



## Climate policies, carbon taxation and distributional compensations

### Key messages

- Energy environmental taxes are crucial to achieve a successful transition to a decarbonized economy.
- The use of additional tax revenue to establish distributional compensations will be fundamental to achieve a fair transition
- It is very important to ensure the salience of the measures through extensive communication efforts. In this way, the public will understand and support the measures, thereby increasing their effectiveness and viability since it could lend trust to the government and make citizens believe in the Pigouvian mechanism, two important motivations for protesters' opposition in Sweden as recognized in [2].
- Compensation should be decoupled from energy consumption to encourage energy savings and efficiency, and should be targeted primarily at particularly affected households, wherever possible.

### Policy context and barriers

To achieve a successful transition to a decarbonized economy, a key tool available to policy makers is energy-environmental taxes. While there are various regulatory alternatives to achieve significant reductions in greenhouse gas emissions, energy-environmental taxes are a particularly suitable instrument, as they provide continuous incentives to reduce emissions, are more flexible than conventional regulations, create price signals to mobilize investments in clean technologies, lead to reductions in local pollution and other environmental co-benefits, and generate additional revenue for the public sector. However, in spite of their advantages, energy-environmental taxes currently remain, in most countries, at a much lower level than is necessary to achieve significant reductions in greenhouse gas emissions. This is the case for Spain, which is at the bottom of the European Union countries in the use of these instruments and demands future action in the near future.

Among the factors that explain the low use of energy-environmental taxation are concerns about its possible regressive distributive impacts on households. Faced with an increase in energy-environmental taxation, households will be affected differently due to differences in their income levels, preferences, consumption patterns and living conditions but, in general, impacts will be higher on lower income groups. This is because, although richer households spend more on energy, energy costs account for a higher proportion of expenditure in low-income households. In addition, in general, lower-income households spend relatively more on carbon-intensive goods and are likely to own older, energy-inefficient energy-consuming durable goods, due to their lower ability to take on debt. However, the distributional impact of energy-environmental taxation will also depend on the energy product considered, as energy-related transport taxes are generally less regressive than those on electricity or heating fuels, as poorer households are less likely to own a car. There are also several factors that are not necessarily related to household income that will influence the distributional impact of energy-environmental taxation, such as housing type, area of residence or household size. Households living in areas with no public transport, in places with more extreme climatic conditions, in sparsely populated areas that require long commutes or in inefficient houses will be particularly affected.

### Distributional assessment and compensation

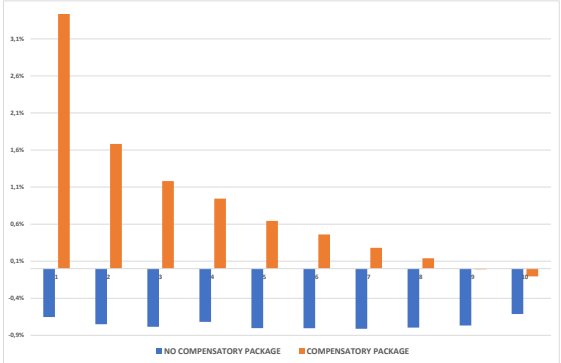
In this context, social acceptance of energy-environmental taxation will require calculating and compensating for its possible regressive distributional impacts. Given that energy-environmental taxes generate significant public revenues, in practice their distributional effects will depend on how these revenues are used to compensate the most affected households. There are different compensatory alternatives, which can be classified into three categories: generalized or targeted compensation, transfer or price-based compensation, and short- or medium/long-term compensation. In principle, generalized compensations involve providing assistance also to wealthier households that do not need it, so ideally com-

pensatory devices should target only vulnerable households. However, such targeted offsets can be difficult to design. A certain income threshold could be used as an indicator of means-tested, but this requires reliable information on household income, and income is not the only factor determining the impacts. Also, households with an income level close to the threshold might want to reduce their income in order to receive the compensation. To avoid these problems, it would be possible to use income-varying compensations, as well as other additional criteria, although this would increase the complexity of the system and make it difficult for the poorest households to participate. If it is not possible to identify vulnerable households, or there is no disproportionate impact on low-income households, universal offsets can be used. This alternative, while also benefiting wealthy households, is progressive as it will provide a higher share of income to low-income households.

**An illustration for Spain**

In this context, Figure 1 presents an example of the distributional impact of an increase in fuel taxation in Spain (without and with distributional compensations). It shows that using the additional tax revenue to provide a lump-sum transfer to all households would allow to substantially increase the progressivity of the policy (see [1]). Furthermore, since the transfers benefit the entire electoral spectrum once they are in place, it will not be easy to remove them even if there is a change of government.

**Figure 1. Distributional impact of the increase of car fuel taxation in Spain**



Source: [1]  
 Notes: (i) % income variation by decile of equivalent income.  
 (ii) Compensatory package: Additional revenues recycled through lump-sum transfers to all households

If offsets are intended to reduce energy prices, they allow households to be compensated for increases in energy costs but remove incentives for energy savings and efficiency, which is the main objective of the policy. Alternatively, monetary transfers, independent of energy consumption, can be used. These transfers allow households to be compensated without distorting the signals to further decarbonize the economy and can be made in cash if country’s legislation allows it, or using existing taxes or social security systems, so at relatively low administrative costs. In any case, it is desirable that the amount of the transfers is progressively reduced over time, so that households have incentives to adapt to a low-carbon economy.

It is important to note, while these transfers can reduce the short-term distributional impacts on households, in the long term a larger effort is needed to reduce dependence on fossil fuels by providing incentives for energy efficiency and the use of renewable energies. To achieve this, subsidies on shifting to more efficient household appliance or home insulation improvements can be used to improve the energy efficiency, which would allow them to reduce their energy use and, consequently, their costs. However, it is very important that subsidies are targeted to vulnerable households, since if they are generalized their impact is likely to be regressive as wealthy households have more resources to make energy efficient investments. Alternatively, subsidies could be targeted to options such as public transport or renovation of social housing, used mainly by lower income households.

Additionally, it is important to take the salience of the measures into account, *i.e.*, their ability to be comprehended by agents, thus increasing their effectiveness and viability. Bearing in mind that increases in energy-environmental taxation generally have a high media coverage that makes them very salient, it is crucial that the compensatory mechanism used is also salient, for which a good communication strategy that explains its distributive impacts on households will be necessary. In this context, confidence in the government ability to manage the collection of energy-environmental taxes in an effective, fair and transparent manner will be

key to achieving the acceptability of increases in energy-environmental taxes.

### Summing up

To conclude, given the need to increase energy-environmental taxation in the coming years to achieve the transition to a decarbonized economy, the establishment of distributional compensations will be fundamental to achieve a successful and fair transition. To this end, a rigorous analysis must first be carried out to identify winners and losers, as well as the effects of the available compensatory alternatives. Compensation should be decoupled from energy consumption to encourage energy savings and efficiency, and should be targeted primarily at particularly affected households, wherever possible. In addition, it is also important that the chosen offset mechanism is salient and that there is trust in the government. Finally, distributional compensations

should be progressively reduced over time to incentivize households to adapt to a decarbonized economy.

### References

[1]. Gago, A., Labandeira, X., Labeaga, J.M., López-Otero, X. (2021). Transport taxes and decarbonization in Spain: Distributional impacts and compensation. *Hacienda Pública Española/Review of Public Economics* 238, 101-136.

[2]. Ewald, J., Sterner, T, Sterner, E. (2022). Understanding the resistance to carbon taxes: Drivers and barriers among the general public and fuel-tax protesters. *Resource and Energy Economics* 70.

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