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# The multi-level fiscal governance of ecological transition

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## Abstract

### **The multi-level fiscal governance of ecological transition**

This paper investigates the role of fiscal federalism in driving ecological transition, a key challenge in the United Nations' Sustainable Development Goals agenda. The ecological transition seeks a sustainable society that prioritises natural resource preservation and reduces environmental impacts. The study investigates the link between fiscal federalism institutions and ecological transition policies, focusing on regional and local governments' role in implementing environmental goals. Despite subnational governments' commitment to green objectives, comprehensive plan implementation has been limited due to local governments' incentive schemes and capacity constraints. The paper examines the potential of fiscal federalism institutions, such as fiscal rules, transfers and capacity-building programs, to support ecological transition policies. The research emphasises engaging regional and local governments in the green agenda and highlights the need for tailored approaches in multi-level fiscal governance to effectively achieve environmental goals. By investigating fiscal federalism's potential contribution to ecological transition, the paper offers valuable insights for policymakers addressing environmental challenges through a multi-level governance approach.

*Keywords:* fiscal federalism, ecological transition, green agendas, environmental goals, fiscal federal institutions

*JEL classification:* H23; H77; Q57

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## Résumé

### La gouvernance fiscale multi-niveaux de la transition écologique

Cet article étudie le rôle du fédéralisme fiscal dans la conduite de la transition écologique, un défi clé dans l'agenda des Objectifs de Développement Durable des Nations Unies. La transition écologique vise à créer une société durable qui donne la priorité à la préservation des ressources naturelles et réduit les impacts sur l'environnement. L'étude examine le lien entre les institutions du fédéralisme fiscal et les politiques de transition écologique, en se concentrant sur le rôle des gouvernements régionaux et locaux dans la mise en œuvre des objectifs environnementaux. Malgré l'engagement des gouvernements infranationaux en faveur des objectifs écologiques, la mise en œuvre de plans globaux a été limitée en raison des systèmes d'incitation des gouvernements locaux et des contraintes de capacité. Le document examine le potentiel des institutions du fédéralisme fiscal, telles que les règles fiscales, les transferts et les programmes de renforcement des capacités, pour soutenir les politiques de transition écologique. La recherche met l'accent sur l'engagement des gouvernements régionaux et locaux dans l'agenda vert et souligne la nécessité d'approches adaptées dans la gouvernance fiscale à plusieurs niveaux pour atteindre efficacement les objectifs environnementaux. En étudiant la contribution potentielle du fédéralisme fiscal à la transition écologique, l'article offre des indications précieuses aux décideurs politiques qui s'attaquent aux défis environnementaux par le biais d'une approche de gouvernance à plusieurs niveaux.

*Mots-clés* : fédéralisme fiscal, transition écologique, agendas verts, objectifs environnementaux, institutions fédérales fiscales

*Classification JEL* : H23; H77; Q57

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# The multi-level fiscal governance of ecological transition

By Sean Dougherty and Andoni Montes Nebreda<sup>1</sup>

## 1. Introduction

1. Ecological transition is defined as a process towards a smarter social and economic model which better responds to green challenges. It is a key challenge that policymakers are trying to address within the United Nations' Sustainable Development Goals (SDG) agenda. The approach aims for a shift towards a more sustainable and environmentally conscious society that prioritises the preservation of natural resources and the reduction of negative impacts on the environment. The pre-pandemic momentum of increased sensitivity towards the environment allowed for more rigorous green objectives to be agreed upon at the international level. Examples of this trend include the signature of the Paris Agreement and the launch of the European Green Deal. In this context, environmental protection policies, especially climate change mitigation and adaptation policies, have gained traction due to the increasingly apparent effects of rising temperatures and heightened social awareness (European Commission, 2022).

2. Despite the overlap between environmental protection and climate policies, there is not an exact separation between them, as they are intertwined. While climate policies are mainly circumscribed to addressing greenhouse gases (GHGs) causing global warming (mitigation) and its consequences (adaptation), environmental protection policies go beyond this and cover a broader scope of issues not strictly included in the former concept, including soil, noise and water pollution, as just some examples. Moreover, it is not possible to examine climate policies without looking into broader environmental issues. The inverse is also true. Therefore, although this report focuses on environmental protection and ecological transition, thus references to climate policies will be frequent.

3. Climate change is a global problem, and thus it should be tackled by measures at the global level. However, this does not preclude the possibility of countries using tailored approaches, as outlined in the Paris Agreement's Nationally Determined Contributions, which can be implemented using various instruments. Moreover, the broader concept of the ecological transition underscores that it is a multidimensional phenomenon. Environmental issues such as biodiversity and ecosystem protection, water quality, waste production and management, air and soil pollution, and natural landscapes are predominantly local in scale. While most goals related to these issues are set at the international or national levels using a top-down approach, the responsibility for designing and implementing policies necessary to achieve these goals is shared across levels of government or is decentralised to regions and cities.

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<sup>1</sup> This document was discussed at the 2023 Annual Meeting of the OECD Network on Fiscal Relations across Levels of Government on 20-21 April 2023. It was prepared by Andoni Montes Nebreda, consultant to the Fiscal Network, in collaboration with Sean Dougherty, head of Network Secretariat. We thank Network delegates and internal referees Hansjörg Blöchliger (OECD Economics Department) and Isabelle Chatry (OECD Centre for Entrepreneurship, SMEs, Regions and Cities) for their valuable feedback. Inputs and comments from Assia Elgouacem & Kurt Van Dender (OECD Centre for Tax Policy and Administration) are also gratefully acknowledged.

4. Furthermore, the perceived fairness of the ecological transition is a crucial factor in ensuring the feasibility of reforms. For instance, public opposition movements have emerged in response to increases in prices or taxes on fossil fuels, and restrictions on private vehicles or pricing schemes such as pay-per-drive and pay-as-you-throw that follow “the polluter pays” principle have been met with low popularity, indicating that the political economy of the ecological transition requires a tailored approach. The most widely extended measures to gain citizens’ support involve compensating vulnerable groups to switch to sustainable alternatives and avoid the potentially regressive effects of green policies, particularly those related to environmental taxation (Böhringer et al., 2019; OECD, 2019a; Montes and Moreno, 2022; OECD, 2022f). Additionally, recent survey-based evidence suggests that framing and information that specifically address households’ concerns might also be helpful to shape attitudes (Dechezleprêtre et al., 2022). Local governments, which are closer to citizens, are better placed to facilitate public participation (OECD, 2022c), and on average, enjoy a better public image than higher government tiers, and thus can play a critical role in getting local communities on board for the ecological transition.

5. The success of environmental goals hinges on the engagement of regional and local governments with the green agenda. However, although OECD & EU-CoR survey data shows that subnational governments (SNGs) are committed to green objectives, results so far have been unimpressive, with few municipalities having implemented comprehensive plans for the ecological transition (OECD, 2020). The main determinants for such plans are central mandates, political will and city scale. This can be attributed to the incentive scheme that guides local governments’ policymaking and their limited capacity, particularly for smaller administrations. Fiscal federalism institutions, and especially intergovernmental fiscal arrangements, such as fiscal rules, transfers, and capacity-building programmes, could help in addressing these issues.

6. This document focuses on the link between fiscal federalism institutions and ecological transition policies, which is an increasingly important policy issue, as shown by the increasing literature in the field (Martinez-Vazquez, 2021; De Mello and Martinez-Vazquez, 2022, Smoke and Cook, 2022).

7. The structure of this report will be as follows: Section 2 will provide a snapshot of green transition and intergovernmental frameworks. Section 3 will investigate the current state of multi-level fiscal governance of the ecological transition, by looking into the allocation of responsibility across levels of government and policy areas. Questions such as, “are green policies decentralised?” and if so, “to which extent?” will be addressed, together with measurement issues and evidence on the impact of decentralisation on environmental policy success. Next, Section 4 will present a discussion on how intergovernmental fiscal relations can contribute to the fight against climate change or, on whether fiscal federalism can be useful to gather support for climate policy. Finally, in Section 5 conclusions are provided. The main findings from the paper are presented in Box 1.

### Box 1. Main Findings

**Although global green targets are set at international and national levels, subnational governments are responsible for managing crucial policies for the ecological transition.** Local institutions, in particular, are responsible for the majority of public spending on environmental protection. In our sample of 25 OECD countries, only four of their central governments execute more than 50% of environmental public spending.

**Water waste and waste management are predominantly subnational spending areas.** In contrast, pollution abatement and biodiversity and landscape spending are mainly centralised. Despite the decentralised execution of environmental expenditure, legal basic frameworks are elaborated by central governments and are often developed by regional institutions.

**Disparities in environmental outcomes are not correlated with policy decentralisation levels.**

There is large cross-regional and cross-city heterogeneity in the level of attainment, in both centralised and decentralised contexts.

**The transversal nature of environmental sustainability issues poses challenges in measuring how much funding is devoted to green programmes.**

The OECD-EC Subnational Climate Finance database addresses this question and shows that on average across 33 OECD and EU countries, subnational governments are responsible for 63% of climate-significant spending overall and 69% of climate-related public investment. Still, those figures only represent 1.1% and 0.4% of GDP, respectively.

**Energy represents almost 80% of environmental tax revenue (energy, transport, pollution and natural resources).**

Despite mainly centralised energy taxation, intergovernmental transfers in federal and quasi-federal countries often depend on energy tax revenues, meaning that SNGs budgets might be affected by temporary tax cuts passed to cope with the price crisis.

**Although local governments increasingly report being aware and concerned about environmental issues, smartly designed incentives are needed to induce necessary behavioural change.**

Green contributions should be charged proportionately and according to, for instance, waste thrown, or kilometres driven.

**Subnational governments are increasingly engaged in the ecological transition, but they recognise difficulties in complying with environmental targets.**

SNGs – particularly smaller ones – may lack the capacity or political willingness to align with international green agendas. Ecological Fiscal Transfers (EFTs) represent an example of how earmarked grants linked to environmental protection may be useful, despite general recommendations against conditional grants. However, among OECD countries in our sample, earmarked transfers for environmental protection are only used intensively in Slovenia, while their use is negligible among the remainder.

**Local governments are well-positioned to ease the popular opposition against ecological transition policies.**

Being close to citizens and the most trusted government tier, municipalities are well-positioned to get local communities on board, notably through participatory processes. Yet, they have limited powers to deal with political resistance to distributional issues.

## 2. The green transition and intergovernmental frameworks: a snapshot

8. Due to the multidimensional nature of the ecological transition, a broad range of policy areas should be considered when designing an appropriate response. Therefore, it is very likely that subnational governments (SNGs) will have responsibilities over some of these areas, whether they are exclusive or shared competencies. To gain a better understanding of how responsibilities are allocated across levels of government, two approaches can be taken: constitutional or budgetary analysis. The focus of the constitutional approach is on the functions (legislation, execution/management) and policy areas for which each level of government is responsible according to the Constitution and other fundamental laws. This first approach aligns with qualitative methodologies of measurement. Alternatively, the responsibility test can be based on budgetary data on spending and revenue, following a more quantitative approach.

9. Although recent OECD work has provided figures based on a survey-based approach for spending autonomy on education and healthcare (Dougherty and Philips, 2019), this resource is not yet available for environmental protection. Therefore, this report will use quantitative variables to approximate the decentralisation level of the policy function. On the contrary, we will combine both approaches to examine the revenue perspective of public green policies.

## 2.1. Expenditure

10. When looking at the links between decentralisation and the ecological transition, the first question that arises is whether these policies are decentralised and, if so, to what extent. Although statistical availability and standardisation have made great advances during recent decades, thanks to international institutions' efforts such as the System of National Accounts (SNA) or Classification of the Functions of Government (COFOG) methodologies, this remains a difficult question to address (OECD, forthcoming b).

11. It is well known that regions and cities manage highly relevant public spending policies, with education (24%) and healthcare (18%) as the two main functions in SNGs budgets across the OECD (OECD, 2021a). The case of environmental spending is different, as although it is mainly a subnational responsibility, it still represents a tiny share of public spending and investment.

12. Figure 1 provides figures for public spending on environmental protection measured as a per cent of GDP. The data used come from a new extension to the OECD Fiscal Decentralisation database, developed by the Fiscal Network which, for the first time, provides consolidated expenditure data by government level and function. Although this database reveals which level of government spends and funds environmental protection – with intergovernmental transfers representing the difference between both – only “Spent by” numbers are reported, as environmental earmarked transfers are very small (Figure 8).<sup>2</sup> This means that the largest part of subnational government spending is funded through general non-earmarked grants or own revenues.

13. According to Figure 1, Greece, the Netherlands, and Belgium are the OECD countries for which data is available with the largest environmental protection spending. These three OECD countries are the only ones for which disaggregated data is available that surpass a threshold of 1% of GDP devoted to environmental protection policies. On the other hand, Finland, Lithuania, and Ireland register the lowest such figures, ranging from 0.2% to 0.38% of GDP. The COFOG functional category for environmental protection (050) includes the following policy areas: Waste Management (501), Waste Water Management (502), Air Pollution Abatement (503), Protection of Biodiversity and Landscape (504), and R&D in Environmental Protection (505), among other (506). It should be noted that COFOG definition of environmental activities is quite restrictive and that some activities with a green component could be included in other COFOG signatures, such as housing and community amenities, or economic affairs, which also have a strong local component.

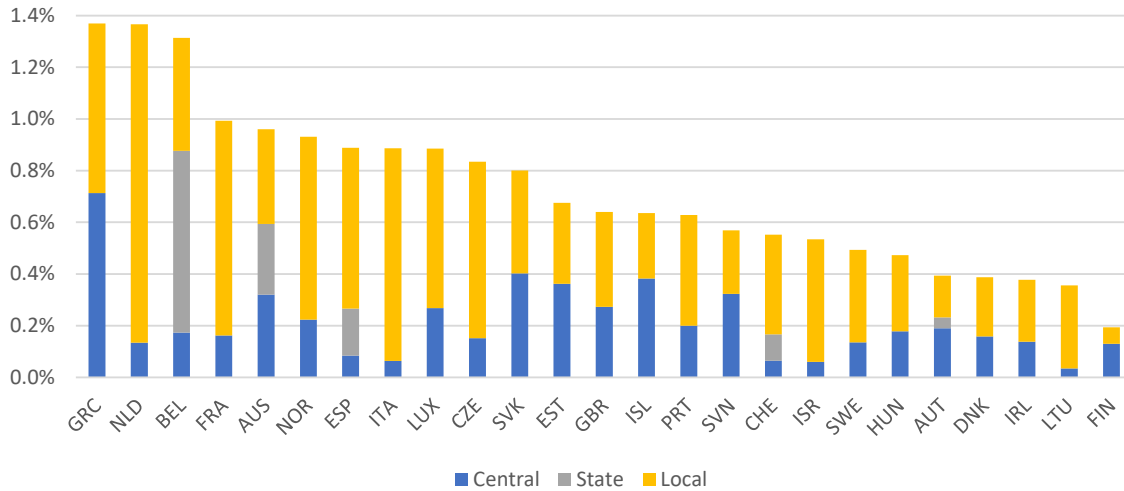
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<sup>2</sup> For a detailed explanation on the consolidation methodology, please refer to Dougherty and Montes (2023).



**Figure 1. Consolidated Public Spending (% of GDP) on environmental protection (050)**

In % of GDP, using the “Spent by” approach, 2019

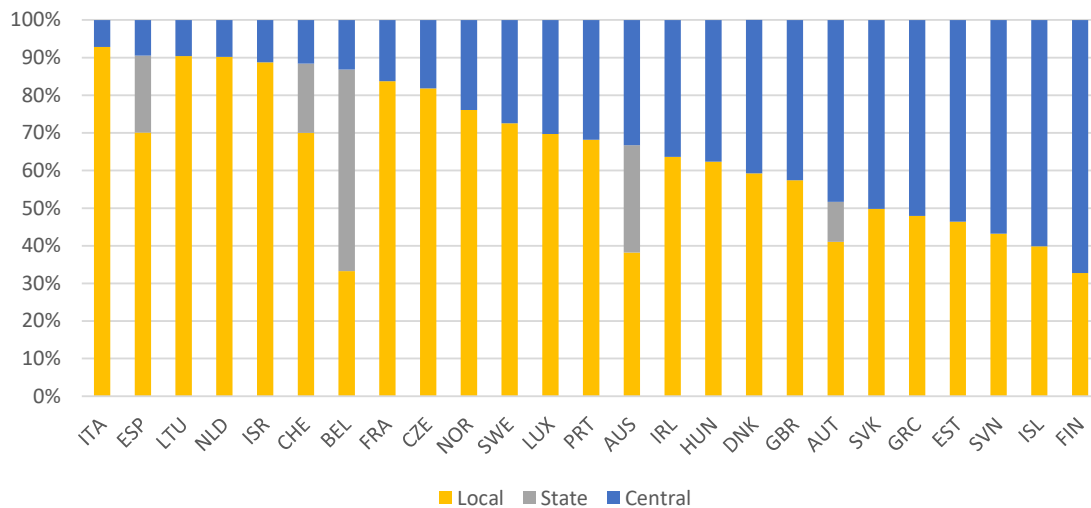


Source: own elaboration based on OECD data.

14. When examining how spending is allocated across levels of government (Figure 2), it becomes evident that, overall, this is a highly decentralised policy area. In all but five countries, SNGs spend the largest share of the general government’s environmental protection expenditure. Italy, Spain and Lithuania show the largest decentralisation levels, whereas Finland, Iceland and Slovenia show the lowest. Within SNGs, local governments carry out most of the public spending. Only in Belgium, Australia, Spain, and Switzerland do regions play a relevant role.

**Figure 2. Decentralisation of consolidated public spending (%) on environmental protection (050)**

In % of total spending, using the “Spent by” approach, 2019



Source: own elaboration based on OECD data.

15. The multifaceted nature of environmental issues represents an obstacle to developing standardised measurement methodologies. The OECD project on green budgetary tagging (Blazey and Lelong, 2022) has identified three main limitations. First, there are technical difficulties to set definitions, labels, and reporting frameworks and practices. For instance, sometimes programmes do not correspond with mutually exclusive categories and might have contradictory objectives. For instance, nuclear energy is considered climate-favourable by France, but not by many OECD countries. Second, there is the fact that current statistical frameworks are not designed for green tagging or to meet international statistical standards for cross-cutting programmes. And third, there is the spread of private initiatives in the face of a lack of internationally agreed methodologies. In this context, more data-intensive qualitative approaches, are available for only a few countries (e.g. Ireland or France) or regions (e.g. Andalucía in Spain) (OECD, 2022a; OECD, 2023b).

16. Green tagging can apply two different approaches. On the one hand, a structural approach focuses on involved agents, activities, products or operations, and it is usually used when the impact cannot be estimated. On the other hand, a functional approach targets the final purpose of the programme, and it is easier to implement and less data-intensive. To address the multifaceted nature of green spending and investment, double-tagging has been developed too. Double-tagging not only labels activities with positive and negative impacts but also provides a second-level tag according to intensity (OECD, forthcoming b).

17. The use of COFOG budgetary data – reported public spending with environmental impacts– is not a straightforward task due to its cross-cutting nature. Indeed, relevant spending programmes are not concentrated in a single government function but appear distributed across several policy clusters, from energy and transport to housing and social policies. This may be particularly true when green variables are used in public procurement. Therefore, currently reported figures are not systematic, and thus lack comparability and are likely to be underestimated. Several parts of the OECD including the Centre for Entrepreneurship, SMEs, Regions and Cities, the Environment Directorate and the Public Governance Directorate are involved in setting up comprehensive methodologies to address this issue (e.g. Green Budget Tagging Guidance, Paris Collaborative on Green Budgeting, subnational green budgeting guidelines) (Blazey and Lelong, 2022; OECD, 2021b; OECD, 2022a). Interestingly, the OECD Subnational Government Climate Finance Hub<sup>3</sup> addresses the measurement of climate-related spending and investment – defined as a subcategory of public spending devoted to capital formation – from the multi-level governance perspective. The “climate significant” tagging exercise follows the guidelines set by the EU Taxonomy on sustainable activities Regulation.

18. Figures 3 and 4 present data provided by the OECD-EC Subnational Government Climate Finance database. As observed, the public sectors of Belgium, Luxembourg, and Norway spend the largest share of GDP on climate-significant activities. In contrast, Iceland, Ireland and Türkiye appear on the opposite end of the chart, with the lowest relative efforts on climate-significant activities.

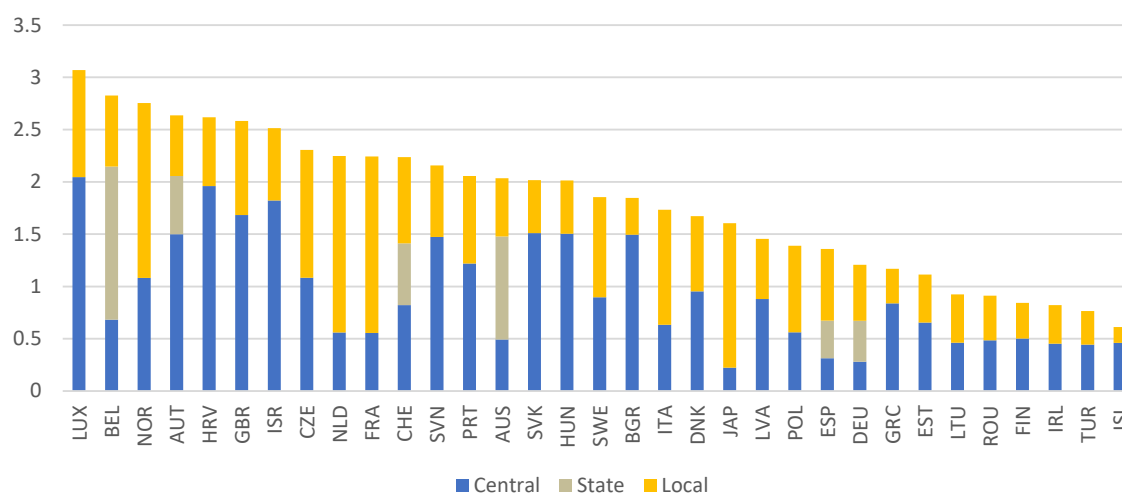
19. Climate significant expenditure and investment are heavily decentralised too, although not as much as environmental protection spending based on COFOG data reported earlier in this section. Indeed, an analysis of the database reveals that in 2019 subnational governments accounted for 63% of climate-significant public expenditure overall (1.1% of GDP) and 69% of climate-significant public investment (0.4% of GDP), on average, in 33 OECD and EU countries (OECD, 2022g). For instance, France, the Netherlands, and Japan follow a highly local approach, while Australia and Belgium follow a region-centred one. In contrast, Bulgaria, Croatia, Slovakia and Hungary apply a centralised approach.

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<sup>3</sup> Available at: [www.oecd.org/regional/sngclimatefinancehub.htm](http://www.oecd.org/regional/sngclimatefinancehub.htm)

**Figure 3. Climate significant expenditure**

In % of GDP, 2019



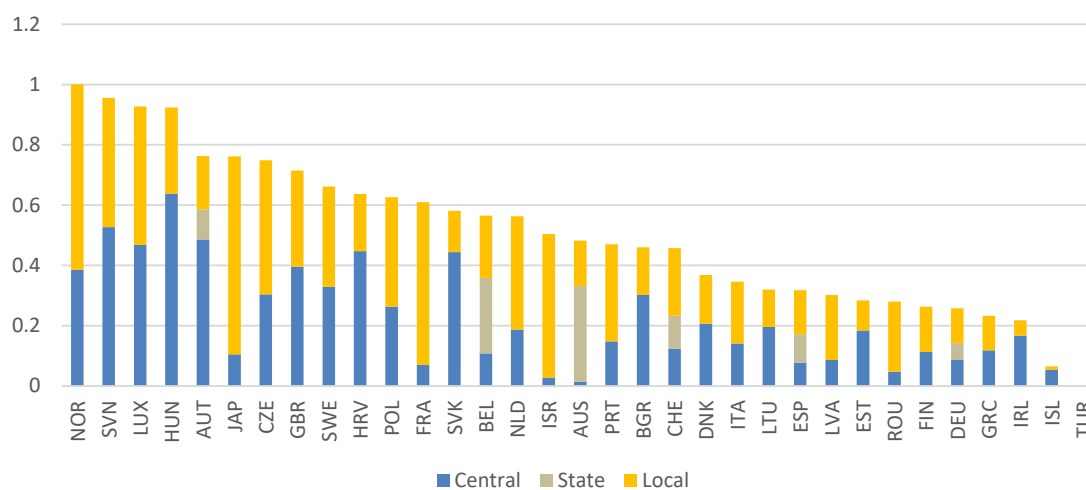
Note: expenditure refers to both current and capital public spending.

Source: own elaboration based on OECD-EC Subnational Government Climate Finance database (OECD, 2022g).

20. Out of previous figures of climate significant expenditure, only a small share is devoted to capital spending, or in other words, to climate significant investment. Among top spending countries, Luxembourg or Norway only devote around a third of it to investment, while figures are closer to a fifth for Belgium. Still, Norway is the OECD country that reports the highest effort on climate significant investment (1% of GDP in 2019), followed by Slovenia and Luxembourg. Climate-significant investment is even more decentralised than spending, overall.

**Figure 4. Climate significant investment**

In % of GDP, 2019



Note: Climate-significant investment refers to a subset of expenditure, which corresponds to direct investment. This category corresponds to gross capital formation and acquisition minus disposals of non-financial non-productive assets (P5\_K2CG or OP5ANP categories in the National Accounts).

Source: own elaboration based on OECD-EC Subnational Government Climate Finance database (OECD, 2022g).

21. Regarding climate policies, two separate areas of intervention can be identified. First, mitigation policies aim to prevent increases in temperatures by either reducing greenhouse gas (GHG) emissions or aiming to remove GHGs already in the atmosphere or the ocean. Second, adaptation policies facilitate urban and rural areas and infrastructure to remain resilient and liveable once temperatures increase. These two groups of policies have varying links with fiscal decentralisation arrangements.

22. On the one hand, while mitigation-oriented environmental policies, such as restrictions on the use of vehicles or land use protection, equate to an opportunity cost in terms of revenue losses for subnational governments; adaptation policies, in contrast, are usually linked to an increase in their expenditure needs. Protecting neighbourhoods from the rise in the sea level or making cities liveable during longer and hotter summers, require a large amount of investment and are expected to rise in the future (CEA, 2023).

23. On the other hand, although large climate adaptation infrastructure policies are usually carried out and funded by regional or central governments, due to their larger magnitudes, when this infrastructure is circumscribed to cities, it is local public budgets that typically have to support these projects. For instance, if a city decides to reform its streets and urban design to alleviate the “Urban heat island effect”, then it would usually have to assume the costs.

## 2.2 Revenue

24. Together with public expenditure, governments also make use of their revenue-raising power, and specifically of their taxation power, to tackle environmental problems. Indeed, taxes and other non-tax revenue, such as user charges and fees, are crucial to set incentives for more sustainable behaviour of economic agents. The following section will delve into the current state of environmental revenue, the role of subnational governments in this area, and the incentives set by the current framework, making suggestions on how to improve them.

25. Ideally, most environmentally-related taxes, user charges and fees, should apply the well-known “polluter pays” principle. Therefore, most examples of green excises are of the “Pigouvian” kind, and thus aim to internalise negative environmental externalities caused by economic activity. The four main tax bases over which these revenues are imposed are energy, transportation, resources and pollution. Overall, government revenue from environment-related taxes relies disproportionately on energy-related bases in comparison with other tax bases. Indeed, taxes on energy represented 78% of total green revenue across the European Union in 2021, according to Eurostat.

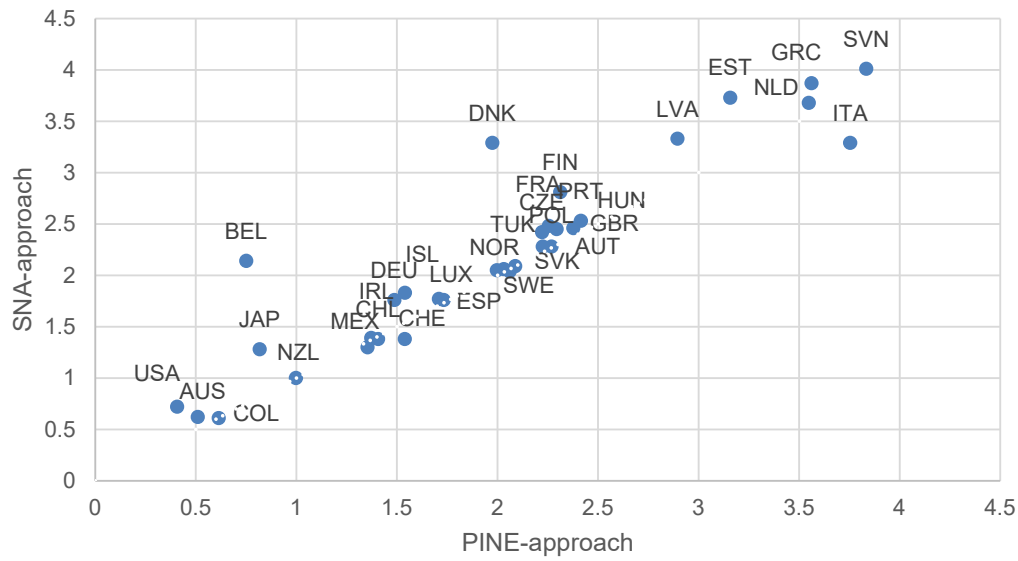
26. As has been explained for public expenditure statistics too, the traditional budgetary approach faces the risk of underestimating green revenues as these results are dependent on the criteria considered to include each tax within the category of environmentally-related or “green” taxes. Specifically, how should a non-environmental levy with a green clause be accounted for – for instance, can one-time car registration fees that include deductions for less polluting cars be considered green taxes?

27. Some OECD work has tried to address this issue by building specific and tailored databases on green revenues, such as the Compendium of Financial Instruments that Support Subnational Climate Action in OECD and EU Countries. It is also the case of the Policy Instruments for the Environment (PINE) portal, which offers a very detailed and thorough time series on revenues raised by around 3 900 environmentally-related policy instruments implemented across more than 130 countries. However, since it is based on surveys or queries of national experts, it may be less comprehensive than SNA data while potentially leaving some figures out. Figure 5 compares revenue results estimated according to the traditional budgetary SNA approach (y-axis) with those figures provided by the OECD Policy Instruments for the Environment database (x-axis).

28. As can be observed in Figure 5, despite methodological heterogeneity, both approaches lead to similar results, except for Belgium and Denmark, for which the PINE approach suggests significantly less green revenue raised. According to the traditional budgetary approach, Slovenia, Greece, Estonia and the

Netherlands have the largest figures, exceeding 3.5% of GDP. When considering the PINE approach, Italy and Slovenia lead the ranking, as they charge high transport fuel excises. In contrast, Australia, Colombia and the United States make the least use of environmental taxation, raising less than 0.4% of GDP. Despite these interesting results, this approach does not offer information about which level of government raises revenue.

**Figure 5. Environmentally-related revenue in % of GDP (General Government) (2019)**

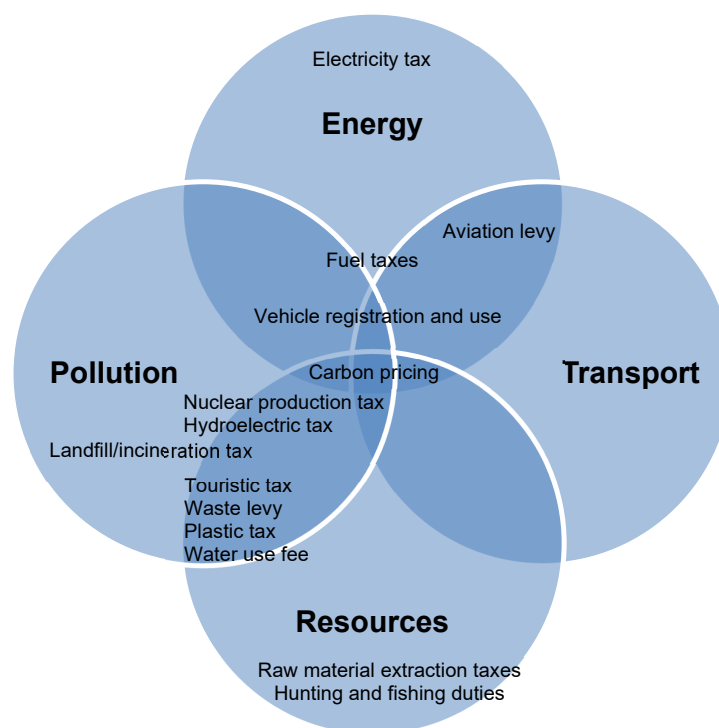


Source: own elaboration based on OECD and Policy Instruments for the Environment (PINE) portal.

29. PINE allows one to enumerate some of the most common environmentally related tax figures:

- Aviation levy
- Carbon pricing mechanisms (carbon tax/cap and trade)
- Electricity production and consumption
- Fuel taxes
- Hunting and fishing duties
- Landfill/incineration tax
- Nuclear production or waste tax
- Plastic tax (bags/non-reusable non-recycled packaging)
- Raw material extraction tax
- Touristic tax
- Vehicle registration
- Vehicle use annual taxes, tolls
- Waste levy
- Water consumption fee
- Water use for energy production tax (Tax on Hydroelectric energy production)

Figure 6. The intertwined nature of environmental tax figures



Source: own elaboration.

30. Simultaneously, as the SNA classifies “green” or environmental-related revenue in the COFOG database, the list of figures can also be sorted according to the tax bases charged: energy, transport, pollution and natural resources. However, if we look into the complex nature of environmental tax bases, then we realise that this exercise is not as straightforward. Indeed, most green tax figures are related to pollution and the use of natural resources (Figure 6). However, it has already been explained that most revenue – close to 80% – comes from energy-related taxes. This suggests that charges on pollution and resources are diverse but of limited revenue-raising capacity, whereas the few taxes on energy generate large revenues for the public sector. Indeed, taxes on tourism, waste disposal, or water use are often charged at the subnational level, whereas purely energy-related taxes are most of the time charged by national governments.

31. Among listed revenue sources, carbon pricing has gained the most attention during recent years in the context of rising awareness for climate change. In 2021, more than 40% of GHG emissions were covered by carbon prices, at an average rate of EUR 4 per tonne of CO<sub>2</sub> equivalent. Compared to 2018, increases in carbon prices have been stronger in countries with already higher rates, increasing concerns over carbon leakage and unlevel playing fields. Still, even where carbon prices are net positive, often due to large charges on fuels for road use, price levels are still too low to provide strong enough incentives to achieve net zero objectives (OECD, 2022f).

32. There are two main fiscal tools to establish a price on greenhouse gas emissions (GHG): carbon taxes, and cap and trade systems. The first imposes a surcharge on activities that liberate GHG emissions to discourage them, as they become more expensive in comparison to sustainable alternatives. The

second instrument fixes the total amount of GHG emissions (the cap) and then allocates the emission rights across producers, who can trade them according to their needs. IMF and OECD work has pointed towards both as efficient tools, that should be chosen depending on the political economy context (OECD, 2022f; Parry et al., 2022). Following this rationale, despite the political economy advantages of cap-and-trade schemes overall, carbon taxes are increasingly viewed as easier to administer, offer price certainty that helps to boost green investment, as well as have considerable revenue-raising potential while covering a broad range of emissions sources (Parry et al., 2022). Precisely, Flues and Van Dender (2020) provide a complete overview of the role of carbon price stability for green investment, public revenue and distributive effects for households and firms. One important new initiative in this area is profiled in Box 2.

### **Box 2. The OECD's Inclusive Forum on Carbon Mitigation Approaches**

The Inclusive Forum on Carbon Mitigation Approaches (IFCMA) is an initiative designed to help improve the global impact of emissions reduction efforts around the world through better data and information sharing, evidence-based mutual learning and inclusive multilateral dialogue. It brings together all relevant policy perspectives from a diverse range of countries from around the world, participating on an equal footing basis, to take stock of and consider the effectiveness of different carbon mitigation approaches.

#### **Stocktaking of policies and mapping them to an emissions base**

The IFCMA will take stock of mitigation policy instruments that countries use to reduce carbon emissions and estimate the emissions that these instruments relate to (mapping to the emissions base). Granular information based on an internationally harmonised and standardised typology across IFCMA member countries and across sectors, together with harmonised data on emissions coverage, can increase transparency and enhance understanding of countries' diverse mitigation approaches. It can also support policy analysis and international dialogue, and country efforts to scale-up action on climate change.

The IFCMA's stocktaking exercise will build on existing data-gathering efforts at the OECD, including the Climate Actions and Policies Measurement Framework (CAPMF), International Programme for Action on Climate (IPAC), Carbon Prices and Energy Taxation publication series, the Policy Instruments for the Environment (PINE) database and the Inventory of Support for Fossil Fuels. It will also draw on all other relevant analysis and work internationally available.

#### **Measuring effects of policies on emission reductions**

The IFCMA will develop and apply a consistent methodology to assess the effects of carbon mitigation policies and policy packages on emission reductions at the country level. High-quality, consistent, and objective insights on the effects of policies and policy packages on emission reductions will contribute to a better understanding of the effects of mitigation policies in terms of emission reductions across countries, and support progress towards countries' emission-reduction targets. They can help inform and enhance the comparability of estimates of the impact of mitigation policies or policy packages on carbon emission reductions as part of country reporting under the UNFCCC Enhanced Transparency Framework.

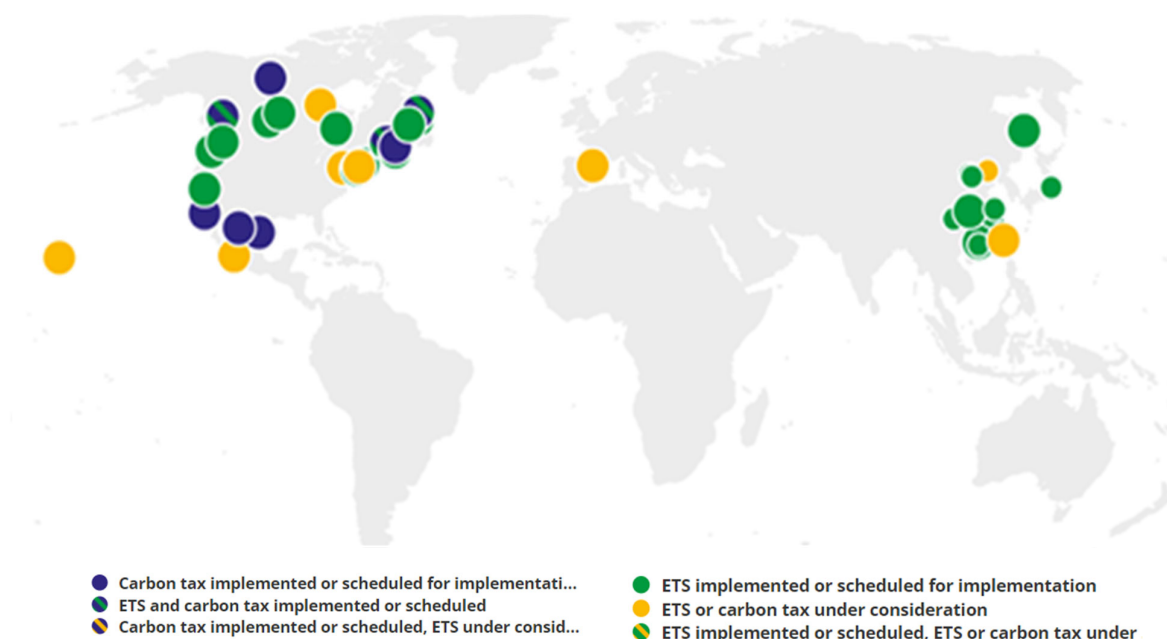
Comparable metrics to measure the effects of policies on emission reductions are key elements to address concerns over competitiveness losses and carbon leakage, informing dialogue on mechanisms to strengthen the environmental integrity of various approaches to greenhouse gas mitigation. They can reinforce trust among countries by providing insight into countries' approaches and the emissions reductions they can be expected to deliver, and reduce the risks of implementation slippage.

Source: OECD IFCMA [www.oecd.org/climate-change/inclusive-forum-on-carbon-mitigation-approaches/](http://www.oecd.org/climate-change/inclusive-forum-on-carbon-mitigation-approaches/)

33. According to OECD (2022f), between 2018 and 2021 permit prices related to GHGs increased in the EU, and also in Canada, New Zealand and the United Kingdom. For its part, Germany launched a new national ETS for heating and transport fuels, that complements EU ETS until it is expanded as expected in the “Fit for 55” legislative package. In parallel, new carbon taxes were introduced in Luxembourg and Iceland; they were increased in Finland, Iceland, Ireland, and Norway; and exemptions were phased out in Portugal and Sweden.

34. The World Bank Carbon Pricing Dashboard (Figure 7) maps a broad picture of the current state of the use of these schemes across jurisdictions. In 2022, there were 70 carbon pricing initiatives identified. Even if the inter-jurisdictional spillovers that GHG emissions generate and their global implications would recommend opting for national – and, when possible, supranational – responses to carbon pricing, 30 of the 70 initiatives are carried out at the subnational level, covering a total of 36 subnational jurisdictions. Most of these are located in Canada (see Box 3), the United States, China and Mexico. The most common approach in China and the US is cap-and-trade schemes, in the latter case thanks to the Regional Greenhouse Gas Initiative that in 2021 covered around 10% of GHGs of the electricity sector (OECD, 2022f). In contrast, carbon taxes are the most common approach applied by Mexican SNGs, which after reform, cover around 49% of electricity sector GHGs (OECD, 2022f).

Figure 7. Subnational carbon pricing initiatives (2022)



Source: World Bank Carbon Pricing Dashboard (2022).



### Box 3. Canadian provincial carbon pricing schemes and the federal backstop

Carbon taxes and cap-and-trade systems started emerging across Canadian provinces without federal coordination. While British Columbia, Alberta, and Manitoba opted for carbon taxes, Quebec and Ontario decided to follow cap-and-trade schemes. In contrast, the rest of the provinces did not introduce any kind of carbon pricing, unbalancing the effort against climate change and opening room for environmental dumping, a kind of cross-jurisdictional tax competition. This is why in 2019, the federal government intervened and created the so-called “Federal Backstop”. The latter scheme, which reached CAD 50 per tonne in 2022, serves as a minimum floor and activates when a provincial carbon pricing scheme, if it exists, does not reach it. In that case, it is the federal government that tops up the charge up to the Federal Backstop. This tool contributed to tripling related revenues in only five years. Overall, small provinces rely on federal carbon pricing and, in contrast, large provinces raise their own (Snoddon and Tombe, 2019).

Fiscal equalisation, which represents around 2% of total general government spending (OECD, 2021a), has traditionally been very contested in some Canadian provinces. In fact, in 2021, Alberta held a referendum asking its residents whether federal fiscal equalisation should be eliminated. The asymmetric treatment provided to carbon pricing revenue by the federal government could become problematic as their increase in size in the following years. Indeed, while provincial carbon pricing revenues and those coming from the voluntary opt-in into the Federal Backstop are considered to compute provinces’ fiscal capacity to be equalised, this is not the case for revenues from the compulsory application of the Federal Backstop. In fact, federally raised carbon pricing revenues are largely devolved to provinces’ residents through green compensation. This differential treatment set the incentive for provinces to avoid enforcing local carbon pricing schemes, which is the opposite of the initial aim of the Federal Backstop.

Sources: Snoddon and Tombe (2019); OECD (2021a); OECD (2023c).

35. The question of how to use carbon pricing revenue is also expected to continue gaining salience in parallel with its growth. Currently, the revenue is often earmarked for specific spending programmes and is not considered part of general revenue. This is the case for more than 80% of revenue from ETS and for almost 65% of carbon tax revenue. Marten and Van Dender (2019) calculate that carbon price revenue could represent up to 2% of GDP if all energy-related GHG emissions were priced at EUR 30 per tonne of CO<sub>2</sub> equivalent (tCO<sub>2</sub>). A similar amount (2.2% of GDP) could be raised if emission coverage would remain constant and prices would increase up to EUR 120/tCO<sub>2</sub> (OECD, 2022f). This large revenue forecast is likely to raise doubts on whether carbon pricing revenues should remain largely earmarked in the context of pressing spending needs caused by other megatrends, such as ageing.

36. As mentioned already, energy taxation is the most important environmentally related tax base in terms of revenue raised. In this context, we discuss electricity and fuel taxes. Due to the existence of large efficiency gains from the scale for energy policy, in most cases, it remains almost completely centralised. Both energy sector regulation and taxation usually take place at the national level, and, indeed in the European Union, relatively high harmonization levels are recorded. Still, there are a few exceptions to this, such as the case of Belgium, where the regulatory agency is regional and has a say on network tariffs, among other charges on electricity bills (e.g. charges to fund energy-related subsidies).

37. Electricity can be taxed at two stages: first, at the production phase, and second, at the consumption phase (e.g. VAT and special taxes). Depending on the design of these taxes, they might represent revenue-raising tools rather than actual environmental taxes. Indeed, it is important that taxes on electricity consumption depend on the number of kilowatt hours consumed so that they incentivise energy efficiency and contention with energy demand. In a similar sense, taxes on electricity generation

should discriminate between clean (e.g. renewable) and fossil-based production sources (e.g. coal/gas power plants). Indeed, in order to ensure and support the electrification process, taxes on its production could be translated towards fuel taxes or the extraction and use of non-renewable resources (OECD, 2019; CETR, 2022).

38. Precisely, fuel taxes are expected to keep increasing in the future to reinforce price signals to lower demand, and to set incentives to transit towards more sustainable options. Policies promoting the electrification of heating and transport are key and should be adopted in parallel, so as to provide feasible and affordable alternatives. Before the energy price crisis emerged, the main discussion regarding fuel taxes was focused on the necessary abolition of lower rates or preferential regimes for diesel, in contrast to petrol (Harding, 2014). For instance, the soon-to-be updated European Energy Taxation Directive allows member states to set lower minimum tax rates on diesel. This has led to “excessive dieselisation”, worsening air pollution (European Parliament, 2021).

39. Although even in most fiscally decentralised countries, regulation and management of energy taxation remains centralised, central governments’ decisions in this area can still impact SNGs’ revenue through intergovernmental transfers. More precisely, revenue from taxes on goods and services (that also apply on energy bases and electricity consumption), represents a relatively large share of subnational tax revenues (OECD, 2021a). In particular, in federal countries, VAT and energy tax revenues are usually shared with SNGs or are (partially) devoted to funding intergovernmental transfer schemes (e.g. Australia, Canada, Germany, Spain). Indeed, in Germany or Spain, almost 50% of the VAT revenue is shared with SNGs. In addition, 58% of fuel taxes accrue to Spanish regions’ budgets. While in the former case, Länders have a say on rates (jointly decided in the Senate), in Spain regulation is fully determined by the central government. In Australia, the revenue-sharing percentage reaches 100%, as all the revenue from the goods and services tax is transferred to states through the equalisation system, aiming to reduce both vertical and horizontal imbalances. Generalised tax breaks on energy consumption taxes applied during the energy crisis serve as an example of the intergovernmental implications of this kind of green taxation. Consequently, when central governments lowered VAT or special taxes on energy products and electricity to protect households’ purchasing power and businesses’ activity, if no compensation is paid to SNGs, their revenues were eroded.

40. Tax breaks applied to contribute to energy price containment amounted up to EUR 50/tCO<sub>2</sub> in some countries (OECD, 2022f; OECD, 2023d). Among the OECD policy recommendations made on this matter – also linked to the response to Russia’s illegal, unprovoked and unjustifiable war of aggression against Ukraine – is the Network’s Intergovernmental Fiscal Outlook (OECD, 2023d). These measures should be temporary and become more targeted, aiming to contain costs and restore price signals, for which there is evidence that they improve incentives for lowering fossil fuel consumption (Château, 2022; OECD, 2022i, 2022h).

41. Following energy tax bases, transport is the second largest revenue source for green taxation. Here, there is a particular space for charges on vehicles. One-time taxes on purchases and recurrent user charges are the most usual. The first one, also named after car registration fees, might vary according to the amount of GHG emissions generated per kilometre and, in some countries, such as Belgium, Spain, Switzerland or the United States, regions/states are allowed to modify rates or even to set different criteria according to which the tariff is designed. For their part, recurrent taxes on vehicle use are of a particularly local nature since they claim to address congestion and air pollution. For instance, municipalities often charge an annual payment just for being a vehicle owner. Moreover, tolls might be paid for using certain large-capacity roads – set by the level of government that owns the highway – and for entering the centre of large cities, through local congestion charges. Local congestion charges are applied in several European cities such as Brussels, London, Milan, Oslo, Palermo and Stockholm. Low Emission Zones, which restrict traffic without charging a pricing scheme, are far more extensive, according to the Urban Access Regulations in Europe platform supported by the European Commission.

42. Future reforms should pursue a pay-as-you-drive pricing scheme for vehicles according not only to the kilometres driven, but also to the time of the day, the type of road they are used in, by establishing “peak charges”, and the type of vehicle driven. This way, not only GHG emissions and air pollution would be addressed, but also traffic congestion, road safety, noise and road damage (Santos et al., 2008; Schaller, 2010; De Palma et al., 2011; Van Dender 2019). Consistently, Van Dender (2019) recommends combining distance charges for long travels with congestion charges for areas suffering from traffic jams, as this approach can compensate for decreases in fuel tax revenues caused by vehicle fuel efficiency and electrification. The Belgian experience represents a good lesson for what road pricing could look like. In 2014, the three Belgian regions set up a pilot to test the impact a time and place-sensitive road price system could have. They found that urban residents, who have alternative means of transport available, adapted their commuting behaviour more than suburban and rural residents, which indeed were the main target of the tax as they drive more kilometres (De Vos, 2016). Nonetheless, these kinds of flexible arrangements set more powerful incentives towards lower use of combustion engine private vehicles, as they increase with use, than flat rate tools, such as the nationally charged Eurovignette for heavy vehicles. Despite widespread consensus on powerful efficiency reasons to implement pay-as-you-drive schemes, lack of public acceptance remains a potential barrier to congestion charges, and road pricing more generally. Schaller (2010) suggested proposals should be perceived as beneficial for individual drivers and not just for society as a whole in order to gain support. Similarly, Fafoutellis et al. (2022) identified travel time and monetary gains or discounts as key drivers of the acceptance of this kind of pricing schemes. For instance, Norwegian cities try to gain support by devoting revenue to improving the road system and/or public transport.

43. Although climate change is at the centre of the challenge of ecological transition, it is just one of the fields that environmental policy must address. Green revenues are also related to other local environmental policies such as waste and water management, which will be examined in Section 3.

### **2.3 Intergovernmental transfers**

44. After discussing environmental spending and revenues, the multi-level governance of the ecological transition means that intergovernmental transfers need to be examined. This is a key tool for central governments to support and set incentives for subnational governments to engage with the green agenda, whose main objectives are usually decided at the national, international or supranational level. Although both theoretical Fiscal Federalism literature and applied policy recommendations argue that the use of unconditional general grants is preferred since they allow to take advantage of efficiency gains of fiscal decentralisation, there are good arguments for grant conditionality in the environmental arena.

45. Indeed, general unconditional grants provide the spending autonomy necessary for SNGs to offer differentiated policy menus that better match the preferences and needs of residents of each jurisdiction. However, when it comes to policies to support the ecological transition, leaving regions and cities to decide the supply level could lead to worrying undersupply. Completely unguided subnational provision of environmental policies might be not enough to reach nationally agreed green targets. It is not that regional and city governments are not aware of the urgency or are not committed to green agendas. Indeed, a recent OECD-CoR survey showed that most subnational governments participate in SDG implementation, especially to achieve environmental goals (OECD, 2020). However, there is still limited progress at the regional and local levels, due to limited subnational institutional capacity, particularly among smaller municipalities, as well as doubts about the electoral consequences of unevenly distributed costs (Dougherty and Montes, 2022).

46. Linking subnational funding to the attainment of environmental goals may help in aligning national and local green agendas while avoiding the negative consequences of unfunded mandates (Rodríguez-Pose and Vidal-Bover, 2022). Recent deadly earthquakes in Türkiye and Syria remind an example of this phenomenon linked to disaster-risk management. Indeed, although Türkiye gave governors and municipal

authorities more responsibilities to manage crises after 1999 earthquake, the reform was not accompanied by an investment in upskilling subnational staff or extra revenue. Consequences will probably be felt in the management of current and future disasters (Wolfrom, 2022; OECD, forthcoming c).

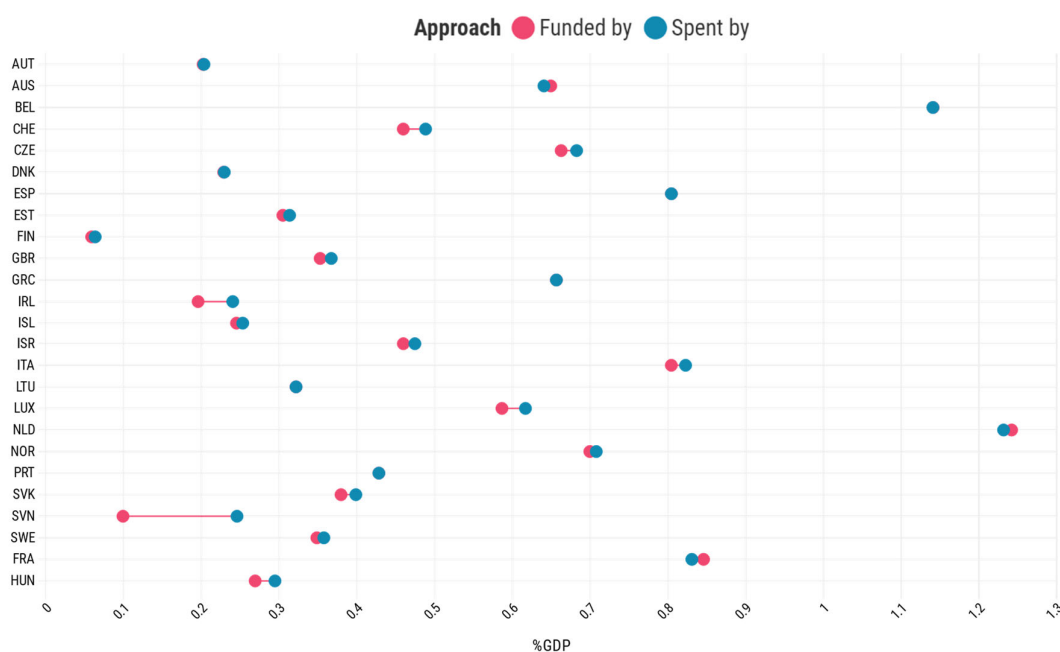
47. Misalignment is precisely what Ecological Fiscal Transfers (EFT) aim to avoid (Ring, 2002; Busch et al., 2021). Most EFT schemes compensate municipalities for increased expenditure needs due to large coverage of locally protected areas, for the inter-jurisdictional positive spillovers generated by the so-called “ecosystem services”, or for the opportunity cost for revenue-raising caused by the implementation of stricter environmental protection policies (Busch et al., 2021). Since EFTs are intimately related to water and landscape protection, they will be analysed more in detail.

48. Although EFTs are still uncommon, they are a growing trend, already adopted in France, Portugal, India, Indonesia, China, as well as some Brazilian and German regions. However, most experiences are small-scale and are not part of comprehensive intergovernmental grant schemes, but of *ad hoc* programmes. Consequently, there are still not large-scale and systematic linkages between subnational budgets and environmental goals (Busch et al., 2021; Smoke and Cook, 2022).

49. Despite the numerous arguments supporting the use of earmarked green grants, Figure 8 shows that they are usually negligible. Only in Slovenia are they large, with more than half of environmental protection spending carried out at the subnational level, funded through earmarked vertical grants. The figure illustrates the share of environmental grants by drawing the gap between decentralised spending calculated according to “Spent by” and “Funded by” approaches. The “Spent by” approach allocates spending to the level of government that actually executes spending, while the “Funded by” approach records expenditure to the level of government that finances it, often through vertical grants paid by higher-tier institutions.

**Figure 8. Decentralised spending on environmental protection (050)**

In % of GDP, “Funded by” versus “Spent by” approaches, 2019



Source: own elaboration based on OECD Fiscal Decentralisation Database.

50. Regarding the intergovernmental perspective of environmental ecological transition funding, the OECD and the European Commission have recently launched a new joint project to better understand which sources of funding SNGs receive, to support the fight against climate change. The Compendium of Financial Instruments that Support Subnational Climate Action in OECD and EU Countries (OECD and European Commission DG-REGIO) follows a different approach as it includes climate-related grants, climate and green funds, loans, guarantee schemes and contractual arrangements provided by supra-national, national and regional governments to SNGs (OECD, 2022b).

51. Among all the financial instruments and incentives included in the database, the Compendium highlights the relevance of two particular schemes. First, the use of intergovernmental contracts in France. And, second, the EU's fiscal tools for the support of SNGs. The former refers to the *Contrat de relance et de transition écologique*, lasting for the 2020-2026 period and aims to promote territorial cohesion and ecological transition by defining local priorities and agreeing and coordinating them with the central government in exchange for funding support through the Local Investment Support Grant, central government grants and the private sector funding (OECD, 2022b). For its part, the EU scheme provides funding to SNGs through more than 22 instruments distributed through two separate channels. The first, indirectly from the EU to SNGs through central governments, such as Recovery and Resilience Facility (NGEU), the Common Agricultural Policy (CAP) funds, Modernisation Fund and Cohesion Fund. And the second, directly from the EU to SNGs, as the Environment and Climate Policy Program, Connecting Europe Facility, Invest EU Programme, Horizon Europe research fund or the Just Transition Mechanism, which aims to protect regions from the phase-out effects caused by ecological transition (e.g. former mining regions) (Montes and Moreno, 2022).

### 3. Decentralisation of environmental protection policies

52. The previous section outlined cross-country differences in terms of the decentralisation levels of climate programmes and environmental policies in general. Aiming to add an extra level of granularity to the analysis, and due to data availability, this section will focus on each of the policy areas tagged as part of environmental protection by the COFOG classification system. This includes waste management, waste water management, pollution abatement, as well as protection of biodiversity and landscape. First, the decentralisation level of each of these policy sub-areas will be measured. We apply the "Spent by" approach, a quantitative methodology based on COFOG consolidated budgetary data that imputes spending to the level of government that executes spending programmes (Dougherty and Montes, 2023). Next, we look into policy outcomes related to each policy function, and in particular to cross-city or cross-metropolitan differences in results, to observe if higher decentralisation leads to more uneven results, as it is usually identified as a side-effect of decentralisation.

53. Regarding the decentralisation level of environmental protection policies, the analysis suggests that overall, besides cross-country diversity, there are also within-country differences across green policy sub-functions. On the one hand, some countries, such as Belgium, apply a consistent subnational approach to all sub-functions. On the other hand, countries such as Greece or Portugal, show substantial heterogeneity, with high decentralisation levels in some policies while very low levels in others. In general, while waste and water waste management are very decentralised in virtually all OECD countries analysed, the opposite is true for pollution abatement and protection of biodiversity and landscape, which are usually centralised.

#### **a) Waste management**

54. Waste management is a key policy for the ecological transition (Gatto and Montes, 2021), and is necessary for making possible the transformation of our linear economies into circular ones. Circular economy strategies are based on: first, reducing the number of raw material inputs needed to produce and

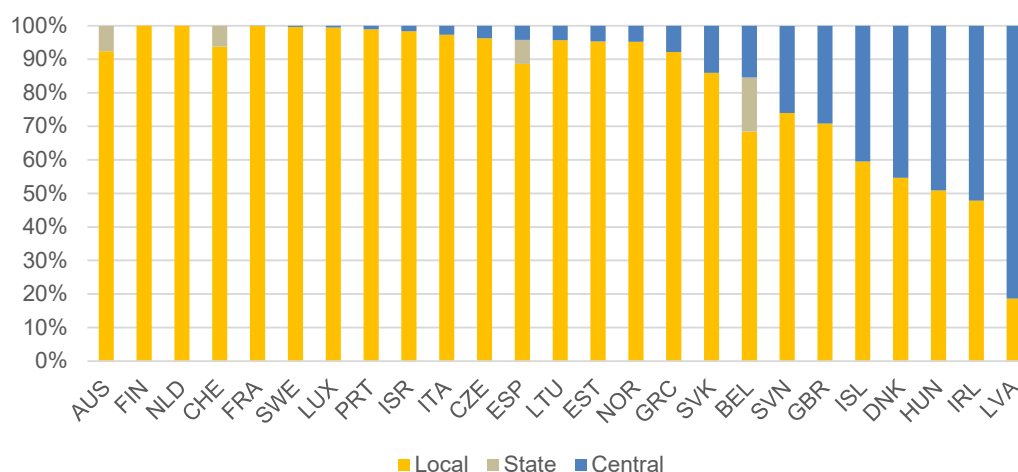
the unneeded consumption made by households, to prevent future generations of waste. Second, addressing waste collection by fostering both industrial and urban waste sorting as a way to facilitate waste treatment. Finally, applying the hierarchy of waste treatment to recover the largest share of materials possible to be newly used as inputs of the production process. In this sense, reusing and recycling are preferred to other alternatives of waste treatment such as incineration (with or without energy recovery) or landfill disposal (Directive 2008/98/EC).

55. Subnational governments, and in particular, local governments, play a crucial role in waste management. The most common responsibility allocation across government levels regarding this policy combines national/federal legislation of the basic framework, with often regional legal development, with local management. Local entities can usually choose how waste is collected (e.g. traditional containers, door-to-door, or pneumatic systems) and which kind of treatment is applied, but they must comply with nationally or regionally set treatment priorities. Often, local governments use public procurement schemes to provide this service through private firms. In addition, to take advantage of economies of scale in public procurement, municipalities (except large cities) often use inter-municipal entities with this aim.

56. Figure 9 illustrates the degree of decentralisation of waste management policies across a set of OECD countries. Consistently, most public spending in this policy subarea is executed by local governments (this may include not only municipalities, but also inter-municipal entities, counties, or provinces). In most cases, the share of central spending is negligible. Only in Denmark, Hungary, Iceland, Ireland, Latvia, Slovenia and the United Kingdom do central governments play an important role. Still, only in Latvia and Ireland is the central share of spending larger than the local. The strong role of local government in this field is such, that even in federal countries, regions have very limited space.

**Figure 4. Decentralisation of consolidated public spending (%) on waste management (501)**

Spent by approach, 2019



Source: own elaboration based on the OECD Fiscal Decentralisation database.

57. Decentralisation of public services allows for different levels of supply of public services that better match the preferences and needs of the local population. In some policy areas, providing diverse policy menus of services might be desirable, as it might be efficiency improving (e.g. Tiebout-kind of sorting). However, this means that nationally-set environmental targets might lead not only to divergent inputs, but also results. For example, if certain municipalities do not pay enough attention to sustainability when managing waste, then the whole country might find it difficult to comply with assumed targets on waste

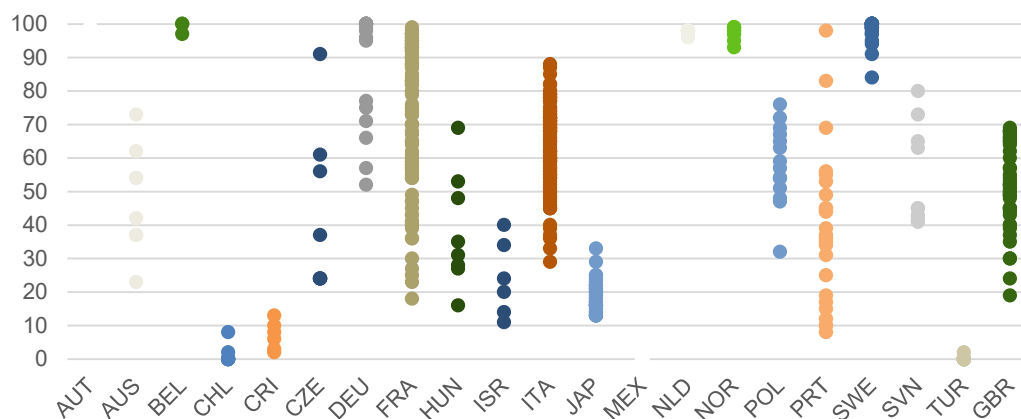
reduction, sorting or recycling. Large shares of local spending reported in Figure 9 suggest that it is very likely that compliance with green targets related to waste might be very uneven across jurisdictions within countries (Gatto and Montes, 2021).

58. This uneven compliance is confirmed by Figure 10. This chart represents urban waste recycling rates across the OECD, with the largest level of granularity available. That is the local level, when possible, or the regional tier otherwise. On the one hand, there is a first group of top performers, such as Austria, Belgium, the Netherlands, Norway and Sweden, where all SNGs approach 100% recycling rates. On the other hand, cross-jurisdictional disparities in outcomes are small too among worst performers, such as Chile, Costa Rica, Mexico or Türkiye, where most figures do not even reach 10%. Finally, variability is very large in other OECD countries, especially in the Czech Republic, France and Portugal.

59. Interestingly, there is virtually no correlation between the decentralisation level of waste management and variability in outcomes. For instance, the United Kingdom and Belgium report similar spending decentralisation levels in this policy sub-area, but while the former record very large disparities in urban recycling rates, these are negligible in the latter. However, it is true that among countries where there is an almost full local provision of waste management, only in Norway is the disparity small.

**Figure 5. Urban waste recycling rate (%) at regional (TL2) or local/provincial level (TL3)**

Based on 2020 or the latest year available



Note: lowest level of disaggregation and most recent data available are reported.

Source: own elaboration based on OECD data.

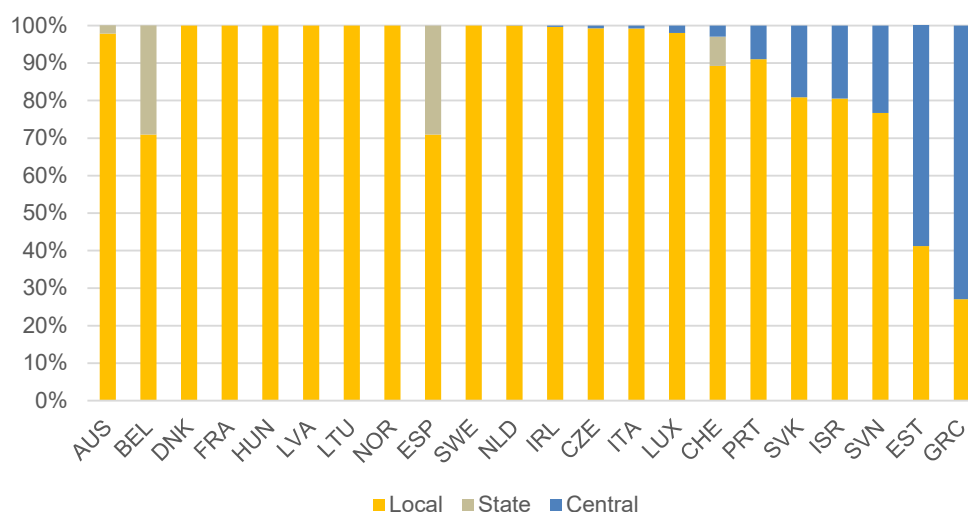
60. Circular economy experts often point to the lack of high-quality information and adequate incentive schemes as the main obstacles to improving waste management outcomes. On the one hand, the principal-agent problem between waste collection and treatment companies and local governments, who often lack human, technical and financial resources, hinders the production of reliable and detailed data on waste, traceability and the financial relationships within the system. To address this, some countries have created centralised registers to improve information and accountability of the actors involved. The need to cover cross-jurisdictional operations provides a rationale for a centralised informational solution. On the other hand, both subnational governments and citizens often lack the incentives to pursue more ambitious waste policies or to collaborate in achieving national (or even supranational) targets. Conditional intergovernmental transfers linked to target compliance or pay-as-you-through (PAYT) schemes for citizens might help address this issue (Gatto and Montes, 2021).

## b) Water waste management

61. Similarly to waste management, water waste management is also a very decentralised green policy subarea. The responsibility allocation in this field follows a very close rationale to the scheme applied to waste. Indeed, national legal frameworks, and sometimes those developed at a regional level, are executed by local governments. In fact, there are probably few elements with a more local nature as sewage systems since the inception of modern cities as urban agglomerations. The latter is well reflected in Figure 11. Except for Greece and Estonia, in all OECD countries in the sample, the local level spends the largest share, and sometimes the whole share, of funds on water waste management. In contrast to waste management, in Spain and Belgium regions spend around 30% of the total budget in this subarea. Both central and regional shares are likely to reflect purification and filtration plant ownership and management, whereas sewage and pipe systems remain in the hands of local institutions.

**Figure 6. Decentralisation of consolidated public spending (%) on water waste management (502)**

Using “Spent by” approach, 2019



Source: own elaboration based on OECD data.

62. Going beyond waste water management, preserving both continental and coastal water is included as a priority by SDGs (6, Clean water and sanitation; and 14, Life below water). Indeed, the rise of the “blue economy”, focused on water-related economic activities ranging from fishing to tourism, is considered strategic for growth, employment, social inclusion and cohesion, fostering a community spirit, climate mitigation and adaptation, and ecosystem and biodiversity conservation (OECD, forthcoming a). However, the spread of local blue economy initiatives often lacks a holistic view, as they are fragmented across blue economy sectors. Fragmentation is not just cross-sectoral, but also cross-jurisdictional, since local communities and regions within the scope of water vicinities may pursue contradicting interests, turning shared water endowments into a hostile field. The recent interstate issue regarding the exploitation of the Colorado river in the United States is just one example.

63. As mentioned before, few central governments have introduced Ecological Fiscal Transfers (EFT) to set subnational incentives to align with national green agendas. In particular, water-related variables are considered by transfer allocation formulas in China and Brazil. First, China set up a horizontal EFT scheme in 2012 that distributes 100% of its funding – including a vertical contribution – depending on water quality



indicators of Chinese provinces. Second, water protection and treatment are among the variables considered in the formula used by Brazilian states of Paraná, Sao Paulo, Minas Gerais, Pernambuco, Tocantins, Rio de Janeiro, and Goiás, to allocate state VAT revenue across municipalities (Busch et al., 2021). In fact, it was the Brazilian state of Paraná the pioneer that introduced the policy innovation of EFTs in 1991. During the last three decades, the scheme has spread up to cover almost all Brazilian states, representing a great example of federalism as a policy laboratory.

### c) Pollution abatement

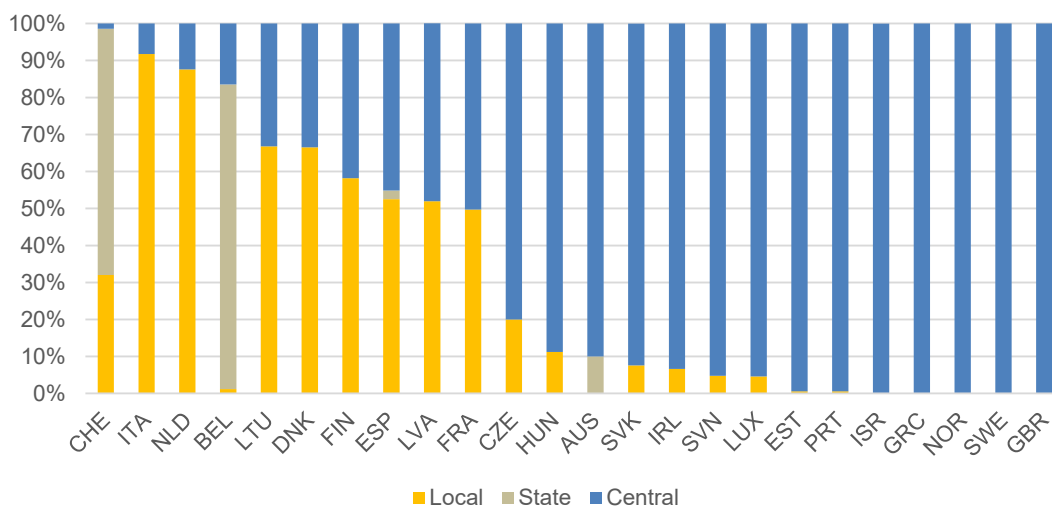
64. When pollution abatement is mentioned, air pollution is the quintessential element that often comes to mind. In contrast with the global component of greenhouse emissions gases, air quality has a stronger local nature, as pollutants do not rise so high into the atmosphere and are kept closer to their source (Dougherty and Montes, 2022). However, pollution abatement applies a broader scope to this issue, including protection of ambient air and climate, protection and remediation of soil, groundwater and surface water, noise and vibration abatement, and protection against radiation. In other words, air, noise, radiation, water and soil protection, abatement and remediation lie within the definition of this policy subfunction.

65. In contrast to the two previous subfunctions, there are very large disparities in pollution abatement decentralisation (Figure 12). The decentralisation level of these types of policies is highly correlated with the decentralisation level of spending. This means that countries with high overall decentralisation levels, with the exception of Australia, Norway and Sweden, have very decentralised pollution abatement policies too. This is the case for countries such as Belgium, Denmark, the Netherlands and Switzerland. In contrast, among the least decentralised countries within this policy subarea, Greece, Estonia, Israel, Norway, Portugal, Sweden and the United Kingdom, where it is the central government that spends all of the funding on pollution abatement. Again, the relevance of Belgian regions and Swiss cantons stand out among the most local approach of the remaining countries.

66. Although the disaggregation level of the data does not show it clearly, a common view is that local spending should correspond more to air and noise pollution abatement, whereas soil, water, and particularly radiation-related programmes should correspond to a larger extent to central governments.

**Figure 7. Decentralisation level of consolidated public spending (%) on pollution abatement (503)**

“Spent by” approach, 2019



Source: own elaboration based on OECD data.

67. Since the COVID-19 pandemic, air quality abatement policies are of particular interest. They are being debated as part of the conversation on how to build more sustainable, liveable, and healthy cities. Indeed, a lack of mobility imposed by confinements showed that vehicles, together with building heating, are the main causes of smog visible in cities (OECD, 2023a). In response, municipalities are experimenting with a transformation of their urban planning, supporting the transition towards clean transport alternatives, such as walking, bikes and electrified public transport, and imposing new measures to cope with traffic congestion. Regarding the latter, Low Emission Zones (LEZ) and congestion charges are the two main alternatives. In addition, energy efficiency measures, such as building isolation, the electrification of building heating – e.g. through heat pumps – are often financed by central governments (OECD, 2023a).

68. Dougherty and Montes (2022) identified limited institutional capacity and doubts about electoral consequences of unevenly distributed costs as the main obstacles for subnational governments to engage in intergovernmental cooperation to comply with air quality targets, recently updated by the WHO (2021), and often violated (European Environment Agency, 2022). This research found that subnational public spending on environmental protection is more strongly associated with better metropolitan air quality than that made by the general government overall. Moreover, institutional quality would represent a mediating factor to spur this effect.

69. In addition, due to the diffuse geographical scope of air pollution, traditional municipal administrative divisions with rigid borders might represent a barrier to effectively address. Particularly in large urban centres, infrastructure, transport planning, and traffic congestion policies should be designed at the inter-municipal level. Metropolitan authorities, experienced in the United Kingdom in a very particular approach to institutional devolution (Puentes and Bailey, 2003), could be part of the solution. The rationale is similar to the one followed for waste management. It is not only that costs could be contained as infrastructures are not duplicated, but also that bus lines could be planned in a “smarter” way, or that undesired side-effects of LEZ, such as “border effects” (Tassinari, 2022) could be solved thanks to increased coordination. See Box 4 for an example.

#### Box 4. The inter-governmental discussion on LEZ in Spain

The WHO calculates that every year 238 000 premature deaths in the European Union can be attributed to air pollution in excess of the recommended thresholds (European Environmental Agency, 2023). In 2022, the European Court of Justice determined that Spain systematically and continuously breached European air quality (NO<sub>2</sub>) standards, and this was particularly the case in the two largest cities, Madrid and Barcelona. This took place before WHO air quality guidelines got updated with more ambitious targets, that only 7 out of 80 largest cities in Spain would comply with (Planelles, 2021).

In response, the Climate Change Law passed by the Spanish Congress in 2021 set LEZs’ compulsory roll-out in cities with more than 50 000 inhabitants or with very polluted air for 2023. During 2022, the Spanish Ministry for Ecological Transition published, together with the Spanish Municipalities’ Association, the guidelines to help municipalities in designing LEZs. However, the central government did not publish the legal plan of the law until the end of the year. This argument was used by municipalities to justify their late implementation of LEZ and to call for a time extension. Only 15 out of 149 affected cities reached the deadline on time. The Ministry rejected this possibility.

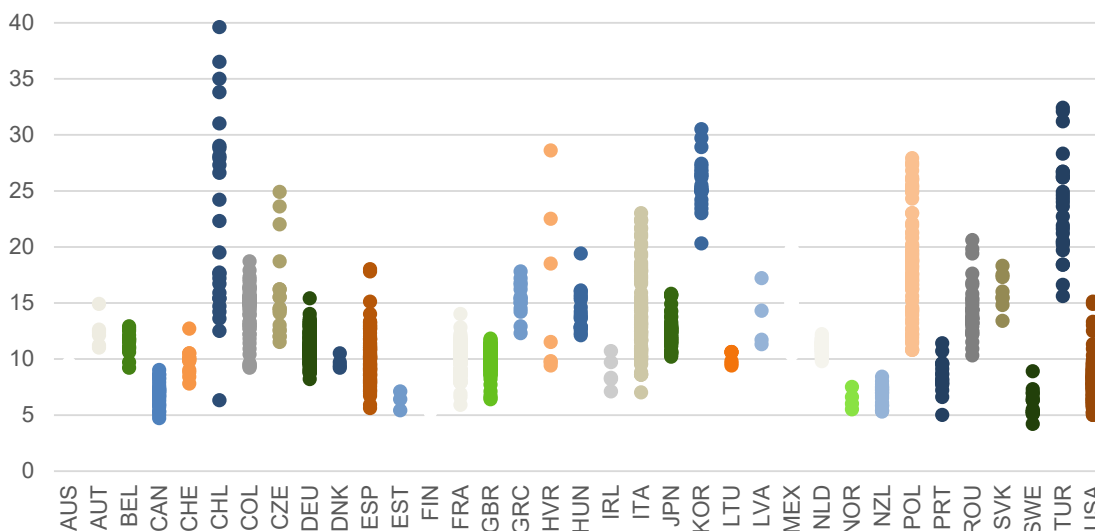
As with EFTs, incentives and intergovernmental fiscal relations play a role in this case. Municipalities, aware of low public support for car restrictions (15%), even lower than for air pollution surcharges (18%) (European Commission, 2022) and the proximity of local elections in May 2023, have been trying to postpone their implementation until after elections are held. This happened even when the central government provided technical and financial support for municipalities, through Next Generations European funds.

70. Regarding transport, although general regulation and large transport infrastructures are also of national institutions' responsibility, SNG intervention in this field is still relevant. Indeed, disregarding the decentralisation level of a country, regions and cities are often in charge of managing and funding projects when their geographical relevance is restricted to their jurisdiction. This applies not only to infrastructure projects key for ecological transition, such as the construction of railway lines but also to the provision and management of public transport services that will use those infrastructures afterwards. The relevance of the geographical component of transport on responsibility allocation is such that it is usually the case that several levels of government create combined authorities, to better provide public transport infrastructure and services (e.g. metropolitan areas, transport consortiums). This complexity has recently made evident when national governments across the OECD have tried to pass discounts on user fees to cope with the energy crisis (e.g., Germany, Spain).

71. Considering the predominantly centralised approach to pollution abatement policies, the cross-city variability in outcomes should be lower. As mentioned before, pollution is a multidimensional issue, so we would focus on air pollution, as more detailed data is available. Figure 13 shows two main groups of OECD and candidate countries. First, a group of top performers, with low figures and low variability of the concentration of air pollutants across cities. Australia, Canada, Estonia, Finland, Norway and New Zealand are included in this first group. And second, countries that perform worse overall and that also record higher variability rates. These are Chile, Croatia (in accession), Poland and Türkiye.

**Figure 8. Mean population exposure to PM<sub>2.5</sub> air pollution in cities**

In micrograms per cubic metre, 2020



Source: own elaboration with OECD data.

72. Some cities, such as Barcelona in Spain, have recently approached this issue from a revenue perspective. The municipality created a new fee in 2023 on the "last mile". Companies that earn more than a million euros thanks to parcel delivery to homes in Barcelona have to pay the 1.25% of their revenue to the city tax administration (Ajuntament de Barcelona, 2023). The fee is justified by the use of public space made by vans, that park on the side of the road while they carry out delivery, is expected to affect 16 firms and is meant to raise up to 2.6 million euros. This fee, which cities such as New York also charge, also sets an incentive to prioritise pick-up point delivery to lower air pollution and emissions by reducing the number of kilometres driven.

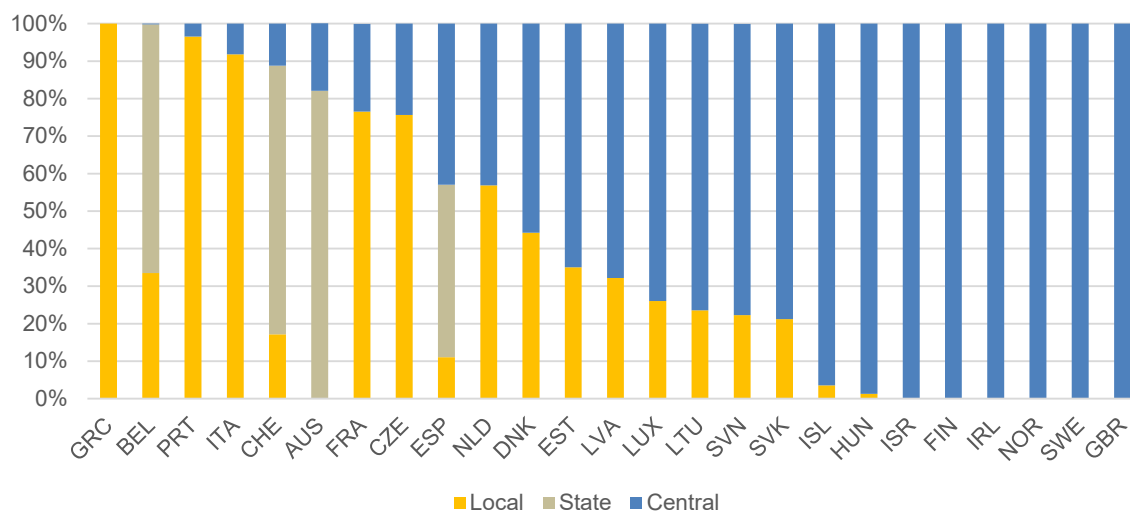
#### d) Protection of biodiversity and landscape

73. Finally, COFOG classification allows distinguishing public expenditure devoted to the protection of biodiversity and landscape. It includes programmes taking care of flora and fauna, and preserving natural landscapes, both coastal and mountainous, such as natural reserves and parks. Conservation of woods and forest has become increasingly important due to the central role attributed to them, as natural sinks, in the net-zero target pursued for 2050 by many OECD economies. Indeed, despite recent worrying evidence that depicts Amazon as a net GHG emitter due to deforestation and fires, the earth's largest forest on its own has absorbed 25% of carbon emissions from fossil fuels since the 60s (Gatti et al., 2021).

74. The data on the decentralisation level of public spending in protecting biodiversity and landscape allows to classify countries according to three different categories (Figure 14). First, countries with a central response, such as Finland, Hungary, Ireland, Norway, Sweden and the United Kingdom. Second, countries that apply a local approach, such as the Czech Republic, France, Greece, Italy and Portugal. And, third, the group of federal and quasi-federal countries, where it is regions that lead spending in this subarea. This is the case for Australia, Belgium, Spain and Switzerland.

**Figure 9. Decentralisation of consolidated public spending (%) on protection of biodiversity and landscape (504)**

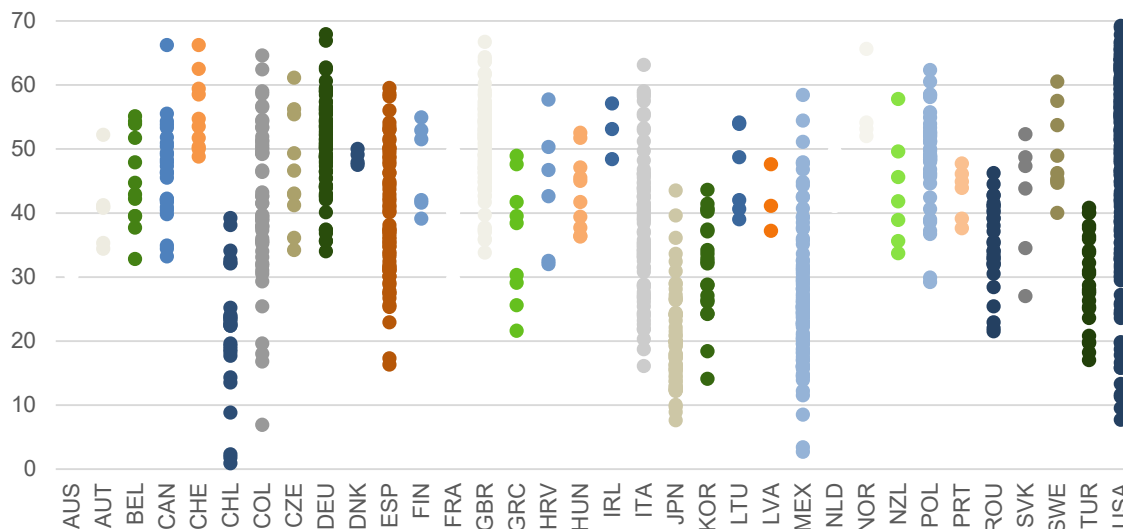
“Spent by” approach, 2019



Source: own elaboration and OECD data.

75. Despite the common central provision of protection of biodiversity and landscape, within cities, land use and spatial planning are most of the time local responsibilities. As can be observed in Figure 15, there is no clear pattern in terms of the share of green areas in urban centres depending on the spending approach followed. Disparities are particularly large for Colombia, Italy, Mexico and the United States. In contrast, smaller divergences are recorded by countries with fewer observations, which should be interpreted cautiously.

Figure 10. Share of green areas in functional urban areas (%) 2021



Source: own elaboration based on OECD Metropolitan database.

76. Opposite the other policy areas investigated, green surface area is very stable on time. In particular, there are strong barriers to upward changes, as it is difficult to increase green areas in consolidated urban centres, even if there are incentives set to do so. Long and intense heatwaves suffered last summer, which are forecasted to be fiercer and more frequent as climate change advances, have shown the need for creative solutions to make cities liveable in summer. Among proposed imaginative measures, examples include the use of clear light-reflecting colours in the streets, new materials for pavements, planting of trees and grass and greater use of mass timber in buildings (CCC, 2019).

77. Outside cities, the situation is the opposite, since green surfaces remain with little change because of land use regulations and protection, which represents the limit for urban and industrial soil expansions, particularly in continental and mountainous areas. However, pressures from construction and touristic industries have been more often capable of surpassing protection regarding coastal areas. Indeed, only 10% of OECD coastal regions have achieved the goal for SDG 14 (Life below water) of having protected at least 46% of coastal areas, while the remaining are still two-thirds away from meeting this objective (OECD, forthcoming a).

78. As a consequence of the lack of coastal protection, or lack of enforcement, the rise of the sea level threatens housing and the livelihoods of many households, which will cost billions in adaptation policies (CCC, 2018; CEA, 2023), such as relocation and landscape recovery. This is already an issue in the public eye in some coastal developed countries. However, the issue is particularly dramatic in insular developing countries, such as Vanuatu, in Oceania, where there are already relocation plans being designed, and are meant to be applied in the short term (France24, 2022).

79. Negative consequences of the lack of humid landscape protection are not only a coastal issue but also one in continental water vicinities, such as riverbanks and lakeshores. The example of the degradation of the Great Salt Lake in Utah, in the United States, is among the most paradigmatic. This popular touristic destination and source of raw materials has become an environmental risk for 10 million migratory birds and the air quality of most residents in Utah, as long as is degraded (Flavelle, 2022).

80. Competence allocation for disaster risk management shows that despite designed multi-level governance schemes, and signed cost-sharing agreements, such as in Australia, Canada, Mexico, Japan,

New Zealand or Peru, when the scale of the phenomenon and its consequences is large-scale, then it is likely that the central government steps in. It will do so through reinforced coordination of SNGs, direct management of the emergence, or federal fiscal and financial response, as it happened during the first stages of COVID-19 pandemic (Wolfram, 2022).

81. Finally, the share of protected surface area is the most used variable for EFT allocation. In Brazil, all of the states that make use of EFTs to support local government finances use it. Portugal does the same for centrally provided local support, and France adds marine park extensions as well. Finally, since 2015, India uses EFTs based on the area of dense forests to support states fiscally (Busch et al., 2021).

82. In addition to policy areas strictly included in environmental protection COFOG classification, there are other subareas not included in this signature that also have a green component (e.g. agriculture, forestry, fishing and hunting; fuel and energy; or transportation). Due to the low disaggregation level, the green component share of those programmes cannot be computed.

#### 4. How can intergovernmental fiscal frameworks contribute to a fair ecological transition?

83. After examining the multi-level dimension of policies necessary to achieve ecological transition in general (Section 2), and environmental protection policies in particular (Section 3), this section reflects on how intergovernmental fiscal frameworks can help achieve a fair move towards a more sustainable economic model. Based on the analysis of multi-level expenditures and responsibilities carried out in previous sections, subnational governments have a highly relevant role in achieving green targets. According to a recent OECD & EU-CoR recent mapping exercise, 105 out of the 169 SDG targets entail subnational relevance. However, 80% of regions and 70% of cities had not reached (in 2019) any SDG target for 2030, even if 73% prioritise environment-related goals (OECD, 2020).

84. Would higher/lower autonomy or decentralisation levels contribute to improve these figures? The subnational scope of environmental policies represents an opportunity. According to Smoke and Cook (2022), regarding regulatory and operational aspects, decentralisation has proved to be efficiency-improving due to better knowledge of the local context. Even if decentralisation is primarily administrative, it allows for bidirectional informational gains. On the one hand, institutions know better local communities' preferences and needs and, on the other hand, citizens will better understand which policies are chosen. If, in addition, decentralisation is of a political nature too, then local governments will be able to provide tailored policies to better match local communities, and citizens will be able to hold them accountable through local election processes. This kind of decentralisation also opens the floor for policy innovation dynamics, in the so-called laboratory federalism. As explained for EFTs, when a policy experimented with at the subnational level works, then it is likely to be adopted by other jurisdictions.

85. Regarding information and analytics, federal and quasi-federal countries have a more entrenched culture of reporting more granular data than unitary countries, for instance regarding public budgets or regional and local performance indicators. This experience can be useful to develop green indicators with a higher disaggregation level. Precisely, gathering subnational level data, and designing standardised and comparable environmental measurement tools have been identified as some of the main challenges for multi-level fiscal governance of ecological transition.

86. However, the decentralisation of environmental policies also poses risks. On the one hand, administrative decentralisation presents the risk of a lack of administrative capacity, regarding financial means, personnel and skills, particularly for small jurisdictions, which can be identified as one of the obstacles to SNGs' engaging on the green agenda. On the other hand, the global of the green agenda will not be achieved without proper engagement and coordination with local and regional governments. In other words, as it is common in other policy areas, multi-level governance leaves the floor open for getting local

institutions on board to comply with global challenges, while at the same time, it introduces a new dimension on the level of complexity in its management. Additionally, from the revenue perspective, one of the risks that tax revenue decentralisation entails is represented by potential cross-jurisdictional tax competition. Local green surcharges leave the floor open for tax base mobility and “race to the bottom” dynamics. This has been recorded even in the field of waste, with pay-as-you-throw (PAYT) local schemes, for example in Switzerland, where they named the phenomenon “waste tourism” (Gatto and Montes, 2021).

87. Nevertheless, despite evidence of the greater success of decentralised air quality policies, there is a lack of specific evidence on the impact of decentralisation on other environmental policy areas. Indeed, one of the main conclusions obtained in Section 3 lies in the fact that there is no correlation between the decentralisation degree of certain green policies and the variance of the outcomes. Therefore, rather than being dependent on the degree of decentralisation, the achievement of green policies is likely to be more dependent on how well-designed intergovernmental fiscal relations are. Of course, a minimum level of decentralisation is necessary to allow SNGs to carry out green policies with a strong local component, such as those analysed in the previous section. However, once that minimum level is reached, then more relevant is how good intergovernmental governance tools are, such as coordination mechanisms or transfer frameworks, to enable SNGs’ capabilities and set adequate incentives for them to engage in the green agenda.

88. First, linked to collaborative governance, regardless of which government level leads environmental action, vertical and horizontal coordination are essential (Smoke and Cook, 2022). On the one hand, as previously suggested, cross-jurisdictional authorities, such as metropolitan authorities or interregional horizontal coordination bodies, could be useful to more efficiently and effectively progress on day-to-day management of environmental protection policy subfunctions as analysed before. On the other hand, clear responsibility allocation for emergency response in the case of extreme climate phenomena is required. This should consider: a) territorial scale, b) territorial administrative structures, c) regulatory frameworks, d) the availability of human and financial resources, and e) the culture of collaboration between the national and subnational governments (OECD, forthcoming c). Overall, prevention and preparedness for emergencies are most relevant at the local level. In contrast, response and recovery – the post-emergency phase – requires a more large-scale response by higher levels of government, in coordination with SNGs. This is the same rationale followed in the past for facing the Global Financial Crisis and the COVID-19 pandemic, for which central governments stepped in to absorb much of the negative large-scale shock.

89. And second, greening intergovernmental fiscal transfer schemes is crucial to establish a link between environmental challenges and intergovernmental transfers. Fiscal transfers should play a double role: as an enabler and as an engager. On the one hand, they can be an enabler, since SNGs, in particular small jurisdictions, often lack the necessary capacity to cope with environmental challenges. Furthermore, adaptation policies are linked to an increase in jurisdictions’ expenditure needs. In fact, protecting neighbourhoods from the rise in the level of the sea or rivers or creating cities liveable during longer and hotter summers (e.g. by providing climate shelters during heat waves), requires a large amount of investment. Although large climate adaptation infrastructure policies are usually carried out and funded by regional or central governments due to their magnitude, smaller-scale and geographically concentrated projects are often implemented and funded through local public budgets.

90. More precisely, one of the interesting ongoing debates is who should face the costs of highly costly climate adaptation policies. For example, only in the United Kingdom, estimates calculate that 530 000 properties are at risk of flooding, and these figures could increase up to 1.5 million by 2080 (CCC, 2018). Notably, should the private sector, insurance, local or central governments face relocation costs? Responses could come from a public risk-insurance framework that sets shared responsibility. Consistently, ongoing discussions point out that to avoid moral hazard problems, a relevant share of liability should be faced by the government level that gives permission for construction to have information on risks (Wolfram, 2022).

91. And, on the other hand, intergovernmental transfers should play an engager role. As mentioned before, one of the main problems of the multi-level governance of climate transition is the agenda misalignment across levels of government. This could be addressed by incorporating the environmental perspective within transfer allocation formulas to improve SNGs' incentives to foster sustainable policies (e.g. lack of action due to negative expected consequences on re-election probability). Three alternatives can be depicted regarding the inclusion of environmental components on intergovernmental grant schemes:

- Considering the cost of ecological and environmental services as part of the public services menu provided by local governments to determine the vertical allocation of funds (across levels of government).
- Including ecological functions as bases for calculating fiscal needs relevant for horizontal allocation (across jurisdictions) (e.g. to compensate regions address environmental damages, such as those caused by mining) (Busch et al., 2021).
- Devoting earmarked grants to environmental projects (e.g. waste disposal or water supply). For instance, this is the scope adopted by Next Generation EU funds, since a third of its total amount has to be spent on projects whose aim is to fight climate change. It is also the approach of a share of earmarked grants provided to municipalities by some German *länder*.

92. The second alternative refers to the concept of “Ecological Fiscal Transfers” (EFTs). As previously mentioned, this particular kind of transfer is allocated according to environmental variables to compensate subnational governments for implementing environmental protection policies (expenditure needs), for the positive spillovers generated by them, and for the opportunity cost represented by revenues that they could have raised if, for example, certain land areas would have been assigned to productive economic activities instead (Busch et al., 2021). Indeed, ambitious mitigation-oriented environmental policies, such as restrictions on the use of cars or urban land use, equate to an opportunity cost in terms of revenue losses for subnational governments (CEA, 2023). For instance, higher shares of green surface in a city could translate into lower local property tax revenues.

93. Due to the variables used to distribute EFTs, they are focused on supporting climate mitigation policies, and natural sinks in particular (e.g. forests and protected natural areas), a field at which the current reactive approach should be complemented by proactive policies and greater recognition of local institutions (Roberts et al., 2009). A more comprehensive approach to EFTs should include not only mitigation (protected areas, air quality, waste separation and recycling rates, energy and water consumption intensity, etc.) but also adaptation (vulnerability to climate extreme events, such as droughts, floods and the rise of sea level).

94. The room for improvement is still large since EFTs remain mostly anecdotal and do not represent a large share of intergovernmental transfers. Indeed, as Figure 7 shows, environmental protection is one of the COFOG policy functions where earmarked grants have less relative relevance. Consequently, the use of EFTs should become more widespread, serving to allocate larger shares of intergovernmental fiscal transfers and should consider increased spending needs for climate adaptation policies by more vulnerable jurisdictions, and lower fiscal capacity driven by more ambitious climate mitigation and environmental protection policies.

95. After drawing how intergovernmental fiscal frameworks should look to generate positive synergies in SNGs to be part of the international and national drive on the environmental agenda, then it is a must to discuss whether subnational approach could be useful to gather social support. Securing voters' support has become one of the most significant obstacles to making and maintaining progress in the climate transition (Dechezleprêtre et al., 2022). There are many examples of technically appropriate or environmentally successful policies that have failed due to a lack of popular support. For instance, this was the case with the increase of green taxation in France, or the use of door-to-door waste collection systems in the Basque Country (Spain).



96. Recent examples show to which extent a local component is fundamental to ensure citizens' support for measures necessary to successfully achieve the ecological transition. For instance, despite consensus around the positive climate impact of wind power, in the last years *not in my backyard-ism* has popped up to oppose the installation of aerogenerators. Among the arguments used is that while negative environmental impacts on landscapes are suffered by local communities, electricity produced is not locally consumed, but benefits to society as a whole through a cleaner energy mix. It is a clear case of political economy difficulties raised by a policy because of its concentrated costs but diffused benefits.

97. Trade-offs between GHG emissions and the protection of the natural landscape and biodiversity can also be observed in other areas of environmental protection. For instance, the domestic exploitation of critical raw materials, necessary to develop Open Strategic Autonomy, implies that mining – including urban mining – must be carried out locally (Bobba et al., 2020). However, local citizens are usually more critical than importing the same materials, since the main environmental costs are externalised to third countries.

98. Dechezleprêtre et al. (2022) recently carried out an extensive survey – of 40 000 respondents across 20 countries, accounting for 72% of global GHG emissions – and found that support for climate policies depends on three key factors: perceived effectiveness, perceived distributional impacts on the lower-income households and their own household's gains and losses. In addition, the study suggests that providing information about these aspects as well as on how policies work is useful to gather support, rather than simply presenting catastrophic consequences of climate change.

99. Social acceptance requires the perception of fairness for the green transition. A recent Eurobarometer (European Commission, 2022) asked about attitudes toward climate policies. Results show a clear income-based pattern in responses. In fact, it is the lowest income group that more often reports that governments are not doing enough to ensure fairness. They are worried about energy affordability and are less optimistic about the impact on labour of the green transition since they are less prone to think that their skills contribute to it. They think they can reduce energy consumption, but mainly for economic reasons. And most think that the wealthiest should make more effort. Cost is reported as the main barrier to switching to more sustainable energy or transport alternatives. Finally, regarding policies, citizens typically prefer public investment and subsidies rather than taxes and quotas.

100. Political decentralisation could contribute to facilitating voters' support for the ecological transition by providing better-tailored measures, thanks to informational gains, improved public participation, and a better alignment between policies and preferences/needs from decentralisation. Furthermore, as survey data repeatedly report that citizens feel closer and show more positive attitudes towards local and regional governments than towards higher institutional layers, a subnational approach to this issue could enjoy better acceptance.

101. Finally, social policy can also serve as a useful tool to alleviate the negative consequences of climate change and encourage society and the economy to adapt to it. This could be achieved through new education programmes that train people on how to react to extreme climate events or by promoting healthcare services to prevent and support populations against more likely diseases. In addition, housing and social protection policies may become increasingly necessary to provide support to the most vulnerable population groups, as they may lose their homes or livelihoods, and territories may become depopulated or economically impoverished. Furthermore, according to the most recent migration statistics and estimates, the phenomenon of climate asylum-seekers is already one of the main drivers of forced migration movements, and this phenomenon will continue to increase as the consequences of climate change become more and more apparent. Cross-level and inter-jurisdictional coordination of labour, education, healthcare, housing and social protection policies, will be increasingly critical to provide a more effective means of ensuring migrants' social inclusion (OECD, 2022d).

102. A fair ecological transition represents an opportunity to improve social well-being through a more balanced income and wealth distribution, but also to accelerate climate action, in a virtuous circle.

Green compensation is meant to balance the potential negative distributive effect of regressive environmental taxes (Böhringer et al., 2019). In addition, a reduction of inequality would contribute to a decrease in GHG emissions of private consumption, since they are correlated with the level of income and wealth. Nonetheless, it is the richest that pollute the most (Chancel et al., 2023). Decentralisation could ease initial opposing attitudes towards “push” redistributive measures as evidence for social protection policies supports that citizens are more favourable to accept income transferences when they take place between neighbours and more homogeneous communities (Kleven, 2014).

## 5. Conclusions

103. Institutions and frameworks are of key importance for the success of the ecological transition. Consequently, decentralisation choices, through their effect on addressing allocative problems and equity, both from the interpersonal and interregional point of view, can provide better tools for policymakers to reach net-zero objectives more fairly. Several critical points emerge:

- *Improving data availability.* Data needs to be granular enough regarding sectors and functions but also geographies. Experience of federal countries with local and regional data might be useful to make progress in this sphere.
- *Developing standard and comparable measures.* Despite difficulties introduced by the multidimensional character of environmental activities, it is necessary to set common international measurement standards that allow for fair comparisons. The Paris Collaborative on Green Budgeting, the Subnational Government Climate Finance Hub from the spending side, or the Compendium of Financial Instruments that Support Subnational Climate Action from the revenue side, are good examples of the kind of initiatives that could make a difference.
- *Setting better incentives for economic agents and SNGs to engage with the international green agenda.* Current policies do not set adequate incentives for firms, households or subnational institutions to switch their behaviours towards more sustainable alternatives, such as pay-per-use alternatives. The same applies to SNGs, whose funding, meaning intergovernmental transfers, should consider green variables in their allocation or be earmarked, following the path of Ecological Fiscal Transfers. Indeed, aligning regional and local policy agendas with international and national environmental commitments is key for ecological transition to succeed.
- *Ensuring central support for SNGs.* Unfunded mandates should be avoided by supporting subnational governments so they can design and implement best practices in environmental protection and sustainable public governance (e.g. green budgeting). Support should not be limited to providing funding, but also technical and human capacities, particularly for smaller jurisdictions.
- *Gathering social support.* It has often been mentioned that ecological transition will need to be fair, or it will not happen. In order to gather social support for green policies, it is essential that citizens perceive the measures to be effective and fair. That could be achieved by improved information about how policies work and who they affect. Smart use of compensation for economic agents considered could be worse off during ecological transition should also take a central role. As subnational governments occupy the closest position to communities, they need to engage citizens by making possible social participation, providing more targeted information and by taking advantage of their experience in managing social policies.

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