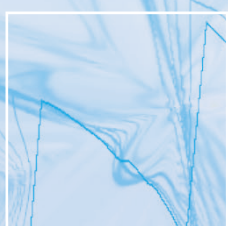
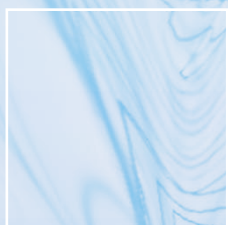


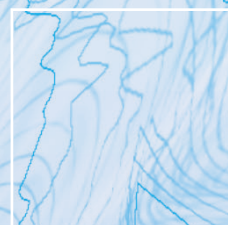
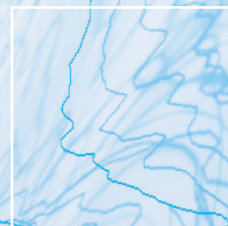
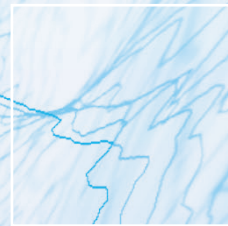


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Linking Emissions Trading Systems with Different Price Control Mechanisms

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Highlights

- Most existing Emissions Trading Systems (ETs) include their own specific Price Control Mechanism (PCM): a design feature which steers the allowance price into a desired range.
- Divergences along five key dimensions of PCMs may impact linking between ETs in several ways, positive or negative.
- Restricted linking, e.g. exchange ratios or import quotas on allowances, could mitigate adverse effects of PCM differences between prospective partners.
- Convergence towards soft and price-based PCMs is both desirable and likely difficult to accomplish.
- PCMs may increase allocative efficiency if they make the allowance supply more responsive to shocks.
- The most effective way to reduce long term price uncertainty remains creating an environmentally ambitious climate policy framework.





1. Introduction

In the context of the LIFE DICET project¹, the second session of the first Carbon Market Policy Dialogue (CMPD) on “Differences in price control mechanisms between ETSs: implications for linking” took place on 24 September 2020. The CMPD sees the participation of the regulators of six major emissions trading systems (ETSs), namely those of the EU, California, China, Québec, New Zealand and Switzerland, and a number of international stakeholders, including policymakers, researchers as well as representatives of industry and civil society. In view of the meeting, a background report (Galdi *et al.*, 2020) was produced. This policy brief offers an abridged version of the report and, in addition, it provides a selection of insights from the policy dialogue.

Whether allowance prices are too high or too low, price uncertainty risks undermining the cost-effectiveness and constitutes a disadvantage for Emissions Trading Systems. If allowance prices are too low, the economic incentive to decarbonise is not sufficient, undermining the system’s cost-effectiveness over the long term. This is the scenario that unrolled in the EU following the 2008 financial crisis. In the opposite (and less frequently observed) case in which allowance prices are too high, the ETS might lose political support.

For this reason, all existing ETSs have some form of price control mechanism (PCMs, hereafter), i.e. design features meant to keep allowance prices within a desired range. However, each jurisdiction developed its own PCM, with significant differences on the way they impact allowance prices, auction proceeds, and environmental effectiveness of the system. Since these are all very relevant aspects of emission trading, how does divergence in PCMs design affect ETS linkages?

2. ETS Integration and Price Control

To provide a clearer picture of the PCM characteristics and diversity, we proposed the following five relevant PCM dimensions to analyse.

Purpose - Some PCMs are implemented with the purpose of supporting allowance prices when they are too low, whereas others are aimed at containing them when they are too high.

Degree of Discretion - The response of most PCMs is automatic, i.e. it follows a predetermined rule, without leaving discretion to the regulator. By contrast, in some jurisdictions the activation of a PCM calls for a decision by the regulator, for example whether to buy back some allowances from the market or decide what to do with unsold ones.

Trigger - PCMs may be divided into price-based and quantity-based mechanisms, depending on whether the PCM is activated by a price or a quantity indicator. Intuitively, a price trigger (price ceiling or price floor) would activate the PCM when the allowance price reaches a predetermined threshold. Alternatively, the trigger might be an indicator of the supply of allowances: if there are too many or too few allowances in circulation, the PCM kicks in. The EU Market Stability Reserve (MSR), which subtracts or injects allowances into the market according to a two-year lagged supply indicator, is currently the only quantity-triggered PCM.

Bounds of Intervention - The impact of PCMs may be contained to the primary market, or affect the secondary market, as well. In the first case, the PCM enforces soft boundaries, whereas it enforces hard ones in the second case. A soft price ceiling increases the allowance supply by a predetermined amount if the price hits an upper threshold, relieving excess demand. By contrast, a hard price ceiling prompts the regulator to sell all allowances requested at the threshold price.

1. FSR Climate is managing an EU funded project titled LIFE DICET (Deepening International Cooperation for Emissions Trading) which supports European Union and Member States policymakers in deepening international cooperation for the development and possible integration of carbon markets – website: lifedictproject.eu.eu



Impact on Emissions Cap - Finally, PCMs may affect the emissions caps of jurisdictions if it cancels allowances from the carbon market or issues allowances in excess of the original cap. An instance of the latter is a hard price ceiling, that forces the regulator to sell any amount of allowances at the price ceiling threshold, even if these are in excess of the predetermined cap. This undermines the environmental integrity of the ETS and potentially even its regulatory certainty and political support. Whether a PCM has an impact on the emissions cap of an ETS depends on whether the injected or subtracted allowances modify the supply permanently.

3. Implications of PCM Divergences for Linking

The five dimensions we have just outlined, based on the work by Evans *et al.* (2020), provide a basic conceptual framework to characterise PCMs and to understand the implications of divergences between ETSs. We here discuss such implications, noting that the five dimensions are strictly interconnected and must be considered together to assess the compatibility of PCMs.

Purpose - While combining a price floor and a price ceiling is hardly a problem, linking PCMs with the same purpose, e.g. either floors or ceilings, is not trivial. Which would be the effective price collar following a linkage? The answer depends on whether the PCMs are hard or soft. Should both linked ETSs have hard price boundaries, the only effective PCMs would be the higher of the floors and the lower of the ceilings (Burtraw *et al.*, 2017). Indeed, higher ceilings or lower prices would be superseded and made ineffective. By contrast, should all linked ETSs have soft price boundaries, all PCMs are in principle preserved and effective. In this case, the supply of allowances would not be completely rigid, but would rather define a multi-stepped curve, whose level varies according to the demand of allowances. Finally, if the soft price floor of one ETS is higher than the hard one of the linked ETS, both PCMs are preserved. Otherwise, the soft PCM is made obsolete by the hard PCM. With price ceilings the process works in the opposite direction.

Degree of Discretion - If one ETS leaves some degree of discretion to the functioning of its PCM, there is the risk that this discretion is exploited to the detriment of the partner in what is called secondary free-riding behaviour (Weitzman, 2019). In general, PCMs whose parameters are either automatically adjusted or that need no regular adjustment should be favoured to reduce price uncertainty (Burtraw *et al.*, 2018).

Trigger - Potential drawbacks exist also when linking ETSs whose PCMs differ in the trigger dimension. A difference in the trigger type might induce the PCMs of linked ETSs to react in opposite directions (Evans *et al.*, 2020). For example, in case allowance prices reach the price trigger of an ETS, the price-triggered PCM would inject new allowances into the market. On the other hand, increased banking by regulated entities could induce the other quantity-triggered PCM, e.g., the MSR in the EU ETS, to cut allowances to reduce oversupply. For this reason, it seems crucial to harmonise the trigger or at least to consider this aspect when adjusting the PCMs in view of a possible linking.

Bounds of intervention - Hard PCMs appear as the most problematic design features in a prospective linking. In addition to the already mentioned issues in setting the price collar with hard PCMs, they also have implications on the budget of jurisdictions and on the emissions cap (more on the latter in the next paragraph). On the one hand, regulators from ETSs including a hard-price floor would need to be ready to buy back allowances exchanged in the partner jurisdiction. On the other hand, if a partner ETS has a hard price ceiling, then domestic firms might decide to purchase their allowances from the partner jurisdiction when domestic prices rise above a said ceiling. In both cases, there would be negative effects on the auctions for the domestic jurisdiction. To prevent complications and adverse budgetary consequences brought by hard PCMs, prospective partners should converge towards PCMs with soft bounds of intervention to the extent possible, although hard PCMs might prove difficult to amend as they represent a strong commitment of the regulator. In the linkages achieved to date, none of the ETSs had a hard PCM.



Impact on Emissions Cap - If one PCM has an impact on the emissions cap of its ETS, the cap of the linked carbon market is affected, as well. Thus, the environmental ambition of the linked market might be heavily affected by the PCM features implemented in partner ETSs. All hard PCMs, both floors and ceilings, and the MSR (through its cancellation provision) may impact the emissions cap.

4. Evidence from the Scientific Literature

The PCMs introduce complexity in the linkage negotiations, as the assessment of their compatibility requires a thorough analyses of the economic, institutional, and political elements of all jurisdictions involved. In addition to the most direct implications outlined in the previous section, several other crucial aspects emerge from the scientific evidence.

Companion Policies

Harmonisation between PCM features needs to account for the broader climate policy frameworks in the partners' jurisdictions, in particular those companion policies that may affect regulated emissions and allowance prices (Marcantonini *et al.*, 2017). A common illustrative example is represented by policies incentivising renewable energy sources production, ultimately lowering the demand for allowances from the energy sector. The harmonisation process of PCM features should take into account how the allowance price of the linked carbon market might be affected by climate policy frameworks from the linked jurisdictions.

Cooperation Issues

PCMs can be both an enabler and an obstacle to linkage talks. On the one hand, to the extent that a PCM would compromise the functioning of the partner ETS, the PCM is likely to be a hindrance. On the other hand, PCMs signal the commitment of prospective partners to sustain prices and keep them within a certain price range. The low prices that were long observed in the EU ETS have reportedly deterred talks on linking the EU ETS and

the California ETS (Ranson and Stavins, 2016). The presence of PCMs could have assured interested partners of the robustness and maturity of the system.

Another way in which PCMs may influence cooperation towards linking is via the setting of the price collar. Regulators have an incentive to have the lowest floor and ceiling, in order to benefit fiscally from the linkage. This constitutes a cooperation problem as jurisdictions are tempted to free-ride and adjust either their caps or their PCMs (Weitzman, 2019; Mehling *et al.*, 2018; Flachsland *et al.*, 2009).

Some scholars suggest that delegating the regulation of a linked carbon market to a supranational authority would limit free-riding among members, while also reducing regulatory uncertainty (Tuerk *et al.*, 2009). However, Doda *et al.* (2019) note that the efficiency gains from linking more than offset negative effects from any free-riding attitudes of ETS partners.

Call for Price-Based PCMs

There is an increasing agreement in the scientific community and in the political world for complementing the unique quantity-based PCM, the MSR in the EU ETS, with price-based PCMs. Some scholars (e.g. Flachsland *et al.*, 2020; Fischer *et al.*, 2019; Flachsland *et al.*, 2018) argue that legal limitations to a price floor could be currently overestimated. The implementation of a price-based PCM would be more effective in increasing the environmental ambition of the EU ETS and in containing the waterbed effect (Flues and van Dender, 2020; Osorio *et al.*, 2020). Finally, a price ceiling could shelter the allowance price from short-term speculation and shocks. This experience gives a sense of the general preference towards price-based PCMs.

Restricted Linking

The challenges of linking ETSs with different PCMs could be somewhat limited by some forms of restricted linking (Borghesi and Zhu, 2020), such as the implementation of exchange ratios or quotas among ETS partners (see



Lazarus *et al.*, 2015). An exchange ratio is a provision that gives allowances from one system a different value with respect to the allowances of a partner. In an exchange ratio, the effective price collar is determined by adjusting and sorting all price thresholds in terms of the same allowance unit. This can also lead to different PCMs being effective if the order of triggers changes with the exchange ratio. Prospective partners should thus consider the effect of the exchange ratio on the effective price collar. Another option of restricted linking would be to set allowance quotas, which represent the maximum shares of external allowances that can be used for compliance. As import quotas allow to circumvent domestic floors and ceilings only up to the determined share of allowances, import quotas mitigate the effects of allowance trading between partners. In this perspective, quotas might be useful for testing the implication of the linkage for PCMs (Quemin and De Perthuis, 2019).

Strategic Dimension

There appears to be two different strategies to address the question of what makes the best partner. The first strategy is to pursue the linking that would yield the highest gains (Doda *et al.*, 2019; Li *et al.*, 2019). The second strategy is to increase cooperation with the ETSs with which linking would be easier. The choice between these strategies becomes urgent when they point to different linkages.

Concerning the conduct of the harmonisation process, one alternative is represented by convergence on the most urgent ETS design differences, including several PCM dimensions (Burtraw *et al.*, 2013, Kachi *et al.*, 2015). The second alternative would be to pick the ‘low hanging fruit’ and initiate cooperation along the easiest dimensions to provide some immediate benefits for the parties. This can be a stepping-stone towards further harmonisation (Lazarus *et al.*, 2015): exchanging information on each other’s carbon market and achieving harmonisation between PCMs can be a useful foundation for cooperation on the hardest features to amend (Green *et al.*, 2014; Burtraw *et al.*, 2013).

This tension between the urgency and the difficulty of harmonising on PCMs, and on hard vs. soft ones in particular, is a key political hurdle. The political debate would greatly benefit from additional research addressing specific linking scenarios in which ETS partners differ with respect to PCMs and identifying possible pathways to ‘link by degrees’, as an intermediate step (Borghesi and Zhu, 2020; Burtraw *et al.*, 2013).

5. Insights from the Carbon Market Policy Dialogue

From the input of the CMPD discussion with the other participants, it emerges that the existence of a robust relationship between prospective linking partners is fundamental. The existing linkages are indeed between jurisdictions that were already quite close in terms of environmental ambition and whose relation built on mutual trust. The first step in any linkage should thus be to verify that such mutual trust exists or build it gradually. Such mutual trust is then maintained through a continuous dialogue on emerging issues in the carbon markets of partners. In particular, the linkage between California and Quebec is exemplary of this process and should inform future attempts.

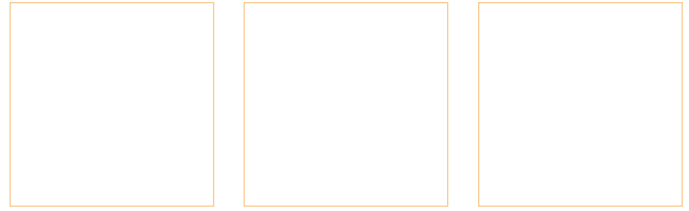
There was strong consensus among CMPD participants that the main strategy to reduce price uncertainty is to define a credible and ambitious long-term climate target. Embedding carbon pricing within a more complex climate policy framework is the safest route both to reduce the risk that political swings in the governments lead to its dismissal and to signal an overarching commitment to environmental issues. While PCMs are appropriate to tackle medium term uncertainty, it is up to regulators to propose a vision to guide allowance prices in the long term. In other terms, instead of discussing the best way to control prices, it could be better to consistently signal where we want prices to go in the future.

The discussion highlighted that what PCMs do is to transfer price uncertainty from the market (i.e. from the firms) to the public, with potential consequences on budget and environmental ambition. Participants stressed



that the design of an ETS is the result of the stakeholders engaged in related consultation. In this perspective, some CMPD participants suggested that PCMs are not neutral and tend to favour some stakeholders over the others. An argument was made that the burden of price uncertainty should fall on the shoulders of the ones who create it. Nonetheless, it was acknowledged that PCMs play an important role in preserving the usefulness of the programme, facilitate linkage talks, and signal a commitment to the instrument.

All speakers highlighted the benefits of implementing a stepped supply curve analogous to the ones of the RGGI and the California-Quebec ETS. The discussion confirmed that it could prove useful to implement it also in the EU ETS and in emerging economies, as the price responsiveness reduces the uncertainty for investors and the price thresholds are more comprehensible. A PCM implementing a stepped supply curve in the EU ETS would increase its appeal as a linking partner, as the lack of a price floor was deemed by some CMPD participants as disadvantageous in a linkage. However, some CMPD participants were sceptical towards creating an upward stepped supply curve. One concern is that PCMs with multiple price tiers may result in an overly complex design: it could be simpler to directly set a price path conditional on achieving determined quantity targets. Another concern raised regards whether a price ceiling is even necessary, as they are so seldom triggered. Finally, it was pointed out that the MSR is a very recent addition and there has not been the time to evaluate its effectiveness ex-post and could thus be premature to consider alternative ways to control prices in the EU ETS. The CMPD briefly discussed the implication of linking an ETS with a quantity-based PCM with another system with a price-based PCM. As the precise contours of the design features of the two prospective partners would be fundamental in order to draw a judgment, only two general indications could be brought forward. First, any incompatibility between the two PCMs of prospective partners can be determined by understanding what is the supply curve that would result from the linkage. Second, the relative size of the ETSs is still going to be a relevant determinant of the final linking arrangements, which



would possibly tilt negotiations towards harmonisation towards one or the other PCM.

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