



# Effective Carbon Rates

PRICING CO<sub>2</sub> THROUGH TAXES AND EMISSIONS  
TRADING SYSTEMS

EXECUTIVE SUMMARY



## EXECUTIVE SUMMARY

Tackling climate change requires deep cuts in greenhouse gas emissions, including CO<sub>2</sub> emissions. Carbon pricing is an effective and low cost means of inducing carbon abatement. While not in itself sufficient to deliver the degree of abatement required for limiting the risks of climate change, carbon pricing is an essential part of the solution. However, new evidence presented in this report shows that 90% of carbon emissions are not priced at a level reflecting even a conservative estimate of their climate cost.

This report presents the first comprehensive analysis of the extent to which countries use carbon prices. It measures effective carbon rates, the price of carbon emissions resulting from taxes and emissions trading systems, in 41 OECD and G20 countries, accounting for 80% of global energy use and of CO<sub>2</sub> emissions. For each country, the analysis shows the distribution of effective carbon rates across all energy use and their composition by six economic sectors.

Carbon prices often are zero or very low. Across the 41 countries, 60% of carbon emissions from energy use are unpriced. Where carbon is priced, the price tends to be low. The damage from climate change resulting from a tonne of CO<sub>2</sub> emissions can very conservatively be estimated at EUR 30. Only 10% of emissions are priced at an effective carbon rate equal or exceeding EUR 30 per tonne of CO<sub>2</sub>. In other words, 90% of emissions fail the weak test of being priced at a level in accordance with a low end estimate of the climate damage they cause.

Across all countries, effective carbon rates are particularly low in sectors outside road transport, with 70% of emissions not priced at all and only 4% of emissions subject to an effective carbon rate above EUR 30. These sectors, which include the industry, electricity and commercial & residential sectors as well as off-road transport and agriculture & fisheries, emit 85% of carbon emissions from energy use in the group of 41 countries.

Specific taxes on energy use form the main component of effective carbon rates in the non-road sectors, with 23% of emissions from energy use subject to such a tax, and with specific tax rates on average higher than carbon tax or permit price levels. Emissions trading systems have a significant impact on coverage, and they extend the share of emissions subject to a price to 30%.

Road transport has comparatively high effective carbon rates, with 46% of emissions priced above EUR 30 per tonne of CO<sub>2</sub> and only 2% of emissions unpriced. These rates are almost entirely the result of specific taxes on road transport fuel, which are not usually introduced primarily for climate reasons. Fuel taxes can reflect air pollution and to some extent congestion costs, justifying rates well above EUR 30 per tonne of CO<sub>2</sub>.

Within countries, effective carbon rates on transport fuels are higher than those on other energy use. In the non-road sectors, some countries mostly price emissions from industry, though often at low rates, while other countries price emissions from the commercial and residential sector more strongly. Emissions from the electricity sector are priced in many countries, mostly at low rates and often through consumption taxes, which do not encourage switching to cleaner fuels. The impact of emissions trading systems on effective carbon rates is largest in the industry and the electricity sectors. Taxes apply to 17% of emissions in industry and 27% in electricity, and price signals from emissions trading increases these shares to 26% for industry and 36% for electricity.

The report introduces the “carbon pricing gap” as a synthetic indicator of the extent to which effective carbon rates fall short of pricing emissions at EUR 30 per tonne of CO<sub>2</sub>. If all emissions were priced at least at EUR 30, the carbon pricing gap would be zero, and if all emissions were unpriced, it would be 100%. Currently, the carbon pricing gap is 80.1% for the group of 41 countries. If carbon prices and coverage were to increase to at least the levels currently observed at the median for each economic sector, the carbon pricing gap would decline to 53.1%. This suggests that meaningful progress with carbon pricing can be made by increasing rates where they are currently low and introducing pricing instruments where they are zero. Such an approach would contribute to more uniform carbon prices, which improves cost-effectiveness.

The non-road sectors, and in particular the industry, the electricity and the commercial and residential sectors, are prime targets for raising rates. Within these sectors, non-oil based energy tends to face lower rates than oil products. Efforts could also be concentrated in countries where effective carbon rates are low across all energy use, although in some cases this may lead to calls for inter-country transfers. Such a gradual approach would lead to more uniform carbon prices, broadening the scope for cost-effective abatement. Cost-effectiveness is always desirable and becomes indispensable as abatement targets become stringent.

Progress with carbon pricing can be made by utilising taxes or emissions trading systems. Carbon pricing mechanisms co-exist with other mitigation policies. Ideally pricing should be the primary policy tool used to drive abatement, for if regulatory or other policies lead, cost-effectiveness likely suffers. Trading may have the advantage of better political feasibility, particularly when combined with free allocation of allowances. However, making durable progress with meaningful carbon pricing will require higher and more stable rates than currently observed in trading systems, as well as increased attention to revenue raising and productive ways of using revenue from taxes or auctioned emission permits. Turning towards taxes may be the simplest approach administratively, as carbon taxes can often be grafted onto existing systems, and the most effective approach economically, as creating well-functioning markets is not always straightforward.

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## PRICING CO<sub>2</sub> THROUGH TAXES AND EMISSIONS TRADING SYSTEMS

To tackle climate change, CO<sub>2</sub> emissions need to be cut. Pricing carbon is one of the most effective and lowest-cost ways of inducing such cuts. This report presents the first full analysis of the use of carbon pricing on energy in 41 OECD and G20 economies, covering 80% of global energy use and of CO<sub>2</sub> emissions. The analysis takes a comprehensive view of carbon prices, including specific taxes on energy use, carbon taxes and tradable emission permit prices. It shows the entire distribution of effective carbon rates by country and the composition of effective carbon rates by six economic sectors within each country. Carbon prices are seen to be often very low, but some countries price significant shares of their carbon emissions. The “carbon pricing gap”, a synthetic indicator showing the extent to which effective carbon rates fall short of pricing emissions at EUR 30 per tonne, the low-end estimate of the cost of carbon used in this study, sheds light on potential ways of strengthening carbon pricing.

Consult this publication on line: <http://dx.doi.org/10.1787/9789264260115-en>.

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