

POLICY BRIEF

15 years of the carbon market: six lessons for strengthening the system

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○ **Setting the cap: tighter constraint needed!**

For 15 years, the emissions cap has been based on non-binding climate targets. The move to a 55% reduction target in 2030 compared to 1990 provides a historic opportunity to strengthen the emissions trading system.

○ **Governance: where's the pilot in the event of turbulence?**

To ensure that the market can be managed in the face of unforeseen events and to ensure the transparency of the CO₂ price trajectory, an independent authority would have the power to allocate and withdraw allowances in the same way as a central bank.

○ **The scope of the scheme: time to change gear!**

From 2023 onwards, the emissions trading scheme should cover all CO₂ emissions linked to the use of fossil fuels (including international transport) and industrial processes.

○ **The allowances bonanza: how should the carbon rent be redistributed?**

The strengthening of the system will lead to an increase in carbon rent. From 2023 onwards, it would be possible to return almost €400 to each EU citizen from this rent to support them in the low-carbon transition.

○ **When the system subsidises fossil fuels: hands off my allowances!**

In order to support the industrial sectors subject to allowances in the transition and to strengthen their competitiveness, it is crucial to put an end to the free allocation of allowances.

○ **Protecting the border: the art of inclusive levies.**

Behind the technical debate on the border adjustment mechanism there lies a major political question: how can the EU convince its partners that it is now time, by extending carbon pricing, to make free trade conditional on higher climate standards?

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In combatting the spread of Covid, governments have used the weapon of lockdown. In terms of the economy, lockdown has rationed work on the supply side and consumer purchases on the demand side. This double rationing brought the economy to a halt and resulted in an unprecedented decline in CO₂ emissions. But it is the stock of CO₂ accumulating in the atmosphere that is warming the planet, not the annual flow of emissions. To stabilise this stock, such rationing would have to be maintained for at least two to three decades. Few citizens would be willing remain under lockdown for the next thirty years!

On the other hand, it is possible to ration CO₂ emissions from energy sources without immobilising the economy. The way to do this is by introducing flexibility through the trading of emissions rights. The scarcity thereby created gives rise to a price, which provides the signal required to make a timely transfer of fossil-dependent assets to those freed from this addiction. The introduction of a CO₂ price causes adjustments similar to those of double rationing: the carbon price induces both producers and consumers to move away from carbon-based energy.

The European Union introduced such a rationing system in 2005 in the form of the emissions trading scheme (EU ETS), capping CO₂ emissions from energy and industrial installations – the largest carbon market in the world. During its first fifteen years of existence, this market has experienced many ups and downs. Though often disparaged, it has withstood these various shocks: the great recession of 2008-2009, attacks by cyber-criminals, the euro crisis, the delaying tactics of lobbies to avoid the constraints, Brexit...

The Commission is preparing a reform proposal that will be put on the table in June 2021. Will it enable us to engage in emissions rationing leading to climate neutrality by 2050? From the experience of fifteen years of operation, I here present six lessons learned for making the EU-ETS a powerful instrument for decarbonising the economy.

Lesson 1 - Setting the cap: tighter constraint needed!

In any emissions trading scheme, the setting of the emissions cap is the most crucial decision. It determines the degree of constraint on the players, and hence the degree of scarcity that will drive the price up or down.

During the trial phase of the market (2005-2007), the cap was set in a decentralised manner, with each Member State having a large degree of autonomy and limited information on the quantities emitted by the installations covered. The upshot of this was that most Member States were overly generous towards their industries. Far too many allowances were distributed. Their price quickly tended towards zero!¹

One might assume that this was a mistake stemming from youthful inexperience. But analysis of the subsequent phases of the market shows that the problem went far deeper.² Much has been written to explain the recurrent imbalance between supply and demand on the European carbon market and the resulting low prices. However, the root of the problem is easy enough to identify. Since the start of the market, the level of the cap has been set according to the European Union's climate objectives, with regard to all greenhouse gas emissions. Yet despite appearances and self-justifying rhetoric, these targets have never actually been binding.

The second phase of the carbon market (2008-2012) overlapped with the compliance period of the Kyoto Protocol. The emissions cap was therefore set to facilitate the achievement of the Protocol's objectives: a reduction of 8% for total EU emissions compared to 1990. In itself this target was not very binding, as the EU had already reached its emissions peak in 1980. By adding the

possibility of using offset credits under the project mechanisms, the constraint became very “soft”. This is exactly what happened with the ETS. The fact that installations were able to use these credits for compliance meant that the effective cap was raised by a little over 10%. As a result, the price of allowances had fallen to €6 per tonne by late 2012 in a market that was permanently over-allocated.

Graph 1

Price trends for allowances and certified emission reductions (2005-2019)



Source : European Environment Agency, [Eionet Report](#), Dec 2020

The cap for the third phase of the market (2013-2020) was set directly at EU level, with reference to the objective of the Climate and Energy Package adopted in December 2008: a 20% reduction in emissions by 2020, compared to 1990. Was this a binding target? Let’s just take a look at the EU’s emissions curve. The target was reached in 2013, in the first year of the period: the emissions trading system was superfluous to meeting it in 2020!

At the time the rules setting the cap for the fourth phase (2021-2030) were established,³ the EU target, submitted to the United Nations in the context of the Paris Agreement, was a 40% reduction by 2030 compared to 1990, corresponding to a 43% reduction in emissions covered by the emissions trading scheme compared to 2005. Here again, the target was not very binding: for the part covered by allowances, it was virtually reached at the end of 2020 due to the contraction caused by Covid-19!⁴ Once again, we were heading straight for a fourth phase with no real constraints.

The European elections in May 2019, the resulting ‘greening’ of EU institutions, and the catalyst of the pandemic have changed the picture. After a complicated process, in December 2020 the European Council raised the climate target to a minimum 55% reduction. The figure is the revised EU contribution submitted to the United Nations in the run-up to the next COP in Glasgow (November 2021). This demanding target is likely to reinvigorate the allowances instrument if the cap for the fourth period is adjusted accordingly.

Among the proposals on the table, the Commission could possibly draw inspiration from what has been suggested by the organisation Carbon Market Watch: moving from an annual rate of cap reduction of 2.2% to around 6% from 2023, or alternatively reducing it to just over 3% after purging the system by a 25% cut in the cap in 2023.⁵ To deliver its potential, such adjustment should be

accompanied by a thorough review of governance to make the instrument simpler, more manageable and more comprehensible to citizens.

Lesson 2 - Governance: where's the pilot in the event of turbulence?

While the principles of an emissions trading scheme are very simple – rationing with flexibility –, its implementation in the EU is becoming increasingly complex. Although this complexity is sometimes blamed on a Brussels technocracy cut off from reality, in actual fact it reflects inadequate governance, in which decision-making is becoming ever more time-consuming. In order to strengthen the exchange system, its governance should be modified by delegating its management to an independent authority based on a model similar that of central banks.⁶

The setting of climate objectives in terms of emission reductions, the required changes in production and consumption patterns, and the instruments to be used to achieve them, should of course remain a political prerogative. Within the framework of the European institutions, it is the Council that assumes executive power with the help of a very special institution – the Commission – which has a major role in making proposals but few real powers of execution. In the case of the emissions trading scheme, the Commission has to play a dual role: defining the rules for the operation of the market upstream and implementing them by supervising the operation of the system during each period.

These rules are defined at EU level, for periods that grow longer over time: three years for the initial test phase, five years for the second period, eight years for the third and ten years for the fourth, which began on 1 January 2021. Before each phase, a series of regulations and laws are adopted, sometimes with an almost surreal degree of precision. Once adopted, they leave the Commission very little room for manoeuvre to react to unforeseen circumstances. To put it graphically, once the flight plan has been drawn up, the aircraft does not have a pilot who can react to turbulence.

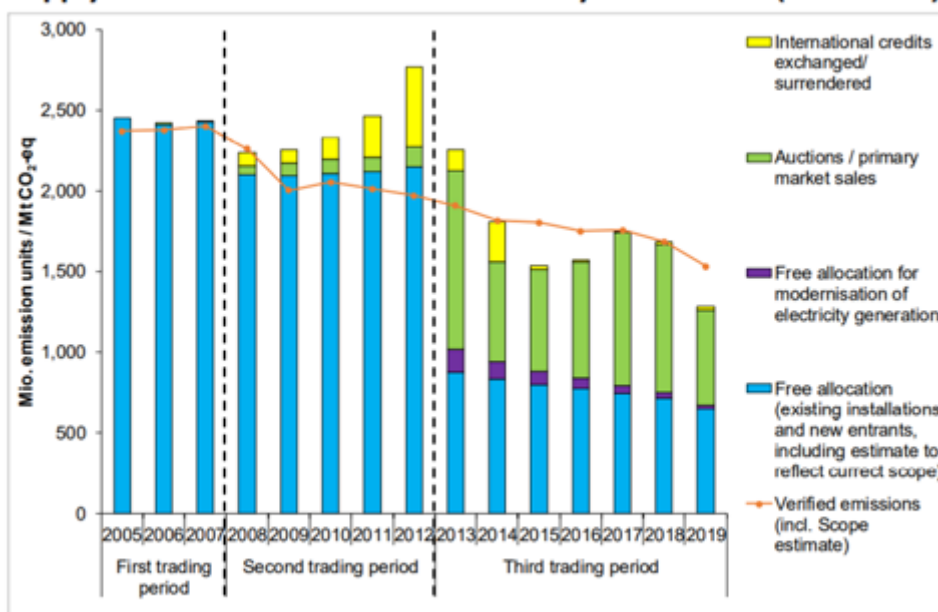
The examples could be multiplied. From the start of phase 2, it became apparent that the opening up of the Kyoto offset credits cancelled out the impact of the reduction in the agreed cap. The Commission then tried to slow down the inflow of credits by means of qualitative restrictions, but to little avail. For it did not have the requisite authority to take the only measure that would have solved the problem: keeping the effective cap unchanged either by blocking the entry of credits or by withdrawing the same number of allowances as the offset credits used.

The profound imbalance between supply and demand for allowances was perfectly clear from 2011-2012, before the start of the third phase (Graph 2). As it was too late to change the rules, the Commission was forced to engage in the tortuous exercise of delaying the auctioning schedule (the so-called “backloading” decision) and waiting until 2018 to institute a Market Stability Reserve that would only start withdrawing allowances from circulation in 2019.

The outcome of these twists and turns was a serious market failure, where the allowance price remained at a standstill between 2011 and 2018, below the threshold that would have led the electricity generation system to switch from coal to gas.⁷ Throughout this period, the market did not deliver any emission reductions and consequently the EU missed out on many very low-cost reductions.

Graph 2

Supply and demand balance for stationary installations (2005-2019)



Source: EEA (2020a), EEA (2020b)

To guard against such mishaps, the two functions currently allocated to the Commission should be decoupled, by relieving it of its market supervision role and assigning that to an independent authority, on the model of a central bank which manages the money market through its sovereign power to create or destroy money.⁸

The corollary of this change in governance would be a change in the operation of the stability reserve. This reserve absorbs or releases the allowances in circulation according to a quantitative criterion (the overall quantity of allowances in circulation). It is built on a unique model: whether it is a question of money, financial assets, agricultural products or any other underlying asset, market regulation is usually based on the price indicator, the only one known in real time.

Using a quantity indicator instead of a price to regulate a market gives rise to various problems. Quantities are only known with a time lag: more than a year in the case of CO₂ allowances. Rather too long an interval to react to shocks!⁹ Moreover, regulation by quantities risks encouraging strategic behaviour that has effects contrary to the objectives targeted.¹⁰

For these reasons, the quantity indicator should be replaced by a price indicator for managing the stability reserve, by establishing a de facto floor and ceiling. The floor price could be set in such a way that it would never be profitable to burn coal instead of natural gas to generate electricity, or set with a target for 2030 allowing the production of green hydrogen instead of hydrogen derived from hydrocarbons without any subsidy. These considerations lead us to recommend a minimum price ranging from €45 per tonne in 2023 to €100 in 2030. The ceiling price could simultaneously be set at twice the floor price.

In practice, there are many reasons, starting with variations in the world price of fossil fuels, why the trajectory set ex ante may not correspond to the emission reductions targeted. If the price of allowances is permanently at the floor price, this is a signal that the cap is not sufficiently binding. It will then be up to policymakers to decide whether to raise the climate target accordingly by means of the independent authority withdrawing allowances from circulation. Conversely, if the price of the allowance reaches a long-term ceiling, policymakers will have to decide on additional measures (or

raise the price ceiling) to ensure that the climate objectives are met. The division of labour between policymakers on the one hand and the independent authority on the other is clearly defined.

Lesson 3 - The scope of the scheme: time to change gear!

A standard rule for carbon markets is to test the scheme on a limited scale and then expand it. This approach has been followed in California-Quebec and China. Despite the initial intentions, it did not work well in Europe, where the emissions covered by allowances were around 46% of the total during phase 1, but only 38.5% at the end of 2019.

In the trial phase (2005-2007), only the CO₂ emissions from some 10,000 industrial and energy installations were included in the scheme. These accounted for just over 46% of European greenhouse gas emissions (excluding land use changes). This was a high proportion for a start-up phase, which in any case was surprisingly brief.

The scope was extended in 2012 and 2013, with N₂O emissions from the chemicals industry and non-CO₂ gases arising from aluminium processing being included in the scheme (2% of total emissions). The second phase was originally intended to cover all aviation emissions, which are also included in the EU's climate commitments.¹¹ While the inclusion of non-CO₂ gases from industry did not present any problems, the situation regarding civil aviation emissions was convoluted. Faced with the hostility of airlines, the EU abandoned the idea of including emissions from international flights in the cap-and-trade system. Instead, it decided to set up a scheme for domestic flights only (about a third of the total), which would be linked to but not completely merged with the cap on emissions from fixed installations.

Despite the expansion between the second and third phases, the amount of emissions covered declined between 2005-2007 and 2009. Emissions subject to the ETS fell much faster (by 33%, and by 35% for emissions from fixed installations alone, compared to 2005) than total emissions (down 25%). For this reason, the Commission will be making proposals in June to extend the scope of the scheme.

Of the emissions not covered, three groups can be distinguished in decreasing order of importance: emissions from transport; emissions from fossil fuel combustion in buildings and small industrial, artisanal and agricultural installations; and methane and nitrous oxide emissions from agriculture and waste management.

Agricultural emissions have their own specificities due to the multiplicity of sources and the technical difficulty of estimating them. It is neither possible nor desirable to include them directly in the ETS. The inclusion of emissions from the waste sector is also fraught with problems of calculating them. For methane emissions, inclusion is not considered desirable. On the other hand, the inclusion of incinerators should now be feasible because it is technically possible to calculate the proportion of CO₂ emissions of non-biogenic origin (the only ones that should be covered by allowances) at stack outlets.¹²

On the other hand, none of these difficulties arise when it comes to capping the CO₂ emissions caused by the combustion of fossil fuels: it is sufficient, as has been done for several years in California and Quebec, to distribute allowances upstream (mainly to refineries and import terminals). These regulation points are limited in number and already known since they are used to calculate harmonised energy excise duties in the 27 Member States. Contrary to what is sometimes claimed, there are no technical obstacles to extending the carbon market base to all these emissions. Doing so would make the EU the first major economic area in the world to price all greenhouse gas emissions related to fossil fuel use and industrial processes.

The reasons preventing this leap forward are primarily political. Powerful lobbies opposed to it allege that it faces technical obstacles. Paradoxically, they are joined in their opposition by environmental NGOs, which are in favour of including emissions from international aviation and shipping but not from road transport and buildings. Their fear is that such inclusion would come at the cost of relaxing existing regulations in these sectors.¹³ Economically, however, a carbon price would in fact reduce the cost of implementing these regulations, and would facilitate their tightening rather than easing.

An additional argument is sometimes offered: it would take much higher CO₂ prices than with energy production to generate emission reductions in land transport and buildings. But the argument is misleading, because the efficiency gains from carbon pricing are all the greater when there is a wide spread of costs among the entities subject to it.

The real obstacle to such an enlargement, which is highly desirable for speeding up the decarbonisation of the economy, concerns its redistributive implications – and these are something that the EU as currently organised is unwilling to address.

Lesson 4 - The allowances bonanza: how should the carbon rent be redistributed?

When a cap-and-trade system is set up, the rationing of emissions creates a price. By multiplying this price by the volume of emissions, we obtain a value: €42 billion in 2005, €8.5 billion in 2013, €40 billion in 2019. This value is a rent, created by scarcity. To extend the cap-and-trade system to diffuse emissions, part of this rent should be redistributed to the most vulnerable households, to prevent a backlash arising, such as the “gilets jaunes” movement.

During the first two phases (2005 to 2012), the great majority of CO₂ allowances were allocated free of charge. The carbon rent was distributed to companies which were obliged to surrender part or all of it each year depending on the amount of their emissions.

There were multiple distributional impacts within the productive system. Some companies used this rent to reduce their emissions – precisely the aim of the scheme! Some were able to benefit from initially over-generous allowances – mainly in the case of industrial companies. And some were able to keep the rent by passing on to their customers the value of the allowances they received free of charge – a situation that occurred mostly in the electricity sector, for which the auctioning of allowances was introduced in 2013.

From 2013 onwards, the allocation of allowances by auction has theoretically been the norm (except in the aviation sector where there is 15% auctioning and 85% free allocation). The original timetable provided for the gradual phasing out of free allocations in industry between 2013 and 2020 and granted transitional exemptions in the electricity sector for ten low-income countries that had joined the EU since 2000. A new public resource thus emerged: the proceeds of auctions.

Over the third phase as a whole, revenue from auctions accounted for 40% of the carbon rent. This figure fluctuated from year to year (Table 1), as the restrictions on the supply of allowances during this phase concerned auctions only – a choice based on reducing the public resource rather than touching the free distribution of allowances.

In Phase 3, auction proceeds were returned to Member States according to a distribution formula based on 88% of their share of historical emissions and 10% of priority targeting to the ten countries mentioned above plus a 2% ‘Kyoto bonus’ for some of them. The regulations recommend that at least half of these proceeds be used by Member States for internal or external climate action. According to their declarations, this happened for 78% of the income, mainly for domestic measures.¹⁴

A complementary programme, known as NER-300, was entrusted to the European Investment Bank, which sold 300,000 allowances for the sum of just over 2 billion euros to finance industrial demonstrators.

Table 1: Estimated carbon rent and auction share

	CO ₂ Price €/t	Verified Emissions GtCO ₂ eq	Carbon Rent Bns €	Auctions Revenues Bns € % of the Rent	
2005	21,1	2,01	42,40		
2006	17,3	2,04	35,22		
2007	0,7	2,17	1,43		
2008	22,3	2,12	47,27		
2009	13,2	1,88	24,74		
2010	14,3	1,94	27,81		
2011	13,1	1,90	24,86		
2012	6,3	1,95	12,31	0,62	5%
2013	4,4	1,96	8,55	3,55	42%
2014	6,9	1,87	12,95	3,17	24%
2015	8,1	1,86	15,10	4,93	33%
2016	5,3	1,81	9,51	3,79	40%
2017	5,8	1,82	10,55	5,52	52%
2018	15,6	1,75	27,23	14,18	52%
2019	24,7	1,60	39,50	14,17	36%

Data source: EEX & European Commission

Note: In 2019, the auctioning of UK allowances was suspended in preparation for Brexit. These allowances were put on the market in 2020 and no longer appear in EU auctions.

In essence, this logic of favouring large historical emitters and leaving a considerable amount of discretion to Member States was carried over in 2018 to the 2021-2030 phase. NER-300 is to be replaced by the Innovation Fund, monetising at least 450,000 allowances over the period. The Kyoto bonus has been converted into a Modernisation Fund dedicated to restructuring projects, targeted primarily at the ten countries.¹⁵

In February 2021, the allowance price rose above the €40/t mark. If this recovery is maintained, it will considerably increase the financial resources available for climate policies. On a like-for-like basis, if we assume that auctions are held in 2023 at the minimum price of €45/t, this would increase their revenue to over €130 billion. Does it make sense to redistribute this windfall in the same way? Widening the scope of coverage needs to be accompanied by a new approach to the distribution of carbon rent.

The proceeds from the auctioning of international transport allowances should logically be added to the European budget's own resources, as is the case with customs duties. The same applies to the expected proceeds from the border adjustment mechanism.

The 50% that Member States are required to earmark for climate action can be retained, provided that the actions are better defined and reporting by Member States is strengthened.¹⁶

The remaining 50%, plus the proceeds from the auction of diffuse emissions, should be returned to households. Such a redistribution is advocated by many economists in the case of a tax.¹⁷ In France, it was recommended by the present author in 2013 for a third of the proceeds of the carbon tax introduced in 2014,¹⁸ though it was never followed up by the government.

The most appropriate solution would be a flat-rate per capita redistribution, based on the "Carbon Dividend" proposals supported by a number of US economists¹⁹ and some NGOs.²⁰ Such a redistribution has the added advantage of being straightforward and easy to understand. It could take the form of a "green cheque" that each European citizen would receive. According to our calculations

(Box 1), Member States could distribute a cheque of around €400 to each EU citizen in 2023 to help them meet the rising price of fossil fuels.

Box 1: Potential carbon rent in 2023 and its use

Hypotheses. Full pricing of emissions from fossil fuel use is introduced in 2023, by including diffuse CO₂ emissions and international transport in the ETS. The price of carbon is set at a minimum of €45/t. All allowances are auctioned. Emissions in 2023 are globally estimated to be 13% lower than in 2019, with a faster decline for fixed installations subject to allowances in 2009 (down 20%) than in other sectors (down 8% for emissions from buildings and small installations and 5% for transport). For the border adjustment mechanism, I have used the middle of the estimation range quoted by the European Parliament report.

Under these assumptions, the total carbon rent amounts to €131 billion in 2023. Its redistribution according to the rules proposed in the text is given in the table below. It allows each European household to be given a cheque of just under €400 over the year.

Distribution of carbon rent in 2023

	€ bn
Modernisation & Innovation Fund	13
National climate policies	22
Green cheque	75
EU-27 own resources	21
TOTAL	131

An alternative solution sometimes put forward would be to distribute individual allowances free of charge to citizens, who could then trade them.²¹ However, the experience of 15 years of carbon trading reveals the dangers inherent in the free distribution of allowances.

Lesson 5 - When the system subsidises fossil fuels: hands off my allowances!

The free distribution of allowances facilitates the acceptability of the scheme at the outset. Economic theory shows that in perfect competition, it does not alter the incentives to reduce emissions.²² However, 15 years of operation of the carbon market have taught us how free allowances can undermine its effectiveness.

Under the free allocation system, whether for countries or industrial installations, there needs to be benchmark against which allowances are distributed. The simplest method, known as “grandfathering”, involves using a historical benchmark. This method was used during the first two phases of the European market.

Its main drawback is that it favours large historical emitters to the disadvantage of those who have taken early action to reduce emissions. The method was therefore abandoned in the transition to the third phase in favour of sectoral benchmarks, ranking installations in order of increasing efficiency (in terms of the amount of CO₂ emitted per unit produced) and allocating allowances to the most efficient 10%.

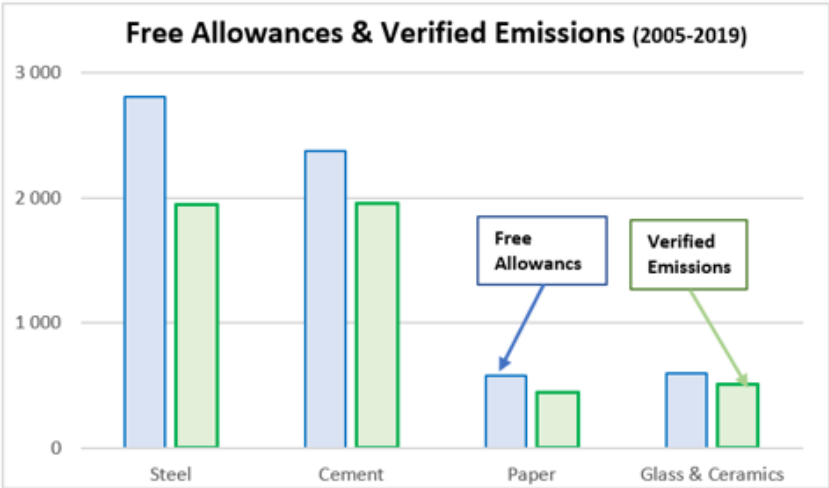
This shift to sectoral benchmarks has required fairly extensive technical work to produce a better understanding of the variety of situations within each industrial sector. It has allowed certain abusive situations to be corrected, but it has also led to a high degree of complexity favouring the action of the best technically equipped lobbies. Nor has it helped reduce the proportion of free allowances, as initially intended. Theoretically reserved only for sectors subject to strong international

competition, free allocation continues to be used for more than 90% of the allowances allocated to industry. In its audit report, the European Court of Auditors estimates that 40% of allowances will continue to be distributed free of charge during the fourth phase, if the rules adopted in 2018 are not changed.

Maintaining a large volume of free allowances has greatly weakened the system. In the electricity sector, countries that have benefited from exemptions have reduced their emissions much less than others. In the manufacturing industry, changes in emissions have been driven by economic and oil price fluctuations rather than by action to reduce CO₂ emissions. The large companies producing steel, cement and other commodities have become experts at capturing carbon rent. But effort they devote to defending their free allowances would be far better spent on decarbonising their processes and reducing the use of fossil fuels.

It has to be said that free allowances represent a huge subsidy to fossil fuels. From 2005 to 2019, the majority of large industrial companies received more free allowances than they surrendered for compliance (Graph 3). The scheme was designed to give them an incentive to reduce their emissions. Instead, it generated net subsidies for the largest CO₂ emitters. In 2019, free allowances represented a transfer of just under €20 billion to these industries. With the prices seen in early 2021, this transfer could amount to more than twice that figure!

Graph 3



Data source: EEA (2021)

Note: For the iron and steel sector includes allowances for emissions that are actually reported under combustion installations, for example if blast furnace gas is burnt in power plants.

If we want to initiate in-depth decarbonisation of the industrial sector, we should be more tenacious in pursuing the objective specified at the start of the third market period: to switch to a system where all allowances are allocated by auction. Doing so will simply be a matter of bringing reality into line with the stated aims, in that, officially, since 2013 “auctioning is the default mode of allocation of allowances”.²³

Such a switch would not alter the conditions of competition between European producers and the rest of the world by generating “carbon leakage”. For this is the purpose of the “border adjustment mechanism” on which the European Parliament²⁴ has taken a position before the Commission presents its own proposals in June 2021.

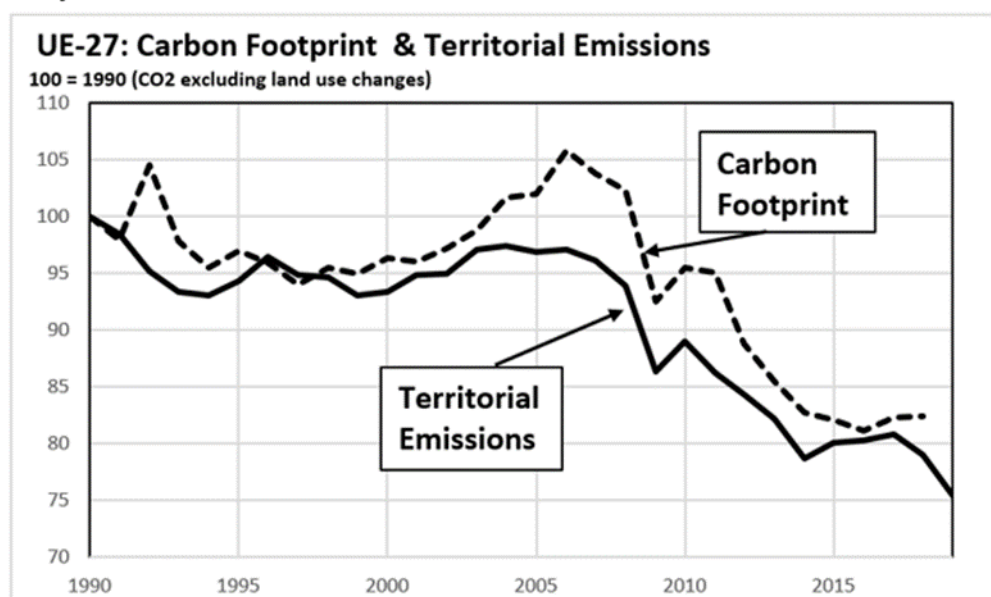
Lesson 6 – Protecting the border: the art of inclusive levies!

If carbon prices were applied to all countries, the playing field would be level. A carbon price applied to only one area can affect trade, because it may encourage companies to relocate emissions to regions without carbon pricing rather than reduce them. This risk of carbon leakage raises the question of the link between the EU's climate policy and its trade policy.

Empirical studies of the EU ETS²⁵ find no evidence of such carbon leakage. This is not really surprising given the levels of the CO₂ price to date and the size of the financial transfers to carbon-emitting industries through free allocation of allowances.

Comparing the EU's territorial emissions with its consumption footprint confirms the diagnosis. Since the start of the cap-and-trade system, the consumption footprint has in fact decreased slightly more rapidly than territorial emissions (Graph 4).

Graph 4



Data source: Global Carbon Budget (2020)

The risk of carbon leakage could, however, become more serious with the planned strengthening of the emissions trading scheme. To prevent this, the Green Deal adopted by the EU at the end of 2019 foresees the introduction of a border adjustment mechanism. Such a mechanism could follow two routes.

Two possible routes

The first was described by William Nordhaus in his article on the 'Climate Club'²⁶, referring to those countries that have committed themselves to carbon pricing. Nordhaus advocates protecting the club's border and avoiding the complexity inherent in implementing carbon pricing. He suggests that a uniform tariff should be introduced on all products imported from outside the club. The level of the tariff should be calculated on the basis of the economic damage to club countries caused by non-club members' lack of carbon pricing. In this approach, the border mechanism is a trade policy instrument aiming, through the threat of retaliation, to induce other countries to join the club.

The second option is the one outlined by the European Parliament, and also favoured by the French government.²⁷ It aims to establish a buffer between the global prices of products produced without carbon pricing and the EU price, in which the cost of the allowances is incorporated. This would

involve applying a levy on imports of goods produced without carbon pricing in proportion to the quantity of CO₂ emissions incorporated; symmetrically, exporters would benefit from a refund to compensate for the additional production costs stemming from the ETS (Box 2).

This second mechanism is similar to the one long practised by the Common Agricultural Policy (CAP), which disconnects European guaranteed prices from world prices. One of its major lessons concerns processed products. The CAP has effectively protected cereal producers, but has profoundly disrupted the livestock feed industry. It has increased the European protein deficit (soya) and encouraged poultry farms (one chicken = 2.5 kg of processed grain) to set up outside the EU, even if it means buying exported grain with export refunds.

The same type of dysfunction could occur with a carbon levy at the border. The risk would be that protecting European producers subject to allowances would harm the client industries buying their products. For example, the protection of steelmakers could be to the detriment of car production lines or could induce wind turbine manufacturers to relocate where steel is cheaper.

Who will pay?

There is a strange consensus in the political sphere around a carbon border levy. In France, it is supported as much by Yannick Jadot, who has been actively involved in the issue in the European Parliament, as it is by Emmanuel Macron, who abandoned the domestic carbon tax following the “gilets jaunes” movement.

This consensus is partly based on a fallacy, and one that is broadly believed by the general public, to the effect that the border levy would be paid by the Chinese, Russians, Americans or Turks. It would have no adverse effects on Europeans’ wallets!

However, it won’t be the EU’s trading partners who’ll pay the border levy, but the European companies using the goods concerned as intermediate consumption. It is these user sectors that are likely to bear the brunt of the operation. Located downstream in the production chains, they are often more strategic for European competitiveness than the upstream sectors.

Before any introduction of the mechanism, its impact on these downstream sectors must be rigorously anticipated, taking into account the great diversity of sectoral situations.²⁸

In three important sectors for the decarbonisation of the economy, namely electricity, fuel refining and cement, the introduction of the levy in the form of an allowance refund at the border seems relevant from 2023 onwards. In these sectors, the volume of foreign trade is relatively small. For electricity, there is also a mechanism that cushions the impact on client sectors of the increase in electricity prices resulting from carbon pricing.

In other sectors, the introduction of a border levy is probably not the right way to end the free allocation of allowances without causing carbon leakage. It would certainly be conceivable to extend the levy to CO₂ emissions associated with processed products (for example, the metal sheets used to manufacture imported vehicles or wind turbines). But the last thing the EU ETS needs is even greater complexity!

In these sectors, the proceeds of the auctions should be used to finance low-carbon conversion plans for the industries concerned, with a non-amendable timetable for the ending of free allowances before 2030. In the steel industry, doing so would pave the way for a zero-carbon primary steel production sector based on green hydrogen; in fertilisers and chemicals, it would facilitate the conversion of existing installations to bio-based products; and in non-ferrous metals, border

adjustment could be linked to a plan to reduce the carbon footprint of batteries and other components of the electric power sectors of the future.

What is an “inclusive levy”?

As Nordhaus reminds us, a border levy is not an end in itself. It is an instrument for a policy that has two components: environmental and commercial. Its introduction aims to include as many countries as possible in the club that put a price on CO₂.

So far, the expansion of the EU carbon market has involved relatively small emitters – Norway, Australia, Switzerland – and has been managed by technical experts. With the border levy, it is necessary to change gear by clearly stating the political conditions for inclusion.

With regard to the least developed countries, inclusion must be unconditional. Any suspicion of protectionism must be ruled out. The right way to apply the principle is not to exempt these countries from the levy, but to give them back the full amount, with a multiplier if the money returned is used for low-carbon investment.

It would be advisable to include the southern Mediterranean countries in the introduction of the carbon levy in the electricity sector. The levy could help finance the investments required to open up the EU market to their solar electricity resources.

A major breakthrough in international climate action would be to form a carbon club that brings together the EU, China and the US. China is in the process of introducing a domestic emissions trading scheme. President Biden was elected on a platform that promises (rather vaguely) to set up domestic carbon pricing and a border mechanism. The EU, which is still well ahead in this respect, needs to be firm on the conditions for increasing global climate ambition by linking these different schemes.

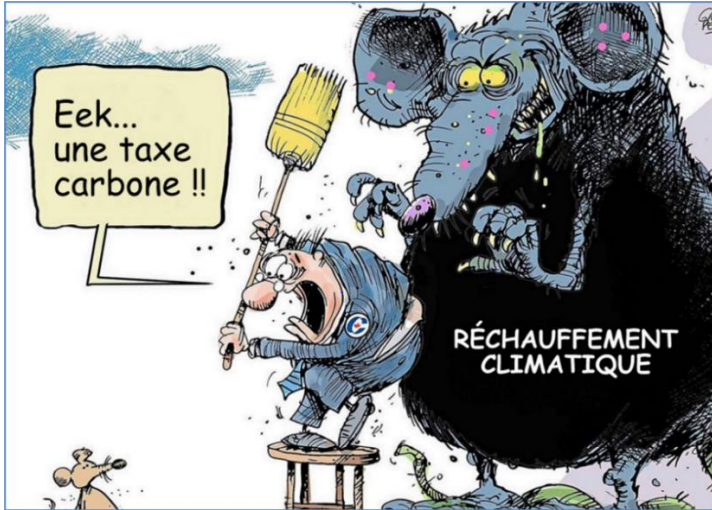
In the global cacophony provoked by the escalating trade dispute between the US and China, the EU must make its voice heard. It should put forward a new doctrine that departs from its traditional positions based on the dogmas of liberalism inherited from the 1980s. In view of the climate emergency, free trade should now be subordinated to higher climate standards.

Conclusion: the choice between higher CO₂ prices or rising global temperatures

At the conclusion of this 15-year review of the European carbon market, I would like to add a seventh lesson. It is inspired by Greg Perry’s eloquent cartoon about the Quebec carbon tax (Illustration 1).

More effectively than any economist, the cartoonist illustrates a simple truth: once carbon pricing is introduced, governments are far more concerned about the threat posed by the mouse of a carbon tax than by the monster of climate change. I have seen this many times, both in France and at EU level. So let’s stop panicking about the tiny carbon tax mouse, which is nothing compared to the climate change monster that threatens to devour us all!

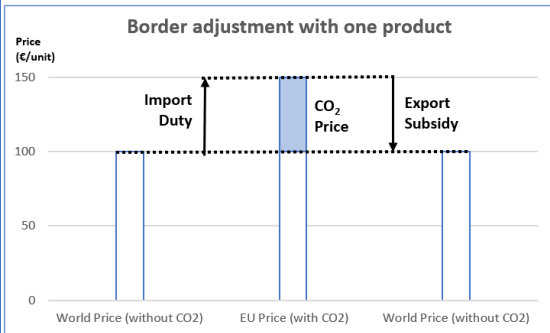
Illustration 1



Cartoon by Greg Perry on the carbon tax in Quebec

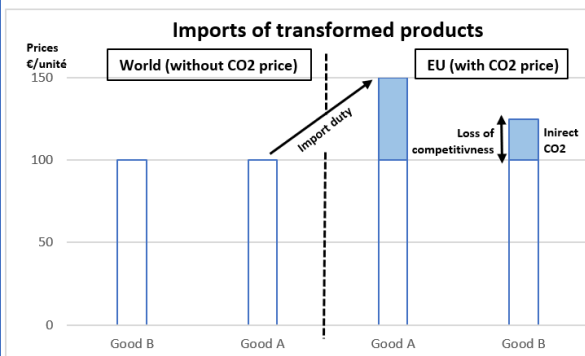
Box 2: The problem of border adjustment in three graphs

Case of one product



Product A, with a price of €100/unit, emits 1 tonne of CO₂ per unit produced. With a CO₂ price of €50, its cost in the EU is €150. The levy at the EU border increases the price of the imported good to €150. An export subsidy scheme gives EU producers access to the world market. Border adjustment protects EU producers against competition from producers not pricing CO₂. The border adjustment mechanism is the same as the one used until the early 1990s by the CAP to safeguard the price of wheat or milk for EU farmers.

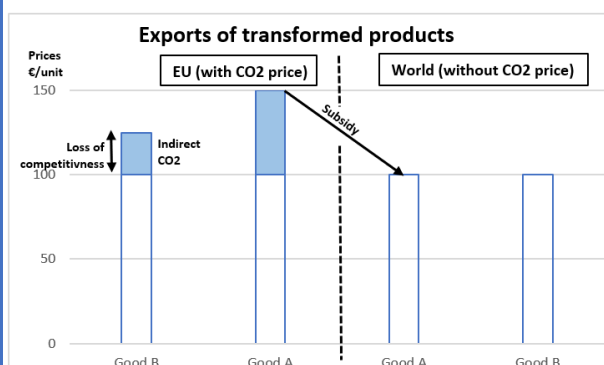
Case of two products (Import)



Good B is introduced, the production of which uses 50% of product A as intermediate consumption. The border levy increases the price of imported product A to the EU market price. Producers of B incur an additional cost of €25, which their competitors on the world market do not. It is this type of mechanism that has widened the EU's livestock feed deficit, as local producers lose this market to imported products that escape the levy (soya and protein crops). Similarly, border adjustment on unrefined steel risks undermining the competitiveness of downstream industries (automotive, durable goods, etc.). To counter this perverse effect, a compensatory subsidy of the type set up for "electro-intensive" industries could be instituted, or the levy could be extended to indirect emissions borne by importers of processed products (the CO₂ emitted by the sheet metal used to manufacture imported cars). In both cases, this creates complexity and risks increasing tensions with trading partners.

Box 2: The problem of border adjustment in three graphs

Case of two products (Export)



Through the export subsidy, border adjustment allows EU producers of product A to remain competitive on the international market, while producers of product B may have an incentive to relocate part of their production, even if it means continuing to buy the export-subsidised product A produced in the EU. This type of indirect effect was observed under the CAP when poultry farming projects proliferated in Brazil and Egypt, using grain exported from the EU and in some cases re-exporting the poultry to the EU market at prices impossible for EU farms to match. This effect illustrates what economists call “cross-subsidies”, which unless sufficient precautions are taken could affect the downstream industries processing intermediate goods subject to the carbon levy.

Footnotes

¹ Frank Convery, Christian de Perthuis, Denny Ellerman, *Pricing Carbon : The European Emissions Trading Scheme*, Cambridge University Press, 2010, pp.36-48.

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⁵ [Carbon Market Watch’s response to the public consultation on the EU Emissions Trading System \(EU ETS\) review](#), website consulted on 22 March 2021.

⁶ Christian de Perthuis and Raphael Trotignon, Governance of CO₂ markets: Lessons from the EU ETS, *Energy Policy* 75 (2014), November 2014

⁷ Boris Solier, Le rôle du prix du carbone dans la transition électrique, *Annales des Mines, Responsabilité et Environnement* N°93, January 2019

⁸ The institutional question of the extent of delegation to the Commission and the Authority also arises, as Philippe Quirion pointed out to me. This is a central question, but one that goes beyond the scope of the field covered by economists.

⁹ Christian de Perthuis, Simon Quemin and Raphaël Trotignon, Hausse du prix européen du carbone : feu de paille ou changement durable ?, *The Conversation*, 13 April 2018.

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¹¹ The existing rules under the UN Climate Convention only oblige the Parties to the Convention to report and cover emissions from domestic flights.

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- ¹⁵ Jos Delbek & Peter Vis (Editors), *Towards a Climate-Neutral Europe*, Routledge, pp.80-84. (available via open source: <https://doi.org/10.4324/9789276082569>).
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- ²¹ <https://www.comptecarbhone.org/>
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- ²⁷ William L'Heudé, Maëva Chailloux and Xavier Jardi, [Un mécanisme d'ajustement carbone aux frontières de l'Union européenne](#), *Trésor-éco* N°280, March 2021.
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