

Emissions Trading in New Zealand: Points of Obligation for Holding Tradable GHG Emission Rights

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Key messages

1. The point of obligation should be chosen (as much as possible) in order to:
 - Obtain comprehensive coverage
 - Minimise transaction costs; and
 - Provide the most clearly targeted incentives to reduce emissions.
2. The point of obligation does not affect the ability of any party to mitigate, and will usually also not affect:
 - the way in which the economic burden is shared across parties in the vertical chain; or
 - the incentives of parties to respond.
3. If accurate targeting of GHGs cannot be achieved at all points in a vertical chain, then the point of obligation will affect mitigation incentives and the sharing of the economic burden.

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Generic Issues

The point of obligation is the entity that is required to report a defined set of information. This information is used to model the GHG emissions relating to the chain of production. The point of obligation must then surrender sufficient emission units to match those GHG emissions.

Economic Burden of Obligations

In any industry, there is a vertical chain of production and consumption, with several 'layers' from initial production to final consumption. When a legal obligation to hold rights is placed on one such layer, the economic burden of that obligation will usually be shared by all parties in the chain of value.

Because of the extra costs imposed on parties in one layer (the cost of meeting their obligation), prices change at all points along the chain. Generally, prices rise downstream of the obligation point (towards consumption) and fall upstream (toward initial production). Parties in downstream layers (including final consumers) bear some burden from the higher purchase prices, while upstream parties face lower prices for their output. The exact share of economic burden that each layer bears depends on competitive conditions within the supply chain, and these vary by industry.

The way the economic burden is shared between parties in the chain is independent of the point at which the legal obligation is placed, provided accurate targeting of GHGs can be achieved at all points. An example of where accurate targeting cannot be achieved is electricity retailers, who have no way of knowing the source (and hence emission profile) of the power they are supplying to end-users.

Incentives to Respond

All parties that bear part of the economic burden of an obligation have an incentive to respond. Since economic burdens are shared through the vertical chain of production and consumption, parties with no legal obligation also have incentives to respond.

The total incentive to mitigate does not generally depend on the point of obligation, because the way in which the burden is shared is usually independent of the point of obligation. Incentives depend on the sharing of burden, and if the point of obligation does not affect sharing then it does not affect incentives to mitigate.

The point of obligation will affect the incentive to respond if the accuracy of accounting for the GHGs is affected. For example, if agricultural emissions are monitored at the processor rather than the farm level, there will be weaker incentives for on-farm efforts to reduce the emissions intensity per unit of production.

Ability to Respond

The ability to respond varies by sector and layer, but is independent of the point of obligation. All parties that bear some economic burden have the ability to respond. The activity causing the economic burden is now less attractive compared to others, and parties can reduce the amount of that activity they undertake. Developing new mitigation technologies is also now more attractive.

Emissions trading allows obligation holders to acquire mitigation from third parties rather than undertaking their own mitigation activities. This reduces the social cost of mitigation, and thereby also reduces the economic burden on others in the same vertical chain. It follows that there is no need for the obligation to reside with the party most capable of mitigating (or any other party for that matter).

Transaction Costs

Imposing an obligation to hold rights on every party in a layer of a supply chain involves costs. The size of these transaction costs can vary considerably depending on the particular layer. These costs should be minimized (while giving due consideration to other factors). Generally, layers with a small number of parties and where the relevant data are already collected have low transaction costs.

Comprehensive Coverage

All parties in the targeted layer should be obliged to hold rights. It will be easier to ensure complete coverage, the fewer parties are in a layer.

Sectoral Issues

Transport Fuels

There are good arguments for placing obligations with oil companies. This is the vertical layer with fewest parties, so transaction costs are minimised and complete coverage is obtained. Additionally, CO₂ emissions are directly proportional to fuel usage and independent of vehicle technology.

Electricity

Transactions costs point towards obliging either retailers or generators rather than end-users of electricity. These layers are vertically integrated in New Zealand, so the identity of the companies that should bear the obligation is clear. Considerations of accurate targeting of incentives point towards putting obligations on generators, because a range of technologies is available with very different GHG emission profiles.

Placing the obligation on generators rather than retailers will lead to higher retail prices, but there will be correspondingly clearer incentives for generators to move towards less GHG-intensive plant. If retailers were obliged, the price signal's relationship to emissions would be muted, reflecting the average emissions of the sector, because electricity deliveries are determined by the laws of physics. That would create free-rider problems for generation investors, who would not face the full social cost of installing more thermal plant.

Electricity is generated in industrial plants for their own use, and for sale to other users nearby. Most of this does not pass through the wholesale market, so a parallel accounting/reporting system would be needed. This could involve upstream obligations on fossil fuel supplies with a carve-out for fuels sold to electricity generators.

Industrial Coal and Gas

Domestic and imported coal is used in many industrial processes. There is not an enormous number of such plants, but there are considerably fewer coal vendors, so transactions costs will be minimised by placing obligations on vendors. Additionally, end-users could be granted credits for installing and using carbon sequestration equipment.

Similar considerations apply to gas. The emissions are directly proportional to gas used, so there are no targeting advantages in obliging gas users rather than gas suppliers.

For each of these sectors, the most clearly targetted option also involves a small number of players so the best point of obligation is relatively easy to identify. In contrast, for forestry and agricultural emissions there is a potential conflict between accurate measurement of emissions and transaction costs. This can be addressed in part by making the assessment of emissions as simple and standardised as possible and by basing it on existing data. However in the short run at least, compromises may need to be made.

Forestry

Tree growers receive credits and face liabilities. Liability is best borne by land owners because they control long term land use so can most easily ensure that an efficient decision is made at the end of a rotation. If existing forest owners were held liable for deforestation at the end of a rotation when their forestry right ends, they would be in an extremely weak bargaining position with the landowner. A significant proportion of forest is on land owned by Maori or the Crown – transactions costs in negotiating with these groups may be high. In addition, landowners are easier to identify and track than forest owners.

These factors all argue for making the landowner the point of obligation. In the short run there will be some complex legal situations under existing contracts between land and forest owners. This is more of an issue for pre 1990 forests than post-1990. To get efficiency, landowners will need to negotiate with forest owners to achieve efficient rotation lengths. The distribution of the value of credit from existing forests between landowners and forest owners will be contentious. Any new contracts will specify this in advance.

Carbon sequestration and release can be monitored at low cost (and medium accuracy) through satellite monitoring of forests and use of regional carbon tables by species. This could be supplemented by more detailed information provided by landowners where the benefits outweigh the cost of the information (e.g. for larger forestry blocks).

Agriculture

Animal farmers are required to maintain good stock records for tax purposes, so it is feasible to oblige them to hold stock-related emission permits. That may be adequate for meat and wool producers. However for dairying, emissions are more closely associated with milk production than cow numbers, so dairy processors may provide better targeting. The mostly clearly targetted system for methane emissions would both stock number and productivity data so will require data from farmers. For nitrous oxide emissions many on farm options are possible which makes farm level monitoring attractive. This may however be offset in the short run by the high costs of making such a large number of farmers points of obligation and by challenges in the science behind the models used to monitor nitrous oxides.

Nitrogenous fertilizers are supplied by a small number of companies that would provide the best monitoring point. However the associated emissions depend on farm-specific factors (soil type, time and concentration of application) that require specialised modelling such as with Overseer. More carefully tailored use of nitrogenous fertilizer is highly desirable, and incentives for that can be provided through the ETS. Fertiliser companies are obvious partners.