Emissions trading in New Zealand: Options for Addressing Trade Exposure and Emissions Leakage

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Key messages and recommendations

1. Some products or processes in New Zealand may be disadvantaged in international markets because they face a carbon price, whereas competing suppliers of the same or similar products do not. This may result in emissions leakage, which arises when a product's manufacture is re-located to countries without a carbon cap, leading to no (or a smaller) net decrease in global greenhouse gas (GHG) emissions and potential economic and social disruption from the re-location of that production.

2. Policy design should:
- Protect only trade exposed emissions intensive products or processes (exported or competing with imports) that would otherwise contribute to significant emissions leakage.
- Prevent emissions leakage only where it is cost effective; address firm/production relocation not financial losses resulting from higher costs.
- Ensure there are sufficient incentives to reduce GHG emissions intensity in the manufacture of trade exposed emissions intensive products.
- Establish thresholds for identifying those trade exposed emissions intensive products or processes with significant potential for emissions leakage. Clearly defining trade exposed emissions intensive products or processes is complex and as some policies will be implemented through firms, they will be blunt instruments.
- Be flexible. As more countries implement climate policies, adjust the list of trade exposed emissions intensive products and the extent of protection in response to any changes in price and trade signals.

4. Two options that reduce or avoid emissions leakage are output-based free allocation or border tax adjustments for trade exposed emissions-intensive products or processes.
3. There will be no perfect option for addressing trade exposed emissions intensive products or processes and emissions leakage; all involve some form of compromise.

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Potential Consequences of Putting a Price on Carbon—Loss of Competitiveness and Emissions Leakage

Putting a price on greenhouse gas (GHG) emissions provides incentives to change production and consumption patterns. For instance, manufacturers might substitute biomass energy for coal-fired boilers; farmers could apply nitrification inhibitors to land and use less fertilizer; homeowners may buy more energy-efficient kitchen appliances. Such changes will have production, profit, consumption, price and employment effects—all necessary adjustment costs of moving to a carbon-constrained world, and are discussed further in an associated paper on the distribution of costs and allocation of emissions units (Stroombergen and Kerr).

With current international climate policy, some countries face GHG emission caps and some do not. Of greatest concern to New Zealand is where New Zealand producers of emission-intensive goods compete with producers of the same or similar goods in other countries who do not face a carbon price. Issues around trade exposure and emissions leakage will exist only while there is an uneven playing field in terms of climate policy. As more countries agree to emissions caps and implement climate policies or whole sectors adopt uniform measures across countries, then the risk of trade exposure and emissions leakage resulting from differential carbon prices will decline and eventually disappear.

An emissions trading system (ETS) in New Zealand is likely to increase the marginal cost of producing GHG-intensive goods and services in New Zealand compared to countries without similar policies. In the short-term, policies that price carbon could lead to exported products becoming uncompetitive, or products imported from countries with less stringent climate policies being substituted for domestic products. Hence, there would be changes in the pattern of international trade and investments and thus, the international pattern of GHG emissions—reducing them in countries with a carbon price and increasing them in countries without a carbon price and no emissions cap. Furthermore, differences in efficiency or additional transport requirements could even raise global net GHG emissions. This is known as '*emissions leakage'*.

Emissions leakage is of concern because it reduces the environmental effectiveness of international emissions caps that do not bind all countries, and creates local costs (e.g., job losses and consequent unemployment and retraining expenses) that would not occur if producers in all countries faced the same price of carbon. Even when other countries enter the agreement, we would not necessarily get the lost production back because of adjustment costs. Once capacity has been destroyed it may not be recreated.

The simple loss of competitiveness argument also ignores general equilibrium effects such as changes in the exchange rate. If introducing a price on carbon results in a significant reduction in NZ exports, this will lead to a decline in the NZ dollar, at least partially restoring the competitiveness of NZ exports. Accordingly, any assessment of the effect of a carbon price on a given product, process or indeed on the wider economy should also look at any flow-on effects that could offset (or in some cases exacerbate) any initial effects.

Many firms may face 'unavoidable' financial losses due to increases in energy prices and the other effects of greenhouse gas prices. However, if their products are not trade exposed or are immobile (i.e. production cannot easily move offshore) there are no significant leakage implications. It is the leakage related to the relocation of production and international investment that is of greatest concern in this paper— these affected products or processes are considered *'trade exposed emissions intensive'*. [2]

[2] 'Trade exposed emissions intensive products' have also been referred to as 'competitiveness-at-risk' products in some literature. The use of 'trade exposed emissions intensive' differentiates the narrower focus in this paper on

Policy Objectives for Addressing Trade Exposure and Emissions Leakage

Climate policy has a number of sometimes competing objectives. These include:

- Maximizing the environmental effectiveness of international climate policy.
- Meeting our international obligations at least cost to New Zealand (including minimizing social disruption and adjustment costs).
- Minimising the fiscal cost to taxpayers.
- Positioning the NZ economy for efficiency in a carbon-constrained future.

The first three objectives may be in conflict. The fourth calls for greater foresight, but with long term uncertainty the policy implications are less clear. Despite this uncertainty, it is how to best position the economy for efficiency in a carbon-constrained world that should be of greatest importance.

Environmental and social considerations

To maximize the environmental effectiveness of international climate policy, emissions leakage needs to be minimized. To do this, New Zealand would ensure that exporting and import-competing firms facing a higher cost of GHGs than competitors do not reduce production (or expand less) as a result, unless they are relatively GHG inefficient. At the same time New Zealand needs to design policy to maintain an incentive on firms to reduce the emissions intensity of trade exposed emissions intensive products.

The same policies that minimize emissions leakage will also reduce unnecessary social disruption (i.e., job losses and flow on effects to local communities). Social disruption could be minimized by protecting existing levels of production, while making firms pay the full cost of any increase in emissions. This avoids actual job losses from differential emissions pricing but does not prevent any leakage that may arise if a NZ firm is unable, due to emissions costs, to increase its output to meet growing demand. Nor is this necessarily the 'least cost policy' for New Zealand since the cost of protecting local production over a number of years could exceed the one-off costs of social disruption.

Short and long-term economic considerations

Meeting international obligations at least cost to New Zealand is achieved when the lowest cost options for reducing NZ GHG emissions, across the entire economy, are implemented. It may be in New Zealand's economic interest to allow some emissions leakage to take place if New Zealand has no lower-cost sources of emissions reduction. This is especially true if the disparity in emissions pricing that creates the competitiveness problem is likely to persist for a number of years, because protecting 'trade exposed emissions intensive' production requires support from the rest of the economy. Thus, minimizing emissions leakage will not achieve a 'least-cost' policy objective unless the economic losses from unnecessary reduction in production exceed the on-going higher costs of protecting trade exposed emissions intensive production.

Policies aimed at protecting trade exposed emissions intensive products will come at some cost. Policy should therefore be rigorous in protecting only those products where substantial emissions leakage would otherwise occur and which are not likely to substantially decline anyway in a carbon-constrained future.

Options to Reduce Emissions Leakage

Identifying Trade-Exposed Emissions-Intensive Products and Processes

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products and processes compared to the sometimes broader focus on *firms* that have been referred to as having their 'competitiveness-at-risk'.

When defining trade-exposed emissions-intensive products and processes we are trying to distinguish between emissions leakage that is caused by GHG reduction policies and other forces that might drive the location or relocation of GHG intensive industries regardless of climate policies in other countries. Therefore, criteria or thresholds should be set that identify products that are trade exposed and emissions intensive, or identify the applicable processes[3] related to these products. Such triggers should relate to the percentage of output likely to be displaced by products or processes from countries without binding emissions obligations. Criteria that would help inform this decision include:

- Whether there is international competition (exports and imports) with products from countries without binding emissions obligations.
- The sensitivity of domestic supply to a price on GHG emissions.
- The GHG emissions intensity of product (t CO_2e/value of production), i.e., the overall emissions intensity of the manufacture of the product itself.

Information from the Negotiated Greenhouse Agreements (NGA) process could form the basis for establishing both appropriate levels for the threshold and what products or processes could be initially classed as 'trade exposed emissions intensive', even though the NGA process was negotiated at the company level. For example, in terms of 'emissions intensive' the manufacture of many types of cement may meet the GHG emissions intensity of product threshold but the downstream manufacture of concrete pipes would not. Even though concrete pipe manufacture does have an energy requirement, it is small compared to the manufacture of the cement itself.

Addressing leakage where it is significant

Once the products and processes of concern are identified, two compelling options for addressing leakage within an ETS are output-based allocations of emissions units and border tax adjustments.

Output–based allocation / emissions intensity
In an ETS, emission units (or the right to emit a certain amount of GHGs) are allocated or sold to firms. Some of these could be allocated for free as a way of addressing leakage concerns. The allocation option that warrants consideration is output-based or intensity-based allocation. This involves setting a level of GHG emissions per unit of output for products and then multiplying this by the volume of production. Allocation would be reviewed, usually annually, based on output in the previous period. Rolling average output could also be used to smooth production fluctuations.

For output-based allocations, GHG emissions intensities need to be defined. This can be based on either historic intensities (as per the EU ETS) or a technology or performance-based standard (as per the NGA process). Use of output-based allocation provides an incentive for firms to improve emissions efficiency. The allocated intensity level could also increase in stringency over time. This avoids immediate emissions leakage while recognizing that New Zealand products and processes will be increasingly competing in GHG-constrained markets.

Allocation based on output or intensity is an effective mechanism for dealing with trade exposed emissions intensive products or processes and the threat of emissions leakage. An output-based allocation provides no incentive to reduce emissions by reducing output, though of course if the aim is to avoid emissions leakage that is precisely the point. Output-based free allocation does not penalize any expansion of production, thereby allowing production to increase with increased (domestic or international) demand. The presence of a GHG price signal at the intensity margin focuses efforts into lowering the GHG or

[3] Coverage of the EU ETS is essentially defined by process rather than product. This is appealing as it is processes that emit GHG gases. There are also fewer processes than there are products, implying easier decision-making.

energy intensity of production. Output based allocation provides no incentive to reduce domestic consumption of protected products and is costly to tax payers because the government has fewer emission units to sell.

The Government could control its liability by capping the output-based allocation a firm could receive or by adjusting the allocated intensity level annually. A cap might be based on an historical level of output with some allowance for growth. Beyond the cap, a firm would be liable for any additional emissions. While both of these options increase the potential for leakage, they limit the Government's exposure to rising emissions from an expanding emission-intensive industry.

Border tax adjustment (BTA)

BTA also protects trade exposed emissions intensive production while maintaining a domestic price signal to reduce GHG emissions. It involves rebating emission allowances for emission-intensive goods that are exported from New Zealand, while imposing emissions obligations (e.g. a tax, or an obligation to hold emission allowances) on emission-intensive goods imported from countries without corresponding policies.

BTA has several strengths in common with output based allocation—it preserves the competitiveness of trade exposed emissions intensive products and processes; it provides incentives to reduce the GHG intensity of products or processes; and it effectively reduces international emissions leakage. In contrast to output-based allocation, it involves a lower transfer of wealth from taxpayers to firms producing trade exposed emissions intensive products. The government earns tax revenue on imports of these products. It also creates efficient incentives for consumers of these products and processes in New Zealand to reduce their demand where an output-based allocation system does not.

BTA may however be perceived by developing countries as a trade protection measure and, depending on how the BTA is structured, have compliance issues with world trade rules. Determining the emissions attributable to imported goods would also pose some challenges. Finally, BTA leaves the NZ government with a potentially growing fiscal liability for emissions from trade-exposed emissions intensive exports.

There is increasing interest in Australia, the EU and the USA to use BTA to address competitiveness effects of climate policies. The best outcome would be achieved if New Zealand joined other countries to design a uniform BTA policy to be implemented by all countries. This could resolve most, if not all, competitiveness issues posed by a NZ ETS. However, it is unlikely that any such agreement would be finalized before the start of New Zealand's obligation period and an interim measure might therefore be required, such as the allocation option outlined above.

Further Reading and References

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Important Definitions

Allocation: The method used to distribute emission units.

Emission units: A kind of currency that entitles the holder to emit a defined quantity of GHG emissions.
Emissions Leakage: Increase in GHG emissions in a country without climate policies as a result of any decreases in production associated with the domestic climate policies of another.
Trade Exposed Emissions Intensive Product: A product that is disadvantaged because it faces a carbon price whereas competing suppliers of the product do not, and as a result its production re-locates to countries with a lower or no carbon price.