

**Submission on:**

**The Climate Change  
(Stationary Energy and Industrial Processes)  
Regulations 2008 (Draft for Consultation)**

**from**

**Ballance Agri-Nutrients Limited**

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## 0 Key information

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# 1 Company Overview

## 1.1 Ballance Agri-Nutrients Limited

- 1) Ballance Agri-Nutrients Limited (*Ballance*) is one of New Zealand's leading fertiliser specialists, with manufacturing plants located in Whangarei, Mount Maunganui and Invercargill. In addition the company owns the ammonia-urea manufacturing plant at Kapuni in Taranaki, Super Air one of the country's largest agricultural aviation companies, and Summit Quinphos New Zealand's third largest fertiliser company.
- 2) Ballance is a 100-percent farmer-owned co-operative, with some 18,000 shareholders throughout New Zealand. It was officially launched in 2001, the final step in a series of company amalgamations and alliances that saw regional fertiliser co-operatives come together under the umbrella of what was then Bay of Plenty Fertiliser.
- 3) Today, Ballance is a truly national company, with over 750 staff located from the Far North to the Deep South. The company places a strong emphasis on delivering value to its shareholders and on the use of a scientific approach to sustainable plant nutrient management.

## 1.2 Ballance Agri-Nutrients (Kapuni) Limited

- 4) Ballance Agri-Nutrients (Kapuni) Limited (*Ballance-Kapuni*) is a wholly owned subsidiary of Ballance Agri-Nutrients Limited.
- 5) Ballance-Kapuni owns and operates New Zealand's only ammonia-urea plant located on a 32.4 hectare site at Kapuni in South Taranaki.
- 6) Using some 7 petajoules of natural gas, the plant produces 150,000 tonnes of ammonia per year, most of which is converted to 260,000 tonnes a year of premium grade granular urea. The high quality granular urea product is used as a nitrogen-rich fertiliser in the agricultural, horticultural and forestry sectors, and as a component in the manufacture of other products (primarily resins).
- 7) The Kapuni plant production meets less than one half of New Zealand's demand for urea. Remaining demand is met through imports sourced primarily from the Middle East, Far East and North America. Ballance is therefore in direct competition against countries with less stringent international climate change obligations.
- 8) The company makes a significant economic contribution to the local economy and employs 127 permanent staff and 17 contractors.
- 9) The company has a strong environmental record and has been proactive in greenhouse gas issues through its participation in the Voluntary Agreement programme of the mid

1990's and in assisting Government greenhouse gas emissions reporting through provision of data.

- 10) In September 2005, Ballance lodged an application for a Negotiated Greenhouse Agreement (NGA) with the Ministry for the Environment. Internal assessment of the application showed that Ballance met the criteria to be deemed Competitiveness at Risk and therefore would have been eligible to enter into an NGA with the Crown.
- 11) In the context of future energy and climate change policy, the company is reliant on:
  - Secure gas supply (approximately 7 PJ per annum) at internationally competitive gas prices;
  - Secure electricity supply (approximately 32 GWh per annum) at internationally competitive electricity prices; and
  - Recognition of "trade exposure" in any price based climate change policy measures, until such time that competing nations impose climate change policy with equivalent stringency and impact.

## 2 Introduction

- 12) Ballance would like to thank the Emissions Trading Group and The Ministry for the Environment for the opportunity to make this submission on the Climate Change (Stationary Energy and Industrial Processes) Regulations 2008 (Draft for Consultation) (“the Regulations”) released for consultation in October 2008.
- 13) This submission presents a summary of our analysis of the Regulations taking into account the wider context of New Zealand Emissions Trading Scheme (NZ ETS) as legislated through the Climate Change Response Act as at 26 September 2008 (“the Act”).
- 14) The submission focuses on Ballance’s urea operations as this is the most significantly impacted part of the business.
- 15) In light of the announced review of the legislation, where appropriate we have sought to identify the root cause of issues providing context to the symptoms exhibited in the Regulations.
- 16) Noting the specific issues identified, Ballance requests a meeting with officials to discuss this written submission and additional materials.
- 17) The submission structure is set out below:
  - Section 3 provides the context to the submission through a process description of the urea production process;
  - Section 4 highlights how urea production is treated under the NZ ETS, identifying specific issues of ETS design philosophy that drive concerns with regulations;
  - Section 5 presents specific comments on the Regulations including commentary on the consultation process and the natural gas emission factors;
  - Section 6 highlights the importance of Unique Emission Factors and presents an analysis of the implementation timeline for the sector with respect to the Allocation and Determination steps for trade exposed firms; and
  - Section 7 provides Ballance’s concluding comments.

### 3 Description of the Urea Production Process

- 18) At the Kapuni site, urea is produced from natural gas feedstock. Of 7 PJ of gas (predominantly  $\text{CH}_4$ ), approximately half is used as an energy source, while the remainder is reacted with steam, forming  $\text{CO}$ ,  $\text{CO}_2$  and  $\text{H}_2$ . This mixture of gases is then mixed with air. During this process all of the  $\text{CO}$  is converted to  $\text{CO}_2$ , which is removed, for use in a later step (see below). The hydrogen and nitrogen (from the air) are reacted over a catalyst to form ammonia ( $\text{NH}_3$ ). Liquid ammonia and  $\text{CO}_2$  are subsequently reacted together to form urea ( $\text{H}_2\text{N-CO-NH}_2$ ).
- 19) The process is described in more detail below and in Figure 1 on the next page.

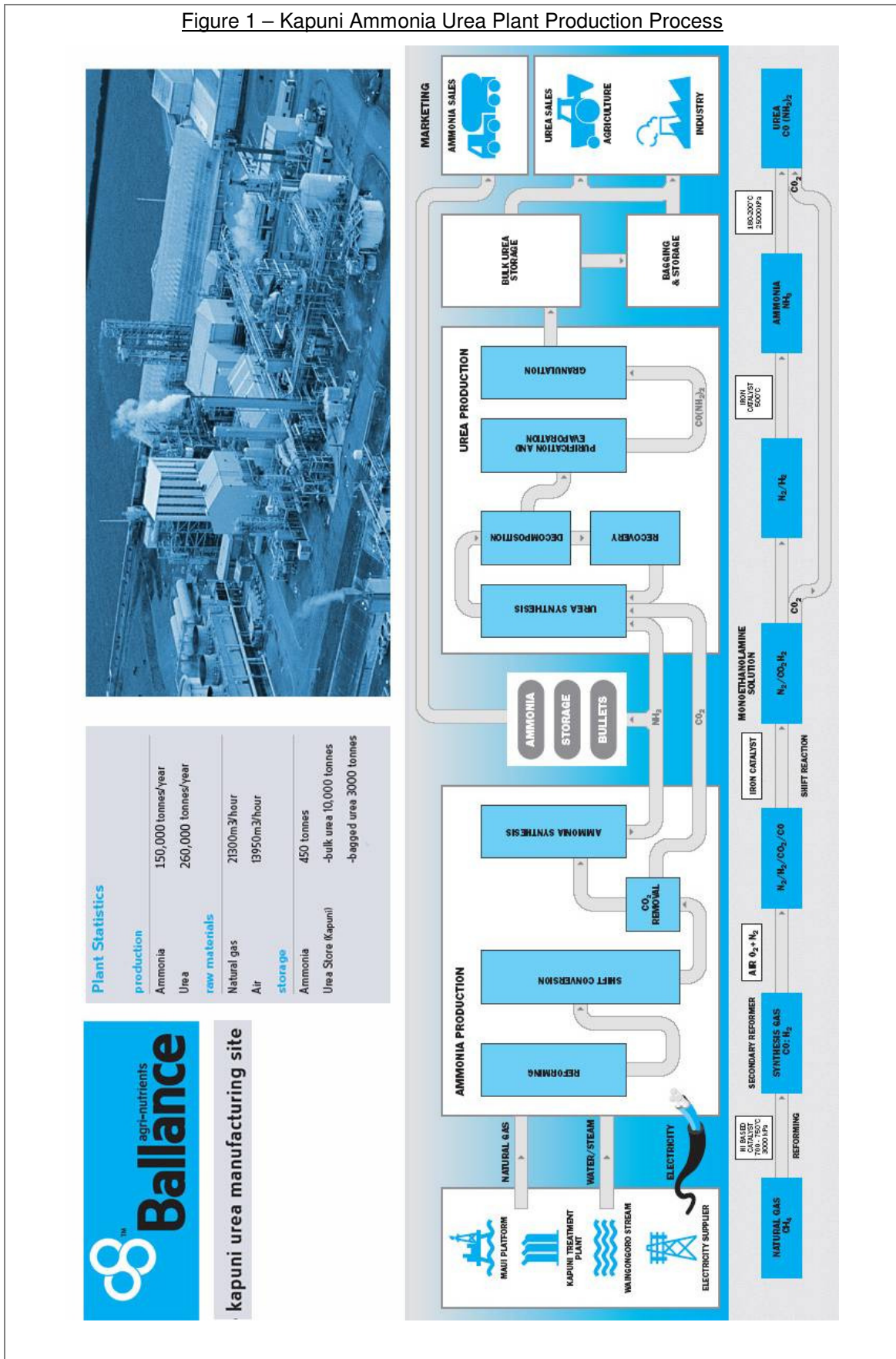
#### Step 1: Ammonia ( $\text{NH}_3$ ) Production

- 20) Pre-heated and desulphurised natural gas is reacted with steam in the primary reformer. This is a gas fired furnace containing vertical, catalyst-filled tubes through which the reacting mixture passes to produce carbon monoxide, carbon dioxide and hydrogen. A controlled quantity of air is then added to this mixture in the secondary reformer to produce synthesis gas containing the correct ratio of hydrogen to nitrogen. The gas then passes to the shift converters, where carbon monoxide is converted to carbon dioxide. This is subsequently removed in an absorber-stripper unit to provide one of the feedstocks of the urea plant. After removal of the last traces of carbon oxides in the methanator, this synthesis gas is compressed by two 3700kW - and one 4800kW - Cooper Bessemer Compressors, operating in parallel (which also provide compressed air and ammonia refrigeration compression for the plant). The compressed process gases, consisting mainly of nitrogen and hydrogen, are fed into the ammonia loop and pass through the ammonia synthesis convertor. The gases are then refrigerated and ammonia condensed to be drawn off from the circulation synthesis gas as a liquid. This product is over 99.5% pure and is stored as a liquid in three tanks with a combined capacity of 450 tonnes.

#### Step 2: Urea ( $\text{H}_2\text{N-CO-NH}_2$ ) Production

- 21) Anhydrous liquid ammonia, both direct from the ammonia plant and from storage, is combined with carbon dioxide (separated from the ammonia synthesis gas) in the urea synthesis reactor. The resulting product is a mixture of urea, water and an intermediate by-product, ammonium carbonate, which is separated from the aqueous urea in a three-stage decomposition and absorption process. This purification section produces a liquid stream which is recycled to a second urea reactor. Aqueous urea is concentrated by evaporating water from the molten solution, which is then granulated in a mixed fluid-spouting bed granulator.

Figure 1 – Kapuni Ammonia Urea Plant Production Process



## 4 Treatment of Urea Production under the NZ ETS

- 22) Under the NZ ETS, urea production is treated solely as a stationary energy user with no distinction being made between:
- a) natural gas as a fuel component with resulting combustion emissions (CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O); and
  - b) natural gas as a feedstock to a chemical reaction (“feedstock gas”) with resulting industrial process emissions (CO<sub>2</sub> only).
- 23) The matter described in paragraph 22 is expanded on below:

### 4.1 Upstream Point of Obligation on Natural Gas

- 24) The NZ ETS operates on an upstream Point of Obligation basis. For natural gas this point of obligation, i.e. the mandatory Participant, is the gas miner (Schedule 3 Part 3 of the Act).
- 25) The provision for “opt-in” on this gas supply is provided for (Schedule 5 Part 4 of the Act) however as the gas supply chain is complex and as opt-in is restricted to being one step in the supply chain away from the mandatory participant, the opportunity for Ballance (downstream user) to opt-in is constrained.
- 26) Assuming that Ballance does not opt-in, Ballance would see an increase in the cost of natural gas passed on from the miner through the gas supply chain.
- 27) If Ballance is not a Participant under the Act it is not in a position to seek the appropriate differentiated emission factors and allocation for:
- a) fuel component (“combustion emissions” - CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O); and
  - b) feedstock gas (“industrial process emissions” - CO<sub>2</sub> only).<sup>1</sup>
- 28) Ballance does not consider itself to be in isolation on this issue; hydrogen manufacture (oil refining) and methanol manufacture are other examples where gas is used as a feedstock. However, there are further nuances for Ballance regarding these industrial process emissions. These are described in detail below.

### 4.2 Nature of Industrial Process Emissions for Urea Production

- 29) Industrial process emissions for urea production are not released in the manufacturing process nor are they released while under the control of Ballance.

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<sup>1</sup> This distinction is consistent with the Ministry of Economic Development’s reporting of Energy Greenhouse Gas Emissions 1990-2007.

- 30) Instead these ascribed industrial process emissions relate to the carbon content of the finished urea product ( $\text{H}_2\text{N}-\text{CO}-\text{NH}_2$ ) and its potential conversion to carbon dioxide in downstream applications (e.g. fertiliser).

IPCC 1996 Methodology used

- 31) Use of the IPCC 1996 Methodology is in line with the emissions inventory methodology for New Zealand under the Kyoto Protocol. Emissions inventory methodologies have been developed and improved over time. Those released by the Intergovernmental Panel on Climate Change (IPCC) in 1996 are currently adopted for the Kyoto Protocol Commitment Period 1 (CP1 2008-12).
- 32) The IPCC 1996 Methodology relates primarily to ammonia and splits the emissions into those associated with energy and non-energy industrial process emissions.
- a) Emissions from natural gas used as an energy source are calculated by multiplying the quantity of natural gas by an emissions factor.
  - b) For the industrial process emissions it is assumed that from the reacted gas in the ammonia production step “all of the carbon content is emitted to air”.
- 33) An extract from the IPCC 1996 Methodology is provided below<sup>2</sup>:

The most accurate method of estimation will be:

$$\text{Emission (kt)} = \text{Consumption of gas (kt)} \times \text{carbon content} \times 44/12$$

If the gas consumption is not available, an alternative is to calculate the emissions from the ammonia production:

$$\text{Emission (kt)} = \text{Production of ammonia} \times \text{Emission factor}$$

In both cases, in order to avoid double counting, the quantities of oil or gas used must be subtracted from the quantity reported under energy and non-energy use in the Energy Chapter.

The  $\text{CO}_2$  from ammonia production may be used for producing urea or dry ice. This carbon will only be stored for a short time. Therefore, no account should consequently be taken for intermediate binding of  $\text{CO}_2$  in downstream manufacturing processes and products.

<sup>2</sup> Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories : Reference Manual Chapter 2 Section 2.8.3

- 34) Notably, the IPCC 1996 methodology assumes that carbon contained in urea produced will be released within a short time period and that this carbon should therefore be attributed to the manufacturing step rather than the end user.

*IPCC 2006 Methodology (Likely Post 2012)*

- 35) The IPCC 2006 Methodology<sup>3</sup> which may be adopted for any post 2012 international agreement takes a different approach. While still focusing on ammonia production as an industrial process, it specifically provides for the deduction of CO<sub>2</sub> recovered for downstream use including urea production. This is shown below:<sup>4</sup>

**EQUATION 3.3**  
**CO<sub>2</sub> EMISSIONS FROM AMMONIA PRODUCTION – TIER 2 AND 3**

$$E_{CO_2} = \sum_i (TFR_i \cdot CCF_i \cdot COF_i \cdot 44/12) - R_{CO_2}$$

Where:

$E_{CO_2}$  = emissions of CO<sub>2</sub>, kg  
 $TFR_i$  = total fuel requirement for fuel type  $i$ , GJ  
 $CCF_i$  = carbon content factor of the fuel type  $i$ , kg C/GJ  
 $COF_i$  = carbon oxidation factor of the fuel type  $i$ , fraction  
 $R_{CO_2}$  = CO<sub>2</sub> recovered for downstream use (urea production, CO<sub>2</sub> capture and storage (CCS)), kg

- 36) The CO<sub>2</sub> emissions associated with the use of urea are then accounted for in the corresponding sector of use. This is explained in Box 3.2 from the same source.

**BOX 3.2**  
**DOUBLE COUNTING**

In order to avoid double counting, the total quantities of oil or gas used (fuel plus feedstock) in ammonia production must be subtracted from the quantity reported under energy use in the Energy Sector.

In addition, the quantity of CO<sub>2</sub> recovered for downstream use in urea production must be subtracted from the total quantity of CO<sub>2</sub> generated to derive CO<sub>2</sub> emitted. Emissions of CO<sub>2</sub> from urea use should be accounted for in the corresponding sectors. In particular, emissions from urea use as fertiliser should be included in the Agriculture Forestry and Other Land Use (AFOLU) Sector (see Volume 4). Emissions from urea use in automobile catalytic converters should be accounted for in the Energy Sector (Volume 2). Emissions from any other chemical products manufactured using CO<sub>2</sub> recovered from the process (e.g., emissions from carbonic acid use) are covered by methodology suggested in this section and should not be accounted for in other IPPU sections or in other sectors.

<sup>3</sup> Refer Attachment 1 for full copy of relevant sections.

<sup>4</sup> 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3: Industrial Process and Product Use, Chapter 3: Chemical Industry Emissions Section 3.2 Ammonia Production  
[http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/3\\_Volume3/V3\\_3\\_Ch3\\_Chemical\\_Industry.pdf](http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/3_Volume3/V3_3_Ch3_Chemical_Industry.pdf)

- 37) The 2006 IPCC guidelines have specific methodologies for CO<sub>2</sub> emissions from Urea fertilisation.<sup>5</sup> In the simplest Tier 1 calculation, the following approach is taken:

**Tier 1**  
CO<sub>2</sub> emissions from urea fertilisation can be estimated with Equation 11.13:

**EQUATION 11.13**  
**ANNUAL CO<sub>2</sub> EMISSIONS FROM UREA APPLICATION**  
 $CO_2\text{-C Emission} = M \cdot EF$

Where:

CO<sub>2</sub>-C Emission = annual C emissions from urea application, tonnes C yr<sup>-1</sup>  
M = annual amount of urea fertilisation, tonnes urea yr<sup>-1</sup>  
EF = emission factor, tonne of C (tonne of urea)<sup>-1</sup>

*Procedural Steps for Calculations*  
The steps for estimating CO<sub>2</sub>-C emissions from urea applications are:

**Step 1:** Estimate the total amount of urea applied annually to a soil in the country (M).

**Step 2:** Apply an overall emission factor (EF) of 0.20 for urea, which is equivalent to the carbon content of urea on an atomic weight basis (20% for CO(NH<sub>2</sub>)<sub>2</sub>). A default -50% uncertainty may be applied (Note: uncertainties can not exceed the default emission factor because this value represents the absolute maximum emissions associated with urea fertilization).

**Step 3:** Estimate the total CO<sub>2</sub>-C emission based on the product of the amount of urea applied and the emission factor.

Multiply by 44/12 to convert CO<sub>2</sub>-C emissions into CO<sub>2</sub>. Urea is often applied in combination with other nitrogenous fertilizers, particularly in solutions, and it will be necessary to estimate the proportion of urea in the fertilizer solution for M. If the proportion is not known, it is considered *good practice* to assume that the entire solution is urea, rather than potentially under-estimating emissions for this sub-category.

- 38) The IPCC 2006 approach clearly relates the emissions from the use of urea to the end use.

Consequences of IPCC 1996 Approach Being Strictly Adhered To

- 39) The consequences of the choice of application of the IPCC 1996 guidelines are a series of economically and environmentally significant approximations:
- a) Only domestic (Ballance Kapuni) produced urea emissions are incorporated in the national inventory;
  - b) Emissions from the application of imported urea in New Zealand are not taken into account in the national inventory; and
  - c) It presumes that all of the urea is used in applications such as fertiliser where release of CO<sub>2</sub> within a short period of time occurs. This ignores the use of domestic urea in applications such as formaldehyde resin where the carbon is bound in the final product.

<sup>5</sup> 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4: Agriculture, Forestry and Other land Uses, Chapter 11: N<sub>2</sub>O Emissions from Managed Soils, and CO<sub>2</sub> Emissions from Lime and Urea Application  
[http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4\\_Volume4/V4\\_11\\_Ch11\\_N2O&CO2.pdf](http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_11_Ch11_N2O&CO2.pdf)

- 40) The latter point (refer paragraph 39 c) has been addressed in the Act through the provisions for a “Removal Activity” however this will be far from simple to administer as is explained below.

### 4.3 Removal Activity Treatment

- 41) Although not set out in legislation specifically, from the officials’ report to the select committee, it is apparent that the emissions associated with carbon content in domestically manufactured urea will be treated no differently to those arising from natural gas used for energy.<sup>6</sup>

*“Officials note that following the policy intent of this part (non forestry removals), urea manufacturing is not in itself a removal activity, as the urea can be put to a variety of uses which do not result in embedding the urea. Accordingly, we consider that it is not appropriate to provide units to urea manufacturers. Rather, where a person uses the urea in a process that embeds the urea in a product, such as in the making of formaldehyde resin, then that person should directly receive the relevant credit.”*

- 42) While most urea sold to the industrial sector is used for the manufacture of urea formaldehyde resin (adhesive) used for making plywood, particle board, abrasive papers and fibreboards, urea also has uses in other industries. These include fibreglass, yeast making, livestock feeds, pharmaceutical, cosmetics, cleaners and paint.
- 43) The Government will need to provide clear guidance on which industrial uses “embed carbon” and which do not.
- 44) A further requirement is for the provision of credits for removal activities must be restricted to domestically produced urea only. This is to avoid a liability to the Crown being created from the award of NZUs in relation to emissions that otherwise are on another nation’s inventory. Whether this has been considered is unknown.

### 4.4 Summary of Issues

- 45) Ballance considers the issues identified as substantive and such that they can not, and should not be resolved through amending draft regulations alone, without further consultation.
- 46) The requirement for differentiated emission factors for natural gas used for fuel and feedstock has been missed and may be negated through an upstream point of obligation.
- 47) The use of the IPCC 1996 methodology may be an appropriate approximation at a national inventory level, however Ballance opposes strict adherence to the IPCC 1996 methodology for a domestic emissions trading scheme.

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<sup>6</sup> Departmental Report on the Climate Change (Emissions Trading and Renewable Preference) Bill, 12/06/2008, p264

- 48) It is important to recognise that Ballance has no mechanism to control or reduce the quantity of industrial process emissions as it is simply a function of stoichiometry. In layman's terms the industrial process is one of controlled chemical reactions occurring in defined ratios, with no option for emissions mitigation.
- 49) Due to the nature of the process Ballance cannot reduce industrial process emissions through operational improvement or capital investment. Any price signal (marginal or otherwise) on Ballance with respect to this carbon content is simply a tax.
- 50) It is likely that significant administrative difficulty will be created for the treatment of removals for industrial use of urea, for example:
- a) Which industrial processes are covered?
  - b) How is domestically produced urea tracked vs. imported material?
  - c) Creation of perverse incentives to supply all industrial use customers from domestic production regardless of location, where supply logistics would otherwise favour imports.
- 51) Furthermore, the administrative difficulties may only be in place for three years (2010-12) should the IPCC 2006 guidelines be adopted for any post 2012 agreements.
- 52) For all of the above reasons Ballance strongly recommends that the CCRA is revised with appropriate recognition of the nature of the industrial process emissions from urea manufacturing.
- 53) This recognition would take the form of an exemption for such emissions or a 100% allocation for the industrial process element.

## 4.5 Consultation and Proposed Way Forward

- 54) Ballance continues to advocate proper consultation so that all identified matters will be resolved and a workable outcome achieved for both the Crown and industry.
- 55) Ballance considers that to date this proper consultation step has been missing. A timeline of consultation to date with Ballance is provided as follows:
- a) Officials were briefed in November 2007 on the need to be aware of the specifics around urea manufacture. However, by this time the NZ ETS Bill had been drafted;
  - b) Input through the Stationary Energy and Industrial Process (SEIP) Technical Advisory Group (TAG) was not possible as urea production was not classified as an industrial process under Schedule 3 Part 4 of the NZ ETS Bill. Addressing the issue was therefore ruled to be outside the scope of the SEIP TAG;

- c) A submission to the Select Committee was made, however the officials report back does not appear to have recognised the significance of the issue (refer paragraph 41 above for the sole substantive comment made in the Departmental Report).
- d) In November 2008 a meeting was arranged with Ballance representatives from Kapuni and Head Office and the Emissions Trading Group (ETG) agriculture and SEIP representatives. The meeting went ahead however the SEIP representative pulled out of the meeting at the last minute and could not provide an alternative resource to attend.
- e) Ballance subsequently made a request for someone in the ETG to be nominated as a focal point for follow up on urea issues from an SEIP perspective. The response received is provided below:

*"Hi Stuart,  
with both Sara (Arhaim) and I leaving I really don't know who in ETG or elsewhere in MfE will cover this. As you may be aware MfE is in the midst of recruiting people at present and I am not sure if this will be looked at again light of the review process. Its one issue I'll bring up with the management team.  
Mark (Storey)"<sup>7</sup>*

- 56) Ballance continues to seek a meeting with officials to discuss the matters raised in this submission in an open, constructive and unconstrained manner.

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<sup>7</sup> E-mail Mark Storey (MfE / ETG) to Stuart Frazer (representing Ballance) 19/11/08.

## 5 Specific Comments on Draft SEIP Regulations

### 5.1 Consultation Process

- 57) Ballance’s submission points on the Regulations are made in the context of the broader concerns we raised in Section 4 above. The submission points should not be assessed in isolation.
- 58) The Emissions Trading Bulletin No. 8, October 2008<sup>8</sup> (“the Bulletin”) issued with the Regulations clearly highlights that the Regulations are incomplete with respect to unique emission factors, while both the Bulletin and the Regulations are silent regarding removal activities.
- 59) This submission is therefore being made on only one part of the wider SEIP regulatory framework without the benefit of knowing whether other elements are complimentary or are in conflict.
- 60) Ballance understands that the consultation on the Regulations is being made pursuant to Section 163 and 167 of the Act.
- 61) Section 166 subpart (2) of the Act states that:

- (2) The process for consultation must include—
- (a) giving adequate and appropriate notice of the proposed terms of the recommendation, and of the reasons for it; and
  - (b) the provision of a reasonable opportunity for interested persons to consider the recommendation and make submissions; and
  - (c) adequate and appropriate consideration of submissions.

However subpart (4) states:

- (4) A failure to comply with this section does not affect the validity of regulations made under section 163, 164, or 165.

- 62) Ballance is deeply concerned that subpart 4 may be relied upon in isolation and for expediency. Ballance considers due process, as described in subpart (2), to be vital and requiring of a further consultation round once additional regulations have been drafted for unique emissions factor and removal activities.
- 63) Ballance notes that the Regulations refer to section 167 of the Act “Regulations relating to fees and charges” yet the Regulations are silent on what these may be (Schedule 1 shows them as “pending”).

<sup>8</sup> <http://www.mfe.govt.nz/publications/climate/emissions-trading-bulletin-8/emissions-trading-bulletin-8.pdf>

- 64) Emissions Trading Bulletin No. 8 states that “many of the emission factors set out in the list in Appendices 1 and 2 are intended to be reviewed by external parties and are therefore subject to further analysis and confirmation”.
- 65) Due to omissions, further work pending, and working timeframes, Ballance considers it necessary for continued development of the Draft Regulations with a view to further consultation rounds.

## 5.2 Natural Gas Emission Factors

- 66) Schedule 2 Table 5 Part D (Processed Gas) and Part F (Specification Gas) are of specific relevance to Ballance as a major gas user at its Kapuni urea production site.
- 67) While Ballance considers that the field operators / gas suppliers are in the best position to comment on the correctness of the emission factors, Ballance has significant reservations regarding the approach taken in their development and intended application.
- 68) The emission factors are shown to a staggering eight decimal places yet the relevant material inputs do not have this level of accuracy.
  - a) This is seen from a review of the data presented in the Bulletin. As an example the CO<sub>2</sub> component of the processed gas emissions factor are typically available to only four or five decimal places. This component makes up some 99.8% of the total CO<sub>2</sub>e emissions factor.
  - b) As noted above any presentation of accuracy beyond five decimal places is spurious and is likely to lead to reporting errors and confusion due to increased likelihood of transposed numbers. The data will almost certainly be entered and submitted in spreadsheet form and the increased likelihood of entry errors, subsequent re-work and additional checking time that will inevitably be taken up by both industry and Government staff for no real increase in accuracy is unwarranted.
- 69) Ballance considers the inclusion of such detail with regard to accounting for N<sub>2</sub>O and CH<sub>4</sub> emissions arising from combustion to be inappropriate, for the following reasons:
  - a) The emission factors used for N<sub>2</sub>O and CH<sub>4</sub> are clearly defaults (however shown to eight decimal places) as they are invariable across all processed gas streams with the exception of coal seam gas.
  - b) The level of accuracy of these default factors is low. To quote the Ministry of Economic Developments Energy Greenhouse Gas Emissions Report”

In contrast to CO<sub>2</sub> emissions, the non-CO<sub>2</sub> emissions from combustion depend on the precise nature of the activity in which the fuel is being combusted. A PJ of diesel used for industrial heating produces a different

level of methane emissions compared with the same amount used in road vehicles. Given that we have an imprecise knowledge of where and how fuel is being consumed and also because the emission factors used are inherently imprecise, there is a much greater level of uncertainty surrounding estimates of non-CO<sub>2</sub> emissions than there is for CO<sub>2</sub> emissions.<sup>9</sup>

- c) While the inclusion of N<sub>2</sub>O and CH<sub>4</sub> default factors arising from combustion may assist the Government to devolve its Kyoto deficit by an extra 0.2% of fuel emissions, Ballance considers the level of complexity it introduces as unaccounted for and possibly unworkable.
- d) If the level of accuracy in reporting N<sub>2</sub>O and CH<sub>4</sub> combustion emissions is considered material to the Government, it follows as appropriate for the same approach to be taken in all areas. This would then require a distinction between the use of gas for feedstock (CO<sub>2</sub> only emissions) and combustion (CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O). The difference between emissions factors for processing (100% conversion of carbon to CO<sub>2</sub> giving 0.05305 tCO<sub>2</sub>e/GJ) and combustion (99.5% conversion of carbon to CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O giving 0.05320 tCO<sub>2</sub>e/GJ) is 0.28%. This “improvement” in accuracy falls into the category of the Law of Diminishing Returns where a never-ending increase in detail can be included for no real benefit to New Zealand Inc. due to the cost of compliance, verification and rework.
- e) Discrete emission factors would therefore be required for feedstock use, however this is problematic with an upstream point of obligation!
- 70) In summary a materiality approach is recommended with a sensible level of accuracy such as five decimal places (i.e. four significant digits) in the case of natural gas combustion emission factors, as measured in tCO<sub>2</sub>e/GJ. We appreciate that this may appear as somewhat pedantic repetition of minor point to some readers but the key message here is one of wanting to ensure that the material elements in the CCRA and ETS are correct and workable, while not over-burdening industry or Government stakeholders with unnecessary detail or the perception of more accuracy in the submissions and day-to-day running of the scheme than is warranted. For those unfamiliar with the maths of significant figures there are numerous explanations available on the internet; a very readable one from Dr Math of The Math Forum @ Drexel (University) gives the following rules<sup>10</sup>;

- When you add (or subtract), you keep as many \*decimal places\* as there are in the least accurate number.
- When you multiply (or divide), you keep as many \*significant digits\* as there are in the least accurate number.

<sup>9</sup> MED Energy Greenhouse Gas Emissions 1990-2007, August 2008, p35.

<sup>10</sup> <http://mathforum.org/library/drmath/view/58335.html>

## 6 Unique Emission Factor Regulation Development

### 6.1 Summary of Issue

- 71) The SEIP Allocation process in the Act allocates emissions units to trade exposed participants from a fixed pool. The current timeline does not allow for the use of Unique Emissions Factors (UEFs), which are critical to ensuring an accurate Draft Determination, that all participants are treated fairly, and to reduce the number of iterations in reaching a Final Determination.
- 72) It is recommended that the implementation timeline for the SEIP sector is modified to allow time to incorporate Unique Emissions Factors (UEFs) into the Determination step in the Allocation process. This will provide assurance to both the Crown and participants that the Determination process is as effective as possible and all participants are treated fairly.
- 73) Modification to the Allocation process implementation timeline for the SEIP sector will necessitate a minimum one year delay to the start of the first full compliance period.
- 74) Alternatively the removal / relaxation of the capped allocation pool would provide the necessary degree of freedom to enable:
  - a) applications to be processed and parties issued units sequentially rather than being dependent on all applications to be completed; and
  - b) UEFs and emission rulings to be taken into account without requiring a new determination.
- 75) The Government should weigh up the costs of such a relaxation against the risk that the entry of the SEIP sector to the NZ ETS is deferred due to a potentially unworkable timeline.

### 6.2 Requirement for Unique Emissions Factors

- 76) Unique Emissions Factors (UEFs) have been highlighted as an input to the Allocation process that is a key element for certain participants. Although included in the CCRA the regulations have not yet been developed. The following extract from the Bulletin provides background.

***Unique emissions factors***

Section 164 of the Act allows for regulations that relate to unique emissions factors. At a high level, where there are default emissions factors (such as are provided for in the draft SEIP regulations), regulations may enable a participant to seek a unique emissions factor if they meet the relevant criteria and follow the specified process or method.

Officials are working on developing an appropriate method for establishing unique emissions factors for use in SEIP activities and will develop regulations outlining the process by mid-2009. Further consultation will be undertaken on the proposals for unique emissions in 2009.

- 77) Unique Emissions Factors (UEFs) need to be incorporated into the NZ ETS implementation timeline for the following reasons;
- a) The Draft Determination will allocate units from a fixed pool. If UEFs are submitted after the Draft or Final Determination has been published then this will require a re-draft of the Determination and introduce continued uncertainty into what each participant's final allocation will be.
  - b) Although Default Emissions Factors (DEFs) have been published, cover all sectors, and generally have been specified to at least four significant digits, in some cases the published DEF is double what the Emissions Factor is in reality.
  - c) Where no Default Emissions Factor exists it is proposed that a factor 10% higher than the highest for similar products is used, irrespective of actual emissions factor.
- 78) These variances will make a material difference to some participant's allocation and is therefore a critical element in getting the Draft Determination as accurate as possible.

### **6.3 Allocation Process**

- 79) The allocation process covers both eligibility assessment and assignment of emission units to individual firms. Although participants may be expecting the allocation process to be completed in a single step, the NZ ETS allocation is completed with a minimum of two steps.
- 80) The first step in the NZ ETS Allocation is the Allocation Plan (methodology) step, followed by the Determination (numerical) step. Once the Allocation Plan is finalised participants are required to make an application to receive an allocation of units calculated in the Determination step. Once the Final Determination is completed and published the allocated units are transferred.
- 81) The key activities in this three-step allocation process are as follows;

1. Allocation Plan
  - Allocation Plan developed in Draft form
  - Submissions to the Draft Allocation Plan called for
  - Final Allocation Plan issued and presented to house
  - Final Allocation plan comes into force
2. Determination
  - Applications for Allocation submitted
  - Eligibility reviewed
  - Preparation of Draft Determination
  - Publication of Draft Determination
  - Notification period for errors in Draft Determination
  - Final Determination published
3. Annual NZU allocation transferred based on Final Determination

82) Other steps that may be required by a participant are;

1. Emissions Ruling
  - Application for Emissions Ruling to confirm liability and/or eligibility for allocation
2. Unique Emissions Factors
  - Application for use of Unique Emissions Factors

83) Given the requirement to include UEFs in the Determination process it is necessary to complete the Regulations for UEFs, allow time for applications and approvals of UEFs prior to the start of the Draft Determination.

84) This should be seen as a mandatory Finish-to-Start dependency; where an adequate period for approval of UEFs must be finished before Draft Determination can be started.

## 6.4 Timeline Review - SEIP Entry to ETS and Allocation

### SEIP Entry to ETS

85) Full compliance with the ETS includes all sectors with a phased entry to the ETS. In some cases a company may need to be a participant in more than one sector. The introduction for the SEIP sector is shown below in Table 1.

Table 1: SEIP Sector Full Compliance and Allocation

Sector	First Full Compliance Period	Estimated Allocation Issuance
SEIP (Trade Exposed)	2010	Nov-2010
SEIP (not Trade Exposed)	2010	N / A

- 86) The Allocation process includes assessment of eligibility once information has been submitted during the “Determination” phase. The allocation process involves a number of steps and is described in more detail below.

Application for Unique Emissions Factors

- 87) The Government’s timeline does not appear to have an allowance for the time required to develop the regulations to allow Unique Emissions Factors (UEFs) to be used in the Determination process (refer Table 2: SEIP Trade Exposed Timeline).
- 88) With regards to the actual application for a UEF it is unlikely that an application will be accepted until after the regulations are finalised. However, it should be possible to prepare the application once the draft regulations have been published and get the UEF verified in parallel with the final regulations.

SEIP (Trade Exposed) Timeline

- 89) A key element of the SEIP (Trade Exposed) timeline (refer Table 2: SEIP Trade Exposed Timeline) is the need for the development of the Allocation plan, followed by submission of data into the Determination process, prior to receiving NZUs.
- 90) The time required to develop, consult and finalise the Allocation plan, followed by the time needed to do the determination (including eligibility assessment) is expected to take up nearly all of the available time between now and the end of the first full compliance year (2010).
- 91) Ballance’s opinion is based on comments from officials, notes in the Bulletin No.8 and experience of the time taken in prior Negotiated Greenhouse Agreement (NGA) eligibility assessment (2003-5).
- 92) Ballance considers its opinions on issues surrounding Allocation Plan development to be based on the following:
- a) We have incorporated the periods for each (relevant) step as per the Forestry Draft Allocation Plan<sup>11</sup> timings, yet in that document it is stated:

<sup>11</sup> Information document: New Zealand Emissions Trading Scheme – Draft Forestry Allocation Plan – p19 <http://www.maf.govt.nz/sustainable-forestry/ets/information/information.pdf>.

*“There is a very tight timeline up to the intended point of transferring NZUs some time between December 2009 (at the earliest) and April 2010. The timeline will be reassessed in April 2009 when the finalised Allocation Plan is issued.”* and

- b) We have only allowed six months (excluding 28 days for the December /January holiday season) for the preparation of the draft determination including the completion of the eligibility assessment of all applicants. As the allocation pool is determined by the applicants’ 2005 emissions, it is necessary to process all applications prior to setting the pool cap. This pool of units is then distributed to eligible firms as per the allocation plan. Our prior NGA experience tells us that this six month timeline is very ambitious.
- 93) It is expected to take one year from the publication of the Act to develop the UEF methodology, develop UEF regulations and allow for consultation. If participants prepare their applications for UEFs in parallel to the confirmation of the regulations it is still expected to take eighteen months to develop UEFs and get them approved where required.
- 94) Given the very thorough research of the timelines as currently enacted or drafted, Ballance considers at least a six month delay to the Draft Determination and a minimum one year delay to the start of the first full compliance period for the SEIP sector as a necessity.

Table 2: SEIP Trade Exposed Timeline

<b>Activity</b>	<b>Status</b>	<b>Days</b>	<b>Start</b>	<b>Complete</b>
<b><u>CCRA 2002 Reprinted 26-Sep-2008</u></b>	<b>ACT</b>	<b>1</b>	<b>26-Sep-08</b>	27-Sep-08
Draft Allocation Development Phase (Est)	<b>EST</b>	120	29-Dec-08	28-Apr-09
Draft Allocation Plan "Issued" - TBA (Est.)	<b>EST</b>	1	28-Apr-09	29-Apr-09
Submissions to the Draft Allocation Plan	<b>ACT</b>	56	29-Apr-09	24-Jun-09
Final Allocation Plan "Issued" (Est.)	<b>EST</b>	63	24-Jun-09	26-Aug-09
Final Allocation Plan "comes into force"	<b>ACT</b>	21	27-Aug-09	17-Sep-09
<b><u>Determination</u></b>			17-Sep-09	09-Nov-10
Deadline for providing data to apply for allocation	<b>ACT</b>	56	17-Sep-09	12-Nov-09
Preparation of Draft Determination	<b>EST</b>	28	12-Nov-09	10-Dec-09
Contingency in timeline for Festive & Holiday Season	<b>EST</b>	28	10-Dec-09	07-Jan-10
Contingency for Eligibility (incl. process step) Analysis of Trade Exposed applicant	<b>EST</b>	150	07-Jan-10	06-Jun-10
Publication of Draft Determination	<b>EST</b>	1	06-Jun-10	07-Jun-10
Deadline for notification of error in Draft Determination	<b>ACT</b>	28	07-Jun-10	05-Jul-10
Final Determination published	<b>EST</b>	63	05-Jul-10	06-Sep-10
Contingency in Final Determination publication date (as per draft Forestry Allocation Plan)	<b>EST</b>	63	06-Sep-10	08-Nov-10
Annual NZU transfer based on Final Determination	<b>EST</b>	1	08-Nov-10	09-Nov-10
<b><u>Annual Full Compliance Period</u></b>	<b>ACT</b>		01-Jan-10	31-Dec-10
Mandatory Participants must notify they are participants	<b>ACT</b>	28	01-Jan-10	29-Jan-10
Open a holding account and supply account number to CEO	<b>ACT</b>	14	29-Jan-10	12-Feb-10
<b><u>Period to file returns</u></b>	<b>ACT</b>		31-Dec-10	31-Mar-11
Last day for extensions	<b>ACT</b>	1	29-Mar-11	30-Mar-11
<b><u>Surrender of units</u></b>	<b>ACT</b>		01-Jan-11	30-Apr-11
CEO Publishes Information specified in Sec89(1)	<b>ACT</b>	1	29-Jun-11	30-Jun-11
<b><u>In Parallel - Develop Regulations for UEFs</u></b>			22-Sep-08	31-Dec-09
Develop Methodology	<b>EST</b>	100	22-Sep-08	31-Dec-08
Develop Regulations	<b>EST</b>	180	01-Jan-09	30-Jun-09
Consultation and Amendments to Regulations	<b>EST</b>	184	30-Jun-09	31-Dec-09
<b><u>In Parallel - Application to use UEFs</u></b>			30-Jun-09	08-Feb-10
Prepare application to use UEFs	<b>EST</b>	180	30-Jun-09	27-Dec-09
Verify UEF	<b>EST</b>	60	28-Oct-09	27-Dec-09
Review and Approval of application	<b>EST</b>	28	27-Dec-09	24-Jan-10
Notify applicant	<b>EST</b>	1	24-Jan-10	25-Jan-10
Publish in the NZ Government Gazette (weekly, during year)	<b>EST</b>	14	25-Jan-10	08-Feb-10

**Key:**

ACT = "Actual" - timing taken from Act or alternative Government document

EST = Estimate – timing estimated based on prior policy / process experience.

## 6.5 Recommendation

- 95) Ballance recommends that the implementation timeline for the SEIP sector is modified to allow time to incorporate Unique Emissions Factors (UEFs) into the Determination step in the Allocation process. This will provide assurance to both the Crown and participants that the Determination process is as effective as possible and all participants are treated fairly.
- 96) Necessary modification to the implementation timeline for the SEIP sector to allow time to incorporate Unique Emissions Factors (UEFs) into the Determination step in the Allocation process will necessitate a minimum one year delay to the start of the first full compliance period for the SEIP sector.
- 97) Alternatively the removal / relaxation of the capped allocation pool would provide the necessary degree of freedom to enable:
  - a) applications to be processed and parties issued units sequentially rather than being dependent on all applications to be completed; and
  - b) UEFs and emission rulings to be taken into account without requiring a new determination.
- 98) Ballance recommends that the Government should weigh up the costs of such a relaxation against the risk that the entry of the SEIP sector to the NZ ETS is deferred due to a potentially unworkable timeline.
- 99) Ballance recommends a similar review of the implementation timeline for the development of removal step regulations.

## 7 Concluding Comments

- 100) Since the Act was legislated, Ballance has carried out significant further reviews and analysis of the Act's practicality.
- 101) The consultation process for the Regulations is the first and only opportunity to make a formal submission to officials since the NZ ETS was launched in September 2007.
- 102) It is therefore only appropriate to take this opportunity to highlight concerns not only on the regulations but on the Act itself.
- 103) Ballance believes the NZ ETS implementation approach for domestic urea production is seriously flawed.
  - a) Ballance considers the use of the IPCC 1996 methodology to be an appropriate approximation at a national inventory level, however strict adherence to the IPCC 1996 methodology for a domestic emissions trading scheme is considered inappropriate due to the treatment of domestic and imported urea, and on a process with no mitigating opportunities.
  - b) Ballance strongly recommends that the CCRA is revised with appropriate recognition of the nature of the industrial process emissions from urea manufacturing. This recognition would take the form of an exemption for such emissions or a 100% allocation for the industrial process element
- 104) Ballance's analysis of the Regulations highlight significant gaps in development, for example; Unique Emission Factors, which jeopardise the NZ ETS implementation timeline, yet the detail focus applied in other areas (e.g. emission factors) is staggering yet immaterial.
- 105) Ballance's analysis of the implementation timeline for the SEIP sector highlights serious delays in the Allocation/Determination process even in the absence of modification to allow time to incorporate Unique Emissions Factors (UEFs). It is recommended that the Act be rigorously reviewed for dependency links and that their potential impacts be properly assessed and mitigated through Act amendments.
- 106) Ballance fully recognises that the Act was developed in a short time period and that officials faced with deadlines may not have had the time to fully consider issues fully. If the NZ ETS is to function and be durable, now is the time to ensure that all issues are properly addressed.
- 107) Ballance therefore seeks a meeting with officials to discuss the matters raised in this submission in an open, constructive and unconstrained manner.