Ministry for the Environment
Manatū Mō Te Taiao

Development of

Industrial Allocation Regulations

under the New Zealand Emissions Trading Scheme

Consultation Document

New Zealand Government

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Foreword

Industrial allocation is one of the most challenging aspects of the design and development of an emissions trading scheme. There are large sums at stake, the future of some of New Zealand's most important industries is affected, and there are a range of potentially complex engineering and financial concepts involved.

The recent amendments to the Climate Change Response Act 2002 provide an allocation regime that better protects New Zealand's emissions-intensive trade-exposed industries and better aligns with the approach to allocation taken by our key trading partners. The amendments to the New Zealand Emissions Trading Scheme (NZ ETS) provide New Zealand industry with greater certainty over the detail of the approach to allocation and who the likely recipients will be. The challenge now is to implement the provisions of the Act in a timely and efficient way. This document outlines how this will be achieved.

The transition phase of the NZ ETS provides an opportunity to establish a system of allocation in an environment where the price of emissions is low. I intend to adopt a pragmatic approach by taking advantage of the substantial technical work undertaken here and abroad. The review of allocation scheduled for 2011 and future reviews provide opportunities to refine the allocation regime over time.

This consultation document provides a number of opportunities for input into the process of making allocation. I invite industry to contribute to an efficient allocation process and look forward to receiving constructive feedback on the issues consulted on in this document.

Hon Dr Nick Smith
Minister for Climate Changes Issues

Contents

Annexures

Tables

Figures

Executive Summary

The New Zealand Emissions Trading Scheme

The New Zealand Emissions Trading Scheme (NZ ETS) is a key part of the Government's response to global climate change. It is the primary means by which New Zealand will meet its obligations under international agreements such as the Kyoto Protocol.

Under the NZ ETS, some businesses will have a legal obligation to surrender 'emission units'[1] to cover their direct greenhouse gas emissions or the emissions associated with their products. The consequent need to acquire these units will effectively put a price on emissions of these greenhouse gases.

Businesses with legal obligations under the scheme will generally be 'upstream' operators, such as transport fuel producers or importers bringing products in to New Zealand. More information about the scheme and who will have legal obligations can be found at www.climatechange.govt.nz/emissions-trading-scheme

From 1 July 2010 the NZ ETS will apply to the stationary energy, industrial processes and liquid fossil fuels sectors. From this date many energy producers (such as transport fuel producers and electricity generators) and some businesses undertaking industrial processes that lead to direct emissions of greenhouse gases (such as the production of iron or steel) will face obligations and a price on emissions. In many cases this price will be passed through to consumers; for example, through higher electricity and gas prices.

Businesses with legal obligations will be able to acquire emission units in a number of ways. They may buy them from other New Zealand firms or from international carbon markets.

The Government intends to give some emission units to those firms that will be particularly adversely affected by the costs imposed by the NZ ETS. This is called 'allocation'.

This consultation document sets out the Government's approach to allocation. In summary, it:

- sets out the process for awarding allocation under the moderated NZ ETS
- seeks feedback on a number of technical matters
- invites people who believe they meet the tests for allocation to identify themselves and provide some preliminary data to demonstrate this.

The Climate Change Response Act 2002 ("the Act") requires the Minister for Climate Change Issues to consult during the development of regulations that make people eligible to receive allocations. This consultation document forms part of this consultation.

[1] A 'New Zealand unit' or other unit created under the Kyoto Protocol.

Why allocation?

Allocation of emission units will protect the competitiveness of firms that face a large increase in costs as a result of the introduction of the NZ ETS but will not be able to pass those costs on to customers through higher prices. This may apply to firms facing competition from foreign firms that do not face a comparable cost on emissions in their home countries. The impacts will be greatest for those that are very emissions intensive – meaning those that produce a significant amount of emissions and/or use large amounts of energy to produce their products – and therefore face significant increases in costs as a result of the NZ ETS. In other words, the firms that will be most affected by the introduction of the NZ ETS will be those that are both *emissions intensive* and *trade exposed* (EITE).

If assistance is not offered to these firms, they may react to the costs imposed by the NZ ETS by reducing their production in New Zealand. This production might then shift to other countries. If these other countries do not place controls on emissions, this may cause emissions leakage: New Zealand emissions fall, but there is no reduction in global emissions since production has simply shifted abroad. The lost business activity may not return to New Zealand in future, even when emissions pricing is more widespread internationally.

Firms that face higher energy prices as a result of the NZ ETS may also be eligible. In determining whether firms are emissions intensive, the Government will take into account direct emissions – such as the use of certain fuels (for example, gas) or emissions from certain industrial processes – but also 'indirect' emissions associated with their use of electricity.

Where firms have legal obligations to acquire and surrender emission units under the NZ ETS, allocation can assist them in meeting these obligations at a lower cost. Firms without obligations will be able to sell their allocated units to offset part of the increased costs they face as a result of the NZ ETS.

The provision of allocation will be done in a way that maintains incentives for firms to reduce emissions and improve their efficiency. In addition, it is expected that emissions pricing will be steadily introduced in many other countries, gradually reducing the need to protect the competitiveness of New Zealand firms. The level of allocation will therefore be reduced over time ('phased out').

Similarities with Australia

Australia is proposing to introduce an emissions trading system in the form of the Carbon Pollution Reduction Scheme (CPRS). Australia is a key trading partner. New Zealand's approach to allocation is very similar to the approach being developed in Australia. The Australian Government has also undertaken considerable work to identify activities that should be eligible for allocation and to determine how much allocation they should receive. By making use of this work, the New Zealand Government may be able to speed up the process of providing allocation under the NZ ETS.

However, there is currently uncertainty about whether the CPRS will pass into law in Australia. It is important that New Zealand creates incentives to reduce emissions that are suitable for its specific circumstances. Therefore, the Government intends to implement the NZ ETS even if the CPRS does not proceed. Similarly, the Government intends to move ahead with the provision of allocation in New Zealand, rather than waiting for the position in Australia to become more certain.

The basis for allocation: activities

Allocation of emission units will be awarded on the basis of emissions from *activities*, rather than on the basis of firms or sites. An example of an activity might be the production of glass or newsprint. Eligible activities will be the most emissions-intensive, trade-exposed processes in the economy. People conducting eligible activities will be able to apply for allocation.

Each eligible activity will be defined by an activity description, which will include a starting point (the input of a specified substance or substances) and an end point (the output of a specified saleable product).

An intensity-based approach to allocation is being adopted because one of the main objectives of allocation is to maintain production in New Zealand. For each eligible activity, allocation will be in the form of a fixed number of emission units per unit of saleable product. This is based on what is called an 'allocative baseline'. These allocative baselines will generally be based on the average emissions per unit of saleable product across all people conducting the activity in a particular historical period. This will have the effect of rewarding firms that improve the efficiency of their production.

Each person conducting an eligible activity will receive a number of units per unit of saleable product equal to a percentage of the relevant allocative baseline. That percentage will start at 90 per cent or 60 per cent depending on whether they are 'highly' or 'moderately' emissions intensive, and will reduce by 1.3 per cent per annum after 2012. If an activity does not meet the threshold to be classified moderately emissions intensive, no allocation is available.

The formula for allocating emission units will be:

volume of production x the allocative baseline x a percentage of assistance.

Two possible tracks to eligibility

The NZ ETS provides two routes by which activities can be made eligible for an allocation:

- a 'New Zealand' track – which includes tests to identify emissions-intensive trade-exposed activities
- an 'Australian track' – activities that are eligible (or likely to be eligible) for allocation in Australia can be made eligible for allocation in New Zealand without the need for additional analysis.

The New Zealand track

Under the New Zealand track, activities can be made eligible for allocation in New Zealand if they meet certain tests set out in legislation.

All activities will need to meet a minimum level of emissions intensity, specified as tonnes of emissions from the process per million dollars of revenue from the output. Depending on their level of emissions intensity, they will be defined as either 'moderately' or 'highly' emissions intensive.

The definition of 'revenue' is discussed in section 5 of this consultation document.

Emissions that will be included in the test are the direct emissions from undertaking the activity, plus indirect emissions associated with the use of electricity. The direct emissions will be those that result from the direct use of certain fossil fuels,[2] direct use of geothermal fluids, and those that result directly from certain industrial processes. To determine indirect emissions associated with the use of electricity, an 'electricity emissions factor' will be used: a standard quantity of emissions that is attached to each megawatt hour of electricity used.

To determine eligibility, the electricity emissions factor proposed will reflect the electricity generation mix in Australia,[3] to ensure fair treatment of activities compared to any that might be made eligible via the Australian track.

Activities that are eligible for allocation in Australia

Rather than wait for the position in Australia to become more certain, the current thinking of the Government is to assess whether activities that are eligible (or likely to be eligible) for allocation under the proposed CPRS can be made eligible under the New Zealand track.

Activities that have been defined as eligible in Australia are listed in table 1 (see section 3). A number of additional activities are being investigated in Australia currently because it is believed they *might* be eligible; these are listed in Table 2 (see section 3). A full activity description, derived from work undertaken in Australia, for each of these activities is set out in Annex 1.

Where it is appropriate for existing activity descriptions to be utilised from Australia, these activities will have a significant head-start on the activities that need to be defined specifically for New Zealand. The Act sets out how activities are to be defined and we want your feedback on the Australian activity descriptions and other matters in Annex 1 to judge whether they should be progressed down the New Zealand track.

If (taking into account responses to this consultation document and other legal requirements in the Act) the Government judges it to be appropriate, these activities will go through the process of data collection and testing against eligibility thresholds on the New Zealand track. *Gazette* notices requesting data on emissions and revenue will be issued for all activities before they are considered for eligibility.

The Government will retain the option of using the Australia track should the CPRS eventually pass into law.

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2 Under the Act these fuels are coal, natural gas, used or waste oil and emissions associated with the use of steam generated from the use of these fuels is included.

3 1 tonne of CO_2-e per megawatt hour.

Determining allocative baselines

The allocative baselines will be set under the New Zealand track using average data for all firms undertaking the activity in New Zealand during a given historical period. The allocative baselines will be calculated from the same types of emissions as will be included in the emissions intensity test, but the proposed electricity emissions factor (or 'electricity allocation factor') reflects the electricity generation mix in New Zealand.[4] This ensures that firms will be compensated for the likely rise in electricity costs they will actually face.

If the Australian track were to be used, the allocative baselines would be based on those developed in Australia, but modified to reflect New Zealand's different mix of electricity generation and natural gas production emissions.

Timing

The Government will aim to give firms certainty over allocation as soon as possible. It is expected that certainty will increase through 2010 as work progresses.

The timing of regulations made via the New Zealand track will depend on the number and complexity of activities and the time required for industry to collect and submit data. The Government will make all reasonable endeavours to give firms certainty over allocation before obligations start under the NZ ETS in July 2010.

Timely input from industry will be important to ensuring that the allocation process is completed as quickly as possible. Thorough responses to this consultation document will assist the Government with this. In addition, those firms conducting an activity in Annex 1 (or other activity they think will be eligible) are urged to begin the process of compiling information on emissions, revenue and output that will be necessary to make decisions on eligibility and allocative baselines.

To mitigate against any unforeseen delays in providing allocation during the first year, allocation will be provided back-dated to 1 July 2010 for those found eligible and the impact of the NZ ETS has been softened during the transitional period when firms will benefit from the progressive obligation to surrender only one unit for every 2 tons of emissions, and a fixed price of $25 per New Zealand unit.

We need your feedback

This consultation document contains a number of specific questions the Government is seeking feedback on. These questions are gathered together in section 8, 'How to make a submission'. Quality feedback on this consultation document is important. Feedback will help the Government identify activities in Annex 1 that are occurring in New Zealand, identify other activities with potential to meet eligibility tests, and finalise detailed rules on issues like data collection.

Responding to this consultation document is the key opportunity for industry to engage in the allocation process.

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[4] 0.52 tonnes CO_2-e per megawatt hour.

1 Introduction

Overview

The New Zealand Emissions Trading Scheme (NZ ETS) is part of the Government's response to global climate change. It is the primary means by which New Zealand will meet its obligations under international agreements such as the Kyoto Protocol. Under the NZ ETS, some businesses will have a legal obligation to surrender 'emission units'[5] to cover their direct greenhouse gas emissions or the emissions associated with their products. The consequent need to acquire these units will effectively put a price on emissions of these greenhouse gases.

The surrender obligations of the NZ ETS will apply to emissions from stationary energy and industrial processes and liquid fossil fuels sectors from 1 July 2010. From this date many energy producers (such as transport fuel producers and electricity generators) and some businesses undertaking industrial processes that lead to direct emissions of greenhouse gases (such as the production of iron or steel) will face obligations and a price on emissions. In many cases this price will be passed through to consumers; for example, through higher electricity and gas prices. However, the Government intends to give some emission units (called 'allocation') to the most adversely affected firms. This allocation will be targeted at firms that face a significant increase in costs and have a limited ability to pass these costs on to customers. In other words, it will be targeted at those firms that are conducting activities that are both *emissions intensive* and *trade exposed*.

This consultation document sets out the Government's approach to developing regulations under the Climate Change Response Act 2002 ("the Act") that make people eligible to receive allocations. It:

- sets out the process for awarding allocation under the moderated NZ ETS
- seeks feedback on a number of technical matters
- invites people who believe they meet the tests for allocation to identify themselves and provide some preliminary data to demonstrate this.

The Climate Change Response Act 2002 requires the Minister for Climate Change Issues to consult during the development of regulations that make people eligible to receive allocations. This consultation document forms part of this consultation.

The reason for allocating to affected parties

Many New Zealand-based firms operate in markets in which prices are set internationally. This includes both firms that are exporting and those that produce goods that compete against imports. For these 'trade-exposed' firms, an increase in the costs of production in New Zealand as a result of the NZ ETS will make them less competitive relative to firms in other countries that are not facing an increase in their production costs. The impacts will be greatest for those that have significant emissions and therefore face significant increases in costs. These are the firms that have emissions-intensive, trade-exposed (EITE) activities.

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[5] A 'New Zealand unit' or other unit created under the Kyoto Protocol.

The concern is that this reduced competitiveness may result in reduced production and output in New Zealand and a corresponding increase in production and output in other countries. This could result in both:

- emissions leakage – New Zealand emissions fall and, although we are better able to meet our international emissions obligations, there is no reduction in global emissions
- economic regrets for New Zealand as a result of losing business activity that may not return, even when emissions pricing is more widespread internationally.

In response to these concerns, allocation is being used to maintain production in New Zealand to reduce emissions leakage and maintain industrial capacity to reduce economic regrets. These two objectives influence the approach taken to allocation, particularly the use of an intensity-based approach that provides incentives to maintain production. At the same time, the allocation approach needs to maintain incentives for emission reduction through improvements in the emissions intensity of manufacturing.

One of the main reasons for the amendments to the original Act was to reduce the adverse international competitiveness impacts of the NZ ETS, including using a slower rate of phase-out. Another reason was to achieve greater alignment with approaches proposed in Australia to maintain cross-Tasman competitiveness.

Because it is expected that emissions pricing will be introduced in many more countries over time, including New Zealand's major trading partners, the need to protect competitiveness is likely to reduce year by year.

How will allocation work?

Costs will increase for industry because of the requirement to surrender emission units, so allocation of emission units is an effective way to limit net costs. The size of the cost increases will change with the price of emission units, and so will the value of the allocation to limit these costs. As was noted above, allocation of emission units aims to maintain both production levels and productive capacity. These objectives have different implications for allocation.

Business decisions about production levels are made on the basis of the marginal costs of production. Other things being equal, a firm will produce another unit of output so long as the revenue it receives for that next unit is greater than the cost of producing it. The introduction of the requirement to surrender emission units affects the marginal cost of production because each additional unit of output results in more emissions and an additional requirement to surrender emission units. If a firm is given a lump sum allocation of emission units (ie, it is given the same number regardless of how much it produces), allocation will not change costs and revenues at the margin, or the decision to reduce production.

In contrast, if the number of emission units a firm is given changes with the amount it produces (an 'intensity' or output-based approach), then allocation changes marginal costs and revenues: producing another unit of product both increases the requirement to surrender emission units (or increases pass-through costs) *and* results in an additional allocation that limits the increase in net costs.

Decisions about maintaining capacity (staying in business) are made on the basis of average costs and revenues. A firm will keep operating if its profits are greater than its costs of capital. This can be achieved by intensity-based allocation. Intensity-based allocation will be used under the NZ ETS.

Similarities with Australia

To summarise, the approach to allocation in the Act is:

- targeted at trade-exposed, emissions-intensive activities
- intensity-based
- phased out over time.

This is very similar to the approach being developed in Australia as part of its proposed Carbon Pollution Reduction Scheme (CPRS). This provides opportunities to manage across-Tasman competitiveness impacts and to benefit from the considerable amount of work the Australian Government has done on industrial allocation.

There are a number of good reasons for aligning with Australia. This approach can reduce trans-Tasman competitiveness concerns (which are a proxy for international competitiveness concerns more generally). Also, making use of technical work completed in Australia could accelerate the allocation process.

However, regardless of whether or not the CPRS is passed into law, the Government intends to move ahead with implementation of industrial allocation in New Zealand.

2 The overall approach to industrial allocation

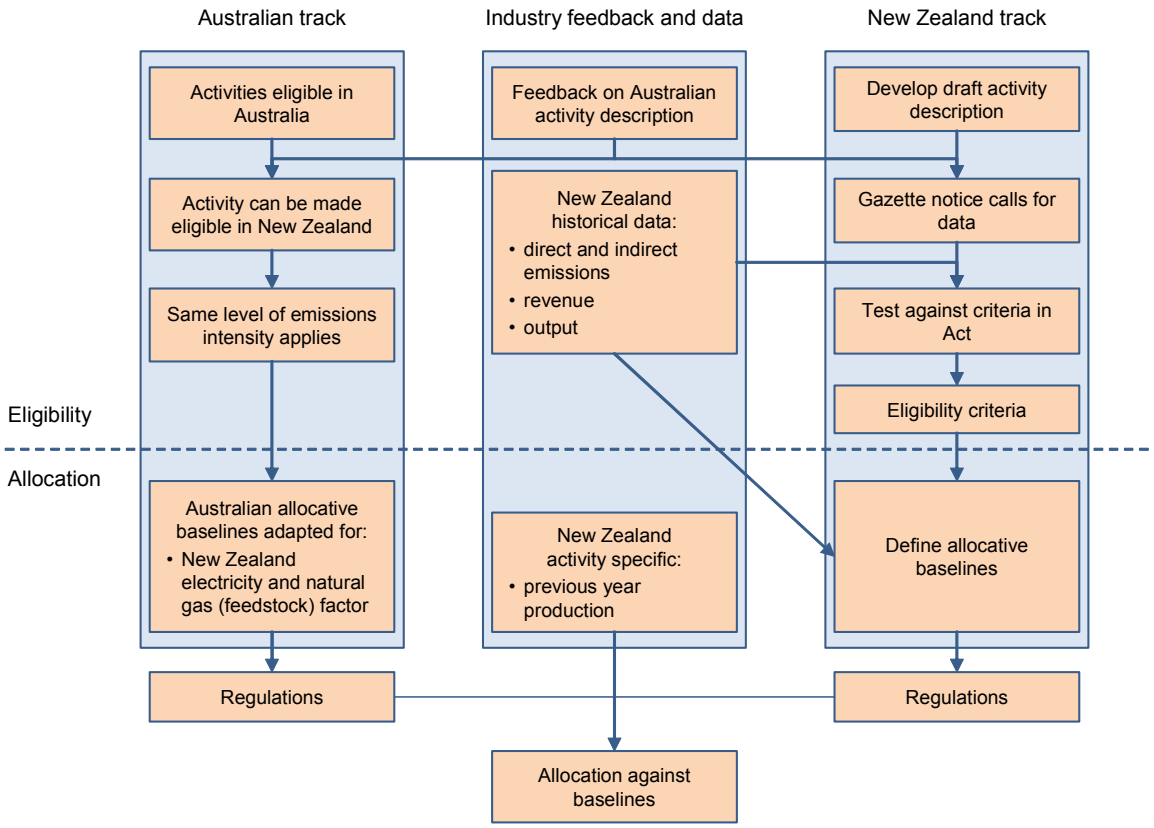
The process for determining allocations

There are two parts to the process of determining allocations:

- defining eligibility – who will receive an allocation (covered in section 3)
- defining the allocation amount – how much they will receive (covered in section 4).

There are two potential 'tracks' for determining an allocation: a New Zealand track and an Australian track. They are illustrated in figure 1.

Figure 1: Alternative tracks to allocation



As Figure 1 shows, these different tracks relate to both determining eligibility and determining amounts of allocation.

The proposed New Zealand track does not require Australia to have an emissions trading scheme. It can be used for an activity that is being conducted in New Zealand and is emissions intensive and trade exposed.

The proposed New Zealand track requires a number of steps, including:

- identifying that an activity has the potential to meet the eligibility tests in the Act, either because its case for receiving allocation is being considered for eligibility in Australia or by taking into account preliminary data from industry (as requested under this consultation document)
- defining the activity, including the start and finish of the process
- publishing a *Gazette* notice that requests data on the activity
- formally assessing the data against the emissions intensity and trade exposure tests, as set out in the Act
- if tests are passed, developing allocative baselines for eligible activities on the basis of historical emissions intensity using the data gathered under the *Gazette* notice. The allocative baseline is an intensity measure and is defined in terms of emission units per unit of product (eg, tonnes of product).

The Australian track can only be used if Australia passes its proposed Carbon Pollution Reduction Scheme (or a similar scheme) into law. Where an activity has been defined as emissions-intensive and trade-exposed (EITE) in Australia the Australian track allows for it to be made eligible for an allocation in New Zealand by the development of a regulation.

In addition, under the Australian track the amount of emission units a firm receives would be based on allocative baselines defined in Australia. The Australian allocative baselines would be modified to take account of relevant New Zealand electricity allocation and natural gas 'feedstock' allocation factors.

Under both tracks, the actual annual allocation is developed by using the allocative baseline for the activity and multiplying it by the amount of production from the specified activity and by a declining rate of assistance.

The elements of the allocation process are outlined in more detail in sections 3 and 4 of this document.

The process for receiving allocations

Applying for an allocation

Regulations are required to establish the eligibility of an activity and to set the baseline(s) for allocation for that activity.

During the transitional period, applications for allocation may be made during the three months after a regulation comes into force. Once a regulation has been made, firms may apply for a provisional allocation between January and April of each year, based on the previous year's output. If a provisional allocation is made, an adjustment must be included in the following year's allocation to reflect the actual output from that year.

Further information on the application process will be provided in due course.

When will eligible activities receive allocation?

Eligible persons cannot apply for allocation until a regulation is complete, establishing that the activity being conducted is eligible to receive allocation. The timeframes to establish these regulations will vary from activity to activity. Key factors that determine how long it will take to develop a regulation include:

- the difficulty of developing activity descriptions
- the timeliness, quality and transparency of data supplied by industry
- the number of activities.

The timing of regulations made via the New Zealand track will depend on the number and complexity of activities and the time required for industry to collect and submit data. The Government will make all reasonable endeavours to give firms certainty over allocation before obligations under the NZ ETS start in July 2010.

Industry will be able to influence the speed of the allocation process by providing thorough submissions on this consultation document and providing quality data in response to *Gazette* notices. Firms that are conducting an activity in Annex 1 (or conducting an activity that they think is eligible) should begin the process of collating data on emissions, revenue and output now, to prepare for the Government issuing a *Gazette* notice calling for data on their activity.

To mitigate against any unforeseen delays in providing allocation during the first year, allocation will be provided backdated to 1 July 2010 for those found eligible and the impact of the NZ ETS has been softened during the transitional period when firms will benefit from the progressive obligation to surrender only one unit for every 2 tons of emissions, and a fixed price of $25 per New Zealand unit.

Once regulations have been established, people conducting activities covered by the regulations will be able to apply for a provisional allocation at the beginning of each year in which emission costs are due to be incurred.

We will now look in more detail at how eligibility for allocations of emission units will be determined.

3 Who will receive an allocation?

In this section we describe how activities will be looked at to see whether they are eligible for an allocation. First we describe what we mean by an 'activity'. Firms do many things and are structured in different ways, but to ensure different firms are treated fairly and allocation is targeted only at the most emissions-intensive activities, the things they do that will be measured in order to determine eligibility need to be carefully specified. The concept of an activity does this.

We also describe the two tracks for defining eligibility for different activities: the New Zealand track and the Australian track.

What is an activity?

When we examine the vulnerability of firms to an emissions price, this vulnerability is defined in terms of a specific *output*. It is the output that is traded internationally, and it is the company's inability to increase the price of that output sufficiently that reduces the company's competitiveness in producing that output. Establishing the output is therefore the first step.

But the output does not produce the emissions: its manufacture does. So the basis for defining what is trade exposed and emissions intensive is the *process* that produces a trade-exposed *output*. This is called an 'activity'.

The Act contains a number of matters that are used to define an activity and to determine whether it is eligible. These matters are outlined and explained in more detail in Box 1.

Box 1: Defining the boundaries of an activity

Under the Act, the Minister must have regard to the following matters when developing activity descriptions.

1. **The requirement to define each activity by reference to a physical, chemical or biological transformation of inputs into outputs.**

The key idea here is that an activity is defined by specific inputs and outputs rather than the actual process. Processes change over time with improvements in technology and may vary between firms. Both inputs and outputs must be specific, particularly if producers make outputs with a range of varying grades or emissions intensities. This avoids awarding or penalising different approaches to producing an output, potentially leading to distorted incentives to change the output mix or specification after the activity definition, baseline and allocation are established.

2. **The undesirability of activities being defined by reference to the technology employed, the fuel used, the age of the plant, or the quality of the types of feedstock used when the activity is carried out.**

Activity definitions are technology neutral because not all producers of an output are the same, and it is expected that, over time, producers will use improved technologies and processes with reduced emissions. This allows equitable treatment between firms producing the same output even if they have varying emissions intensities. It also ensures the activity definitions will be relevant in the long run. Because assistance is provided on an activity basis, firms have a strong incentive to use cleaner technology and reduce their specific emissions intensity without their level of assistance being reduced.

3. **The desirability of defining activities:**
   a. **consistently and equitably across industries**
   b. **in a way that takes into account the impact that definitions may have on business investment, geographical location, and the structure of activities**
   c. **in a way that takes into account the potential for intermediate inputs produced when the activity is carried out to be substituted for bought-in inputs.**

This matter has three parts.

a. The first part involves the consistent treatment of complementary activities that are not part of the activity. All parts of an activity must be 'integral to and essential for' the process being defined. Some examples of processes that would be excluded from all definitions would be the emissions from the transport of inputs, outputs or intermediate products; packaging; and the production of raw materials prior to the specific activity.

b. The activity description should consider whether it creates perverse incentives, such as the restructuring or redesign of a business to improve the firm's level of assistance. Firms with different structures and processes should be treated equally because they perform the same activity.

c. The third part ensures each activity description is specific. Some firms may be vertically integrated – performing all the processes in the supply chain – while other firms may perform incremental steps within the supply chain. In the latter case, the inputs or outputs may be intermediate goods and the activity therefore forms a portion of the overall supply chain for a final product. The activity descriptions should specify the actual start and end of a process. It is possible that some firms will perform more than one emissions-intensive activity along the supply chain. In these cases, the activities are defined by specific inputs and outputs, which then become the inputs to the next defined activity. Although the intermediate good may not actually be traded in New Zealand, if the intermediate output has a commercial (saleable) value, the business could be rearranged to take advantage of this. This part of the principle prevents certain market and investment distortions.

4. **The desirability of there being no overlap between activity definitions.**

It should not be possible for a firm to receive assistance more than once for a given process. This is more likely to be possible if wider activity descriptions are used; for example, if the an activity description included mining of the raw materials as an input to an industrial process, there could be double counting if mining was also an eligible activity.

5. The desirability of activity definitions reflecting activity definitions used in Australia.

Because the moderated NZ ETS assistance scheme is consistent with the proposed Australian CPRS EITE assistance scheme, it is prudent for the activity definitions to be consistent. This avoids any impacts on cross-Tasman competitiveness and ensures both New Zealand and Australian producers have the same incentives for investment, production and emissions reduction.

6. Any other matters that the Minister considers relevant.

Lastly, the legislation allows the Minister to take account of other matters considered relevant. This will assist with a smooth and effective implementation of the NZ ETS.

How activities are described

Key issues for describing activities are that they:

- are specified by the inputs and outputs of a process
- are technology neutral
- take account of the incentives for business investment, organisation and emissions reduction.

Each of these issues is now discussed in detail.

Inputs and outputs

The description of an activity needs to specify a start point and an end point. The end point is where the trade-exposed output has been produced. The start point is where a tradable commodity is input, usually as the main part of a transformation process. As an example, the Australian Government's activity definition for *aluminium smelting* is the physical and chemical transformation of alumina (the starting point) into saleable aluminium metal (the end point).

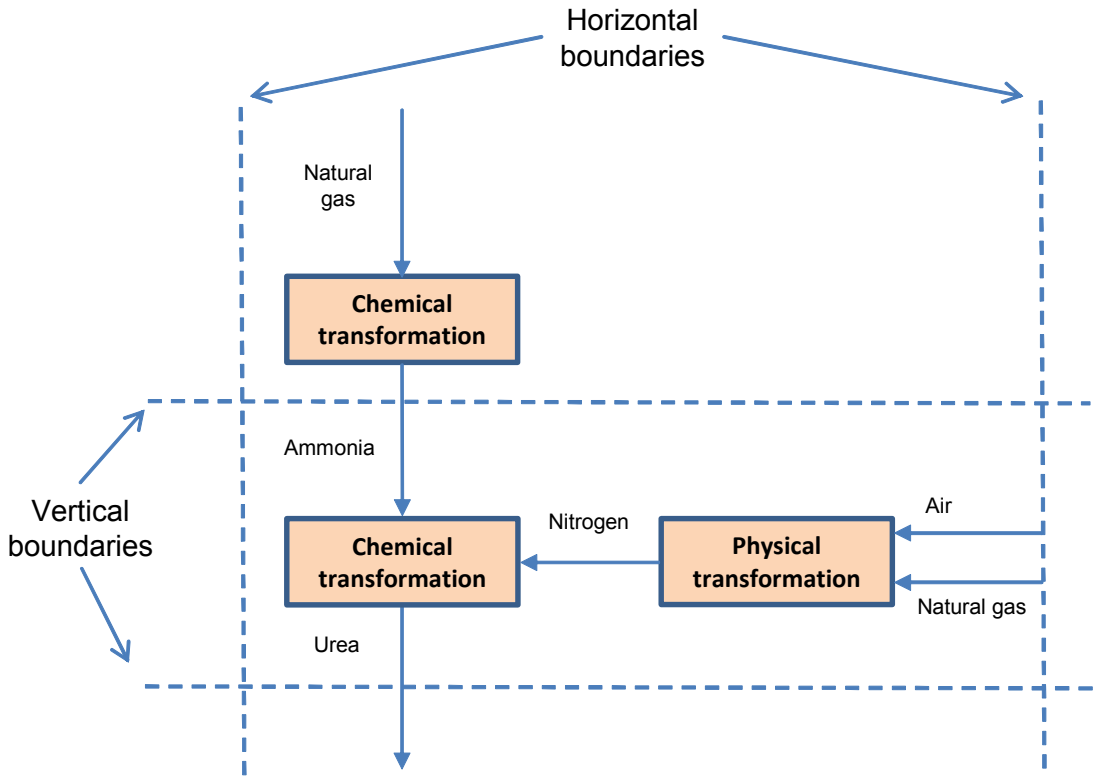
To avoid ambiguity, when collecting data on emissions from an activity, activity descriptions will be accompanied by a number of clarifications about the emissions and electricity use to be included ('inclusions') and excluded ('exclusions') from calculations.

For example, the Australian Government's definition of *integrated iron and steel manufacturing* has an end point of "crude carbon steel products and hot-rolled carbon steel products, where carbon steel is defined as a material which contains by mass more iron (Fe) than any other single element and has a carbon (C) content less than 2 per cent", but clarifies that emissions and electricity use from "any finishing processes, including, but not limited to, cold-rolling, annealing, pickling or coating of steel products" are excluded from calculation of eligibility and allocative baselines. In New Zealand, the Act contains a typical, non-exhaustive list of exclusions.

Additional descriptions may be required for intermediary inputs. For example, the activity of urea production involves chemically transforming natural gas into ammonia, and then ammonia into urea. The process also requires the intermediate input of nitrogen, which is produced through a physical transformation using air and natural gas. Activity boundaries will need to be made clear, both vertically and horizontally, as illustrated in figure 2. In this example, the activity is defined to exclude the upstream transformation of natural gas into ammonia, but to include the production of nitrogen.

The concept of a tradable output used to define the end point is meant to define an output that would be considered to have a commercial value, but it is also used to define the simplest output (or the first output) that has a commercial value. This means the activity ends before there is further processing (eg, of pure metal into metal alloys).

Figure 2: Example of activity boundaries



Technology neutral

If different processes can be used to manufacture an output, the activity description should not treat the two processes as separate activities for which eligibility can be defined. Doing so might remove any incentives for firms to improve the efficiency of producing that output. For example, there are different ways to manufacture cement – a dry process and a wet process – with different energy and emission intensities, both of which are employed in New Zealand.

The intensity-based approach to allocation does not provide incentives for emission reductions by reducing production, but instead is intended to encourage improvements (reductions) in industrial emissions intensity. Having technology-specific activity definitions could mute these incentives if, for example, a more emissions-intensive technology received a greater level of allocation, reflecting higher historical emission rates.

Technology-neutral definitions also give greater longevity to activity definitions: technologies may change over time, more often than the inputs and outputs.

Accounting for incentive effects

This approach to activity descriptions takes account of the incentives for business investment, organisation and emissions reduction.

If an activity description is extended vertically, to include more steps in an industrial process, and this includes a traded output *within* an activity, there is a risk that a New Zealand-based firm might be either included or excluded as a result of undertaking only part of the process. For example, cement manufacture involves the transformation of limestone and other feedstocks into clinker, followed by the grinding (milling) of clinker to form cement. The Australian Government has defined clinker production as an activity, rather than the full process of cement manufacture. If cement manufacture was defined as an activity, a clinker manufacturer could be excluded.

Use of the narrower description enables the Government to concentrate its assistance on the most emissions-intensive parts of a business. There is an additional argument that including tradable product (eg, clinker) *within* the activity description risks a firm choosing to import that intermediate product if it was still able to be counted as eligible for an allocation. This might lead to significant emissions leakage.

Summary

Activity descriptions are used:

- in regulations, to enable activities that are eligible for assistance to be identified
- in *Gazette* notices that call for data from persons conducting the activity (under the New Zealand track only).

Activity descriptions cover:

- clear inputs and outputs (the outputs of an activity are relevant to calculating the revenue from the activity and levels of production for the purposes of determining eligibility)
- the physical or chemical transformation that takes place to transform the inputs into the outputs.

When activity descriptions appear in a *Gazette* notice they will be accompanied by inclusions and exclusions: lists of emission sources that clarify the boundaries of the activity. Included emissions are included in determining whether an activity is eligible and its allocative baseline, excluded emissions are emissions which are not to be included.

Activity descriptions in *Gazette* notices and in regulations will be accompanied by a definition of 'product' (the basis for allocation), which is the metric of production for the activity (this will usually be given in tonnes of saleable output).

Two routes to eligibility

The Act provides for two tracks by which an activity can be defined as eligible for an allocation:

- a New Zealand track, whereby activities not defined as eligible in Australia could be defined as eligible here
- an Australian track, whereby if an activity is defined as eligible in Australia it would be eligible in New Zealand.

The Government is not currently pursuing the Australian track to make regulations. Should the CPRS pass into law, the Government may choose to make activities eligible via the Australian track. In the meantime, the Government intends to press ahead with making activities eligible via the New Zealand track.

The New Zealand track

Activities can be considered for eligibility in New Zealand using the eligibility test in the Act. The eligibility test has two parts: trade exposure and emissions intensity.

Trade exposure test

Under the New Zealand track, all activities will be assumed to be trade exposed unless they are very obviously not. The trade exposure test contained in the Act is that activities cannot receive allocation where:

- the activity is electricity generation
- there is no international trade of the output across oceans, or it is not economically viable to import or export the output of the activity.

This is different from the proposed Australian test for trade exposure and may lead to additional activities being included in New Zealand that do not meet the more restrictive trade exposure requirements in Australia. The rationale for a trade exposure test is discussed in Annex 4.

Emissions intensity test

The Act contains two emissions intensity thresholds:

- a moderately emissions-intensive activity emits between 800 tonnes of CO_2-e per 1 million New Zealand dollars of revenue and 1600 tonnes of CO_2-e per 1 million New Zealand dollars of revenue
- a highly emissions-intensive activity emits more than 1600 tonnes of CO_2-e per 1 million New Zealand dollars of revenue.

The amount of assistance an eligible activity receives depends on which of these thresholds it passes. Eligible activities that are moderately emissions intensive will initially receive assistance at the rate of 60 per cent of the relevant allocative baseline. Eligible activities that are highly emissions intensive will initially receive assistance at the rate of 90 per cent of the relevant allocative baseline.

The rationale for an emissions intensity test is discussed in Annex 4.

Measuring emissions intensity

The threshold test will be applied to the average emission intensity for an activity across the whole industry carrying out that activity. An individual firm conducting an activity will not receive assistance if the average emissions intensity for all firms conducting the activity does not meet the threshold, even if that particular firm meets the threshold.

When considering eligibility, the New Zealand track will include an assessment of emissions from the following sources:

- emissions from the direct use of coal, natural gas, waste and used oil combusted in carrying out the activity (including emissions associated with the use of steam generated from these fuels)
- emissions from geothermal steam used in carrying out the activity
- industrial process emissions from the industrial processes in Part 4 of Schedule 3 of the Act (iron and steel production, aluminium smelting, calcination of limestone or calcium carbonates, and the use of soda ash that are part of the activity)
- emissions from the generation of electricity used in the activity, employing an emission factor that represents an increase in electricity costs. However, rather than using a New Zealand-specific emission factor for electricity, the Australian factor (1 tonne of CO_2-e per megawatt hour) of electricity is proposed. This is to ensure a degree of comparability between the two tracks (in Australia, activities are compared against thresholds on the basis of an electricity factor of 1 tonne of CO_2-e per megawatt hour).

Applying for eligibility under the New Zealand track: Activities under consideration in Australia

At present, eight activities have been defined as eligible in Australia[6] as part of work to develop the CPRS, and a further group are currently under consideration. Firms that conduct these activities in New Zealand (listed in tables 1 or 2) should make themselves known to the Ministry for the Environment by responding to the questions in this consultation document.

The current thinking of the Government is to assess whether activities under consideration for allocation under the proposed CPRS can be made eligible under the New Zealand track. As a result, this document seeks feedback on the proposed activity definitions, definition of product, inclusions and exclusions, and years for collection of data contained in Annex 1.

In taking this approach, the Government intends to keep open the option of using the Australian track for the activities in tables 1 and 2 should the CPRS pass into law.

For activities to progress via the New Zealand track the Minister for Climate Change Issues must have regard to the matters contained in Box 1. The activity definitions and associated inclusions and exclusions in Annex 1 are seen as consistent with the matters in Box 1 as similar considerations apply in Australia. However, feedback is welcome on the consistency of the definitions in Annex 1 with the matters contained in Box 1.

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[6] Proposed Australian tests of trade exposure and emissions intensity are similar to those that will be used to determine allocation under the New Zealand track (see Annex 3).

Table 1: Activities defined as eligible under the proposed Australian CPRS

Activity	Eligibility results (tonnes of CO_2-e per $AUD million revenue)	Emissions intensity
Production of bulk flat glass	2,100–2,199	High
Production of methanol	2,300–2,399	High
Production of carbon black	2,700–2,799	High
Production of silicon	6,000–6,099	High
Smelting zinc	8,000–8,099[7]	High
Manufacture of newsprint	3,700–3,799	High
Production of glass containers	1,200–1,299	Moderate
Production of white titanium dioxide pigment	1,000–1,099	Moderate

Source: Australian Government. 2009. *Establishing the Eligibility of Activities under the Emissions-intensive Trade-exposed Assistance Program*.

Table 2: Activities defined for data collection under the proposed Australian CPRS

Additional activities defined for collection of data but not yet eligible for allocation		
Alumina refining	Fused alumina production	Packaging and industrial paper manufacturing
Aluminium smelting	Fused zirconia production	Petroleum refining
Carbamide (urea) production	High purity ethanol production	Pig iron production
Cartonboard manufacturing	Hydrogen peroxide	Printing and writing paper manufacturing
Carbon steel from cold ferrous feed	Integrated iron and steel	Soda ash production
Chlorine gas and sodium hydroxide (caustic soda) production	Integrated lead and zinc production	Synthetic rutile production
Clinker	Iron ore pellet production	Tissue paper manufacturing
Dry pulp manufacturing	Lime production	
	Magnesia production	

Question 1

a. Are you conducting an activity or activities contained in Annex 1? If yes:
   i. What is the activity or activities you are conducting?
   ii. Please list other persons you are aware of who are or may be undertaking the activity or activities in New Zealand.

b. Do you have any comment on the activity descriptions, products, inclusions/exclusions and years for collecting data proposed in Annex 1?

c. Do you have any comment on the consistency of the definition of activities in Annex 1 with the matters contained in Box 1?

Applying for eligibility under the New Zealand track: Other activities

For other activities an initial assessment will need to be made of the potential for activities to meet the eligibility tests in the Act on the basis of the preliminary data supplied in response to this document (see Question 2 below). If this information indicates that an activity is likely to pass the trade exposure and emissions intensity tests in the Act, the formal process of developing an activity description and requesting data under a *Gazette* notice would be initiated.

[7] Note that zinc smelting was assessed in Australia on a value added basis.

Those conducting an activity that they think would meet the eligibility tests in the Act should identify themselves to the Ministry for the Environment and provide preliminary data on emissions and revenue by responding to Question 2 below in their submission on this document. If it seems likely that an activity will be eligible, a decision will be taken to develop an activity description and a list of inclusions/exclusions for that activity, in consultation with stakeholders.

Gazette notices

Depending on the responses to this consultation document *Gazette* notices will be issued as follows:

- for activities listed in Annex 1, once feedback on this consultation document has been taken into account
- for other activities that have demonstrated the potential to meet the eligibility test in the Act, after the Government has developed an activity description and a list of inclusions/exclusions for that activity.

Gazette notices will formally request data in accordance with the relevant activity description, inclusions and exclusions. The data will be used to determine eligibility and develop a regulation that sets out the allocative baseline if the activity meets tests.

A *Gazette* notice will contain:

- a description of the activity in question
- a definition of 'product' (the basis for allocation), which is the metric of production for the activity (this will usually be given in tonnes of saleable output)
- emissions to be included in the determination of eligibility and allocative baselines
- emissions that are *not* to be included in the determination of eligibility and allocative baselines
- financial years for which information must be provided
- requirements (rules) for how data on emissions, output, revenue or other information must be prepared (see section 5 for the proposed data requirements).

If data cannot be obtained from all persons conducting an activity for which data are requested under a *Gazette* notice, or cannot be obtained within an acceptable timeframe, the Government may choose not to make regulations until satisfactory data are collected, or may choose to make regulations on the basis of data already submitted. Persons undertaking an activity for which data are collected who do not submit data will *not* be eligible for an allocation.

The proposed requirements that will govern the submission of product data, financial data and emissions data are set out in section 5.

Question 2

a. Are you conducting an activity or activities that you think is/are emissions intensive and trade exposed and not listed in Annex 1? If yes, please include the following in your submission for each activity:

   i. A clear description of the activity (what inputs are being transformed into what outputs).

   ii. A simplified process diagram.

   iii. Your estimate of the revenue from the outputs of the activity in a typical year.

   iv. Your estimate of the amount of coal, natural gas, or used or waste oil used in carrying out the activity in a typical year.

   v. Your estimate of the amount of greenhouse gas emissions resulting from carrying out the activity from the direct use of coal, natural gas, used or waste oil (including the use of steam generated from these fuels), geothermal fluid, and industrial processes listed in Part 4 of Schedule 3 of the Climate Change Response Act in a typical year.

   vi. Your estimate of the electricity used in carrying out the activity in a typical year.

   vii. Your understanding of whether the output(s) of the activity are internationally traded across oceans.

   viii. Your understanding of whether the output(s) of the activity are economically viable to import to or export from New Zealand.

   ix. Whether you are aware of any other people undertaking the activity in New Zealand, and who these people are.

   x. Whether or not you were conducting the activity in all of the (July to June) financial years 2006/07, 2007/08 and 2008/09.

Note that the Government's decision to further investigate the case for eligibility of other activities via the New Zealand track will be influenced by the quality and transparency of the preliminary data provided in response to Question 2.

4 How much will be allocated: determining allocative baselines

Doing the calculations

We have already looked at the two tracks for determining *eligibility* – the Australian and New Zealand tracks. When it comes to determining an *allocation amount* for an eligible activity conducted by an individual firm there are again two proposed tracks – the Australian and New Zealand tracks.

Under both tracks the quantity of emission units allocated will be calculated using an 'allocative baseline', which is multiplied by activity data in the form of product from that activity. The allocation each eligible person receives for a given year will thus be calculated as follows:

$$FA = LA \times PDCT \times AB$$

where:

- FA = the person's final allocation for the year (a number of New Zealand units)
- LA = the level of assistance (initially 60 per cent and 90 per cent for moderately and highly emission-intensive activities, respectively, and declining at the rate of 1.3 per cent per year after 2012)
- PDCT = the amount of product from conducting the eligible activity for the year
- AB = the allocative baseline for the activity (tonnes of emissions per unit of product).

The Act also provides for eligible persons to apply for a provisional allocation for a given year based on the previous year's production, with a true-up payment ('allocation adjustment') paid once actual production for the year is known. Box 2 contains a hypothetical example of how an allocation would be calculated.

The allocative baseline is a historical measure of emissions intensity, but it is measured differently from the intensity measure used to define eligibility. When determining baselines, intensity is measured in physical terms (eg, in emissions per tonnes of product from an activity), as follows.

- The New Zealand track will estimate a New Zealand-specific baseline using an average emissions intensity for the activity, based on recent historical data.
- The Australian track would use the allocative baseline developed in Australia, adapted to take account of New Zealand-specific emissions intensities for electricity generation and natural gas production.

As discussed above, the Australian track is not currently being pursued as a means for making regulations. Should the Carbon Pollution Reduction Scheme pass into law, this will be reconsidered.

Is there a pool of emission units to be allocated?

There is no cap on the total quantity of emission units that will be allocated. This means that if a firm increases output from an eligible activity, it will be given more emission units.

Proposed electricity allocation factor

A common issue for both tracks is how many emission units to allocate for the use of electricity.

The NZ ETS will increase the costs of generating electricity from fossil fuels and geothermal sources. Although fossil fuels make up a relatively small proportion of total electricity generation (34 per cent of the total in 2008),[8] they have a larger impact on the average wholesale price under New Zealand's competitive electricity market.

A number of energy-intensive firms will face significantly higher costs of production because of the electricity intensity of their production. Work was undertaken in 2008 by the Stationary Energy and Industrial Process Technical Advisory Group (SEIP TAG) on the expected increase in electricity price as a result of the introduction of the NZ ETS. This was used to derive an emission factor that would take account of this price increase. The factor is 0.52 tonnes of CO_2 per megawatt hour of electricity. This consultation document proposes that this factor be used for determining allocative baselines for industrial allocation under the NZ ETS.

The estimate was based on analysis using the GEM (Generation Expansion Model) to determine plant mix and the SDDP (Stochastic Dual Dynamic Programme) to estimate the price impact of a range of plausible emissions prices. The proposed factor is the median of the range of outcomes. A summary of this work is available on the www.climatechange.govt.nz website.[9]

The same approach will be used regardless of whether the electricity is generated on site, via distributed generation or purchased from the grid. The only exception will be for very large users (greater than 2000 gigawatt hours per annum at a single facility) with contracts for electricity. These contracts will be examined to establish an appropriate emission factor.

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[8] Ministry of Economic Development. 2009. *New Zealand Energy Data File: 2008 Calendar Year Edition*.

[9] See: http://www.climatechange.govt.nz/emissions-trading-scheme/input-and-engagement/stationary-energy-industrial-technical-advisory-group/emission-trading-scheme-final-report-addendum/

Determining allocative baselines

New Zealand track

Under the New Zealand track, allocative baselines will be calculated using New Zealand data. They will be calculated as an average emissions intensity of the activity in New Zealand in a given historical period. The default years for data collection will be the three financial years[10] 2006/07, 2007/08 and 2008/09. For these periods, data will be collected on emissions and product from the process. Two allocative baselines are defined:

1. direct emissions intensity, based on measured emissions (in other words, the same emissions that count towards eligibility will count towards allocative baselines)
2. electricity use, for which an electricity allocation factor of 0.52 tonnes of CO_2 per megawatt hour is proposed.[11]

The data required to define the allocative baselines is data on production in these historical years, direct emissions, and electricity use.

The same *Gazette* notice that requests data for eligibility purposes will be requesting data for the purposes of determining allocative baselines.

Box 2: Example of the use of an allocative baseline

Acme Inc

This example shows how the allocative baseline for the production of bulk flat glass would be used, assuming regulations were made containing an allocative baseline of 0.985 tonnes of CO_2-e per tonne of bulk flat glass.

Acme Inc is a producer of bulk flat glass. In 2014 they produce 48,000 tonnes of saleable bulk flat glass. In 2015 they produce 50,000 tonnes of saleable bulk flat glass. Under the Act, Acme Inc would calculate their allocation for 2015 as follows:

Calculation of provisional allocation (PA)

PA = 2015 level of assistance (LA) × amount of product in the preceding year (PDCT) × allocative baseline (AB)

LA = 0.9 × 0.987× 0.987× 0.987 = 0.87

PDCT = 48,000 tonnes

AB = 0.985 tonnes CO_2-e /tonne bulk flat glass

PA = 0.87 × 48,000 × .985 = 41,134 NZU

Acme Inc is able to apply for a provisional allocation of this number of NZU (New Zealand units).

[10] The Act defines the financial year as July to June.

[11] The only exception will be for very large users (greater than 2000 gigawatt hours per annum at a single facility) with contracts for electricity. These contracts will be examined to establish an appropriate emission factor.

Calculation of final allocation (FA)

(FA) = level of assistance (LA) × amount of product in 2015 (PDCT) × allocative baseline (AB)

LA = 0.9 × 0.987× 0.987× 0.987 = 0.87

PDCT = 50,000 tonnes

AB = 0.985 CO_2-e /tonne bulk flat glass

FA = 0.87 × 50,000 × .985 = 42,848 NZU

Calculation of allocation adjustment (AA)

AA = PA – FA

AA = 41,134 NZU – 42,848 NZU = –1,714 NZU

AA is a negative amount, which means Acme Inc is entitled to be allocated this number of units in addition to their provisional allocation for 2015. If AA were a positive amount, Acme Inc would be liable to repay this number of NZU.

(Note that modifications will apply to the allocation formulas during the transition phase to account for the 1 July 2010 start of the stationary energy and industrial process sectors and the 2:1 progressive obligation.)

Question 3

a. Do you have any comments on the proposed use of an electricity allocation factor of 0.52 tonnes of CO_2 per megawatt hour when adjusting allocative baselines from Australia and creating baselines from New Zealand data?

b. Do you have any comment on the proposed use of an electricity factor of 1 tonne of CO_2-e per megawatt hour when testing activities against the emissions intensity thresholds in the Act?

Question 4

a. If you are conducting an activity or activities listed in Annex 1, or an activity that you believe would be eligible, do you consume more than 2000 gigawatt hours of electricity at a single facility in a typical year?

5 Proposed requirements for data submitted under *Gazette* notices

Gazette notices

The Act establishes a *Gazette* notice process for collecting data on an activity in order to make decisions about its eligibility, level of assistance, and allocative baselines on the New Zealand track. A *Gazette* notice will request that firms supply financial and emissions data to determine the eligibility of an activity and allocative baselines. In doing so, *Gazette* notices will provide:

- a description of the activity, including input(s), output(s) and the transformation that takes place
- the product(s) that may be used as the basis for allocation (ie, the metric of production used to calculate entitlements)
- the emissions that must be included in any information provided
- the emissions that must be excluded in any information provided (emission sources that would typically be excluded are discussed below)
- the financial years for which information must be provided (discussed below)
- the date by which information must be provided
- methodologies for calculating emissions and revenue (ie, data collection rules, discussed below).

Emissions to be excluded

As discussed in section 3, the *Gazette* notices used to call for data on an activity will clarify which emissions are to be excluded or included in calculating emissions for each activity. The Act clarifies that emissions sources typically *excluded* will be:

- the use of machinery and equipment, and other processes, that are not integral to, nor essential to, transformation taking place when the activity is carried out
- any extraction or production of raw materials that are subsequently used when the activity is carried out
- the transportation of inputs used in the activity to storage at the location where the activity is carried out
- the transportation of outputs of the activity from storage at the location where the activity is carried out to another location
- the transportation of intermediate products between different locations where the activity is carried out
- operations that are complementary to the activity, including (but not limited to) packaging, head office operations, and administration and marketing (whether carried out at the same location where the activity is carried out or at another location)
- the generation of electricity at the location where the activity is carried out.

Financial years for information

Gazette notices will specify the financial years for which information must be provided. If an activity was carried out by any person in each of the financial years 2006/07, 2007/08 and 2008/09, the Act requires that those financial years be specified. However, if the activity was not carried out in each of those years, other years may be specified.

A financial year is defined in the Act as a period of 12 months commencing on the first day of July and ending with the 30th day of June. Therefore, regardless of the financial year a firm normally uses for financial reporting, information must be provided for July to June financial years.

Data collection rules

Data called for must be submitted in accordance with the requirements (rules) specified in the *Gazette* notice. This subsection sets out the proposed requirements that will govern the preparation of data for submission under *Gazette* notices for the New Zealand track.

Proposed rules for calculating revenue

Revenue data is required for calculating the emissions intensity of an activity. It is important for considering whether an activity meets thresholds that will define it as moderately or highly emissions intensive. Emissions intensity is calculated by the quantity of emissions per million dollars of revenue:

emissions intensity = total emissions ÷ total revenue (NZ$ million)

The revenue portion of this equation can be estimated on the basis of actual sales revenues, although there is a need for clarity about how to treat the costs of sales, including transport to market (especially if to an export market). The Government will estimate emissions intensity using the total sum of emissions and the total revenue over the selected years. The overall requirement is defined by the following rule:

Revenue Rule 1: Revenue should be calculated as the output of a process multiplied by its market price, exclusive of GST, at the time(s) of sale, for each of the historical financial years listed in the *Gazette* notice.[12]

Table 3 illustrates the likely data required in order to generate revenue and is used to provide context to the rules that follow. Total revenue is the value in the 'Total' column of line I in the table; it is the sum of revenues in each historical year, where revenue in each year is calculated from the production quantity (row A) multiplied by the market price (row H).

The ways in which the data collected using this table are used in estimating revenue is explained further below.

[12] Or other years if specified in the *Gazette* notice.

Table 3: Revenue data requirements (using sales revenue)

		2006/07	2007/08	2008/09	Total
A	Output quantity (physical units; eg, tonnes)				
B	Units sold externally (physical units; eg, tonnes)				
C	Output sales revenue (original currency)				
D	Exchange rate (if applicable)				
E	Sales revenue (NZ$) (C x D)				
F	Transport costs to market (NZ$)				
G	Revenue at gate (NZ$)				
H	Market (gate) price (NZ$/unit of output) (G ÷ B)				
I	Revenue (NZ$) (A x H)				

Revenue Rule 2: Quantity of output is *either* defined as the direct measure of output of the defined product for the defined activity, excluding product that is not of saleable quality, *or* is calculated from units sold and changes in inventory.

This rule builds on the proposed Australian scheme, under which quantity of output can be calculated using one of the following two methods:

1. quantity of output = direct measurement of output for the defined activity (eg, operational data)
2. quantity of output = units sold (externally or internally) + closing inventory – opening inventory.[13]

The preference and under the NZ ETS (and under the proposed CPRS) – is to use the first method. Under the second approach the number of units sold internally is used to define outputs that are further processed before sale, just as clinker is 'sold' for use in manufacturing cement.

Revenue Rule 3: The market price is the fair value of the product, as defined under NZ Accounting Standard NZ IAS 18, received at the 'plant gate' for the output produced. It should be calculated from the revenue from external output sales divided by the number of unit sales; or, if sales data is not available, by using an observable market price.

The market price is the price received for the output at the plant gate. (This is the same as the approach used in Australia, where the price used should "exclude recovery of transport costs".)[14] Estimating revenues at the plant gate eliminates differences between plants on the basis of location. In many cases this means that a market price will need to be calculated net of transport costs. Firms may choose to use a gross market price that does not take account of transport costs if they wish. This would increase estimated revenues and decrease the measured

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[13] Inventory is as defined in the New Zealand International Equivalent to International Accounting Standards, available at https://www.nzica.com, as follows:

Inventories are assets:

(a) held for sale in the ordinary course of business;

(b) in the process of production for such sale; or

(c) in the form of materials or supplies to be consumed in the production process or in the rendering of services.

[14] Department of Climate Change. 2009. *Assessment of Activities for the Purposes of the Emissions-intensive Trade-exposed Assistance Program: Guidance Paper*. Australian Government.

intensity, so it could be disadvantageous to firms seeking to establish eligibility. However, it might be simpler to collect, so if eligibility can be demonstrated using this higher estimate of revenue, it might be chosen for reasons of simplicity.

Table 3 is based on the assumption that price is calculated from sales revenue at the gate (row G) divided by external sales (row B). The sales revenue at the gate will often need to be calculated from the revenue received for products delivered to market (row C), adjusted for the exchange rate (row D) to produce a delivered price in NZ dollars (row E); this then needs to be adjusted to a gate price by subtracting the costs of transport to market (row F). The market price calculated this way is a weighted average price for each year.

Table 3 recognises that the quantity of units sold externally may be different from total production, because total production may include outputs that are processed further. The external sales numbers are used to represent the sales of output, defined as the output of the activity.

If there are no external sales of that output, an alternative market price should be used rather than an estimate from sales revenue. An example would be clinker used in cement production: there is a market price for clinker, but in New Zealand it is produced in an integrated process that produces cement as a final output.

The data required for this approach are summarised in table 4**.** Output is recorded in the same way (row A) and is multiplied by the observed market price (row B) to estimate sales revenue (row C), converted to NZ$ using the relevant exchange rate (row D) to produce a NZ$ estimate of sales revenue. As for the sales revenue methodology in table 3, the gate revenue is estimated by subtracting the transport costs (row F) to produce a gate revenue and an implied gate price (row H).

Table 4: Revenue data requirements (using market price)

		2006/07	2007/08	2008/09	Total
A	Output quantity (physical units; eg, tonnes)				
B	Market price (original currency)				
C	Output sales revenue (original currency) (A x B)				
D	Exchange rate (if applicable)				
E	Sales revenue (NZ$) (C x D)				
F	Transport costs to market (NZ$)				
G	Revenue at gate (NZ$)				
H	Market (gate) price (NZ$/unit of output) (G ÷ A)				

Revenue Rule 4: Market prices should be converted from foreign currencies to New Zealand dollars at the historical rate relevant to the period of output consistent with NZ Accounting Standard NZIAS 21.

Where sales are in a foreign currency, an appropriate exchange rate should be used. This should be either the actual rate achieved for sales, or based on the standard practice used in converting overseas income to New Zealand income for tax purposes.[15] Monthly and 12-month average rates are available from the Inland Revenue Department. The appropriate exchange rate will depend on the data. If data is gathered on an annual basis, then the 12-monthly average rate should be used for the ending month of the financial year. If data is gathered on a monthly basis, then New Zealand prices can be estimated for each month using the monthly exchange rates.

Rules for calculating emissions

Emissions and other data required to demonstrate eligibility include direct emissions (from oxidation, use of fossil fuels as a feedstock, and industrial processes) and the direct consumption of electricity.

Emissions Rule 1: Data should be supplied for *each* of the historical financial years specified in the *Gazette* notice from *only* the emissions sources specified in the Act, expressed in tonnes of CO_2 equivalent.

The Act specifies emissions sources as:

- those resulting from the direct use of any coal, natural gas, geothermal fluid, used oil, or waste oil as part of the activity
- those resulting from the direct use of any coal, natural gas, geothermal fluid, used oil, or waste oil to generate steam that is used as part of the activity
- those resulting from any of the activities listed in Part 4 of Schedule 3[16] carried out as part of the activity
- electricity used when the activity is carried out.

Emissions Rule 2: Emissions should be calculated using the applicable formulas and emission factors.

Table 5 provides an indication of the type of data likely to be requested.

[15] This is available from the Inland Revenue Department's website at http://www.ird.govt.nz/how-to/overseas-currency/

[16] These are those producing iron and steel; aluminium; clinker or burnt lime; glass using soda ash; and gold.

Table 5: Emissions data requirements

		2006/07	2007/08	2008/09	Total
A	Coal oxidation or use as feedstock				
B	Natural gas oxidation or use as feedstock				
C	Use of geothermal fluid				
D	Used and waste oil oxidation				
E	Producing iron or steel				
F	Producing aluminium				
G	Producing clinker or burnt lime				
H	Producing glass using soda ash				
I	Producing gold				
J	Emissions from heat plant				
K	Emissions from co-generation plant				
L	TOTAL				

Direct emissions

The Act allows for the inclusion of emissions from the "direct use of any coal, natural gas, geothermal fluid, used oil or waste oil".

> **Emissions Rule 3: Emissions from the direct use of gas/coal should include the use of gas/coal as a feedstock. Emissions from the use of gas/coal as a feedstock should be calculated as zero when either (1) the output of the activity is an obligation fuel[17] under the NZ ETS, or (2) the production of the output is eligible to earn emission units under the Climate Change (Other Removal Activities) Regulations 2009.[18]**
>
> **Emissions Rule 4: Emissions from coal, natural gas, used oil or waste oil should include emissions from the oxidation of these fuels.**

The situations where emissions from feedstock are to be counted as zero take account of instances where:

- the production of obligation fuels for which competing imports will also be subject to obligations under the NZ ETS such that there is no competitiveness disadvantage from the NZ ETS
- the firm conducting the activity will be earning emission units for their removal activity and therefore do not face NZ ETS costs for gas/coal used as a feedstock.

[17] 'Obligation fuel' is defined in the Climate Change (Liquid Fossil Fuels) Regulations 2008. These regulations are available at http://www.legislation.govt.nz/

[18] These regulations are available at http://www.legislation.govt.nz/

Emissions Rule 5: Total emissions from a heat plant should be allocated to an activity in proportion to its use of the output of the plant. Total emissions from a co-generation plant should be split between heat and electricity emissions on the basis of relative efficiencies of production, then the heat emissions should be allocated to the activity in proportion to its use of the output of heat from the plant.

In some cases, some emissions on an industrial site may need to be allocated only partly to an activity. For example, where a heat or co-generation plant provides output to more than one activity at a site, the emissions from the heat plant should be assigned to the activity in proportion to its use of the output from the plant. For co-generation plants this needs to be adjusted for the relative efficiency of production of each output (electricity and steam).

The proposed approach is based on the efficiency method as set out in guidance issued under the GHG Protocol[19] and has the following components.

- Step 1: Determine the total direct emissions and the total steam and electricity outputs for the combined heat and power (CHP) co-generation system.
- Step 2: Assign efficiencies to steam and electricity production. Values of 80 per cent efficiency for steam and 35 per cent efficiency for electricity are to be used.
- Step 3: Determine the fractions of total emissions to allocate to steam and electricity production using the following formulas:

$$E_H = \frac{H/e_H}{H/e_H + P/e_P} * E_T \qquad \text{and} \qquad E_P = E_T - E_H$$

where:

E_H	=	emissions allocated to steam production
H	=	steam output (energy)
e_H	=	assumed efficiency of steam production
P	=	delivered electricity generation (energy)
e_P	=	assumed efficiency of electricity generation
E_T	=	total direct emissions of the CHP system
E_P	=	emissions allocated to electricity production

- Step 4: Calculate emission rates for steam production. Divide the total emissions from steam production (step 3) by the total amount of steam produced.
- Step 5: Estimate emissions from steam used in the activity.

The same approach is used for a heat plant, but there will be only one type of output from the plant. The total emissions from the plant are divided by the total steam output from the plant to produce an emissions factor, which is then multiplied by the steam used by the activity.

Electricity emissions should use the same emission rate regardless of whether the electricity is generated on site or purchased from outside the site. The emission factor to use is discussed below.

[19] Allocation of GHG Emissions from a Combined Heat and Power (CHP) Plant. Guide to calculation worksheets (September 2006) v1.0. A WRI/WBCSD GHG Protocol Initiative calculation tool. Available at: www.ghgprotocol.org/calculation-tools/all-tools

Formulas

Emissions Rule 6: Specific formulas should be used in estimating direct emissions.

The formulas to use are set out below.

Coal

Emissions = $(A_{L1} \times CV_{L1} \times EF_{L1}) + (A_{L2} \times CV_{L2} \times EF_{L2}) + (A_{SB} \times CV_{SB} \times EF_{SB}) + (A_{B} \times CV_{B} \times EF_{B})$

where:

A = tonnes of coal consumed for different varieties, including L1 = lignite (Waimumu and Roxburgh fields), L2 = other lignite, SB = sub-bituminous, B = bituminous

CV = calorific value of the coal class used

EF = relevant emission factor for the relevant coal class.

Natural gas

Emissions = A × EF

where:

A = consumption of natural gas (in terajoules)

EF = emission factor for natural gas (use either one for the appropriate field, if known, or the national average if the gas field is not known).

Geothermal fluid

Emissions = A x EF

where:

A = consumption of geothermal fluid (in tonnes)

EF = emission factor for geothermal fluid.

Used or waste oil

Emissions = A × CV × EF

where:

A = consumption of used or waste oil (in tonnes)

CV = calorific value of the used or waste oil

EF = emission factor for the used or waste oil.

Emissions Rule 7: Emissions from industrial process emissions should be calculated using the formulas set out in Part 3 of the Climate Change (Stationary Energy and Industrial Processes) Regulations 2009.[20]

[20] These regulations are available at http://www.legislation.govt.nz/

Emission factors

Emissions Rule 8: The emission factors used in calculating emissions should be those listed in Schedule 2 of the Climate Change (Stationary Energy and Industrial Processes) Regulations 2009.

The emission factors should be those listed in Schedule 2 of the Climate Change (Stationary Energy and Industrial Processes) Regulations 2009.

Electricity use

Emissions Rule 9: For eligibility purposes, electricity emissions should be estimated using an electricity allocation factor of 1 tonne of CO_2-e per megawatt hour of consumption.

Emissions are measured in order to assess eligibility for allocation of emission units, although the real concern is with costs that result from those emissions. For direct emissions, costs are directly related to emissions, so emissions are a sound proxy for costs. However, for electricity consumption the effects are more complex because the cost impact results from the way in which an emissions price affects the cost of electricity in the wholesale market.

As discussed in section 4, the relationship between emissions price and electricity price has been estimated specifically for New Zealand. This has been used to produce an electricity allocation factor proposed for use in developing allocative baselines. However, for the purpose of determining eligibility, it is proposed that the Australian electricity allocation factor be used. This is higher than the rate for New Zealand, reflecting the greater contribution of coal generation to price setting in the Australian electricity market. This will ensure some degree of comparability between eligibility on the New Zealand and Australian tracks.

Both electricity consumption and the calculated emissions using the relevant electricity allocation factor should be reported.

Emissions Rule 10: For allocative baseline purposes, electricity emissions are to be estimated using an electricity allocation factor of 0.52 tonnes of CO_2-e per megawatt hour of consumption.

As discussed in section 4 for the purpose of calculating allocative baselines, it is proposed that an electricity allocation factor of 0.52 be used.

Both electricity consumption and the calculated emissions using the relevant electricity allocation factor should be reported.

Materiality

Emissions Rule 11: Best endeavours should be used in calculating emissions from small sources that are part of an activity.

In collecting emissions data for an activity, all emissions should be calculated unless they are explicitly excluded. However, some emissions sources will be small, and the effort required to accurately calculate them may be out of proportion to their size. In all cases, best endeavours should be used to calculate the emissions, but we recognise that efforts may be less for some small sources.

Scrapped products

Emissions Rule 12: All emissions associated with the activity should be counted, regardless of whether the output is of saleable quality.

Emissions from the production of products that are scrapped or not of saleable quality can be included in the assessment.

Disclosure of methods used in preparing data

Data preparation Rule 1: The methods, assumptions and calculations used to produce the data should be disclosed along with the data.

Firms should disclose how they have calculated each part of their data. In terms of revenue data, this includes:

- whether they have used actual output or inventory data
- the source of the prices used, including the actual average price received or a market price
- how they have estimated transport costs, and the source of data used
- what exchange rates are used for converting foreign currencies to NZ$.

The basis for the emissions calculations should also be set out, including the emission factors used and the activity or fuel-use data.

Question 5

a. Would the proposed rules covering production, revenue and emissions allow you to calculate emissions and revenue for your activity if the Minister for Climate Change Issues decided to call for data for that activity?

b. Are there any situations the rules do not cover, and which would need to be covered for revenue or emissions from your activity to be calculated? If so, please describe the situation the rules would need to cover.

c. Do any of the emissions and financial data requirements need to be clarified? If so, please explain the issues that need to be clarified.

d. Do you have any other comments or questions on the proposed rules?

e. If a *Gazette* notice were issued requesting data on your activity in accordance with the proposed rules in this section, how long do you estimate it would take to collect this data?

6 Confidentiality of data

The content of responses to *Gazette* notices provided will be subject to public release under the Official Information Act 1982 following requests to the Ministry.

Generally there is a need for the industrial allocation process to be as transparent as possible, however, the Government recognises the need for this to be balanced against commercial confidentiality concerns. Respondents to *Gazette* notices should therefore note whether there is any objection to the release of any information contained in their response, and, in particular, the part(s) that should be withheld, together with the reason(s) for withholding the information. This will allow the Ministry to take into account such objections when responding to requests for information under the Official Information Act 1982.

It will be necessary for the Government to publish eligibility results following the consideration of data submitted under *Gazette* notices. This is likely to be expressed in terms of a number of tonnes of emissions per million dollars of revenue. It is possible that these results could be expressed as a range of figures where legitimate concerns about commercial confidentiality exist.

Note that once regulations are in place for an activity and firms submit production data in order to receive an allocation, the default position in the Act is that allocation amounts to individual firms are to be published. However, the Act does allow this information to be withheld if the Chief Executive of the Ministry for the Environment considers that publishing this information would be likely to unreasonably prejudice the commercial position of the eligible person who received the allocation.

7 Penalties and verification

Information provided to the Government during the implementation of the allocation regime must be a correct representation of the actual situation. The proposed rules governing the submission of data under *Gazette* notices do not contain requirements for mandatory third-party audits or verifications. However, data submitted under *Gazette* notices will need to be accompanied by a signed declaration, and the Government has the power under the Act to require any further information considered necessary.

The allocation regime relies on a series of penalties to prevent the provision of incorrect information. These include penalties for providing altered, false, incomplete or misleading information. Also, where information required to determine eligibility of an activity and to develop allocative baselines is not provided, the persons who do not provide this information will not be eligible for allocation.

To assist firms supplying accurate and complete data under *Gazette* notices the Government may consider engaging contractors to help firms collect and collate the data required.

Those firms who supply information to the Government (particularly under *Gazette* notices used to collect data) are strongly encouraged to quality assure the information provided to the Government under the allocation processes. Firms may wish to engage third parties to conduct this quality assurance.

The Government may also choose to verify applications for allocation that are made under regulations. The Act contains a general requirement for persons applying for allocation to keep sufficient records to enable the Government to verify that they are entitled to receive an allocation, the amount of production they reported and calculations of their allocation. This may require the Government to issue guidance about the types of records that should be kept.

Question 6

a. Do you have any views about the types of records that should be kept by those applying under regulations for allocation to enable their applications to be verified by the Government?

8 How to make a submission

Please ensure your submission addresses each of the questions asked in the text and gathered together below, and contains the following contact details:

1. your name
2. the name of the organisation you represent
3. your address
4. your email address
5. your telephone number.

We encourage you to email your submission to emissionstrading@climatechange.govt.nz, using the electronic form available on the Ministry's website. If you do not have access to the internet, or would prefer to submit a hard copy submission, please post your submission to:

2009 Industrial Allocation Consultation
Ministry for the Environment
PO Box 10362
Wellington 6143

Submissions close 5.00 pm 12 February 2010.

Publication of submissions

The Ministry of for the Environment may post all or parts of any written submission on its website at http://www.climatechange.govt.nz. We will consider you to have consented to such posting by making a submission, unless you clearly specify otherwise in your submission. The content of submissions provided will be subject to public release under the Official Information Act 1982 following requests to the Ministry.

Please note in your submission if you have any objection to the release of any information contained in a submission, and, in particular, which part(s) you consider should be withheld, together with the reason(s) for withholding the information. We will take into account all such objections when responding to requests for copies of, and information on, submissions to this document under the Official Information Act 1982.

Consultation questions

Defining activities eligible for an allocation (section 3)

Question 1

a. Are you conducting an activity or activities contained in Annex 1? If yes:
   i. What is the activity or activities you are conducting?
   ii. Please list other persons you are aware of who are or may be undertaking the activity or activities in New Zealand.

b. Do you have any comment on the activity descriptions, products, inclusions/exclusions and years for collection of data proposed in Annex 1?

c. Do you have any comment on the consistency of the definition of activities in Annex 1 with the matters contained in Box 1?

Question 2

a. Are you conducting an activity or activities that you think is/are emissions intensive and trade exposed and not listed in Annex 1? If yes, please include the following in your submission for each activity:

   i. A clear description of the activity (what inputs are being transformed into what outputs).

   ii. A simplified process diagram.

   iii. Your estimate of the revenue from the outputs of the activity in a typical year.

   iv. Your estimate of the amount of coal, natural gas, or used or waste oil used in carrying out the activity in a typical year.

   v. Your estimate of the amount of greenhouse gas emissions resulting from carrying out the activity from the direct use of coal, natural gas, used or waste oil (including the use of steam generated from these fuels), geothermal fluid, and industrial processes listed in Part 4 of Schedule 3 of the Climate Change Response Act in a typical year.

   vi. Your estimate of the electricity used in carrying out the activity in a typical year.

   vii. Your understanding of whether the output(s) of the activity are internationally traded across oceans.

   viii. Your understanding of whether the output(s) of the activity are economically viable to import to or export from New Zealand.

   ix. Whether you are aware of any other people undertaking the activity in New Zealand, and who these people are.

   x. Whether or not you were conducting the activity in all of the (July to June) financial years 2006/07, 2007/08 and 2008/09.

How much will be allocated (section 4)

Question 3

a. Do you have any comments on the proposed use of an electricity allocation factor of 0.52 tonnes of CO_2 per megawatt hour when adjusting allocative baselines from Australia and creating baselines from New Zealand data?

b. Do you have any comment on the proposed use of an electricity factor of 1 tonne of CO_2-e per megawatt hour when testing activities against the emissions intensity thresholds in the Act?

Question 4

a. If you are conducting an activity or activities listed in Annex 1, or an activity that you believe would be eligible, do you consume more than 2000 gigawatt hours of electricity at a single facility in a typical year?

Proposed requirements for data submitted under gazette notices (section 5)

Question 5

a. Would the proposed rules covering production, revenue and emissions allow you to calculate emissions and revenue for your activity if the Minister for Climate Change Issues decided to call for data for that activity?

b. Are there any situations the rules do not cover, and which would need to be covered for revenue or emissions from your activity to be calculated? If so, please describe the situation the rules would need to cover.

c. Do any of the emissions and financial data requirements need to be clarified? If so, please explain the issues that need to be clarified.

d. Do you have any other comments or questions on the proposed rules?

e. If a *Gazette* notice were issued requesting data on your activity in accordance with the proposed rules in this section, how long do you estimate it would take to collect this data?

Penalties and verification (section 7)

Question 6

a. Do you have any views about the types of records that should be kept by those applying under regulations for allocation to enable their applications to be verified by the Government?

Other comments

Question 7

a. Do you have any other comments or suggestions on the issues covered by this consultation document?

Annex 1: Activity descriptions, inclusions, exclusions, products and specified years

This annex contains proposed activity descriptions, definitions of 'product', inclusions/exclusions, and years for collecting data for each activity for activities that have either been found eligible in Australia or are under consideration for eligibility there.

As discussed in the body of this document, the Government's current thinking is to consider whether these activities can be made eligible in New Zealand via the New Zealand track. This Annex shows information proposed for inclusion in *Gazette* notices issued by the Government in gathering data for these activities under the New Zealand track. The Government will keep open the ability to use the Australian track should the Carbon Pollution Reduction Scheme pass into law.

The questions in the body of this document seek feedback on the activity descriptions, product, inclusions/exclusions, and years for data collection proposed in this annex.

Production of glass containers

Activity description

The production of glass containers is the physical and chemical transformation of silica (silicon dioxide (SiO_2)) and other raw and recycled materials (such as cullet) to produce blown or pressed glass containers, by controlled melting and forming in a contiguous process.

Product (basis for allocation)

The product (basis for allocation) is total tonnes of blown and pressed glass containers that are:

a. produced by carrying on the activity

b. of saleable quality.

Note: **Saleable quality** is explained in Annex 2.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity

  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- extraction and production of all raw materials
- collection of external recycled cullet from a location that is not the same as the activity and the subsequent processing and transport of the cullet not at the same location as the activity
- secondary finishing of glass containers such as printing / labelling, treatment for chemical resistance and coating.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of bulk flat glass

Activity description

The production of bulk flat glass is the physical and chemical transformation of silica (silicon dioxide (SiO_2)) and other raw and recycled materials (such as cullet) to produce bulk flat glass products, including wired glass and patterned glass, by controlled melting and forming in a contiguous process.

Product (basis for allocation)

The product (basis for allocation) is total tonnes of bulk flat glass that is:

a. produced by carrying on the activity
b. of saleable quality.

Note: **Saleable quality** is explained in Annex 2.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity, including mobile equipment
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
  - furnaces
  - primary coating and trimming/cutting to produce bulk flat glass
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- production of compressed air used as a utility
- production of nitrogen and hydrogen used as atmospheric gases.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- extraction and production of all raw materials
- collection of external recycled cullet from a location that is not the same as the activity and the subsequent processing and transport of the cullet not at the same location as the activity
- secondary finishing of bulk flat glass such as secondary coating, laminating, toughening, mirroring, printing, cutting, edgeworking, insulating, glazing, encapsulating, extrusion assembling and moulding.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of methanol

Activity description

The production of methanol is the chemical transformation of one or more of the following:

a. hydrocarbons
b. hydrogen feedstocks
c. carbon feedstocks
d. oxygen feedstocks

to produce liquid methanol (CH_3OH) in which the concentration of methanol is equal to or greater than 98 per cent with respect to mass.

Product (basis for allocation)

The product (basis for allocation) is total tonnes of 100 per cent equivalent methanol (CH_3OH) that is produced by carrying on the activity.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - controls rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- production of oxygen for use as a feedstock within the process
- production of nitrogen used as a utility.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- any extraction or production of raw materials that are subsequently used when the activity is carried out
- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of carbon black

Activity description

The production of carbon black is the chemical transformation of gaseous or liquid hydrocarbons to produce a colloidal carbon material (known as 'carbon black') in the form of spheres, or of fused aggregates of the spheres.

The particle size of the colloidal carbon must be below 1 000nm in at least 1 dimension.

Product (basis for allocation)

The product (basis for allocation) is total tonnes, on a dry weight basis, of pelletised carbon black that is:

a. produced by carrying on the activity
b. of saleable quality.

Note: **Saleable quality** is explained in Annex 2.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:

  - machinery used to move materials within and as part of the activity
  - controls rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- the combustion of tail gas
- the wet pelletisation process
- recycling of carbon black within the activity boundary.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- any extraction or production of raw materials that are subsequently used when the activity is carried out
- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of white titanium dioxide (TiO_2) pigment

Activity description

The production of white titanium dioxide (TiO_2) pigment is the chemical transformation of one or more of the following:

a. rutile (TiO_2)
b. synthetic rutile (TiO_2)
c. ilmenite ($FeTiO_3$)

d. leucoxene

e. titanium slag that has an iron (Fe) concentration of greater than or equal to 7 per cent

to produce white titanium dioxide (TiO_2) pigment.

The white titanium dioxide (TiO_2) pigment must:

a. conform with ASTM classification D476-00

b. have an iron (Fe) concentration of less than or equal to 0.5 per cent.

Product (basis for allocation)

The product (basis for allocation) is total tonnes of white titanium dioxide (TiO_2) pigment that:

a. is produced by carrying on the activity

b. conforms with ASTM classification D476-00

c. has an iron (Fe) concentration of less than or equal to 0.5 per cent

d. is of saleable quality.

Note: **Saleable quality** is explained in Annex 2.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- emissions associated with the production of nitrogen and oxygen consumed within the activity.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity

- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- production of rutile, synthetic rutile, ilmenite ($FeTiO_3$), titanium slag or leucoxene
- emissions associated with the generation of electricity on the site where the activity is conducted
- transportation of intermediate products between locations where the activity takes place over more than one location.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of silicon

Activity description

The production of silicon is the chemical transformation of silica (silicon dioxide (SiO_2)) to produce silicon (Si) with a concentration of silicon equal to or greater than 98.0 per cent, conducted in accordance with the overall chemical equation:

$$SiO_{2(s)} + 2C_{(s)} \rightarrow Si_{(s)} + 2CO_{(g)}$$

Product (basis for allocation)

The product (basis for allocation) is total tonnes of silicon that:

a. has a concentration of silicon equal to or greater than 98.0 per cent
b. is produced by carrying on the activity
c. is of saleable quality.

Note: **Saleable quality** is explained in Annex 2.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of waste materials from the activity to comply with regulatory obligations

- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- crushing of silicon in order to produce saleable silicon.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- mining, crushing, grinding and milling of silica (silicon dioxide, SiO_2) prior to the smelting process
- charcoal production
- wood processing.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Smelting zinc

Activity description

Smelting zinc is the chemical transformation of either or both of:

a. concentrated mineralised zinc compounds
b. zinc-bearing secondary materials

to produce zinc metal (Zn) with a concentration of zinc equal to or greater than 99.95 per cent.

Product (basis for allocation)

The product (basis for allocation) is total tonnes of zinc that:

a. has a concentration of zinc equal to or greater than 99.95 per cent
b. is produced by carrying on the activity
c. is of saleable quality.

Note: **Saleable quality** is explained in Annex 2.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- roasting, leaching, purification, electrolytic and casting processes
- processing of residues and /or intermediate products in the activity, including, for example, cadmium cementates (Cd) and zinc dust (Zn)
- onsite processing of sulphur compounds to produce sulphuric acid, and effluent treatment operations.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- mining and pre-processing of concentrated mineralised zinc compounds and/or zinc bearing materials, and other intermediate inputs
- processing of other by-products, such as copper sulphate ($CuSO_4$)
- post-cast rolling, extruding, re-forming or alloying of zinc metal (Zn)
- secondary smelting and secondary casting of recycled compounds containing zinc metal (Zn).

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Manufacture of newsprint

Activity description

The manufacture of newsprint is the physical transformation of any or all of wood chips, sawdust, wood pulp and recovered paper into rolls of uncoated newsprint that:

a. has a grammage range of 30 to 80 g/m^2
b. has a moisture content in the range of 6 to 11 per cent by weight
c. is generally usable for newspaper products

through an integrated process.

Product (basis for allocation)

For the manufacture of uncoated newsprint which:

a. has a grammage range of 30 to 80 g/m^2
b. has a moisture content in the range of 6 to 11 per cent by weight
c. is generally usable for newspaper products

the product (basis for allocation) is total air dried tonnes of rolls of uncoated newsprint of saleable quality produced by carrying on the activity.

Note: **Saleable quality** is explained in Annex 2.

For the production of pulp from either or both of wood chips and sawdust, the product (basis for allocation) is total tonnes of bone dried equivalent pulp which is:

a. used in the integrated process of manufacturing newsprint
b. produced as part of carrying on the activity.

For the production of pulp from recovered paper, the product (basis for allocation) is total tonnes of bone dried equivalent pulp which is:

a. used in the integrated process of manufacturing newsprint
b. produced as part of carrying on the activity.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity

  - the processing of by-products where it involves the recovery of materials for re-use within the activity or it is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
  - the processing of water and wastewater used in the activity
  - emissions associated with onsite processes of chemical preparation, compressed air generation and delivery and cooling tower operation
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- the production of pulp for use in the activity by the conversion of:
  - wood chips and/or sawdust using mechanical refining; or a combination of mechanical refining with heat or chemical treatment, and/or
  - recovered paper (including de-inking and onsite processing).

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output of the activity from storage at the same location as the activity
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- all forestry operations including establishment, maintenance and harvesting
- the production of wood chips
- the collection, sorting, transport and baling of recovered paper for use in the activity
- transportation of pulp and recovered paper between sites conducting the activity
- further processing, cutting or colouring of newsprint rolls
- the generation of steam for use outside the activity.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Alumina refining

Activity description

The physical and chemical transformation of bauxite (ore containing mineralised aluminium compounds) into saleable alumina (aluminium oxide, Al_20_3) with a purity equal to or greater than 95 per cent.

Where:

- the output of this activity is saleable alumina (aluminium oxide, Al_20_3) with a purity equal to or greater than 95 per cent, which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is tonnes of saleable alumina (aluminium oxide, Al_20_3) with a purity equal to or greater than 95 per cent, which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including the production of specialty aluminas and hydrate (alumina trihydrate, $Al(OH)_3$), for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described
  - onsite processing of waste materials from the activity to comply with regulatory obligations
- wet grinding, digestion, clarification, precipitation and calcination, including using a process commonly referred to as the 'Bayer Process'
- any bauxite residue processing which involves caustic liquor recovery for reuse in the activity
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output of the activity from storage at the same location as the activity

- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- extraction (eg, mining) and pre-processing (eg, crushing) of bauxite prior to wet grinding, including washing and crushing at the bauxite mine
- production of lime (calcium oxide compounds)
- production of feedstock caustic soda (sodium hydroxide, NaOH) besides that which is generated or recovered in the activity.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Aluminium smelting

Activity description

The physical and chemical transformation of alumina (aluminium oxide, Al_20_3) into saleable aluminium metal (Al).

Where:

- the output of this activity is saleable aluminium metal, which is to be used for the calculation of revenue from the activity.

Product (basis for allocation)

The product (basis for allocation) is tonnes of primary aluminium (Al) with a purity equal to or greater than 98 per cent, and which result from carrying out the activity as described.

Note: Such measurement of primary aluminium (Al) should be as weighed after electrolysis but before casting.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity

  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- electrolysis, including using a process commonly referred to as the Hall-Héroult Process
- alloying and casting of primary aluminium into saleable aluminium metal
- the production of anodes
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- the production of alumina (aluminium oxide, Al_20_3)
- the production of cathodes
- the production of alloying materials
- the smelting and associated casting of secondary aluminium metal (Al)
- further downstream processing of aluminium metal (Al) beyond the boundary of this activity.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of carbamide (urea)

Activity description

The chemical transformation of carbon dioxide (CO_2) and anhydrous ammonia (NH_3) to produce carbamide solution ($CO(NH_2)_2$(aq), urea), where the concentration of carbamide ($CO(NH_2)_2$, urea) is greater than or equal to 80 per cent with respect to mass, and subsequent production of:

- carbamide solutions ($CO(NH_2)_2$(aq), urea), and/or
- saleable granulated, prilled or other solid forms of carbamide ($CO(NH_2)_2$(s), urea).

The chemical transformation follows the following chemical reactions:

$2NH_3(L) + CO_2(g) \rightarrow H_2COONH_4(aq)$

$H_2NCOONH_4(aq) \rightarrow H_2CONH_2 + H_2O$

Where:

- the outputs of this activity include all of the following products produced as a result from carrying out the activity as described:
  - carbamide solutions ($CO(NH_2)_2$(aq), urea) produced from the carbamide solution which has a concentration of carbamide ($CO(NH_2)_2$, urea) greater than or equal to 80 per cent with respect to mass, and/or
  - saleable granulated, prilled or other solid forms of carbamide ($CO(NH_2)_2$(s), urea)

  which are to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is tonnes of saleable dry weight carbamide ($CO(NH_2)_2$, urea), which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- production of nitrogen and oxygen consumed within the activity
- solvent recovery system (or equivalent) used to recover the un-reacted or intermediary gases

- compression of anhydrous ammonia (NH_3) and carbon dioxide (CO_2) gases prior to urea reactor
- conversion of carbamide solution ($CO(NH_2)_2$(aq), urea) with a concentration of carbamide ($CO(NH_2)_2$, urea) greater than or equal to 80 per cent with respect to mass to either granulated, prilled or other solid product form, or aqueous solution
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of input/s used in the activity to storage at the same location as the activity
- transportation of the output/s of the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- production and liquefaction of anhydrous ammonia (NH_3)
- production of carbon dioxide (CO_2).

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Cartonboard manufacturing

Activity description

The physical transformation of wood chips, sawdust, wood pulp and/or recovered paper into rolls of cartonboard where the product has a grammage range of 150 g/m^2–500 g/m^2, a moisture content in the range of 4 to 11 per cent by weight, is coated and which is generally useable as cartonboard product such as coated kraft liner, coated multiply and other coated paperboard.

Where:

- the output of this activity is rolls or sheets of cartonboard where the product has a grammage range of 150 g/m^2–500 g/m^2, a moisture content in the range of 4 to 11 per cent by weight, is coated and which is generally useable as cartonboard product such as coated kraft liner, coated multiply and other coated paperboard, which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is:

- air dried tonnes (10 per cent moisture content) equivalent pulp produced from wood chips and/or sawdust which are produced as part of, and used in, the activity as described
- tonnes of saleable rolls or sheets of cartonboard where the product has a grammage range of 150 g–500 g, a moisture content in the range of 4 to 11 per cent by weight, is coated and which is generally useable as cartonboard product such as coated kraft liner, coated multiply and other coated paperboard, which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or it is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
  - the processing of water and wastewater used in the activity
  - emissions associated with onsite processes of chemical preparation, compressed air generation and delivery and cooling tower operation
  - waste heat recovery within the activity boundary
  - steam consumed within the activity boundary
  - the production of pulp for use in the activity from:
    - wood chips and/or sawdust using any combination of mechanical, heat or chemical processes, and/or
    - recovered paper (including de-inking and onsite processing).

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- any extraction or production of raw materials that are subsequently used when the activity is carried out
- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output of the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out

- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- all forestry operations including establishment, maintenance and harvesting
- the production of wood chips.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Manufacturing of carbon steel from cold ferrous feed

Activity description

The physical and chemical transformation of cold ferrous feed, such as ferrous scrap and pig iron, by heating and melting (such as where electric power is used as the predominant energy source) into liquid steel, continuously cast carbon steel products and ingots of carbon steel and saleable hot-rolled carbon steel products, which commence hot-rolling at over 800°C, where carbon steel is defined as a material which contains by mass more iron (Fe) than any other single element, and has a carbon (C) content less than 2 per cent.

Where:

- the outputs of this activity to be used for the calculation of revenue from the activity are saleable continuously cast carbon steel products and saleable ingots of carbon steel which are not hot rolled, and saleable hot-rolled carbon steel products.

Product (basis for allocation)

The product (basis for allocation) is:

- tonnes of saleable continuously cast carbon steel products and saleable ingots of carbon steel (where carbon steel is defined as a material which contains by mass more iron (Fe) than any other single element and has a carbon (C) content less than 2 per cent) whether or not it is subsequently hot-rolled, which result from carrying out the activity as described
- tonnes of saleable long products[21] of hot-rolled carbon steel, which result from carrying out the activity as described

[21] Long products of hot-rolled carbon steel are defined to be hot-rolled steel products in coils or straight lengths produced in rod, bar and structural/section mills. They are characterised by having one of a variety of cross-sectional shapes, such as I, T, Y, U, V, H, C, L, square, rectangular, round, flat, hexagonal, angle, channel, structural beam profile or rail profile. Their surface finish may be smooth or may contain ribs, grooves, indentations or other deformations produced by the hot-rolling process.

- tonnes of saleable flat products[22] of hot-rolled carbon steel, which result from carrying out the activity as described.

Note that a product is 'saleable' if it can be used in downstream steel manufacturing processes and it does not include product which is rejected.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described
  - onsite processing of waste materials or by-products from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- warehousing or storage of activity outputs, raw materials and consumables used by the activity where this is at the same location as the activity
- the preparation of cold ferrous feed prior to any heating and melting into liquid steel
- the conduct of secondary metallurgical treatment
- the production of cryogenic gases, eg, oxygen, nitrogen and argon that are consumed in the activity
- casting via processes such as continuous casting or ingot casting into intermediate steel products
- water and waste treatment (including gases, etc) necessary for the activity to be conducted
- the hot rolling of the crude carbon steel which is produced in the activity.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the outputs of the activity from storage at the same location as the activity

[22] Flat products of hot-rolled carbon steel are defined to be hot-rolled steel products produced in hot strip and plate mills, are flat in profile such as plate and hot-rolled coil, and typically are greater than 600 mm in width and less than 150 mm in thickness.

- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- electricity generation on the site where the activity is conducted
- transportation of intermediate products between separate site locations conducting the activity
- the extraction of raw materials prior to the conduct of the activity
- any finishing processes including, but not limited to, cold rolling, annealing, pickling or coating of steel products.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of chlorine gas and sodium hydroxide (caustic soda) solution

Activity description

The chemical transformation of sodium chloride solution (NaCl(aq), brine) to chlorine (Cl_2(l,g)) and sodium hydroxide solution (NaOH(aq), caustic soda solution) where the concentration of sodium hydroxide (NaOH) is equal to or greater than 14 per cent with respect to mass and where the sodium hydroxide (NaOH) production is 1:1.13 times the production of chlorine (Cl_2) by mass. The chemical reaction involved in this chemical transformation is:

$$2NaCl(aq) + 2H_2O(l) \rightarrow 2NaOH(aq) + Cl_2(g) + H_2(g)$$

Where:

- the outputs of this activity are chlorine (Cl_2(l,g)) and sodium hydroxide solution (NaOH(aq), caustic soda solution) where the concentration of sodium hydroxide (NaOH) is equal to or greater than 14 per cent with respect to mass, which are to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is tonnes of 100 per cent equivalent dry weight sodium hydroxide (NaOH, caustic soda) which is not recycled back into the activity and results from carrying out the activity as described.

Note: Such measurement of dry weight sodium hydroxide (NaOH, caustic soda) does not include the recycle stream of sodium hydroxide solution back to chemical treatment step.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - controls rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or it is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- nitrogen used within the activity boundary
- liquefaction of the chlorine gas
- drying of the caustic soda solution to saleable concentration.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- any extraction or production of raw materials that are subsequently used when the activity is carried out
- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of clinker

Activity description

The physical and chemical transformation of:

- calcium carbonate compounds ($CaCO_3$, limestone) and/or other calcium carbonate ($CaCO_3$) feedstocks
- clay or other silicon dioxide (SiO_2, silica), iron (Fe) and aluminium oxide (Al_2O_3, alumina) feedstocks

that are fused together at a temperature greater than 1000ºC into Portland cement clinker that consists of at least 60 per cent by mass of calcium silicates, a maximum magnesium oxide (MgO) mass content of 4.5 per cent and is useable in the making of Portland cement.

Where:

- the output of this activity is Portland cement clinker that consists of at least 60 per cent by mass of calcium silicates, a maximum magnesium oxide (MgO) mass content of 4.5 per cent and is useable in the making of Portland cement which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is tonnes, on a dry weight basis, of saleable Portland cement clinker that consists of at least 60 per cent by mass of calcium silicates, a maximum magnesium oxide (MgO) mass content of 4.5 per cent and is useable in the making of Portland cement which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described
  - onsite processing of waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- crushing, pre-homogenisation and grinding of raw materials that is contiguous with the clinker production process

- kiln dust production and reprocessing
- reject production where this is not recycled in the process.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- extraction of raw materials
- crushing of raw materials that is not contiguous with the clinker production process
- downstream processing of Portland cement clinker including grinding, rolling, milling and blending processes.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Dry pulp manufacturing

Activity description

The physical transformation of wood chips, sawdust, wood pulp and/or recovered paper into rolls and/or bales of dry pulp where the product has a moisture content in the range of 4 to 14 per cent by weight and which is generally useable in paper manufacturing and/or in the production of sanitary products (eg, fluff pulp layer in sanitary products).

Where:

- the output of this activity is saleable rolls and/or bales of dry pulp where the product has a moisture content in the range of 4 to 14 per cent by weight and which is generally useable in paper manufacturing and/or in the production of sanitary products (eg, fluff pulp layer in sanitary products), which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is:

- air dried tonnes (10 per cent moisture content) equivalent pulp produced from woodchips and/or sawdust which are produced as part of, and used in, the activity as described; and
- tonnes as produced of saleable rolls and/or bales of dry pulp where the product has a moisture content in the range of 4 to 14 per cent by weight and which is generally useable in paper manufacturing and/or in the production of sanitary products (eg, fluff pulp layer in sanitary products), which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or it is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- the processing of water and wastewater used in the activity
- emissions associated with onsite processes of chemical preparation, compressed air generation and delivery and cooling tower operation
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- the production of pulp for use in the activity from:
  - wood chips and/or sawdust using any combination of mechanical, heat or chemical processes, and/or
  - recovered paper (including de-inking and onsite processing).

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- any extraction or production of raw materials that are subsequently used when the activity is carried out
- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output of the activity from storage at the same location as the activity
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere

- emissions associated with the generation of electricity on the site where the activity is conducted
- all forestry operations including establishment, maintenance and harvesting
- the production of wood chips
- the collection, sorting, transport and baling of recovered paper for use in the activity
- transportation of pulp and recovered paper between sites conducting the activity
- further processing, cutting or colouring of dry wood pulp rolls
- the generation of steam for use outside the activity.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Fused alumina production

Activity description

The physical transformation of alumina (aluminium oxide, Al_2O_3) through heating it to its fusion point to produce fused alumina with an alpha alumina crystalline structure and a purity equal to or greater than 99 per cent.

Where:

- the output of this activity is saleable fused alumina (aluminium oxide, Al_2O_3) with an alpha alumina crystalline structure and a purity equal to or greater than 99 per cent, which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is tonnes of saleable fused alumina (aluminium oxide, Al2O3) with an alpha alumina crystalline structure and a purity equal to or greater than 99 per cent, which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity

  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- crushing and milling of fused alumina (aluminium oxide, Al_2O_3) in order to produce saleable fused alumina.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- mining and processing of bauxite to produce alumina (aluminium oxide, Al_2O_3) inputs prior to the fusion process.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of fused zirconia

Activity description

The physical and chemical transformation of zircon ($ZrSiO_4$), through the removal of silica (silicon dioxide, SiO_2) using a reductant such as carbon and heating to its fusion point, to produce fused zirconia (zirconium dioxide, ZrO_2) with a purity equal to or greater than 96 per cent.

Where:

- the output of this activity is saleable fused zirconia (zirconium dioxide, ZrO_2) with a purity equal to or greater than 96 per cent which is to be used for the calculation of revenue. Note that revenue from the sale of by-products, such as silica fume, is not included for the calculation of revenue from the activity.

Product (basis for allocation)

The product (basis for allocation) is tonnes of fused zirconia (zirconium dioxide, ZrO_2) with a purity equal to or greater than 96 per cent which result from carrying out the activity as described, where no tonnage of pure fused zirconia may be allocated for more than once.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described
  - onsite processing of waste materials and by-products from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output of the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- mining and concentrating (including wet and dry concentrating and electrostatic separation) of zircon ($ZrSiO_4$)
- crushing and milling of cast fused zirconia (zirconium dioxide, ZrO_2).

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of high purity ethanol

Activity description

The chemical transformation of fermentable sugars (such as $C_6H_{12}O_6$ or $C_5H_{10}O_5$ or $C_{12}H_{22}O_{11}$ or $C_{18}H_{32}O_{16}$) to ethanol (C_2H_5OH) and the subsequent purification process to obtain a solution of high purity ethanol where the concentration of ethanol (C_2H_5OH) is equal to or greater than 95 per cent with respect to volume.

Where:

- the output of this activity is ethanol (C_2H_5OH) where the concentration of ethanol (C_2H_5OH) in solution is equal to or greater than 95 per cent with respect to volume, which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is kilolitres of 100 per cent ethanol (C_2H_5OH) equivalent at 20°C assuming a density of ethanol (C_2H_5OH) of 789.24 kg/m^3 at 20°C,[23] which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- electricity use associated with fermentation
- distillation and dehydration
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary.

[23] International Organisation of Legal Metrology, 1975, *Alcoholometry: International alcoholometric tables* (International recommendation no. 22).

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output of the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- upstream processing of inputs to the activity, including the production of sugar feed for fermentation
- downstream processing of ethanol, including denaturation and blending
- direct emissions associated with fermentation
- processing of by-products and waste products not otherwise included
- production of yeast for fermentation.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of hydrogen peroxide

Activity description

The chemical transformation of hydrogen (H) feedstocks and oxygen (O) feedstocks to produce a crude aqueous hydrogen peroxide solution where the concentration of hydrogen peroxide (H_2O_2(aq)) is equal to or greater than 39 per cent with respect to mass, and subsequent production of saleable aqueous hydrogen peroxide solutions where the concentration of hydrogen peroxide (H_2O_2(aq)) is equal to or greater than 34 per cent with respect to mass.

Where:

- the output of this activity is saleable aqueous hydrogen peroxide solutions (H_2O_2(aq)) produced from the crude aqueous hydrogen peroxide solution where the concentration of hydrogen peroxide (H_2O_2(aq)) in the saleable aqueous solution is equal to or greater than 34 per cent with respect to mass, which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is tonnes of 100 per cent equivalent hydrogen peroxide which are contained within the saleable aqueous hydrogen peroxide solutions, and which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- production of hydrogen consumed within the activity
- compression of air consumed within the activity
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- any extraction or production of raw materials that are subsequently used when the activity is carried out
- transportation of input/s used in the activity to storage at the same location as the activity
- transportation of the output/s of the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Integrated production of lead and zinc

Activity description

The chemical transformation of:

- concentrated mineralised lead compounds with or without additional lead bearing secondary materials, and/or
- concentrated mineralised zinc compounds with or without additional zinc bearing secondary materials

into lead metal (Pb) with a concentration of lead equal to or more than 99.97 per cent and zinc in fume (Zn) with a concentration of zinc equal to or more than 60 per cent.

Where:

- the outputs of this activity which are to be used for the calculation of revenue are:
  - saleable lead metal (Pb) with a concentration of lead equal to or more than 99.97 per cent
  - saleable zinc in fume (Zn) with a concentration of zinc equal to or more than 60 per cent which has not undergone further processing to produce saleable zinc metal (Zn) with a concentration of zinc equal to or more than 99.95 per cent
  - saleable zinc metal (Zn) with a concentration of zinc equal to or more than 99.95 per cent
  - saleable gold metal (Au) with a concentration of gold equal to or more than 95 per cent
  - saleable silver metal (Ag) with a concentration of silver equal to or more than 99.0 per cent
  - intermediate copper matte (Cu) with a concentration of copper equal to or more than 35 per cent which has not undergone further processing to produce saleable copper cathode (Cu) with a concentration of copper equal to or greater than 99.90 per cent.

Product (basis for allocation)

The product (basis for allocation) is:

- tonnes of saleable lead metal (Pb) with a concentration of lead equal to or more than 99.97 per cent, which result from carrying out the activity as described
- tonnes of zinc in fume (Zn) with a concentration of zinc equal to or more than 60 per cent, which result from carrying out the activity as described; and
- tonnes of saleable zinc metal (Zn) with a concentration of zinc equal to or more than 99.95 per cent, which is produced subsequent to the production of zinc in fume (Zn) in a contiguous manner with the activity described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:

  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- production of oxygen consumed within the activity
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- sintering, blast furnace, refining, slag fuming, leaching, electrolytic and casting processes, commonly referred to as pyrometallurgical and hydrometallurgical processes
- processing of residues and/or intermediate products in the activity, including the precious metals refinery
- onsite processing of sulphur compounds to produce sulphuric acid, and effluent treatment operations.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the outputs of the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- mining and production of concentrated mineralised lead compounds and/or lead bearing secondary materials and/or concentrated mineralised zinc compounds and/or zinc bearing secondary materials
- processing and production of other materials and metals other than zinc, lead, gold and silver, such as cadmium (Cd)
- the production of copper cathode from copper matte.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Integrated iron and steel manufacturing

Activity description

The physical and chemical transformation of iron ore into crude carbon steel products and hot-rolled carbon steel products, where carbon steel is defined as a material which contains by mass more iron (Fe) than any other single element and has a carbon (C) content less than 2 per cent, involving the conduct of the following processes:

- the chemical and physical transformation of iron ore into agglomerated iron ore, such as sinter or pellets
- the carbonisation of coal (principally coking coal) into coke oven coke[24]
- the chemical and physical transformation of limestone and/or dolomite, into lime, including burnt lime and burnt dolomite
- the chemical and physical transformation of iron ore feed, including agglomerated iron ore, into molten iron which proceeds via the reduction of oxides of iron using carbon as the predominant reducing agent
- the chemical and physical transformation of molten iron and cold ferrous feed, such as pig iron and ferrous scrap (where the maximum percentage of cold ferrous feed charged as a proportion of the total ferrous bearing material does not exceed 30 per cent with respect to mass over the relevant year) into saleable continuously cast carbon steel products and saleable ingots of carbon steel and saleable hot-rolled carbon steel products, which commence hot-rolling at over 800°C.

Where:

- the outputs of this activity which are to be used for the calculation of revenue from the activity are:
  - saleable continuously cast carbon steel products and saleable ingots of carbon steel which are not hot rolled, and saleable hot-rolled carbon steel products
  - saleable coke oven coke which is not subsequently used in the integrated steel making process.

Product (basis for allocation)

The product (basis for allocation) is:

- tonnes of sinter on a dry weight basis, which meet the necessary requirements for use in the integrated iron and steel making process, which result from carrying out the activity as described
- tonnes of pellets on a dry weight basis, which meet the necessary requirements for use in the integrated iron and steel making process, which result from carrying out the activity as described
- tonnes of coke oven coke on a dry weight basis, which result from carrying out the activity as described
- tonnes of lime, which meet the necessary requirements for use in the integrated iron and steel making process, which result from carrying out the activity as described

[24] As defined in Australian National Greenhouse and Energy Reporting Regulations 2008.

- tonnes of saleable continuously cast carbon steel products and saleable ingots of carbon steel (where carbon steel is defined as a material which contains by mass more iron (Fe) than any other single element and has a carbon (C) content less than 2 per cent) whether or not it is subsequently hot rolled, which result from carrying out the activity as described
- tonnes of saleable long products[25] of hot-rolled carbon steel, which result from carrying out the activity as described
- tonnes of saleable flat products of hot-rolled carbon steel, which result from carrying out the activity as described.

Note that a product is 'saleable' if it can be used in downstream steel manufacturing processes and it does not include product which is rejected.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described[26]
  - onsite processing of waste materials and by-products from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- the production of cryogenic gases, eg, oxygen, nitrogen and argon that are consumed in the activity
- the conduct of secondary metallurgical treatment
- casting via the continuous casting process or ingot casting process into intermediate steel products
- the processing of cold ferrous feed where that process is conducted on site
- the treatment of indigenous waste gases, eg, coke oven gas, blast furnace gas and basic oxygen steelmaking off-gas

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[25] Long products of hot-rolled carbon steel are defined to be hot-rolled steel products in coils or straight lengths produced in rod, bar and structural/section mills. They are characterised by having one of a variety of cross-sectional shapes, such as I, T, Y, U, V, H, C, L, square, rectangular, round, flat, hexagonal, angle, channel, structural beam profile or rail profile. Their surface finish may be smooth or may contain ribs, grooves, indentations or other deformations produced by the hot-rolling process. 3 Flat products of hot-rolled carbon steel are defined to be hot-rolled steel products produced in hot strip and plate mills, are flat in profile such as plate and hot-rolled coil, and typically are greater than 600 mm in width and less than 150 mm in thickness.

[26] Examples include BTX, blast furnace slag, gypsum and ammonium sulphate.

- steel scrap receival (including quality checks and storage)
- warehousing or storage of activity outputs, raw materials and consumables used by the activity where this is at the same location as the activity
- water and waste treatment (including gases) necessary for the activity to be conducted
- the hot rolling of the crude carbon steel which is produced in the integrated iron and steel activity.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the outputs from the activity from storage at the same location as the activity
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- electricity generation on the site where the activity is conducted
- transportation of intermediate products between separate site locations conducting the activity
- the extraction and concentration of raw materials prior to the conduct of the activity, including iron ore crushing and screening
- any finishing processes, including, but not limited to, cold-rolling, annealing, pickling or coating of steel products.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of iron ore pellets

Activity description

The physical and chemical transformation of iron ore concentrate to produce saleable iron ore pellets for the production of steel where: the concentration of iron (Fe) is equal to or greater than 63 per cent with respect to mass, the concentration of alumina (Al_20_3, aluminium oxide) is equal to or less than 2 per cent with respect to mass, the concentration of silicon dioxide (SiO_2, silica) is equal to or less than 7 per cent with respect to mass, the saleable product has an average diameter of between 9 and 16 millimetres and a minimum cold compression strength of 200 kilograms force per pellet.

Where:

- the output of the activity to be used for the calculation of revenue is saleable iron ore pellets for the production of steel where: the concentration of iron (Fe) is equal to or greater than 63 per cent with respect to mass, the concentration of alumina (Al_20_3, aluminium oxide) is equal to or less than 2 per cent with respect to mass, the concentration of silicon dioxide (SiO_2, silica) is equal to or less than 7 per cent with respect to mass, the saleable product has an average diameter of between 9 and 16 millimetres and a minimum cold compression strength of 200 kilograms force per pellet.

Product (basis for allocation)

The product (basis for allocation) is tonnes of saleable iron ore pellets on a dry weight basis for the production of steel where: the concentration of iron (Fe) is equal to or greater than 63 per cent with respect to mass, the concentration of alumina (Al_20_3, aluminium oxide) is equal to or less than 2 per cent with respect to mass, the concentration of silicon dioxide (SiO_2, silica) is equal to or less than 7 per cent with respect to mass, the saleable product has an average diameter of between 9 and 16 millimetres and a minimum cold compression strength of 200 kilograms force per pellet which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment, facilities and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- emissions associated with the production of hot air for use in furnace operations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out

- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- the production of iron ore concentrate.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of lime

Activity description

The physical and chemical transformation through the calcining process of calcium and magnesium sources (eg, calcium carbonate ($CaCO_3$) and magnesium carbonate ($MgCO_3$)) into lime produced to saleable quality with a calcium oxide (CaO) and/or magnesium oxide (MgO) mass content equal to or greater than 60 per cent.

Where:

- the output of this activity is lime with a calcium oxide (CaO) and/or magnesium oxide (MgO) mass content equal to or greater than 60 per cent which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is tonnes of lime produced to saleable quality with a calcium oxide (CaO) and/or magnesium oxide (MgO) mass content equal to or greater than 60 per cent which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where they involve the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations

- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- kiln dust production
- crushing, grinding and preparation of raw materials contiguous with the equipment required to conduct the transformation as described
- reject production where this is not recycled in the process.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- extraction of raw materials
- crushing, grinding and preparation of raw materials not contiguous with the equipment required to conduct the transformation as described
- downstream processing of lime, eg, hydrated lime, lime slurry, finishing lime or lime putty.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Magnesia production

Activity description

The chemical and physical transformation of magnesite ($MgCO_3$, magnesium carbonate) into magnesia where the magnesia has a minimum magnesium oxide (MgO) mass content of 75 per cent.

Where:

- the output of this activity is caustic calcined magnesia, deadburned magnesia and/or electrofused magnesia where the magnesia has a minimum magnesium oxide (MgO) mass content of 75 per cent.

Product (basis for allocation)

The product (basis for allocation) is tonnes, on a dry weight basis, of:

- saleable caustic calcined magnesia where the magnesia has a minimum magnesium oxide (MgO) mass content of 75 per cent and burning has occurred between 650ºC and 1200ºC
- saleable deadburned magnesia where the magnesia has a minimum magnesium oxide (MgO) mass content of 85 per cent, grain density of 3.00g.cm^{-3} to 3.45g.cm^{-3} and burned to between 1450ºC and 2200ºC
- saleable electrofused magnesia where the magnesia has a minimum magnesium oxide (MgO) mass content of 90 per cent, grain density of greater than 3.45g.cm^{-3} and is fused at temperatures in excess of 2750ºC

which results from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - controls rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or it is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- kiln dust production
- crushing, grinding and preparation of raw materials contiguous with the equipment required to conduct the transformation as described.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the outputs of the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere

- emissions associated with the generation of electricity on the site where the activity is conducted
- extraction of raw materials
- crushing of raw materials that are not contiguous with the equipment required to conduct the transformation as described.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Packaging and industrial paper manufacturing

Activity description

The physical transformation of wood chips, sawdust, wood pulp and/or recovered paper into rolls of uncoated packaging and industrial paper where the product is produced from wholly or partially unbleached input fibre, has a grammage range of 30 g/m^2–500 g/m^2, a moisture content in the range of 4 to 11 per cent by weight and which is generally useable as a packaging or industrial paper product such as kraft liner; recycled or multiply liner; medium, sack and bag papers; wrapping papers; plasterboard liner; horticultural paper; building papers; but excluding cartonboard as defined.

Where:

- the output of this activity is saleable rolls of uncoated packaging and industrial paper where the product is produced from wholly or partially unbleached input fibre, has a grammage range of 30 g/m^2–500 g/m^2, a moisture content in the range of 4 to 11 per cent by weight and which is generally useable as a packaging or industrial paper product such as kraft liner; recycled or multiply liner; medium, sack and bag papers; wrapping papers; plasterboard liner; horticultural paper; building papers; but excluding cartonboard as defined, which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is:

- air dried tonnes (10 per cent moisture content) equivalent pulp produced from woodchips and/or sawdust which are produced as part of, and used in, the activity as described
- tonnes of saleable rolls of uncoated packaging and industrial paper where the product is produced from wholly or partially unbleached input fibre, has a grammage range of 30 g/m^2 500 g/m^2, a moisture content in the range of 4 to 11 per cent by weight and which is generally useable as a packaging or industrial paper product such as kraft liner; recycled or multiply liner; medium, sack and bag papers; wrapping papers; plasterboard liner; horticultural paper; building papers; but excluding cartonboard as defined, which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or it is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- the processing of water and wastewater used in the activity
- emissions associated with onsite processes of chemical preparation, compressed air generation and delivery and cooling tower operation
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- the production of pulp for use in the activity from:
  - wood chips and/or sawdust using any combination of mechanical, heat or chemical processes, and/or
  - recovered paper (including de-inking and onsite processing).

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- any extraction or production of raw materials that are subsequently used when the activity is carried out
- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output of the activity from storage at the same location as the activity
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- all forestry operations including establishment, maintenance and harvesting
- the production of wood chips
- the collection, sorting, transport and baling of recovered paper for use in the activity
- transportation of pulp and recovered paper between sites conducting the activity
- further processing, cutting or colouring of packaging paper rolls
- the generation of steam for use outside the activity.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Petroleum refining

Activity description

An integrated refining process chemically and physically transforming stabilised crude petroleum oil,[27] which may be supplemented with condensate[28] and/or other petroleum feedstocks, to produce a range of refined petroleum products. This process includes:

1) the distillation of stabilised crude petroleum oil, condensate and other petroleum feedstocks
2) the adjustment of molecular weight and structure of hydrocarbons (such as that which occurs through catalytic or hydro-cracking, steam or catalytic reforming, polymerisation, isomerisation or alkylation)
3) the blending of products from distillation and adjustment of molecular weight and structure to produce New Zealand or International Standard: diesel, jet fuel, and unleaded petrol[29]
4) the production of two or more of the following refinery products saleable in New Zealand or international markets: hydrogen, ethane, propane, refinery grade propylene, polymer grade propylene, liquefied petroleum gas, butane, naphtha, aviation gasoline, before oxygenate blend, kerosene, heating oil, solvents, lubricant base stocks, leaded petrol, waxes and bitumen.

Where:

- each of the processes described in items (1) to (4) above must be conducted within the relevant financial year for the activity of petroleum refining to be carried out however all steps are not required to be conducted in relation to every output listed in items (3) and (4) above

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[27] The definition of stabilised crude petroleum oil is in accordance with Australian Taxation Office Interpretative Decision, ATO ID 2008/154.

[28] In accordance with the Australian Excise Act 1901, Section 4 "condensate" means either:

(a) liquid petroleum; or

(b) a substance:

(i) that is derived from gas associated with oil production; and

(ii) that is liquid at standard temperature and pressure.

Where:

"liquid petroleum" is a mixture of hydrocarbons:

(a) that is produced from gas wells

(b) that is liquid at standard temperature and pressure after recovery in surface separation facilities; but does not include a substance referred to in paragraph (b) of the definition of condensate

"standard temperature and pressure" as defined in the Australian Excise Act means a temperature of 20° Centigrade and a pressure of one standard atmosphere.

[29] 'Unleaded petrol' includes all grades of unleaded petrol meeting Australian or international standards and includes standard unleaded, premium unleaded and other proprietary forms of unleaded petrol. In general, the term 'unleaded petrol' is used interchangeably with the term 'gasoline'.

- over a relevant year the combined volume (L) of diesel, jet fuel, unleaded petrol, lubricant base stocks and bitumen at 15°C and 1 atm produced from the inputs specified in the basis of allocation (the combined volume) is equal to or greater than 75 per cent of the combined volume of inputs specified in the basis of allocation
- the outputs from the petroleum refining activity which are to be used for the calculation of emissions intensity, is defined by the produced products listed in items (3) and (4).

Product (basis for allocation)

The product (basis for allocation) is combined litres at 15°C and 1 atm of the following inputs refined to petroleum products listed in sections (3) and (4) of the activity description and other by-products which result from carrying out the activity as described:

1) stabilised crude petroleum oil
2) condensate
3) tallow
4) vegetable oil
5) catalytic cracker feedstocks that are processed in the catalytic cracker and were not produced through the conduct of an eligible industrial activity
6) hydro-cracker unit feedstocks that are processed in the hydro-cracking unit and were not produced through the conduct of an eligible industrial activity
7) reformer unit feedstocks that must be used to produce reformate and were not produced through the conduct of an eligible industrial activity
8) alkylation unit feedstocks that must be used to produce alkylate and were not produced through the conduct of an eligible industrial activity
9) bitumen feedstocks that must be used to produce bitumen and were not produced through the conduct of an eligible industrial activity
10) lubricant base stock feedstocks that must be used to produce lubricant base stocks and were not produced through the conduct of an eligible industrial activity.

Where:

- each litre of the inputs upon which an allocation will be made, must be refined through either or both of the processes described in items (1) or (2) of the activity description
- the refinery feedstocks mentioned in items (5) to (10) of the product (basis for allocation) display the following density (at 15°C and 1 atm):

Feedstock	Density (kg/L)[30]
Catalytic cracker feedstock	0.84–0.98
Hydro-cracker unit feedstock	0.84–0.98
Reformer unit feedstock	0.60–0.80
Alkylation unit feedstock	0.55–0.62
Bitumen feedstock	> 0.95
Lubricant base stock feedstock	0.84–0.98

[30] 15°C and 1 atm.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- the additional processing of any stabilised crude petroleum oil derivatives at the site where products listed in (3) and (4) are produced
- the on-site production of hydrogen at the refinery where that hydrogen is consumed within the activity
- the production of nitrogen and oxygen where consumed within the activity boundary
- emissions associated with cooling water pumps
- the pre-treatment of petroleum fractions to remove impurities that poison the catalysts, treat products to meet Australian specifications and may include process units for the manufacture of lubricant base stocks and bitumen
- the regeneration of catalysts consumed within the activity boundary
- emissions from storage tanks located at the site where the activity is undertaken and which are used to store crude oil, intermediate and final products.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- any extraction or production of raw materials that are subsequently used when the activity is carried out
- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the outputs of the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted

- production of catalysts
- emissions associated with the transferral of stabilised crude petroleum oil from a wharf or other loading point to the stabilised crude petroleum oil storage vessel on the site where the activity is conducted
- emissions associated with the transferral of the final refined product from the final product storage tank on the site where the activity is conducted to a wharf or other loading point
- emissions from storage tanks, pumps and wharf operations located off-site from where the activity is conducted.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of pig iron

Activity description

The chemical and physical transformation of iron ore oxides into molten iron which proceeds via the reduction of oxides of iron using carbon and the subsequent solidification of the molten iron into pig iron where the pig iron has a maximum total carbon (C) mass content of 6 per cent and a minimum total iron (Fe) mass content of 94 per cent.

Where:

- the output of this activity is saleable pig iron, where the pig iron has a maximum total carbon (C) mass content of 6 per cent and a minimum total iron (Fe) mass content of 94 per cent, which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is tonnes of saleable pig iron, where the pig iron has a maximum total carbon (C) mass content of 6 per cent and a minimum total iron (Fe) mass content of 94 per cent, which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity

  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- combined drying and grinding of carbon (eg, coal) immediately prior to direct reduction
- pre-reduction of iron ore oxides in a pre-heater.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- the mining and extraction of coal and iron oxides.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Printing and writing paper manufacturing

Activity description

The physical transformation of wood chips, sawdust, wood pulp and/or recovered paper into rolls of coated or uncoated printing and writing paper where the product is produced from 100 per cent bleached or brightened input fibre, has a grammage range of 42g/m^2–350 g/m^2, a moisture content in the range of 4 to 11 per cent by weight and which is generally useable as a printing and writing paper product such as offset paper, copy paper, laser printing paper, magazine paper, filing card paper, manila, book printing paper, envelope paper, forms paper, scholastic paper, cheque paper, security paper, but excluding newsprint as defined.

Where:

- the output of this activity is saleable rolls of coated or uncoated printing paper where the product is produced from 100 per cent bleached or brightened input fibre, has a grammage range of 42g/m^2–350 g/m^2, a moisture content in the range of 4 to 11 per cent by weight and which is generally useable as a printing and writing paper product such as offset paper, copy paper, laser printing paper, magazine paper, filing card paper, manilla, book printing paper, envelope paper, forms paper, scholastic paper, cheque paper, security paper, but excluding newsprint as defined, which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is:

- air dried tonnes (10 per cent moisture content) equivalent pulp produced from wood chips and/or sawdust which are produced as part of, and used in, the activity as described
- tonnes of saleable rolls of coated or uncoated printing paper where the product is produced from 100 per cent bleached or brightened input fibre, has a grammage range of 42 g/m^2–350 g/m^2, a moisture content in the range of 4 to 11 per cent by weight and which is generally useable as a printing and writing paper product such as offset paper, copy paper, laser printing paper, magazine paper, filing card paper, manilla, book printing paper, envelope paper, forms paper, scholastic paper, cheque paper, security paper, but excluding newsprint as defined, which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or it is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
- the processing of water and wastewater used in the activity
- emissions associated with onsite processes of chemical preparation, compressed air generation and delivery and cooling tower operation
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- the production of pulp for use in the activity from:
  - wood chips and/or sawdust using any combination of mechanical, heat or chemical processes, and/or
  - recovered paper (including de-inking and onsite processing).

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- any extraction or production of raw materials that are subsequently used when the activity is carried out
- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output of the activity from storage at the same location as the activity
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- all forestry operations including establishment, maintenance and harvesting
- the production of wood chips
- the collection, sorting, transport and baling of recovered paper for use in the activity
- transportation of pulp and recovered paper between sites conducting the activity
- further processing, cutting or colouring of printing paper rolls
- the generation of steam for use outside the activity.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of sodium carbonate (soda ash) and sodium bicarbonate

Activity description

The chemical and physical transformation of calcium carbonate ($CaCO_3$), sodium chloride (NaCl, salt), ammonia (NH_3), and carbon bearing materials (eg, coke) into:

- light sodium carbonate (Na_2CO_3, light soda ash) which has a concentration of light sodium carbonate greater than or equal to 98.0 per cent with respect to mass
- dense sodium carbonate (Na_2CO_3, dense soda ash) which has a concentration of dense sodium carbonate greater than or equal to 97.5 per cent with respect to mass, and/or
- refined sodium bicarbonate ($NaHCO_3$) which has a concentration of refined sodium bicarbonate greater than or equal to 95.0 per cent with respect to mass.

Where:

- the outputs of this activity are light sodium carbonate (Na_2CO_3, light soda ash) which has a concentration of light sodium carbonate greater than or equal to 98.0 per cent with respect to mass; dense sodium carbonate (Na_2CO_3, dense soda ash) which has a concentration of dense sodium carbonate greater than or equal to 97.5 per cent with respect to mass; and/or refined sodium bicarbonate ($NaHCO_3$) which has a concentration of refined sodium bicarbonate greater than or equal to 95.0 per cent with respect to mass, which are to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is combined tonnes of saleable light sodium carbonate ($Na2CO3$, light soda ash) which has a concentration of light sodium carbonate greater than or equal to 98.0 per cent with respect to mass; dense sodium carbonate ($Na2CO3$, dense soda ash) which has a concentration of dense sodium carbonate greater than or equal to 97.5 per cent with respect to mass; and/or refined sodium bicarbonate ($NaHCO3$) which has a concentration of refined sodium bicarbonate greater than or equal to 95.0 per cent, which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described
  - onsite processing of waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- off specification production (eg, reject production) where this is not recycled in the process.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the outputs of the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out

- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- extraction and crushing of calcium carbonate ($CaCO_3$) and other raw materials
- production of calcium oxide (CaO, lime) that is not used to make light or dense sodium carbonate or sodium bicarbonate.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Production of synthetic rutile

Activity description

The chemical transformation of iron titanium oxide ($FeTiO_3$, 'ilmenite') through the reduction of iron oxides in order to increase the titanium dioxide (TiO_2) concentration to produce synthetic rutile, which has a content of equal to or greater than 88 per cent and less than 95.5 per cent titanium dioxide, and an iron (Fe) concentration of greater than 0.5 per cent, where this is not titanium dioxide pigment production.

Where:

- the output of this activity is saleable synthetic rutile directly produced from iron titanium oxide ($FeTiO_3$, 'ilmenite'), where synthetic rutile has a content of equal to or greater than 88 per cent and less than 95.5 per cent titanium dioxide (TiO_2), and an iron (Fe) concentration of greater than 0.5 per cent, which is to be used for the calculation of revenue. Note that revenue from the sale of by-products, such as activated carbon and neutralised acid, is not included for the calculation of revenue from the activity.

Product (basis for allocation)

The product (basis for allocation) is tonnes of saleable synthetic rutile directly produced from iron titanium oxide ($FeTiO_3$, 'ilmenite') which results from carrying out the activity as described, where synthetic rutile has a content of equal to or greater than 88 per cent and less than 95.5 per cent titanium dioxide (TiO_2), and an iron (Fe) concentration of greater than 0.5 per cent.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:

  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described
  - onsite processing of waste materials from the activity to comply with regulatory obligations
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- emissions associated with the production of nitrogen and oxygen consumed within the activity.

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output from the activity from storage at the same location as the activity
- the transportation of intermediate products between different locations where the activity is carried out
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- extraction (eg, mining) and processing (eg, wet/dry concentration, magnetic and electrostatic separation) of iron titanium oxide ($FeTiO_3$, 'ilmenite').

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Tissue paper manufacturing

Activity description

The physical transformation of wood chips, sawdust, wood pulp and/or recovered paper into rolls of uncoated tissue paper where the product has a grammage range of 13 g/m^2–75 g/m^2, a moisture content in the range of 4 to 11 per cent by weight and which is generally useable in sanitary products such as facial tissue, paper towel, bathroom tissue and napkins.

Where:

- the output of this activity is saleable rolls of uncoated tissue paper where the product has a grammage range of 13 g/m^2–75 g/m^2, a moisture content in the range of 4 to 11 per cent by weight and which is generally useable as a tissue paper product such as facial tissue, paper towel, bathroom tissue and napkins, which is to be used for the calculation of revenue.

Product (basis for allocation)

The product (basis for allocation) is:

- air dried tonnes (10 per cent moisture content) equivalent pulp produced from woodchips and/or sawdust which are produced as part of, and used in, the activity as described
- tonnes of saleable rolls of uncoated tissue paper where the product has a grammage range of 13 g/m^2–75g/m^2, a moisture content in the range of 4 to 11 per cent by weight and which is generally useable as a tissue paper product such as facial tissue, paper towel, bathroom tissue and napkins, which result from carrying out the activity as described.

Inclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be included within the activity boundary are:

- the direct emissions from, and electricity use of, machinery, equipment and processes which are integral to, and essential for, the physical and/or chemical transformation described in the activity definition, including, for example:
  - machinery used to move materials within and as part of the activity
  - control rooms, laboratories, maintenance workshops
  - machinery used to create non-electrical energy for use in the activity
  - the processing of by-products where it involves the recovery of materials for re-use within the activity or it is necessary for the activity to proceed as described
  - onsite processing of by-products and waste materials from the activity to comply with regulatory obligations
  - the processing of water and wastewater used in the activity
  - emissions associated with onsite processes of chemical preparation, compressed air generation and delivery and cooling tower operation
- waste heat recovery within the activity boundary
- steam consumed within the activity boundary
- the production of pulp for use in the activity from:
  - wood chips and/or sawdust using any combination of mechanical, heat or chemical processes; and/or
  - recovered paper (including de-inking and onsite processing).

Exclusions

For the purposes of the formal data assessment, emissions and electricity use which are to be excluded from the activity boundary are:

- any extraction or production of raw materials that are subsequently used when the activity is carried out
- transportation of inputs used in the activity to storage at the same location as the activity
- transportation of the output of the activity from storage at the same location as the activity
- complementary activities, such as packaging, head office, administrative and marketing operations, either at the same location as the activity or elsewhere
- emissions associated with the generation of electricity on the site where the activity is conducted
- all forestry operations including establishment, maintenance and harvesting
- the production of wood chips
- the collection, sorting, transport and baling of recovered paper for use in the activity
- transportation of pulp and recovered paper between sites conducting the activity
- further processing, cutting or colouring of tissue paper rolls
- the generation of steam for use outside the activity.

Years for which information must be provided

Information must be provided for the financial years 2006/07, 2007/08 and 2008/09.

Annex 2: Meaning of saleable

The meaning of saleable will be the same as defined under the Carbon Pollution Reduction Scheme Regulations 2009:

(1) The concept of a ***saleable*** product, or a product which is of ***saleable*** quality, is intended to have its ordinary meaning as understood by participants in the relevant market, subject to subclauses (2) to (5).

(2) A product is taken to be saleable or of saleable quality if it is produced to a level at which it would ordinarily be considered by participants in the relevant market:

(a) to be the output of the process; and

(b) to have a commercial value as that output.

Note: On this basis, the output may meet particular industry standards or specifications (either general specifications or those set by particular customers). It may also meet internal standards by which it can be used by the firm as part of another process conducted by the firm.

Outputs that are saleable, or of saleable quality, do not need to be sold in the year of production. Therefore, an output that is produced and entered on an inventory can be saleable or of saleable quality.

(3) A sub-standard product which is discarded is taken not to be saleable or of saleable quality.

(4) A product which is recycled back into the same emissions-intensive trade-exposed activity to produce a new output may be taken to be saleable or of saleable quality only once.

Examples

1 Metal which is re-melted in the same equipment in which it was produced.

2 Paper which is re-inputted into a paper making process.

(5) Material which is scrapped or lost before it is packaged as a product that is saleable or of saleable quality:

(a) is taken not to be saleable or of saleable quality; and

(b) is taken not to be included in an amount of product that is saleable or of saleable quality that is to be counted for the basis for allocation.

Annex 3: Eligibility rules under the proposed CPRS EITE Assistance Scheme

Under the Carbon Pollution Reduction Scheme (CPRS) activities must pass two tests before they are considered eligible for assistance: A trade exposure test and an emissions intensity test.

Trade exposure is assessed through a quantitative or qualitative test:

- Quantitative test: Trade share (ratio of the value of imports and exports to the value of domestic production) is greater than 10% in any one of the years 2004–05, 2005–06, 2006–07 or 2007–08.
- Qualitative test: Demonstrated lack of capacity to pass through costs due to the potential for international competition.

Emissions intensity is defined based on tonnes of emissions per 1 million Australian dollars of revenue or value added:

- A moderately emissions-intensive activity has between 1000 tonnes and 1999 tonnes of CO2-e/$AUm of revenue OR between 3000 tonnes and 5999 tonnes of CO2e/$AUm of Value Added.
- A highly emissions intensive activity has greater than 2000 tonnes of CO2e/$AUm of revenue OR greater than 6000 tonnes of CO2e/$AUm of Value Added.

An activity must meet both these tests to be eligible for assistance. Moderately emissions intensive activities are eligible for assistance with CPRS obligations for 60% of their baseline emissions and highly emissions intensive activities are eligible for assistance with CPRS obligations for 90% of their baseline emissions.

Annex 4: Trade-exposure and emissions-intensity tests

Trade-exposure test

Demonstrating trade exposure on the basis of quantitative tests is extremely difficult. The key issue here is that any cost increase in New Zealand because of the NZ ETS cannot be passed on because the price is set by plants in another country that do not face the same cost increase. There are thus two elements that need to be examined:

1 whether the output is traded between different countries, and so it is likely that prices will be set outside of New Zealand

2 whether the output price currently includes the cost of emissions – this would be the case where the price was set in countries that regulated greenhouse gas emissions, but it might also be the case where new investments are being made on the basis of anticipated future pricing of emissions.

The question of whether an output is traded is relatively simple to answer, although it should be noted that the extent of trade to and from New Zealand is not always a measure of whether a price is set internationally. For example, an output could be manufactured entirely in New Zealand for the domestic market, with no exports, but the New Zealand price is set on the basis of international benchmarks because there is the potential for imports to compete with domestically produced goods. The relevant question is therefore more about whether international trade is *possible* than whether it is *currently occurring* to or from New Zealand.

The current inclusion of emission costs in a commodity price is far less clear, especially where there is the potential for investment decisions to be made on the assumption of future pricing.

In theory, prices in competitive markets will be set by the marginal costs of production of the marginal producer(s).[31] However, the marginal producer – either the actual plant or its country of location – is often not identifiable in practice. So if some other countries – but not all – introduce emission policies that affect production costs, it may not be possible to identify whether prices are being influenced by these emission policies.[32]

Detailed analysis of price setting for individual commodities is complex and ultimately may not yield useful results. Also, it is a field of analysis in which the Government has much less information than the industry that is being assessed. Simpler criteria are needed.

Measuring quantities produced in different countries is one approach (eg, New Zealand production as a proportion of the world total, or the proportion of the total produced in non-Annex 1 parties), but this does not really address the issue of where the marginal (price-setting) producer is.

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[31] That is, if we assume that market demand is met by all the plants in the world supplying in price order, the most expensive plant that is supplying some of the market demand is the marginal producer.

[32] Note that these might include non-price measures (eg, technical standards).

In addition, prices might be starting to incorporate a market expectation of future emissions regulation. For example, investment in electricity-intensive industry might be occurring in countries where marginal electricity generation is from renewable sources, because this is where electricity costs over the long run are expected to be lowest given an anticipated future carbon price. Under these circumstances, production costs and commodity prices would be starting to incorporate an emissions price.

Given these complexities and uncertainties, under the New Zealand track all activities will be assumed to be trade exposed unless they are very obviously not. Therefore, activities which cannot receive allocation because of the trade exposure test are those where:

- the activity is electricity generation
- there is no international trade of the output across oceans, or it is not economically viable to import or export the output of the activity.

This is different from the Australian test for trade exposure, and may lead to additional activities being included in New Zealand that do not meet the more restrictive trade exposure requirements in Australia.

Emissions intensity test

Emissions intensity is a measure of the extent to which the increase in costs as a result of the NZ ETS will have a material impact on the firm and its activities. Ultimately, what affects a firm's decision to maintain production will be the extent to which marginal revenues exceed marginal costs (this affects how much it produces) and whether its profit exceeds its costs of capital (this affects whether it will remain in business).

A marginal cost test requires very detailed knowledge about an individual firm or industry and is thought to be too complex for an eligibility test. Arguably there is greater concern over a firm staying in business than in maintaining levels of production *per se*. Thus the emphasis should be on the test of whether there will be a significant impact on profits.

This leaves two questions:

- What is the right metric for defining emissions intensity?
- What are the right thresholds?

Metrics

If the concern is about plant closure, then the target is to define a level above which the cost of emission units would reduce company profits (on average) to less than the ongoing cost of capital (or all capital costs for new plants). A threshold defined as a percentage of profit (eg, as EBITDA)[33] may be a reasonable approach, although the problem here is that it might simply lead to the inclusion of plants and industries that are relatively unprofitable, rather than being particularly emissions intensive, and would also be a difficult test to apply in practice.

[33] Earnings Before Interest Tax and Depreciation of Assets.

Alternative approaches examined have been:

- value added
- revenue
- costs.

A value-added test has similarities to profits: it is the contribution the firm makes to the wealth of the economy, and the simplest way to understand it is as pre-tax profit plus payments to workers; this quantity is also equal to revenue less the costs of bought-in goods and services. Properly defined, value added is a wider concept than this because some of the bought-in goods and services have value added themselves, and in estimating the GDP contributions of a sector (eg, in input-output tables), these contributions are added using multipliers estimated for specific inputs to specific sectors. However, a value-added test would tend to focus assistance on those activities that are vulnerable to a range of cost increases rather than those for which the cost of emissions in particular is significant. A value-added test also requires decisions about which costs can legitimately be subtracted from revenue. The Government would be at a disadvantage in making these judgements.

An analysis of data in Statistics New Zealand's Annual Enterprise Survey suggests there is a statistically significant relationship between profit, value added, revenue and costs. It suggests that any of these indicators could be used to produce a measure of intensity. The simplest to collect and verify is revenue, and this is the test that has been included in the Act for use on the New Zealand track.

The Act contains two emissions intensity thresholds:

- a moderately emissions-intensive activity emits between 800 tonnes of CO_2-e per 1 million New Zealand dollars of revenue and 1600 tonnes of CO_2-e per $1 million of revenue
- a highly emissions-intensive activity emits more than 1600 tonnes of CO_2-e per 1 million New Zealand dollars of revenue.

The amount of assistance an eligible activity receives depends on which of these thresholds it passes. Eligible activities that are moderately emissions intensive will initially receive assistance at the rate of 60 per cent of the relevant allocative baseline. Eligible activities that are highly emissions intensive will initially receive assistance at the rate of 90 per cent of the relevant allocative baseline.