

Supplement to Effective Carbon Rates 2021

Country profiles



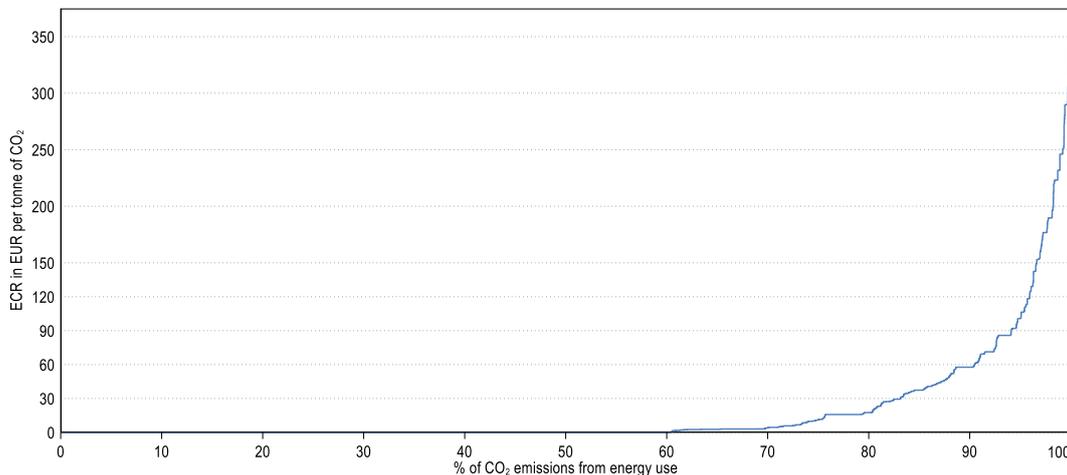
Effective Carbon Rates across 44 countries and on a country-by-country basis

The supplementary country notes for *Effective Carbon Rates 2021* (OECD, 2021^[1]) provide detail on the proportion of CO₂ emissions from energy use subject to different effective carbon rates (ECR) in each of the 44 countries in Figure 1. The country notes also show the level and components of average ECRs in each of the six economic sectors (road transport, off-road transport, industry, agriculture and fishing, residential & commercial, and electricity) in Figure 2. To facilitate the interpretation of the two figures shown in each of the country notes, this file presents and explains the two figures for the group of 44 countries as a whole.

Distribution of Effective Carbon Rates

Figure 1 presents the full distribution of Effective Carbon Rate (ECR) levels across the 44 economies, sorting CO₂ emissions from energy use according to the ECR at which they are priced, starting at zero. The horizontal axis shows the proportion of CO₂ emissions while the vertical axis shows the ECR in EUR per tonne of CO₂. Figure 1 allows the share of CO₂ emissions from energy use priced at or below any given ECR to be identified. For example, around 60% of emissions in the 44 economies are unpriced, i.e. the blue line in Figure 1 is at an ECR of zero. In addition, where the blue line crosses the dashed grey line corresponding to an ECR of EUR 30 per tonne CO₂ in Figure 1, the horizontal axis indicates that around 83% of carbon emissions from energy use across the 44 countries are priced below an effective carbon rate of EUR 30. Similarly, around 90% of emissions are priced below an effective carbon rate of EUR 60 per tonne of CO₂.

Figure 1. Proportion of CO₂ emissions from energy use subject to different levels of effective carbon rates in 44 OECD and selected partner economies in 2015



Average Effective Carbon Rates by sector and price instrument

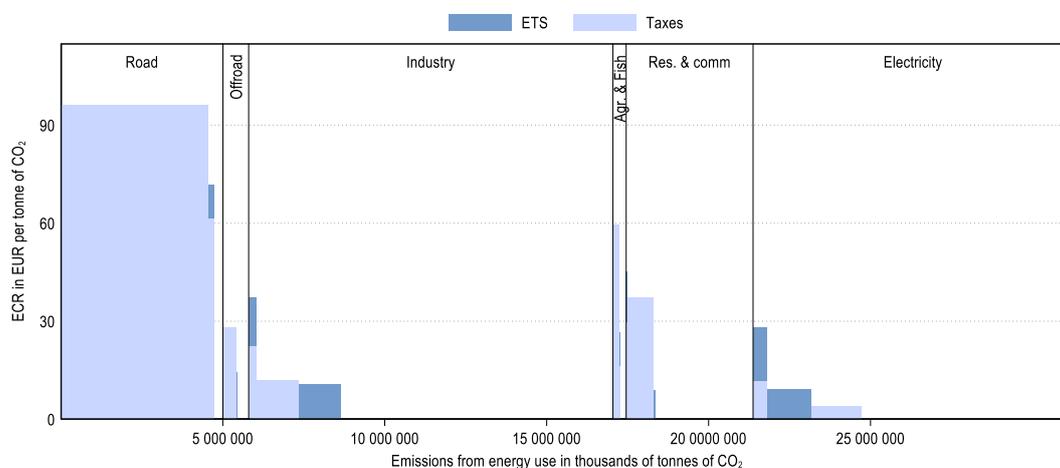
The levels and coverage of effective carbon rates vary widely across different sectors of the economy. This is illustrated in Figure 2, which presents the average ECRs and carbon emissions from energy use for six sectors of the economy (road transport, off-road transport, industry, agriculture and fishing, residential & commercial, and electricity). The horizontal axis of Figure 2 shows total CO₂ emissions from energy use for each sector in the 44 countries in thousand tonnes of CO₂. The width of each sector along the horizontal axis therefore represents the total carbon emissions from energy use from each sector. The vertical axis shows different levels of ECRs. Within each of the six sectors, the width of the shaded rectangles shows the amount of CO₂ emissions from energy use in that sector subject to each type of price instrument. The height of each shaded rectangle represents the average price signal from the corresponding instrument for all emissions priced by that instrument (i.e. zeros are excluded).

Figure 2 allows the components of the average ECR in each sector to be identified. Carbon taxes and specific taxes from energy use are shown in light blue, while the

Emissions Trading System (ETS) components of average ECRs are shown in dark blue. A tonne of CO₂ emissions can be priced in different ways: only via taxes (a light blue rectangle), only via a tradable emissions permit price (a dark blue rectangle), or via taxes and tradable permits (a light blue rectangle, with a dark blue rectangle on top). Emissions that are not priced are shown in the base, with no light blue or dark blue rectangle.

Figure 2 illustrates the wide variation in the composition of average ECRs in the different sectors of the economy across the 44 countries. Around ninety-five percent of carbon emissions from road transport are priced (shown as the combined width of the two light blue rectangles in the road transport sector). Around ninety-one percent of road emissions are priced by taxes alone at an average rate of EUR 96 per tonne of CO₂. About four percent of road emissions are subject to taxes and an ETS (the narrow dark blue bar) at an overall average ECR of EUR 72 per tonne CO₂. CO₂ emissions from off-road transport and from agriculture and fishing – two relatively small sectors in terms of CO₂ emissions – are mainly priced via taxes, but ECR coverage is significantly lower than in the road sector (see the width of the light blue bars), and they are also priced at lower average rates (see the height of the light blue bars). ETSs only cover a very small proportion of emissions in each of these sectors, as shown by the barely discernible dark blue bar in these two sectors.

Figure 2. Average effective carbon rates across in 44 OECD and selected partner economies by sector and component



Emissions from industry account for more than a third of carbon emissions from energy use across the 44 countries. About three-quarter of industrial emissions are unpriced. Of the remainder, the instrument mix is relatively diverse: Around 12% of emissions are subject to taxes only (the light blue bar), around 11% of emissions are priced via an ETS only (the dark blue bar), and around 4% of emissions are priced via both taxes and ETS (the dark blue and light blue bar combined). The overlap between ETS and taxes is thus relatively small in the industry sector, implying that the two pricing instruments often cover different emissions, increasing the total amount of emissions covered by a price.

A similar pricing pattern is observed for carbon emissions from energy used in electricity generation, which also account for a bit less than a third of emissions in

the 44 countries on average. While in this sector about two-thirds of carbon emissions are unpriced, around 4% of emissions are subject to both a tax and an ETS and face an average combined price from these instruments of EUR 28 per tonne CO₂ (i.e. the light blue and dark blue bar). Taxes on energy use alone (the light blue bar in the electricity sector) apply to around 15% of emissions at an average rate of EUR 4 per tonne of CO₂. A similar proportion of emissions (around 14%) are priced at EUR 9 per tonne of CO₂ on average through an ETS (the dark blue bar). As in the industry sector, the taxes and permit prices often cover different emissions.

The price signal from energy taxes dominates the ECR on carbon emissions from the residential and commercial sector, as it covers a relatively large proportion of the base (around 21%).

Because different fuels used in one sector may be taxed at very different rates, the average carbon rates presented in Figure 2 may hide significant differences within sectors. For example, a majority of countries tax CO₂ emissions from gasoline used in the road transport sector at much higher rates than those from diesel. Similarly, emissions from coal use are often taxed at rates significantly lower than those applied to emissions from oil products or natural gas. *Taxing Energy Use 2019* (OECD, 2019^[2]) provides more detail on the exact distribution of tax rates that underlies the average tax rates shown in Figure 2.

All figures in the country notes include emissions from biomass. Where emissions from biomass account for a large share of a country's carbon emissions, numbers excluding emissions from biomass are cited in the text accompanying the figures.

Annex A of *Effective Carbon Rates* (OECD, 2016^[3]) describes the methodology and the data sources used for calculating ECRs.

Effective Carbon Rates 2021 (OECD, 2021^[1]) is available on: <http://oe.cd/ECR2021>.

References

- OECD (2021), *Effective Carbon Rates 2021: Pricing Carbon Emissions through Taxes and Emissions Trading*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/0e8e24f5-en>. [1]
- OECD (2019), *Taxing Energy Use 2019: Using Taxes for Climate Action*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/058ca239-en>. [2]
- OECD (2016), *Effective Carbon Rates: Pricing CO2 through Taxes and Emissions Trading Systems*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264260115-en>. [3]