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Lear Competition Note

When State aid overlaps with market based mechanisms: an example from energy markets

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Introduction

The European Union (EU) Treaty prohibits State aid to undertakings that might unduly distort competition and the functioning of the internal market. Nonetheless, when used as an instrument to correct market failures and promote general economic development and objectives of the Union, State aid might be deemed compatible with the internal rules.

The Communication on State Aid Modernisation (SAM) called for the identification and definition of common principles applicable to the assessment of compatibility of all aid measures carried out by the European Commission (EC).[1] The rules adopted under the SAM establish, *inter alia*, that the State Aid intervention is compatible with the internal market when it is needed and appropriate. The mere existence of market failures in a certain context is not sufficient to justify State intervention. Other policies and measures may already be in place to address some of the market failures identified. Different measures to remedy the same market failure may counteract each other. This is the case where an efficient, market-based mechanism has been put in place to deal specifically with the problem of externalities. An additional support measure to address the same market failure risks to undermine the efficiency of the market-based mechanism.[2] Member States should ensure that the same positive contribution cannot be achieved through other less distortive policy instruments.

On 7 January 2019 the EC launched, in line with the Commission's Better Regulation Guidelines[3], the evaluation of the rules which were adopted as part of the State aid Modernisation exercise. The evaluation takes the form of a "fitness check". Lear, together with DIW Berlin, E.CA, Sheppard Mullin, University of East Anglia, has been appointed by the Commission to support the fitness check in several sectors, including the aviation sector,

[1] See https://ec.europa.eu/competition-policy/state-aid/legislation/modernisation_en. The modernisation exercise had three main, closely linked objectives: foster growth in a strengthened, dynamic and competitive internal market, focus enforcement on cases with the biggest impact on the internal market, streamlined rules and faster decisions. The Commission adopted new rules in line with these principles.

[2] See the Guidelines on State aid for environmental protection and energy 2014-2020, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52014XC0628%2801%29

[3] See http://ec.europa.eu/smart-regulation/guidelines/docs/swd_br_guidelines_en.pdf.

the energy sector and the financial sector. When revising the Guidelines on State aid for environmental protection and energy 2014-2020, Lear has closely worked with the Commission to assess the interaction between state aid in the field of environmental protection and energy with the European Union Emission Trading System (EU ETS) – a market-based mechanism to reduce CO2 emissions.

The Emission Trading System

Introduced in 2005, the EU ETS is the EU's instrument to meet the Kyoto Protocol commitments and fight climate change. It is a "cap-and-trade" system, in which all European Union countries (and Iceland, Liechtenstein and Norway) participate; it limits the amount of GHG emissions[4] that firms are allowed to emit and set a price for each tonne of CO2-equivalent gasses, defining in this way a so-called carbon price. While the carbon price in itself is no different from a tax on emissions, setting a cap provides certainty on the quantity of GHG emissions that will be produced over a period of time. The number of allowances available in the market has been decreasing since 2013, when a new rule dictating an annual reduction has been introduced; each year the number of allowances is reduced by 1.74% (linear reduction factor) with respect to the amount available in 2010. The reduction factor has been increased to 2.2% in 2021.

Emission allowances are allocated in two different ways: (i) for free, or (ii) through auctions. Free allowances are allocated to manufacturing industries (but not to the power sector), in a share equal to 30% of the emissions of the 10% most efficient firms in each sector; this share will be gradually phased out until 2030. For industries with the highest risk of carbon leakage[5], the share of free allowances is 100%. The remaining allowances are auctioned in single round, sealed bid, uniform-price auctions. At the end of each year, firms have to surrender the allowances needed to cover their GHG emissions level; firms with a shortage of allowances can also trade among each other, obtaining allowances from those with a surplus (although trading might not always be a solution, as firms are also allowed to bank allowances and surrender them in subsequent years); firms that are unable to cover the emissions level, have to pay a fine of €100 per additional tonne of CO2-equivalent. The level of the fine plays a pivotal role in the functioning of the EU ETS, as it is much higher than price of allowances (for reference, the auction price of allowances in May 2021 was around €51), and therefore acts as an incentive for firms to either buy allowances or reduce GHG emissions.

The waterbed effect

The interaction between the EU ETS and financial support for decarbonisation policies has been at the centre of economic debates for more than a decade.

A wide literature justifies the combination of EU ETS and decarbonisation policies to achieve different policy goals and address other market failures. The underlying reasoning is that the implementation of incentive-based policies such as carbon pricing stimulates the investment in and diffusion of low-cost CO2 abating technologies, but still doesn't make the adoption of more expensive technologies (e.g. renewable energies technologies) attractive. Currently costly technologies have indeed a large potential of cost reductions through learning effects, research and development (R&D) investments and economies of scale. They can prove to be a crucial instrument to meet emissions reduction targets at moderate costs in the long term. For this reason, ETS alone is not efficient and should therefore coexist with different instruments such as renewable energies sources (RES) support: dedicated subsidies would allow more expensive technologies with cost-reduction potential to develop, bridging the so-called

[4] The gasses cover by EU ETS are: carbon dioxide (CO2), nitrous oxide (N2O), and perfluorocarbons (PFCs).

[5] Carbon leakage refers to the situation that may occur if, for reasons of costs related to climate policies, businesses were to transfer production to other countries with laxer emission constraints (source: European Commission).

valley of death[6], and thus counterbalancing the "lock out" effect of immature and promising technologies induced by carbon pricing.

On the other hand, overlapping policies such as ETS and renewable energy sources (RES) support are considered emission neutral, meaning that when the emission from electricity generation is priced or the cap is binding – as in the EU ETS – an increase in electricity from RES offers zero incremental emission reduction. The underlying rationale is that firms affected by a policy aimed at reducing emissions will in turn reduce their need for allowances, inducing a drop in demand. The perverse effect of this interaction is that it determines no abatement of cumulative emissions at the EU level: as the emissions are capped, the lower demand for allowances in one part of the EU ETS signals the need for less abatement in other parts of the capped system (or to defer abatement in the same part), leading to a net effect of zero on the level of cumulative emissions. In the economic literature, this is known as the "waterbed effect". However, this theory neglects that the cap is not static, but subject to policy reforms, and can be adjusted when there is a surplus of allowances. Recent research on the subject points out that the waterbed effect might be mitigated during the fourth phase of the EU ETS (2021-2030), thanks to the introduction of the Market Stability Reserve (MSR).

The Market Stability Reserve: will it be able to puncture the waterbed effect?

The MSR has been introduced in 2015 (but has started operating in 2019), with the aim of reducing the surplus of allowances in the market. Each year, the European Commission publishes by May 15 the total number of allowances banked by firms for future use: if the number exceeds the 833 million threshold, the number of allowances auctioned the next year is reduced by 24% (12% after 2023), and these allowances are placed in the reserve. Then, when the banked allowances drop to/below 400 million, 100 million of allowances are auctioned each subsequent year, until the reserve is empty. In addition, as from 2023, the MSR will hold only as many allowances as the amount auctioned the previous year, which, according to some estimates, should be around 57% of the annual cap. Allowances over this threshold will be cancelled. Considering that the MSR is seeded with 900 million allowances, plus all the unallocated allowances from the third phase (2013-2020), and that the allowance cap is reduced each year, this means that there will be scarcity of allowances in circulation, leading to a higher carbon price.

The effect of the MSR is to puncture the waterbed. Ceteris paribus, one extra allowance placed in the MSR will lead to one extra allowance being cancelled. This effect persists until the number of banked allowances drops below the 400 million threshold, which depends on the linear reduction factor of the EU ETS. Therefore, the longer the MSR takes in allowances, the more cumulative emissions will be reduced. Furthermore, the puncture is retroactive: as the number of banked allowances is a market outcome, policies aimed at reducing GHG emissions have created large banks, which will lead to more allowances being put in the MSR and therefore cancelled.

Still, when the number of banked allowances drops below the 400 million threshold the MSR will stop taking in allowances and will start injecting the reserve in the market; as the number of extra allowances auctioned from the MSR (100 million) is higher than the number of allowances cancelled each year because of the linear reduction factor (around 50 million), the waterbed effect is restored. The puncture is therefore only temporary.

Moreover, this effect crucially depends on when policies are implemented, on the time horizon of their effect and on producers' expectations. For instance, a policy that is announced today but is implemented only after the MSR has stopped taking in allowances - but before the number of banked allowances is depleted - will reduce the future demand for allowances and hence the incentive to bank

[6] The valley of death concerns projects in capital-intensive sectors, which often do not have enough capital to leave the pilot phase and to be further carried out.

them, leading firms to increase their level of pollution today. This also implies that less allowances will end up in the MSR, and hence fewer will be cancelled; overall, cumulative emissions might as well end up increasing.

Instead, if a new policy that reduces GHG emissions is implemented today, demand will decline both before and after the MSR has stopped storing allowances; the net effect on cumulative emissions in this case is unclear. Therefore, the puncturing of the waterbed depends critically on both how long the MSR will keep taking in allowances, and when the bank will drop to zero. There is high uncertainty on these events, with estimates varying by decades.

Conclusion

This note has reviewed the existing debate on the interaction between the ETS, the main policy instrument of the European Unition to counter climate change, and other decarbonisation policies. Now in its fourth phase, the EU ETS is often considered the most effective policy to reduce greenhouse gas emissions.

While Member States keep increasing their efforts to cut GHG emissions, economists have been focusing on the interaction between the EU ETS and other policies aimed at reducing the production of polluting emissions, such as support for electricity from renewable energy sources. When the emission from electricity generation is priced or the cap is binding, the interaction between the two policies might actually be carbon neutral, i.e. not leading to any reduction the cumulative emissions at the European level, as a result of the so-called "waterbed effect".

What this theory disregards, though, is that the emission cap is dynamically set. With the introduction of the Market Stability Reserve, since 2019 the number of allowances auctioned is reduced by 24% of the amount banked by firms for future use, and from 2023 onwards the number of allowances held in the MSR will be capped at a maximum equal to the amount auctioned the previous year. This will create scarcity and induce a price increase in the market. The waterbed could therefore be punctured.

Still, the puncture could be only temporary, and the waterbed will be restored once the MSR start pouring allowances in the market. This depends on two factors: how long the MSR will keep taking in allowances, and when the number of banked allowances will drop to zero. There seems to be no consensus in the economic literature about when these two events will happen, as estimates vary by decades; while the puncturing of the waterbed effect is only temporary, it could take a long time before the hole is patched and the interaction between the EU ETS and other policies becomes carbon neutral once again.

References

Agora Energiewende und Öko-Institut (2018): "Vom Wasserbett zur Badewanne. Die Auswirkungen der EU-Emissionshandelsreform 2018 auf CO_2-Preis, Kohleausstieg und den Ausbau der Erneuerbaren"

Burtraw, D., Keyes, A., Zetterberg, L. "Companion Policies under Capped Systems and Implications for Efficiency - The North American Experience and Lessons in the EU Context" *RFF report - Resources for the Future* - 2018

Del Río González, P. "Why does the combination of the European Union Emissions Trading Scheme and a renewable energy target makes economic sense?" *Renewable and Sustainable Energy Reviews* - 2017

Marcantonini, C., Teixido-Figueras, J., Verde, S. F., Labandeira, X. "The EU ETS and its Interactions with other Climate and Energy Policies", *European University Institute - Robert Schuman Centre for Advanced Studies (RSCAS) Policy brief* - 2017

Perino, G. "New EU ETS Phase 4 rules temporarily puncture waterbed", *Nature Climate Change* - 2018

Rosendal, K. E. "EU ETS and the waterbed effect", *Nature Climate Change* - 2019

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