



**Submission to the inquiry by the
House of Commons Select Committee on
Energy and Climate Change on
'Linking Emissions Trading Systems'**

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Policy paper

April 2014

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the Environment**

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This policy paper is intended to inform decision-makers in the public, private and third sectors. It has been reviewed by at least two internal referees before publication. The views expressed in this paper represent those of the author(s) and do not necessarily represent those of the host institutions or funders.

1 Introduction

1. This submission to the inquiry by the House of Commons Select Committee on Energy and Climate Change on 'Linking Emissions Trading Systems' offers the results of analysis that is relevant to the following questions from the terms of reference:
2. What are the main challenges to linking emissions trading systems and what are the consequences of failing to address them adequately? Specifically:
 - 2.1. How can differing levels of ambition in terms of emissions caps in different systems best be managed?
 - 2.2. How can systems between countries at different stages of economic development be harmonised?
 - 2.3. How can national priorities and particularities best be catered for?
3. What are the essential common features of linked emissions trading systems? Do these include common definition of emissions? Do linked systems have to cover emissions from the same sources and have the same banking and time periods? How can the rules of linked systems be renegotiated in the event of unexpected events?

2 What are the main challenges to linking emissions trading systems and what are the consequences of failing to address them adequately? Specifically:

How can differing levels of ambition in terms of emissions caps in different systems best be managed?

4. Direct linking of two systems with differing stringencies of emissions cap is likely to be very challenging. If it is possible at all, it is likely to be easier in the early stages of trading when market prices have not yet been fully formed. Indeed, according to Ranson and Stavins (2013), the allowance price in the Regional Greenhouse Gas Initiative (RGGI), which links a number of states and provinces in the North-eastern United States and Eastern Canada, and the California-Quebec link were negotiated without a precise opinion about future prices in any of the individual markets and that these linkages may have been more politically difficult were each of the participating systems to have a fully formed carbon price in place.
5. Furthermore, when evaluating the relative stringency of caps and the impact this has on a potential linking of emissions trading systems, it is important to place the discussion in the context of the over-arching climate policies of the respective jurisdictions. Under the Western Climate Initiative (WCI), for instance, while each constituent jurisdiction is responsible for developing its own targets independently, the cap-and-trade programs of Canada and Quebec are one element of their climate policies, and arguably not the most

important (Purdon et al, 2013). In summary, the linking of emissions trading systems, is likely to be limited to cases where the systems being linked have not yet matured, or where emissions trading is but one, and not the most important, element of domestic climate policy.

6. Generally, however, an agreement on the relative stringency of the emissions cap is a necessary pre-requisite of system linking. Such an agreement could, in theory, be reached through a pre-link negotiation of future cap trajectories, but it is most likely that the decision to link with a system will be the result of an earlier 'linking partner match' selection process carried out by each counterparty in order to identify whether the differences in market design are prohibitive to linking.
7. Often emissions trading systems with a high allowance price seek to link with systems with a lower price, and visa versa. This arises because the regulators of the higher price system want to offer regulated entities cheaper abatement options. Whereas, the lower price scheme sees linking as a way to strengthen the price signal provided by its carbon market. The price differential makes linking a challenge. Whether a successful link could be made is likely to be determined as part of the 'linking partner match' selection process, which will assess whether a design compromise could be reached so that some economic benefits from linking can be reaped. Two scenarios are possible.
 - 7.1 First, a high-price system will accept the price differential mainly to provide its regulated entities with cheaper abatement options. In practice, two possibilities have been observed: (i) a unilateral link between an emissions trading system and the offsets markets, such as between the European Union Emissions Trading System (EU ETS) and the offsets generated under the CDM (with the corresponding restrictions), and (ii) a bi-lateral link between a smaller and a larger jurisdiction, such as between the California and Quebec emissions trading systems, where the smaller system adapts to the larger one.
 - 7.2 Second, the higher-price system may condition the possibility to link on its ability to retain some control over its allowance prices, and thus indirectly over the price differential. To understand why, it is useful to remember that a system's design features are a reflection of an internal political agreement. An adjustment to these features, such as one resulting in a material change to local allowances prices following the link, can jeopardise the domestic political consensus regarding the existing scheme.
8. In theory, a possible way in which differing ambition levels could be reconciled during the pre-link negotiations is through the adoption of an exchange rate on the monetary value of allowances from the linking systems. This would mean that regulated entities from one system could substitute foreign allowances for domestic allowances in proportion to the exchange rate. Arguably, in this case the linking agreement should also include provisions by which the rate would need to be adjusted given that the linking markets are evolving systems. This could introduce undesirable risk and uncertainty into the market. To avoid this would require careful calibration of the rate and transparency, which in itself is

costly. Finally, it must be acknowledged that setting an exchange rate may be politically unacceptable given that it may lead to its unintended interpretation as a measure of the relative emissions reduction efforts between the two systems.

9. While theoretically feasible, in practice, technical solutions (such as the exchange rate above) to manage misaligned of ambition levels for emissions reductions, and thus of allowance prices, are unlikely to be suitable, at least for emerging emissions trading systems for which price predictability is imperative. For example, Burtraw et al (2013) argue that the absence of the link between California and RGGI is largely due to the weakness of RGGI prices, while California has cited the collapse of prices in the EU ETS as a reason for not working to develop a link with the EU ETS (Ranson and Stavins, 2013 citing ClimateWire, 2013). These examples come in support of the previous argument regarding the pre-selection of a matching linking partner. Indeed, it has become clear that for bi-/multi-lateral direct linking to occur, the objectives of potential partners in regards to their emissions cap and allowance price trajectories must be compatible to start with.

How can systems between countries at different stages of economic development be harmonised?

10. To assess the feasibility of linking emissions trading systems from jurisdictions at different stages of economic development, the following must be considered: (i) ambition levels; (ii) sector coverage; and (iii) eligibility of offsets for compliance purposes.
11. Differing ambition levels. This has been addressed in more detail in the answer to the previous question. Related to the issue of relative stringency of targets, in order for the link to occur, both systems would also need to be comfortable with the resulting financial flows. For example, if one system is structurally a net seller, the other system has to be happy with the corresponding financial transfer.
12. Difference in sector coverage
 - 12.1 Linking trading systems does not necessarily require identical coverage of emitters. In fact, differences in sector coverage may improve economic efficiency given that cost savings opportunities are provided by the differing abatements costs among a range of regulated entities.
 - 12.2 The extent to which economic efficiency gains can be achieved in this sense depends on the overall market liquidity, which in turn is affected by whether the linking systems are exposed to the same economic shocks. This can occur when systems are structurally similar in terms of the share and type of covered industries. Generally, the impact of economic shocks on market liquidity (as measured by the number of market participants) is as follows:

12.2.1 In recession, the overall market liquidity drops because the over-supply of allowances reduces the need for regulated entities to trade actively in the market.

12.2.2 During strong economic growth, regulated entities are incentivised to hold their allowances in anticipation of price increases, thus reducing the number of counterparties to trade with in the market.

12.3 When systems are exposed to different shocks, the negative effect on market liquidity during recession or economic growth as described above is lower. Shocks are pooled and the effect on the regional price is cushioned. Thus, as part of the 'linking partner match' selection process, preference might be given to systems that have different sector coverage and, consequently, different exposures to economic shocks.

13. Difference in offsets eligibility criteria

13.1 In a trading system, the scope of offsets eligible for meeting domestic compliance obligations is driven by the regulator's will to provide covered entities with cheaper compliance options in a way that does not compromise the system's environmental integrity objectives. In particular, offset-generating projects must prove that the claimed emissions reduction would not have occurred without the project. Demonstrating this is challenging and different emissions trading systems have different rules for managing the risk that offsets are not 'additional', largely in the form of quantitative and/or qualitative restrictions on offsets eligibility.¹

13.2 Linkage often requires an emissions trading system to accept some uncertainty about the environmental integrity of the overall market if the scope of offsets eligible for domestic compliance differs from the one of the linking partner. This is because allowances and credits are interchangeable: the use of offsets in the second systems frees up domestic allowances that could be sold to the first system, without the latter knowing the origin of these allowances. Therefore, compliance obligations in the first system may end up being (partially) fulfilled through an indirect acceptance of offsets that would otherwise be ineligible. For this reason, linking between two emissions trading systems that (i) have environmental integrity as their primary objective, and (ii) treat the additionality risk of offset programs in different ways, is very difficult.

14. It should also be noted that linking does not necessarily require that the offset protocols accepted in each of the individual systems should be the same. The WCI, for example, provides participating jurisdictions with flexibility regarding the domestic eligibility of offset protocols. At the same time, it facilitates the

¹ To understand the general motivation behind the use of restrictions on the acceptance of offsets, imagine an extreme situation where there are no quantitative limits, no additional issues and perfect MRVs. In this case, offsets would flood a market as all the world's cheapest emissions would be undertaken, pushing the price to near zero. Although this is efficient, the financing flows are inequitable due to being almost entirely one way.

recognition of offsets across the member jurisdictions. Generally, any explicit pre-link restrictions on offset protocols will most likely be absent from the combined market if linking is to occur in the first place.

15. The following is a list of options that could be used to address concerns regarding the quality of offsets traded in a potential linking partner:
 - 15.1 During their pre-link negotiations, trading systems could in theory agree on discount rates to be applied on offsets originating from controversial sources. In practice, discounts have been applied by some emissions trading systems as an alternative to explicit quantitative restrictions on the eligibility of offsets. For example, the RGGI discounts carbon sequestration projects by 10 per cent to account for potential reversals (Pizer, 2013). In the context of linking, discount rates applicable to similar offsets programs would have to be aligned in order to prevent arbitrage trading between the schemes.
 - 15.2 A system could apply an exchange rate on allowances originating from a second system that has a wider recognition of its offsets.² This is largely premised on the fact that allowances from the second system embed some value of the offsets eligible in that system because the two types of units are fungible. However, the determination and application of such an exchange rate will increase transaction costs, potentially to an extent that could override the economic benefits of linking.
 - 15.3 Harmonisation of accounting rules for greenhouse gas emissions could help to avoid the otherwise increased transactions costs resulting from adjustment measures like exchange rates.
 - 15.4 Strong domestic measurement, reporting and verification (MRV) procedures can significantly reduce barriers to linking by mitigating concerns about the quality of offsets. For a linked system that has the prospect of scaling up in the future, it might be useful to set up a framework of common offset recognition rules, in order to facilitate the mutual acceptance of offsets across the linking systems. An example of this is the WCI offset recommendation process that has been put in place to ensure the rigor and interchangeability of offset certificates across its jurisdictions (WCI, 2012).
16. Linking two emissions trading systems from jurisdictions at different levels of economic development is possible. In order to facilitate potential links with other systems in the future, design elements of emerging emissions trading systems that are contemplating linking should be harmonised upfront with those they may wish to link to. This is particularly the case for features that would otherwise be hard to reconcile, including: relative stringency of targets,

² Note that the underlying driver for setting this exchange rate is different from the one relating to the exchange rate on allowances as a measure to address differing caps. Here, the rate is to address the differing offset protocols used by the linking systems. Overall, a final exchange rate would likely take both of these factors into account.

stringency of enforcement, eligibility of offset credits, cost containment measures, allocation methods (Burtraw et al, 2013; Tuerk et al, 2009b; Zetterberg, 2012).

How can national priorities and particularities best be catered for?

17. Two key areas in which national priorities can diverge are (i) the trade-off between allowance price control and environmental integrity, and (ii) the scope of projects generating offsets eligible for domestic compliance.
18. First, allowance price predictability is particularly relevant for emerging emissions trading systems in order to build and maintain domestic support for the chosen emissions control policy. It is thus not surprising to find that a number of the most recently initiated emissions trading systems, and those currently in the design phase, have adopted explicit allowance price containment rules to support their regulatory objective of achieving emissions reduction at lowest cost (via a price ceiling) and stimulating earlier investment in low-carbon technologies (via a price floor). California and Quebec, for example, have both adopted a price floor and ceiling, while the Australian proposal provides for an allowance price ceiling (Tuerk et al, 2013). By contrast, the European Union Emissions Trading System (EU ETS) prioritises the achievement of a particular emissions reduction target and can tolerate price variations.
19. In the context of fully integrated markets, price impact considerations are particularly relevant for the smaller systems that are expected to be exposed to the demand patterns imposed by the larger systems. This is because, in the absence of domestic price containment policies, such markets become exposed to price-relevant decisions from the larger schemes.
20. For schemes primarily concerned with the integrity of their emissions caps, price containment mechanisms, and particularly price ceilings, may be incompatible. This is because the system defending a price ceiling would allow the release of additional allowances in its market, thus jeopardising the environmental integrity of the combined market. At the same time, the perceived incompatibility of the two priorities may no longer be an issue depending on the regulator's tolerance for an inter-temporal distribution³ of emissions growth and reduction levels.
21. Consider the price ceiling provisions in the Californian emissions trading system, for example. Accordingly, the additional allowances that are sold into the market from the Allowance Price Containment Reserve (APCR) are removed from the cap in future years. In other words, if viewed across its trading phases, the environmental integrity of the scheme is preserved because the allowances sold are borrowed from the future instead of being issued by fiat, which would inflate the overall cap. Thus, if the regulator from the system

³ In the sense that the regulator tolerates an increase in the level of emissions today with the expectation that an equal reduction will occur sometime in the future.

prioritising the emission cap of a trading phase (i) tolerates an increase in the level of emissions today with the expectation that an equal reduction will occur sometime in the future, and (ii) accepts the effective inheritance of a price ceiling from the second system, then a bilateral link between the two is theoretically conceivable.

3 What are the essential common features of linked emissions trading systems?

22. The essential common features of linked systems reflect the design elements that are difficult yet necessary to harmonise in order for the link to be established. These include: the relative stringency of targets, stringency of enforcement, eligibility of offset credits, cost-containment targets, method of allocation (free of charge vs. auctioning) and common definition of emissions. A decision to link with another system will most likely be positive if the 'matching linking partner' selection process mentioned previously has identified these essential features to already be more or less aligned.

Do these include common definition of emissions?

23. Emission reduction targets can be measured in absolute or relative terms, where relative refers to the maximum tones of CO₂e allowed per unit of output (also called intensity targets).
 - 23.1 In theory, it may possible to link systems with absolute targets to ones with intensity targets; however, this raises several concerns. First, the fact that emitters covered by an intensity-based target are allowed to increase production, and thus to emit more, may be viewed by the absolute-target system as a welfare transfer. Thus, in order for the link to occur, the linking systems must be happy with the constant financial transfers between them.
 - 23.2 Second, another potential problem is that intensity-based allocations take place in two steps: an initial allocation based on projected output, and an adjustment ex-post once the actual production levels are known. This could lead to liquidity shocks in the linked scheme at the moment of adjustment (Sterk et al, 2006).
24. In order for the link to occur, potential partners must also address differences in their views on the correctness of recognising emissions from any source, as measured by the eligible monitoring protocols (for example, to measure land use emissions). Furthermore, the requirement to align emissions reduction targets also implies that linking systems must have comparable views on global warming potentials, and thus on the pathway by which caps might need adjustment in the future.

Do linked systems have to cover emissions from the same sources and have the same banking and time periods?

25. Sources. For a discussion of potential issues from linking two systems with differing sectorial coverage please refer back to section 12 above.

26. Banking period

26.1 For the purpose of the discussion below, consider two systems - A and B - where the former prohibits banking of local permits and the latter allows it.

26.2 Linking between systems A and B leads to the propagation of the banking option from the latter system to the combined market. This is because a decrease in present emissions in system B due to banking effectively increases the volume of allowed future emissions in the linked system as a whole. Thus, non-harmonised banking provisions could lead to price and investment distortions (see also the discussion of time periods).

26.3 Whether installations from system A can also inherit the banking option depends on any restrictions that system A may decide to impose on the acceptance of banked allowances from system B for local compliance.

27. Time periods

27.1 Decisions taken on the length of a system's trading period are closely related to decisions regarding the amount of allowances that regulated entities want to bank or borrow between periods. Given this, the length of a commitment period is important for inter-temporal efficiency.⁴

27.2 The length of a trading period is also relevant for investment strategies. If periods are short, investors are forced to guess the emissions caps that will be set by future governments. Given this, differences in the length of the regulated periods between systems considering linkage can significantly increase investment and price distortions.

28. In summary, given the challenges described above, if a link were to occur, the banking options and the time periods across the linking partners would most likely need to be harmonised prior to the link. At the same time, linking of trading systems does not necessarily require an identical coverage of emitters, although this could lead to carbon leakage concerns that could (to some extent) be addressed through adequate allocation rules.

How can the rules of linked systems be renegotiated in the event of unexpected events?

29. The process by which the rules of linked systems can be renegotiated, and under what circumstances this can occur, should be agreed upon during the

⁴ The inter-temporal decisions of how many permits to trade or store matters for economic efficiency as measured by the optimal allocation of abatement efforts and investments in low-carbon technologies across time.

pre-link discussions. A pre-requisite for this is for each potential linking partner to have already provided some flexibility within its trading system for calibrating critical design features to the local market's evolution. For example, the European Union and Californian emissions trading systems provide mechanisms for overview and adjustment of rules relating to offsets eligibility and imbalances in allowance supply (Zetterberg, 2012).

30. Unexpected events that could trigger a renegotiation of rules relate to the possible occurrence of extreme economic conditions that can affect the liquidity of the combined market. When two systems are exposed to different shocks, the larger overall market created through linking can better absorb the price shocks from one single jurisdictions. By contrast, if two systems are exposed to similar shocks, the transmission of price shocks may be exacerbated. In both cases, linking implies that system-specific shocks from one system can be exported to the other linked systems, although to a greater extent when the systems are exposed to similar shocks than not.
31. Thus, depending on the similarity of economic shocks that two systems may be exposed to, during the pre-link negotiations these systems can agree on a set of restrictions on the mutual acceptability of allowances.⁵ Such restrictions would be triggered in the event of extreme economic conditions in order to limit the propagation of price shocks from one system to another.

⁵ Note that restrictions imply that the allowance origination can be identified. By contrast, when the link is unrestricted, the origin of issuance may be anonymised for the purpose of allocation and trading.

References

Burtraw, D., Palmer, K., Munnings, C., Weber, P., Woerman, M., 2013. *Linking by degrees: Incremental alignment of cap-and-trade markets*. Discussion Paper 13-04, Resources for the Future. [pdf] Washington D.C: RFF. Available at <http://www.rff.org/Documents/RFF-DP-13-04.pdf> [Accessed 16th December 2013].

European Commission (EC), 2011. *288 Final, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A Roadmap for Moving to a Competitive Low Carbon Economy in 2050*. Brussels: EC.

European Commission (EC), 2014a. *The Emissions Trading System: Questions and Answers on the revised EU Emissions Trading System*. [online] Brussels: EC. Available at http://ec.europa.eu/clima/policies/ets/faq_en.htm [Accessed 7th April 2014].

European Commission (EC), 2014b. *LUCLUF in the EU*. [Online] Available at http://ec.europa.eu/clima/policies/forests/lulucf/index_en.htm [Accessed 7th April 2014].

Helm, D., 2008. *Caps and Floors for the EU ETS: a practical carbon price*. [Online] Available at <http://www.dieterhelm.co.uk/node/670> [Accessed 8th April 2014].

International Energy Agency (IEA), 2011. *World Energy Outlook, 2010*. Paris: IEA.

Martin, R., Muuls, M., Wagner, U., 2011. *Climate Change, Investment and Carbon Markets and Prices—Evidence from Manager Interviews*.

Prag, A., Briner, G., Hood, C., 2012. *Making Markets: Unpacking Carbon Market Mechanisms*. OECD, IEA Report. [Online] Available at [http://www.oecd.org/env/cc/\(2012\)4%20-%20Market%20Mechanisms_AE%20\(2\).pdf](http://www.oecd.org/env/cc/(2012)4%20-%20Market%20Mechanisms_AE%20(2).pdf) [Accessed 6th April 2014].

Purdon, M., Houle, D., Lachapelle, E., 2013. *The Political Economy of California and Quebec's Cap-and-Trade Systems*, COP19 Draft, Sustainable Prosperity Report.

Ranson, M., Stavins, R. N., 2013. *Linkage of Greenhouse Gas Emissions Trading Systems: Learning from Experience*. Harvard Project on Climate Agreements, Discussion Paper ES 13-2. [Online] Available at http://belfercenter.hks.harvard.edu/publication/23585/linkage_of_greenhouse_gas_emissions_trading_systems.htm [Accessed 27th March 2014].

Sterk, W., Braun, M., Haug, C., Korytarova, K., Scholten., 2006. *Ready to Link Up? Implications of Design Differences for Linking Domestic Emissions Trading Schemes*. Joint Emissions Trading as a Socio-Ecological Transformation (JET-SET), Cross-Section Project 4, Working Paper I/06.

Tuerk, A., Sterk, W., Haites, E., Mehling, M., Flachslund, C., Kimura, H., Betz, R., Jotzo, F., 2009a. *Linking Emissions Trading Scheme. Synthesis Report*. Climate Strategies. [Online] Available at <http://www.climatestrategies.org/research/our-reports/category/33.html> [Accessed 27th March 2014].

Tuerk, A., Mehling, M., Flachslund, C., Sterk, W., 2009b. Linking carbon markets: Concepts, case studies and pathways. *Climate Policy*, 9(4), pp.341-357.

Tuerk, A., Mehling, M., Klinsky, S., Wang, X., 2013. *Emerging Carbon Markets: Experiences, Trends and Challenges*. Climate Strategies, Working Paper. [Online] Available at <http://www.climatestrategies.org/research/our-reports/category/63.html> [Accessed 27th March 2014].

Western Climate Initiative (WCI), 2012. *Final Recommendations Offset System Process*, Offset Committee Task 1.3. [Online] Available at <http://www.westernclimateinitiative.org/document-archives/Offsets-Committee-Documents/Offset-System-Process-Final-Recommendations/> [Accessed 7th April 2014].

Zachmann, G., Holtermann, M., Radeke, J., Tam, M., Huberty, M., Naumenko, D., and Ndoye Faye, A., 2012. *The great transformation: decarbonising Europe's energy and transport systems*, Blueprint 16, Bruegel. Brussels: Bruegel.

Zetterberg, L., 2012. *Linking the Emissions Trading Systems in the EU and California*. IVL Swedish Environmental Research Institute, Report B 2061. Stockholm: Swedish Environmental Research Institute.