Submission on reforms of the Safeguard Mechanism

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Executive summary

The Safeguard Mechanism should combine strong incentives to reduce greenhouse gas (GHG) emissions, consistent with Australia achieving Net Zero by 2050 while also limiting its cumulative GHG emissions. Existing facilities must be incentivised to rapidly adopt all cost-effective mitigation measures available to them. New facilities must be incentivised to use the lowest emissions technologies available. At the same time, it is important that the Safeguard Mechanism does not merely displace emissions-intensive production to countries with weaker mitigation policies. For these reasons, we recommend the use of production-linked baselines in the Safeguard Mechanism, with Safeguard Mechanism Credits (SMCs) traded between under- and over-achieving facilities.

In sections 1 and 2, our recommendations on production-linked baselines are:

1. For new facilities or major expansions of existing facilities, intensities based initially on international industry best practices, declining over time to zero.
2. For existing facilities, appropriate initial intensities will be higher, but should be well below current industry averages and should decline over time to zero.
3. For cost-efficiency, baseline intensities for the existing facilities within each industry should not be differentiated.
4. If the application of the Safeguard Mechanism is subject to a high emissions threshold (currently 100,000 CO_2-e), applying production-linked baselines in all industries—i.e. regardless of their emissions-intensive, trade-exposed (EITE) status—is justified to avoid domestic intra-industry emissions leakage.
5. Once covered by the Safeguard Mechanism, a facility should remain so if its emissions fall below the threshold.

In sections 3–5, we make these further recommendations:

6. Complement the baseline-and-credit scheme with a price collar—i.e. both a floor and a ceiling price—to enhance market stability and predictability for both Safeguard Mechanism participants and government. There are implications for linking with other carbon markets (section 3).
7. Permit banking of SMCs to increase cost-efficiency.
8. Borrowing of SMCs, if permitted, should be highly constrained or heavily penalised; particularly given that production-linked baselines do not define a cumulative emissions cap.
9. Apply quantitative limits and/or discount factors to the use of external credits to mitigate residual leakage.
10. Do not permit use in the Safeguard Mechanism of any Australian Carbon Credit Units (ACCU) generated by Emissions Reduction Fund (ERF) projects of doubtful environmental integrity.

1 Baseline setting

Most large industrial facilities have planned operating lives of many decades. Some existing and most new facilities covered by the Safeguard Mechanism will be operating well beyond 2050. Cost-effective actions that reduce emissions from existing facilities and minimise emissions from new facilities are therefore urgent. In a baseline-and-credit scheme, facilities' marginal cost of emissions will equal the SMC price. However, because facilities are credited their baseline emissions, their average cost of emissions may be much lower (Bernard, Fischer and Fox 2007; Fischer 2019).

With production-linked baselines, the effects and costs of the Safeguard Mechanism will depend critically on the baseline intensities set. The end-point is straightforward: emissions intensities for all Safeguard Mechanism industries should reach zero in 2050. In most cases, achieving net zero intensities will require not only the adoption of low or zero carbon production technologies, but also carbon capture and storage and/or use of carbon offsets.

Determining appropriate initial emissions intensities and declining paths towards zero is harder. We recommend that in each industry, an ambitious baseline be set for all new facilities and for all major capacity expansions of existing facilities. It is not appropriate to use emissions intensities of existing facilities as a point of reference for two reasons. Firstly, given the age of many existing facilities and the general absence of carbon pricing in Australia (the brief period of the Carbon Pricing Mechanism excepted), it is likely that most have emissions intensities well above what would have occurred under reasonable carbon prices. Secondly, there are too few facilities in many industries to determine any meaningful statistical distribution of emissions intensities. Consequently, we recommend that a wider definition of best practices should be used. For example, reference could be made to standards established in the European Union Emissions Trading Scheme. Sartor, Pallière and Lecourt (2014) discusses the use of these standards in the scheme's third phase. Defining new facility baselines slightly above international best practices would provide modest investment incentives in the form of expected SMC revenues.

For many existing facilities, imposing baselines as described above would result in unacceptably high costs, potentially leading to large reductions of output or even closure. Thus, appropriate initial baseline intensities for existing facilities will generally be higher. At an industry level, initial baseline intensities should be significantly less than the current average emissions intensity. Otherwise, the scheme will be incapable of generating a significant carbon price.[1] These baselines should also be reduced over time to reach zero by 2050. Optionally, they could be reduced faster, until they converged—and merged—with new facility baseline intensities (e.g. in 2040).

It is most important that baselines for existing facilities be set in a simple, transparent way that is not vulnerable to manipulation. The simplest and most

[1] Alternatively, if external demands for SMCs generated a carbon price, Safeguard Mechanisms firms would be over-subsidised, but understand that no such linkage is envisaged as part of the present reforms.

economically efficient solution is to assign all facilities an industry-wide intensity baseline. Alternatively, each facility could be assigned an initial baseline intensity in proportion to its average emissions intensity over several recent years, with the proportionality calculated to yield the desired industry-wide baseline intensity. A combination of these two methods could also be used. However, differentiation of standards is likely to result in less overall mitigation and higher overall costs (Bielen 2018; Fischer 2019; Weng et al. 2018).

Recommendations

1. For new facilities or major expansions of existing facilities, intensities based initially on international industry best practices, declining over time to zero.
2. For existing facilities, appropriate initial intensities will be higher, but should be well below current industry averages and should decline over time to zero.
3. For cost-efficiency, baseline intensities for the existing facilities within each industry should not be differentiated.

2 Non-emissions-intensive, trade-exposed industries

A majority of Safeguard Mechanism facilities and a large majority of the covered emissions are in industries classified by the Australian government as 'emissions-intensive and trade-exposed' (EITE). However, the 100,000 CO_2-e threshold creates the potential for leakage between covered and lower-emitting domestic facilities. An intensity-based scheme also has merit in this context.

For those few types of facilities that could pass on most or all costs, the economically efficient approach would be to set zero baselines. However, if non-zero baselines are granted, production-linked baselines will provide a more equitable outcome than fixed baselines. Production linking will limit additional costs faced by customers. With fixed baselines, facilities will pass on the full marginal costs of emissions on to customers regardless of their baseline. Any fixed baseline allowance will simply generate windfall profits for facilities' owners. This is not merely a theoretical argument. With unconditional free allocations to electricity generators in the first stages of the European Union's Emissions Trading Scheme, electricity prices and generators' profits rose in tandem (Joltreau and Sommerfeld 2019).

Limitations of the Safeguard Mechanism's application to non-EITE industries could also be offset by complementary industry-specific regulations. For example, it is theoretically most economically efficient to expose all domestic gas users to the full emissions costs associated with gas production and distribution. However, there may be more practical and politically acceptable ways to reduce both gas consumption and emissions. For example, Victoria is no longer requiring gas connections for new residential subdivisions (Department of Environment, Land,Water and Planning 2022). One could easily go further by charging a high fee for such connections or banning them outright.

We acknowledge that the reforms under consultation do not include any change to the 100,000t CO_2-e threshold. Nevertheless, we note that the threshold gives rise to the domestic leakage concerns just mentioned. In the longer term, it will be necessary to lower the threshold or institute complementary policies to provide similar incentives to smaller emitters. Additionally, the threshold weakens the incentives provided by the Safeguard Mechanism if facilities may drop out if their emissions fall below it—whether because of output and/or emissions intensity reductions. Thus, we recommend that once a facility is subject to the Safeguard Mechanism, it should remain so.

Recommendations

4. If the application of the Safeguard Mechanism is subject to a high emissions threshold (currently 100,000 CO_2-e), applying production-linked baselines in all industries—i.e. regardless of their emissions-intensive, trade-exposed (EITE) status—is justified to avoid domestic intra-industry emissions leakage.
5. Once covered by the Safeguard Mechanism, a facility should remain so if its emissions fall below the threshold.

3 Price collar

To encourage more ambition in setting baselines and reduce uncertainties faced by participants, we recommend that the Safeguard Mechanism be subject to a price collar; that is, a price floor and a price ceiling (Stavins 2022; Aldy and Armitage 2022; Li, Zhang and Zhang 2022). A price floor should be set high enough to ensure that significant mitigation actions are taken by Safeguard Mechanism facilities. In the short term, that includes an appropriate contribution to meeting Australia's 2030 target. A price ceiling should be high but tolerable, taking into account the output subsidising effects of an intensity-based scheme. Both the floor and ceiling prices should rise at an annual rate of CPI plus 4–5%.

To implement a price ceiling, covered facilities could meet their obligations with units sold by the Australian government at a predetermined price. This mechanism would have two advantages. Firstly, it ensures that facilities will not face excessive costs if baselines are more stringent than intended. Secondly, should the price hit the ceiling, the government will receive some revenues from selling permits, which could be used to reduce emissions elsewhere in the economy. This would be particularly important if reductions from the industrial sector are contributing less than expected to Australia's 2030 target.

With an intensity-based system, implementing a price floor is somewhat more complicated. A mechanism that has been used successfully in other contexts is consignment auctioning (Wang, Pizer and Munnings 2021; Li, Zhang and Zhang 2022). Facilities are obliged to consign their baseline allowance (or just some fraction of them) to auction. They receive auction revenues proportionate to their consigned allowance. If not all consigned allowance units sell above the auction reserve price (i.e. the floor price), the remaining units are cancelled. In effect, a market mechanism is used to make a downward adjustment of all baselines. Facilities having the most ambitious baselines (as described above, this would include all new facilities) could be partially or fully exempted from consigning their baseline allowances.

If a limited or unlimited amount of external carbon credits can be used by Safeguard Mechanism facilities for compliance, this must not undermine the floor price. This could be ensured by imposing a levy on the difference between the floor price and the purchase price of the credits.

Recommendations

6. Complement the baseline-and-credit scheme with a price collar—i.e. both a floor and a ceiling price—to enhance market stability and predictability for both Safeguard Mechanism participants and government.

4 Banking and borrowing

Allowing banking and/or borrowing of SMCs could make the quantitative baselines of the Safeguard Mechanism more or less flexible. In particular, it would allow firms to equalise their expected discounted marginal abatement costs over time (Chevallier 2012). Early economic research on capped emissions trading schemes suggested that this would result in cost-efficient outcomes (Rubin 1996). More recent contributions have provided grounds for scepticism (Weitzman 2020). Allowing banking may also create commitment problems with respect to baseline setting (Kuusela and Lintunen 2020).

In practice, many capped emissions trading schemes have incorporated banking, while allowing much less scope for borrowing, but this flexibility is generally acknowledged to be important to achieving adequate price stability. For example, Stavins (2022, p73) writes

> *Provisions for allowance banking have been important and account for a large share of realized gains from trade (lead phase-down, SO_2 trading).*

> *In contrast, the absence of banking provisions can lead to allowance price spikes (RECLAIM) and collapses (EU ETS).*

Unlike schemes with fixed caps, an intensity-based scheme with banking and borrowing is *not* equivalent to capping cumulative emissions. This strengthens arguments for heavily constraining borrowing, and/or heavily penalising it by discounting borrowed credits (Chevallier 2012). In practice, banking (and sometimes also borrowing) have also been allowed in intensity-based schemes. In the United States automotive sector, relatively lax initial tradable performance standards resulted in early banking of cheap credits, which were used to reduce compliance costs in later periods (Yeh et al. 2021).

We recommend that the Safeguard Scheme incorporates a mechanism for banking SMCs. If banking is allowed, it is all the more important that initial emissions intensities are set low enough to generate appropriately SMC prices; or failing that, that an appropriate floor price is enforced. Borrowing of SMCs should either be not be allowed in general. However, we accept that there might be justifications for allowing limited short-term borrowing under specific circumstances.

Recommendations

7. Permit banking of SMCs to increase cost-efficiency.
8. Borrowing of SMCs, if permitted, should be highly constrained or heavily penalised; particularly given that production-linked baselines do not define a cumulative emissions cap.

5 Use of external carbon credits

Linkages to other domestic or international market-based mechanisms are desirable in principle. International linkages between emissions trading schemes are possible, but complex (Tuerk et al. 2009; Evans and Wu 2021). Domestically, the immediate option is to maintain a linkage with the ERF.

Project-based schemes such as the ERF—or internationally, the United Nations' Clean Development Mechanism—are vulnerable to problems of adverse selection (Burke 2016; Kerr 2013). Macintosh and Butler (2022) claim there are serious flaws in the current operation of the ERF, citing three ERF methods in particular: avoided deforestation, human-induced regeneration or landfill gas methods. Major waste industry players—who generate landfill gas credits—have recently backed the claims regarding their sector and called for reforms (Slezak, Michael 2022). Several problems relating to measurement and additionality in forestry and regeneration are described in Macintosh, Butler, Evans et al. (2022a), Macintosh, Butler, Ansell et al. (2022) and Macintosh, Butler, Evans et al. (2022b). In the case of landfill gas, integrity issues relate mainly to projects that would be financially viable without credits (Macintosh 2022).

Even in high quality project-based schemes, some carbon leakage is inevitable. This could be mitigated by quantitatively limiting the use of external credits for Safeguard Mechanism compliance (e.g. up to a maximum fraction of credits purchased). Alternatively, or additionally, a discount factor could be applied to external credits for the purposes of Safeguard Mechanism compliance (see e.g. Sterk and Kruger 2009; Castro and Michaelowa 2010).

Recommendations

9. Apply quantitative limits and/or discount factors to the use of external credits to mitigate residual leakage.

10. Do not permit use in the Safeguard Mechanism of any Australian Carbon Credit Units (ACCU) generated by Emissions Reduction Fund (ERF) projects of doubtful environmental integrity.

References

Adams, Philip (2021). "Zero Greenhouse Gas Emissions by 2050: What it means for the Australian Economy, Industries and Regions." In: *Centre of Policy Studies Working Paper No. G-324, Victoria University*, p. 3.

Adams, Philip D and Brian R Parmenter (2013). "Computable general equilibrium modeling of environmental issues in Australia: economic impacts of an emissions trading scheme". In: *Handbook of computable general equilibrium modeling.* Vol. 1. Elsevier, pp. 553–657.

Aldy, Joseph E and Sarah Armitage (2022). "The Welfare Implications of Carbon Price Certainty". In: *Journal of the Association of Environmental and Resource Economists* 9.5, pp. 921–946.

Andrew, Robbie, Glen P Peters and James Lennox (2009). "Approximation and regional aggregation in multi-regional input–output analysis for national carbon footprint accounting". In: *Economic Systems Research* 21.3, pp. 311–335.

Bernard, Alain L, Carolyn Fischer and Alan K Fox (2007). "Is there a rationale for output-based rebating of environmental levies?" In: *Resource and Energy Economics* 29.2, pp. 83–101.

Bielen, David A (2018). "Do differentiated performance standards help coal? CO2 policy in the US electricity sector". In: *Resource and Energy Economics* 53, pp. 79–100.

Burke, Paul J (2016). "Undermined by adverse selection: Australia's direct action abatement subsidies". In: *Economic Papers: A journal of applied economics and policy* 35.3, pp. 216–229.

Castro, Paula and Axel Michaelowa (2010). “The impact of discounting emission credits on the competitiveness of different CDM host countries”. In: *Ecological Economics* 70.1, pp. 34–42.

Chevallier, Julien (2012). “Banking and borrowing in the EU ETS: A review of economic modelling, current provisions and prospects for future design”. In: *Journal of Economic Surveys* 26.1, pp. 157–176.

Department of Environment, Land,Water and Planning (2022). *Gas substitution roadmap*. Victorian State Government. ISBN: 978-1-76077-900-9.

Evans, Stuart and Aaron Z Wu (2021). “What drives cooperation in carbon markets? Lessons from decision-makers in the Australia-EU ETS linking negotiations”. In: *Climate Policy* 21.8, pp. 1086–1098.

Fischer, Carolyn (2019). “Market-based clean performance standards as building blocks for carbon pricing”. In: *Policy proposal, The Hamilton Project-Brookings*.

Hatfield-Dodds, Steve et al. (2015). “Australia is ‘free to choose’economic growth and falling environmental pressures”. In: *Nature* 527.7576, pp. 49–53.

Joltreau, Eugénie and Katrin Sommerfeld (2019). “Why does emissions trading under the EU Emissions Trading System (ETS) not affect firms’ competitiveness? Empirical findings from the literature”. In: *Climate policy* 19.4, pp. 453–471.

Kerr, Suzi C. (2013). “The Economics of International Policy Agreements to Reduce Emissions from Deforestation and Degradation”. In: *Review of Environmental Economics and Policy* 7.1, pp. 47–66. DOI: 10.1093/reep/res021. eprint: https://doi.org/10.1093/reep/res021. URL: https://doi.org/10.1093/reep/res021.

Kuusela, Olli-Pekka and Jussi Lintunen (2020). “A cap-and-trade commitment policy with allowance banking”. In: *Environmental and Resource Economics* 75.3, pp. 421–455.

Lennox, James A and Renger Van Nieuwkoop (2010). “Output-based allocations and revenue recycling: Implications for the New Zealand Emissions Trading Scheme”. In: *Energy Policy* 38.12, pp. 7861–7872.

Lennox, James A and Jan Witajewski-Baltvilks (2017). “Directed technical change with capital-embodied technologies: implications for climate policy”. In: *Energy Economics* 67, pp. 400–409.

Li, Zhi, Da Zhang and Xiiang Zhang (2022). “Emissions Trading with Consignment Auctioning: A Lab-in-The-Field Experiment”. In:

Macintosh, Andrew (March 2022). “The Emissions Reduction Fund’s Landfill Gas Method: An Assessment of its Integrity”. The Australian National University (ANU).

Macintosh, Andrew and Don Butler (June 2022). “Statement in response to the Emissions Reduction Assurance Committee (ERAC) and Clean Energy Regulator (CER)”. The Australian National University (ANU).

Macintosh, Andrew, Don Butler, Dean Ansell et al. (August 2022). “Integrity Problems with the ERF’s 2022 Plantation Forestry Method”. The Australian National University (ANU).

Macintosh, Andrew, Don Butler, Megan C. Evans et al. (July 2022a). “Integrity and the ERF’s Human-Induced Regeneration Method: The Additionality Problem Explained”. The Australian National University (ANU).

— (July 2022b). “Integrity and the ERF’s Human-Induced Regeneration Method: The Measurement Problem Explained”. The Australian National University (ANU).

Peters, Glen P, Robbie Andrew and James Lennox (2011). “Constructing an environmentally-extended multi-regional input–output table using the GTAP database”. In: *Economic Systems Research* 23.2, pp. 131–152.

Rubin, Jonathan D (1996). “A model of intertemporal emission trading, banking, and borrowing”. In: *Journal of environmental economics and management* 31.3, pp. 269–286.

Sartor, Oliver, Clement Pallière and Stephen Lecourt (2014). “Benchmark-based allocations in EU ETS Phase 3: an early assessment”. In: *Climate Policy* 14.4, pp. 507–524.

Slezak, Michael (2022). *Industry bosses making money from carbon credits say system needs to change.* ABC News. 6th Sept, 2022. URL: https://www.abc.net.au/news/2022-09-06/companies-making-money-from-carbon-credits-speak-out/101400566.

Stavins, Robert N (2022). “The Relative Merits of Carbon Pricing Instruments: Taxes versus Trading”. In: *Review of Environmental Economics and Policy* 16.1, pp. 62–82.

Sterk, Wolfgang and Joseph Kruger (2009). “Establishing a transatlantic carbon market”. In: *Climate Policy* 9.4, pp. 389–401.

Tuerk, Andreas et al. (2009). “Linking carbon markets: concepts, case studies and pathways”. In: *Climate Policy* 9.4, pp. 341–357.

Wang, Banban, William A Pizer and Clayton Munnings (2021). *Price Limits in a Tradable Performance Standard.* Tech. rep. National Bureau of Economic Research.

Weitzman, Martin L (2020). “Prices or quantities can dominate banking and borrowing”. In: *The Scandinavian Journal of Economics* 122.2, pp. 437–463.

Weng, Zhixiong et al. (2018). “A general equilibrium assessment of economic impacts of provincial unbalanced carbon intensity targets in China”. In: *Resources, conservation and recycling* 133, pp. 157–168.

Yeh, Sonia et al. (2021). “Tradable performance standards in the transportation sector”. In: *Energy Economics* 102, p. 105490.