The 'surrender charge' on international units in the Australian ETS

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1. Introduction

On 8 November 2011, the Australian Senate passed the Clean Energy Future package of 18 bills without amendment. Among other things, these bills introduce carbon pricing arrangements for Australia, starting with a fixed-price regime from 1 July 2012 and moving to a floating-price emissions trading scheme from 1 July 2015.[1]

The Clean Energy Bill includes provisions for a 'price floor' in the emissions trading scheme. This is a minimum carbon price established by setting a reserve price in the auctions of emission allowances. The emissions trading scheme also allows liable entities to comply by surrendering international units, such as Certified Emission Reductions. However, the use of international units could potentially undermine the price floor, if the price of such international units is low. A top-up fee, referred to as a 'surrender charge', is therefore contemplated to be payable if the price of the relevant international unit is below the price floor. Provision for this surrender charge is made in the legislation (see Appendix for selected provisions).

The Australian Department of Climate Change and Energy Efficiency approached the Grantham Research Institute at the London School of Economics for advice about the interaction of the price floor and the use of international units. At a meeting in London on 1 December 2011, along with representatives from Climate Bridge and Vivid Economics, researchers from the Grantham Research Institute addressed various options for the design of the 'surrender charge', and assessed the various design options in terms of their ability to meet the objectives of the Australian carbon pricing mechanism. Subsequent discussions and input has been provided by members of the Grattan Institute in Australia.

The conclusions of this analysis are presented in this Policy Paper. The core conclusion is that the 'surrender charge' should be equal to the floor price minus the **1-month moving average** price of **secondary** (i.e. issued) international units as revealed on a transparent, liquid **market** (rather than by reference to private bilateral trades), calculated at the **date of surrender** of the international unit.[2]

Shortly after this meeting, the government released a discussion paper entitled *Price floor for Australia's carbon pricing mechanism: Implementing a surrender charge for international units* (the Discussion Paper). The Discussion Paper sets out four options for implementation. The recommendation in this Policy Paper most closely corresponds to Option 3 of the Discussion Paper.

This Policy Paper provides an overview of the basic economics of international units (section 2.1) and carbon price floors (section 2.2) before presenting the economic theory of their interaction (section 2.3). We then describe some design options for the 'surrender charge' in section 3. Our recommended design for the surrender charge, and supporting reasons, are presented in section 4.

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[1] See Hepburn and Jotzo (2011) for a summary of the main provisions.
[2] Strictly speaking, the surrender charge is the maximum of this amount and zero.

2. Some background economics

It is not unusual for emissions trading schemes to provide for compliance by surrendering international units (see section 2.1), and to employ floor prices to provide greater price certainty for investors and compliance entities (see section 2.2). Care in implementation, however, is required to ensure that these two design features work together and do not interact in an unhelpful manner (see section 2.3).

2.1 The economics of international units

Greenhouse gas emissions cause roughly the same economic damage no matter where they are emitted on Earth's surface. This is because gases in the atmosphere are 'well mixed', so the geographical source is largely irrelevant. It follows that reducing emissions in one country is as valuable as reducing emissions in another country. This is important, because providing for spatial flexibility in reducing emissions leads to a lower overall economic cost of achieving a given reduction target (Fankhauser and Hepburn, 2010).

For this reason, the Kyoto Protocol provides for several mechanisms to enhance the spatial flexibility in emissions reductions. Similarly, the Australian carbon pricing mechanism provides that international units – created by emissions reductions outside Australia – can be surrendered for use by liable entities in Australia. This reduces the overall costs of achieving Australia's emission reduction targets.

One important example of spatial flexibility is the Clean Development Mechanism (CDM), which was designed to help poorer countries ('non-Annex I' countries) to achieve "sustainable development" and to provide richer countries ('Annex I' countries) with a more cost-effective means of complying with their targets. Under the CDM, Certified Emission Reductions (CERs) can be created if all parties give their voluntary approval and if the emissions reductions are shown to be real, measurable, and additional by a third-party verifier to the satisfaction of the United Nations. The CDM has not been without problems (see, e.g., Hepburn, 2007), but it has been one of the largest channels for providing climate finance to poorer countries, and one of the cheapest ways of reducing emissions.

2.2 The economics of carbon floor prices

Establishing a price on carbon is the most important first step in reducing emissions cheaply (Bowen, 2011). Both emissions trading and carbon taxes can do this (Hepburn, 2006). Trading has various advantages over taxes, but price uncertainty and volatility are not among them. To reduce price uncertainty, trading schemes can incorporate a price floor and/or ceiling. Price ceilings ensure that the overall cost of compliance is capped, although this benefit comes with the disadvantage that the achievement of a specific environmental target cannot be guaranteed. Price floors help to send a clearer signal that investments in low-carbon technology will yield a reasonable return.

Floor and ceilings can be implemented in several different ways. Government can intervene directly in the permit markets, by buying or selling permits, to stabilise prices. This has unwanted fiscal implications, however. Some economists argue that a careful combination of price (subsidy or other forms of compensation) and quantity

(permit) instruments can achieve the same end (Gruell and Taschini, 2011). Others have argued that the implementation of price floors can be established in a softer fashion by simply setting a 'reserve price' in the permit auction (Hepburn et. al., 2006; Wood and Jotzo, 2011). The Australian Government has decided to adopt this latter approach and the legislation provides for an auction reserve price.

2.3 The interaction between floor prices and international units

When an emissions trading scheme provides for international units as well as a floor price, as the Australian carbon pricing mechanism does, an additional design feature is required to ensure that the potentially low-cost international units do not undermine the floor price. It is for this reason that the Australian scheme provides for a 'surrender charge' to be paid with international units, discussed in sections 3 and 4 below.

If the price of an international unit is above the floor price, no problem arises. The case of interest is when the price of an international unit is below the floor price. As of December 2011, this happens to be true. The floor price is set at AU \$15, applicable from 1 July 2015. In contrast, the spot price in January 2012 of issued CERs has been below €5, driven by the European financial crises and short-term regulatory drivers specific to the European market. While CER prices are likely to recover by 2015, it is clear that the potential for international units to be cheaper than the floor price is not a mere theoretical concern.

Figure 1, which is a development of Figure 4 in Hepburn et. al. (2006), describes the situation when the supply curve for international units lies below the auction reserve price. As drawn, the blue supply curve of Compliance Units (CU) incorporates: (i) units that are freely allocated to liable entities that are emissions intensive and trade exposed; (ii) international units; and (iii) units sold at auction, at or above the reserve price. For purposes of illustration only, we draw the supply curve for international units to be gently upwards sloping, indicating the assumption that Australia is largely, but not entirely, a price-taker for international units.

Two demand scenarios are shown in red. In the high-demand scenario, the prevailing price for CUs is above the auction reserve price. In this scenario, liable entities can purchase international units for significantly below the prevailing market price. (The reason these prices may not fully converge, in the high-demand scenario, is because there are quantity limits on the use of international units in the Australian carbon pricing mechanism. In practice, however, these limits are not expected to bind). Even with the imposition of a surrender charge, liable entities still have an incentive to purchase international units as the floor price is below the prevailing market price.

In the low-demand scenario, if there is no surrender charge, the prevailing price of Australian CUs would be driven by the price of international units. In other words, the prevailing price would be below the floor price, and the inclusion of international units would undermine the price floor. However, once the surrender charge is payable, the Australia market price would remain around the floor price, even in a low-demand scenario. In this situation, there may still some benefit to liable entities from purchasing international units, but this depends upon how the surrender change is calculated, as discussed in section 4 below.

The conclusion from this very brief overview is that a surrender charge is required to ensure the integrity of the floor price in an emissions trading scheme in which low-cost international units can be used for compliance. The next section assesses the options for designing the surrender charge.

Figure 1: Economic when International Units are cheaper than the Auction Reserve Price
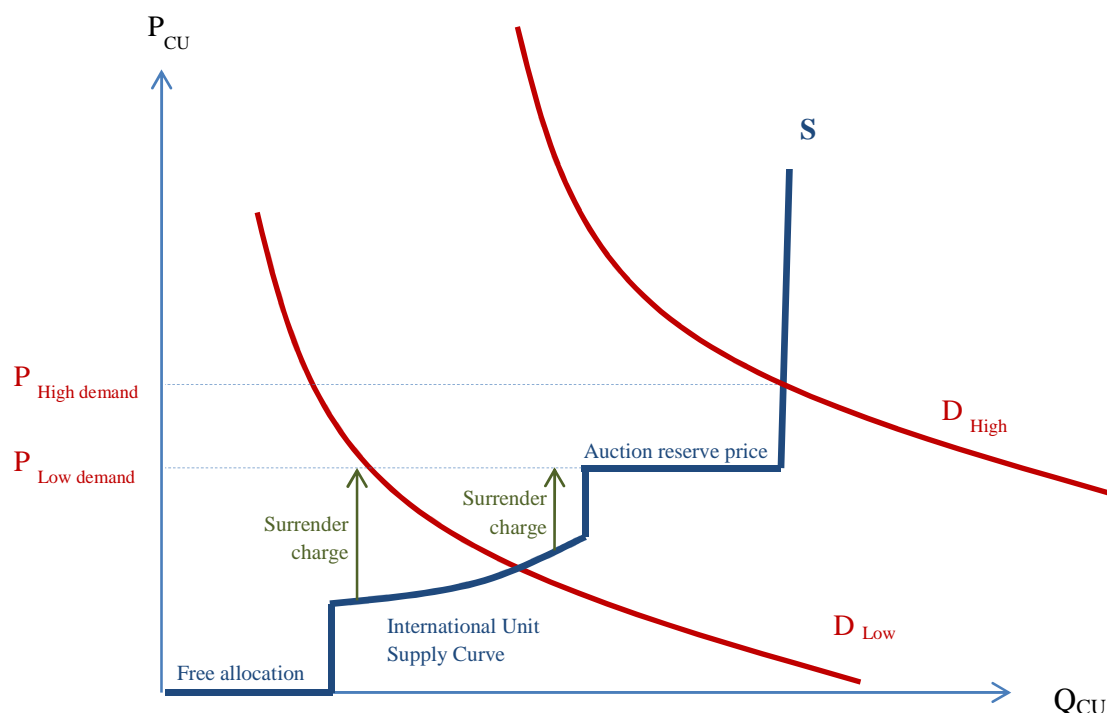
3. Assessing the options for the surrender charge

We present our understanding of the objectives of the Australian government (section 3.1) before setting out the four major design features that are possible for the surrender unit (section 3.2).

3.1 The objectives of the Australian carbon pricing arrangements

The criteria to be applied by the government are effectiveness, efficiency and workability. We infer that in practice this may be translated to requiring that:

1. Liable entities should pay (at least) the floor price for compliance
2. There should be no bias either for or against international or domestic units
3. The development of deep and liquid international carbon markets should be supported and domestic auctions should function well
4. Design choices should not leave needless (costly) risk with market participants
5. Design choices should raise revenue through the collection the surrender charge, if this is less distortionary than the marginal cost of public funds
6. The administrative burden should be minimised.

3.2 Some key design features

There are a variety of design features that might be considered in developing the surrender charge. This policy paper focuses on four key questions that are (implicitly or explicitly) answered by any design:

Contract or market: Should the reference price of the international unit be the price agreed in a bilateral contract between market participants (e.g. an Emissions Reduction Purchase Agreement, or an ERPA price) or a transparent (liquid) market price?

Primary or secondary: Should the relevant unit price be the primary price (i.e. forward contract price that incorporates project delivery risk and other risks) or a secondary (i.e. issued, risk-free) international unit price?

Date of contract or surrender: Should the relevant date for calculation of the surrender charge be the date at which the liable entity contracted to purchase the unit, or the date at which the unit was surrendered?

Day average or N-month moving average: If the surrender charge is calculated by reference to a market price rather than a bilateral contract price, should the relevant price be the volume-weighted average of the trading prices on the day or surrender, or should it be a moving average of prices over the previous 1, 2 or 3 months?

4. Recommendation

Our recommendation is that the surrender charge be equal to the floor price minus the **1-month moving average** price of **secondary** (i.e. issued) international units as revealed on a transparent, liquid **market** (rather than by reference to private bilateral trades), calculated at the **date of surrender** of the international unit. This represents a modification to "Option 3" presented in the Discussion Paper.

4.1 Reasoning

Our reasons for recommending these design features are as follows.

Contract or market. The reference price must be a transparent market price to prevent market participants from conducting side-deals so that they can artificially inflate their IU purchase price, to reduce the surrender charge payable. While we do not necessarily expect such side-deals would become widespread, as a matter of general practice it is simpler and clearer to use a transparent market price as the reference.

Primary or secondary. The relevant price is the price of an issued compliance instrument (e.g. a secondary CER), not a forward contract for primary CERs or similar. Primary projects (e.g. CDM projects) should be considered as an input (or a factor of production) into the generation of the eventual unit of compliance – an international unit such as issued, secondary CER. Government policy should ensure that it gets the position right on issued units. Provided it does this, the primary market will function accordingly to generate the issued units.

Date of contract or surrender. The date for the assessment of the surrender charge must be the date of surrender of the unit. Any other date creates the possibility of perverse incentives, gaming potential or one-way bets, as described in the box below.

Example: One-way bet if the surrender charge were based on the price at date of purchase

- Suppose the price floor is $15. Suppose a liable entity might purchase an international unit for $10. If this unit is surrendered, the liable entity pays a surrender charge of $5, because this is the difference between the price floor and the international unit price at **date of purchase**.

- Suppose the international unit price rises from $10 to $14. The liable entity sells the international unit to another party for $14, and buys a different international unit back from the other party for $14. The liable entity can now surrender the unit purchased for $14, paying a reduced surrender charge of only $1.

- Suppose instead that the international unit price falls from $10 to $1. The liable entity can either hold or surrender the international unit it purchased for $10. With the surrender charge fixed at $5, choosing to surrender when the international unit price was $1 would not mean paying an increased surrender charge of $14.

- The result is that the liable entity can purchase international units in the knowledge that if the price rises, they can 'swap' their international units with another party, reducing their surrender charge, while if the price falls they will not have to pay an increased surrender charge.

Day average or N-month moving average. The use of the previous N-months' average price for compliance reduces short-term price fluctuations. It also reduces the risk of a player trying to manipulate the CER market to move prices, immediately prior to surrender. Using a moving average price may have several other minor effects, but if anything these appear to be likely to reduce price volatility by giving participants a (very gentle) incentive to purchase and retire units after prices have fallen (i.e. where the moving average price is higher than spot so the surrender charge is lower), and a (very gentle) incentive to sell / not retire units after prices have been rising (i.e. when the moving average price is lower than spot, so the surrender charge is higher).

4.2 Limitations

Our recommended design appears to provide suitable outcomes in a range of different price evolution scenarios. One limitation of our recommendation is that it creates the possibility that some entities might lose out if they purchase international units above the floor price and then the spot price falls, so that on the date of surrender they are required to pay a surrender charge, even though they have already paid above the floor price. Equally, other liable entities might make a substantial amount of money if they purchase international units and then the spot price rises.

For liable entities who do not want to take on carbon price risk, one solution is that can purchase the international unit near to the date they retire it, knowing that the relevant 'surrender charge' is the average of the previous month's prices. If prices have been falling, the surrender charge will be a little less than the difference between the floor and their purchase price. If prices have been rising, it will be a little higher. But in any event, this strategy avoids taking on much price risk. Another solution would be to forward purchase international units and to simultaneously hedge any movements in the surrender charge. The hedge would be provided by financial

intermediaries or more sophisticated project developers, who may be likely to offer such products given the reasonably straightforward (negative, censored) relationship between the surrender charge and the price of an international unit. Other solutions are also possible.

For liable entities willing to take on price risk, they must obviously be aware that prices move up and down. They may end up making considerable profits if prices rise between the date of purchase and the date of surrender. Or they make considerable losses if prices fall between those two dates. In short, it is true that losses are possible, but in our view it is not Government's role to insure traders from carbon price risk, given that such risks cut both ways.[3]

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[3] Various forms of asymmetric insurance might be designed to protect against the possibility that firms taking market risk end up paying more than the floor price. The most attractive is the "knock-out barrier option" (Merton, 1973). With this approach, firms would not have to pay a surrender charge if they can show that they purchased and paid for an IU at a price above the floor price. While this has several attractive features, it creates its own problems. For instance, a firm buying at $15.01 has government protection against price declines, while a firm buying at $14.99 would not. As noted above, any system that references prices on the date of purchase, rather than the date of surrender, runs into some kind of problem of perverse incentives.

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Appendix

The relevant provisions of the Clean Energy Bill 2011 are summarised in the Explanatory Memorandum for the Bill:

Price Floor

3.82   A price floor will apply for the first three years of the flexible charge period. A price floor is a minimum carbon price. The responsible Minister will request the Authority to review, by 30 June 2017, the role of the price floor beyond the first three years of the flexible price period.

3.83   The price floor will be implemented through a minimum auction reserve price and a fee on the surrender of international units. If regulations establishing the fee on surrender of international units are not made or are disallowed there will be no price floor in operation.

3.84   The level of the price floor, and the minimum auction reserve price, will be:

- $15 in 2015-16;
- $16 in 2016-17; and
- $17.05 in 2017-18.

3.85   These prices increase by 4 per cent in real terms allowing for 2.5 per cent inflation per year, which is the midpoint of the Reserve Bank of Australia's target range (that is, the carbon price for the preceding year $\times 1.04 \times 1.025$, rounded to the nearest 5 cents.

3.86   For the first three flexible charge years, there will be a charge imposed on the surrender of eligible international units. This charge is imposed by the Clean Energy (International Unit Surrender Charge) Bill 2011.

3.87   The surrender charge will be established through regulations and based on the difference between the estimated international price for a unit type and the price floor, such that:

- If the price for a type of eligible international unit is equal to or above the price floor, the charge will be equal to zero.

- If the price for a type of eligible international unit is below the price floor, the charge will be equal to the amount specified in regulations so that it is equal to the difference between the price floor and the estimated price for that type of unit.

3.88   If regulations setting a surrender charge for eligible international units are not in effect, then there will not be a minimum auction reserve price, but the Regulator may still choose to have an auction reserve price for reasons other than implementing a price floor.