



THE CLIMATE IMPLICATIONS OF GOVERNMENT SUPPORT IN ALUMINIUM SMELTING AND STEELMAKING

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MEASURING GOVERNMENT SUPPORT IN INDUSTRIAL SECTORS



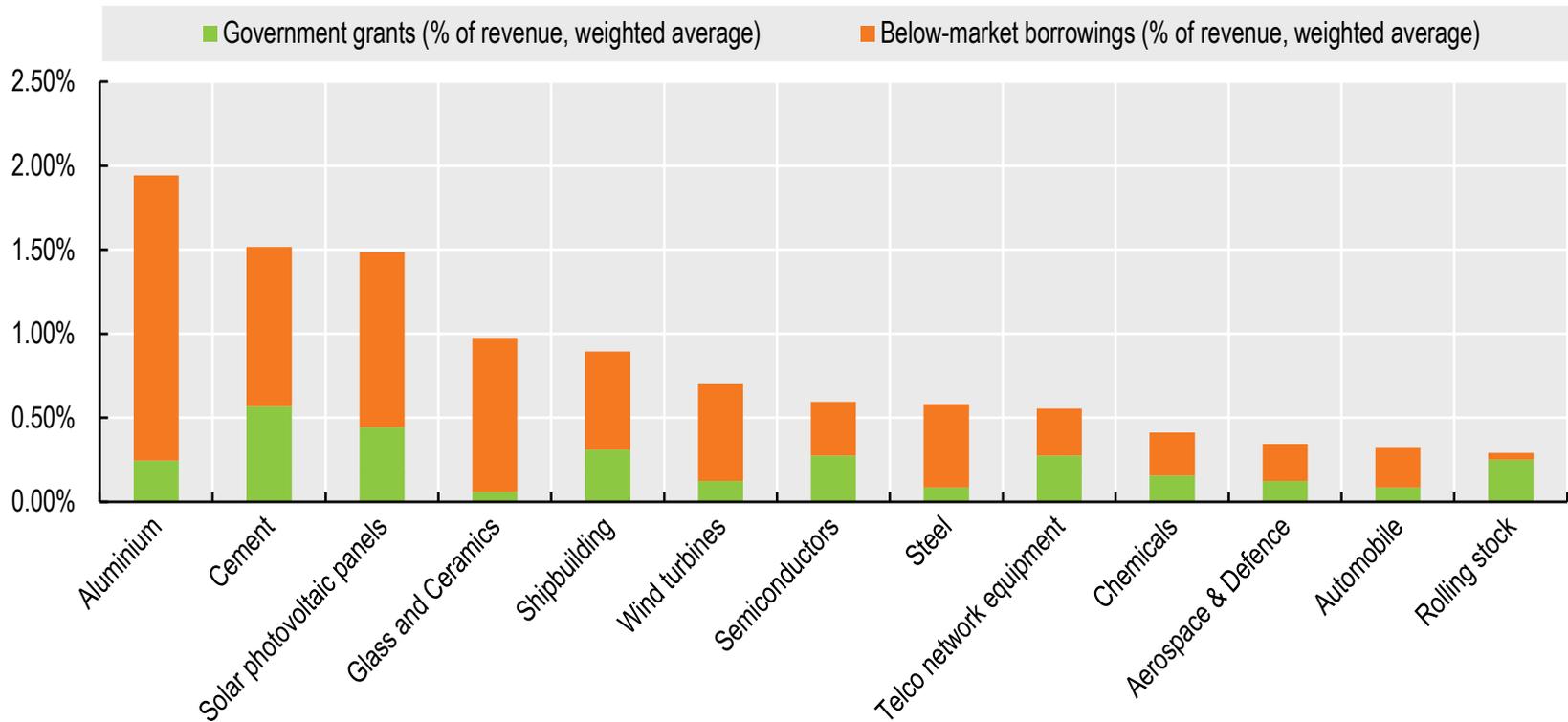
Why look at firms?

- There are **two ways of approaching industrial subsidies**: (1) look at entities that provide subsidies, namely **governments**; or (2) look at the recipients of subsidies, namely **industrial firms**.
- The first approach is ideally better as it is more comprehensive and better suited for trade negotiations. But governments have not been transparent enough so far to enable this approach to be used widely.
- The firm-level approach has limitations since it can be less comprehensive and representative, but has the advantage of resulting in much better geographical and sector coverage. It also gives access to granular data for related analysis.



Energy-intensive firms are relatively large recipients of grants and below-market loans

The OECD has found industrial subsidies to be widespread and significant in 13 key industries



Note: Data are expressed relative to the sales revenue of the firms covered in the study over the period 2005-19. The graph above does not include tax concessions since these are less comparable across countries and sectors than other forms of support. Source: OECD (2021), “Measuring distortions in international markets: Below-market finance”, *OECD Trade Policy Papers*, No. 247, OECD Publishing, Paris.



Industrial subsidies, trade, and competition

- There can be perfectly valid justifications for subsidies, including market failures and income redistribution.
- But there are also good and bad ways of designing subsidies, irrespective of their objectives.
- In the end, judging whether subsidies are trade distorting or environmentally harmful is an empirical question, which requires analysis using more and better data (back to transparency).



CLIMATE IMPLICATIONS OF GOVERNMENT



What is the problem?

- Government support can have multiple implications for trade:
 - Competition distortion: allowing less innovative, efficient or competitive companies to crowd out other firms ((OECD, 2017); (Evenett and Fritz, 2021))
 - Investment decisions: links between government support and larger investments in fixed tangible assets (OECD, 2021)
 - Trust undermining: lower trust in the global trading system and fuel anti-globalization sentiment (OECD, 2017)



What is the problem?

- May also contribute to increase emissions, especially in energy-intensive sectors:
 - Excess production: (inefficient) firms producing industrial output above market levels thereby generating excessive emissions
 - Incentives removal: less incentives to adopt more environmentally friendly production methods (soft budget constraint phenomenon)



What does the OECD do?

Explore empirically whether government support has contributed to increase emissions of GHGs in industrial sectors

- Focus on aluminium smelting and steelmaking because:
 - they are energy intensive (respectively 2% and 10% of global carbon emissions)
 - they receive large amounts of government support (OECD, 2021)



Data on government support

- Firm-level information on the amount of support that companies receive (OECD, 2021):
 - Government grants: lump-sum cash transfers provided by governments and disclosed by firms in their financial statements
 - Tax concessions: reductions on income tax offered by governments and disclosed by firms in their financial statements
 - Below market borrowings: government support provided through more favourable borrowing conditions than the ones prevailing on financial markets and offered by state banks or other government-related financial entities



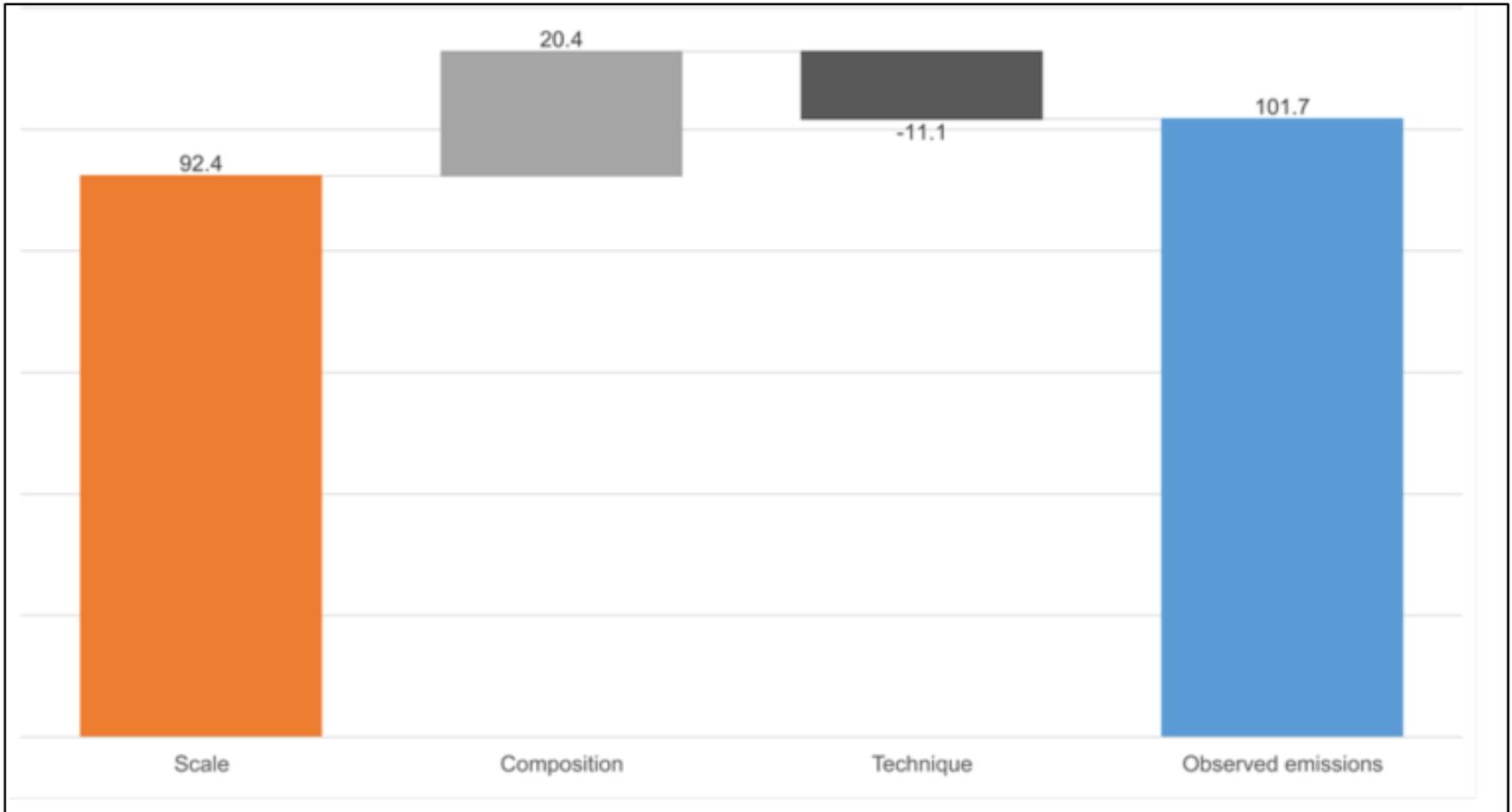
Data on firm-level emissions

- Plant-level information on emissions and production (CRU group):
 - Excellent coverage of the aluminium and steel production units
 - Built-up for like-for-like comparisons by considering emissions associated with specific standardized products (i.e. primary aluminium and crude steel)
 - Boundaries to measure the emissions arising along the manufacturing processes of these products are standardized (scope 1, 2 and 3)

Matching firms across these two datasets to analyze the relationship between government support and firms' environmental performance

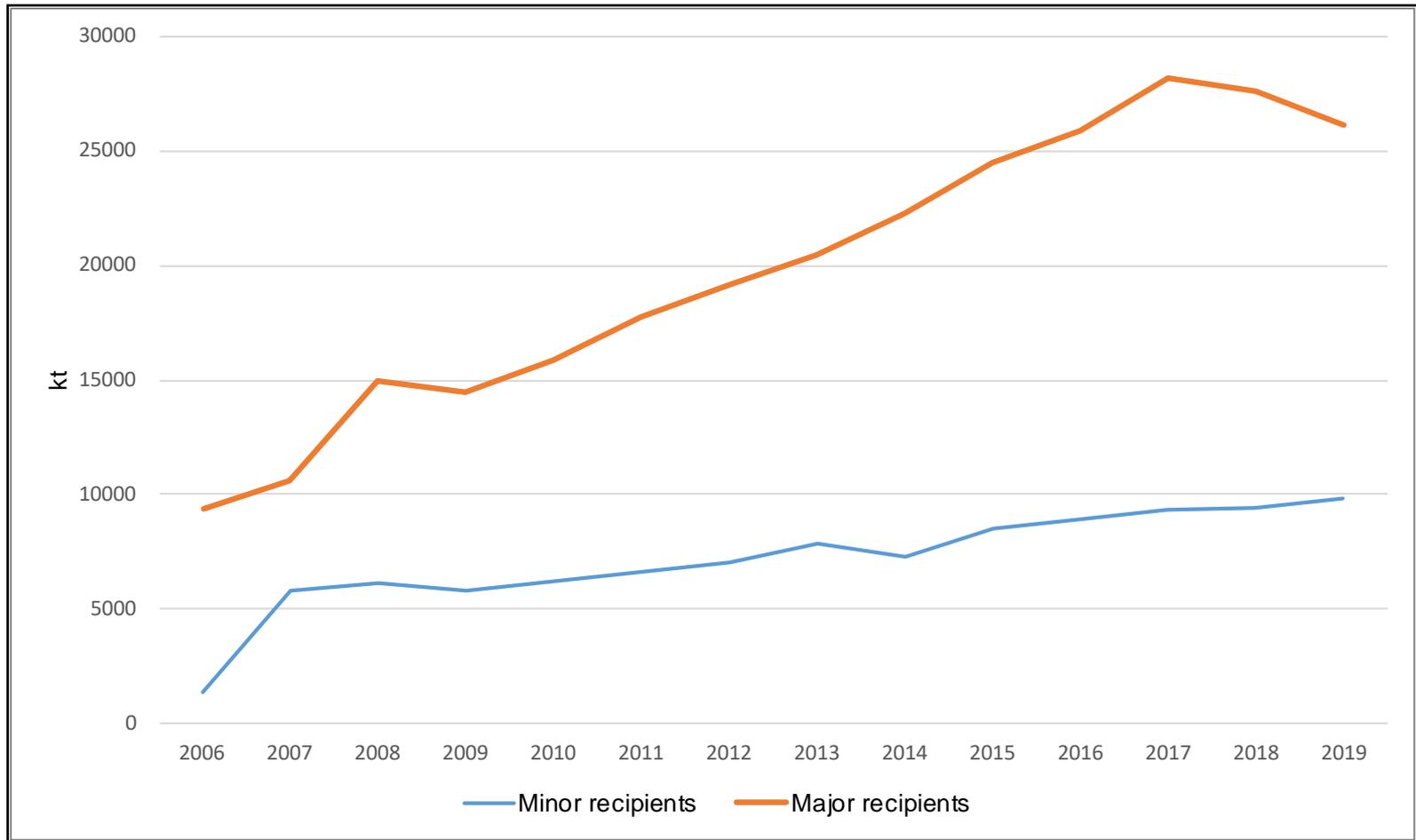


Decomposing emissions in aluminium smelting





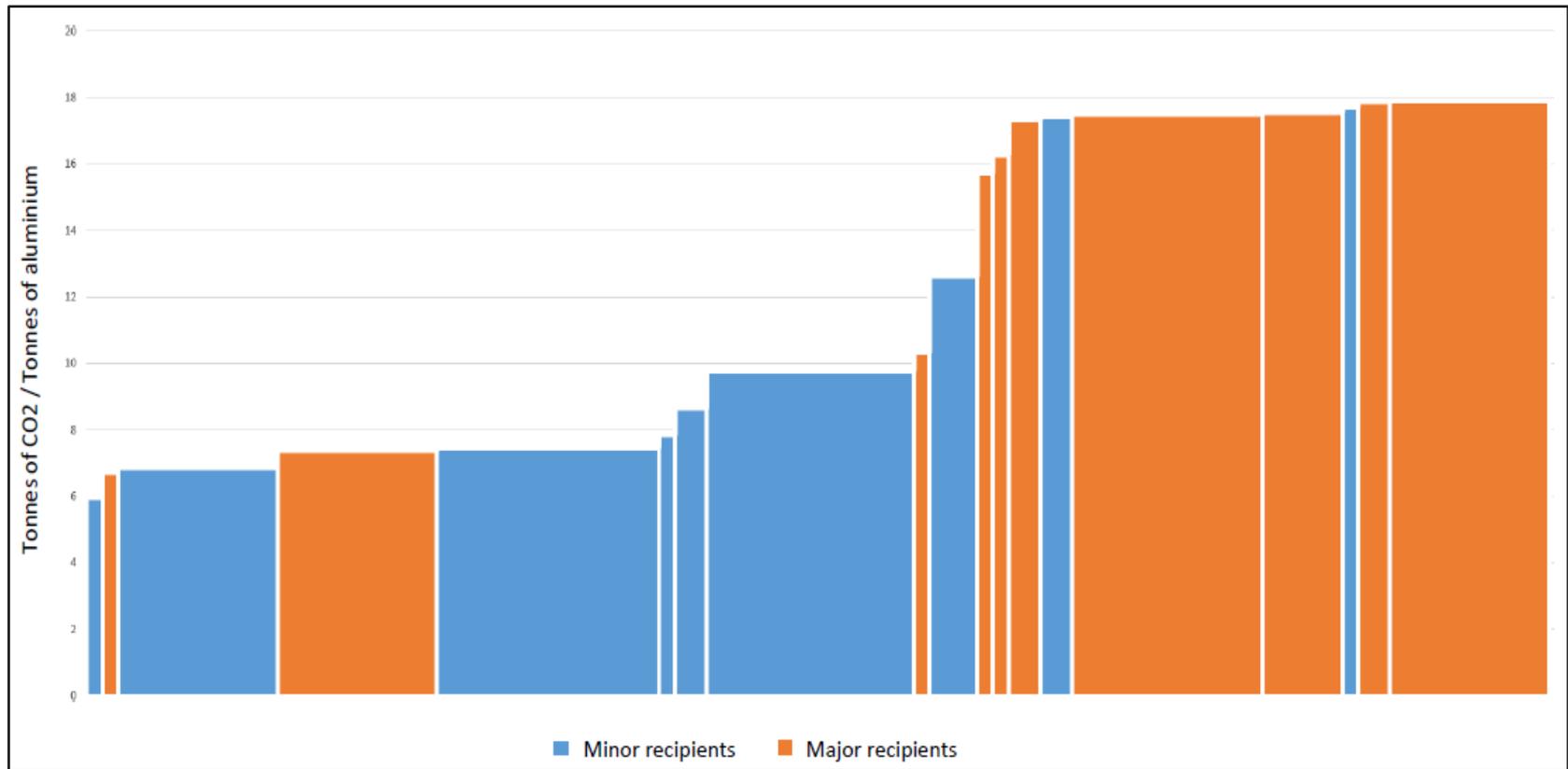
Government support helps drive production, which drives emissions



Production of aluminium firms (major vs minor recipients of government support)



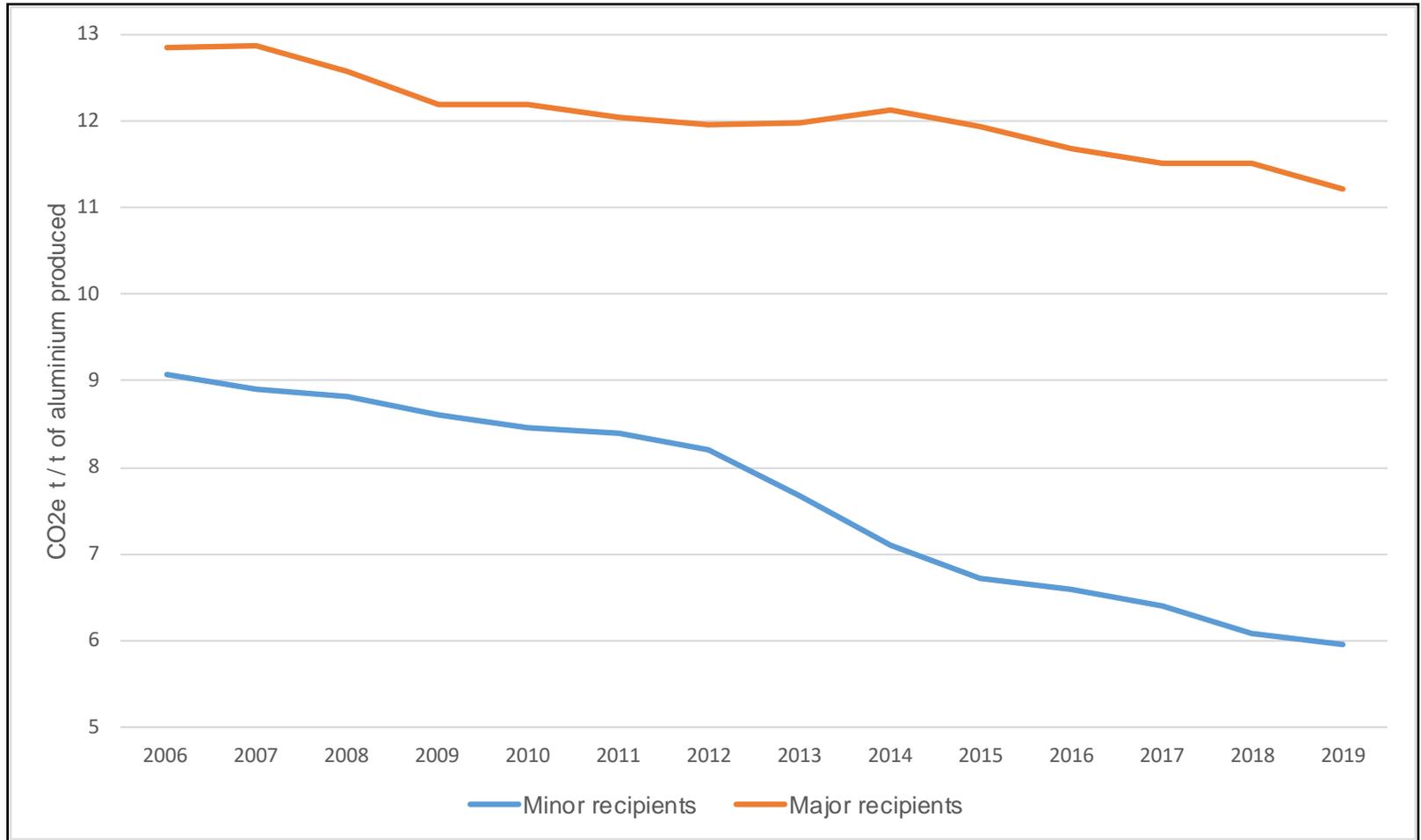
Government support plays a role in the composition effect



Firms' emissions intensity in the aluminium industry (major vs minor recipients of government support)



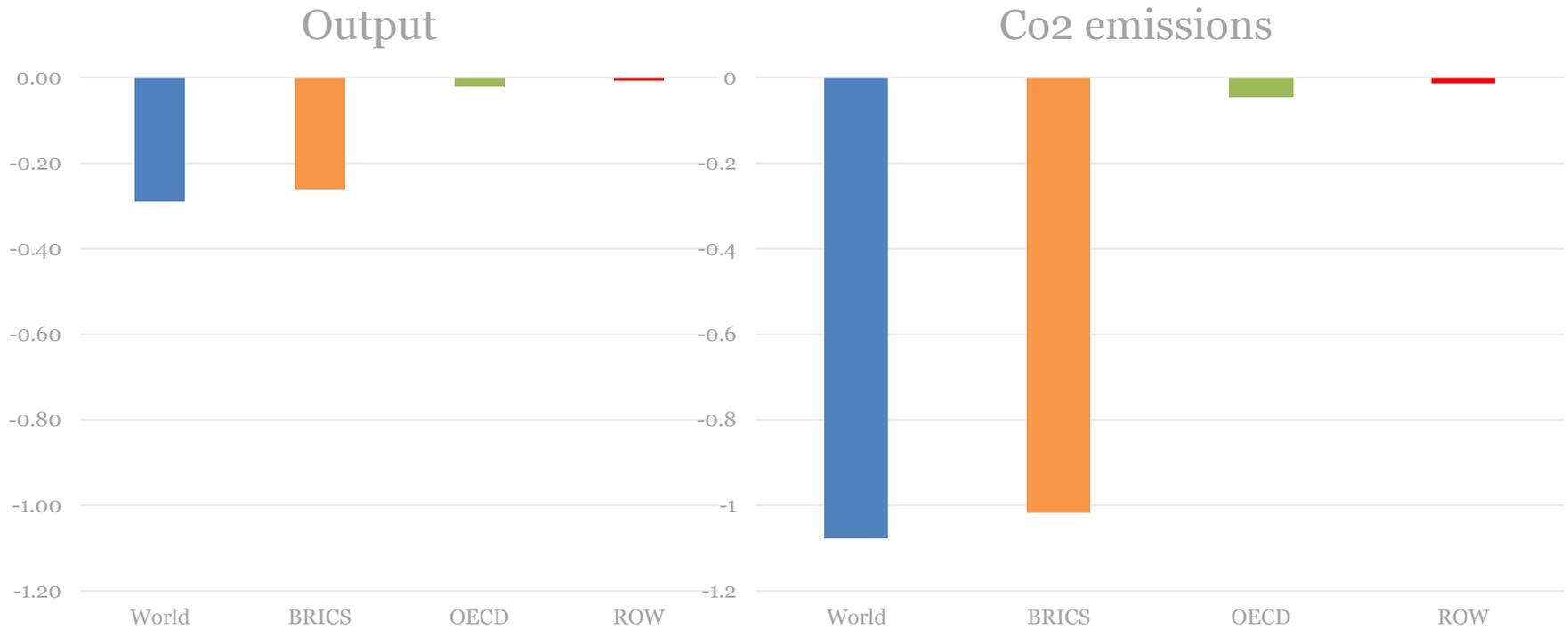
Government support does not drive the technique effect which reduces total emissions



Emission intensities of aluminium plants (major vs minor recipients of government support)



Simulations: what if we remove all government support?



Percent change in output and Co2 emissions decomposed by region



Summing up

Government support...

- ... contributes to increased emissions from aluminium and steelmaking activities:
 - mainly through an increase in production output
 - but also by moving production from more to less efficient plants
- ... does not play a role in the development of techniques enabling enhanced environmental performance



THANKS