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ETS2 AND ENERGY COSTS: WHAT ARE THE BENEFITS FOR CONSUMERS?

POLICY BRIEFING
OCTOBER 2025

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EXECUTIVE SUMMARY

Starting in January 2027, ETS2 will come into force. This is an extension of the European Emissions Trading System (EU ETS) that aims to reduce emissions in key sectors – transport, heating and SMEs – which have so far been excluded from the European Union's carbon market.

- **Between 2027 and 2032, ETS2 will generate between €184 and €483 billion to finance decarbonisation policies in Europe.** This is thanks to the proceeds from the sale of CO_2 allowances, assuming a price of €45 and €100/t respectively.
- In addition to this budget, **€65 billion will be set aside to finance the Social Climate Fund (SCF)**.
- For **Italy**, the resources made available by ETS2 are estimated **at between €21 and €55 billion, to which €7 billion from the SCF should be added.**

The impact of the introduction of ETS2, assuming a quota price of €45 or €100/t, can be estimated as follows:

- on the cost of **a cubic metre of gas between €0.09/Smc and €0.20/Smc;**
- **between €0.11/l and €0.25/l per litre of diesel and petrol.**

For consumers, these values would correspond to 6.6% and 13.3% of the cost of a Smc of gas for a typical user[1] and would account for 5.7% and 12.1% of the cost of diesel and petrol.

The impact on prices, within the current European political context, characterised by growing opposition to Green Deal policies, makes ETS2 a controversial tool. Several initiatives have been launched to modify the mechanism or request its suspension.

In reality, the Directive itself introduces measures to limit the impact on consumers and Member States have numerous options for applying ETS2 without negatively impacting the energy expenditure of households and businesses.

The impact of ETS2 on prices must be seen in the overall context of fiscal costs and parafiscal and environmental charges in the energy sector. From this perspective, ETS2 acts to balance, particularly in Italy, a striking gap in taxation between electricity and, to a much lesser extent, gas, diesel and petrol. The penalisation of electricity, which has been subject to ETS1 since 2005, means that **a significant portion of the greater efficiency of electric technologies** (electric cars and heat pumps are on average four times more efficient than fossil fuel combustion) **is absorbed by fiscal and parafiscal costs and does not benefit the consumer.**

In the various cases examined in this study, electricity is subject to taxes and charges that are three times higher than those on natural gas and about twice as high as those on diesel and petrol. When adopting a heat pump, for example, 63% of the increased efficiency is taken away from the consumer with an estimated tax and charge incidence of 10.7 c€/KWh compared to 3.4 c€/kWh for gas.

Similarly, in the mobility sector, the three typical electric charging users examined bear a tax and parafiscal and environmental charge incidence of 20.6 c€/kWh, 27.4 c€/kWh, 31.2 c€/kWh

[1] Calculated based on a residential customer with an annual consumption of 1,100 Smc at 2024 prices; average 2024 diesel and petrol prices increased by the rise expected from the entry into force of ETS2.

compared to 11.4 c€/kWh for petrol, and see the energy efficiency benefits of vehicles reduced by 44%, 58% and 63% respectively.

The current tax structure, combined with parafiscal charges, represents the true cost to the consumer. **ETS2 may offer an opportunity to review and update taxation and the distribution of parafiscal costs across all energy carriers in a manner consistent with energy policy objectives and consumer benefits**.

Furthermore, the fiscal and parafiscal imbalance that disadvantages the electric carrier not only burdens the consumer but also makes emission reduction policies more expensive and inefficient, as they must compensate for the lack of economic incentives that would otherwise encourage consumers to voluntarily adopt cleaner and more efficient electric solutions.

ETS2, thanks to the revenue it generates, which, according to the Directive, must be entirely dedicated to consumers, makes it possible to finance policies for efficient energy use in building, SMEs and road transport. If designed according to redistributive criteria, these policies allow citizens, regardless of their income level, to access transition technologies that reduce energy costs.

However, ETS2 can only promote a fair energy transition if:

1. EU governments use, as indicated in the Directive, **100% of the revenues from the sale of CO_2 allowances to finance policies promoting renewables and efficiency in transport and civil use, as well as to offset any cost increases** for citizens and businesses. This will enable the financing of redistributive policies, making it possible for even the less well-off to access more efficient, and therefore more economical, technologies and energy uses;
2. **ETS2 is integrated with current taxation in order to manage CO_2 price increases** on energy expenditure of households and businesses. In particular, the introduction of a national price corridor will ensure a minimum guarantee of revenue for the financing of public policies and a maximum CO_2 price guarantee for consumers;
3. **ETS2 is incorporated into a broader review of energy taxation** that addresses current imbalances. This will make it easier and more attractive for consumers to adopt more efficient and affordable electricity solutions;
4. there are no delays in the implementation of ETS2. **The ETS2 Directive provides for the establishment of a Social Climate Fund with a budget of €7 billion for Italy**, which is higher than the estimated expenditure to support the most vulnerable groups. However, in the event of delays, this Fund would be reduced by €1.55 billion.

In conclusion, **the real benefit for citizens and businesses does not lie in rejecting the introduction of ETS2, but in structurally correcting the current imbalances in taxation and parafiscal charges on energy carriers, to which ETS2 contributes.** From this perspective, ETS2 represents an opportunity to promote a fair and sustainable energy transition, making solutions accessible to all segments of the population.

1 WHAT IS ETS2

ETS2 is a key instrument of the European Green Deal architecture. It is a 'technologically neutral', policy as it only acts on costs, without mandating which technological solution should be adopted. This leaves market players room to decide independently – a principle repeatedly invoked by Member States and businesses in the name of simplification and greater flexibility in achieving climate targets.

ETS2 will come into force in 2027 and requires fossil fuel suppliers, for volumes not covered by ETS1 (the original measure in force since 2005), to report and return to the competent authorities a number of CO_2 emission allowances corresponding to the volume of the previous year's emissions. The price of CO_2 is generated by the balance between supply and demand for emission allowances, which energy suppliers must purchase on the market through auctions to offset emissions from the sale of fossil fuels.

The maximum availability of allowances ('cap') decreases year on year in line with European CO_2 emission reduction targets. Their price will therefore be determined by the overall capacity of the EU 27 countries to reduce emissions in proportion to these targets. The cost of purchasing ETS2 allowances at auction is transferred to gas bills and fossil fuel costs, leading to a possible increase in energy costs for citizens and businesses.

The proceeds from the sale of allowances are distributed among Member States in proportion to their average historical emissions for the years 2016-2018, and they are required to spend them entirely on financing decarbonisation policies or temporarily supporting consumer income due to higher energy expenditure. Italy has consistently implemented this provision with Legislative Decree 147/2024.

ETS2 is designed to support Member States' active policies to reduce emissions in the building, road transport and small and medium-sized enterprise sectors, which have shown no signs of reduction over the years or, on the contrary, have increased emissions. For example, looking at Italy, despite an overall reduction in CO_2 emissions of 26% between 1990 and 2023, emissions from the road transport sector grew by 7.3%, while emissions from the residential heating sector remained largely stable and more closely linked to climatic factors than to actual decarbonisation trends.

It is precisely active policies for decarbonisation in the transport, domestic heating and SME sectors, particularly those related to the electrification of end uses, which can be financed with ETS2 revenues, that will make it possible to reduce emissions while at the same time containing CO_2 allowance costs and the impact on final consumer prices[2].

[2] https://publications.pik-potsdam.de/rest/items/item_32144_1/component/file_32191/content

1.1 WHY ETS2 IS NEEDED

ETS2 is an indispensable tool to accompany the decarbonisation of end uses because:

1. it provides a 'price signal' to the end consumer, encouraging them to use energy more efficiently, promoting the electrification of consumption and, therefore, reducing emissions, according to the 'polluter pays' principle;
2. it helps to rebalance the costs between electricity and natural gas/petrol/diesel, partially bridging the significant gap in tax, parafiscal and environmental charges that currently weigh on electricity;
3. it makes the proceeds from the sale of allowances available to Member States to finance climate and social policies, reducing inequalities in accessing the capital needed to adopt the most efficient technologies and enabling end consumers to move away from the use of fossil fuels in the road transport and building sectors;
4. it contributes to the financing of the Social Climate Fund, a European fund designed to support just transition policies targeting the most vulnerable sections of the population and micro-enterprises.

1.2 ETS2 IS A REDISTRIBUTIVE POLICY

ETS2 will make between **€184 and €483 billion** available for the Union's social and environmental policies[3] in the period 2027-2032[4]. In addition to this, ETS2 generates €65 billion from the Social Climate Fund[5], with which Member States can design fair and effective measures through national policies to accompany the transition, including from a social fairness point of view.

The **restriction on spending auction revenues** exclusively on policies and measures to reduce emissions and compensate for any disproportionate impact of policies on end consumers' energy bills **makes it possible to develop pre-distributive policies** that accompany society as a whole, with the different needs of different social groups, in the transition.

Auction revenues are redistributed to Member States and must be used for the purposes set out in the Directive, namely[6]:

1. emissions reduction policies in the building and road transport sectors;
2. financial support policies for low and middle-income citizens and transport users;
3. co-financing of the Social Climate Plan.

Member States meet their revenue spending obligations if they implement fiscal or financial support policies or regulations aimed at promoting financial support for the purposes listed above.

[3] ECCO calculation based on EU cap estimates and price range between 45 and 100 euro/tCO2.
[4] Although the directive sets the cap until 2030, the estimate also refers to subsequent years for consistency with the duration of the Social Climate Fund.
[5] MASE provides for a budget of €9.3 billion for Italy for the period 2027-2032.
[6] The Directive also provides for ad hoc compensatory measures resulting from an imperfect separation between the scope of ETS1 and 2.

1.3 ETS2 IS A CONTROVERSIAL POLICY

The controversy surrounding ETS2 centres around three main arguments:

1. ETS2 introduces a charge, the level of which is determined by the market. This effectively increases the price of fossil fuels for households and businesses. As a result, ETS2 risks being perceived as an additional 'tax' on the end consumer. The costs of ETS2 can be estimated at €0.09/Smc and €0.20/Smc for gas, and €0.11/l and €0.25/l for diesel and petrol, assuming a CO_2 allowance cost of €45 and €100/t respectively. For a typical domestic user[7], this cost corresponds to 6.6% and 13.3% of the cost value for gas and 5.7% and 12.1% for diesel and petrol[8]. In order to avoid these costs, capital must be available to invest in electrical technologies, which depends on the economic capacity of end consumers.
2. The price of CO_2 allowances in ETS2 will depend on the effectiveness of the overall decarbonisation policies of the 27 European countries. Delays in implementing these policies, particularly in countries with higher emissions – Germany, Italy, Poland, France and Spain – would be reflected in the cost of allowances for individual end consumers in all European countries, even those that have been virtuous in their trajectory away from fossil fuel consumption.
3. The 'market' rather than 'fiscal' nature of the ETS system does not allow legislators to predict with certainty the amount of revenue that will be generated from CO_2 allowance auctions. This uncertainty affects the ability of Member States to ensure stable and sustainable funding for policies to reduce emissions or support social groups most affected by increases in energy costs, particularly for countries with high levels of public debt, such as Italy.

At the Environment Council meeting on 25 June 2025, several Member States – including Italy – expressed their governments' concerns about the potential impact of the legislation on energy prices for consumers, calling for targeted changes to the current implementation framework. The Czech Republic subsequently sent, on behalf of 18 Member States, a list of five requests for revision of the Directive from a joint non-paper.

Some of the amendments requested in the non-paper contain elements that could potentially reopen the political debate on some important aspects of ETS2, undermining its effectiveness and potentially delaying its introduction.

[7] Domestic user with an annual consumption of 1,100 Smc based on the average price in 2024.

[8] Calculated based on the average 2024 diesel and petrol price plus the increase expected from the entry into force of ETS2.

The non-paper, presented by the Czech Republic on behalf of 18 Member States, puts forward five proposals:

1. A higher level of information on the forecast of allowance prices, including in the long-term, through the regular publication of official information. This request does not require a legal basis to be implemented.
2. The possibility of starting to auction ETS2 allowances as early as mid-2026 in order to obtain advance indications of their price. The Member States indicate how this request can be implemented through a targeted revision of the implementing regulation on auctions.
3. Limit possible price fluctuations linked to the so-called 'threshold effect' of activating the Market Stability Reserve (MSR) with a more gradual approach, modelled on what has already been done with ETS1. Implementing this request would require a targeted revision of the Decision on the Market Stability Reserve.
4. Extend the life of the Market Stability Reserve beyond 2031 to maintain price stability, with a possible cap on the number of allowances that can be released during this extension period. Again, this would require a targeted revision of the Market Stability Reserve Decision.
5. Strengthen the price control mechanism, which currently provides for a 'soft price cap' of €45/tCO2 as referred to in Article 30h(2) of the Directive, by increasing the volume of allowances released or the frequency of release by the MSR. As above, Member States indicate that this would be possible with a targeted revision of the Market Stabilisation Reserve Decision.

A revision of ETS2 is already planned for 2028. The opening of an early revision procedure would render the rule substantially unenforceable within the currently envisaged timeframe, generating uncertainty more significant than the actual complexities of implementing a rule.

In fact, a delay in the availability of funds would lead both to a delay in the financing of emission reduction policies, which are essential for a structural decline in allowance prices, and to a reduced possibility of offsetting any excessive costs.

For example, a delay in the implementation of ETS2 until 2028 would reduce the Social Climate Fund budget alone from €65.0 billion to €54.6 billion, with a loss for Italy of €1.5 billion to be allocated to the most vulnerable categories of citizens.

In the current context, therefore, it is necessary to avoid political exploitation of the impact of ETS2 on energy prices, focusing instead on optimising the existing design to introduce effective measures to mitigate the risk of excessive impacts.

This objective can be pursued both by introducing instruments aimed at harmonising ETS2 with current energy tax structures and by ensuring the effectiveness of pre-distributive policies in the use of auction revenues. By facilitating access to decarbonisation technologies, these policies contribute to reducing CO_2 emissions and, consequently, to easing pressure on demand and allowance prices.

1.4 ETS2 ALLOWANCE PRICE CONTROL TOOLS

ETS2 has several elements to limit the impact of the regulation on energy prices for end consumers:

1. ETS2, like ETS1, has an ad hoc price control mechanism based on the quantity of allowances in circulation and, therefore, on indirect control of the supply/demand balance through a dedicated Market Stability Reserve.
2. If the average price of allowances exceeds the threshold of €45/tCO2 for two consecutive months, 20 million allowances are released onto the market from the reserve.
3. To ensure market liquidity, the Directive stipulates that in the first year of ETS2 implementation, a volume corresponding to 130% of the planned decarbonisation target must be placed on the market.

For all the points described above and for considerations regarding emissions trends and the effectiveness of decarbonisation policies active at EU level, the European Commission estimates a price of €30/t CO_2, emphasising that higher estimates consider carbon pricing as a tool that is isolated from other policies.

ETS2 PRICE SCENARIOS

On 17 September 2025, Bloomberg published a study estimating an average price of €99/CO_2 between 2027 and 2030, with peaks of up to €122/tCO2. However, the analysis suggests that the adoption of a combination of complementary measures could keep the price around €45/tCO_2. These measures include the introduction of dynamic quota bidding, the use of revenues to subsidise the adoption of electric technologies and the rebalancing of energy carrier taxation (as suggested in this *paper)*, and the strengthening of complementary policies (vehicle emission standards and building energy performance targets).

Analysts have not yet reached a consensus on the expected price of ETS allowances. Considering a maximum price in the early years determined by the threshold of €45/tCO2, some projections indicate a price between €50/tCO_2 and €200/tCO_2 in 2030. The Agora think tank uses €124/tCO_2 as the price in 2030 and €188/tCO_2 in 2045[9] in its study 'Neutral Germany '.

The Commission is currently working on the non-paper sent by Member States, which could increase the supply of allowances in the early years of implementation, with a downward effect on prices. A value of €30/t is indicated as a reference in this scenario.

[9] In 2022 prices

2 NATIONAL MEASURES

The most significant measures to manage the price impacts of ETS2 are to be developed at national level. These fall into two macro areas of intervention by the state, which are:

1. the integration of ETS2 costs into the tax structures of the various energy carriers to facilitate the reduction of fossil fuel use by end consumers; and
2. the introduction of criteria to protect consumers from any excessive costs arising from ETS2.

The first macro area is that of controlling price unpredictability by establishing a price corridor. Member States may set a minimum price, establishing taxation systems complementary to ETS2 in the event that the price falls below certain levels, e.g. €45/tCO_2. **Similarly, a maximum price can be set, e.g., €100/tCO_2, above which mechanisms for direct refunds to end consumers come into play, in a differentiated manner and up to the total reimbursement of costs above the established limit.**

With the introduction of a price corridor, Member States would be guaranteed a minimum and maximum level of revenue with which to finance (and therefore plan) policies. Similarly, consumers would be guaranteed protection against excessive increases in the price of fossil fuels, from which they find it difficult to break free.

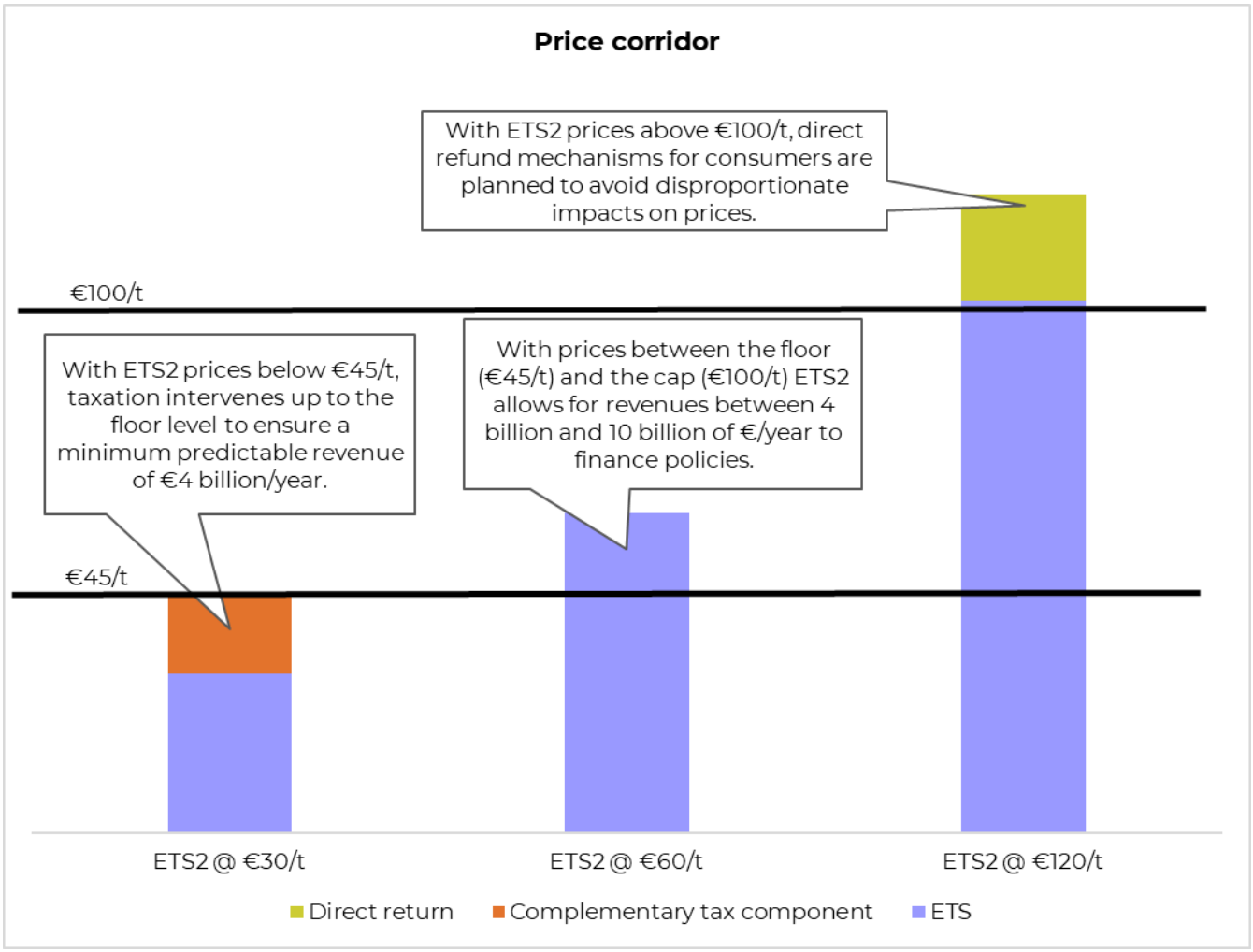

Figure 1 - *Analysis of the price corridor structure and availability for policy financing.*

The introduction of a price corridor ensures availability for policy financing of between €4 and €10 billion per year and an impact on consumers of between **€0.09/Smc and €0.20/Smc** for gas and between **€0.11/l and €0.25/l** for diesel and petrol.

It is precisely the certainty of revenue for the state – effectively equivalent to tax revenue, even if earmarked for the financing of specific policies – that would allow **ETS2 to be integrated with the current energy tax structures.** This could also be achieved by waiving part of the current levy as part of a process of revising energy taxation to bring it back into line with integrated energy and climate policy objectives.

However, the development of mechanisms to complement ETS2 and taxation in specific sectors (gas, diesel and petrol) must not replace a higher and indispensable level of **integration of ETS2 with energy taxation as a whole**, which corresponds to the second macro area of intervention.

The levels of taxation and parafiscal charges on the various energy carriers (electricity, gas, diesel and petrol), and therefore the relative cost-effectiveness of using one or another form of energy for the end consumer, are currently **inconsistent with both energy policy objectives and consumer interests**. For a comprehensive discussion of this issue, please refer to the paper 'Energy taxation and implicit fossil fuel subsidies in Italy', presented by ECCO in September 2025 at the 26th World Conference on Environmental Taxation.

By way of example, the current **stratification of tax, parafiscal and environmental charges** for certain types of consumers who use gas and electricity, and for users of electric motor cars or diesel and petrol combustion engine cars is shown here (Figure 2 and Figure 4). The **imbalances in the charges levied on electricity are directly reflected on consumers,** discouraging them from adopting end-use electric technologies that are more efficient and cleaner, and which could also be economically advantageous (Figure 6 and Figure 7). Even in cases where the price of CO_2 stands at €45/tCO_2 or €100/tCO_2, the introduction of ETS2 proves insufficient to reach a threshold where **the tax burden and system and environmental charges are consistent with the objectives of energy efficiency, electrification, decarbonisation** and energy security on the continent (Figure 3 and Figure 5).

Figure 2 highlights the current stratification of tax costs and charges paid in the bill of a typical consumer[10] per kWh in a comparison between electricity and natural gas. The overall weight of taxation and charges in electricity amounts to 8.7 c€/kWh compared to 2.3 c€/kWh calculated for gas. In the example given, VAT has been calculated only on the tax components and charges and not on the total cost including raw materials, regulated components and sales. The inclusion of VAT on the total price and not only on the tax and parafiscal components does not change the substance of the problem, as we shall see below.

[10] The comparison is made between 1100 Smc of annual natural gas consumption and 2000 kWh of annual electricity consumption for a consumer residing in the north-west.

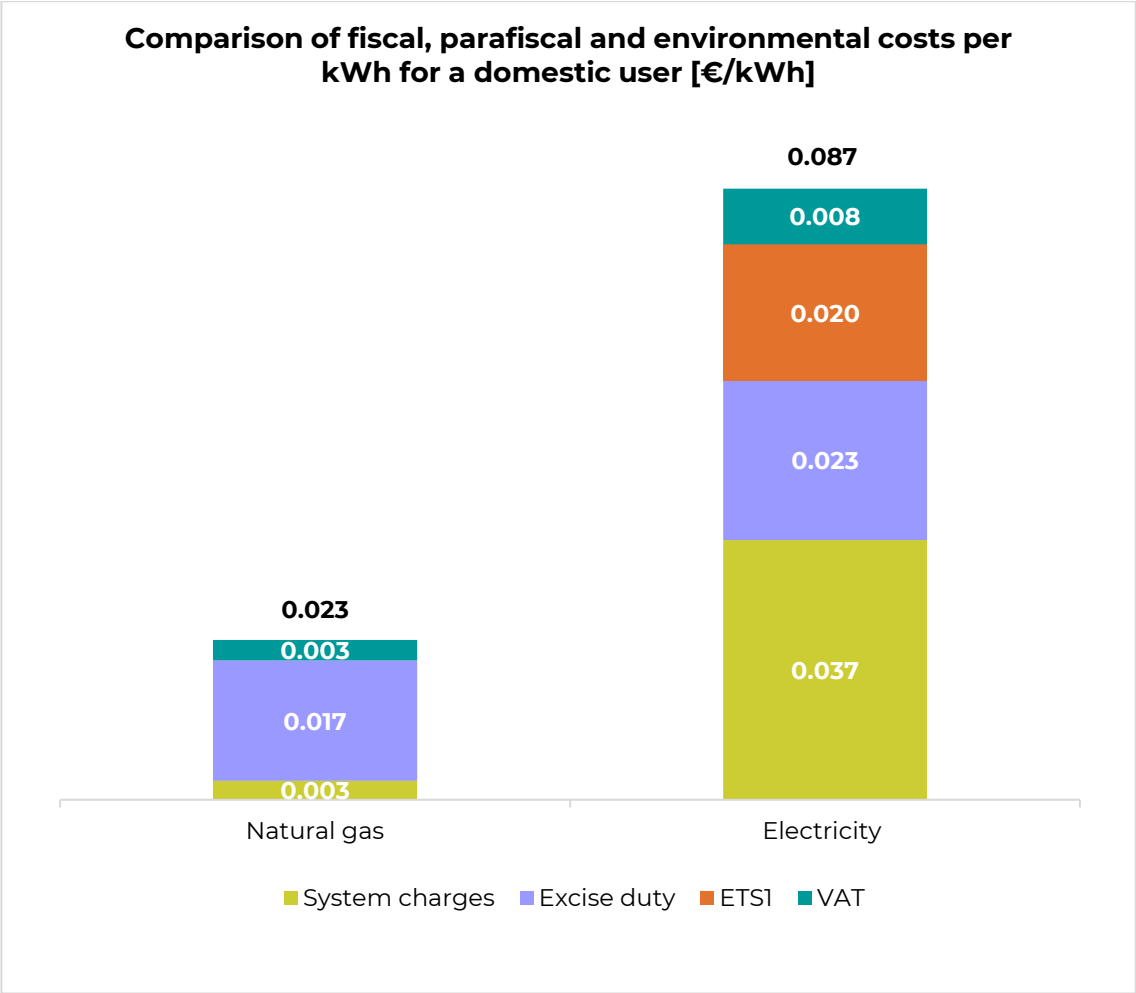

Figure 2 – *Comparison of the fiscal cost (excise duty and VAT), parafiscal cost (system charges) and environmental cost (ETS1) per kWh of energy consumed by a domestic user [€/kWh]. Source: ECCO calculations based on ARERA data for 2024, taking as a reference the electricity and natural gas bills for the following typical consumers: an annual consumption of 2,000 kWh/year for electricity and 1,100 Smc/year for natural gas.*

The values of the individual contributions can be consulted in the following table:

Components	System charges	Excise duty	ETS1	VAT[11]	Total
U.M.	**[€/kWh]**	**[€/kWh]**	**[€/kWh]**	**[€/kWh]**	**[€/kWh]**
Natural gas	0.003	0.017	-	0.003	0.023
Electricity	0.037	0.023	0.020	0.008	0.087

Table 1 – *Values of system charges, excise duty, ETS1 and VAT applied to these components for natural gas and electricity estimated for a typical domestic user.*

The current cost structure imposes a tax and parafiscal levy on residential consumers, consisting of excise duties, system charges, environmental costs (ETS1) and VAT, which for electricity is more than

[11] The VAT rate applied to natural gas is 16.7%, or 10% on the first 480 cubic metres and 22% on the remainder, while it is 10% on electricity and is calculated only on tax, parafiscal and environmental charges.

three times higher than that applied to gas. This result highlights how the tax burden acts as a brake on electrification.

Figure 3 shows the amount of tax, parafiscal and environmental charges per unit of energy (kWh) following the introduction of ETS2 for residential consumers, assuming a CO_2 price of €45/tCO_2 and €100/tCO_2.

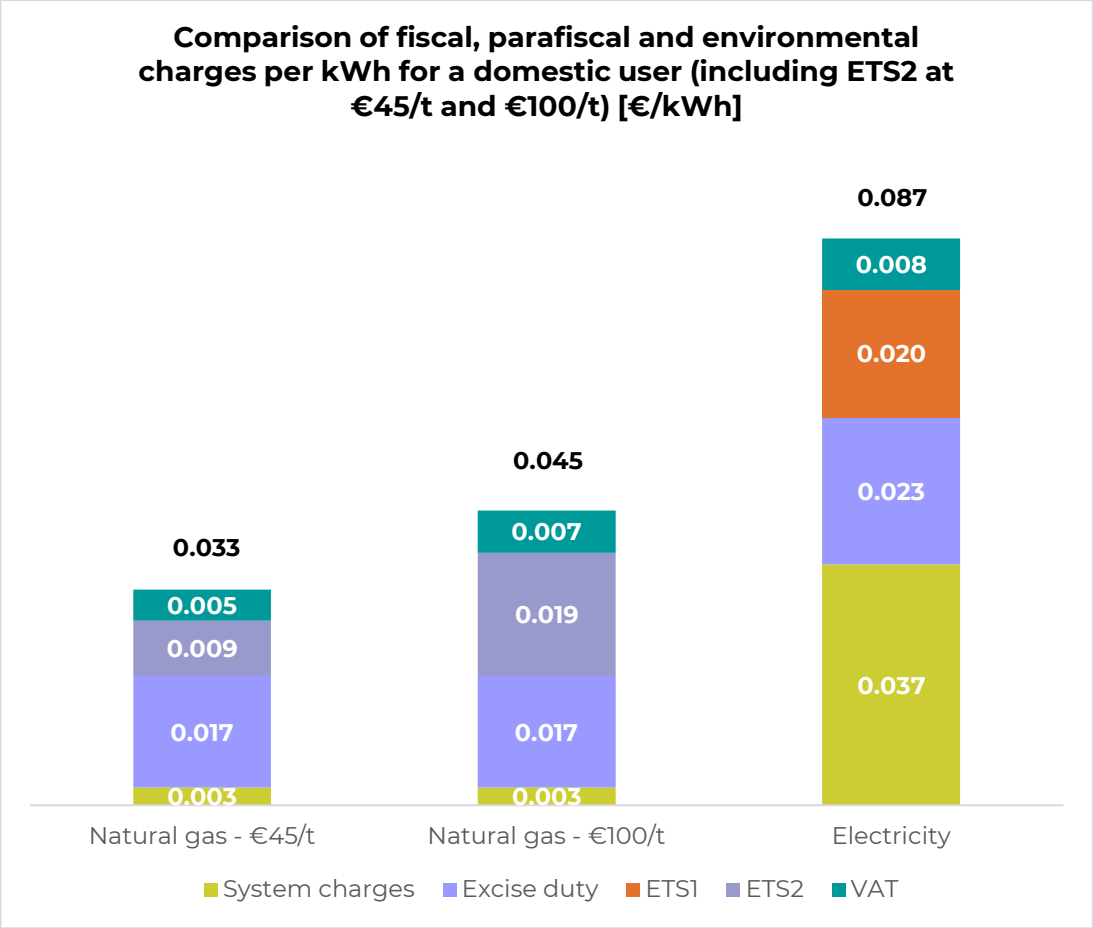

Figure 3 – *Comparison of tax costs (excise duty and VAT), parafiscal costs (system charges) and environmental costs (ETS1 and ETS2 with CO_2 prices of €45 and €100/t CO_2) per kWh of energy consumed by a domestic user [€/kWh]. Sources: ECCO calculations based on ARERA data for 2024.*

The values of the individual contributions can be found in the following table:

Components	System charges	Excise duty	ETS1	ETS2	VAT[12]	Total
U.M.	**[€/kWh]**	**[€/kWh]**	**[€/kWh]**	**[€/kWh]**	**[€/kWh]**	**[€/kWh]**
Natural gas – €45/t	0.003	0.017	-	0.009	0.005	0.033
Natural gas – €100/t	0.003	0.017	-	0.019	0.007	0.045
Electricity	0.037	0.023	0.020	-	0.008	0.087

Table 2 – *Values of system charges, excise duty, ETS1, ETS2 and VAT applied to these components for natural gas and electricity estimated for a typical domestic user.*

The introduction of ETS2 for domestic natural gas consumers only marginally recovers the difference in tax burden and charges between gas and electricity. Even after the introduction of ETS2, electricity users still pay 1 to 1.5 more than gas users. This clearly highlights not the need to increase the price of ETS2 — which would place an excessive burden on consumers unable to switch from gas to electricity — **but rather the urgent need to rebalance taxation, as well as system and environmental charges, between gas and electricity.**

As with the **tariffs applied to residential customers**, in the case of electric mobility, the tariff regime is also **more burdensome** for electric technologies than for fossil fuel technologies, thus reducing the overall effectiveness of **the transition to electrification**.

Figure 4 shows a comparison between **the current incidence of tax, parafiscal and environmental charges** (expressed in €/kWh) incurred by a user who drives a **diesel or petrol** car compared to an **electric car** user. The comparison is made considering **three different charging profiles**: **Domestic**, **Garage** and **Public**[13]. In the best-case scenario for an electric car user who mainly recharges at **home** (Domestic profile), the tax burden is **on average 77% higher** than for those who use a traditional car. The disparity is even worse for the other profiles: **garage** users (who mainly recharge in a private garage with a non-domestic electricity supply) face a tax burden **that is 130% higher** than that of fuel users, while for **public** users (who have no alternative to recharging at public charging stations) the tax burden rises to **152%** compared to that of a motorist with a combustion engine vehicle.

[12] The VAT rate applied to natural gas is 16.7%, or 10% on the first 480 cubic metres and 22% on the remainder, while it is 10% on electricity and is calculated only on tax, parafiscal and environmental charges, including ETS2.
[13] For the **Domestic** profile, a mix was assumed consisting of 55% electric recharges at domestic rates, 30% public or private low voltage recharges and 15% medium voltage recharges; for the **Box** profile, a mix of 55% charging in garages with tariffs for 'other uses' and the remainder divided equally between public and office low voltage charging and medium voltage charging was assumed; for the **Public** profile, a mix of 70% low voltage charging in offices (30%) and public charging (40%) was assumed, with the remaining 30% in medium voltage.

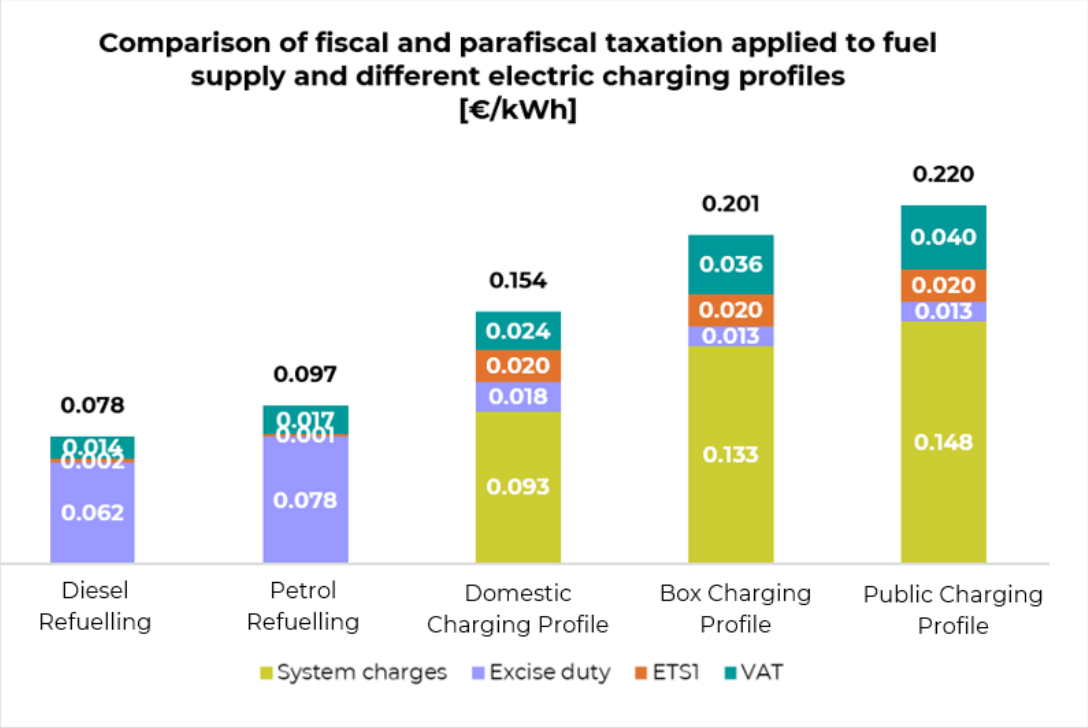

Figure 4 – *Comparison of the tax burden (excise duty and VAT), parafiscal charges (system charges) and environmental charges (ETS1) for one kWh of energy consumed for diesel, petrol and different electric charging profile configurations [€/kWh]. Source: ECCO calculations based on 2024 costs.*

The values of the individual contributions shown in the diagram can be found in the following table:

Components	System charges	Excise duty	ETS1	VAT[14]	Total
U.M.	*[€/kWh]*	*[€/kWh]*	*[€/kWh]*	*[€/kWh]*	*[€/kWh]*
Diesel Refuelling	-	0.062	0.002	0.014	0.078
Petrol Refuelling	-	0.078	0.001	0.017	0.097
Domestic Charging Profile	0.093	0.018	0.020	0.024	0.154
Box Charging Profile	0.133	0.013	0.020	0.036	0.201
Public Charging Profile	0.148	0.013	0.020	0.040	0.220

Table 3 – *Values of system charges, excise duty, ETS1, ETS2 and VAT applied to different fuel and electric charging configurations.*

Extending the analysis to the impact of **the ETS2 mechanism** on fuel taxation in the transport sector, Figure 5 compares (€/kWh) the incidence of fiscal, parafiscal and environmental charges for an electric vehicle user with a domestic charging profile (see note 13), against a user with a diesel and/or petrol car, under two ETS2 price scenarios: €45/tCO_2 and €100/tCO_2. The comparison shows

[14] The VAT rate applied to diesel and petrol is 22%, while it is 15.4% on electricity, which is the weighted average of 10% for domestic charging and 22% for all other types of charging.

that **the increase in the tax burden resulting from higher fuel costs due to ETS2 only marginally reduces the average tax gap between fossil fuels and electric charging.** In the case of the **Domestic** charging mix, which has the lowest average cost, **the overall taxation on charging is on average 52% higher** than for fuels at an ETS2 price of €45/tCO_2, and **30% higher** if the ETS2 price rises to €100/tCO_2 . **These differences increase in the case of charging with Box profiles** (98% with ETS2 at €45/tCO_2; 68% with ETS2 at €100/tCO_2) and **Public profiles** (117% with ETS2 at €45/tCO_2 ;84% with ETS2 at €100/tCO_2).

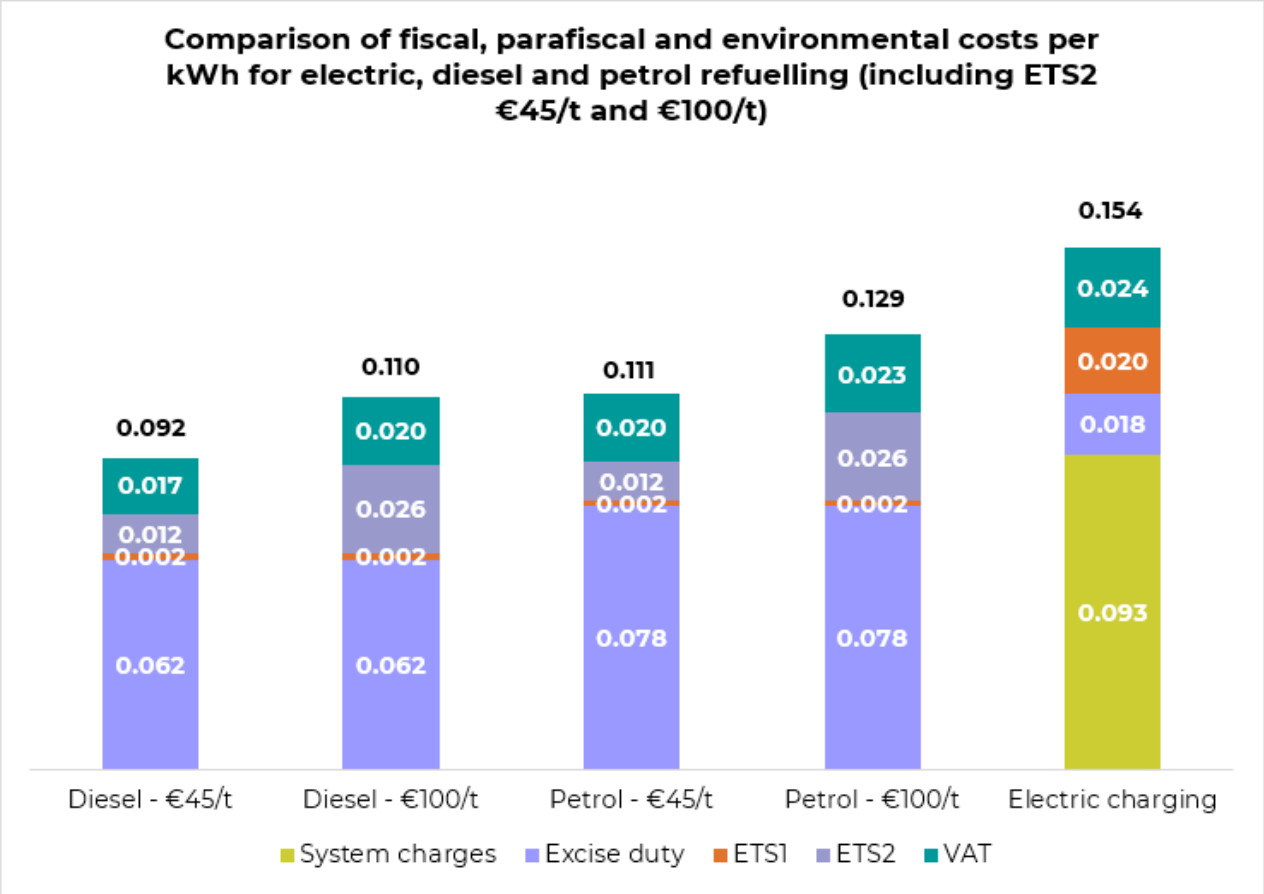

Figure 5 – *Comparison of fiscal (excise duty and VAT), parafiscal (system charges) and environmental (ETS1 and ETS2 with CO_2 prices of €45 and €100/tCO_2) costs per kWh of energy consumed for diesel, petrol and electric charging [€/kWh]. Sources: ECCO calculations based on average data for 2024.*

The values of the individual contributions shown in the diagram can be consulted in the following table:

Components	System charges	Excise duty	ETS1	ETS2	VAT[15]	Total
U.M.	**[€/kWh]**	**[€/kWh]**	**[€/kWh]**	**[€/kWh]**	**[€/kWh]**	**[€/kWh]**
Diesel Refuelling – ETS2 €45/t	-	0.062	0.002	0.012	0.016	0.092
Diesel Refuelling – ETS2 €100/t	-	0.062	0.002	0.027	0.019	0.110
Petrol Refuelling – ETS2 €45/t	-	0.078	0.002	0.012	0.020	0.111
Petrol Refuelling – ETS2 €100/t	-	0.078	0.002	0.026	0.023	0.129
Electric Charging	0.093	0.018	0.020	-	0.024	0.154

Table 4 – *Values of system charges, excise duty, ETS1, ETS2 and VAT applied to these components for diesel, petrol and electric charging.*

The existing tariff imbalance makes it impossible for consumers to benefit from the greater efficiency of electric technologies. In general terms, energy efficiency corresponds to lower consumption and should therefore be consistently reflected in the costs on the bill. This is not the case.

In the case of domestic heating, for example, heat pumps can be up to four times more efficient than gas boilers, significantly reducing the energy required to maintain the same level of thermal comfort.

With the use of a heat pump, annual energy consumption drops from 13,878 kWh/year (equivalent to 1,268 Smc/year of gas) to 3,886 kWh/year, a **reduction of 72% compared to a gas boiler.** However, as shown in Figure 6, **the total energy cost is reduced by only 25%.**

When considering only tax and parafiscal components are considered (excise duty, system charges, environmental charges – ETS1 on electricity – and VAT applied only to these components), the greater energy efficiency of the heat pump does not translate into any economic benefit for the consumer. In fact, the total amount paid in taxes and charges for 3,886 kWh/year of electricity is €339, compared to €284 for the gas bill with a consumption of 13,878 kWh/year. When also accounting for VAT applied to the cost of raw materials, transport and metering, the higher VAT rate on gas compared to electricity leads to an estimated cost of tax and parafiscal charges of €475 for gas heating and €415 for electricity. **The cost per kWh of taxes and charges is €0.034/kWh for gas and €0.107/kWh for electricity, with a ratio of more than three to one to the disadvantage of electricity.**

[15] The VAT rate applied to diesel and petrol is 22%, while it is 10% on electricity.

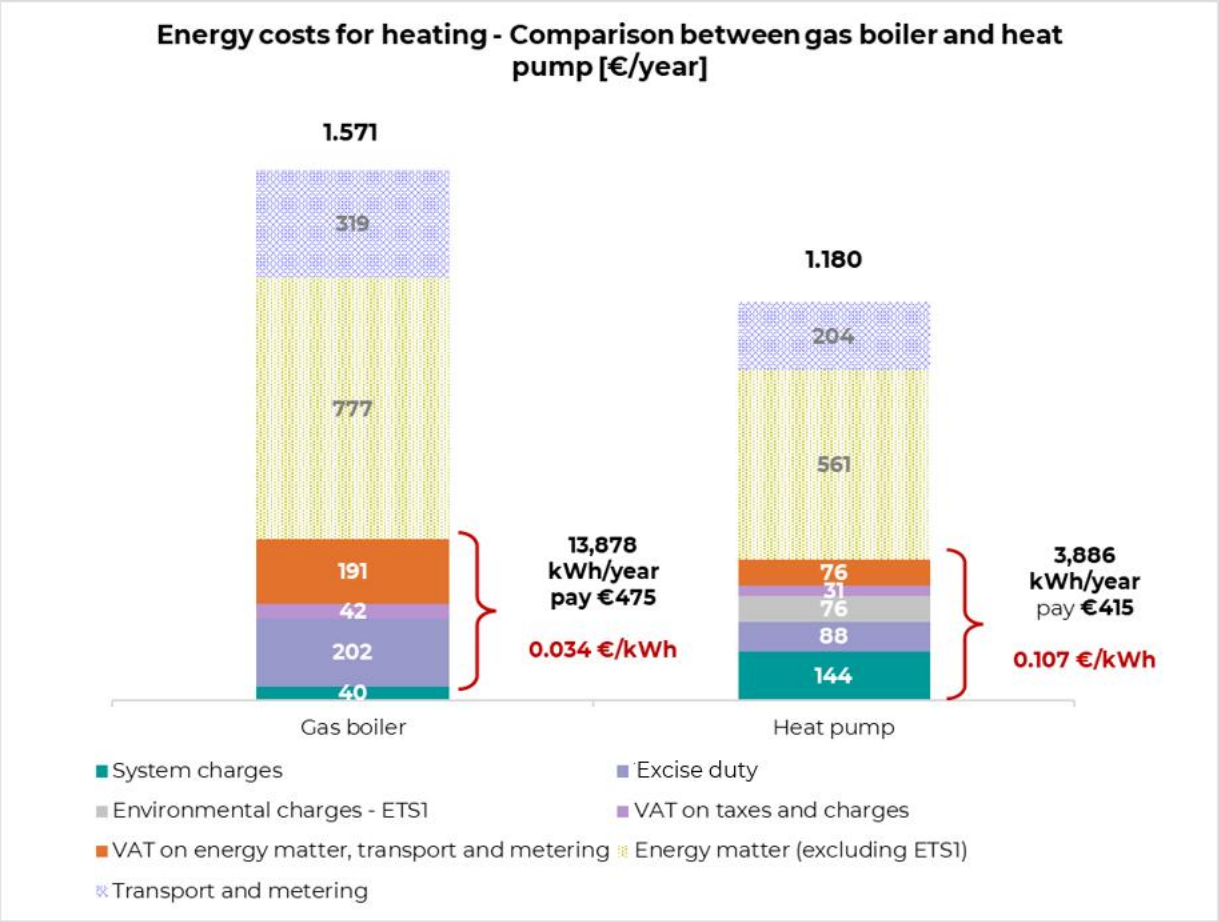

Figure 6 – *Comparison between the energy costs of an electric heat pump (COP = 3.5) and a gas boiler (efficiency = 98%) to heat a 100 m² home in energy class G. Source: ECCO calculations based on the tariff costs defined by ARERA and MEF for 2024. The environmental cost corresponds to the weight of ETS1 applied to the price of energy on electricity.*

The same observation applies to transport. Although the energy consumption of an electric car travelling 15,000 km/year is almost four times lower than that of a petrol car (9,271 kWh consumption for a petrol car compared to 2,400 kWh for an electric car), in the case of **domestic charging,** the weight of all tax and parafiscal components on charging costs (including the various VAT components) is only 53% lower than refuelling: €1,060/year for petrol (for 9,271 kWh consumed, equal to an average cost of €0.114/kWh) compared to €493 for electricity (for 2,400 kWh consumed, €0.206/kWh).

This means that, for the same mileage, **the advantage associated with the energy efficiency of electric technologies compared to internal combustion engines is eroded by 44%** due to the taxation applied to recharging[16]. For **Box** profile recharges, the tax burden increases to €658/year (58% loss of vehicle efficiency advantage), while for the **Public** profiles it reaches €749/year (63% loss).

[16] The erosion of the energy efficiency advantage due to different taxation is calculated as the ratio between the relative efficiency of the electric vehicle and that of the internal combustion engine vehicle (A = *BEV consumption / ICE consumption)* and the ratio between the respective overall taxation (B = *BEV taxation / ICE taxation)*, according to the formula: A/B – 1.

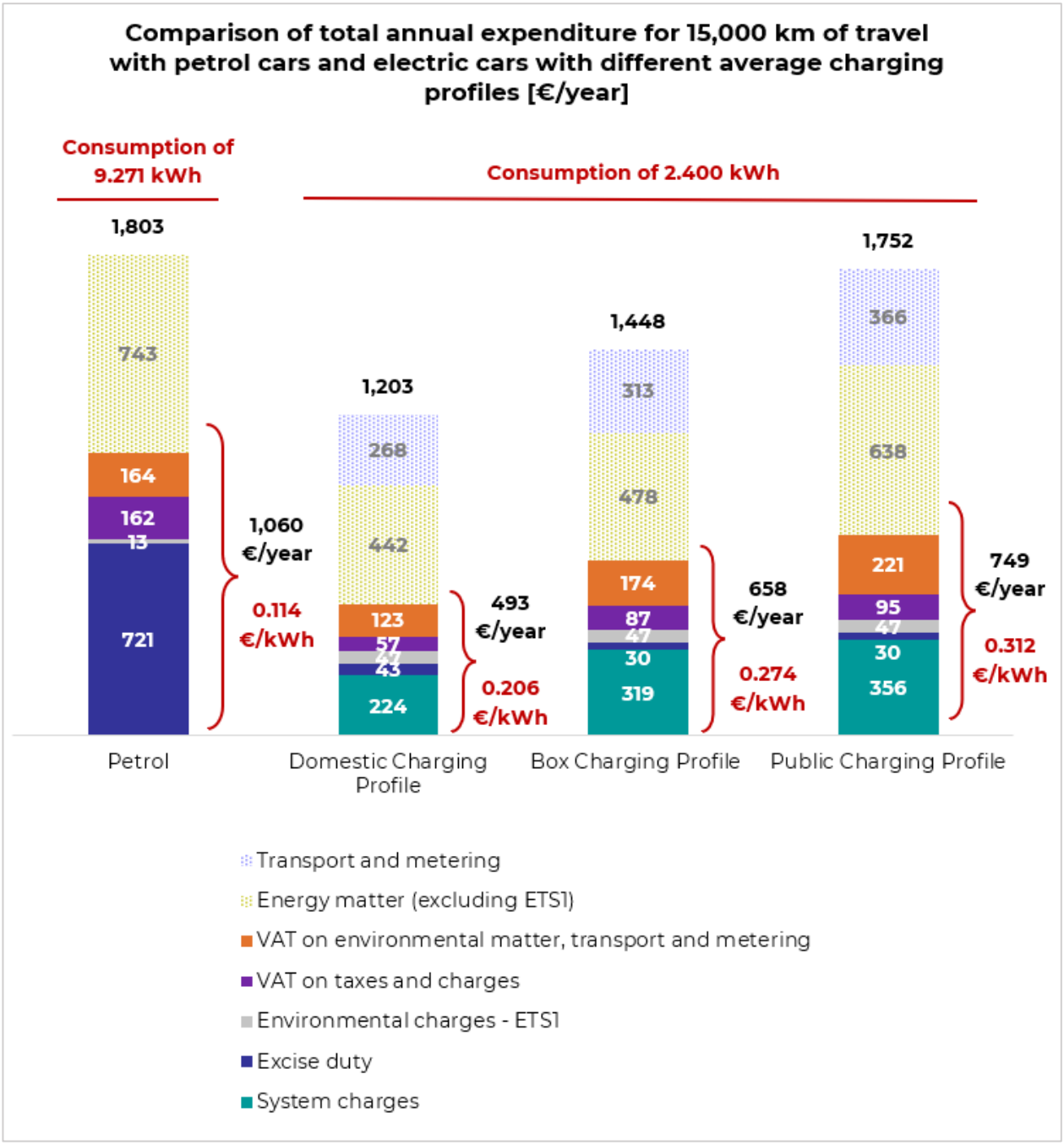

Figure 7 – *Comparison of total annual expenditure for travelling 15,000 km with an electric car and a petrol car. Source: ECCO calculations based on costs for 2024.*

Considering all charging costs (including energy, transport and metering components, commercial components and related VAT), **the cost advantage of driving electric compared to petrol is reduced to 33% in the Domestic charging mix** (€1,803 total costs for a petrol car compared to €1,203 for an electric car), to **20% in the Box profile mix** (€1,803 versus €1,448) and to almost **zero** (3%) **in the Public profile mix** (€1,803 versus €1,752).

3 CONCLUSIONS

The introduction of ETS2 highlights the need for and importance of Italy **reviewing its entire energy taxation and parafiscal structure**, which has a historical stratification that is no longer consistent with the objectives of energy efficiency, decarbonisation and supply security. The joint pursuit of these objectives requires the progressive integration of energy systems in which price formation mechanisms reflect the contribution of different energy carriers in a balanced manner.

The review should be based on objective criteria of fiscal fairness, taking into account both energy content and pollutant emissions, and provide for a balanced distribution of electricity system costs between the various energy sectors and between the energy sector and general taxation.

The outcome of this review will necessarily be a correction of the current fiscal and parafiscal imbalance that weighs on electricity consumption. **The real benefit for consumers**, in fact, does not lie in maintaining the current fiscal and parafiscal imbalances between the various energy carriers, but in being able to **access electrical technologies and fully benefit from their greater efficiency**.

Although ETS2 only partially compensates for the tax and charge differential between electricity, gas, diesel and petrol, **its correct implementation** would offer consumers a clear picture of medium and long-term **benefits**, **supplemented by support mechanisms** and the **guarantee of protection** from excessive price increases for those who, for various reasons, are delaying the process of decarbonising their energy use.

The legislator should introduce ETS2 in order to protect consumers through price control mechanisms, such as a **price corridor**, and, at the same time, review the current inconsistencies in energy taxation.

The ability of Member States to **develop effective and redistributive policies** is key to preventing disproportionate price increases and the potential social tensions that may result from them. The implementation of ETS2 makes it possible to finance policies for the transition away from fossil fuels according to **principles of environmental fairness**, effectively making 'polluters' pay, rather than 'those who pollute because they have no other choice'.

Such policies would be **consistent with the requirements of the European Directive** and could be implemented without prematurely reopening the regulatory text, allowing Member States to **ensure the social and financial sustainability of the implementation of the Directive** in a targeted manner consistent with the economic and social specificities of each country.

These measures are also in line with the objective of the Action Plan for Affordable Energy and with the recommendations that the Commission is expected to publish by the end of 2025 to ensure that **energy taxation in Member States guarantees lower taxation on electricity in all sectors**, while continuing to provide incentives for energy efficiency but favouring investment in electrification.

THE ITALIAN CLIMATE CHANGE THINK TANK

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Date of publication:
20 October 2025