricity bill across jurisdictions come from different transmission and distribution charges that can vary across segmented groups and of course taxation, which is uniform across all households within each jurisdiction. Transmission is regulated federally, while distribution is regulated provincially in most of the country, except in the Metropolitan Area of Buenos Aires (AMBA)[3], where regulation is federal.

To sum up, from a fiscal perspective, the setting of household electricity taxation is one where the federal government charges VAT and provides subsidies to two segmented groups

[1] Decree 322/2022

[2] See Table A.1 in Appendix for elegibility criteria.

[3] The AMBA region includes all households in the Autonomous City of Buenos Aires (CABA) and 60% of the Buenos Aires province.

by distorting wholesale pricing across all jurisdictions, while provinces and municipalities retain autonomy to set their own taxes.[4] Subsidies delivered through depressed prices give rise to foregone tax revenues (Di Bella et al., 2015; Navajas, 2015; Cont and Navajas, 2019) in all levels of government, while the subnational jurisdictions in a federal country can compensate this through their statutary or constitutional freedom to set higher taxes

We characterize the *status quo* (at time 0) studied in this paper by a set of taxes on electricity: t_n^0, t_{ip}^0, and t_{im}^0, where t_n is the federal VAT, and t_{ip} and t_{im} are the provincial and municipal taxes in jurisdiction i, respectively. Each household h in a given jurisdiction, belonging to a segmented group L_{ij} ($i = 1, \ldots, I$; $j = 1, 2, 3$), faces a two-part tariff (which varies in an increasing block pricing (IBP) fashion in many jurisdictions; see Navajas and Puig (2024)), with a corresponding fixed charge A_{ij}^h and a variable volumetric charge p_{ij}^h applied to consumed quantities x_{ij}^h. Thus, the bill or outlay G_{ij}^{h0} faced by any household h of type j of jurisdiction i under the status quo (0) can be written as:

$$G_{ij}^{h0} = (A_{ij}^{h0} + p_{ij}^{h0} \cdot x_{ij}^{h0}) \cdot (1 + t_n^0 + t_{ip}^0 + t_{im}^0) \tag{1}$$

As part of the *status quo*, end-user electricity tariffs p_{ij}^{h0} are formed by wholesale electricity prices p_m that only reflect costs C_m in the case of L_1 households, but are below cost for L_2 and L_3 households; i.e., $p_{m2}^0 < p_{m3}^0 < C_m^0 = p_{m1}^0$. Tariffs also include transmission charges (which tend to be uniform) and distribution charges, which are quite heterogeneous in format and level across jurisdictions. This reflects, in the case of distribution charges, different cost structures and different tariff designs (Navajas and Olguin, 2024).

While household expenditures are represented by expression (1), at the federal level the government receives, under the *status quo*, a share α of VAT from electricity taxation and spends on energy subsidies—given by the lower wholesale electricity prices to groups L_2 and L_3—as shown in expression (2).

$$R_n^0 = \alpha \cdot t_n^0 \sum_i \sum_j \sum_h \left(A_{ij}^{h0} + p_{ij}^{h0} \cdot x_{ij}^{h0}\right) - \sum_i \sum_h \left(\left(p_{m1}^0 - p_{m2}^0\right) \cdot x_{i2}^{h0} + \left(p_{m1}^0 - p_{m3}^0\right) \cdot x_{i3}^{h0}\right) \tag{2}$$

[4] FIEL (2025) describes the provincial laws on which provincial and municipal electricity taxes are based upon. In some municipalities there is a slack or flexibility to impose additional charges on household bills for instance on public lighting, particularly in the province of Buenos Aires. Other municipalities have electricity distribution organized through local cooperatives that, despite being regulated on tariffs and taxes, may use the electricity bill for collecting revenues for other services in a compulsory fashion, which has been legally challenged by the federal government.

As for subnational governments, their tax collection under the *status quo* comes from their share in VAT, $(1-\alpha)\cdot\beta_i$—where β_i is their share in the collective provincial portion of VAT—and from their own taxes, as shown in expressions (3) for provinces and (4) for municipalities.

$$R^0_{ip} = (1-\alpha)\cdot\beta_i\cdot t^0_n \sum_j\sum_h \left(A^{h0}_{ij} + p^{h0}_{ij}\cdot x^{h0}_{ij}\right) + \sum_j\sum_h t^0_{ip}\left(A^{h0}_{ij} + p^{h0}_{ij}\cdot x^{h0}_{ij}\right) \tag{3}$$

$$R^0_{im} = \sum_j\sum_h t^0_{im}\cdot\left(A^{h0}_{ij} + p^{h0}_{ij}\cdot x^{h0}_{ij}\right) \tag{4}$$

One characteristic of the *status quo* is that, due to the allocation of subsidies through depressed electricity prices and given the ad valorem nature of taxation, there exist foregone revenues (FR) from tax collection at all levels of government. These are defined for the federal, provincial, and municipal levels, respectively, in the following expressions:

$$FR^0_n = \alpha\cdot t^0_n \sum_i\sum_j\sum_h \left(\left(p^0_{m1} - p^0_{m2}\right)\cdot x^{h0}_{i2} + \left(p^0_{m1} - p^0_{m3}\right)\cdot x^{h0}_{i3}\right) \tag{5}$$

$$\begin{aligned} FR^0_{ip} = (1-\alpha)\,\beta_i\cdot t^0_n \sum_j\sum_h \left(\left(p^0_{m1} - p^0_{m2}\right)\cdot x^{h0}_{i2} + \left(p^0_{m1} - p^0_{m3}\right)\cdot x^{h0}_{i3}\right) \\ + \sum_j\sum_h t^0_{ip}\left(\left(p^0_{m1} - p^0_{m2}\right)\cdot x^{h0}_{i2} + \left(p^0_{m1} - p^0_{m3}\right)\cdot x^{h0}_{i3}\right) \end{aligned} \tag{6}$$

$$FR^0_{im} = \sum_j\sum_h t^0_{im}\left(\left(p^0_{m1} - p^0_{m2}\right)\cdot x^{h0}_{i2} + \left(p^0_{m1} - p^0_{m3}\right)\cdot x^{h0}_{i3}\right) \tag{7}$$

With this notation, we can now proceed to the following definition.

The electricity taxes-cum-subsidies *status quo* consists of a set of taxes applied to all households and wholesale prices for some segmented households (t^0_n, t^0_{ip}, t^0_{im}, p^0_{m2}, p^0_{m3}), which—given tariff structures and other parameters—give rise to net (of subsidies) revenues (i.e., taxes net of subsidies) and foregone revenues to the federal government (NR^0_n, FR^0_n), as well as revenues and foregone revenues for all subnational jurisdictions: provinces (R^0_{ip}, FR^0_{ip}) and municipalities (R^0_{im}, FR^0_{im}).

In Section 3, we present the data and measurement methodology that we use to: first, in Section 4, measure the structure, burden, and incidence of the *status quo*; and second, in Section 5, simulate a reform of the *status quo* toward uniform wholesale electricity prices across households and a redesign of subsidies in the form of tax expenditures (relative to the *status quo*) shared by all levels of government.

3 Data and measurement methodology

3.1 Background

Argentina is a federal republic comprising 23 provinces and a federal district. Each jurisdiction has one or more Distribution System Operators (DSOs) responsible for providing residential electricity services. Unlike other utilities such as natural gas, electricity access is nearly universal, with 98% of households connected, a proportion that remains relatively consistent across provinces.

Household electricity bills are determined by two primary factors: electricity rates and taxes. Electricity rates are primarily regulated by the National Electricity Regulatory Body (ENRE, in Spanish), while taxation occurs at three government levels-federal, provincial, and municipal—leading to significant heterogeneity in costs.

On the pricing side, Argentina's electricity sector operates under a form of regulatory federalism. The country has an integrated national grid that sets wholesale electricity prices, including federally regulated Transmission System Operators (TSOs), but features independent DSOs at the distribution level. Some DSOs fall under federal jurisdiction, such as those serving the Buenos Aires Metropolitan Area (AMBA)-by far the largest market-while others operate under provincial oversight. Many federal and provincial DSOs inherited their regulatory frameworks from a major sectoral reform in the 1990s, with federally controlled areas governed by ENRE and provincial DSOs regulated under local laws and agencies. ENRE, an independent body reporting to the Ministry of Economy and Finance, oversees both electricity distribution and transmission. While private DSOs are regulated within this framework, some provinces operate state-owned DSOs, which fall under separate provincial regulatory agencies. As a result, Argentina's tariff design varies widely, with block pricing schemes featuring distinct fixed and variable charges, reflecting differences in density, economies of scale, and cost structures.

Meanwhile, taxation is determined independently at the federal, provincial, and municipal levels, typical of a fiscal federalist system. The absence of coordinated tax policies at the subnational levels leads to highly diverse end-user tariff structures, where households face

significantly different final electricity prices depending on their location and consumption patterns. Although wholesale prices remain relatively uniform nationwide, structural market reforms introduced in the 1990s, such as the unbundling of generation, transmission, and distribution, persist today. However, other reform elements—such as locational pricing, which was originally intended as part of the restructuring—were disrupted by regulatory interventions in the early 2000s, preventing congestion costs from being fully reflected in wholesale electricity pricing. Consequently, household-level price signals vary substantially, not only due to differing distribution costs but also because of the complex interplay between taxation and regulation across jurisdictions.

In 2022, Argentina implemented an energy segmentation policy, reorganizing subsidies into three income-based categories:

- Level 1 (High-income households) – No subsidy applied.
- Level 2 (Low-income households) – Highest level of subsidy granted.
- Level 3 (Middle-income households) – Partial subsidies, decreasing as consumption rises.

The segmentation framework, introduced through Decree No. 332/2022, aims to gradually transition households toward real energy costs, while ensuring low-income users retain essential access to electricity and gas. To qualify for subsidies, households had to register in the *Registro de Acceso a los Subsidios de Energía* (RASE). Those who did not register or were ineligible were automatically placed in L1, receiving no subsidy. This segmentation system, alongside the existing pricing and taxation structure, defines the final electricity bills paid by households and represents a crucial component of this paper's analysis.

3.2 Data and Methodology

Based on the model described in Section 2, the methodology to characterize the *status quo* first consists of measuring the magnitude of the residential electricity tax burden on households' final bills, in order to examine jurisdictional and segmentation group differences in the various bill components. Second, a traditional distributive incidence-or tax incidence-analysis is conducted (van de Walle, 1998; Demery, 2000; Bourguignon and Pereira da Silva, 2003; Giuliano et al., 2020; Bertín et al., 2024). Using household per capita income as a welfare indicator, both the absolute and relative incidence of electricity taxes are estimated. The jurisdictions included in this study are the Autonomous City of Buenos Aires (CABA),

Buenos Aires Province, Córdoba, Entre Ríos, Jujuy, Mendoza, Misiones, Neuquén, Santa Fe, and Tucumán.[5]

Regarding the data used for estimating the magnitude of the tax burden and distributive incidence, electricity tariff structures and jurisdiction-specific tax burdens are obtained from the Association of Electric Power Distributors of the Argentine Republic (ADEERA) and combined with microdata on household consumption and income. The primary data source is the Permanent Household Survey (EPH)[6] for the second quarter of 2024, which corresponds to the timing of the tariff schedule under analysis. The survey primarily reports the income distribution of Argentine households but not their energy consumption. For this reason, we rely on the most recent National Household Expenditure Survey (ENGHo) for the years 2017/18. As is standard practice in the literature (Navajas, 2008; Giuliano et al., 2020; Bertín et al., 2024), we do not directly use the quantity values reported in the survey, as these tend to be under-reported relative to administrative data.[7] Instead, we derive quantities based on reported household expenditures after deducting applicable taxes.[8]

At the time the ENGHo was conducted—prior to the implementation of household segmentation—the government had already introduced the social tariff (hereafter, ST) as an earlier attempt to reduce subsidies. Households that qualified for this tariff are now covered under the low-income level in the segmentation policy. This mechanism aimed to protect vulnerable households from the effects of subsidy rollbacks. The presence of the ST introduces an additional methodological challenge, as the ENGHo 2017/18 does not include a variable explicitly identifying ST beneficiaries. Moreover, for a given reported expenditure, two different consumption levels may apply depending on whether a household receives the ST or not. To address these limitations, we construct a binary variable that identifies potential ST beneficiaries based on official eligibility criteria.[9] We then estimate electricity consumption for each household by combining reported spending, the applicable tariff chart, and each household's classification as either a potential ST beneficiary or not.

Next, we impute electricity consumption from ENGHo 2017/18 to the EPH. Imputation is based on variables common to both surveys. We use the DMATCH module in Stata to

[5]This study includes 10 out of 24 jurisdictions, which are the largest, covering 77% of the country's total households (INDEC, 2022), and representing jurisdictions from each of the country's different regions.

[6]EPH represents a nationally representative survey published quarterly and primarily designed to monitor household income and employment conditions.

[7]This under-reporting is often attributed to measurement error: individuals are generally more aware of how much they paid than of how many units they consumed. In ENGHo 2017/18, 67% of quantity observations are equal to or less than one unit.

[8]In ENGHo 2017/18, electricity spending is recorded under the variable "amount" when the "item"" variable equals to "A0451101".

[9]For current criteria, see for example: Northern Distribution and Marketing Company (EDENOR)

perform the matching.[10] Once electricity consumption is imputed, we scale the estimates using administrative data on total residential consumption.[11] Figure A.1 (10 panel charts comparing 2018 vs 2024 consumption distribution by deciles) presents the results of the imputation of energy consumption patterns and reveal a consistent similarity between the two surveys.

Once we have the consumption quantities and income distribution in the EPH, we classify households into three groups (L_1, L_2, and L_3) according to the eligibility criteria of the segmentation policy presented in Table A.1.

4 Tax burden and incidence at the statu quo

4.1 Structure of Electricity Bills: Rates and Taxes

Residential electricity bills in Argentina, in the status quo, consist of two main elements: electricity rates and taxes. Electricity rates typically include a fixed charge and a volumetric charge, although some jurisdictions (Tucumán, Misiones, Neuquén, and Jujuy) also apply additional charges dedicated to infrastructure and generation investments. These additional charges are generally volumetric, with one jurisdiction applying a fixed rate. Taxes, on the other hand, are levied at three levels of government: federal, provincial, and municipal. The structure and magnitude of both rates and taxes vary significantly across jurisdictions, reflecting differences in cost structures and demands, as previously documented in studies such as Secretaría de Energía (2002) and Navajas (2018). Most jurisdictions employ a block tariff structure such that households are charged different rates depending on their consumption tier. However, the design and thresholds of these blocks differ across jurisdictions.

Table 1 depicts some of the heterogeneity in electricity rates in 2024, presenting summary measures of the fixed and volumetric components across different jurisdictions and segmentation tiers.

The tax structure is layered onto these rates. At the federal level, the only tax that is imposed in the electricity bill is the VAT, which comprises a rate of 21%. Tucumán is an exception, also imposing a "check tax" (Law 25.413). At a provincial and municipal level there is a marked heterogeneity of taxes, with Mendoza and Entre Ríos among the ones with higher rates (13.6% and 24.7%, respectively). A summary of these tax rates across jurisdictions is provided in Table 2.

[10] The DMATCH module in Stata allows matching of similar households across surveys based on variables contained in both datasets. In this study, households are matched based on per capita family income.

[11] These data are obtained from the Association of Electric Power Distributors of the Argentine Republic (ADEERA).

Although segmentation groups (L1, L2, and L3) face the same tax rates[12], the tax burden varies significantly across groups due to the differences in consumption and rate structures.

4.2 Incidence and Distribution of Taxes

The breakdown of household electricity expenditure into its main components across the ten selected jurisdictions is illustrated in Figure 1. Across jurisdictions, household electricity expenditures show a similar pattern: volumetric charges account for more than half of the bill, followed by taxes at about 30% (on average). These proportions are relatively stable across segmentation tiers. However, fixed charges become more prominent for L2 and L3 households, which benefit from lower volumetric rates. Table 3 provides an overview of average electricity bills by jurisdiction and segmentation group, expressed in thousands of pesos.

Figure 2 focuses on the tax component of the electricity bill, disaggregating the share of taxes by government level for each segmentation group. This graph highlights the heterogeneity in tax composition across jurisdictions. In Neuquén, Misiones, Buenos Aires, and Ciudad Autónoma de Buenos Aires, more than 75% of total tax payments are for VAT. In contrast, in jurisdictions such as Mendoza, Entre Ríos, and Santa Fe, provincial and municipal taxes account for roughly 50% of total tax payments.

To assess the tax burden and incidence across income groups, we use two measures of incidence. Absolute incidence is captured by the share of total tax revenue contributed by each income decile, calculated as - $\frac{T_h}{T}$, where $h = 1, \ldots, 10$ denotes income deciles. This metric helps identify whether the tax system is "pro-poor" or "pro-rich." Relative incidence, on the other hand, is measured by the share of household income or expenditure allocated to electricity taxes, expressed as - $\frac{T_h}{Y_h}$. This allows for an evaluation of the progressivity or regressivity of electricity taxation across jurisdictions and government levels.

Figure 3 presents both absolute and relative measures of incidence. The blue bars represent each decile's share of total tax revenue (absolute incidence), while the red line indicates the proportion of household income allocated to electricity taxes (relative incidence). Across all jurisdictions, the relative incidence decreases as income rises, suggesting a regressive tendency in the tax burden. Meanwhile, the absolute distribution varies considerably across jurisdictions, with some having a more evenly distributed contribution throughout deciles and others skewed toward lower-income groups.

[12]There is one exception: Misiones, where municipality-level taxes are specific and the amount varies for L1 versus L2 and L3.

5 Reform of federal subsidies with tax expenditures on vulnerable households

In the terms of our setting in Section 2, a reform of the *status quo* consists of a set of new taxes for L_2 households in each jurisdiction and new wholesale electricity prices for L_2 and L_3 households (t^1_n, t^1_{ip}, t^1_{im}, p^1_{m2}, p^1_{m3}), such that wholesale prices converge to subsidy-free values given by L_1 prices under the *status quo* ($p^1_{m2} = p^1_{m3} = p^0_{m1}$). New taxes for L_2 in each jurisdiction are financed by the recovery of foregone revenues due to higher wholesale prices for L_2 and L_3, and by the use, in each jurisdiction, of a fraction γ^1_i, $0 \leq \gamma^1_i \leq 1$, with $\sum_i \gamma^1_i \leq 1$, of the savings achieved through the elimination of federal subsidies. We study the first step of the reform—based on tax expenditures from recovered foregone revenues and tax cuts—and leave for further study the compensation mechanisms involving the use of fiscal savings from federal subsidies.

If the change in taxes on L_2 households at all levels of government (federal, provincial, and municipal) could be assumed equiproportional, we could compute the percentage reduction in total electricity taxes for L_2 households in a given jurisdiction. This reduction would depend on the amount of recovered foregone revenues in that jurisdiction and could then be allocated across all three tax levels. However, the emergence of different VAT rates across jurisdictions does not seem workable. As an alternative, we assume that VAT must remain uniform across jurisdictions. Therefore, a pre-agreed reduction in VAT on L_2 bills is applied uniformly, while provincial and municipal tax reductions are treated jointly and assumed to be equiproportional within each jurisdiction.

This exercise, simulated in this section, will produce heterogeneous impacts on households across jurisdictions. The "funding" of tax reductions for L_2 depends on the level of jurisdictional taxes under the *status quo*, meaning that jurisdictions with higher (lower) taxes will experience—given the same increase in wholesale prices for L_2 and L_3—higher (lower) tax reductions and therefore lower (higher) impacts from the reform.

After computing the new set of taxes for L_2, we evaluate the impact on L_2 household budgets and explore a further compensation mechanism using federal savings from subsidy elimination. This second compensation depends on the desired target for the impact on L_2 budgets. Given the heterogeneous nature of provincial and municipal taxes and the varying impact of the tax reform on household budgets (which depends on both tax levels and distribution tariffs in each jurisdiction), this implies different funds allocated to provinces and municipalities. These funds can be used for further tax reductions or lump-sum transfers to L_2 households. This amounts to a decentralization of electricity subsidies.

For our simulation, we assume that VAT will be reduced—only for L_2 and L_3 house-

holds—uniformly across all jurisdictions to a new agreed level, say half the current rate of 21%. Meanwhile, reductions in provincial and municipal taxes for L_2 households are endogenously determined by the resources recovered from foregone revenues after the increase in wholesale electricity prices for L_2 and L_3. In notation:

$$t_n^1 = \frac{t_n^0}{2} \quad \text{for } L_2 \tag{8}$$

$$\begin{aligned} & \left[(1-\alpha)\beta_i \cdot \frac{t_n^0}{2} + t_{ip}^0 + t_{im}^0\right] \cdot (p_{m1}^0 - p_{m2}^0) \cdot X_{i2}^0 \\ + & \left[(1-\alpha)\beta_i \cdot t_n^0 + t_{ip}^0 + t_{im}^0\right] \cdot (p_{m1}^0 - p_{m3}^0) \cdot X_{i3}^0 \\ = & \left[\sum_h A_{i2}^{h0} + \left(p_{i2}^{h0} + (p_{m1}^0 - p_{m2}^0)\right) \cdot x_{i2}^{h0}\right] \cdot \left[(t_{ip}^0 + t_{im}^0) - (t_{ip}^1 + t_{im}^1)\right] \end{aligned} \tag{9}$$

Where, for jurisdiction i: - $(1-\alpha)\beta_i$ is the share of jurisdiction i in VAT collection, formed by the primary $(1-\alpha)$ and secondary β_i distribution coefficients. - $X_{ij}^0 = \sum_h x_{ij}^{h0}$ for $j = 2, 3$ are total quantities consumed by L_2 and L_3 households. - $A_{i2}^0 = \sum_h A_{i2}^{h0}$ is the sum of fixed charges across L_2 households (same as under the *status quo*). - $p_{i2}^{h1} = p_{i2}^{h0} + (p_{m1}^0 - p_{m2}^0)$ is the new variable charge for L_2 household h after the wholesale price adjustment.

Expression (10) shows that the foregone revenues obtained from the increase in wholesale prices for groups 2 and 3—valuated at the new VAT given by expression 8—are the resources available to finance, without affecting distribution company revenues or jurisdictional fiscal revenues, tax expenditures in the form of lower provincial and municipal taxes.

The tax reduction for each jurisdiction can be obtained from expression 10 as:

$$\begin{aligned} \left[(t_{ip}^0 + t_{im}^0) - (t_{ip}^1 + t_{im}^1)\right] = & \frac{\left[(1-\alpha)\beta_i \cdot \frac{t_n^0}{2} + t_{ip}^0 + t_{im}^0\right] \cdot (p_{m1}^0 - p_{m2}^0) \cdot X_{i2}^0}{\sum_h A_{i2}^{h0} + \left(p_{i2}^{h0} + (p_{m1}^0 - p_{m2}^0)\right) \cdot x_{i2}^{h0}} \\ & + \frac{\left[(1-\alpha)\beta_i \cdot t_n^0 + t_{ip}^0 + t_{im}^0\right] \cdot (p_{m1}^0 - p_{m3}^0) \cdot X_{i3}^0}{\sum_h A_{i2}^{h0} + \left(p_{i2}^{h0} + (p_{m1}^0 - p_{m2}^0)\right) \cdot x_{i2}^{h0}} \end{aligned} \tag{10}$$

From expressions 8 and 10, we obtain the new set of taxes and wholesale prices that allow us to simulate a reform from the *status quo* (t_n^0, t_{ip}^0, t_{im}^0, p_{m2}^0, p_{m3}^0) to the new subsidy-free, tax-expenditure regime characterized by (t_n^1, t_{ip}^1, t_{im}^1, p_{m1}^1). This new set of taxes will vary across jurisdictions, and given the new wholesale prices, the final impacts on L_2 and L_3 households will also vary across jurisdictions.

Table 5 below reproduces the change in taxes computed from expressions 8 and 10, the new tax levels, and the impact on household expenditures $\Delta G_{ij}/G_{ij}^0$ for $j = 2, 3$. The interplay of two effects determines the results of the simulation. First, the higher the provincial and municipal tax rates under the *status quo*, the greater the foregone revenues recovered due to the increase in wholesale electricity prices for L_2 and L_3 households, and the larger the corresponding tax rate reductions for L_2. Second, the higher the level of distribution tariffs—and therefore final bills—the smaller the impact of the increase in wholesale prices on L_2 household budgets.

We find lower impacts on L_2 households in provinces such as Neuquén and Jujuy.

6 Conclusion and further issues

This paper documents, using a comprehensive database, that very high electricity tax rates exist in Argentina. Based on general indirect taxation through VAT, provincial and municipal taxes accumulate through highly heterogeneous structures across households and jurisdictions. This phenomenon is, in turn, affected by an interaction between final tariffs and subsidies by household groups, which requires careful estimation of the effective tax burden on households. Price segmentation and subsidy mechanisms for poor and some middle income households mean that the absolute differences in final bill values are mostly explained by tariff differences and only partly by taxes, creating an inefficiency relative to what should be a logical pattern where pre-tax prices are similar, but the differences would be explained by different tax treatment, for example, by taxation.

The burden distributional impact of household electricity taxes shows a clear pattern of regressivity, with the relative weight of taxes on household income tending to decline as income decile increases, and with provincial and municipal taxes accounting for much of this phenomenon. The evidence gathered in this study shows that the higher the taxation of subnational governments, the greater the regressivity of electricity taxes.

The above results motivate reforms that coordinate a reduction in the subnational tax burden and also place limits on the extra charges levied by municipalities. There are alternative ways to implement these reforms depending on the framework within which this coordination is carried out. Beyond this reform direction, this work highlights the interaction between "low wholesale prices and high taxes," which, in our view, warrants greater attention. The elimination of electricity subsidies, which result in lower wholesale electricity prices for subsidized household segments, has a positive fiscal effect on revenue collection for all three levels of government, which is greater the higher the provincial and municipal burden. This recovery of lost tax revenues associated with energy subsidies, in our view,

influences the analysis of tax reform. This approach, presented in this paper, is not simply a matter of lowering high taxes on depressed prices, but rather coordinating a tax reform that integrates with a convergence of wholesale prices across all segments to similar values, which is a requirement for rethinking a decentralized or de-intervened wholesale market.

This paper simulates the case in which the elimination of wholesale energy subsidies is followed by a tax reform that reduces the tax burden only on vulnerable households (L2) at all three levels of government, in a coordinated manner, and by an amount equivalent to the tax revenue recovered after the subsidy elimination. The exercise is equivalent to a reform of the subsidy regime that shifts from operating via lower wholesale prices and transfers from the Treasury to the wholesale market management company to a tax expenditure scheme for vulnerable households shared by the three levels of government (leaving current revenue collections for each unchanged). That is, it is a reform to share subsidies that fall to the nation, using tax expenditures at all three levels of government. Its dual purpose is to draw attention to the interaction between subsidies and taxes and, at the same time, provide quantitative results on its viability through its impact on households.

The results show that these impacts are significant, with the highest occurring in Buenos Aires Province and Misiones, which have lower axes and relatively lower tariff levels. The impact consequences quickly limit the applicability on this reform unless the part of the federal subsidy reduction is distributed to the provinces, which we leave for further simulation. Using the data estimated in this paper, we show that reducing taxes to offset the elimination of wholesale price subsidies "helps but is not enough" to avoid a visible impact on vulnerable households, except in some jurisdictions. It is not enough because the resources gained by eliminating subsidies to L2 and L3 household groups allow for limited reductions in compensatory transfers to L2 households. Part of this is due to the fact that the fiscal effect of recovering lost tax revenues from eliminating subsidies for wealthy L1 households is not included in this reform, because they have already occurred and have been appropriated by all three levels of government. The "too little" amount of resources for this reform is partly due to the "too late" progress in reducing subsidies to L1 without having transferred the tax revenue to a program of this type. Nevertheless our results are novel, in showing a coexistence and interaction of federal subsidies on wholesale pricing with high subnational taxation that is normally not taken into account and it should be interconnected in a definite reform of electricity subsidies.

References

Ahumada, H., Espina-Mairal, S., Navajas, F., and Rasteletti, A. (2023). Effective carbon rates on energy use in latin america and the caribbean: Estimates and directions of reform. *Technical Note N° IDB-TN-2656,Inter-American Development Bank*.

Ahumada, H., Espina Mairal, S., Navajas, F., and Rasteletti, A. (2024). Determinants of sectoral effective carbon rates on energy use. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4741864. Available at SSRN: https://ssrn.com/abstract=4741864.

Bertín, O., García, T., Pizzi, F., Porto, A., Puig, J., and Puig, J. (2024). Energy subsidies: conceptual framework and measurement for distributional impacts in argentina. *Energy for Sustainable Development*, 83:101557.

Bourguignon, F. and Pereira da Silva, L. A. (2003). *The Impact of Economic Policies on Poverty and Income Distribution: Evaluation Techniques and Tools*. The World Bank, Washington, DC.

Cont, W. and Navajas, F. (2019). Subsidios a los servicios de infraestructura en américa latina y el caribe: direcciones de reforma. Background Paper (no publicado), citado en Cavallo, E., Powell, A. y Serebrisky, T. (eds.), Informe Anual del BID, 2019.

Cont, W., Navajas, F., Pizzi, F., and Porto, A. (2020). Precios y tarifas de servicios públicos. Evolución. 1945-2018. Asociación Argentina de Economía Política: Working Papers 4328, Asociación Argentina de Economía Política.

Demery, L. (2000). Benefit incidence: A practitioner's guide. Technical report, The World Bank, Washington, DC.

Di Bella, G., Norton, L., Ntamatungiro, J., Oguzoglu, U., and Samaké, I. (2015). Energy subsidies in latin america and the caribbean: Stocktaking and policy challenges. IMF Working Paper WP/15/30, International Monetary Fund. February.

Eurostat (2025). Electricity price statistics. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Electricity_price_statistics. Accessed: 2025-08-30.

FIEL (2025). La tributación provincial y municipal a la electricidad residencial en la argentina: estructura, carga tributaria, incidencia y dirección de reforma. Technical report, Fundación de Investigaciones Económicas Latinoamericanas (FIEL).

Giuliano, F., Lugo, M. A., Masut, A., and Puig, J. (2020). Distributional effects of reducing energy subsidies: Evidence from recent policy reform in argentina. *Energy Economics*, 92:104980.

Hancevic, P., Cont, W., and Navajas, F. (2016). Energy populism and household welfare. *Energy Economics*, 56(C):464–474.

Navajas, F. (2008). *La tarifa social en los sectores de infraestructura en la Argentina*. TESIS, buenos aires edition.

Navajas, F. (2015). Energy subsidies revisited. In *5th ELAEE Latin America Energy Economics Meeting*, Medellín, Colombia. March.

Navajas, F. (2018). Impuestos y cargos específicos en las tarifas de los servicios de infraestructura. *Nota Técnica*, 1473.

Navajas, F. and Olguin, S. (2024). Electricity pricing and tax coordination across sub national regulatory jurisdictions. Unpublished mimeo.

Navajas, F. and Puig, J. (2024). Increasing block pricing, household group segmentation and distributional characteristics. Documento de Trabajo 47, Universidad Nacional de La Plata, CEFIP.

OECD (2019). *Taxing Energy Use 2019: Using Taxes for Climate Action*. OECD Publishing, Paris. Also available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2019/10/taxing-energy-use-2019$_e$4652396/058ca239 − $en.pdf$.

OECD (2025). *OECD Economic Surveys: Argentina 2025*. OECD Publishing, Paris.

Secretaría de Energía (2002). Impuestos y subsidios sobre las tarifas eléctricas a usuario final. Technical report, Dirección Nacional de Prospectiva, Secretaría de Energía. Abril.

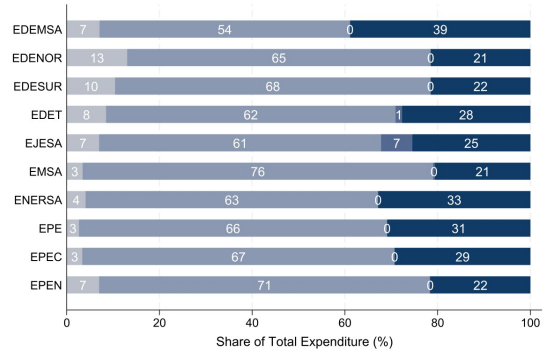
van de Walle, D. (1998). Assessing the welfare impacts of public spending. *World Development*, 26(3):365–379.

7 Figures and Tables

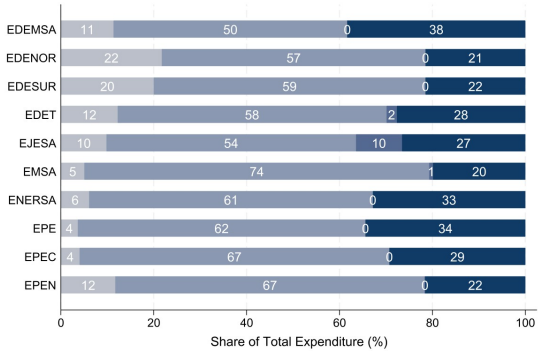
7.1 Figures

Figure 1: Residential Electricity Expenditure Composition by Tier and Jurisdiction in Argentina

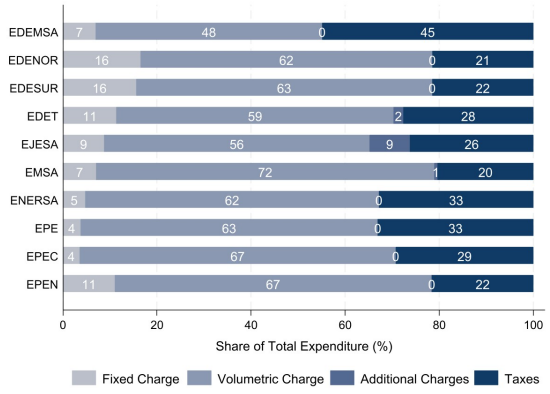
(a) L1 Tier



(b) L2 Tier

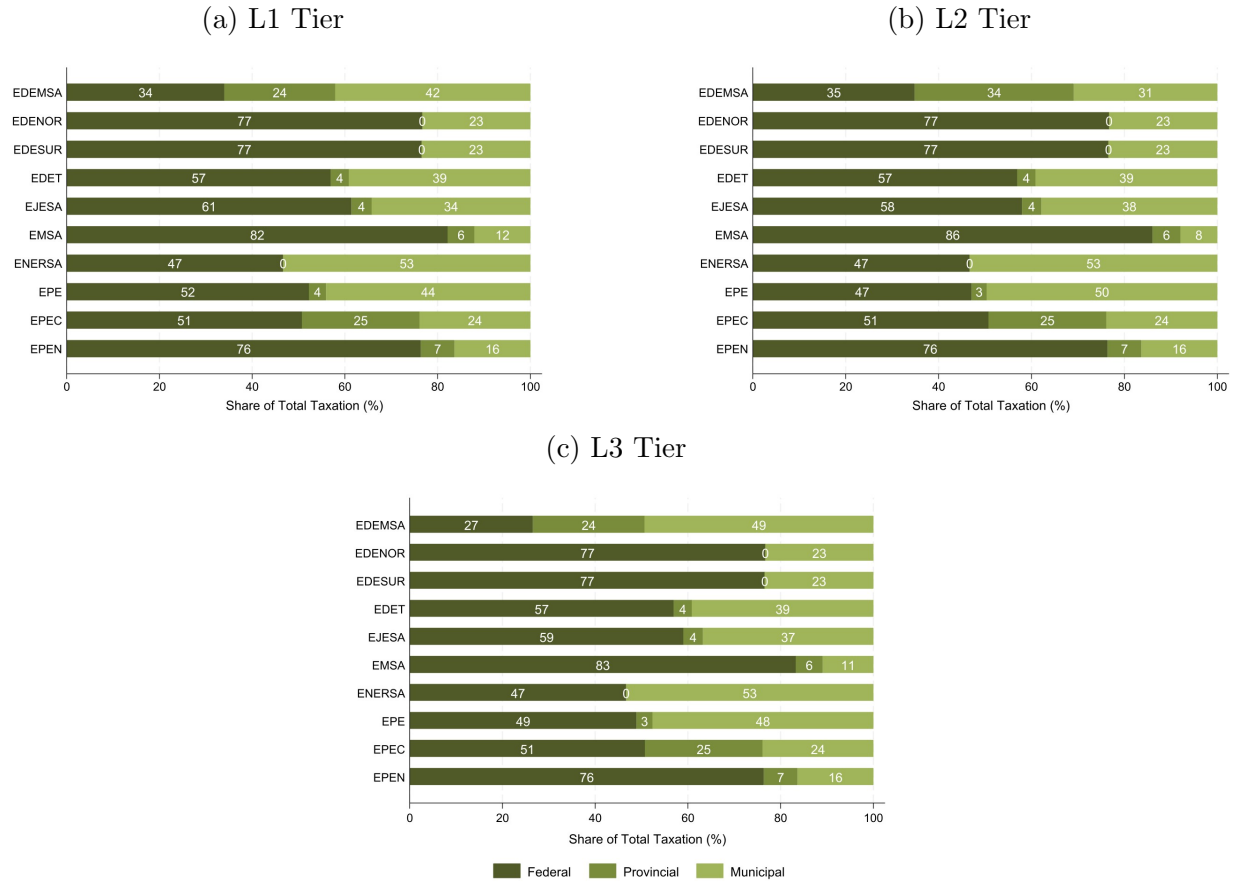


(c) L3 Tier



Notes: This figure presents the share of total electricity expenditure (%) across three segmentation tiers—L1 (high-income), L2 (low-income), and L3 (middle-income)—for a selection of 10 Argentine electricity distribution companies.

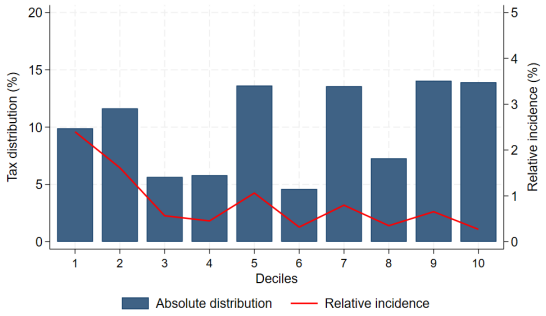
Figure 2: Residential Electricity Taxation Composition by Subsidy Tier and Jurisdiction in Argentina



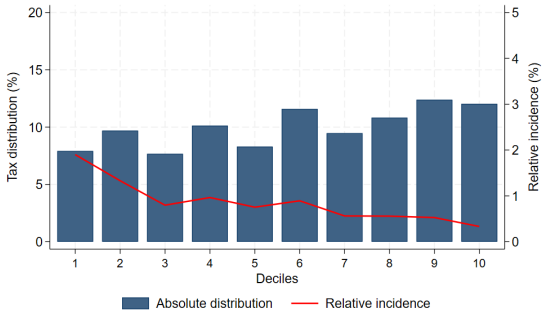
Notes: This figure presents the share of total taxes (%) included in residential electricity bills across three segmentation tiers—L1 (high-income), L2 (low-income), and L3 (middle-income), for a selection of 10 Argentine electricity distribution companies. Taxes are disaggregated by government level (federal, provincial, and municipal).

Figure 3: Distribution of Taxes and Relative Incidence by Income Decile and Utility in Argentina (1 of 2)

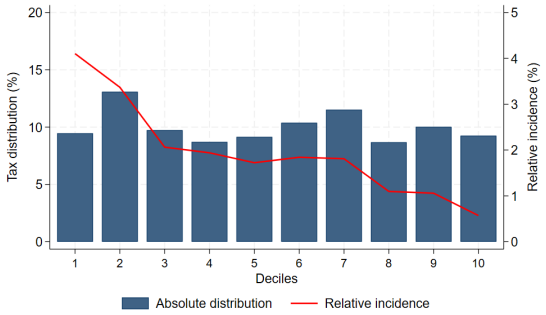
(a) EDENOR



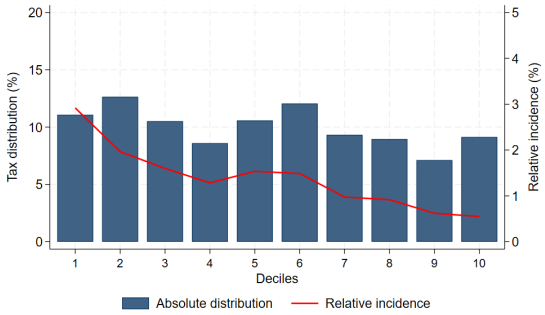
(b) EDESUR



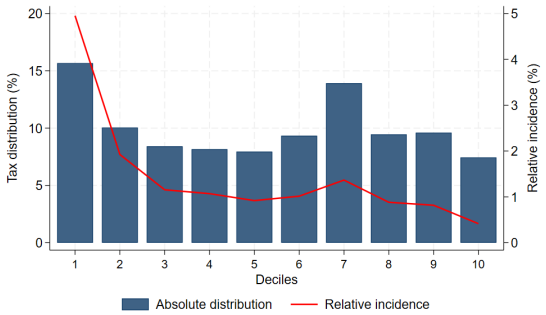
(c) EPE



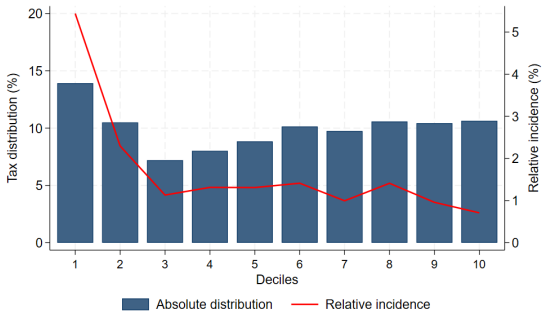
(d) EPEC



(e) EDET



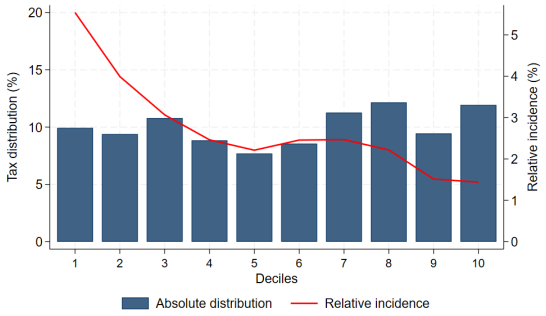
(f) EJESA



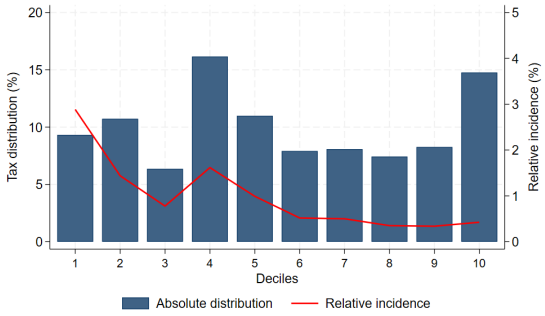
Notes: This figure shows the distribution of taxes (absolute distribution) and the relative incidence of taxes across province-specific household per capita income deciles for 10 selected Argentine electricity distribution companies. Blue bars represent the absolute distribution of taxes as a percentage, while the red line shows the relative incidence.

Figure 3: Distribution of Taxes and Relative Incidence by Income Decile and Utility in Argentina (2 of 2)

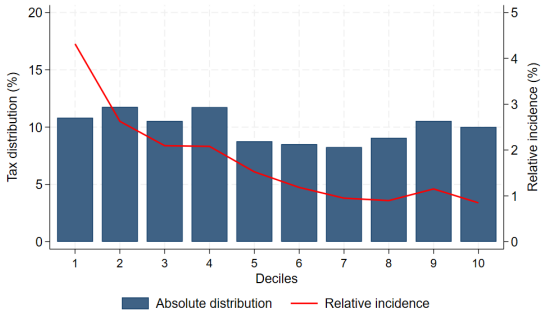
(g) EDEMSA



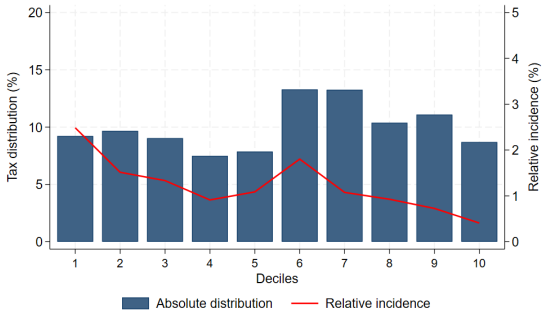
(h) EPEN



(i) ENERSA



(j) EMSA



Notes: This figure shows the distribution of taxes (absolute distribution) and the relative incidence of taxes across province-specific household per capita income deciles for 10 selected Argentine electricity distribution companies. Blue bars represent the absolute distribution of taxes as a percentage, while the red line shows the relative incidence.

7.2 Tables

Table 1: Residential Electricity Rate Structures Across Jurisdictions in Argentina

Utility/ Province	Fixed Rate						Variable Rate						Additional Charges				
	Uniform	Non uniform					Uniform	Non uniform					No charges	Uniform	Non uniform		
		N° blocks	Mean ($)	Min ($)	Max ($)	Ratio (Max/Min)		N° blocks	Mean ($)	Min ($)	Max ($)	Ratio (Max/Min)		($/kWh-month)	Min ($/month)	Max ($/month)	Ratio (Max/Min)
A. L1 Tier																	
EDENOR (CABA)		6	1,688.00	791.27	28,923.74	36.55		6	83.94	83.64	97.55	1.17	X				
EDESUR (PBA)		6	1,644.00	783.43	28,592.58	36.50		6	83.96	83.69	103.68	1.24	X				
EPE (Santa Fé)	1,197.21	1						4	123.83	108.62	167.25	1.54	X				
EPEC (Córdoba)		4	1,326.00	955.04	1,927.27	2.02		4	133.40	110.66	176.25	1.59	X				
EDEMSA (Mendoza)		3	1,847.00	1,714.60	10,676.80	6.23		3	137.34	127.55	137.72	1.08	X				
ENERSA (Entre Ríos)	1,631.12	1						4	129.73	120.99	172.32	1.42	X				
EDET (Tucumán)		4	2,377.00	1,193.36	9,555.09	8.01	99.61								157.27	1,980.37	12.59
EMSA (Misiones)		6	1,446.00	1,446.30	1,654.10	1.14		8	138.61	136.55	143.68	1.05		0.71			
EPEN (Neuquén)		7	2,399.00	1,850.12	17,938.76	9.70		7	175.65	183.95	164.97	0.90		0.15			
EJESA (Jujuy)		8	2,373.00	2,004.00	36,762.00	18.34		9	130.91	130.21	134.89	1.04		14.43			
B. L2 Tier																	
EDENOR (CABA)		6	1,688.00	791.27	28,923.74	36.55		6	31.90	31.59	97.55	3.09	X				
EDESUR (PBA)		6	1,644.00	783.43	28,592.58	36.50		6	31.98	31.71	103.68	3.27	X				
EPE (Santa Fé)	1,197.21	1						2	69.62	54.41	167.25	3.07	X				
EPEC (Córdoba)		4	1,096.00	789.46	1,593.14	2.02		4	73.83	55.03	158.59	2.88	X				
EDEMSA (Mendoza)		3	1,637.00	3,268.75	8,976.88	2.75		3	83.89	82.29	127.55	1.55	X				
ENERSA (Entre Ríos)	1,631.12	1						4	69.30	60.55	172.32	2.85	X				
EDET (Tucumán)		4	2,377.00	1,193.36	9,555.09	8.01		3	47.63	47.63	99.61	2.09			157.27	1,980.37	12.59
EMSA (Misiones)		6	1,446.00	1,446.30	1,654.10	1.14		7	48.86	46.80	49.98	1.07		0.71			
EPEN (Neuquén)		7	2,399.00	1,850.12	17,938.76	9.70		7	65.65	78.62	164.97	2.10		0.15			
EJESA (Jujuy)		8	2,373.00	2,004.00	36,762.00	18.34		9	69.68	69.05	73.81	1.07		14.43			
C. L3 Tier																	
EDENOR (CABA)		6	1,688.00	791.27	28,923.74	36.55		6	51.71	43.16	57.07	1.32	X				
EDESUR (PBA)		6	1,644.00	783.43	28,592.58	36.50		6	46.52	43.26	63.25	1.46	X				
EPE (Santa Fé)		2	1,197.00	1,197.21	1,197.21	1.00		2	81.67	66.45	69.93	1.05	X				
EPEC (Córdoba)		4	1,121.00	807.39	1,629.32	2.02		4	87.55	68.33	101.11	1.48	X				
EDEMSA (Mendoza)		3	1,683.00	1,651.72	9,344.41	5.66		3	95.72	88.48	94.55	1.07	X				
ENERSA (Entre Ríos)	1,631.12	1						5	82.72	73.98	172.32	2.33	X				
EDET (Tucumán)		4	2,377.00	1,193.36	9,555.09	8.01		3	59.18	59.18	99.61	1.68			157.27	1,980.37	12.59
EMSA (Misiones)		6	1,446.00	1,446.30	1,654.10	1.14		7	71.50	60.93	64.11	1.05		0.71			
EPEN (Neuquén)		7	2,399.00	1,850.12	17,938.76	9.70		7	78.32	91.53	67.41	0.74		0.15			
EJESA (Jujuy)		8	2,373.00	2,004.00	36,762.00	18.34		9	82.02	82.02	92.16	1.12		14.43			

Notes: This table shows the structure of residential electricity rates across jurisdictions in Argentina, including fixed and variable components for each utility and tier. Monetary values are in Argentine pesos. "X" indicates the presence of additional charges.

Table 2: Tax Structures Across Jurisdictions in Argentina

	Federal	**Provincial**			**Municipal**				
	Ad-Valorem		Ad-Valorem	Specific	Ad-Valorem	Específicos			
		No tax	Uniform	Uniform	Uniform	Uniform	Non uniform		
Utility/ Jurisdiction							Min	Max	Ratio (Max/Min)
	(%)		(%)	($/month)	(%)	($/month)	($/month)	($/month)	
A. L1 Tier									
EDENOR (CABA)	21.00	**X**			6.38				
EDESUR (GBA)	21.00		0.001		6.42				
EPE (Santa Fé)	21.00		1.50	47.07	8.40		199.51	29,352.07	147.12
EPEC (Córdoba)	21.00		10.50		9.90				
EDEMSA (Mendoza)	21.00		13.60				5,286.00	13,249.00	2.51
ENERSA (Entre Ríos)	21.00	**X**			24.70				
EDET (Tucumán)	21.81		1.50		15.00				
EMSA (Misiones)	21.00		1.50			1,061.37			
EPEN (Neuquén)	21.00		2.00		4.50				
EJESA (Jujuy)	21.00		1.50		6.00		1,518.52	2,472.02	1.63
B. L2 Tier									
EDENOR (CABA)	21.00	**X**			6.38				
EDESUR (GBA)	21.00		0.001		6.42				
EPE (Santa Fé)	21.00		1.50	47.07	8.40		199.51	29,352.07	147.12
EPEC (Córdoba)	21.00		10.50		9.90				
EDEMSA (Mendoza)	21.00		13.60				5,286.00	13,249.00	2.51
ENERSA (Entre Ríos)	21.00	**X**			24.70				
EDET (Tucumán)	21.81		1.50		15.00				
EMSA (Misiones)	21.00		1.50			455.46			
EPEN (Neuquén)	21.00		2.00		4.50				
EJESA (Jujuy)	21.00		1.50		6.00		1,518.52	2,472.02	1.63
C. L3 Tier									
EDENOR (CABA)	21.00	**X**			6.38				
EDESUR (GBA)	21.00		0.001		6.42				
EPE (Santa Fé)	21.00		1.50	47.07	8.40		199.51	29,352.07	147.12
EPEC (Córdoba)	21.00		10.50		9.90				
EDEMSA (Mendoza)	21.00		13.60				5,286.00	13,249.00	2.51
ENERSA (Entre Ríos)	21.00				24.70				
EDET (Tucumán)	21.81				15.00				
EMSA (Misiones)	21.00					455.46			
EPEN (Neuquén)	21.00		2.00		4.50				
EJESA (Jujuy)	21.00				6.00		1,518.52	2,472.02	1.63

Notes: This table shows the structure of electricity-related taxes across jurisdictions in Argentina, disaggregated by segmentation tier (L1, L2, L3) and utility. It includes federal, provincial, and municipal tax components, distinguishing between ad-valorem, uniform, and specific taxes. Non-uniform municipal taxes are reported with their minimum, maximum, and ratios. All monetary values are in Argentine pesos.

Table 3: Summary of Consumption and Billing Components by Utility and Tier

		Electricity Expenditure						
	Consumption	**Fixed Charge**	**Volumetric Charge**	**Additional Charges**	**Taxes**	**Total**	**Users**	**Obs**
A. L1 Tier								
Utility								
EDEMSA (Mendoza)	213.77	3.70	28.40	0.00	20.45	52.56	63,057	111
EDENOR (CABA)	344.96	6.23	31.38	0.00	10.30	47.90	240,844	113
EDESUR (PBA)	264.94	3.61	23.56	0.00	7.45	34.63	1,068,260	821
EDET (Tucumán)	172.84	2.34	17.22	0.39	7.64	27.58	27,719	62
EJESA (Jujuy)	188.71	2.83	24.77	2.72	10.37	40.69	28,031	133
EMSA (Misiones)	232.47	1.45	32.29	0.17	8.79	42.70	25,878	87
ENERSA (Entre Ríos)	186.67	1.63	25.25	0.00	13.15	40.03	32,885	199
EPE (Santa Fé)	228.45	1.20	29.96	0.00	13.94	45.10	154,276	228
EPEC (Córdoba)	177.98	1.20	23.89	0.00	10.39	35.48	217,084	352
EPEN (Neuquén)	179.77	3.04	31.11	0.03	9.40	43.57	25,299	98
Total	255.00	3.37	25.46	0.05	9.31	38.19	678,602	2,204
B. L2 Tier								
Utility								
EDEMSA (Mendoza)	242.61	4.41	19.63	0.00	14.94	38.98	132,969	249
EDENOR (CABA)	299.34	5.03	13.14	0.00	4.97	23.14	410,680	210
EDESUR (PBA)	276.93	3.57	10.47	0.00	3.85	17.89	1,361,362	1,082
EDET (Tucumán)	282.22	3.50	16.63	0.64	7.96	28.73	161,785	393
EJESA (Jujuy)	213.72	3.05	16.73	3.09	8.29	31.16	63,863	259
EMSA (Misiones)	349.07	1.46	21.42	0.25	5.73	28.85	55,850	176
ENERSA (Entre Ríos)	207.09	1.63	16.30	0.00	8.77	26.71	44,025	283
EPE (Santa Fé)	241.43	1.20	20.53	0.00	11.41	33.14	241,790	403
EPEC (Córdoba)	212.28	1.02	17.01	0.00	7.46	25.49	258,230	447
EPEN (Neuquén)	208.34	3.06	17.42	0.03	5.64	26.16	25,985	101
Total	267.99	3.29	13.69	0.11	6.03	23.13	798,384	3,603
B. L3 Tier								
Utility								
EDEMSA (Mendoza)	187.14	2.58	17.77	0.00	16.60	36.95	49,671	88
EDENOR (CABA)	280.38	4.97	18.70	0.00	6.48	30.14	175,882	84
EDESUR (PBA)	264.65	3.98	16.11	0.00	5.51	25.61	620,752	483
EDET (Tucumán)	229.91	3.10	16.06	0.55	7.55	27.25	37,591	86
EJESA (Jujuy)	195.27	2.86	18.44	2.82	8.58	32.70	11,897	51
EMSA (Misiones)	205.53	1.45	14.69	0.15	4.17	20.45	9,795	32
ENERSA (Entre Ríos)	218.55	1.63	21.43	0.00	11.28	34.34	18,797	115
EPE (Santa Fé)	214.00	1.20	20.30	0.00	10.63	32.13	60,657	94
EPEC (Córdoba)	204.57	1.03	19.67	0.00	8.57	29.28	146,646	236
EPEN (Neuquén)	199.83	3.15	19.25	0.03	6.17	28.60	11,881	49
Total	249.51	3.44	17.39	0.05	7.00	27.88	390,063	1,318

Notes: This table reports the average electricity consumption and the breakdown of bill components across three segmentation tiers—L1 (high-income), L2 (low-income), and L3 (middle-income), for a selection of 10 Argentine electricity distribution companies. Includes the number of users and the total observations for each utility. All monetary values are expressed in thousands of Argentine pesos, and consumption is measured in kilowatt-hours (kWh).

Table 4: Summary of Consumption and Billing Components by Utility and Tier - After Reform

		Electricity Expenditure						
	Consumption	**Fixed Charge**	**Volumetric Charge**	**Additional Charges**	**Taxes**	**Total**	**Users**	**Obs**
A. L1 Tier								
Utility								
EDEMSA (Mendoza)	213.77	3.70	28.40	0.00	20.45	52.56	63,057	111
EDENOR (CABA)	344.96	6.23	31.38	0.00	10.30	47.90	240,844	113
EDESUR (PBA)	264.94	3.61	23.56	0.00	7.45	34.63	1,068,260	821
EDET (Tucumán)	172.84	2.34	17.22	0.39	7.64	27.58	27,719	62
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EMSA (Misiones)	232.47	1.45	32.29	0.17	8.79	42.70	25,878	87
ENERSA (Entre Ríos)	186.67	1.63	25.25	0.00	13.15	40.03	32,885	199
EPE (Santa Fé)	228.45	1.20	29.96	0.00	13.94	45.10	154,276	228
EPEC (Córdoba)	177.98	1.20	23.89	0.00	10.39	35.48	217,084	352
EPEN (Neuquén)	179.77	3.04	31.11	0.03	9.40	43.57	25,299	98
Total	255.00	3.37	25.46	0.05	9.31	38.19	678,602	2,204
B. L2 Tier								
Utility								
EDEMSA (Mendoza)	242.61	4.41	30.97	0.00	20.16	54.36	132,969	249
EDENOR (CABA)	299.34	5.03	26.03	0.00	4.02	34.73	410,680	210
EDESUR (PBA)	276.93	3.57	22.22	0.00	2.89	28.54	1,361,362	1,082
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EMSA (Misiones)	349.07	1.46	36.05	0.25	7.92	45.67	55,850	176
ENERSA (Entre Ríos)	207.09	1.63	25.19	0.00	6.78	33.39	44,025	283
EPE (Santa Fé)	241.43	1.20	30.73	0.00	10.45	42.30	241,790	403
EPEC (Córdoba)	212.28	1.02	26.41	0.00	5.26	32.18	258,230	447
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Total	267.99	3.29	25.27	0.11	5.19	33.51	798,384	3,603
B. L3 Tier								
Utility								
EDEMSA (Mendoza)	187.14	2.58	24.91	0.00	20.95	46.75	49,671	88
EDENOR (CABA)	280.38	4.97	27.43	0.00	8.72	40.55	175,882	84
EDESUR (PBA)	264.65	3.98	23.82	0.00	7.63	35.43	620,752	483
EDET (Tucumán)	229.91	3.10	22.75	0.55	10.11	36.51	37,591	86
EJESA (Jujuy)	195.27	2.86	25.69	2.82	10.59	40.40	11,897	51
EMSA (Misiones)	205.53	1.45	20.68	0.15	5.82	28.09	9,795	32
ENERSA (Entre Ríos)	218.55	1.63	28.01	0.00	14.39	43.82	18,797	115
EPE (Santa Fé)	214.00	1.20	26.53	0.00	13.56	41.29	60,657	94
EPEC (Córdoba)	204.57	1.03	26.26	0.00	11.04	37.70	146,646	236
EPEN (Neuquén)	199.83	3.15	25.07	0.03	7.77	36.02	11,881	49
Total	249.51	3.44	24.91	0.05	9.33	37.48	390,063	1,318

Notes: This table reports the average electricity consumption and the breakdown of bill components after the reform across three segmentation tiers—L1 (high-income), L2 (low-income), and L3 (middle-income), for a selection of 10 Argentine electricity distribution companies. Includes the number of users and the total observations for each utility. All monetary values are expressed in thousands of Argentine pesos, and consumption is measured in kilowatt-hours (kWh).

Table 5: Simulated Effects of Subsidy and Tax Reform

	N2 Tier						N3 Tier					
Utility	t^0	t^1	t_i^0	t_i^1	$(t_i^1 - t_i^0)$	$\Delta G/G^0$	t^0	t^1	t_i^0	t_i^1	$(t_i^1 - t_i^0)$	$\Delta G/G^0$
EDEMSA (Mendoza)	0.68	0.65	0.46	0.43	-0.03	0.39	1.10	1.10	0.89	0.89	0.00	0.27
EDENOR (CABA)	0.27	0.13	0.06	0.03	-0.04	0.50	0.27	0.27	0.06	0.06	0.00	0.35
EDESUR (PBA)	0.27	0.11	0.06	0.01	-0.06	0.59	0.27	0.27	0.06	0.06	0.00	0.38
EDET (Tucumán)	0.38	0.18	0.17	0.07	-0.09	0.34	0.38	0.38	0.17	0.17	0.00	0.34
EJESA (Jujuy)	0.53	0.36	0.32	0.25	-0.07	0.21	0.46	0.46	0.25	0.25	0.00	0.24
EMSA (Misiones)	0.27	0.23	0.06	0.01	-0.05	0.58	0.28	0.28	0.07	0.07	0.00	0.37
ENERSA (Entre Ríos)	0.49	0.25	0.26	0.03	-0.23	0.25	0.49	0.49	0.26	0.26	0.00	0.28
EPE (Santa Fe)	0.54	0.34	0.29	0.22	-0.07	0.28	0.50	0.49	0.25	0.25	0.00	0.29
EPEC (Córdoba)	0.41	0.20	0.20	0.09	-0.11	0.26	0.41	0.41	0.20	0.20	0.00	0.29
EPEN (Neuquén)	0.27	0.07	0.06	-0.03	-0.10	0.20	0.27	0.27	0.06	0.06	0.00	0.26

Notes: This table presents subnational tax rates ($t_i^\tau = t_{pi}^\tau + t_{mi}^\tau$) before the reform ($\tau = 0$) and after the reform ($\tau = 1$), along with the resulting changes in household expenditure for segmentation tiers L2 and L3, categorized by distribution company.

A Supplemental Figures and Tables

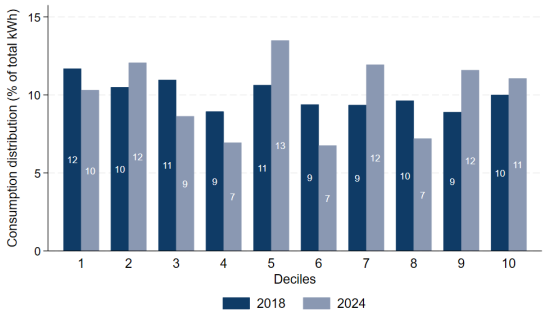
Table A.1: Users segmentation. Eligibility criteria, by group

Group (j)	**Eligibility Criteria**
L1 High	Households that declare meeting one or more of the following conditions, considering all cohabitants: 1) Total monthly household income equivalent to or greater than 3.5 basic baskets for a type 2 household according to INDEC. 2) Owning 3 or more vehicles less than 5 years old. 3) Owning 3 or more properties. 4) Owning a luxury boat, aircraft, or being the holder of corporate assets that demonstrate full economic capacity.
L2 Low	Households that, considering all members of the household together, meet one or more of the following conditions: 1) Net income less than 1 basic basket for a type 2 household according to INDEC. Exception: For households with a cohabitant holding a Unique Disability Certificate (CUD), total monthly income for this segment must be less than 1.5 basic baskets for a type 2 household according to INDEC. 2) Owning up to 1 property. 3) Not owning a vehicle less than 3 years old. Exception: households with a cohabitant holding a Unique Disability Certificate (CUD) may own up to 1 vehicle less than 3 years old to be part of the lower income segment.
L3 Middle	Households that are not within the higher income segment and meet one or more of the following conditions: 1) Total monthly household income between 1 and 3.5 basic baskets for a type 2 household according to INDEC. Exception: for households with a cohabitant holding a Unique Disability Certificate (CUD), total monthly income for this segment may vary between 1.5 and 3.5 basic baskets for a type 2 household according to INDEC. 2) Owning up to 2 properties. 3) Owning up to 1 vehicle less than 3 years old. Exception: households with a cohabitant holding a Unique Disability Certificate (CUD) may own up to 1 vehicle less than 3 years old to be part of the middle income segment.

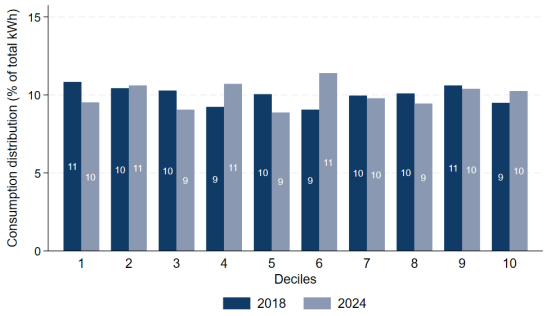
Source: Decree 322/2022.

Figure A.1: Monthly Residential Electricity Consumption by Income Decile and Utility in Argentina (1 of 2)

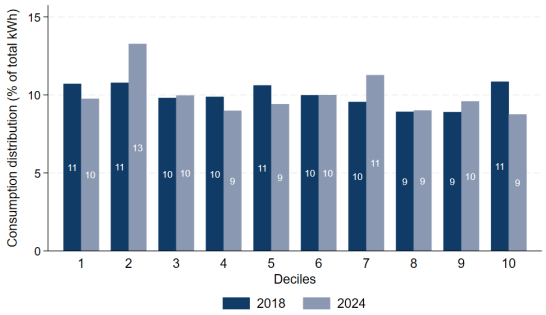
(a) EDENOR



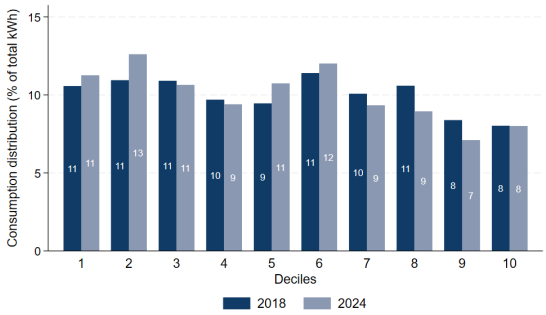
(b) EDESUR



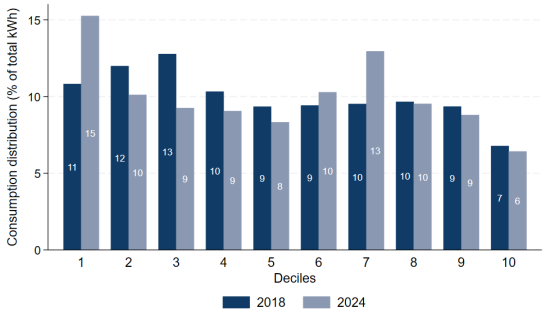
(c) EPE



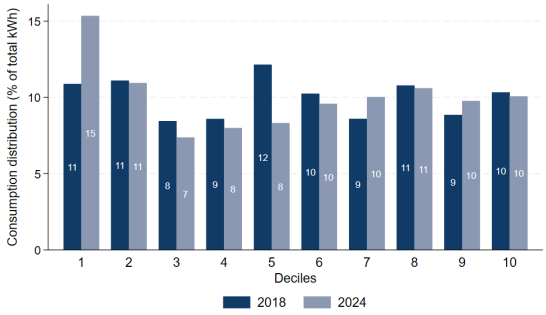
(d) EPEC



(e) EDET



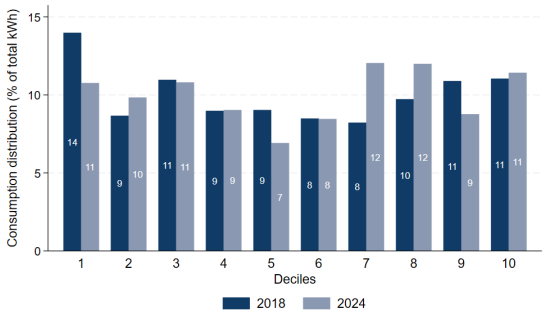
(f) EJESA



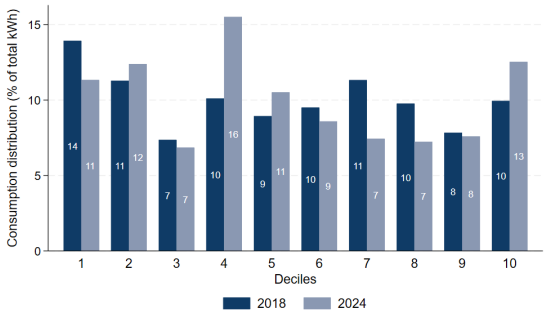
Notes: This figure compares the monthly distribution of residential electricity consumption (% of total kWh) across province-specific household per capita income deciles (1 = lowest income, 10 = highest income) for 2018 and 2024. The figure includes the first six of ten selected Argentine electricity distribution companies. Estimation details are provided in Section 3 of the main paper.

Figure A.1: Monthly Residential Electricity Consumption by Income Decile and Utility in Argentina (2 of 2)

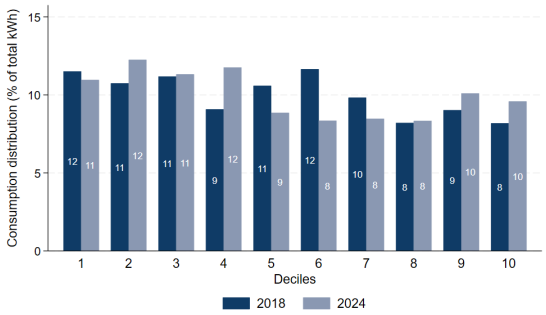
(g) EDEMSA



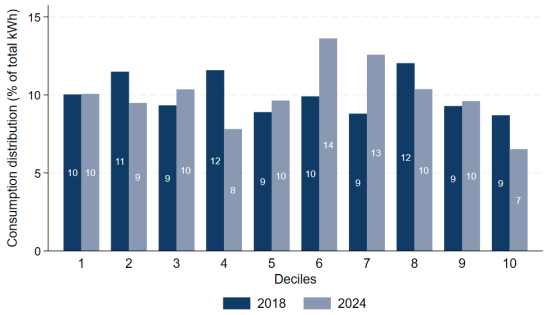
(h) EPEN



(i) ENERSA



(j) EMSA



Notes: This figure compares the monthly distribution of residential electricity consumption (% of total kWh) across province-specific household per capita income deciles (1 = lowest income, 10 = highest income) for 2018 and 2024. The figure includes the remaining four of the ten selected Argentine electricity distribution companies. Estimation details are provided in Section 3 of the main paper.